

# Biological Objectives Stakeholder Advisory Group

## Meeting Summary

December 3, 2012

Note: The list of attendees follows the meeting minutes. Additional materials from the meeting (agenda, presentations) have been posted on the project website ([http://www.waterboards.ca.gov/plans\\_policies/biological\\_objective.shtml](http://www.waterboards.ca.gov/plans_policies/biological_objective.shtml)).

Another note: The summary captures the major issues presented and discussed during the meeting, though they are not intended as an exhaustive record of all comments made. Where it contributes to the readability of the summary, discussion of the same issue that occurred at more than one place during the meeting is summarized together. Items on which the Group expressed general agreement are indicated **in bold**, although it is important to emphasize that the Group did not vote on these items and achieving consensus is not a goal of the Group. Specific commitments by State Board staff, SCCWRP, the facilitator, or Group members are also indicated **in bold**.

### ***Meeting objectives***

The objectives of the meeting were to:

- Present an update on recommendations from the scientific advisory group
- Continue eliciting and capturing issues associated with key aspects of policy implementation

Notes on the discussion are organized according to the major topics addressed.

### ***Scientific Advisory Group update***

(See Ken Schiff's presentation (Scientific Advisory Group Update) on the project website)

Ken Schiff briefly summarized recommendations from the Scientific Advisory Group in five key areas. In priority order, these were:

- Scoring tool
- Determining scoring tool coverage
- Thresholds
- Causal assessment
- Regulatory guidance

### **Scoring Tool**

In terms of the scoring tool and its coverage, they highlighted an important distinction about exception classes. One type of exception would be applicable to areas where there is no definition of reference condition (e.g., Central Valley). The other type of exception would be applicable to sites / locations (e.g., concrete-lined channels) that might not be expected to achieve reference condition. Even in the first case, the scoring tool will still be useful for making comparisons between sites, since, for example, a score of 25 would still be worse than a score of 75.

Ken pointed out (see slide #5) that the high degree of overlap between the triangles and the red dots supports the conclusion that the scoring tool covers the background environmental conditions likely to be

encountered in California streams. This plot is based on data from the statewide reference dataset, which is available to anyone who wants to use it. The hybrid tool (see slide #3) is simply the average of the O/E and pMMI scores.

### **Thresholds**

In terms of thresholds, slide #7 illustrates options for establishing thresholds, but also shows that reference sites will fall below the threshold. Ken explained that any threshold set at a percentile of the distribution (e.g., 95%) will by definition classify some reference sites as impaired (e.g., 5%). The 5% error rate is commonly used in statistical assessment, but the threshold could be set at another level, although this is a policy not a technical decision. The low scores at some reference sites may be due to some misclassification (i.e., they are not truly reference) or the possibility that the model may not score equally well everywhere.

Slide #8 notes the science group's recommendation to use multiple samples at a test site and slide #7 shows the potential effects of using this within-site variability when determining whether the site is above or below the predetermined threshold.

The scoring tool could be used even in the absence of thresholds. This could occur in an upstream/downstream or before/after discharge scenario. In the Central Valley, where reference condition has not been defined, the bioassessment tool could be used to help implement the antidegradation policy. A threshold could also be defined in the future as more data are collected and the scoring tool improved.

### **Causal Assessment**

Ken clarified that the difference between a comparison site and a reference site is that the comparison site need not be, and in many cases should not be, a reference site. The comparison site is selected so that it differs only enough from the test site to help in highlighting the effect(s) of one or more stressors. Ken noted that the stakeholders and science team staff involved in the causal assessment case studies recommended modifying the CADDIS protocol to allow for using multiple sites and multivariate statistical approaches that evaluated multiple indicators / causal factors at a time.

The State Board will not conduct causal assessments. It is likely that regulated parties will take the lead on such studies, although these will be more productive if the regulated community and regulators collaborate. The case study teams identified this type of collaboration as the best feature of the causal assessment case studies.

Slide #10 notes that the case studies determined that CADDIS is a useful, but imperfect tool. Causal assessment will need more thought and development, as well as clear guidance, before it can be usefully applied widely. However, while it didn't always successfully identify the main stressor, it was successful in excluding some causes and this can, in many cases, be as important as or more important than identifying the cause(s).

### **Next steps for science team (slide #12)**

**There was general agreement to shift terminology from “causal assessment” to “stream impairment investigation.”**

**It was agreed that stakeholders will see drafts of the first three types of materials (documentation, journal style articles, technical reports) at or near the same time these are sent to the Scientific Advisory Group for review. However, stakeholders will wait to submit their final comments until they have had an opportunity to see and consider comments from the Scientific Advisory Group.**

This will increase transparency and enable stakeholders to benefit from comments from the scientific experts.

**In terms of the expanded web presence, Ruth Kolb (City of San Diego) and Josh Westfall (LA County Sanitation Districts) volunteered to assist in this effort.**

### ***Brainstorming discussion***

The following notes capture the raw comments, questions, and suggestions put forward by participants. These will be combined with comments from the previous meeting and organized as a basis for further discussion and policy development.

### **Impairment Listing**

1. Current listing policy allows for a listing based on biology but that this must be associated with a chemical that exceeds standards, with the implication that the chemical is the cause of the biological impairment
  - a. Thus, it is not possible to list based only on biology, although listings in some regions include arbitrary (as opposed to causal) relationships between the biological impairment and the chemical exceedance
  - b. This suggests it may be problematic to list before the cause is known, i.e., before causal assessment
  - c. If the cause is known, as for TDS in San Diego, then the listing could be for the pollutant (e.g., TDS) with biology used as a tool for assessing the effects of the control program
  - d. Would a causal assessment be required for listing, i.e., does the causal assessment occur before or after the listing?
  - e. If biological changes / impairment is due to natural causes (e.g., TDS, EC) that would argue for doing the causal assessment before a listing, in part because the sampling requirements for delisting are so much more rigorous than for listing
2. The distinction between pollution and pollutant is important, and no TMDLs are required for listings in category 4c
  - a. Causal assessment could result in moving a listing to another category
3. Biology is not a traditional pollutant and may not fit the current listing policy
  - a. Is it possible to define another framework / path that does lead to listings and TMDLs, i.e., that does not depend directly on Clean Water Act tools?
4. How does biology fit with the TMDL approach?
  - a. What is it that we are trying to accomplish through listing / TMDL?
  - b. How would a TMDL load for biology be assigned?
  - c. In which TMDL category should biology be classified?
  - d. What is the concept of a load in the context of biology?
  - e. It is difficult or impossible to calculate loads for some of the physical conditions that affect biology
  - f. USEPA has developed approaches for designing TMDLs for physical conditions
  - g. Biology might be used to track progress toward TMDL targets
5. Not all listings are resolved through a TMDL (e.g., NPDES permit conditions, nonpoint source reduction, enforcement, cleanup and abatement orders)
  - a. A TMDL is not necessarily required if another management action will address the problem
  - b. TMDLs were not always routinely used but became more prevalent as a result of lawsuits when other management tools were perceived to be ineffective
6. What is the timeframe of the listing process?
  - a. Listings are supposed to occur on a two-year schedule?

- b. Is this an appropriate timeframe for biology?
  - c. What would happen in the interim period between listings?
7. Can the causal assessment be used to confirm a current or new listing?
    - a. If the causal assessment shows that the impairment is due to natural causes, could that be used to delist? Would the sampling requirements for delisting be different in that case?
  8. How will compliance with the basic biological objective be determined?
  9. What are the space and time criteria for listing?
    - a. How many samples are needed for a listing? Per reach? Per watershed? Overall?
    - b. How will episodic vs. chronic impacts be defined and dealt with? Over what length of time must an impact persist to be listed?
    - c. Will listing be based on average condition (over some space / time) or on the simple binomial approach? An average for an area could be calculated and then multiple averages used in the binomial approach
    - d. How far does the listing extend up/downstream?
    - e. How can probability-based sampling be used for listing?
    - f. Same questions for delisting
    - g. Can biology be used to delist where a listing now exists?
  10. How can historical data be used to inform listing decisions? (e.g., evidence of variability, of significant change over time)
  11. What is the size of the grey area and its relationship to the threshold(s), and what are its implications for listing requirements?
  12. Should listings be prioritized based on recovery is more likely, distance from threshold, magnitude of impairment?
    - a. E.g., Chollas Creek (heavily impacted by multiple stressors) vs. Peñasquitos Lagoon (sedimentation issue but still in decent shape)
    - b. Regional Boards can prioritize listings for TMDL development, but it would be useful to be able to prioritize based on other management tools as well
  13. The definition of perenniality is critical to defining where the listing policy will be applied
    - a. Streams may flow year-round one year but be dry the next
    - b. Streams may be flowing in one reach and dry a short distance up/downstream
  14. Interim designation of "threatened status"? (wait to list until you have confidence)
  15. If biology exceeds a trigger, this could be used to define a pool of sites for "further investigation"; this helps ensure that further evaluation occurs without moving immediately to the TMDL trajectory. This also reduces the Type I error (i.e., false positives).
    - a. This is used in the [Region II MS4 permit
    - b. Also the purpose of Category 3 in the listing policy, although is not used much because the threshold for listing (two samples) is so low
  16. How will a responsible party be identified? What if no responsible party can be identified?
  17. How can the SWRCB's listing policy be revised?
    - a. The advisory groups can help make the case for needed changes to the policy
    - b. Biological objectives may lead to another path that doesn't require listings as they are currently formulated

### **Independent Applicability**

Water quality standards are applied to require that an impairment be found to exist if any single line of evidence exceeds its standard. This implies that, if biology is an objective, biology could be used as the basis of an impairment. But the other issue that's been raised is whether biology could be used to "trump" other (e.g., chemical) lines of evidence.

1. Each standard is currently applied independently, but does this make sense for biology?
2. A weight of evidence approach should be incorporated in some way

- a. The SQO uses this approach to ensure that a wider and complementary range of evidence is considered when determining whether a water body supports the aquatic life beneficial use
- b. However, the SQO was somewhat different because there were no existing sediment quality standards and independent applicability was not an issue; in contrast, there are existing water column objectives
- c. Other lines of evidence for perennial Wadeable streams aren't yet fully developed
- d. If a weight of evidence approach was developed, what would it look like?
3. The key question is what beneficial use the policy is trying to protect; that should help determine whether independent applicability, for purposes of this policy, would apply
  - a. However, all standards are related to some beneficial use
  - b. The SQO focused strictly on protection of aquatic life, defined as the benthic infaunal community, from effects of toxic chemicals; other types of impacts (e.g., bioaccumulation) can still be addressed by other policies and standards
4. Bioaccumulative (WILD) vs. acute (COLD, WARM) pollutant impacts
5. The policy should have the capability to discern physical vs. pollutant impacts (impairment due to toxic chemicals), for example, in cases where high EC or low DO are natural occurrences
  - a. This could be addressed through site specific objectives
  - b. However, these are very difficult to obtain; they require a Basin Plan amendment and staffing limitations at Regional Boards limit their ability to process amendments
  - c. Concerns about sidestepping CWA requirements needed for protection of listed fish species
    - i. There are instances in the state database of places where there are good bugs but conditions are bad for fish
  - d. It is important to pursue other management avenues prior to an SSO
6. How often is biology impacted relative to current listings?
  - a. State Board is doing a quick survey to identify areas where there is good biology but listings for low levels of metals
7. This raises the question of whether good biology could be used to allow an exceedance of an existing water quality objective
  - a. More specifically, if the biology meets a best attainable goal but other related water quality standards are exceeded, would the site / reach still be held accountable for meeting these other standards?
  - b. If specific chemicals can be linked to the biology and the causal assessment shows that these chemicals are not involved in any impact, then it would be possible to say that those chemicals are not a concern, even if they exceed water quality standards, thus allowing exceedances in specific situations
8. Downstream vs. upstream tributary rule for biology
9. Will dischargers need to improve water quality beyond existing standards in order to improve biology?

## **Flow**

This issue arises in the context of non-chemical stressors, for example, if diversions of flow are shown to be the cause of bad biology.

1. "flow" covers a range of situations, from natural flow to irrigation flow to effluent-dominated flow to very low or no flow which can also be natural
2. Should we be using biological objectives for managing in-stream flow?
  - a. There are lots of studies of flow criteria and it makes sense to apply the tools to support flow criteria
  - b. If so, this will raise lots of issues about water rights and existing instream flow requirements
  - c. There is still work to be done to see if flow manipulation is a stressor with a biological signal, i.e., is the new tool sensitive to changes in flow? There is quite a bit of work mostly related to dams

- and regulated flows (e.g., in the Sierra) that shows that bugs respond in predictable ways to flow manipulation, but don't want to oversell this either and assume it's applicable to all streams
- d. Can any effects due to flow be separated from effects of other instream stressors?
  - e. Probably not appropriate if this is just a way to get to flow management
3. Defining perenniality is an important first step
    - a. Should define the flow conditions under which the assessment / scoring tools work
    - b. These may be the same flow conditions under which the samples used to develop the tools were collected
    - c. Were any of these streams dry the year before? That would affect the definition of perennial
    - d. The working definition is that the stream was flowing at the time of sampling and flows year round in a normal water year (as defined by DWR)
  4. How will the policy deal with changes in flow mandated by other policies / regulations?
    - a. How will we apply the biological objectives in effluent dominated streams?
      - i. Will depend on what kind of effluent, e.g., POTW vs. stormwater
      - ii. Requirements to increase water recycling / capture may diminish flows, even to the point of drying up streams, and thus make conditions worse for bugs
    - b. Will mandated increased flows that lead to biological impacts be covered by policy? (e.g., re mandated flushing of water production facilities)
    - c. What about situations where nonpoint source runoff has turned a stream from nonperennial to perennial? (increased flow has led to healthier biota, but future MS4 permit requirements will require reduction in flows, leading to a return to more natural conditions (at least in southern CA))
  5. What about unintended secondary impacts of reduced flow? (productivity, habitat loss, connectivity to floodplain)
  6. Are biological objectives mature/sufficiently developed for flow control requirements?
  7. Will biological objectives be sufficient for flow control once additional biological indicators are included (i.e., fish, algae, etc.)?
    - a. Bugs alone are not sufficient for addressing flow requirements for hydro relicensing; these projects extend for two or three years and monitor a wide range of biological indicators
    - b. The State Board's longer-term goal is to develop additional indicators; however, these may differ from region to region depending on habitat and the types of stressors
  8. How do you deal with competing regulatory issues (i.e., FEMA pushing for more channelization for flood control)?
  9. How do you craft flexibility into minimum flow requirements to account for drought years? (e.g., offramps for special situations)
    - a. Minimum flow requirements are becoming increasingly complicated by season and circumstance, with the goal of making the stream behave more naturally. A simple biological objective based only on bugs will not be able to reflect all these effects
  10. Even if the causal assessment shows flow to be a cause of impairment, it may not be possible to then alter flows if they are controlled by other policies / factors; therefore need an offramp for such cases
  11. Water rights and instream flow requirements are complex and there is no overarching state policy or approach to this, which may impair our ability to manage flow based on the biological objectives policy

### **Thresholds**

Pete Ode introduced this topic by showing five slides used in his CABW presentation in November (see presentation "Example of Thresholds " posted on the project website).

1. There are multiple points of overlap / crossover with issues identified for the Monitoring Requirements topic
2. The choice of threshold(s) is largely a policy decision

3. How many categories should there be?
  - a. Preferred multiple categories, which would make prioritization easier and would be helpful for showing progress
  - b. Karen Larsen preferred 3 categories as in the NNE; more categories might be difficult to define, especially if there is more variability in the response
  - c. Even with multiple categories, there will still need to be a "bright line" for listing, as in the SQO, which had a line for impairment at one of the several narrative categories
  - d. The number of categories is largely a policy decision
2. Can use alternative thresholds for triggers for other actions separate from listing that might be identified in permits or other frameworks, e.g., as intended in the new Region 2 MS4 permit
  - a. However, triggers must be clearly defined, either in terms of an exceedance definition or something else
  - b. There could be a number of triggers for different kinds of actions, based on the number and/or magnitude of exceedances or other permit conditions
  - c. But need to be aware of possible requirements to conduct a reasonable potential analysis
4. There is an important distinction between a predefined gray area where a range of scores might be difficult to categorize as impaired or good vs. the uncertainty around any test site score (see slide #3)
  - a. More samples will reduce the uncertainty around a test site score
  - b. More samples should be collected when a test site score is near one of the thresholds that would define a condition category; see the example in slide #3 of Site B with just one sample – this could be in any of three categories
5. Meaningfulness of threshold management actions is perhaps more important than technical justifications
6. Simpler definition of exceedance is preferred over more complex
7. How should Type I and Type II error be balanced, and is one more important than the other?

### **Habitat Restoration**

The issue is to what extent the policy should include requirements for habitat restoration related to non-chemical causes. The Water Board has some influence over new and redevelopment, and over hydromodification, but does not have full authority over habitat restoration.

1. Restoration may be impossible if the riparian zone cannot be reset because flood control channels are surrounded by existing development; restoration may therefore be out of the regulated agencies' purview
2. Restoration planning and permitting is complex and lengthy, e.g., a quick creek restoration in San Diego can take years and more involved projects can take 12 – 15 years
  - a. There would therefore have to be a mechanism to allow a presumption of compliance during the planning effort before actual restoration is accomplished
  - b. Some TMDLs have very long timelines that could encompass restoration
3. Ensure that restoration is at least in the tool box, even if it is not required across the board
4. The scoring tool could be used to assess the effectiveness of restoration projects (as in Region 6)
5. State policy should define the goal(s) of restoration
  - a. Most streams not capable of being fully restored and of meeting reference
  - b. Need to be careful that the policy does not require full restoration / reference in order to be in compliance
  - c. It would be best to make restoration voluntary
  - d. One incentive would be to state that a permittee is in compliance as long as they are doing a restoration project
  - e. Not all restoration projects succeed, so the policy should include some provision for projects that don't succeed; it's not possible to guarantee the outcome

6. How should the disturbance due to restoration projects, and any accompanying liability, be dealt with?
7. Making sure you can identify original habitat condition
8. Can there be restoration banking or credits?
9. Sites more likely to be successfully restored could be prioritized
10. Restoration should more properly be considered at larger scales than as separate site-by-site efforts (NMFS has begun steering their funding away from small and toward larger projects)
11. Can we use non-traditional restoration techniques?
12. Can we produce examples of successful restoration projects?(Garcia River, Forester Creek in San Diego, Napa River, Region 6) (successful and unsuccessful restoration techniques)
13. Can we produce an integrated restoration plan? (reach, stream, watershed, regional scales)
14. Need to ensure that restoration of invertebrate habitat can help all beneficial uses; what needs to be restored may not be bug habitat
15. Be aware of jurisdictional desires to keep restoration projects local, even if projects outside the jurisdiction would be more effective
  - a. Often have to take the projects that are funded and go ahead with those even if another project would make more sense
  - b. Despite that, it would be useful to identify priorities because that could over time change funding decisions
  - c. Something like mitigation credits or banking could enable local entities to benefit from doing a project outside their jurisdiction
16. What is the nexus between biological objectives and the stream protection (wetland and riparian) policy? The State Board is coordinating to the best of their ability

### **Causal Assessment / Stream Impairment Investigation**

1. There will be many sites where causal assessment should occur and need prioritization guidance
  - a. Based on proximity to the impairment threshold; sites that are closer would have a higher priority
  - b. Based on risk of significant degradation to an otherwise good water body (e.g., Peñasquitos Lagoon)
  - c. Based on upper limit on cost and/or total number
  - d. Based on existing knowledge of causes / stressors, i.e., already know enough to bypass a full causal assessment
  - e. Based on likelihood of success and ability to deal with candidate causes / stressor(s)
  - f. Based on presence of listed species
  - g. Where public health concerns may also exist
  - h. Based on need for habitat restoration and/or changes to flow; this will be more complex and involve more parties and may have a lower chance of success
  - i. Use the USEPA Recovery Potential Scoring Tool
2. Need a good guidance document
3. A causal assessment may not always be needed, if already understand the problem (MS4 permit in Region 2 allows for this)
4. When do you have to conduct the causal assessment (before or after listing); how it is conducted and used will depend on where in the process it is conducted
5. Need for modifying and improving the EPA CADDIS framework
6. Can you set an expectation that would limit the # of investigations by a regulated party (resource intensive)
7. What is the likelihood of success?
8. If existing TMDLs are being implemented, can be used in lieu of causal assessment
9. Causal assessments could be used to contest an existing listing, where there is information to suggest that the listed factors are not the cause of the biological impairment
10. Can you develop training and certification of Causal Assessment



11. Must be mandatory? It may be better to make it voluntary for proactive agencies but there may also be downsides to this, e.g., less information to use in setting priorities
12. Linkage to natural source exclusion policy?

### ***Next meeting and next steps***

The next meeting was scheduled for the day after State Board's January 23 workshop on biological objectives, i.e., January 24.

**Karen Larsen agreed to summarize the issues discussed and combine them into specific categories and send them out to the two groups by the 1<sup>st</sup> week of January.** This material will provide raw material and structure for developing the draft policy document.

**Participants agreed to assist in preparing draft language for sections of the draft policy document, but will wait to do so until Karen Larsen has developed a strawman framework to help organize thinking and writing. Specifically, Tess Dunham volunteered to assist on developing legal concepts and language associated with "beneficial use objectives." Karen Ashby volunteered to assist in preparing issue papers for the eight major issues discussed at this meeting and the previous meeting.**

**Ruth Kolb and Josh Westfall volunteered to assist in developing a more informative web presence for the project to better support implementation.**

## Attendees

Name	Organization	Representing
<i>Staff</i>		
Brock Bernstein	Facilitator, Committee Chair	
Karen Larsen	State Water Board	
Peter Ode	CA Dept. Fish and Game	
Ken Schiff	SCCWRP	
<i>Stakeholder group members</i>		
Parry Klassen	East San Joaquin Water Quality Coalition	Agriculture
Chris Sommers (P)	CASQA / EOA	Flood / Munic / SW
Ruth Kolb	City of San Diego	Flood / Munic / SW
Ed Struffenegger (P)	CA Forestry Association	Forestry / Timber
Ed Cheslak (P)	Pacific Gas & Electric	Hydro / Utilities
Theresa Dunham	Somach Simmons & Dunn	Pesticide Manufacturers
Phil Markle	LA County Sanitation Districts	POTW
David Bolland	Assoc. CA Water Agencies	Water Agencies
<i>Regulatory group members</i>		
Jonathan Warmerdam (P)	Regional Water Board Region 1	
Tom Mumley (P)	Regional Water Board Region 2	
Ben Livsey (P)	Regional Water Board Region 2	
Lisa McCann (P)	Regional Water Board Region 3	
Karen Worcester (P)	Regional Water Board Region 3	
LB Nye	Regional Water Board Region 4	
Alan Miller	Regional Water Board Region 6	
Clay Brandow (P)	Cal Fire	
<i>Other participants</i>		
Geremew Amenu (P)	LA County Dept. Public Works	
Arne Anselm (P)	Ventura County Watershed Protection	
Karen Ashby	Larry Walker Associates	
Lauren Bauer (P)	Kern County Water Agency	
Eric Berntsen (P)	Water Board	
Clint Boscher	Tetra Tech	
Lilian Busse (P)	San Diego Regional Water Board	
Amanda Carr	City of Irvine	
Paul Cobian	City of Los Angeles	
Melissa Dekar (P)	Water Board	
Joe Dillon	NOAA Fisheries	
Jan Dougall	Las Virgenes Municipal Water District	
Diana Engle (P)	Larry Walker Associates	
Tessa Fojut (P)	Water Boards	
Terry Fleming (P)	USEPA	
Drew Gantner (P)	Pacific Ecorisk	
Gail Delhant (P)	Western Growers Association	
Bobby Gustafson	City of Santa Barbara	
Bruce Houdesheldt (P)	Northern California Water	
Emiko Innes	LA County Dept. Public Works	
Al Javier	Eastern Municipal Water District	
Scott Johnson (P)	Aquatic Bio Consulting	
Nardy Khan (P)	Orange County Public Works	

<b>Name</b>	<b>Organization</b>	<b>Representing</b>
Clifton Lollar	KRWA	
Joe Miyamoto (P)	East Bay Municipal Utility District	
Jeff Orrell (P)	Brown and Winters	
Katherine Powe	Heal the Bay	
John Rudolph	AMEC	
Eric Stein	SCCWRP	
Tom Suk (P)	Lahontan Regional Water Board	
Jennifer Torres (P)	City of Corona	
Martice Vasquez	Water Board	
Lori Webber (P)	State Water Board	
Debbie Webster (P)	Central Valley Clean Water Authority	
Dennis Westcot (P)	SJRG / SJTA	
Josh Westfall	LA County Sanitation Districts	
Marsha Westropp	Orange County Watersheds	

(P) indicates remote participation by phone and Webex