San Diego Creek Watershed Casual Assessment Project
Informative Workshop #1
SCCWRP
December 17, 2014; 9-3:30 PM

Meeting Notes

1. Greetings/Introductions: The list of people who attended the meeting is attached to the end of these notes.

2. Casual Assessment Training: The morning was devoted to the casual assessment process. David Gillett (SCCWRP) gave a series of presentations introducing casual assessment and explaining the five step casual assessment process developed by US EPA. Ken Schiff (SCCWRP) gave a presentation on linking causal assessment to the bio-integrity of streams.

   The presentations can be downloaded from the Regional Board website: http://www.waterboards.ca.gov/santaana/water_issues/programs/planning/causal_assessment.shtml.

   A recording of the workshop is also available at the following links:
   Part 1: http://vimeo.com/sccwrp/review/114934067/d0bb1be25e
   Part 2: http://vimeo.com/sccwrp/review/115006980/ab918ddb3e

3. San Diego Creek Characterization: The afternoon was focused on defining the parameters for the San Diego Creek casual assessment project. Regional Board staff gave a short presentation describing the resident biota in the San Diego Creek and the Newport Bay Watershed region in general.

   Notes/Comments
   - Presentation focused on County data set collected from eleven targeted sites in the Newport Bay Watershed and adjacent areas. Sites were sampled twice yearly (spring and fall) from spring 2006- fall 2008
   - Three of the four top taxa in San Diego Creek & Peters Canyon Wash tend to be non-insects (Ostracods, *Hyallela azteca* (Amphipod), and Oligochaetes)
   - Buck Gully had a major restoration done in 2011 – post-restoration biota may be different
   - Bonita Creek, though having a thick riparian zone, was sampled in an area that was entrenched. Bonita Creek was a construction site in the 1980s and restored in the 1990s. Site may serve as a useful comparison site for riparian vegetation
   - Fall/spring pattern in *Hyallela* counts doesn't correlate with the measured toxicity data but *Hyallela* strains in the field may have adapted or have a divergence in the genetic makeup vs the lab strains. Reference toxicants are run however. Hardness/conductivity in the creek may also be a confounding factor.
   - SCCWRP cautioned against leaping to conclusions concerning the relationship between channel type and resident biota
   - How to address significant changes in IBI from different adjacent sections of creek? SCCWRP suggests taking care in aggregating sites

- Different collection methods – There is some difference between the targeted riffle/pool approach (used by the County prior to 2009) versus the reach-wide benthos method (currently being used). Although there is a difference, research indicates it is not that significant
- Two fires occurred within the time window (2006-2008) covered by the County's data set and may have affected the local reference sites. Need to look for these outlier events and exercise caution when aggregating data
- The local reference sites from the County's data set (Silverado, Modjeska, Santiago creeks) may not be applicable to San Diego Creek – the systems are totally different.
- The state's Reference Condition Monitoring Program has a specific definition of reference sites. This is an improvement to the original IBI, as more lowland xeric sites are included. The CSCI performs a bit better with fewer false positives and false negatives than the old IBI approach.

4. Case Definition: The afternoon was focused on defining the parameters for the San Diego Creek assessment:
    - Confirming the spatial and temporal extent of test sites
    - Selecting biological endpoints to use for the assessment
    - Selecting the comparator site approach from the following options
        a. Instream (upstream vs downstream)
        b. Local area (based on biogeography)
        c. Empirical selection
    - Identifying a preliminary set of candidate causes

5. Discussion Items

Spatial/Temporal Extent: RWQCB staff proposed the 8,250 feet Jeffrey – Culver reach of San Diego Creek for the assessment. Four sites were sampled in 2006, 2009, 2011, and 2013, with an IBI average of 12. One site had replicate sample collected; another was sampled twice in two separate years (total of six data points).

Issue: How does selenium fit in to this?
Response: It would be a potential candidate cause. Selenium affects the higher trophic levels. Bird & fish health could be a viable biological endpoint – if we have the data. The food web needs to be captured in a conceptual model. Selenium concentrations in the reaches of San Diego Creek being considered for the assessment are low relatively (below the CTR).

Issue: There are extreme differences within San Diego Creek – how applicable will the causal assessment be to other reaches of the creek?
Response: Strictly speaking the assessment will be specific to the 150-meter reaches where the data are from. The stretches of San Diego Creek we are considering would likely have similar biology absent variable channel alteration. The different reaches can serve as comparator sites.

Issue: If the causal assessment finds no impact due to sediment – will that enable us to get over the line with the TMDL? Will the one reach be enough to apply to the whole listed portion of San Diego Creek for TMDL purposes?
Response: The Jeffrey to Culver reach is the section most impacted by sediment accumulation so it should be representative for the TMDL.

Issue: Jeffrey-Culver reach is not significantly influenced by groundwater, making it simpler to assess than the downstream reaches. Also it is a historically existing segment as opposed to the reach downstream of Culver.
Response: It is best to simplify the problem as much as possible. The engineered portions are still technically a stream though.

Issue: Will the other reaches of San Diego Creek be considered as candidate comparison sites?
Response: Eventually yes.

Issue: How do you handle sites in newly created, highly-engineered reaches that weren't there before versus sites from reaches that were modified from a previously existing creek. We should look at traditionally existing sites.
Response: If it has the same water going through different reaches it may help us understand the influence of engineering on biology. We want the comparison site to be somewhat different for compare/contrast purposes.

Issue: Will we be looking at just one site within the Jeffrey-Culver reach?
Response: It is up for debate. Using multiple sites may expand the representativeness of the assessment. SCCWRP will be doing a separate multisite approach regardless.

Issue: What years shall we deal with? Are there outlier years we need to eliminate? Do we need a long-enough timeframe to answer the question of sediment accumulation rate, for example?
Response: Assessment won't be able to answer the sediment accumulation question.

Issue: What if we have data gaps? How about if the chemistry data shows differences between years? Do we average the data?
Response: If there is enough data then averaging is ok, otherwise we will have to make a decision on a case-by-case basis.

Issue: Some of the physical data (e.g. velocity) show large variation between field crews. Need caution when using these data.
Response: We need to take this into account. May want to use CRAM data rather than pHab data from the bioassessment. We also have gaging stations along San Diego Creek so we can use that data instead.

Issue: What variability is there in taxa?
Response: IBI scores in the Jeffrey-Culver reach ranged from 0 to 23. *Fallceon quilleri* numbers fluctuated greatly. Would not put much stock on variability of a single species

though. It is better to look at functional feeding groups than variability in individual or grouped taxa. Organisms could be present within the creek for only one or two weeks of their lifecycle. Need to generate a functional feeding group analysis for this reach of San Diego Creek for the next meeting.

Issue: Should we exclude sites that don't have multiple years of sampling? *Response:* There are some differences in available data: 2013 has associated algae and CRAM data , but not 2009 or earlier. There are several other differences. Start with a wide net and then narrow the test sites if necessary.

Biological Endpoints: What aspects of biology are we going to be dealing with? We can use the IBI or CSCI (California Stream Condition Index). SCCWRP strongly recommends using the CSCI. All SMC (Stormwater Monitoring Coalition) sites have CSCI scores calculated. We also have algal IBI data. We could also use indicator taxa because we have species lists for all these sites. CSCI is a nice tool because it has two components: a species richness score, represented with an Observed/Expected (O/E) score, and an MMI (Multi-Metric Index) score. The algae index also has two components: soft algae and diatoms. In previous casual assessments, submetrics of the IBI were used but SCCWRP recommends against this.

Response: If sediment is stressing the taxa what species are going to be missing? Scrapers? Sedimentation ties into simplification of habitat. Algae also are great indicators of sedimentation. Can look at organisms mobility – they can move very quickly and recover quickly.

Issue: Can we have multiple biological endpoints? Should we start with a larger set of endpoints and then whittle it down?
Response: It is doable but may end up with large workload of e.g. 5 candidate causes X 20 proximate stressors X 12 biological indicators X 6 lines of evidence. Previous assessments used 4 to 8 indicators and did not consider algae.

Issue: Are we concerned about toxics/pyrethroids in sediment? Will our metrics allow us to assess this stressor?
Response: Cyanotoxins will allow assessment of toxicity. Some 2013 data had cyanotoxins collected. There is a good chance that cyanotoxin (specifically microcystin) data is available in the watershed. SCCWRP is doing research on cyanotoxins – they may be a cause of unattributed stream toxicity. Cyanobacteria thrive where there is no canopy cover. The H-twenty (H20) algal index is similar to the CSCI.

Physical habitat alteration: all endpoints will respond to habitat modification.

Comparator Sites: Options for selecting comparator sites are (1) instream (upstream vs downstream), (2) local area and best professional judgment based on biogeography, (3) empirical selection based on natural gradients statewide but then constrained by biogeography (using GIS layers). SCCWRP will be using the empirical approach with site similarity determined by principal component analysis (PCA). A modification of this approach would be to restrict the comparator sites to a local area (e.g. coastal Southern

California). “Empirical” means that the sites will be selected from the statewide database by using thresholds from the PCA or other statistical measures.

Response: If we could find an urbanized flood control channel similar to San Diego Creek that wasn’t experiencing sediment accumulation, and looked at the CSCI score, that would give us the maximum score we could expect and give us a target to work toward with implementation of BMPs. SMC will be doing something similar to this – collecting detailed information on channel engineering to pair with the bioassessment data. For this project we could spot-check or use a GIS layer on engineered channels to guide the selection of the comparator sites. County has a GIS layer on their cluster analysis of the bioassessment sites.

Issue: What is the range of comparator sites that is recommended?
Response: The more data points you have for the stressor-response relationship the better.

Issue: Could we include Buck Gully, Bonita Creek, and Big Canyon?
Response: These are older county data that would need to be have the watershed delineated, and the biota rescored with the CSCI. They would then be automatically added to the comparator pool and could be used as comparator sites for any other site.

Candidate Causes: What are causes that might have impact on biota?

Issue: Can sedimentation be broken down into legacy sediment accumulation versus annual sediment loading rate. Is this significant for the biology?
Response: This can be done but it may overlap with habitat simplification. This can be referred to as annual sediment accumulation. If the annual accumulation is not important then it may be a simpler issue of removing the legacy accumulated sediment to restore the biology. Channel sediment properties will be part of the habitat simplification cause.

Issue: How to account for channel maintenance/management?
Response: Include channel operation and maintenance as candidate cause.

Issue: Pesticides. Should this be related to land use (agricultural, commercial, residential)?
Response: Better to not break it down by source. Leave it as pesticides for the moment. Different chemicals have different sensitivities to the benthic community. Need to analyze this at the specific pesticide level. For now is okay to aggregate as pesticides.

Issue: During strawberry growing season we see massive runoff from ag fields.
Response: Better to group by mode of action on organisms.

Issue: Nutrients.
Response: Include as candidate cause. Bonita Creek has low nutrient concentrations and may be a useful comparator.

Issue: Metals.
Response: Copper is the only one that seemed to be the only metal that had correlations with biota in the County’s data set.

Issue: Flow. What is influence of flow regime on biology?
Response: Highest bioassessment score in San Diego Creek occurred during low flow year.

Issue: Hydromodification (changing land use and hydrology due to land development)
Response: Aspects of this will be captured in flow candidate cause.

Issue: Recycled water.
Response: We have a lot of spills/breaks from the reclaimed water lines. It is prohibited from discharge to the creeks but there are often accidents. Another aspect of recycled water is conductivity. San Diego Creek is typically around 2,000. That will structure the biota.

Issue: Vector control.
Response: They should only be targeting mosquitoes. Bob Stein will check on this.

6. Next Meeting

We will schedule an interactive meeting after the new year to drill down on these issues.

Attachment 1: Attendees Calling in to Workshop

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