ASBS Special Protections
Deadline: 9/1/06 5pm

TENERA Environmental

August 31, 2006

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State Water Resources Control Board
Division of Water Quality
Stormwater Section, Ocean Unit

Subject: Comments to special protections to address storm water and nonpoint source discharges

Hello Dominic:

I was glad I attended the ASBS discharge meeting in Monterey. It was informative. My input regards the biological (benthic) monitoring component of the Proposed Draft Amendments to the Standard Monitoring Procedures (Appendix III) of the California Ocean Plan.

As it presently states on page 4 of the meeting handout: "At a minimum, impact and reference areas are to be surveyed once during each permit cycle". I feel there could be much more description to clarify the purpose of these surveys, mainly for reasons to make clear the study objectives, clarification to the discharger in what they are signing up for, and to scientists who would be conducting the surveys or who would be involved with interpreting the results.

Points that could be further discussed:

1. Are the surveys just to describe the biological communities with no reasons given in reports on why the impact and reference sites differ in species composition and abundance? All areas of the intertidal zone will be different regardless of whether a storm drain is present or not. All that might be accomplished in a one-time survey is a general characterization of what is there with no ability to differentiate impacts from natural variation. If everything 'appears' relatively similar between sites, then one might conclude that impacts are not apparent. However, a more appropriate conclusion would be that the findings are inconclusive. Impacts might be more strongly revealed and convincing where there is a visible gradient in species composition and abundance with distance from the pipe.
2. Is the study to describe/detect impacts from the storm drain using areas with no storm drains as reference/controls? Or, is the study to differentiate impacts from storm drains versus 'natural runoff'. Would 'natural runoff' be groundwater seeps or surface flows through ravines and creeks? In all cases, much care must be given as to what constitutes suitable controls.
3. Are the surveys to provide data to statistically analyze for impacts (or statistically confirm a lack of impacts), or is the impact assessment to be based largely on professional judgment because data is limited or not suitable for rigorous statistical analysis? In other words, does any impact conclusion need to be supported by statistical analysis? If statistical analyses are to be performed, I think there should be much more discussion on how much and in what manner the data needs to be collected.

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4. Using the mean and variance values of quadrats sampled near a storm drain and statistical analyzing them (or comparing them directly) to the mean and variance values from quadrats along a nearby reference transect to determine whether an impact exists is an analysis of data from a pseudo-replicated study. More appropriately, the analysis should compare the differences between the storm drain sites and corresponding reference sites (e.g., 50 storm drain and 50 corresponding reference sites analyzed in one analysis). In this scenario, the transects become the replicates, not the quadrats. This necessitates a regional study approach and would require collaboration among dischargers.
5. The study design, replication, sampling methods, and criteria for reference sites should be standardized across dischargers to the best extent practical for site-specific and regional comparisons.
6. The time of survey is crucial, as storm water discharges may affect species during the wet season, but the effect may not linger though the dry season, due to quick bio-recovery potential.
7. Multivariate analysis methods might more appropriate for this type of study.
8. There was some discussion in the meeting that BMPs might be implemented more rigorously to clean up water, and that the success of the BMPs should be confirmed by examining improvements in the receiving water biological communities. On this note, are the surveys supposed to also detect biological changes linked to discharge cleanup efforts? If so, more than one bio survey would be needed, and the study would likely need to be very rigorous with much replication and repeated surveys to account for seasonal and inter-annual variation. This might be beyond scope and reasonability. A minimum of one baseline survey followed by multiple surveys would be needed (before-after-control-impact study design). Even with this, the study might still be data-limited for univariate statistical analysis because the surveys (differences between control and impact areas over time=deltas) would become the replicates for statistical analysis. We were able to detect responses in impact areas as different from controls, but we had over 30 before-surveys and over 40 after-surveys in control and impact areas (data collected over a 20+ yr period).
9. What is the desired ecological result from storm water cleanup? What criteria would be used to define recovery or the desired resulting community based on the bio-monitoring results? All definitions of recovery can be challenged (e.g., this occurred with the Exxon Valdez oil spill), so there must be a prior understanding as to what would constitute recovery with regards to storm water cleanup. Convergence to controls might not be an appropriate criteria to base recovery, as impact and control areas might be different and remain different regardless of whether a storm drain is present or not. Also, criteria would be needed to define a storm drain impact.
10. Limiting the storm drain surveys to only pipes that empty directly onto rocky habitat can reduce extraneous variation within and between sites. This precludes sampling of pipes that discharge onto sandy beaches. However, the monitoring can include sediment samples from those pipes for bioassay testing.
11. Assessment of storm drain impacts must take into account whether impacts from visitor uses are present (e.g., trampling, collecting), as visitor impacts can create the same impacts as storm drain impacts.

12. A gradient study might be an appropriate alternative sampling approach, but needs further discussion.

Other considerations:

1. It is my understanding that the State needs data to assess whether a particular storm drain or suite of storm drains are individually or collectively resulting in negative impacts to the marine community, in terms of the number of species affected, magnitude of effects, and also the temporal and spatial scales of effects. However, this would likely require an extensive and expensive field sampling program. Limiting surveys to target species, indicator species, and/or target habitats might control costs.
2. The discharger would not likely want to pay for an intensive long-term monitoring program (as you already know).

Suggestions:

1. Unless this has been done, a team of intertidal ecologists should complete reconnaissance surveys at a subset of 'representative' storm drain sites throughout geographical regions (e.g., Monterey Bay, Orange County) during both the wet and dry season to gain a qualitative impression of storm drain impacts/lack of impacts, the species affected/not affected, and spatial scale of effects/no effects. Reference sites should also be identified. A report or briefing on the findings can be shared. I have such information for Duxbury Reef that I can share as a starting point.
2. In a workshop, the State could then use the information from the reconnaissance surveys to help refine the purpose of the monitoring and the appropriate study design to meet project objectives. A framework of criteria can be established to help define impacts, recovery, and desired community components.
3. The results of the workshop should be taken to the stakeholders for their input.
4. Subtidal biological studies can be implemented only if the intertidal studies reveal effects that are large in magnitude, species affected, and large in spatial and temporal scales.

If you have any questions on all this I would be happy to discuss them with you. I would be interested in your input and suggestions, and would be glad to help out in any manner.

Sincerely,

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