Regional Water Quality Control Board
Los Angeles Region

Surface Water Ambient Monitoring Program

FY 2006/07 Workplan

March 18, 2008

1. Introduction

The Los Angeles Regional Board has a monitoring allocation of $317,900 from Fiscal Year 2006-7. We plan to utilize these funds to help implement SWAMP's statewide Perennial Stream Assessment (PSA).

SWAMP plans to begin a statewide PSA in spring/summer 2008. The Southern California portion of the PSA is intended to be funded and implemented via a monitoring design developed by the Stormwater Monitoring Coalition; however, this effort is not scheduled to commence until 2009. Consequently, Region 4 plans to allocate approximately $225,000 to begin this effort in 2008 within the Los Angeles Region to complement the statewide PSA.

2. Goals and Objectives/Assessment Questions

The SWAMP PSA is designed to build upon eight years of previous stream monitoring (Environmental Monitoring and Assessment Program and California Monitoring and Assessment Program studies) conducted throughout the state at more than 400 sites. The PSA will evaluate status and trends of the Aquatic Life Beneficial Use in wadeable streams and establish a context for interpreting aquatic life conditions measured by other statewide and regional programs. The PSA will help develop tools for monitoring the health of the aquatic life beneficial use.

The SWAMP PSA will rely upon a probabilistic design to produce condition assessments of the state's perennial streams, i.e., what percentage (or number of stream miles) fall into the category of non-impaired, impaired or very impaired based upon biological indicators (benthic macroinvertebrate and periphyton communities, riparian condition). The design also will allow condition assessments for four types of land uses: agricultural, urban, forested and other. In addition, the design is intended to produce stressor extent and relative risk estimates, which would identify the greatest threats to stream condition (these estimates would be based primarily on physical habitat, nutrient and conventional chemistry measurements). The SWAMP PSA plans to conduct sampling at approximately 100 random monitoring sites throughout the state in 2008, and would continue with this level of random sampling at new sites in subsequent years.

The Stormwater Monitoring Coalition (SMC) is a coalition of stormwater management agencies and Regional Water Quality Control Boards (RWQCBs) from Ventura to San Diego. The SMC has designed a Regional Watershed Monitoring Program to address three questions of importance to regulated agencies, regulatory organizations, and public:

1) What is the condition of streams in Southern California?;
2) What are the major stressors to aquatic life?
3) Are conditions in locations of special interest getting better or worse?

The first question addresses the magnitude and spatial extent of impacts of all streams in the region using a probabilistic sampling design. The goal will be to achieve an estimate of impacted stream miles at varying severity of impairment. In addition, the spatial extent of impact will be compared among watersheds and land uses. Therefore, stratification of the probabilistic design will occur across 15 different watershed areas that are defined by management units (hereafter referred to as "watersheds"). Stratification will also occur across three different land uses defined as urban, agricultural, and open. At each site, multiple indicators will be used to assess the ecological health of the stream, including water chemistry, aquatic toxicity, benthic macroinvertebrate community structure, periphyton community structure and biomass, and physical and riparian habitat. The goal of the program is to monitor at least 30 sites per watershed over a five-year period, i.e., 6 sites per watershed per year.

The second question addresses the stressors that affect the health of streams in Southern California. The goal of this component is to build upon the stressor and response data collected in the first component to develop a relative risk index. The third question addresses the temporal changes in stream health at locations of primary interest to managers. The goal is to assess if stream health is improving, degrading, or remaining static over time. A targeted monitoring design that focuses on watershed sites that integrate upstream inputs is preferred. To answer this question, we will set up a network of long-term monitoring sites across the region. All coastal watersheds will have at least one long-term monitoring site located at the bottom of the watershed.

Since the statewide PSA will begin in 2008, but the SMC program is unable to start until 2009, Region 4 decided to fund implementation of the SMC design without our region in 2008. Six of the watersheds identified in the SMC Regional Monitoring Program fall within the Los Angeles region. Monitoring within two of these watersheds (San Gabriel River and Los Angeles River Watersheds) will be covered by existing regional programs. Therefore, Region 4 will supply funding to cover monitoring in the remaining four watersheds in our region (Ventura River, Calleguas Creek, Santa Clara River and Santa Monica Bay Watersheds).

The primary goal of the proposed Region 4 perennial stream monitoring will be to evaluate the status of the aquatic life beneficial use throughout the region. This goal will be achieved by answering the following questions:

1. What percent (or number of stream miles) of Region 4's perennial streams are non-impaired, impaired or very impaired for the aquatic life beneficial use?

2. What percent (or number of stream miles) of each of Region 4's six watersheds are non-impaired, impaired or very impaired the aquatic life beneficial use?
3. What percent (or number of stream miles) of agricultural, urban or other land uses within Region 4 are non-impaired, impaired or very impaired the aquatic life beneficial use?
4. What stressors are responsible for observed impairments within region 4? [note: the probabilistic design may only provide a general indication of potential stressors and more detailed targeted and/or site-specific monitoring may be necessary to fully identify stressors]
5. Are aquatic life beneficial use conditions getting better or worse throughout Region 4 over time? [note: this is contingent upon successful continuation of the SMC Regional Monitoring Program in 2009 and subsequent years]
6. How does the proportion of perennial streams in Region 4 falling within the three condition categories defined in questions 1, 2 and 3 compare to other regions and to the state as a whole? [note: this is contingent upon successful implementation of the statewide monitoring program design]

3. Monitoring Design

The SMC Regional Monitoring Program design recommends sampling a minimum of 6 random sites per watershed per year (to accumulate the desired total of 30 sites per watershed within at least a five-year period), which they intend to begin in 2009. However, Region 4 would like to ensure that sampling begins in 2008 within the six watersheds in the Los Angeles Region.

Two of these six watersheds will be covered by existing efforts. The San Gabriel River Watershed Monitoring Program, funded by a group of stakeholders, began probabilistic sampling of the watershed in 2005 (partially funded by SWAMP) and sampled 30 random sites that year. In 2006 and 2007, that program sampled an additional 10 new random sites each year (without any SWAMP funding) and plans to continue with that level of effort in 2008 and subsequent years (again, without the need for any SWAMP funding). The Los Angeles River Watershed was sampled by SWAMP in 2005, including 15 random sites. The Los Angeles River Watershed Monitoring Program, funded by a group of stakeholders, plans to sample an additional 15 random sites in 2008 (without any SWAMP funding), and would expect to sample 10 new random sites in 2009 and subsequent years.

Region 4 would fund implementation of the SMC design to monitor in 2008 in the other four watersheds in the Los Angeles Region (Calleguas Creek, Ventura River, Santa Clara River and Santa Monica Bay Watersheds). We plan to sample 6 random sites in the two smaller watersheds (Calleguas Creek, Ventura River), and 10 random sites in the two larger watersheds (Santa Monica Bay and

Santa Clara River. This would cost approximately $317,900 and would include the following parameters:

MONITORING COMPONENT	DETAILS
Water Chemistry	
-conventional measurements	Temperature, conductivity, dissolved oxygen, alkalinity, hardness, calcium, sulfide
-nutrients	Ammonia, nitrate, nitrite, total nitrogen, orthophosphate, total phosphorus
-trace metals	Total and dissolved arsenic, cadmium, chromium, copper, iron, lead, nickel, zinc
-pyrethroid pesticides	
Water toxicity	
-chronic and acute toxicity	*Ceriodaphnia*
Biological Indicators	
-Benthic macroinvertebrates	Community measures, physical habitat
-Periphyton	Soft algae, diatoms, ash free dry weight biomass, chlorophyll a
-Wetland status	CRAM

Sampling will be conducted under the SWAMP Master Contract by field crews from the California Department of Fish and Game. Toxicity testing will be conducted by the Aquatic Toxicity Laboratory in Davis. Chemical analyses will be conducted by the California Department of Fish and Game Laboratory in Rancho Cordova.

4. Implementation

Stream sampling should not begin until at least 30 days following the last significant rainfall event in Southern California, to allow the benthic macroinvertebrate community sufficient time to become established. Sampling could begin as early as April and we would expect all field work to be completed by the end of May, although it is possible that sampling could continue into June or even July if necessary (which is still within the valid assessment period for the benthic macroinvertebrate and periphyton communities in Southern California).

5. Data Analysis and Reporting

At each site, multiple indicators will be used to assess the ecological health of the stream, including water chemistry, aquatic toxicity, benthic macroinvertebrate community structure, periphyton community structure and biomass, and physical

and riparian habitat. Impacts will be defined by thresholds for each indicator, such as comparison with established benchmarks or standards for water quality. Macroinvertebrate communities will be evaluated by calculating the Southern California Index of Biotic Integrity and by multivariate tools, such as the RIVPACS ratio of observed to expected taxa. A periphyton index of biotic integrity for southern California is currently under development, with a draft IBI expected in 2010. Riparian condition will be evaluated by the California Rapid Assessment Method (CRAM) index.

The Los Angeles River and San Gabriel River Watershed Monitoring programs will produce annual reports for data collected within their watersheds. The annual reports on 2008 data should be available in 2009. The Southern California Coastal Water Research Project probably will be responsible for assessing data collected by the Stormwater Monitoring Coalition. However, Region 4 staff probably will produce a report assessing the data collected in 2008 within the Los Angeles region; this report would be expected to be available in 2009 or 2010.