



ASSESSING ECOLOGICAL HEALTH OF THE SAN DIEGO RIVER WATERSHED

MONITORING & ASSESSMENT
SAN DIEGO WATER BOARD
v2, June 2016

ARE
ECOSYSTEMS
HEALTHY

Is it safe to
swim

Are fish and
shellfish safe
to eat

Is water safe
to drink

San Diego River

Watershed quick facts:

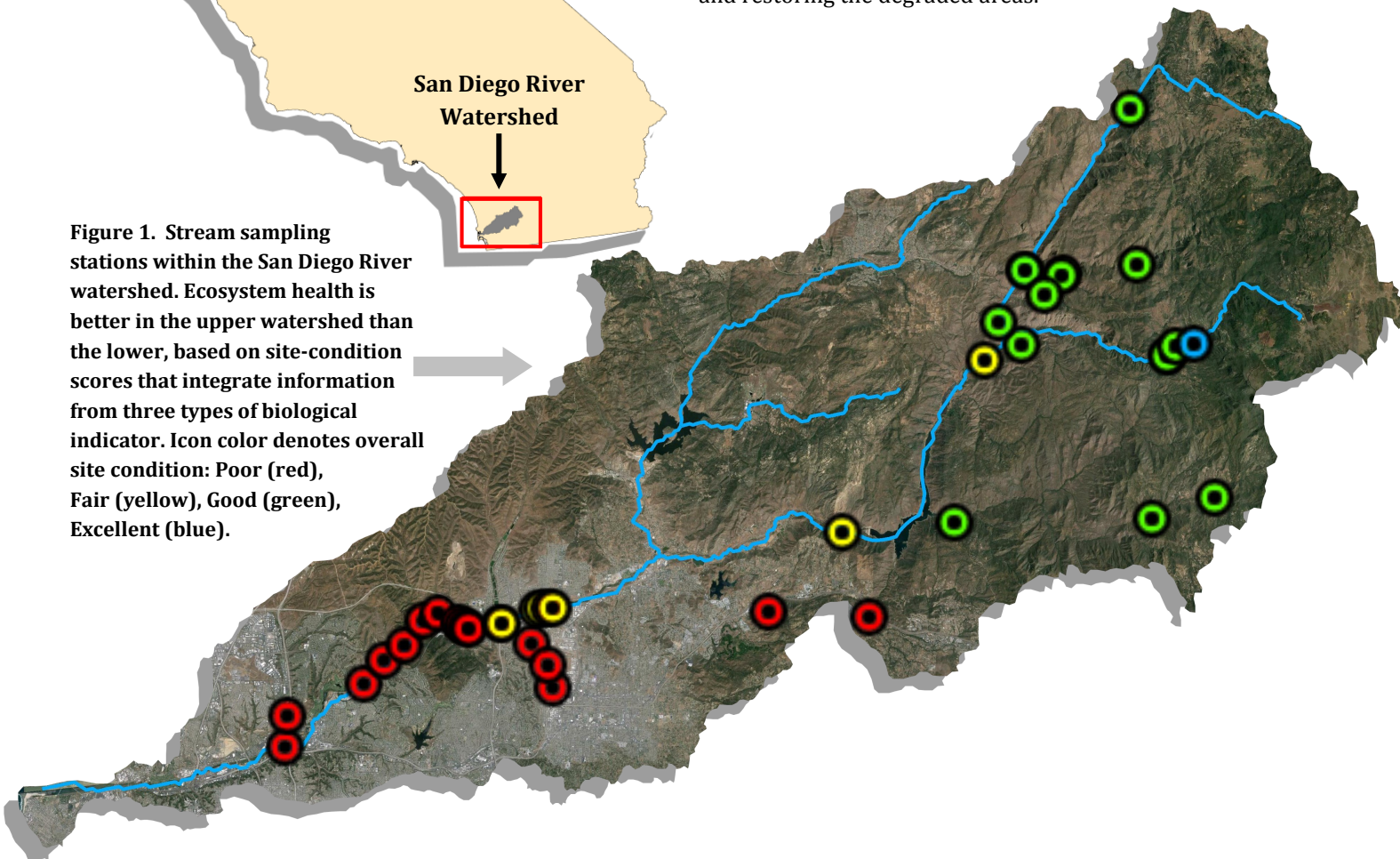
- 440 square miles
- 500,000+ residents
- six municipalities
- five tribes
- five reservoirs
- California's "birthplace"
 - 25+ sensitive species
 - 25 million visitors

BENEFITS OF WATERSHED ASSESSMENT

Watershed assessment helps managers understand the status of aquatic resources and stressors across the landscape and efficiently allocate efforts toward improvement. Several groups collect water- and habitat-quality data in the San Diego River watershed, and the San Diego Water Board is working with them to establish a long-term, coordinated San Diego River Watershed Monitoring and Assessment Program (SDRWMAP). The first steps include understanding existing conditions, as described herein, and identifying data gaps. Ecosystem conditions are generally healthy in the upper San Diego River watershed and poor in the lower watershed (Figure 1). With this knowledge, the Water Board and community partners can focus on preserving the high quality conditions and restoring the degraded areas.

San Diego River
Watershed

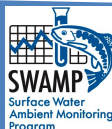
Figure 1. Stream sampling stations within the San Diego River watershed. Ecosystem health is better in the upper watershed than the lower, based on site-condition scores that integrate information from three types of biological indicator. Icon color denotes overall site condition: Poor (red), Fair (yellow), Good (green), Excellent (blue).



CONTACT:

Betty Fetscher, Ph.D., Senior Environmental Scientist
betty.fetscher@waterboards.ca.gov

Project
partners:



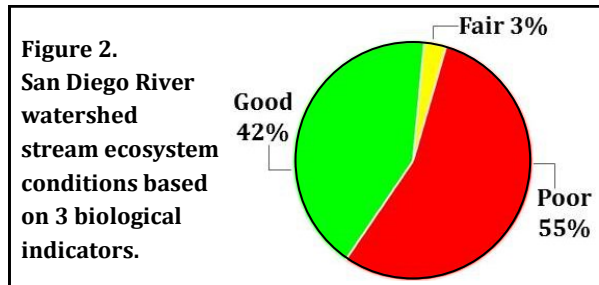
California Department of
Fish and Wildlife

ASSESSING 3 INDICATORS OF ECOSYSTEM HEALTH

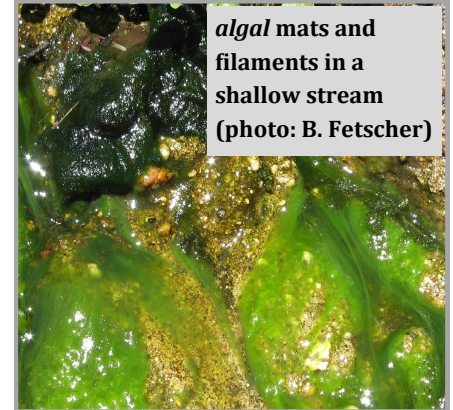
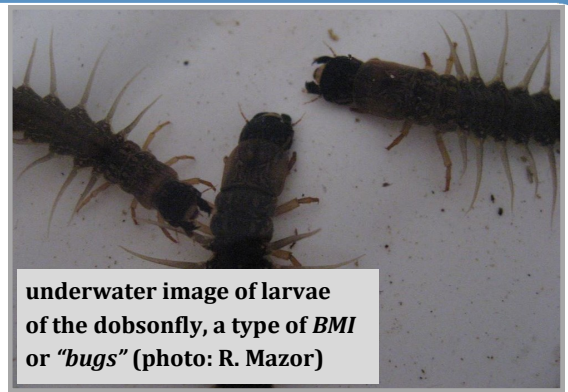
The composition of biological communities, which may include aquatic animals and plants, can reveal stream condition because these communities reflect the negative effects of various human activities (i.e., “stressors”) over time and space. Three types of biological indicator of condition are assessed in the San Diego River watershed by the southern California [Stormwater Monitoring Coalition](#) (SMC) and the Perennial Stream Assessment of the [Surface Water Ambient Monitoring Program](#) (SWAMP):

1. Community composition of benthic (i.e., bottom-dwelling) macroinvertebrates (BMIs, or informally, “bugs”, which include insects, snails, crustaceans),
2. Community composition of benthic algae, and
3. An index of wetland habitat condition called the California Rapid Assessment Method (CRAM).

San Diego River watershed surveys to date indicate that, collectively, nearly half of the stream kilometers are in Fair condition or better, based on the three biological indicator types, combined (Figure 2).



Taken separately, the indicators provide complementary perspectives on stream health: for example, anywhere from 10% to nearly 40% of stream kilometers are estimated to be in Excellent condition, depending upon the indicator assessed (Figure 3).



The different indicator types vary in terms of stressor sensitivity. For example, BMIs tend to be very responsive to stream habitat conditions, whereas algae tend to be particularly well tuned to water quality.

TRENDS IN CONDITION

BMIs are the biological indicator with the longest monitoring history in San

Diego River watershed, and can therefore be used to begin assessing trends in condition at specific sites. For example, a trend station located on Boulder Creek was impacted by the 2003 Cedar wildfire. Pre- and post-fire monitoring shows how BMIs responded to the fire, and how quickly the BMI community was able to recover over time (Figure 4).

NEXT STEPS

The basic groundwork for the SDRWMAP has been laid out, with the establishment of a stakeholder group, compilation and analysis of existing data, and preparation of a report detailing program elements (see link below). Next steps include facilitating integration of additional stakeholders in SDRWMAP and the Stormwater Monitoring Coalition through permit modifications. For more information, please see:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/swamp/docs/SD_River_Program_Document_Final_04_30_2014.pdf

Figure 3. Estimated condition of San Diego River watershed based on individual indicators of ecosystem health.

