



THE STATE OF THE SAN DIEGO RIVER 2018



WHAT DOES THIS REPORT TELL US?

We first put together the State of the River Report to try and answer one of the most common questions we receive:

“Is the River healthy?”

The San Diego River is a large and complex natural system with many factors affecting its overall health and vitality. The River plays an important role in sustaining wildlife, supporting recreation, and providing water for a thirsty region. Despite the critical roles the River plays in our community, it also faces some distressing trends and challenges.

Throughout the year, The San Diego River Park Foundation coordinates volunteers to collect data that informs the State of the San Diego River Report. This data is related to trash, invasive nonnative plants and water quality. Because these impacts are most often associated with urban influence, this report focuses on data for the Lower San Diego River.

The San Diego River Park Foundation compiles and interprets this data into easy-to-understand letter grades for each data point and each segment of the Lower River. These segments are then grouped into eight Sections, defined by similar geography and land use.

These letter grades form an annual Report Card that provides a tool for determining good watershed management.

The State of the River Report is designed to present a snapshot of the condition of the River and has been the guiding force behind The San Diego River Park Foundation’s award-winning Healthy River, Healthy Communities program. The data used for the Report Card establishes the action plan for restoring and improving the San Diego River in the coming year.

Read on to learn more about the data collection, factors that affect the health of the River and what the data tell us this year.



A MESSAGE FROM THE CEO



Unlike our wonderful beaches, the San Diego River suffers greatly during drought conditions. The San Diego River Park Foundation's State of the River Report gives the water quality of the San Diego River ending in October 2018 an F Grade. That, when considered with other health factors, means that our River was given an overall C- Grade for 2018.

REPORT CARD GRADE:



Flow in the River was 74% below average. This lack of flow contributes greatly to the health of the River. Sadly, we experienced fish die-offs, foul odors and other symptoms of an unhealthy river. Overall, the water quality was the second lowest since The San Diego River Park Foundation began its monitoring program in 2004.

Our team of staff and volunteers have significant concerns about the health of the River, but there is some good news. Since October, rains have fallen, and that will help in the coming months. Efforts to work toward a trash-free river, at least in the City of San Diego, have made significant progress. River habitat enhancement projects are underway or about to start. So there is indeed good news to report.

When it comes to water quality, there are no easy answers.

Thank you to the project partners, The San Diego River Park Foundation staff and its volunteers, and everyone who was involved with this year-long effort. Great work!

Sincerely,

Rob Hutsel
President and CEO

USING INDICATORS TO DETERMINE HEALTH

The health and condition of the San Diego River is influenced by many different factors, such as presence of trash or invasive plants in or near the river and the quality of the water itself.

Each factor we have selected is a tool to measure of health of the River. Together, these serve as indicators that point to the condition of the entire Lower River.

OUR INDICATORS



TRASH:

We categorize trash into the four of the most common categories, defined by source: encampments, litter, stormwater debris and dumping. The higher the trash volume per acre, the lower the grade.



INVASIVE PLANTS:

We evaluate the canopy coverage of certain invasive, non-native species in the riverbed: Brazilian pepper tree, giant reed, pampas grass, Canary Island date palm, Mexican fan palm, castor bean and tamarisk. High total canopy coverage means a low grade.



WATER QUALITY:

We collect data at multiple locations along the San Diego River and then aggregate data of the four key water quality parameters below. This is then integrated into an index value. Low index values mean a low grade.



TEMPERATURE:

How hot or cold the water is



CONDUCTIVITY:

Ability of the water to pass an electrical current, which is directly related to the concentration of ions in water (used as a measurement of dissolved solids, like salts)



FLOW:

How much water is moving past a cross-sectional area at a given time



DISSOLVED OXYGEN:

How much oxygen is dissolved or carried in the water

WHERE DOES THE DATA COME FROM?

Citizen science is research conducted by nonprofessional and/or amateur scientists, with the guidance of scientists and using scientific protocols.

The data provided by citizen scientists through the River Park Foundation's programs is valuable and extensive, allowing us to create and advance a work plan to promptly address issues.

Data is collected by volunteers through:

River Blitz:

Twice each year, volunteer teams are led by trained captains to collect data using our special smartphone app called Mapper. These comprehensive surveys are conducted in April and October, with the spring survey focusing on invasive plants and the fall survey focusing on trash.

River Assessment Field Team:

The River Assessment Field Team volunteers visit different locations in the riverbed on a twice weekly basis to update data by adding new trash sites, updating existing sites, and removing sites that have been successfully cleaned. This team greatly increases the accuracy of our trash maps, which in turn supports our clean-up team and other land managers.

RiverWatch:

RiverWatch volunteer teams collect water quality data using an electronic sonde, field forms and nutrient test kits. RiverWatch monitoring follows strict protocols (QA/QC procedures). Data used in this report was collected by volunteers during our monthly RiverWatch water quality monitoring for Water Year 2018 (October 2017 - September 2018).



Mapper

To view complete data on trash, invasive plants, and water quality, please visit our Online Information Center:

[www.sandiegoriver.org/
online_info_center.html](http://www.sandiegoriver.org/online_info_center.html)

Volunteers are always needed for our citizen science teams!

Contact volunteer@sandiegoriver.org to learn more about the teams and their schedules, or visit www.sandiegoriver.org



TRASH:

Significant Investment in Trash Control Results in Marked Improvement



RESULTS:

In October 2018, our annual survey results showed that the total trash in the riverbed associated with homeless encampments had decreased to just 58.6%. By comparison, the results of our annual RiverBlitz trash survey revealed that from 2015 to 2017 the percentage of the total trash in the riverbed associated with homeless encampments increased from 74% to 97.2%. This spike was linked to the increase in enforcement and sanitation in other parts of the City of San Diego following the Hepatitis A outbreak. Our data enabled us to raise awareness of this impact, and successfully advocate for an intensive push to clean up the riverbed, and now we're able to report a decrease in the percentage of trash originating from encampment.

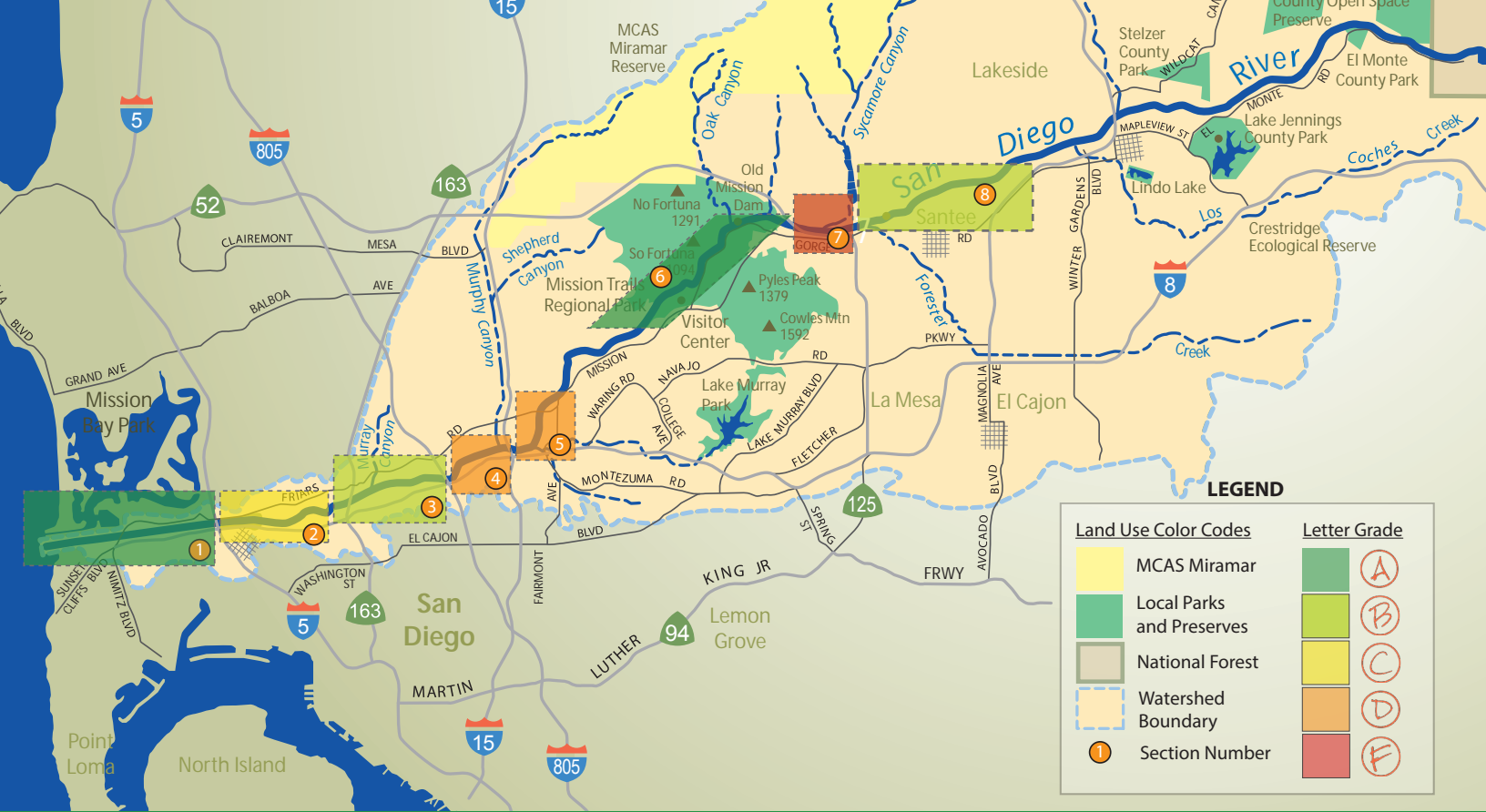
However, in the same period 2015 to 2018, the pounds of stormwater debris increased almost sixfold. We believe this is in part due to removal of invasive plants in the riverbed and tributaries, which had previously hidden and trapped stormwater debris that was not discovered until the removal was complete.

GRADE:



QUICK FACTS:

- Famosa Slough and Chaparral Canyon were newly added to our focus areas in 2018.
- Clean-up efforts were supplemented by tremendous efforts from the City of San Diego's Environmental Services Department.
- In the 12 months ending in October 2018, SDRPF clean-up program volunteers donated 6,167 hours removing 308,931 pounds of trash.

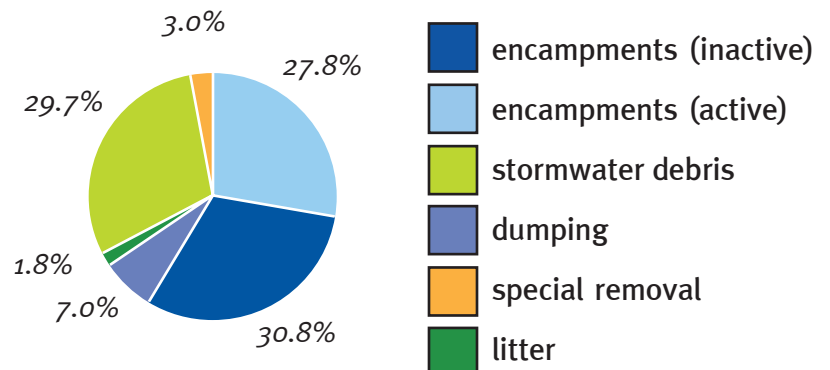


TRASH GRADES BY SECTION

SECTIONS	1	2	3	4	5	6	7	8
Size (acres)	312	61.5	153	104	65.5	87	53	171
Trash quantity (pounds)	1,540	5,320	10,010	13,230	7,070	0	13,930	10,395
Trash density (pounds/acre)	5	87	65	127	108	0	262	61
Cumulative Grade	A	C	B	D	D	A	F	B

TRASH SOURCES:

In order to work on long-term solutions, we must know the source of trash issues along the River. Sourcing gives us critical information to advocate to policymakers so resources are allocated for addressing significant issues impacting the health of the River. This year, the two largest sources were homelessness and stormwater debris, accounting for more than 88% of the trash identified in October 2018 River Blitz surveys.





INVASIVE PLANTS:

Aquatic and Terrestrial Invasives Continue to be a Problem



RESULTS:

As water levels and flows drop, aquatic species increase their dominance in certain areas of the river. In 2018, invasive plants continued to take up a significant amount of biologically valuable land on the banks and surface of the water. While invasive plant stand sizes on land were largely unchanged since 2017, aquatic invasive plants spread further to form dense mats covering the surface of the water in many areas such as eastern Mission Valley Preserve and Fashion Valley (Sections 2 and 3) as well as eastern Santee (Section 8). The increase in stands of water lettuce are of particular note as this species was first documented in the River in the last 7 years and now outcompetes even other non-native plants for dominance. The positive impacts of ongoing habitat restoration and enhancement projects near SDCCU Stadium and eastern Mission Valley Preserve were sustained in 2018.

GRADE:



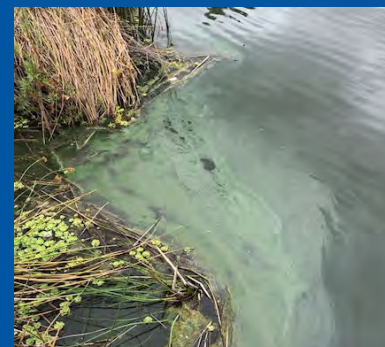
QUICK FACTS:

- Several additional enhancement and restoration projects have commenced since October 2018.
- Aquatic non-native plants thrive in shallow, slow moving water with excess nutrients, a condition that is commonly found in the lower reaches of the River.
- Giant reed and Brazilian pepper continue to be the dominant invasive species along the River.



WATER QUALITY:

Low Rainfall and Low Flow Result in Record Low Water Quality



RESULTS:

Water quality in water year 2018 (October 2017 - September 2018) was the second lowest since monitoring began in 2004. Only 3.34 inches of rain fell at Lindbergh Field in 2018 (very low compared to the 30 year average of 10.20 inches). The low rainfall totals resulted in less water entering the river. With less water, the river moves slower and the water levels are lower, leading to increased temperatures and higher concentrations of dissolved solids like salts in the water. Many aquatic animals cannot tolerate high temperatures or high levels of dissolved solids. In addition, dissolved oxygen levels were low. Most fish species need at least 5 mg/L of oxygen in the water, yet dissolved oxygen levels averaged 4.3 mg/L in 2018. While we cannot control rainfall, decreasing the amount of polluted runoff (containing fertilizers, pesticides, and other pollutants) can reduce issues like high dissolved solids and low dissolved oxygen.

GRADE:



QUICK FACTS:

- Out of 14 years of monitoring, the 4 poorest grades for water quality occurred in the last five years (2014, 2018, 2015, 2016).
- Flow in the San Diego River was 74% below average in 2018.
- Volunteers sampled monthly at 15 locations.

SPECIAL FEATURE: DISSOLVED OXYGEN PROJECT

One of the factors that determines water quality in the San Diego River is dissolved oxygen (DO). After the community raised concerns about bad odors and dead fish in Mission Valley, The San Diego River Park Foundation and partners began a pilot project to test if floating solar-powered aerators could play a role in solving this issue. For this study, aerators were installed in the summers of 2017 and 2018.

What is dissolved oxygen and why is it important?

Dissolved oxygen is how much oxygen is dissolved or carried in the water. Many organisms that live in the river, like fish, insects and other invertebrates, need this oxygen in order to survive and reproduce.

What is the problem?

Through our monitoring programs, we have documented that many sections of the river experience low-oxygen periods, especially during summer months. This is because warm water is less able to hold dissolved oxygen, plus low flow in ponded areas doesn't add oxygen like a fast-moving river would.

What are the effects?

Low dissolved oxygen can result in negative effects like die-offs of fish and other aquatic wildlife, foul-smelling water, overgrowth of nonnative vegetation and overall poor river ecosystem health.

What did we do?

Through this project, our scientists and volunteers installed five solar-powered aerators that pump oxygen beneath the surface with the goal of increasing the dissolved oxygen levels. We then measured the DO levels both nearby and downstream from the aerators every two weeks for 9 months in 2018 to assess if they increased the DO levels.

volunteers install aerators

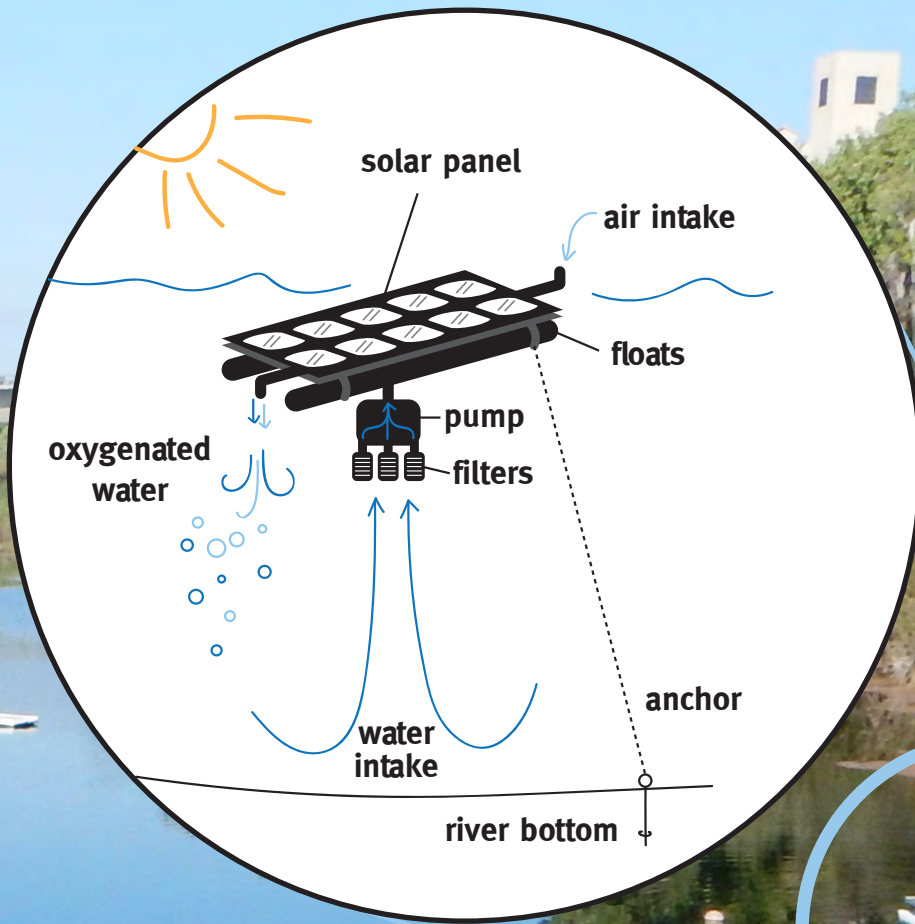


data monitoring



aerator flow



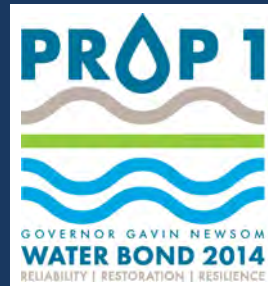


What did we learn?

The aerators added some additional oxygen into the River, but did not work as well as expected. However, the information gained in this study will help to inform future studies and will improve techniques used to effectively maintain healthy DO levels year-round at this location and others.

Contact us to learn more about this project: (619) 297-7380

OUR THANKS TO PROJECT PARTNERS:



and Beyond Land Adventures

OVERALL GRADE FOR THE SAN DIEGO RIVER

2018

For the water year ending September 2018, the San Diego River received an overall grade of C-, or **FAIR**.



Breakdown of Grades by Section

SECTIONS	1	2	3	4	5	6	7	8	2017 Grade	Overall Grade
	Estuary	Mission Valley (West)	Mission Valley (Central)	Mission Valley (East)	Grantville	Mission Trails Regional Park	Santee (West)	Santee (East)		
Trash	A	C	B	D	D	A	F	B	C	B
Water Quality		F	D	D	F	D	F	F	D	F
Invasive Non-Native Plants	A	F	C	A	F	A	D	B	D	C
Cumulative Grade	A	D	C	C	F	B	F	C	D	C-

Grading Criteria by Indicator

NARRATIVE	Grade	Invasive Plant Percent Cover	Trash Density (Pounds/Acre)	Water Quality Index
Excellent	A	< 2%	< 35	> 75
Good	B	2.0 - 2.9%	35 - 69	50 - 74.9
Fair	C	3.0 - 3.9%	70 - 104	36 - 49.9
Poor	D	4.0 - 4.9%	105 - 139	25 - 35.9
Very Poor	F	> 5%	> 140	> 25

These grades are a planning tool that allows us to educate the public, landowners, stakeholders and policymakers to help to address these issues and ultimately, to improve this grade over time.

SO... IS THE RIVER HEALTHY?

The preceding pages explained a breakdown of the methods and data points we use to present this evaluation of the current health of the San Diego River. Of course, the River is more than just water, and when we consider its health, we should also consider the entire ecosystem that depends upon the River.

The most simple answer to the question of whether the River is healthy is no. By evaluating trash, invasive plants, and water quality, the overall grade for this year's Report Card is C - only fair health.

The impacts of more than half a million people living in its watershed, the area that drains into the River, are significant. Some areas of the River are in great shape, and while we have seen

marked improvements in some segments over the last decade, many urban sections still suffer.

Trash, water quality and invasive non-native plants tell part of the story of the River's health. There are other indicators too, such as bacteria levels, contaminant levels in fish tissue, benthic invertebrate community health and more.

Additional community-based monitoring can supplement public agency programs and help inform and engage citizens. There is a need to expand these programs to reach urban tributaries of the River to identify sources of the problems, to increase management of some areas, and to continue cleaning the River until long-term solutions can be found.

WHAT CAN WE DO?

Community involvement is critical to ensuring the River has a strong and powerful voice demanding a better future! In order to affect change, the River Park Foundation is dedicated to engaging community leaders, policymakers, scientists, agencies, researchers and the public to work hand in hand to advance the goals for improving the River's health.

How do we get the overall grade to an A?
Additional funding, research, stewardship and resources are needed.

Join us as a volunteer, a researcher, an advocate or a donor to help achieve this vision for the River and community.



Contact us to learn more about how you can get involved! Learn more:
www.sandiegoriver.org

OUR THANKS TO:

All volunteers who participated in our citizen science, clean-up and restoration programs, especially these core volunteers and leaders:

Aixa Willoughby
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Tessa Anastasio
Tom Fetzter
Tommy Youngusband

Project Leadership:
The San Diego River Park Foundation

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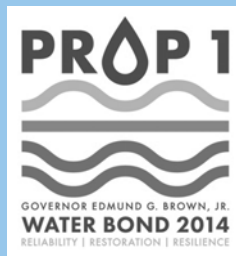
Technical Advisory Committee:

- Martin Offenhauer, Environmental Scientist, Retired
- Gary Strawn, Vice Chairman, San Diego Regional Water Quality Control Board
- Robert Mazalewski, Horticulturalist
- Eleanora I. Robbins, Ph.D., San Diego State University Dept. of Geological Sciences, Retired
- Andrew Smisek, Biologist, RECON Environmental



PROGRAM FUNDERS:

Our thanks to the many sponsors of our Healthy River, Healthy Communities Program who enable us to conduct these citizen science programs, including:



The San Diego River Park Foundation is a 501(c)3 nonprofit dedicated to creating a better future for the historic San Diego River.

To learn more or to get involved:
www.sandiegoriver.org
(619) 297-7380

The Dorrance Family Foundation



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