





Prepared by: The San Diego River Park Foundation

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### **BACKGROUND**

In 2000, the largest sewer spill in California's history dumped 34 million gallons of raw untreated sewage into the San Diego River. Few would argue that a spill of this magnitude is not an environmental tragedy. But this tragedy was made all the worse by the fact that this spill ran for nearly a week while few people even noticed or cared. The community had turned its back on the River.

The San Diego River Park Foundation (SDRPF) was born to give the San Diego River back its voice! There are 164,929 people living within one mile of the San Diego River, and over a half million people living within the 440 square mile watershed. Over 760,000 people rely on drinking water from resources within the watershed, and more surf, swim, or fish at the river's outlet at the Pacific Ocean. In addition, San Diego County is the most biodiverse county in the continental United States, with at least 28 federally-listed endangered species living at least seasonally within the San Diego River watershed.



In a time when people are increasingly suffering from afflictions of a sedentary lifestyle, the time is critical to take action to halt the damage to our remaining natural areas. Despite the urban encroachment on the San Diego River, there are segments that continue to be resilient, thriving ecosystems. These areas are proof that with care and restoration, we can return the function and vibrancy of these natural systems.

The River Park Foundation's Healthy River, Healthy Communities is a multi-pronged approach designed to provide meaningful action-oriented opportunities for the community to track, report and address challenges that the river faces. The program's dynamic nature increases our rate of success. The program is able to adapt to the needs identified in the surveys, and to schedule clean-ups around the seasonal changes like big storms, new dumping areas, and the ever-evolving needs of the River Park. This success has become a model and received state and national recognition. Two components of the Healthy River, Healthy Communities program, RiverWatch and RiverBlitz, are used to inform and provide data for this State of the River report.

Started in 2008, RiverBlitz is a twice annual program to document the conditions along and within the lower San Diego River for trash, invasive non-native plants as well as site condition issues. The purpose of these surveys and recording this information is to help guide management and track progress toward alleviation and reduction of the social and biological impacts from these issues. Results are used to guide the Foundation's clean-up programs and data is mapped online for public access (available at www.imrivers.com/sandiego09) and results compiled annually into State of the River Report.

The volunteer based RiverWatch Team was started in 2004 by the Foundation, to provide baseline water quality data for the San Diego River. The Team currently monitors the lower San Diego River and tributaries from 15 stations stretching from eastern Santee to the San Diego River estuary near I-5 on a monthly basis. Measurements are taken for general chemistry at each site. Nitrate and phosphate measurements are taken at 5 sites and all water samples are analyzed by a partner lab for toxicity. Historical and monthly results are available by station or analyte through the Foundation's web portal (<u>http://108.168.216.185/sdrpf-riverwatch/</u>). Monthly and annual water quality reports including the SDRPF's Water Quality Index are available on the River Park Foundation's website (<u>www.sandiegoriver.org/online\_info\_center.html</u>). The running annual average is used for this report.

# THE RIVER'S GRADE

#### For 2013, the grade for the lower San Diego River is a C or Fair.

#### Figure 1. Sections Evaluated



#### Figure 2. Grades by Section and Overall Grades

<b>SECTIONS</b>	1	2	3	4	5	6	7	8	9	10	Overall
Trash	Α	D	В	F	С	Α	С	С	Α	Α	С
Water Quality		D	С	С	D	С	D	F			D
Invasive Non-Native Plants	Α	В	Α	F	С		Α	С	Α	Α	В
Cumulative Grade	Α	D	В	F	D	В	C	D	A	Α	С

San Diego River Park Foundation

### <u>TRASH</u>

Trash along the San Diego River and within the surrounding riparian habitat affects aesthetics, perception, use of the River Trail and River Park as well as environmental and public health. Addressing the trash issue may seem to be as a simple as preventing littering, but this problem is a result of a complex set of intervening engineering, planning, cultural and social challenges. RiverBlitz surveys by volunteers document the location of trash to within less than a meter of accuracy and allow the River Park Foundation to schedule events to clean it up. The source, location and volume trends gleaned from these surveys allow the River Park Foundation to track efficacy of efforts, prediction of seasonal hotspots, determination of continuing problem areas and sources that help to inform management actions, advocacy and education.



Stormwater debris washed into the River.

The existing conditions documented during RiverBlitz show that the overall trash grade for the San Diego River is a C or fair. One section received an F or poor, four sections received A grades or excellent, one section received a D and another three a C. Of the sections that received F and D, trash associated with camp sites comprised 84% of the volume.

A top priority of the River Park Foundation is trash removal from the River and surrounding riparian habitat. Over 1.5 million pounds of trash have been removed by the Foundation and its volunteers in less than a decade. The Trash Free River Initiative was born in 2008, facilitated from the RiverBlitz surveys that provide a systematic data-driven avenue to address the trash discovered during the surveys. The trash removal goals have been continually accelerated and each time, that new goal has been met. What started as a two year target removal timeframe in 2008 was accelerated to one year then six months. After the most recent surveys in October 2013, we have set a goal to remove all trash within three months of documentation. To achieve the goal requires creative use of all the tools at our disposal, mainly large and small scale volunteer clean-up events. Broader scope area-wide clean-up days along with more frequent small targeted events are being used.

One observed effect of these accelerated goals is that as we clean up the river faster, litter and the other types of trash have less of a chance to accumulate and a larger portion of the overall trash volume is sourced to encampments. The October 2013 survey documented 47,175 pounds of trash, 75% of which was associated with homeless encampments (by volume). Stormwater debris accounted for the lowest level of trash volume among all sections in the past 6 years at just 2% of total trash volume. Primarily we believe the low rainfall in the past two years is one reason. Our storm events bring flushing of this type of trash from streets in the watershed into the river via the storm sewer system, the lack of rainfall means a lack of flushing. The secondary reason we believe is that as trash is picked up from the river banks and flood plains it no longer is poised to enter the river during rain events.

Behavioral and policy changes are needed to reach the



Abandoned homeless encampment in riverbed.

goal of a truly trash free river. In order to meet the goal of a trash free river the Foundation is working with a variety of partners to address trash on a watershed level. This requires coordination of activities, consensus and a common platform for the exchange of information. Until this higher level of coordination, stakeholder buy in and investment are achieved and social challenges to a trash free river are addressed, the Foundation's clean-up program will be needed on a regular basis to ensure that trash is removed quickly and with minimal impact on the San Diego River thereby preventing pollution on site, further downstream and at local beaches as well the Pacific Ocean.





Figure 5. Trash Source by Number of Sites (Comparison 2013 to 2012)



Figure 6. Trash Volume by Segment (number of bags)



# WATER QUALITY

The seasonal variations and trends in water quality of the San Diego River would be largely unknown without our RiverWatch Team's efforts, because permit water quality monitoring focuses on discharge points such as storm drain outlets, while the RiverWatch monitoring program covers 90% of the lower San Diego River at a scale large enough to identify differences by reach and river segment but also fine enough to help pinpoint specific problem sites and areas. The initial baseline monitoring effort has over the last several years matured into a robust ambient monitoring program, obtaining long-term data on San Diego River surface water quality that would otherwise go unmonitored.



Surfactant in water.

The health of the Lower San Diego River declined throughout most reaches and segments during 2013. Data gathered over the last 12 months indicate that all segments of the lower river, extending from Lakeside to the Estuary, experienced lower water quality levels as evidenced by individual parameters and collective index. Of the 9 water years (WY) monitored, two years have been of average rainfall ('09 & '10), 2 years have been above average ('05 & '11) and 5 have been below average rainfall years ('06,'07,'08,'12, '13). Condition trends reflect a correlation between water quality and rainfall. In average rainfall years, we see fair water quality, while in below average rainfall years, we record poor water quality, and with above average rainfall, we record good water quality throughout the lower San Diego River. This reflects that increased flow from rain events positively impacts water quality within the engineered lower San Diego River.



The Water Quality index running average value for WY 2013 is 31 or a D, down 2 points from 33 last year. The current running average is 13% below the 9-Yr average of 37 (D marginal), representing the lowest value to date over the past 110 months of water quality monitoring. Water quality index values at individual sites range from B-Good and F-Poor depending on the season, stream flow and extent of aquatic growth such as the invasive water primrose (Ludwigia sp.). Water Quality index values were particularly low at Mast Park throughout most of WY13 (a low rainfall year). The Mast Park site in Santee received an F. The highest quality site at the downstream end of Mission Trails Regional Park received a B.

The full Water Quality Index report for WY 2013 that includes comprehensive review of water quality results, seasonal patterns and trends within the Lower San Diego River watershed is available on the River Park Foundation's website

www.sandiegoriver.org/online info center.html

Ludwigia sp., an invasive aquatic plant.





Figure 8. Dissolved Oxygen at Mast Park



### **INVASIVE NON-NATIVE PLANTS:**

The California Invasive Plant Council (Cal-IPC) lists 1,800 non native plants within the state of California, of those 1,800, nearly 200 are considered invasive (1). The River Park Foundation's RiverBlitz survey focuses on 8 target species that are among those on the list. Three of the eight are in the high threat category, two in the moderate and an additional three in the limited category (statewide limited) but are prevalent within the San Diego River watershed (1). One of the highest impact species in the high threat category is *Arundo donax*, or Giant Reed (1). About \$71 million has been spent on arundo control statewide (2). At a \$25,000 per acre cost of control, though the cost is high, the benefits of control are a

2:1 ratio over costs invested in the impacts of water use, sediment and debris trapping, flood damage, fire, habitat and beach debris. (2)

Nearly 90% of the RiverBlitz survey area contains arundo including each of the 10 sections. Only 3 segments have zero arundo documentation. Of these, 2 segments have undergone recent arundo removal; the third is within the First San Diego River Improvement Project, known as FSDRIP, an area actively managed for invasive nonnative plants. Other invasive nonnative son the target list are more common in certain sections than others, for instance, tamarisk (*Tamarisk sp.*) documentation



Invasive castor bean.

represents 33% of invasive sites within Santee sections in comparison to 4% of sites in Mission Valley. Brazilian pepper tree (*Schinus terebinthefolius*) comprises 4% of sites in Santee while 18% in Mission Valley. Others like Arundo and Castor Bean (*Ricinus communis*) are more uniformly spread, 21% of segments contain Castor Bean and 16% of segments in Mission Valley. Brazilian pepper tree and Canary Island date palm (*Phoenix canariensis*) exhibit the highest salt tolerance comprising 81% of estuarine invasive non-native plant site documentation.

For the October 2013 survey as in 2012, only one section has an invasive non-native canopy coverage high enough to categorize as an F while five are within the A range. There are two sections in the C range and another in the B range. One section improved a letter grade, in Mission Valley West, and this site had active restoration between the 2012 and 2013 survey. While many sections are in good condition as reflected in the grades, regrowth following treatment from on site seed bank and upstream deposition downstream are threats. For instance, Castor bean is the most highly documented species in recent restoration sites, this may be due in part to the large seed banks with long seed viability and their tendencies to germinate profusely and colonize a landscape in full sun as when invasive canopy has been removed (3). While most sites have treatment plans of 3 years or more ensuring follow-up treatment is occurring is important so as not to resort to pre-restoration conditions.

Addressing the challenges of invasive non-native plants requires not only a top down approach but also area focuses and a watershed-wide initiative as canyons and tributaries contain large amounts of each species. Further coordination with partners documenting canyon populations and their removal can improve efforts on a watershed scale to control invasive non-natives as eradication is not a possibility at this level of invasion. To achieve this, further coordination and capacity is needed to both initiate the effort as well as to manage data, develop meetings and a work plan.









Continue	Comment	Acros	Tresh Dese	Invasive		N/ Course	W0
Sections	Segment	Acres		Acreage	Bag/Acre	% Cover	WQI
1	1	159	54	0.00	0.0	0.0%	
I	2	153	54	0.00	0.4	0.0%	
	3	8.16	234	0.14	28.7	1.7%	29.0
	4	10.4	42	0.20	4.0	1.9%	29.0
	5	13.6	65	0.25	4.8	1.8%	29.0
	6	8.47	11	0.10	1.3	1.2%	29.0
	7a	8.84	2	0.03	0.2	0.4%	29.0
2	7b	2.75	2	0.00	0.7	0.0%	29.0
	8	29.6	41	0.06	1.4	0.2%	39.0
3	9	41	7	0.00	0.2	0.0%	37.0
	10	72.9	760	6.37	10.4	8.7%	37.0
4	11	31.2	192	4.20	6.2	13.5%	37.0
	12	3.55	22	1.05	6.2	29.6%	31.0
	13	27.9	20	Jnder Treatment	0.7	0.0%	28.0
	14	4.97	45	0.04	9.1	0.8%	28.0
5	15	24.5	8	6.34	0.3	25.9%	31.5
6	MTRP	87	0	0.00	0.0	0.0%	44.0
	17	5	14	0.00	2.8	0.0%	25.3
	17b	12.6	22	0.00	1.7	0.0%	25.3
7	18	11.8	26	0.02	2.2	0.1%	25.3
	19	15	8	0.12	0.5	0.8%	25.0
	20	7.6	97	0.58	12.8	7.6%	25.0
	21	4.5	4	0.00	0.9	0.0%	25.0
	22	6.4	8	0.04	1.3	0.7%	25.0
	23	11	6	0.00	0.5	0.0%	12.0
	24	15.5	26	0.00	1.7	0.0%	12.0
	25	9.99	69	0.53	6.9	5.3%	12.0
	26	19.9	83	1.30	4.2	6.5%	12.0
	27	3.75	9	0.46	2.4	12.2%	16.0
8	WP	76.9	10	0.02	0.1	0.0%	ND
9	LRP	60	0	0.00	0.0	0.0%	ND
10	MM 5.5	48	13	0.05	0.3	0.1%	ND

Figure 10. October 2013 Data Table

Invasive % Cover	Trash Bags per Acre	Water Quality Index	Letter Grade	Narrative
0-1.9	<1	>75	А	Excellent
2-2.9	1.0-1.9	50-74.9	В	Good
3-3.9	2.0-2.9	36-49.9	С	Fair
4-4.9	3.0-3.9	25-35.9	D	Marginal
>5	>4	<25	F	Poor

## **CONCLUSION**

The State of the River Report and this Supplemental Report is a powerful tool to bring awareness to the poor health of the River. Trash, water quality, and invasive non-native plants tell part of this story, but there are more indicators of the River's health.

As you can see, there is still much work to be done. Additional community-based monitoring can help not only to supplement public agency programs, but also help to inform the public of emerging issues.

For more information about water quality, invasive non-native plant populations and trash along the Upper San Diego River contact the Foundation at <u>info@sandiegoriver.org</u> 619-297-7380.

Thank you to all volunteers from RiverWatch and RiverBlitz that make this report possible through their diligent and thorough data collection. Thank you to John Kennedy for spearheading the Water Quality Indexing project and the Healthy River, Healthy Communities program sponsors.

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