

Santa Ana Integrated Watershed Plan

Volume 2: Environmental and Wetlands Component



Prepared for:
Santa Ana Watershed Project Authority
11615 Sterling Avenue
Riverside, California 92503
(909) 354-4239
Contact: Jeff Beehler, Environmental Project Manager



Prepared by:
EIP Associates
12301 Wilshire Boulevard, Suite 430
Los Angeles, California 90025
(310) 268-8132
Contact: Wendy Katagi, Technical Director

This project was funded, in part, under a Southern California Integrated Watershed Program grant funding contract (SWRCB Agreement # 01-093-250-0) in the amount of \$195,923. Remaining project funding was provided by various Santa Ana Watershed Project Authority sources.

This document is printed on recycled paper having a content of 100% post-consumer waste.





CONTENTS

Contents	iii
Figures	vi
Tables	vii
Preface	ix
Acknowledgements	xi
Acronyms	xii
Executive Summary	1
Purpose	1
What’s special about the Santa Ana Watershed?	2
Plan Recommendations	3
Watershed Structure and Function Restoration Recommendations	4
Recommendation #1: Improve Water Quality and Preserve and Improve Ecosystem Function	4
Recommendation #2: Protect and Restore Habitat Resources	4
Recommendation #3: Engage the Community through Education and Recreation	5
Recommendation #4: Plan for the Future	5
Strategies	6
1. Creation, Restoration, and Enhancement of Wetlands	6
2. Removal of Invasive Species	7
3. Increasing Connectivity of Regional Trail System	8
4. Multi-objective Conservation Planning and Projects	10
5. Education	11
6. Partnerships	12
7. Funding	14
8. Assessment and Monitoring	15
Opportunities	17
Next Steps	17
Plan Life Continues Beyond Today	17



Section 1. Background 21

- A. Introduction 21
 - What Is the Santa Ana Watershed Project Authority’s Focus? 21
 - Why Is SAWPA Doing This Plan? 22
- B. Historical Context 25
 - Introduction 25
 - Natural History 27
 - Planning History 32
- C. Planning Context 35
 - Message to the Planning Community 35

Section 2. Current Conditions 45

- A. Physical Setting, Hydrology, and Geomorphology 45
 - Geologic and Hydrologic Features of the Watershed 47
 - Climate 50
 - Land Use 50
- B. Biological Resources 52
 - Habitat Modification 52
 - Special Status Species 52
 - Current Aquatic Resources 54
 - Factors Affecting Aquatic Resources 56
- C. Open Space and Recreation 58
 - Parkland Ratios 58
 - Public Access 60
 - Forest Land 60
 - Santa Ana River Trail 60
 - Challenges and Opportunities 61
- D. Water Supply 63
- E. Water Quality 65
- F. Flood Control 67
- G. Watershed Demographics and Growth Pressure Impacts 69

Section 3. Guide for the Future 75

- A. Strategies 75
 - 1. Creation, Restoration, and Enhancement of Wetlands 75
 - 2. Removal of Invasive Species 81
 - 3. Increasing Connectivity of Regional Trail System 92
 - 4. Multi-objective Conservation Planning and Projects 99
 - 5. Education 105
 - 6. Partnerships 112



7. Funding 117

8. Monitoring and Assessment 120

B. Opportunities 123

 Watershed Projects 123

 Watershed Structure and Function Restoration Recommendations 139

C. Next Steps 140

 Plan Life Continues Beyond Today 140

Glossary 143

References 149

Preparers and Contributors 157

 Preparers 157

 EIP Associates 157

 SAWPA 157

 Contributors 158

Appendices

(AVAILABLE ON CD ROM)

- Appendix A: Scoping Meeting Notes, List of Participants
- Appendix B: Santa Ana River Trail Summary
- Appendix C: *Arundo* Removal Protocol
- Appendix D: *Arundo* Removal Program, Notice of Exemption
- Appendix E: Wetlands Program, Notice of Exemption
- Appendix F: California Natural Diversity Database (CNDDDB) List of Sensitive Species and Habitats Potentially Occurring Within the Santa Ana Watershed
- Appendix G: Aquatic Resources Assessment
- Appendix H: Sample Conservation Easement Deed
- Appendix I: Education Curriculum Kit
- Appendix J: Funding Table
- Appendix K: Comments on the Draft IWP Environmental and Wetlands Component
- Appendix L: Public Outreach
- Appendix M: California Environmental Dialogue: Economic and Environmental Benefits of Habitat Protection, Restoration, and Enhancement



FIGURES

1-1	Santa Ana River Watershed Cities	23
2-1	Channel and Floodplain Features	45
2-2	Santa Ana River and Tributaries within the Santa Ana Watershed	46
2-3	Santa Ana Watershed Land Use	51
2-4	Santa Ana Watershed USFWS Designated Critical Habitat	53
2-5	Santa Ana Watershed Open Space	59
2-6	Water Supply by Source	63
2-7	Impaired Water Bodies	64
2-8	Income by Census Tract	70
2-9	Population Density by Census Tract	71
2-10	Santa Ana Watershed Population, 1990–2050	73
2-11	Santa Ana Watershed Population Proportions by County, 1990 and 2025	73
3-1	<i>Arundo</i> Removal within the Watershed	88
3-2	Status of Santa Ana River Trail and Parkway	93
3-3	Proposed Trail Alignment around Prado Wetlands	95
3-4	Essential Resource Conservation Areas	103
3-5	Potential Wetland Projects within the Watershed	124
3-6	Other Projects and Opportunities within the Watershed	125



TABLES

1-1	Fishes Historically Present in the Santa Ana Watershed	28
1-2	IWP Environmental and Wetlands Component Applicable Plans and Policies	44
3-1	Distribution of <i>Arundo donax</i> and Past Removal Efforts within the Santa Ana Watershed	83
3-2	Permitting and Regulatory Compliance Required for <i>Arundo</i> Removal within the State of California	91
3-3	Status of the Santa Ana River Trail, by County and Segment	99
3-4	Educational Program Types and Examples	106
3-5	Existing Educational Programs	108
3-6	Potential Watershed Project Funding Sources	118
3-7	Measurable Goals and Indicators	121
3-8	Examples of Outcome Indicators for <i>Arundo donax</i> Removal	122
3-9	Watershed Projects and Opportunities	126





PREFACE



South fork of the Santa Ana River.
Photo courtesy of SAWPA.

The SAWPA Integrated Watershed Plan, Environmental and Wetlands Component is the first step toward implementing a watershed-wide wetlands program and watershed plan that integrates wetlands, trails, habitat, open space, education, and invasive species removal. This plan can be used by anyone interested in improving the ecological health of the watershed. We are all inextricably linked to the projects and opportunities identified in this Plan because they will help to create a more sustainable Santa Ana Watershed. New partnerships have arisen out of scoping meetings and other discussions during the preparation of this document. Many more partnerships are expected to grow. For

example, there is a special message to the planning community inviting public and private sector planners alike to increase awareness of the benefits of planning on a watershed scale and to integrate watershed thinking into the everyday planning process. It is with great excitement and anticipation that SAWPA invites you to read the pages that follow. We hope you will be inspired by the projects, opportunities, and messages contained within this Plan.





ACKNOWLEDGEMENTS



Santa Ana River outlet in Huntington Beach.
Photo courtesy of SAWPA.

SAWPA wishes to thank its Member Agencies: Orange County Water District, Inland Empire Utilities Agency, Western Municipal Water District, Eastern Municipal Water District, and San Bernardino Valley Municipal Water District, SAWPA Commissioners, and their staff for their support and acknowledgement of the importance of this document. In addition, SAWPA expresses great appreciation to the many participants who attended the IWP Environmental and Wetlands Components Scoping Meetings and those who provided project information and input into the Plan. In particular, SAWPA thanks Ms. Martha Davis for

her comments on the draft document (included in Appendix K). Ms. Davis' recommendations have been incorporated into the final document. A complete list of agencies, organizations, and individuals who contributed to this Plan are included in the Preparers and Contributors Section. Special thanks to Mr. Jerry King, Chairman of the SAWPA Commission and Orange County Water District, whose leadership and commitment to improving the ecological health of the Santa Ana Watershed have made this document a reality.





ACRONYMS

Caltrans

California Department of Transportation

CDFG

California Department of Fish and Game

EMARCD

Elsinore-Murrieta-Anza Resource Conservation District

EMWD

Eastern Municipal Water District

EPA

Environmental Protection Agency

EVMWD

Elsinore Valley Municipal Water District

EVRCD

East Valley Resource Conservation District

HCP

Habitat Conservation Plan

IEWRCD

Inland Empire West Resource Conservation District

IEUA

Inland Empire Utilities Agency

IWRP

Integrated Water Resources Plan

IWP

Integrated Watershed Plan

LESJWA

Lake Elsinore/San Jacinto Watersheds Authority

MWD

Metropolitan Water District

MSHCP

Multi-species Habitat Conservation Plan

NCCP

Natural Community Conservation Plan

NFS

National Forest Service

NPDES

National Pollutant Discharge Elimination System

NPS

National Park Service

OCPFRD

Orange County Public Facilities and Resources Department

OCSD

Orange County Sanitation District



OCWD

Orange County Water District

POTW

Publicly-owned Treatment Works

RWQCB

Regional Water Quality Control Board

RCD

Resource Conservation District

RCRCD

Riverside-Corona Resource Conservation District

SAR

Santa Ana River

SARI

Santa Ana Regional Interceptor

SARWG

Santa Ana River Watershed Group

SAW

Santa Ana Watershed

SAWA

Santa Ana Watershed Association of Resource Conservation Districts

SAWPA

Santa Ana Watershed Project Authority

SBVMWD

San Bernardino Valley Municipal Water District

SBVWCD

San Bernardino Valley Water Conservation District

SCIWP

Southern California Integrated Watershed Program

SJBRCD

San Jacinto Basin Resource Conservation District

SWRCB

State Water Resources Control Board

TDS

Total Dissolved Solids

TIN

Total Inorganic Nitrogen

TMDL

Total Maximum Daily Loads

TVRI

Temescal Valley Regional Interceptor

USACE

United States Army Corps of Engineers

USFWS

United States Fish and Wildlife Service

WMWD

Western Municipal Water District