Changing River Flows and Novel Ecosystems in the Los Angeles & Santa Clara Rivers

League of Women Voters Beach Cities, WIG

Melissa von Mayrhauser, PhD Candidate, UC Berkeley

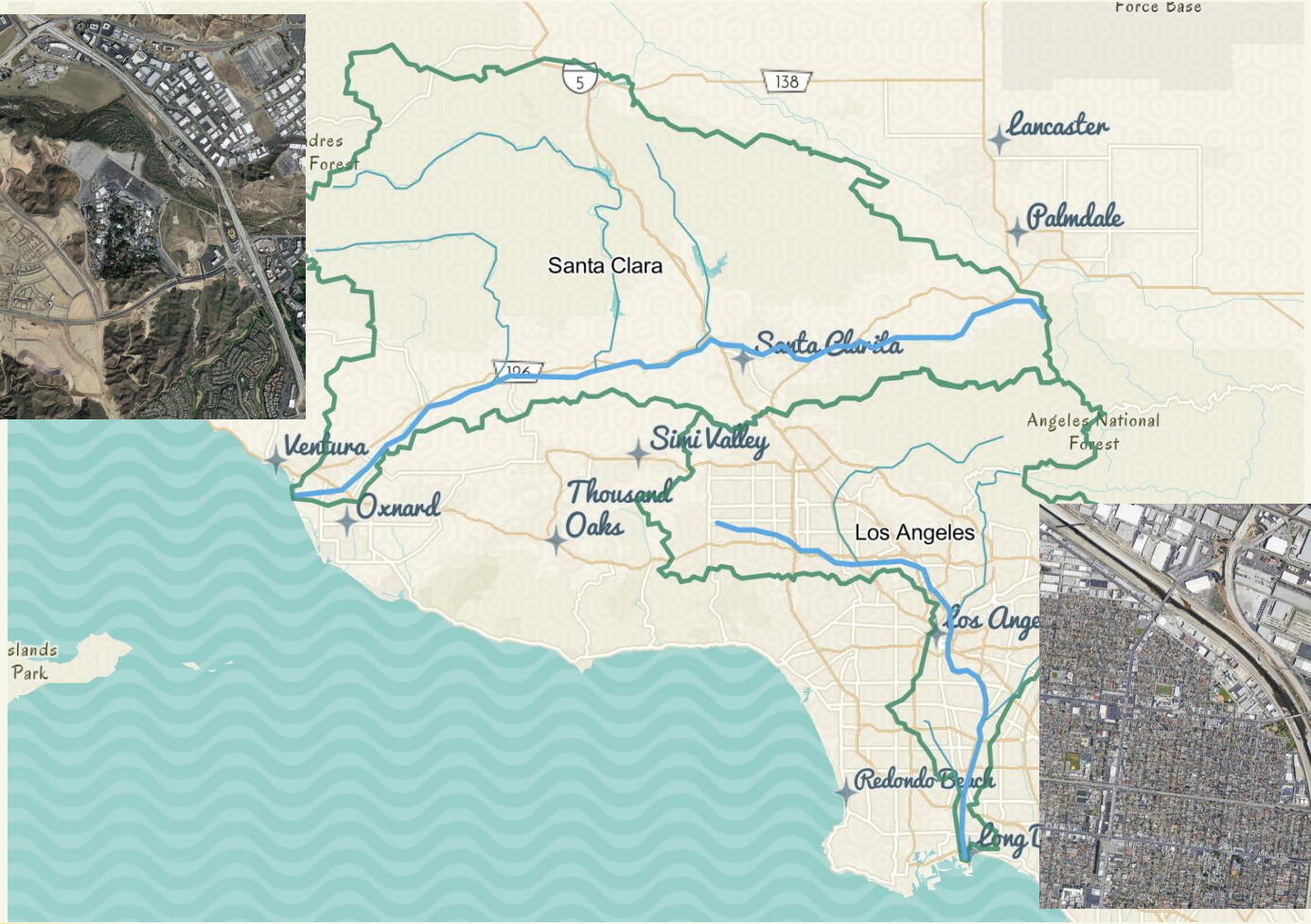
In collaboration with Drs. Raphael Mazor, Ted Grantham, & Albert Ruhi

mvonmayrhauser@berkeley.edu

@melissavonmay

What does river restoration mean to you?


Force Base
5
138
Lancaster
Los Padres
National Forest
Palmdale
Santa Clara
Santa Barbara
Santa Clarita
196
Angeles National
Forest
Ventura
Simi Valley
Thousand
Oaks
Oxnard
Los Angeles
West Covina
Los Angeles
slands
Park
Redondo Beach
Anaheim
Long Beach
Santa Ana


Force Base
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138
Lancaster
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Santa Clarita
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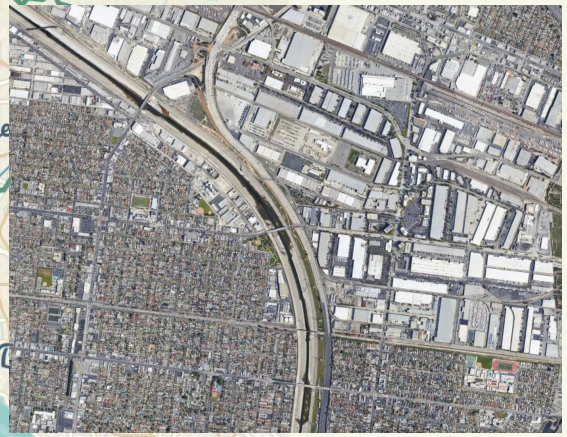
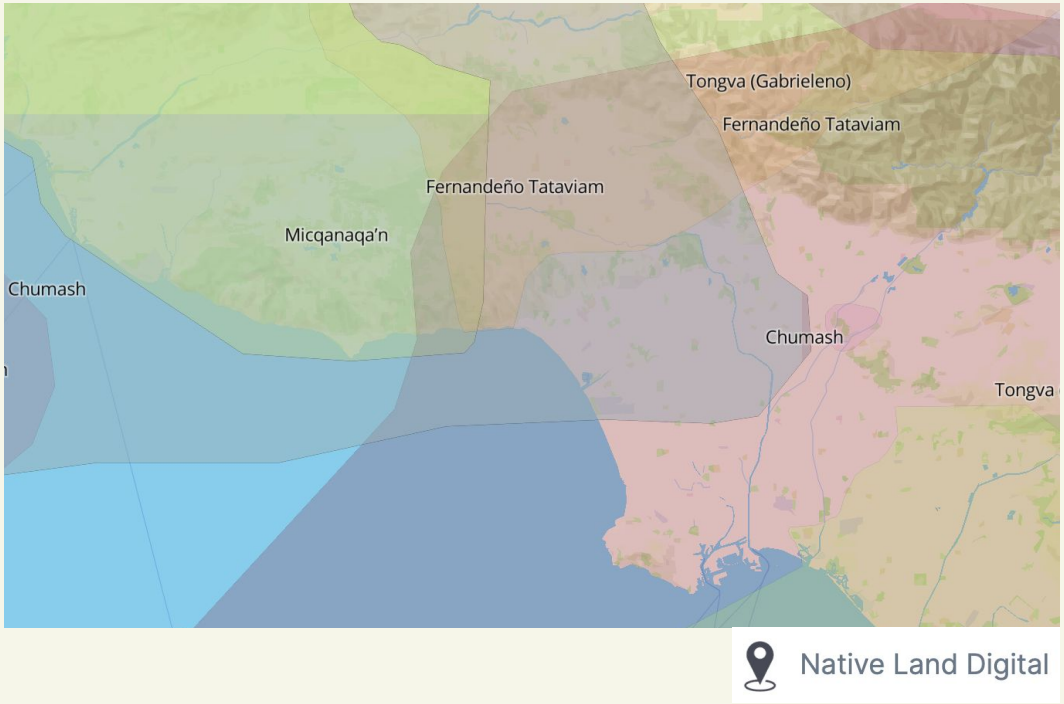
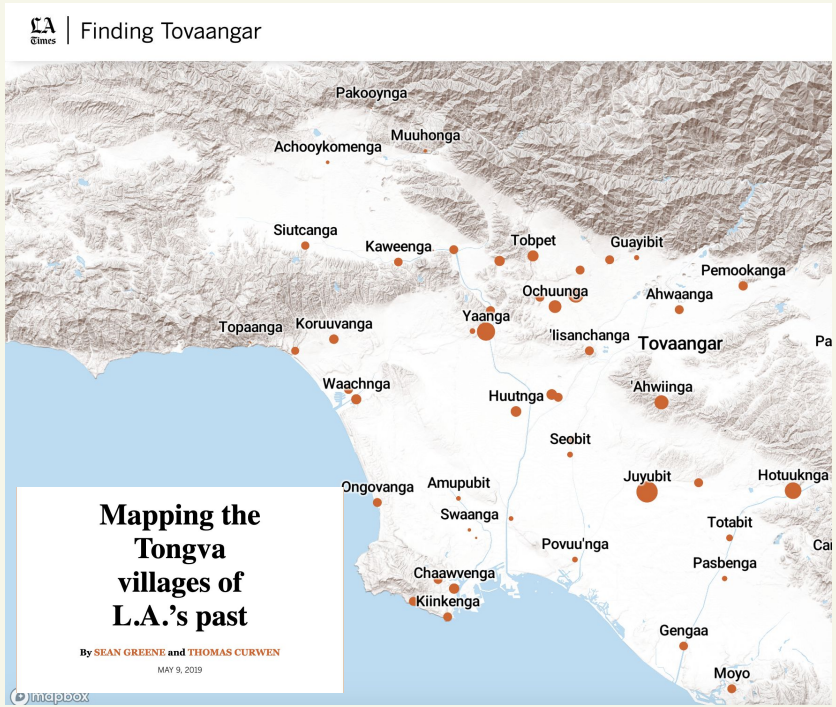
Ventura
Simi Valley
Angeles National Forest
Oxnard
Thousand Oaks
Los Angeles
Los Angeles
Redondo Beach
Long B
Forest
Park



Utom River (Chumash)
Santa Clara River

Paayme Paxaayt (Tongva) Orit (Tataviam) Los Angeles River


Tongva (Gabrieleno)
Fernandeño Tataviam
Fernandeño Tataviam
Micqanaqa'n
Chumash
Chumash
Tongva
Native Land Digital


LA Times | Finding Tovaangar
Pakooynga
Muuhonga
Achooykomenga
Siutcanga
Kaweenga
Tobpet
Guayibit
Pemookanga
Ochuunga
Ahwaanga
Yaanga
Topaanga
Koruuvanga
'Iisanchanga
Tovaangar
Waachnga
Huutnga
'Ahwiinga
Seobit
Juyubit
Hotuuknga
Ongovanga
Amupubit
Swaanga
Totabit
Povuu'nga
Pasbenga
Chaawvenga
Kiinkenga
Gengaa
Moyo
Mapping the Tongva villages of L.A.'s past
By SEAN GREENE and THOMAS CURWEN
MAY 9, 2019
mapbox

Our Sacred Waters: Theorizing *Kuuyam* as a Decolonial Possibility

Decolonization: Indigeneity, Education & Society
Vol 7., No 1, 2018, pp. 40-58

Charles Sepulveda
University of Utah

"In the Tongva language we should be able to call our lands ʻeyoopaviin – our place where water flows… Their villages were located next to the river and their identities were connected to these places geographically, genealogically and through human-land relationships. These connections have not been completely severed despite the attempts."

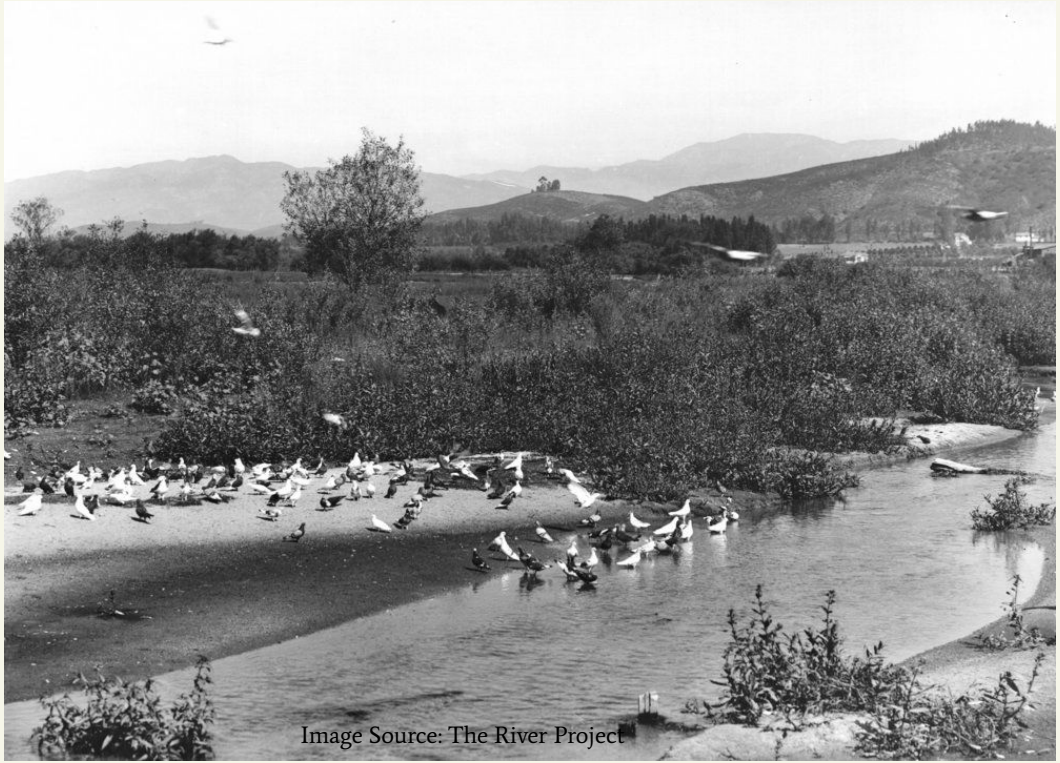


Image Source: The River Project

Image Source: KCET

ELSEVIER
Review
TRENDS in Ecology and Evolution Vol.19 No.2 February 2004
Full text provided by www.sciencedirect.com
SCIENCE DIRECT

Adaptation to natural flow regimes

David A. Lytle[1] and N. LeRoy Poff[2]

Photos of birds from eBird, Cornell Lab of Ornithology

Photo Source:
USC Libraries

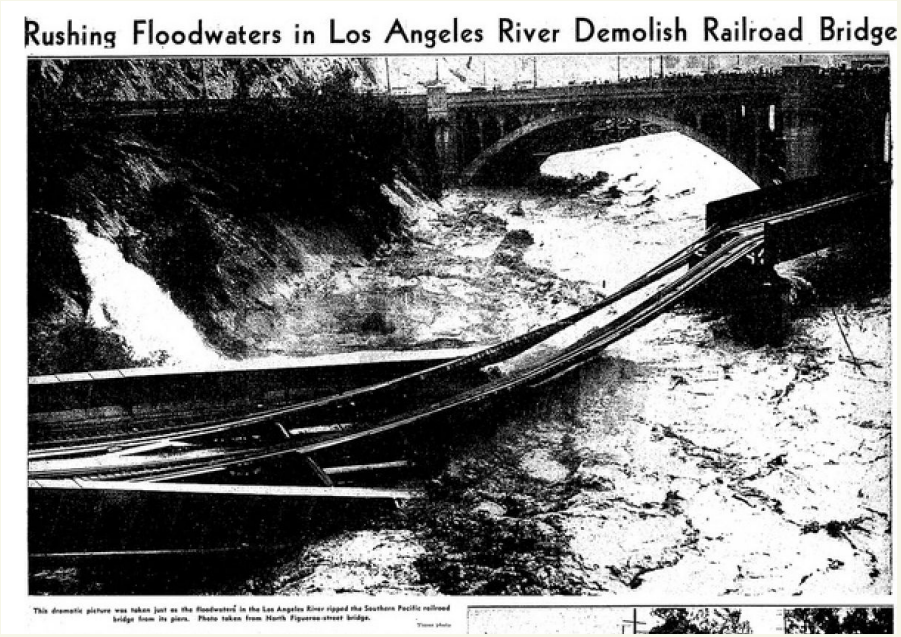
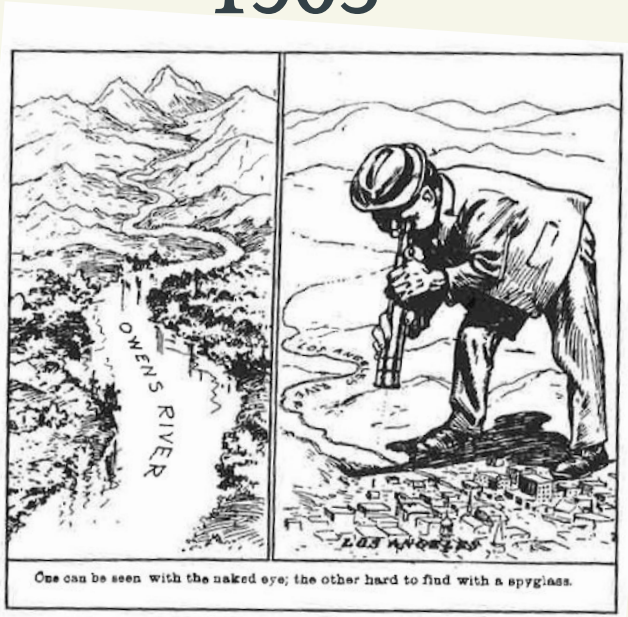



Photo Source: CA State Library

1905



PART II—LOCAL SHEET: 12 PAGES.

Los Angeles Daily Times

XXIV™ YEAR. SATURDAY MORNING, JULY 29, 1905.

TITANIC PROJECT TO GIVE CITY A RIVER.

Thirty Thousand Inches of Water to be Brought to Los Angeles.

Options Secured on Forty Miles of River Frontage in Inyo County—Magnificent Stream to be Conveyed Down to the Southland in Conduit Two Hundred and Forty Miles Long—Stupendous Deal Closed.

INDEPENDENCE (Cal.) July 28.—[Exclusive Dispatch.] Agents representing Los Angeles city have secured options on about forty miles of frontage on the Owens River north of Owens Lake. Fred Eaton, ex-Mayor of Los Angeles, and the superintendent of the Los Angeles water works were in the valley in an automobile the early part of this week. Two days ago they closed the last outstanding options. The price paid for many of the ranches is three or four times what the owners ever expected to sell them for. Everybody in the valley has money, and everyone is happy.

Three months ago Eaton bought the holdings of the Rickey Cattle Company, comprising about 50,000 acres of water-bearing land. It was then thought that Eaton was going into the stock-raising business here, but it has since been learned that he was securing options for Los Angeles city. Eaton has made every option solid and secured all the land the city wanted. The deal is riveted.

THE raise that has held the Rich Fernanda Valley vanish for ten centuries to the artful genius of about to be severed by the magic scholar of modern engineering skill.

Work to the benefactors of the Los

Owens River Valley between Lone Pine and the northern edge of Owens Lake. In this territory are thousands of acres of water-bearing lands, and the city has agreed to turn over to the city of Los Angeles

THE Times announces this morning the most important movement for the development of Los Angeles in all the city's history—the closing of the preliminary negotiations securing 30,000 inches of water, or about ten times our present total supply, enough for a city of 2,000,000 people. In brief, the project is to bring this water to Los Angeles from Owens River in Inyo county, a distance of 240 miles, at a cost of about $23,000,000. Options on the water-bearing lands have been closed by the city's representatives and a series of bond issues will be asked of the voters. This new water supply, immense and unfailing, will make Los Angeles forge ahead by leaps and bounds and remove every specter of drought or enormous stream of the purest mountain water pouring in here, Los Angeles will be the best supplies in the land; she will have water to sell to the San Fernando, San Diego; she will have assured her future for a century. There is no [illegible] will be forthcoming.

[illegible] Thirty thousand inches of water means more to Los Angeles than all the gold hidden away in the California mountains.

LAST SPIKE IN, DEAL CLOSED.

SUPT. MULHOLLAND BRINGS THE GLAD TIDINGS.

Says Options are Fixed and Los Angeles Becomes Owner of Thirty Thousand Inches of Purest Snow Water—Would Give All the Credit to Others.

Stunned and bowed by the almost Titanic proportions of the deal, Superintendent Mulholland returned yesterday afternoon from a during nine days' automobile trip into the heart of the Owens River country, bearing the glad tidings that the deal is closed, the bonds given, the options are all secured; the deal by which Los Angeles city becomes the owner of thirty thousand inches of the purest snow water [illegible]

In the verbal specification here of a knowledge that the water supply question has at last been solved, Mulholland imagined the a schoolboy.

"Well, I guess I [illegible] the last been working on it for thirteen years. In the greatest strategic engineering that ever was pulled off," Mulholland has made it possible for us to accomplish the greatest scheme of the greatest engineer ever attempted in this country."

When Mulholland did not say was [illegible] to himself that made it just

SUPT. MULHOLLAND, AT WORK.

U. S. GOVERNMENT COMMISSIONER

the tales of the time when the Dons [illegible] Angeles—the time when the Chinaman on the work gulch because they could make more money working gold in their sluices.

Showing route of 2

2018

Photo Source: FoLAR

Image Source: Figure 3.7 in Blake Gumprecht's The Los Angeles River: Its Life, Death, and Possible Rebirth

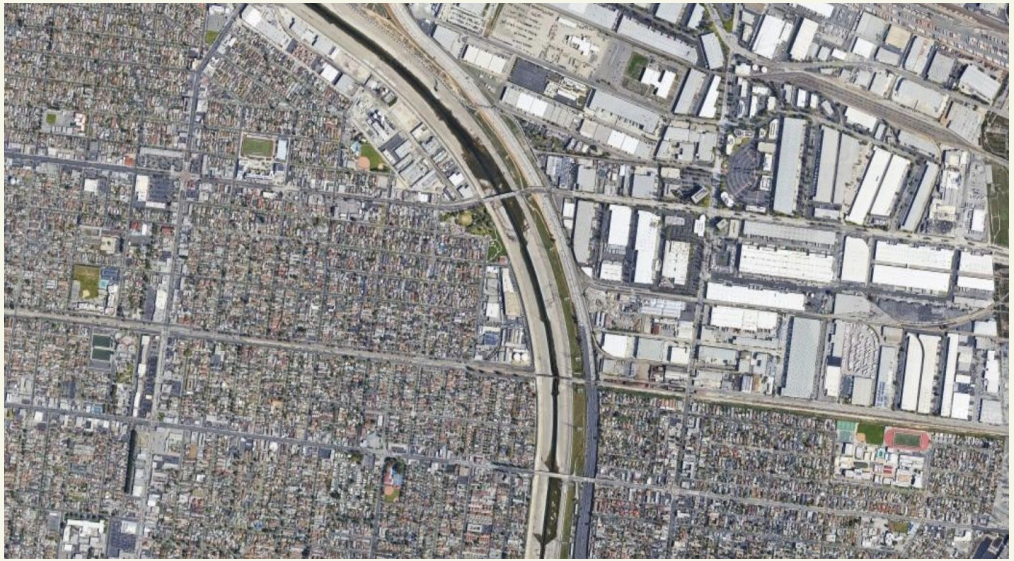
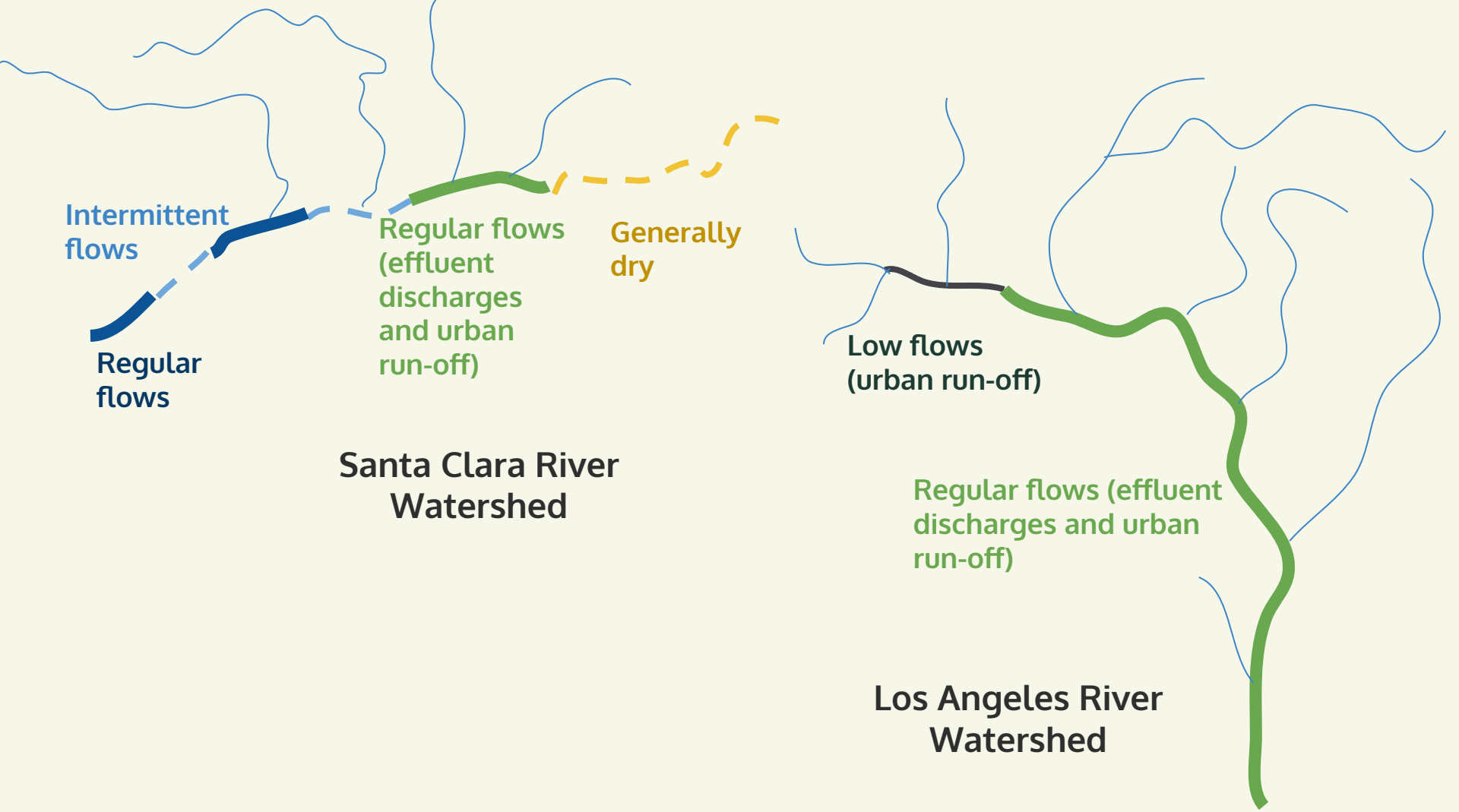


Photo: CADWR


Intermittent flows
Regular flows
Regular flows (effluent discharges and urban run-off)
Generally dry
Santa Clara River Watershed
Low flows (urban run-off)
Regular flows (effluent discharges and urban run-off)
Los Angeles River Watershed

“Novel Ecosystems”

Opinion

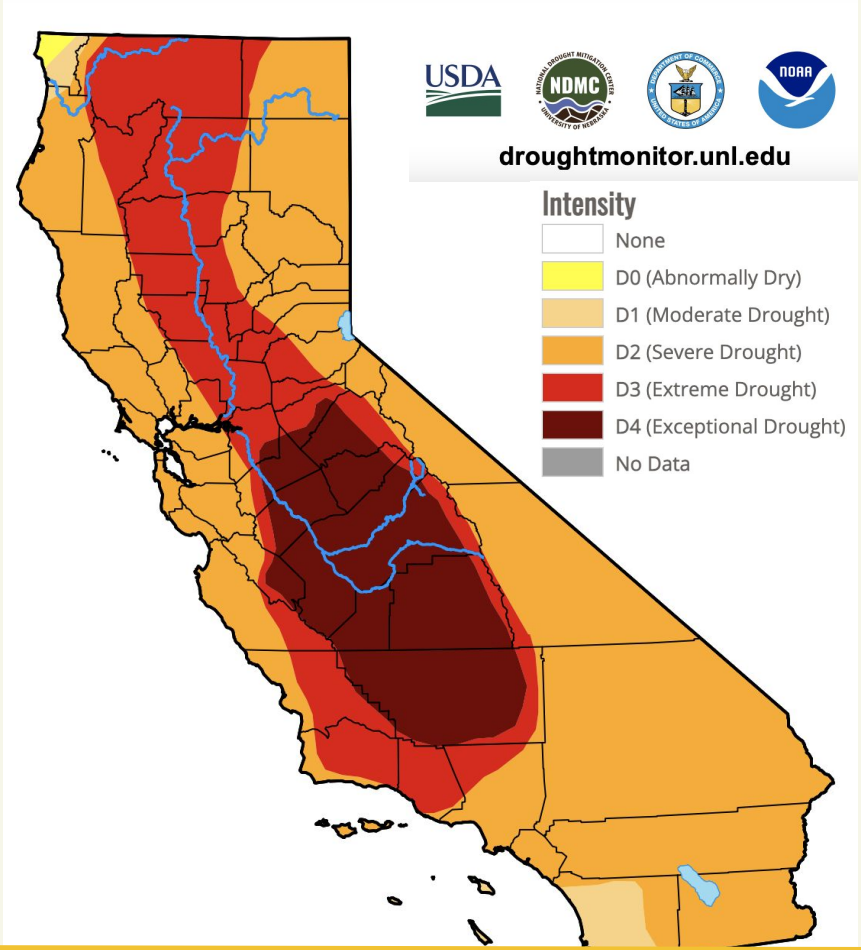
Cell PRESS

Novel ecosystems: implications for conservation and restoration

Richard J. Hobbs[1], Eric Higgs[2] and James A. Harris[3]

[1] School of Plant Biology, University of Western Australia, 35 Stirling Highway, Crawley, WA 6009, Australia
[2] School of Environmental Studies, University of Victoria, Victoria, BC, V8W 2Y2, Canada
[3] School of Applied Sciences, Cranfield University, Cranfield, Bedfordshire, MK43 0AL, UK

“The development of ecosystems that differ in composition and/or function from present and past systems.”



THE SACRAMENTO BEE

Map shows California's current drought status as record heat bakes the region

BY HANH TRUONG

SEPTEMBER 07, 2022 12:00 PM

WATER QUALITY CONTROL POLICY FOR RECYCLED WATER

Recycled Water Policy

Adopted December 11, 2018

Effective April 8, 2019

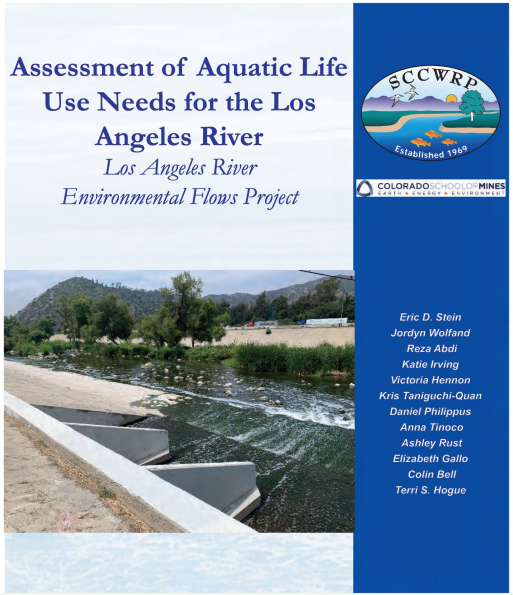
STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

Water Boards

Could the L.A. River dry up? Fears grow as cities work to recycle more wastewater

BY LOUIS SAHAGÚN | STAFF WRITER

FEB. 1, 2022 5 AM PT



"If the city meets its goal of capturing large amounts of run-off and treated water, the river will run dry for several months of the year, affecting revitalization efforts."

By DEBORAH NETBURN

Graphics by SWETHA KANNAN

APRIL 12, 2018

MENU | High Country News

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PEOPLE & PLACES

The Los Angeles River's overlooked anglers

Unhoused Angelenos use the urban river as a source of sustenance, but a proposal to revitalize the waterway could push them out.

Miles Griffis

Image credit: Roberto (Bear) Guerra

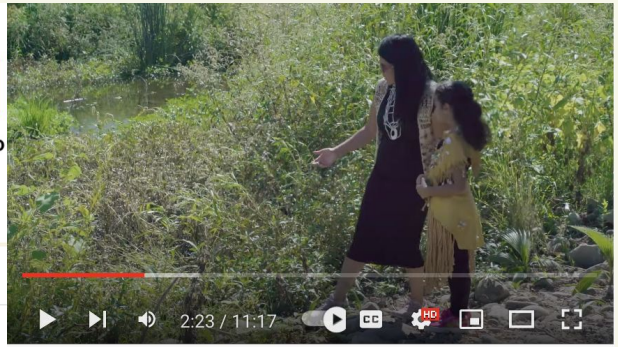
April 20, 2021 | *From the print edition*

Picnic and Birding Along the River on Bird L.A. Day

KCET

By Carren Jao

April 29, 2015



Native Narratives: Tongva Traditions

FOLAR

Los Angeles Times

Steelhead trout in the L.A. River? These experts envision a fish passage through downtown

BY LOUIS SAHAGÚN | STAFF WRITER

OCT. 5, 2020 6 AM PT

THE WALL STREET JOURNAL.

Kayaking the Los Angeles River, an Improbable Eden

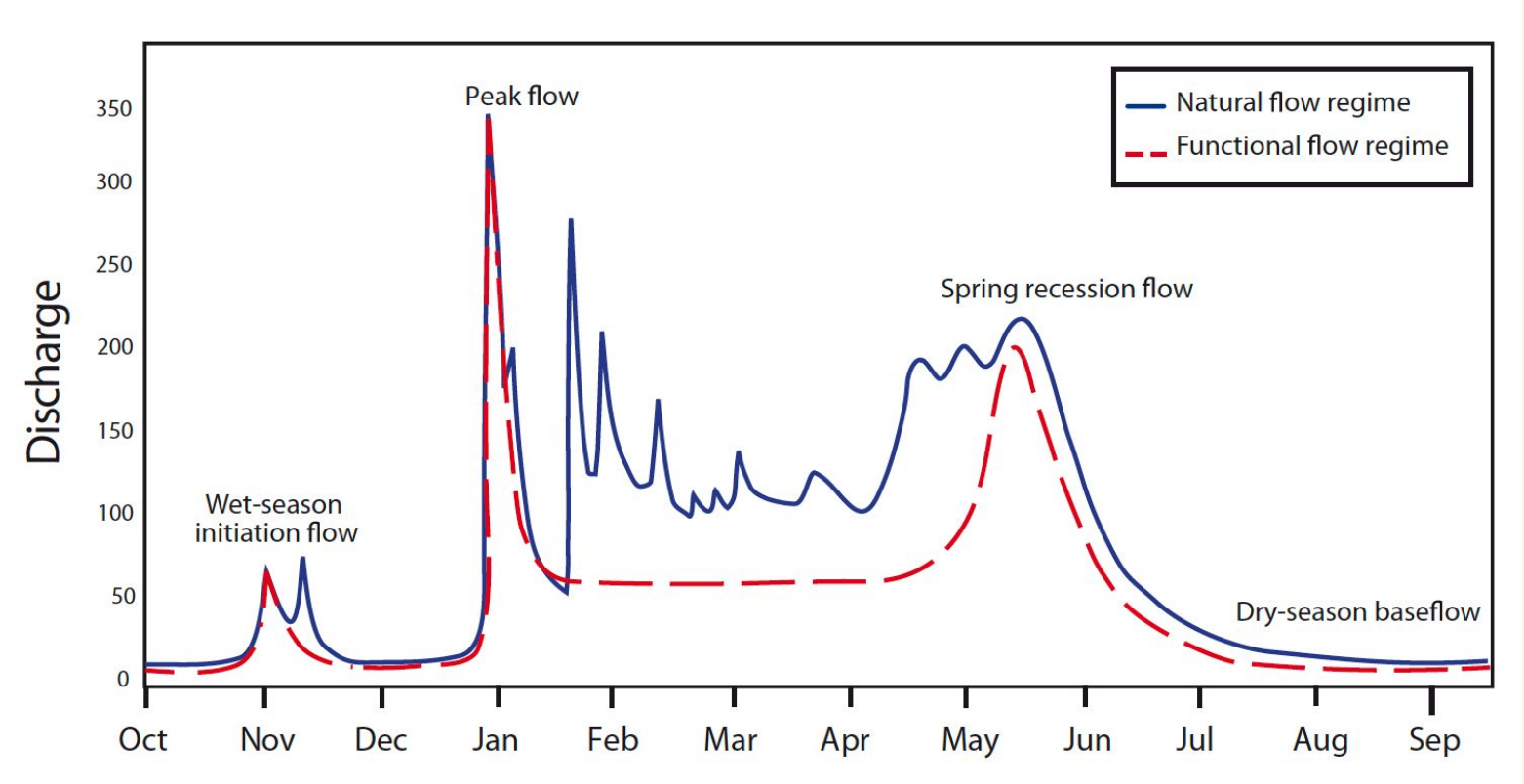
By Tony Perrottet

Aug. 23, 2019 1:02 pm ET

A paddling tour on the L.A. River is surprisingly challenging and bucolic —and best followed by riverside margaritas

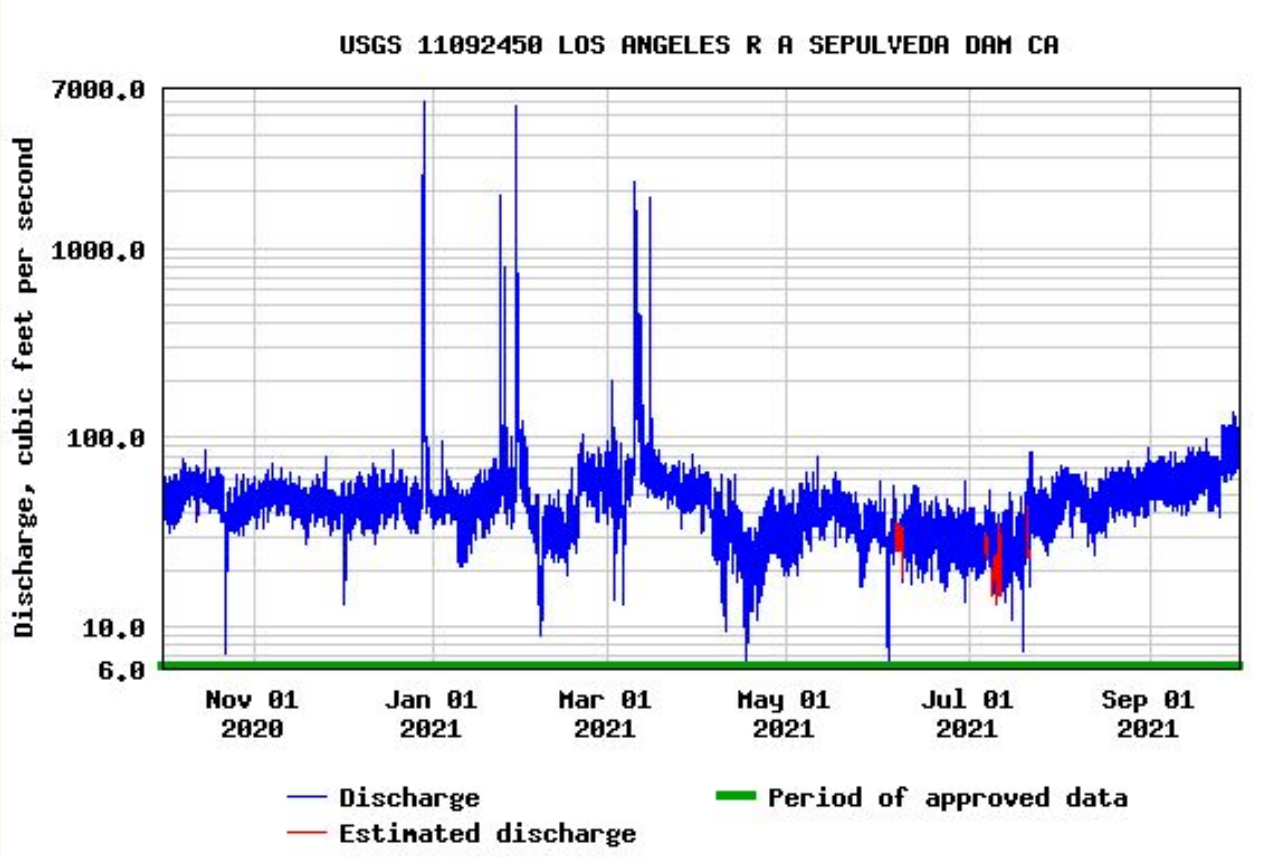
How can effluent and urban run-off be used as tools of urban river restoration?

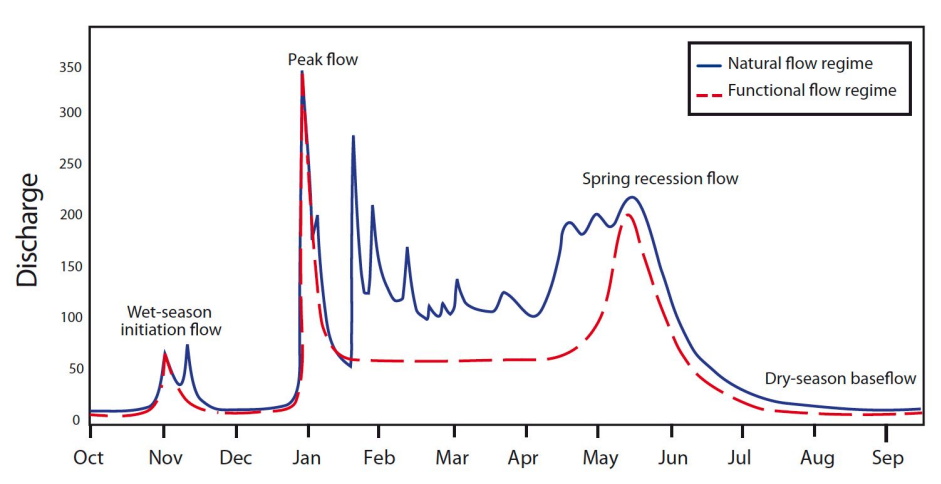
How can we work toward restoring aquatic and riparian habitat watershed-wide as part of climate change mitigation?



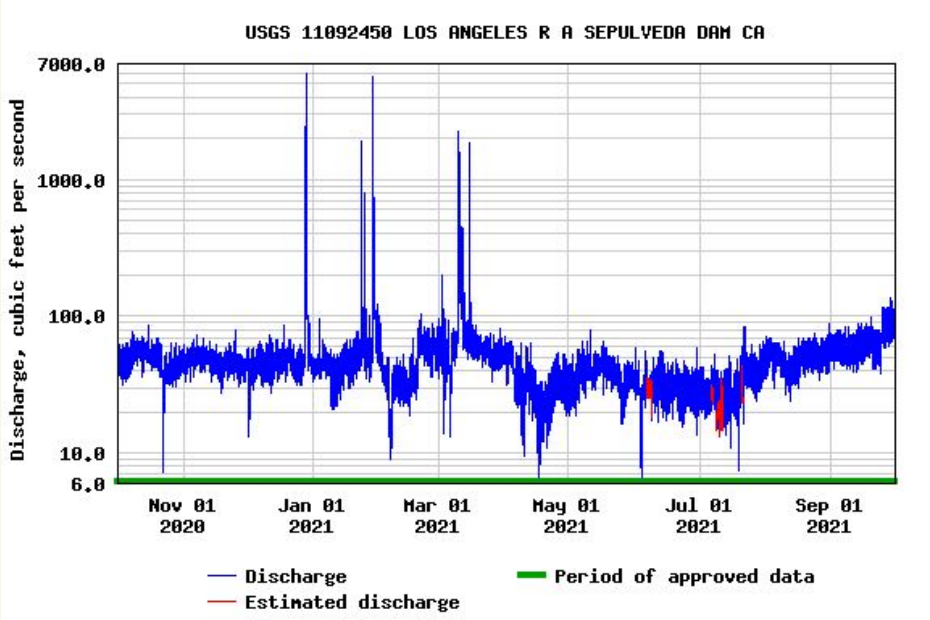
"Functional Flows in Modified Riverscapes: Hydrographs, Habitats and Opportunities"

Yarnell et al, 2015


USGS 11092450 LOS ANGELES R A SEPULVEDA DAM CA
Discharge, cubic feet per second
7000.0
1000.0
100.0
10.0
6.0
Nov 01 2020
Jan 01 2021
Mar 01 2021
May 01 2021
Jul 01 2021
Sep 01 2021
Discharge
Estimated discharge
Period of approved data



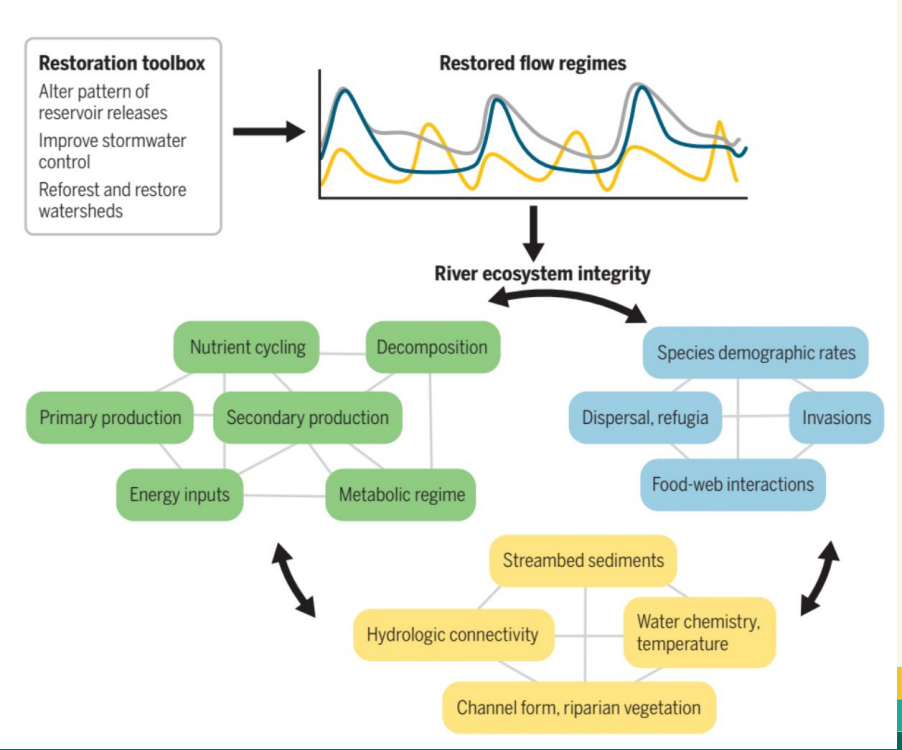
Yarnell et al, 2015



HYDROLOGY

Linkages between flow regime, biota, and ecosystem processes: Implications for river restoration

Margaret Palmer*† and Albert Ruhi*



ELSEVIER
Review
TRENDS in Ecology and Evolution Vol.19 No.2 February 2004
Full text provided by www.sciencedirect.com
SCIENCE DIRECT

Adaptation to natural flow regimes

David A. Lytle[1] and N. LeRoy Poff[2]

Design Criteria for Process-Based Restoration of Fluvial Systems

DAMION C. CIOTTI, JARED MCKEE, KAREN L. POPE, G. MATHIAS KONDOLF, AND MICHAEL M. POLLOCK

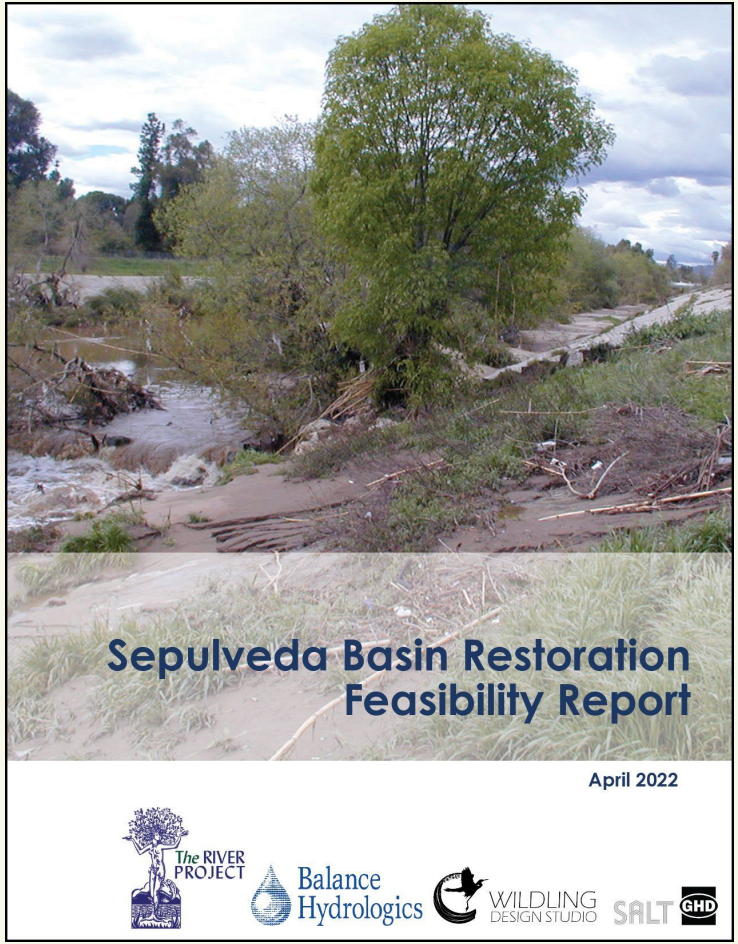
Restoring Dynamic Fluvial Processes in Urban Rivers: Learning from the Aire and Isar Rivers

G. Mathias KONDOLF*
Professor, Department of Landscape Architecture & Environmental Planning, College of Environmental Design, University of California, Berkeley

Georges DESCOMBES
Landscape Architect, Atelier Descombes Rampini SA

Aude ZINGRAFF-HAMED
Research Associate, Chair for Strategic Landscape Planning and Management, School of Life Science, Technical University of Munich

"As restoration science has evolved, we have come to understand that ecosystems provide greater function over the long term when the dynamic forces that create and maintain them are allowed to operate."


Sepulveda Basin Restoration
Feasibility Report
April 2022
The RIVER PROJECT
Balance Hydrologics
WILDLING DESIGN STUDIO
SALT
GHD

If you build it, they will come: rapid colonization by dragonflies in a new effluent-dependent river reach

Michael T. Bogan[1], Drew Eppehimer[1], Hamdhani Hamdhani[1,2] and Kelsey Hollien[1]

"Novel freshwater habitats are also created in cities, such as effluent-dependent streams that rely on treated wastewater for flow. It is unclear how diverse these novel ecosystems are, or how quickly aquatic species are able to colonize them."

Restoration Ecology
THE JOURNAL OF THE SOCIETY FOR ECOLOGICAL RESTORATION INTERNATIONAL

Resilience, Restoration, and Riparian Ecosystems: Case Study of a Dryland, Urban River

Jacqueline M. White[1,2] and Juliet C. Stromberg[3]

"Storm drains in the urban reach function as tributaries by accumulating and transporting resources from the watershed… they do provide sufficient water for the persistence of mesic and hydromesic riparian vegetation within the much-narrowed and channelized river floodplain."

Los Angeles Times

By LOUIS SAHAGÚN

Frank Gehry's bold plan to upgrade the L.A. River seeks to atone for past injustices

Environmental groups allege L.A. River Master Plan was approved without proper review

How Frank Gehry's L.A. River make-over will change the city and why he took the job

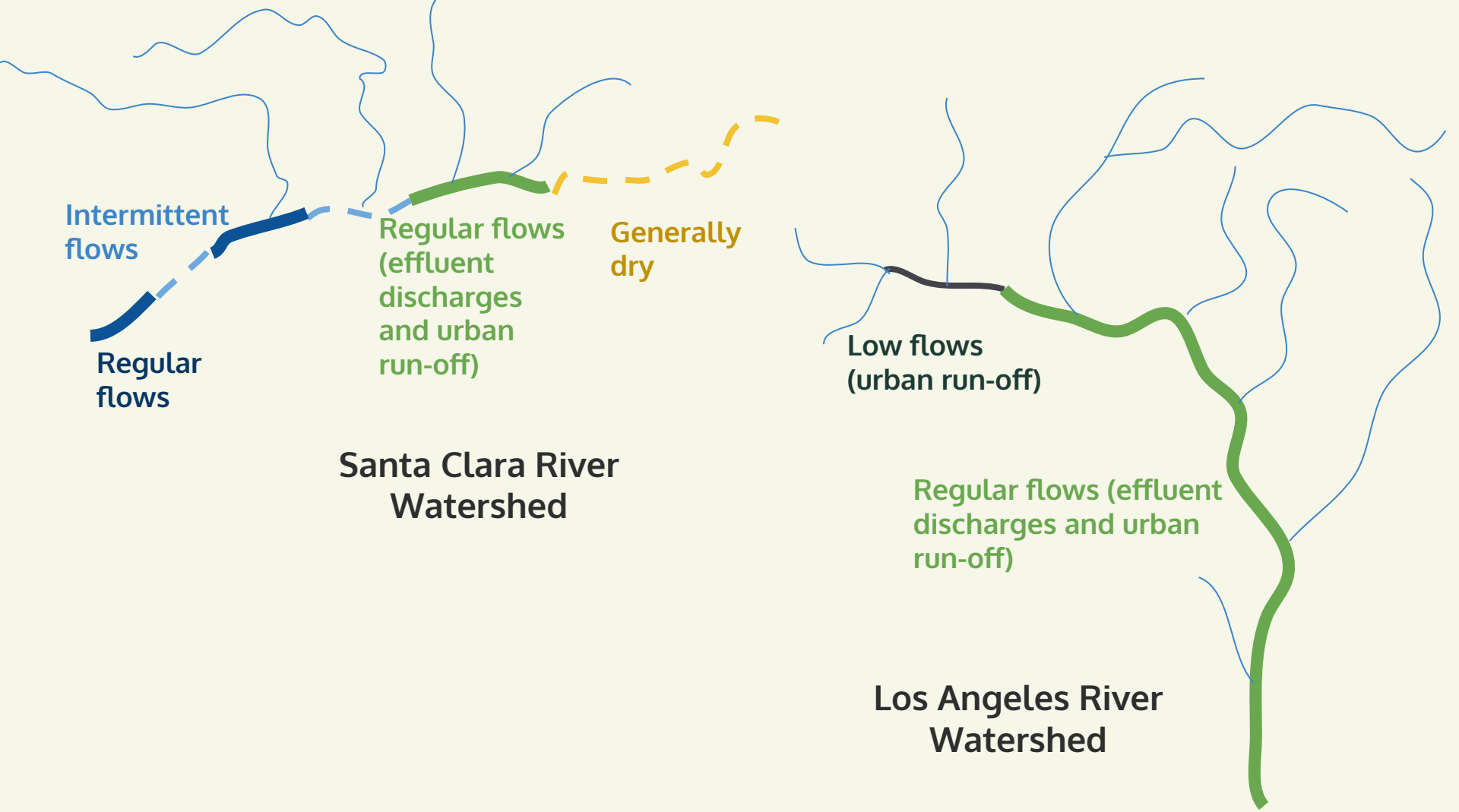
BY CHRISTOPHER HAWTHORNE

Google Earth, Times reporting

Paul Duginski / Los Angeles Times

Frank Gehry: "They came to see me and said they were heading up a committee for Mayor Garcetti and said we have this wonderful river, 51 miles, and that if we could brand it, give it visual coherence, it could become something special."

How do changing flows along the Santa Clara River and Los Angeles River relate to changes in bug, bird, and plant communities — and to changes in people’s perceptions of these waterways?


Intermittent flows
Regular flows
Regular flows (effluent discharges and urban run-off)
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Santa Clara River Watershed
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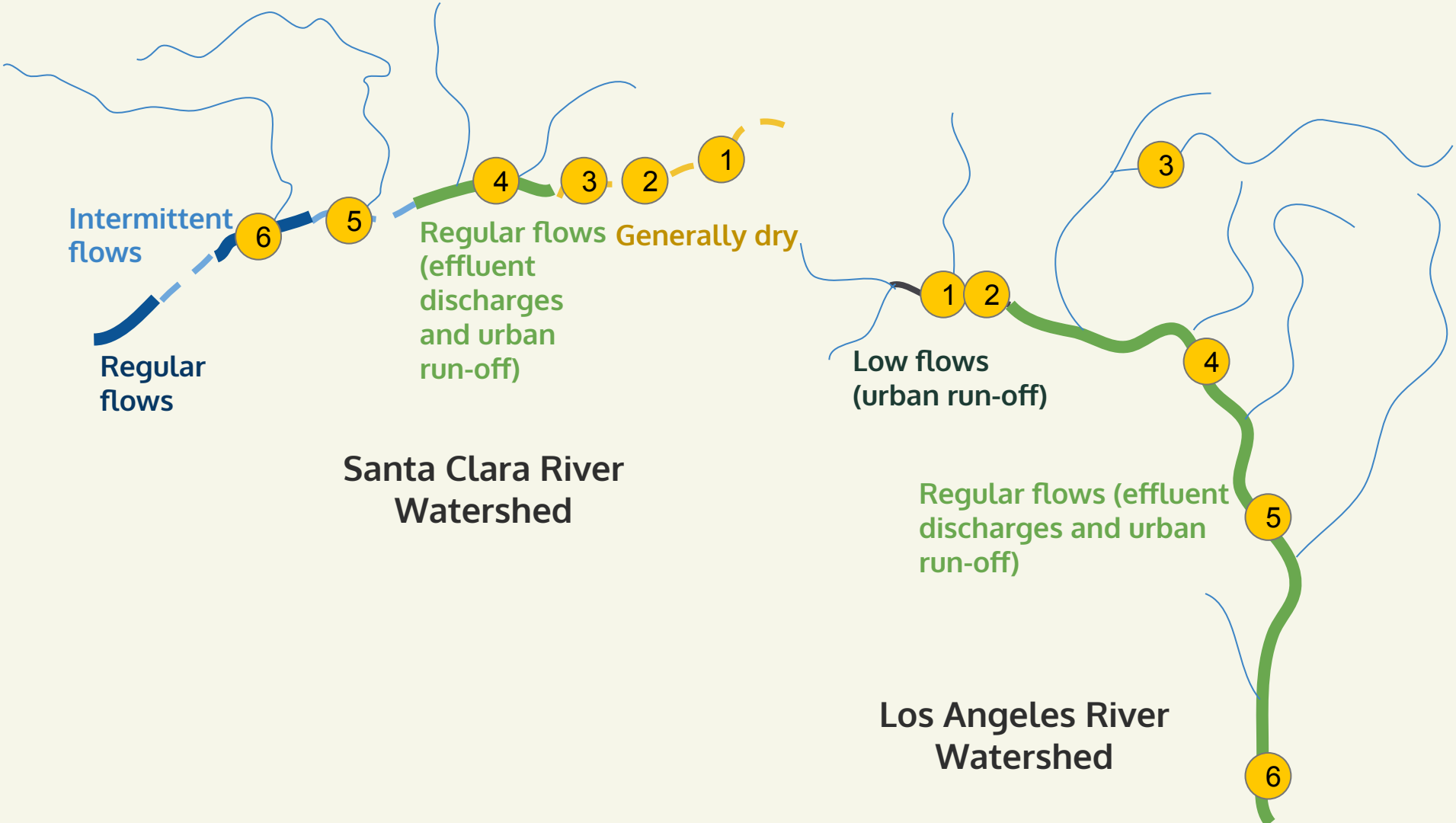
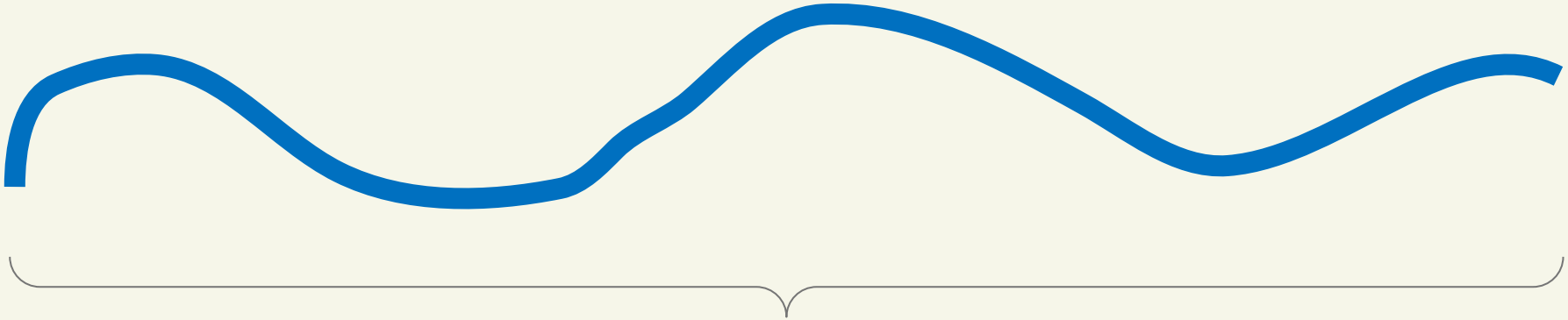
Los Angeles River Watershed

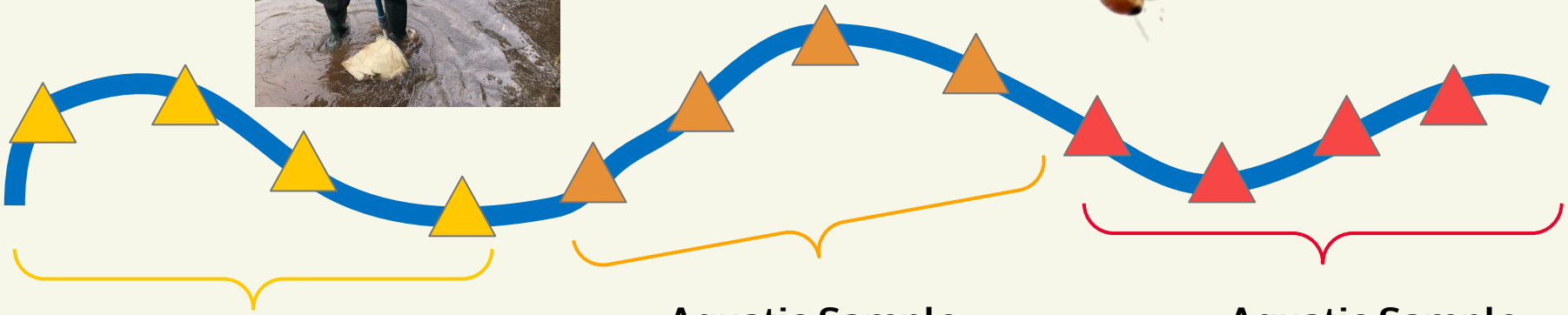
	Upstream of Effluent	Downstream of Effluent
Concrete - lined		
Soft - bottom		
Unconstrained		


Intermittent flows
Regular flows
6
5
4
3
2
1
Regular flows (effluent discharges and urban run-off)
Generally dry
Santa Clara River Watershed
1
2
3
4
5
6
Low flows (urban run-off)
Regular flows (effluent discharges and urban run-off)
Los Angeles River Watershed

Study Design



Study Design



Aquatic Sample #1

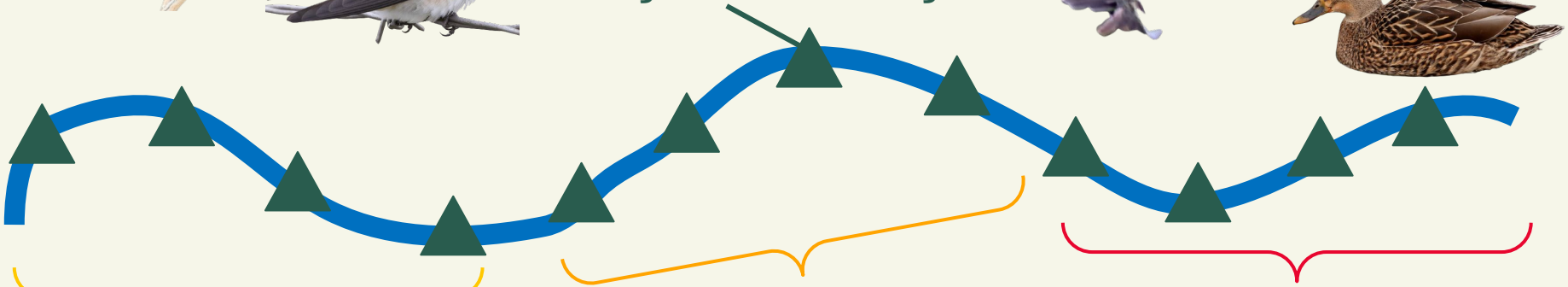
Aquatic Sample #2

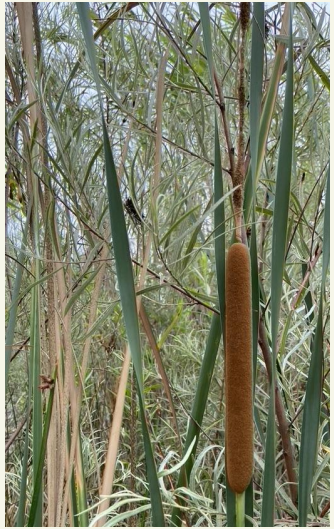
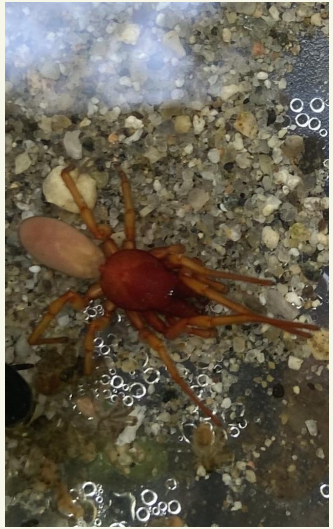
Aquatic Sample #3

Photos of invertebrates from macroinvertebrates.org

Study Design

Study Design

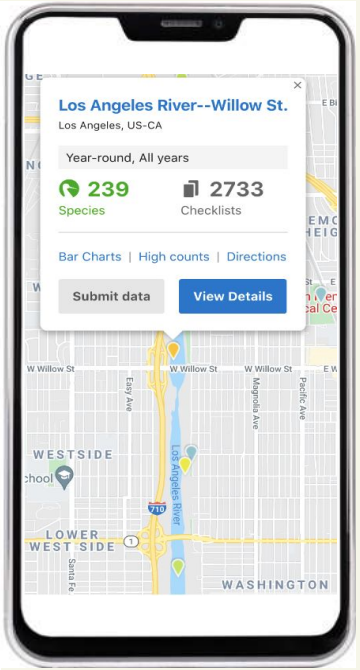


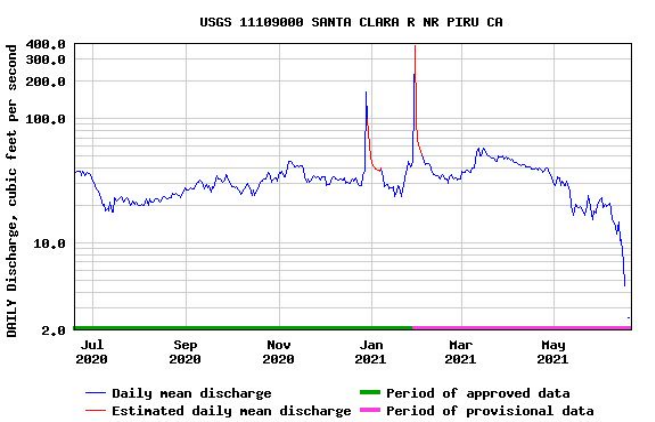



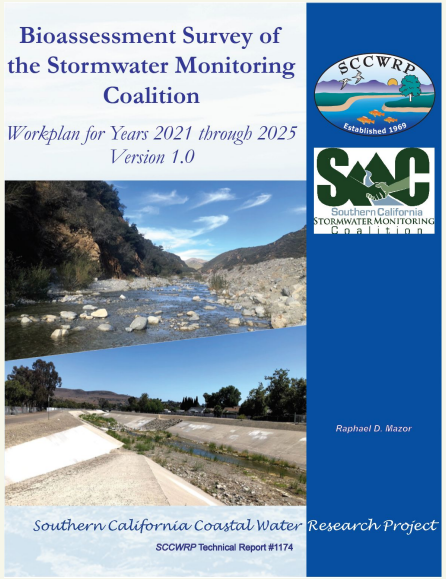
We are studying the food web.

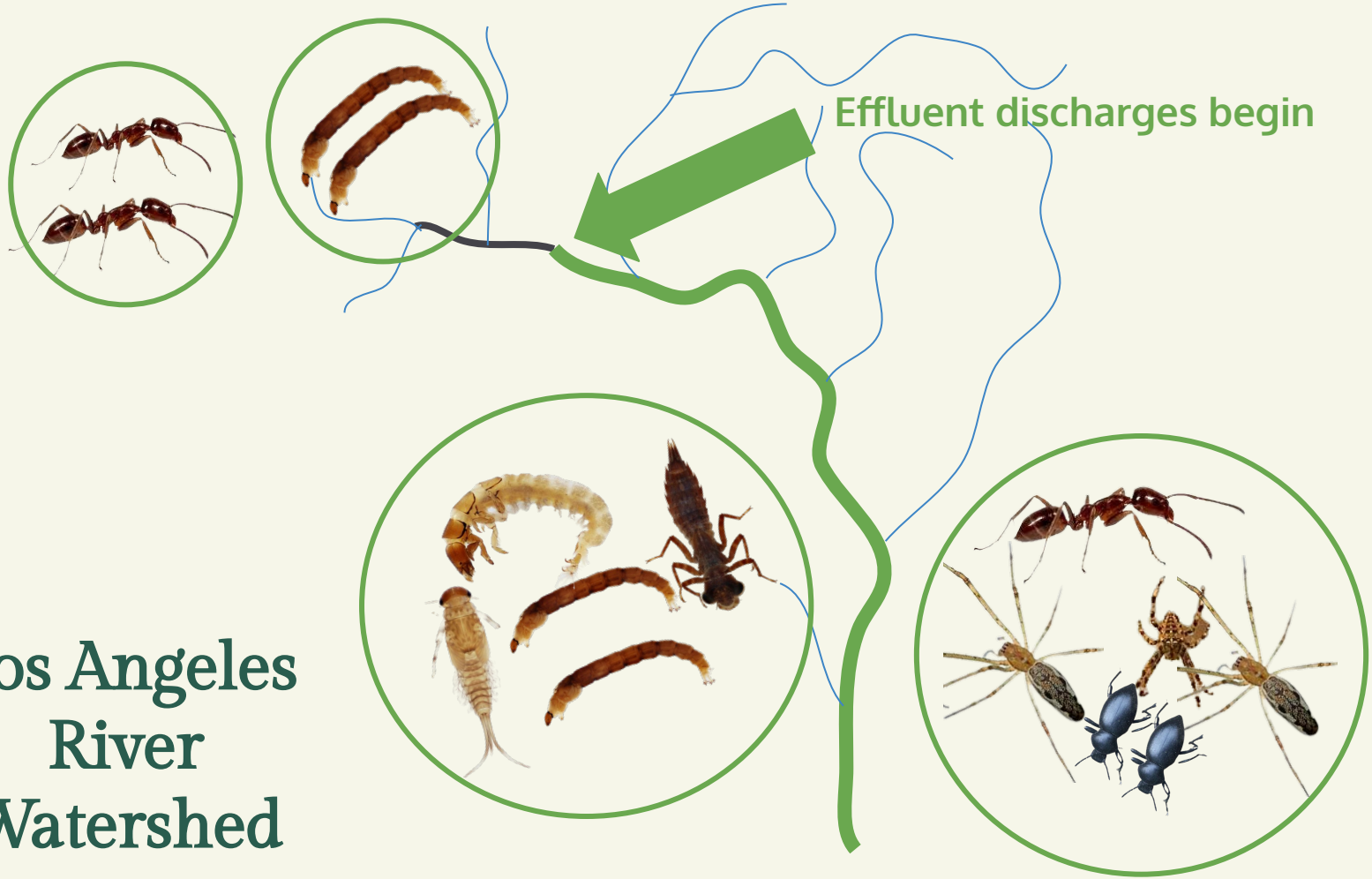
eBird

iNaturalist

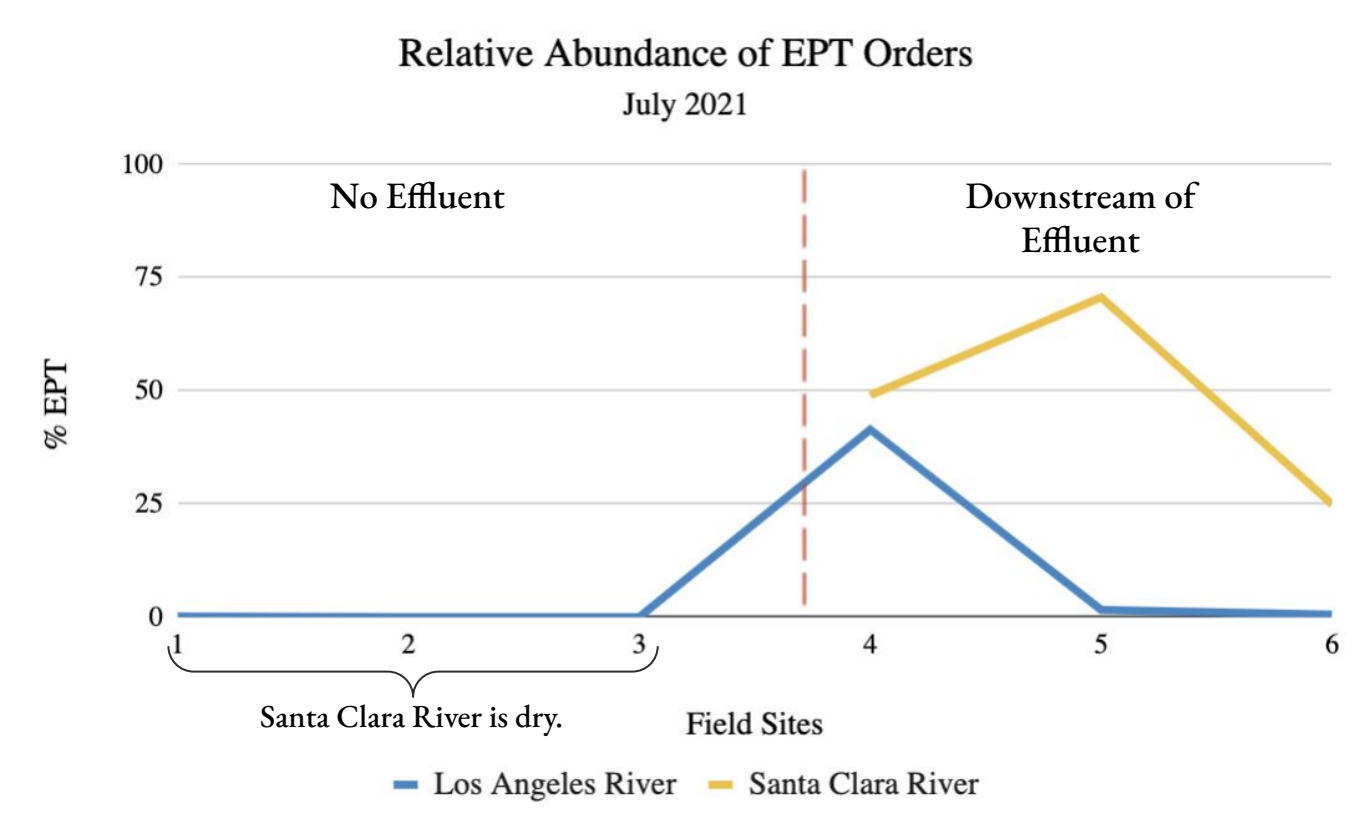








Los Angeles River Watershed

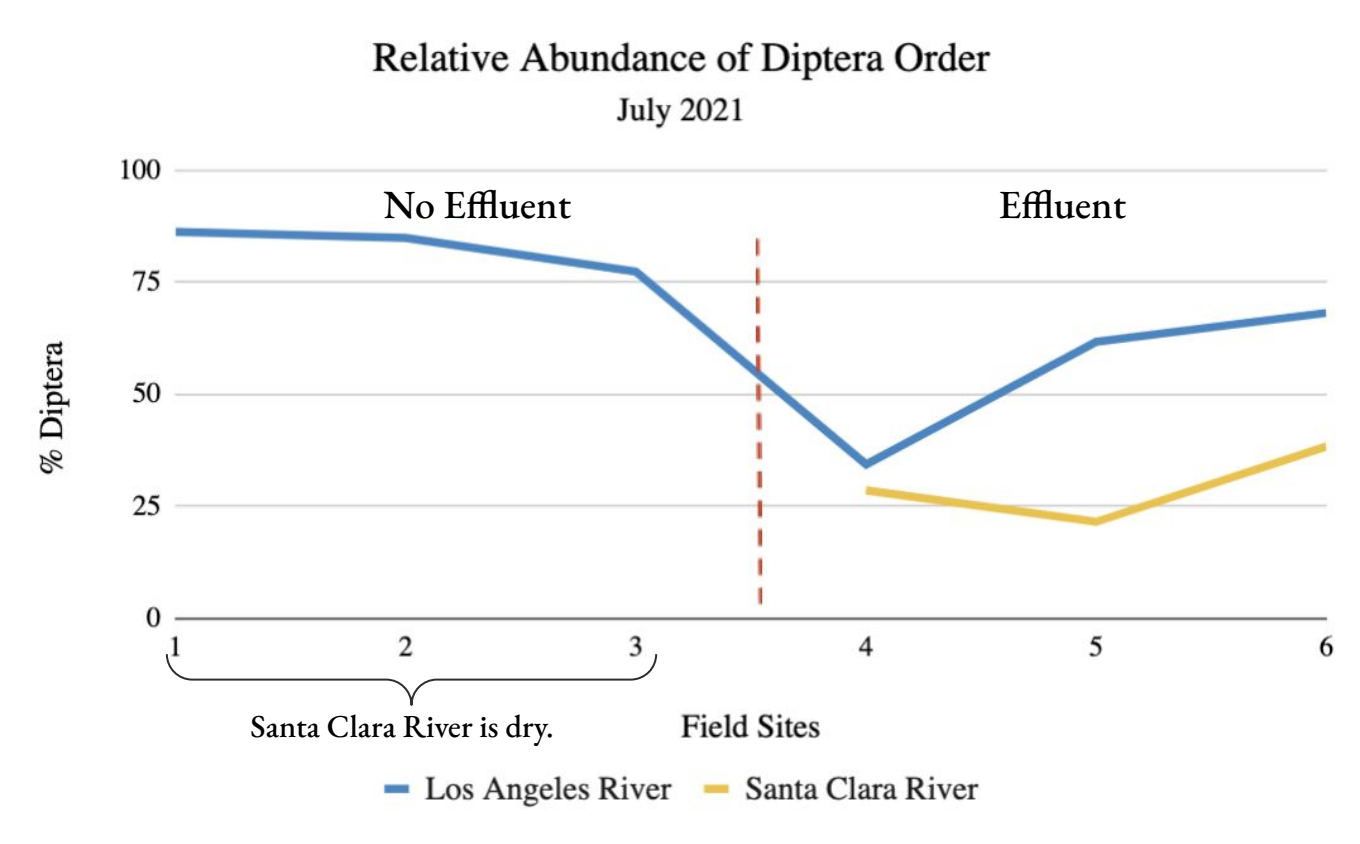


Ephemeroptera (Mayflies)

Plecoptera (Stoneflies)

Trichoptera (Caddisflies)

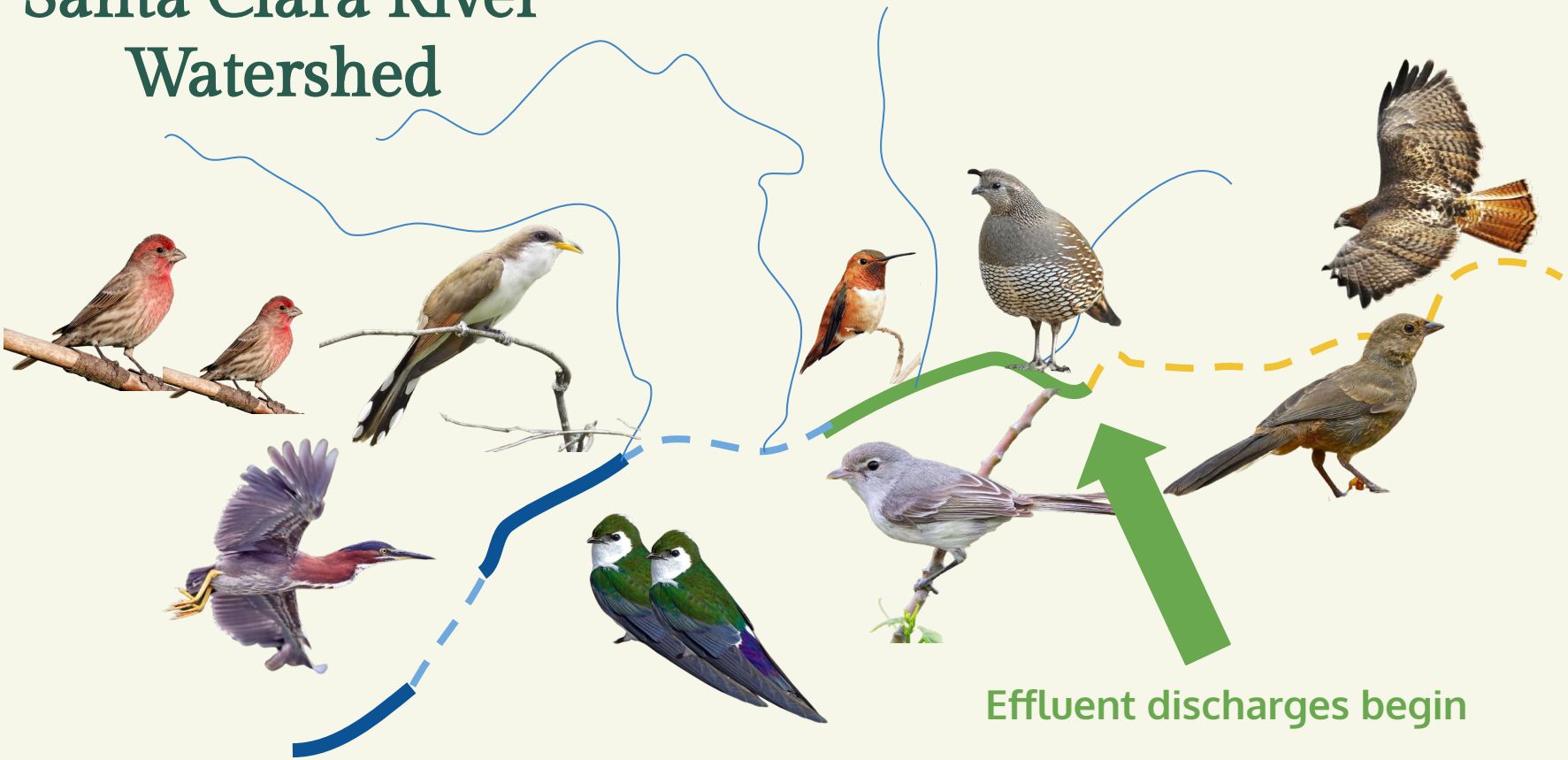
Images: macroinvertebrates.org



Diptera (True Flies)

Images: macroinvertebrates.org

Santa Clara River Watershed



Let’s think about flows - and the biodiversity that they support - as we consider the meaning of restoration in the future of our region’s rivers.

What does river restoration mean to you?

What flows would you like to see in local rivers?

Thank you!

DEPARTMENT *of* ENVIRONMENTAL SCIENCE, POLICY, AND MANAGEMENT

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Questions?

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