



# ***The Riparian Habitat Joint Venture***

## **Voting Members:**

**PRBO Conservation Science  
River Partners  
The Trust for Public Land  
Xerxes Society  
Environmental Defense Fund**

## **Non-Voting Members:**

**US Bureau of Land Management  
US Bureau of Reclamation  
USDA Natural Resources Conservation  
Service  
US Geological Survey  
US Forest Service  
California Dept. of Fish and Game  
California Dept. of Water Resources  
California Natural Resources Agency  
California State Lands Commission  
California Wildlife Conservation Board**

Using science and collaboration  
to manage, protect, and restore  
riparian lands in California

California Riparian Habitat Joint Venture  
C/O The California Department of Water Resources/FESSRO  
901 P street, Rm 411A  
PO Box 942836  
Sacramento, California 94236-0001  
[www.rhiv.org](http://www.rhiv.org)

# Science

## Focal Species

Plants

Birds

Fish

Mammals

## Riparian Communities

Characterizations

Map

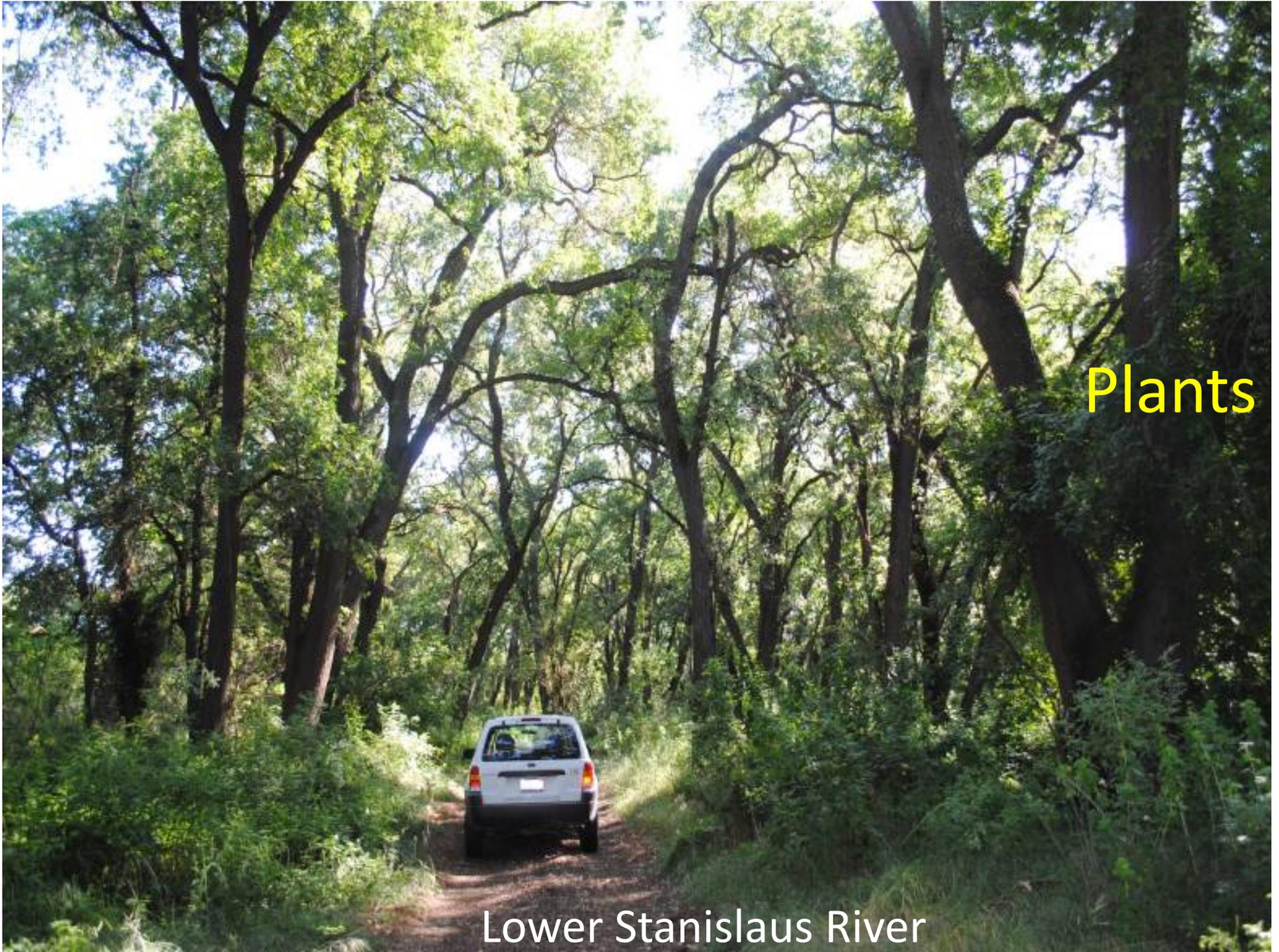
Model

Floodplains

An aerial photograph showing a dense forest of green trees on a floodplain. The forest is composed of various shades of green, indicating a diverse plant community. In the bottom left corner, a dark river is visible, curving along the edge of the forest. The top of the image shows a transition to a more open, grassy area with scattered trees.

## Plant Mosaic on Floodplain

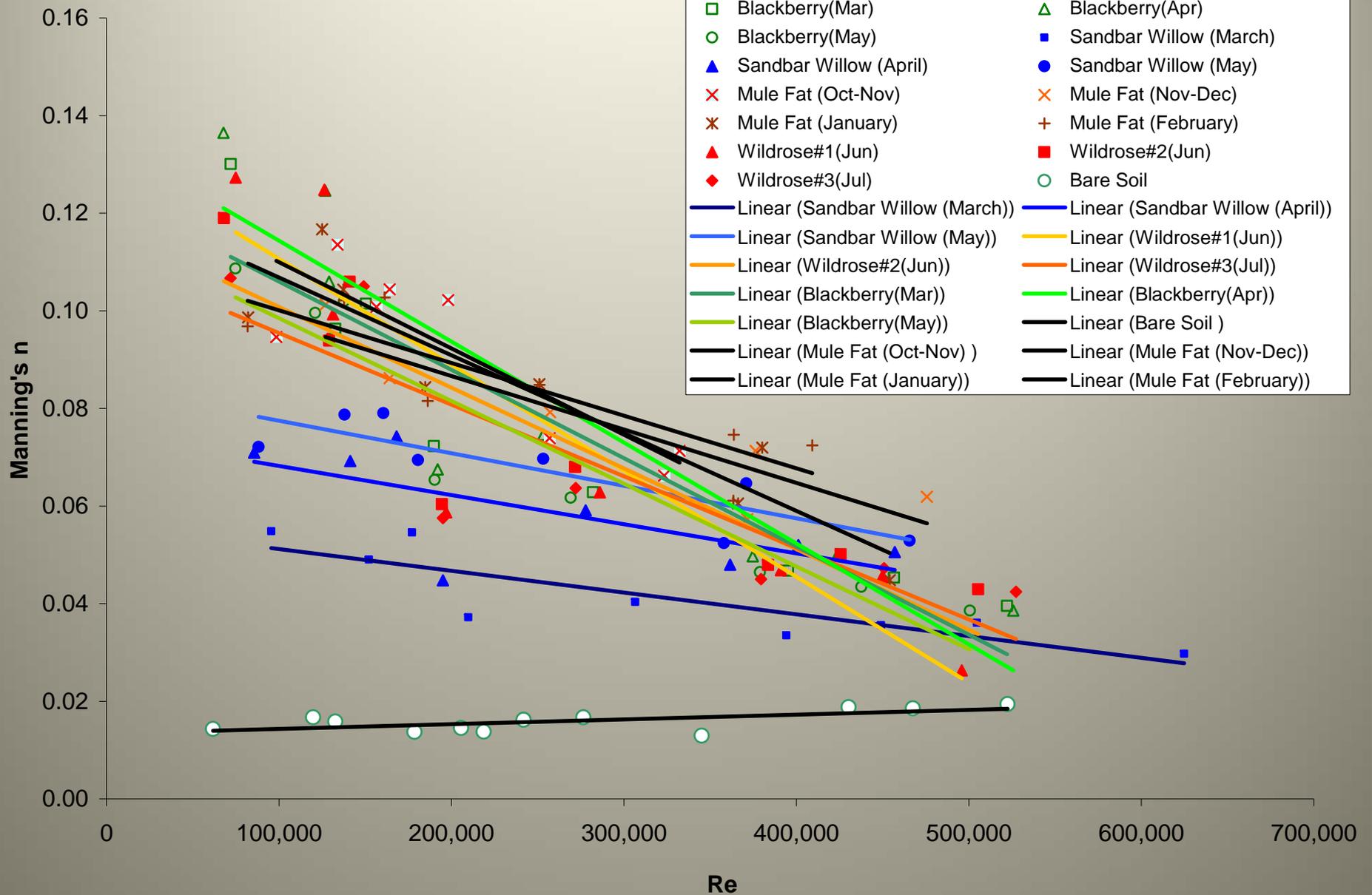
Lower Stanislaus River



Plants

Lower Stanislaus River

# Hydraulic Characteristics of Floodplain Adapted Plants



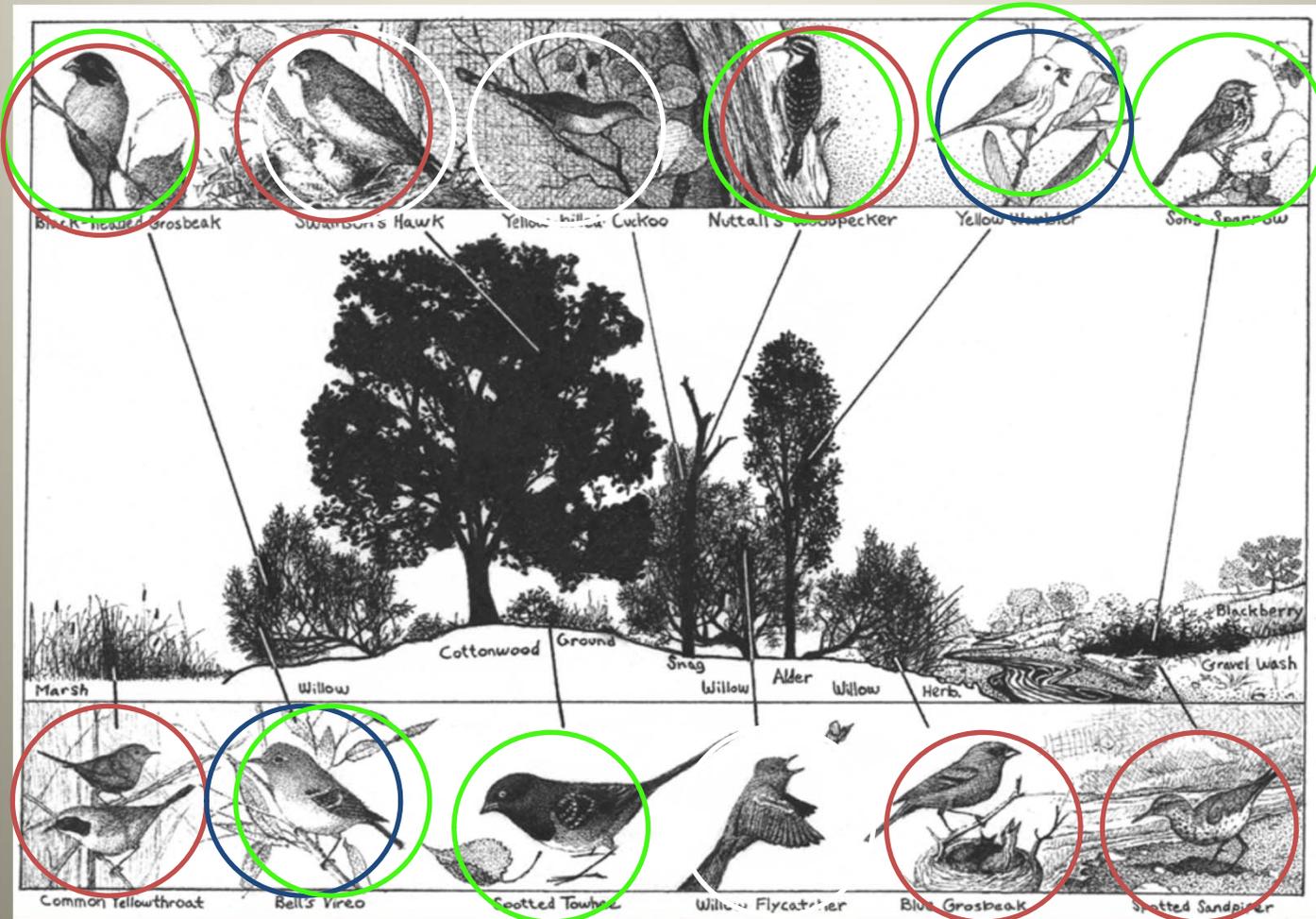
# Birds

- Photos by Dave Bogener



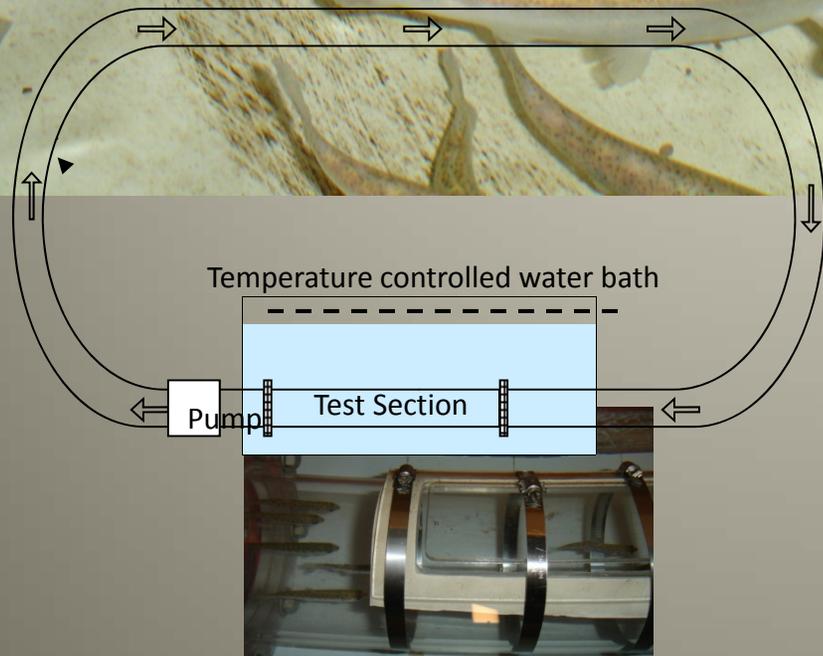
PRBO Conservation Science

Focal species approach (from Chase and Geupel 2005): Includes species at risk, umbrella species and easily monitored species



Focal species that represent a range of critical ecosystem/habitat elements

# Fish



# Mammals



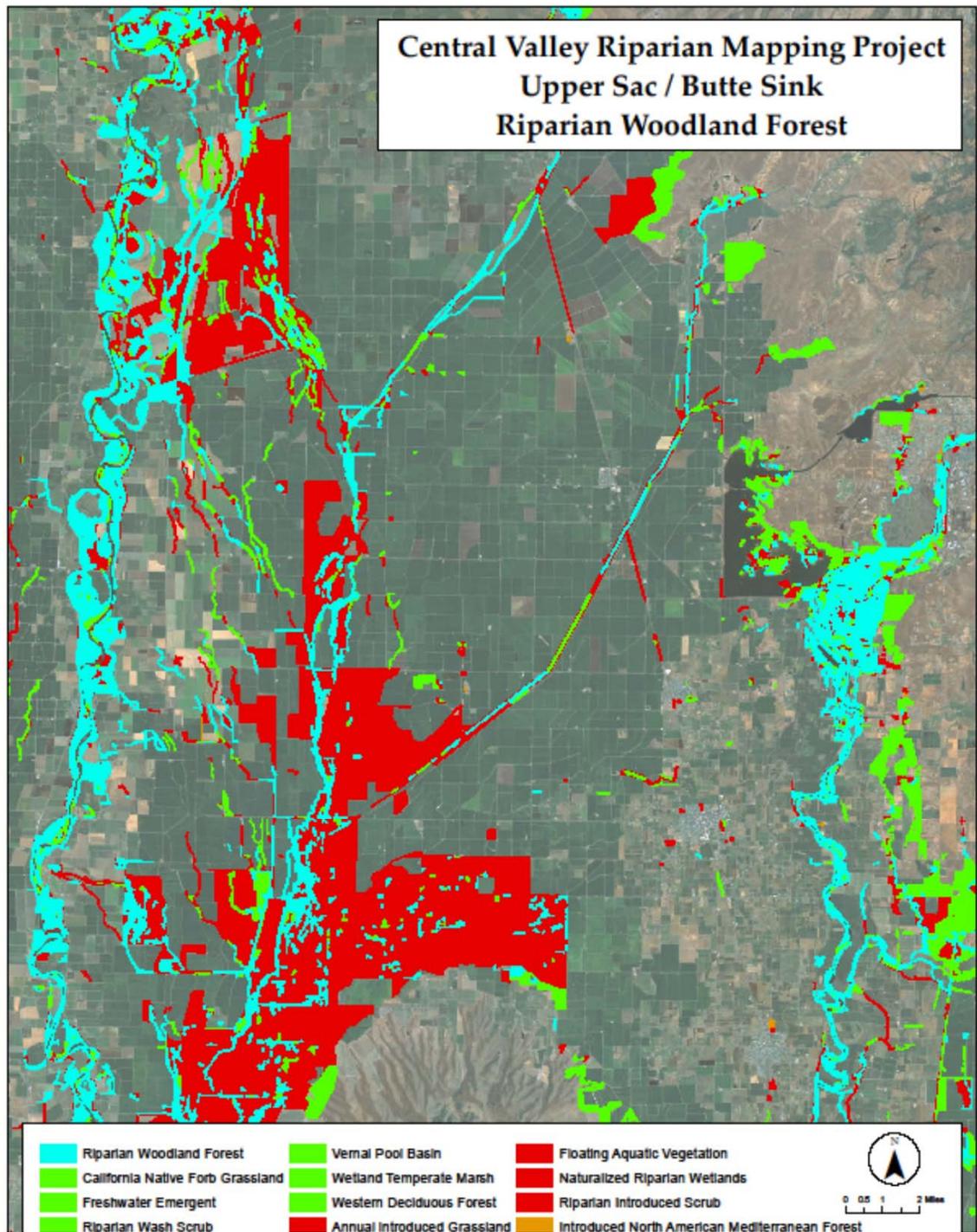
# Mammals



# Riparian Community Characterization



# Mapping



# Modeling



## SAN FRANCISCO ESTUARY INSTITUTE

REGION-WIDE SCIENCE FOR ECOSYSTEM MANAGEMENT

HOME

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DATA CENTER

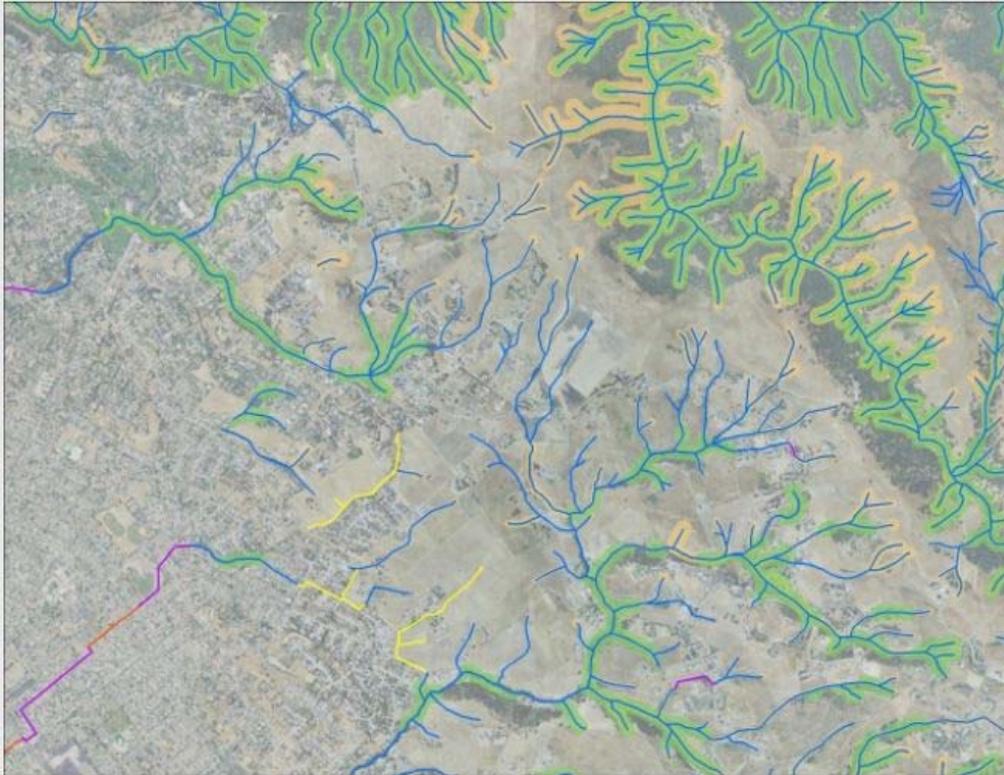
DOCUMENTS and REPORTS

CALENDAR

ABOUT US

Home :: Bay Area Aquatic Resource Inventory (BAARI) :: Riparian Area Mapping Tool

### Riparian Area Mapping Tool



The National Resource Council (NRC) defines riparian as “areas through which surface and subsurface hydrology connect... and significantly influence exchanges of energy and matter”. The riparian area mapping tool (RAMT) was developed as a cost-effective way to map riparian extent as defined by the NRC.

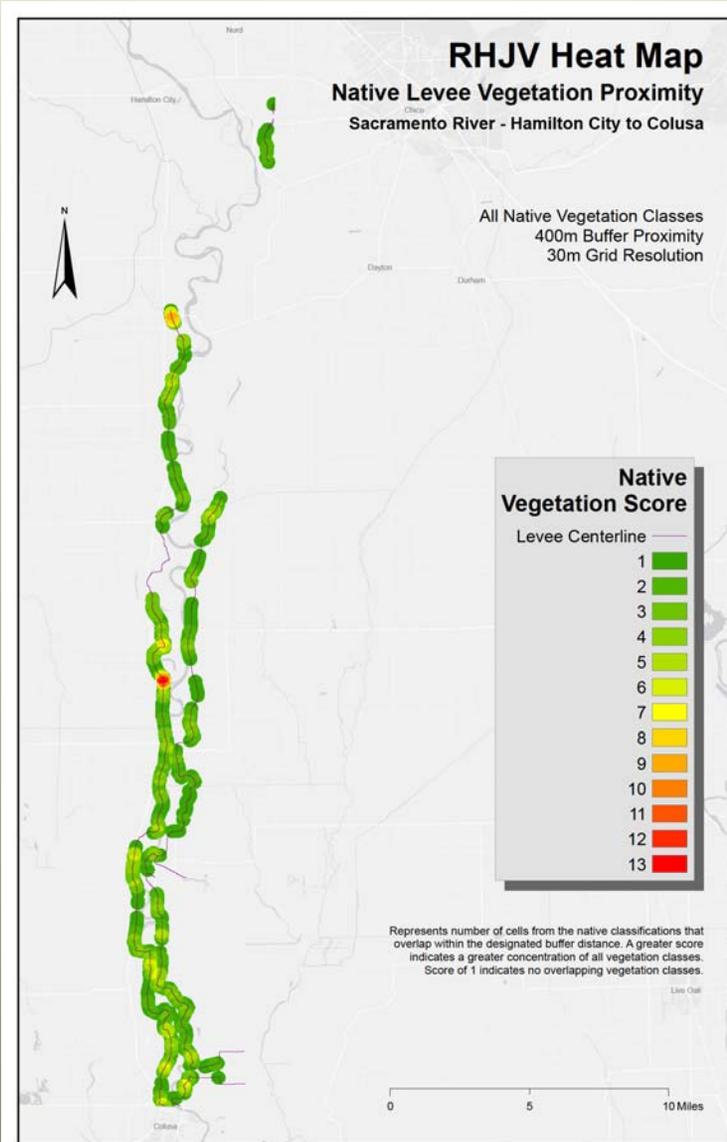
#### SEARCH



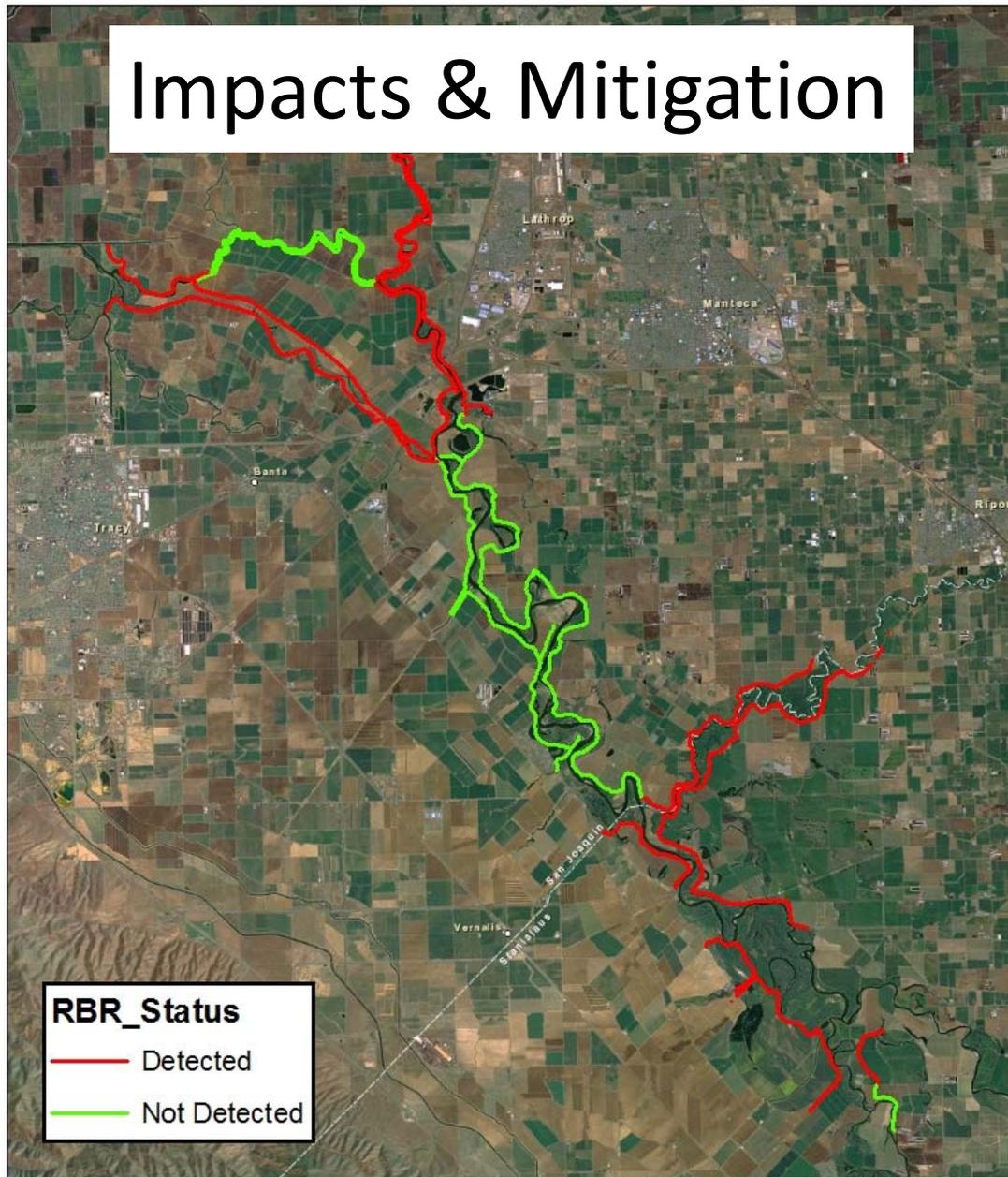
#### MORE INFO

- [BAARI Mapping Documentation](#)
- [Riparian Area Mapping Tool](#)

# Riparian Community Value



# Impacts & Mitigation



## Riparian Brush Rabbit Impact Analysis - CVFPP Veg Management

Data from the CVFPP 2012.

Draft Map - For Discussion Purposes Only

Map created March 2012; R. Melcer

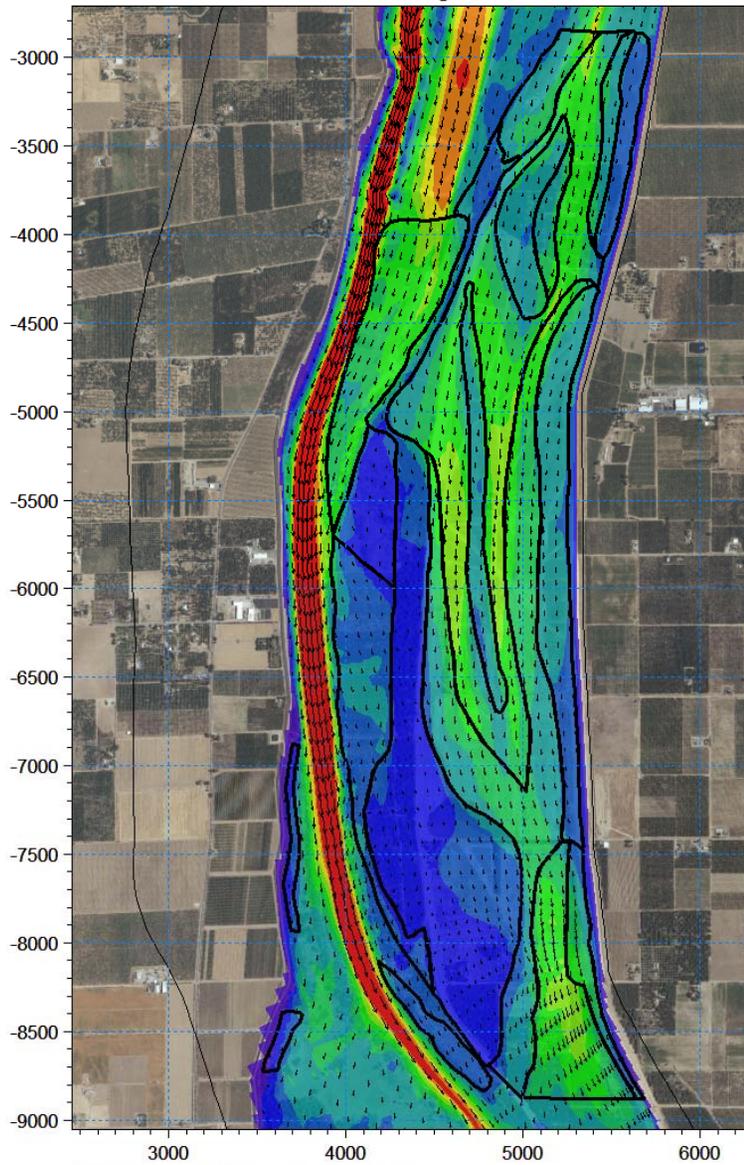


NAIP 2010 Summer Imagery



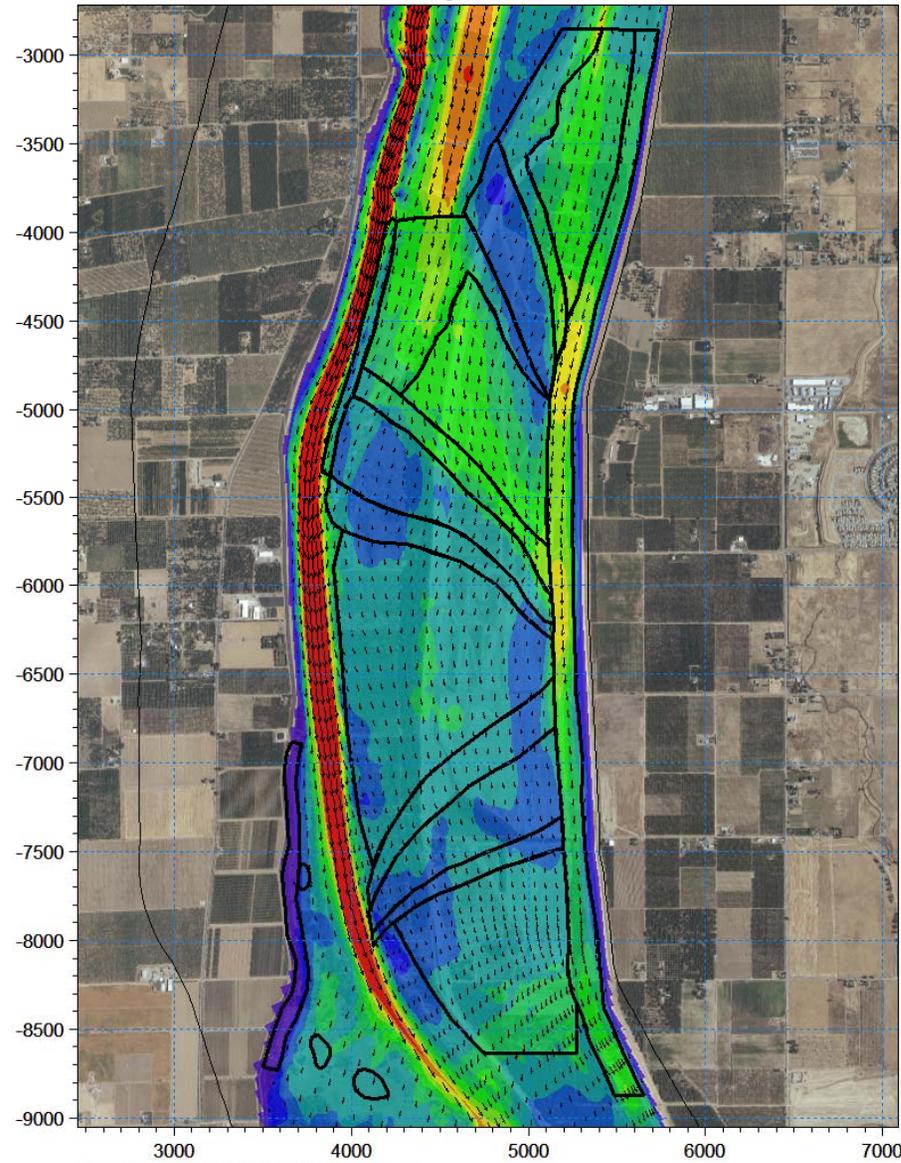
# Floodplain & Bypass Design

Veg Pattern 1

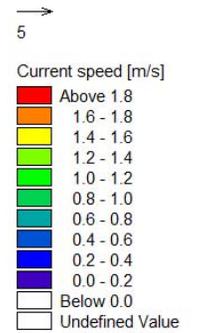


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Veg Pattern 2

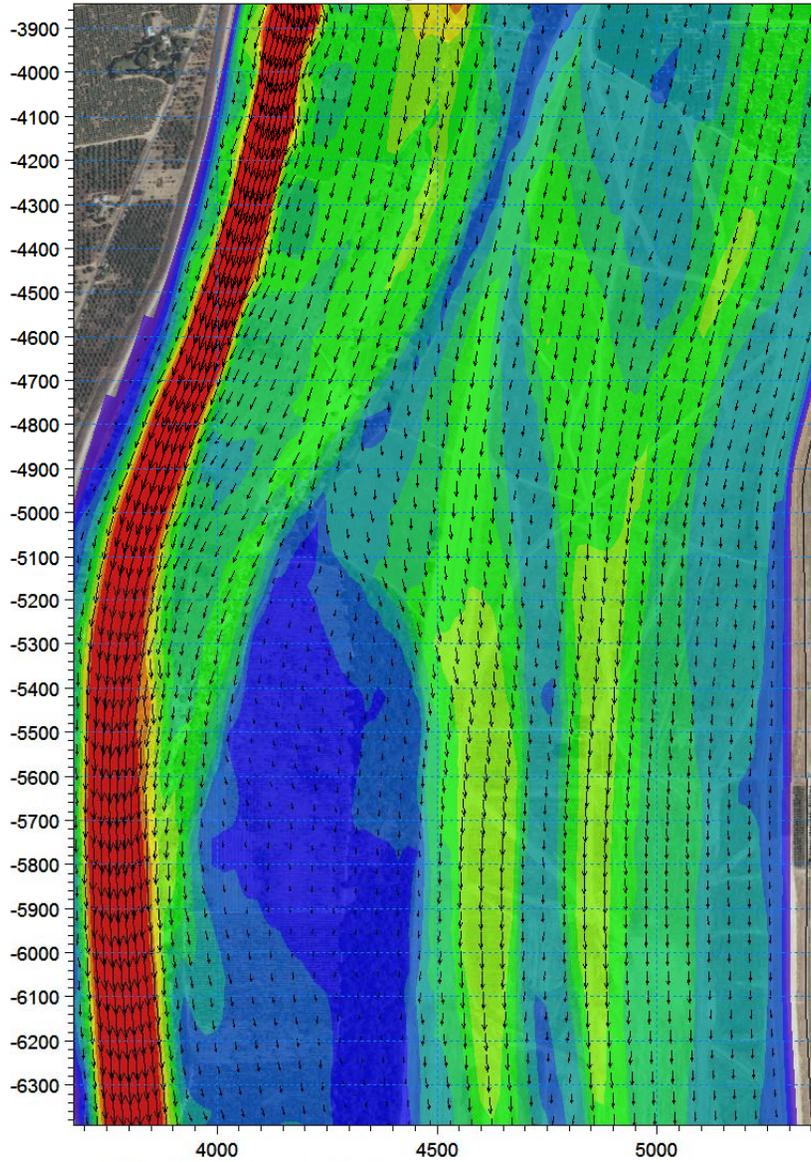


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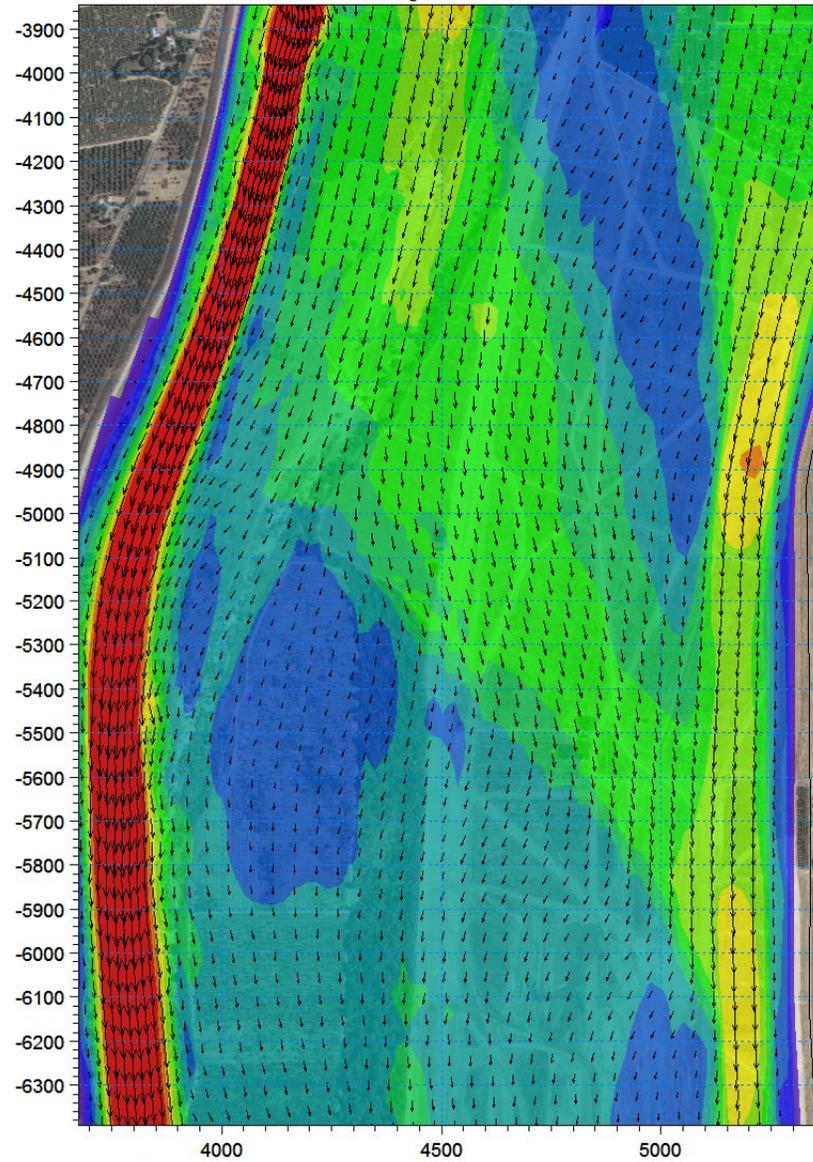
# 200-Yr Event Velocities

Veg Pattern 1

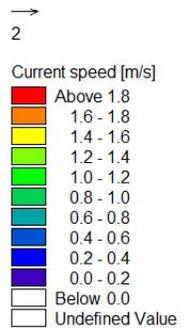


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Veg Pattern 2



01/20/00 16:00:00, Time step 111 of 111



# Collaboration

Improving the outcomes by sharing the work  
Credit enough to go around

**San Francisco Bay Joint Venture**

conserving bird habitat

Partnership Science Habitat Bird Initiatives Features Con

**Our Mission**  
Conserving migratory birds and their habitats for the benefit of wildlife and the public.  
[Read more about CVJV →](#)

**SONORAN JOINT VENTURE**  
Binational Bird Conservation

Conserving the unique birds and habitats of the southwestern United States and northwestern Mexico

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**ABOUT SFBJV**

**Mission**  
The goal of the San Francisco Bay and associated uplands throughout

**Mission**  
The avifauna of the region is diverse, with

**Birds**  
The unique habitats of the SJV include h

**Habitats**  
The unique habitats of the SJV include h

**Projects**  
SJV partners, with support from our ann

Photo Credit: Bob McLean

# The Riparian Bird Conservation Plan

*A strategy for reversing the decline of riparian associated birds in California*



A project of California Partners in Flight and the  
Riparian Habitat Joint Venture



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## California Riparian Habitat Restoration Handbook

*Second Edition*  
*July 2009*



*Aerial view of riparian restoration in progress at the Drumheller Slough Unit of the Sacramento River National Wildlife Refuge. Photo by Tom Griggs, River Partners.*



F. Thomas Griggs, Ph.D.,  
Senior Restoration Ecologist  
River Partners  
[www.RiverPartners.org](http://www.RiverPartners.org)

# Collaboration: Venus for Sharing and learning



# What is Next?



## **Integrative Floodplain Design: Combining hydrodynamic modeling with riparian ecology to improve public safety, enhance property protection, and increase biodiversity and floodplain habitats**



Flooding is a natural process that floodplain ecosystems depend on. The transport and deposition of soils and nutrients, the physical disruption of riparian vegetation, and the displacement of animals are all part of the harsh realities of flooding and they are key processes in how natural floodplain communities organize themselves. Because of the rich resource base created by flooding, people find floodplains, alluvial fans, and other features of floods to be of great value. We occupy these lands for farming, for our communities, for our transportation, energy, and water needs. When floods occur they disrupt our lives and reset our boundaries just as occurs in the rest of the ecosystem. We have developed and continue to develop flood management systems designed to lower the level of flood-risk and give us the most usable land. In doing so we have limited the ecosystems and in some cases put more people at risk than in an uncontrolled system. Re-thinking how the flood flows can be managed with vegetation structure leads to new designs that provide for more benefits while reducing risks.

### Vegetation Structure and Hydraulics:

#### Floodplain Ecology:

Floodplain ecosystems include many species highly adapted to disturbance by floods. A large body of science is available to help understand these adaptations and the intricate web of life that makes these systems so rich in biodiversity. Floodplains and riparian areas support a myriad of plants, birds, fish, mammals and other species.

Photos:



#### River process:

##### Hydrology

Vegetation has adapted to hydrologic feature such as:

- Flood recurrence intervals
- Duration
- timing/magnitude of the flood
- Rate of change

e.g. Cottonwood rooting

##### Sediment Transport

Plants and animals have evolved to key into erosion of the channel, banks and to sites of deposition.

e.g. Bank Swallow, insects, willows

##### Vegetation

Many native plants are adapted to periodic high flows of floods. These plants stabilize channels and banks. Exotic and invasive plants often create hydraulic barriers and lead to the breakdown of channels and banks.

e.g. *Arundo donax*

#### Species Structural Needs:



##### Plants:

Key features for plant placement:

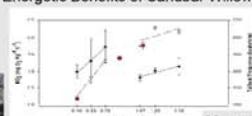
- soil structure, soil moisture
- how long the plant will be under water
- water velocity



##### Birds:

- Canopy height
- Canopy cover
- Food

#### Energetic Benefits of Sandbar Willow



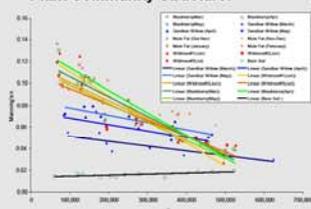
##### Fish:

- Water temperature
- Water Velocity
- Food
- Cover

##### Mammals/Others

- Cover
- Food
- Territory, dens
- mobility

#### Plant Community Structure:



**Bendy Flexible stems:** e.g. Sand bar willow, rose, California berry  
These plants flex during flood flows reducing their resistance to flow and hydraulic roughness, they help keep soils in place:  
Flume Results and graphic  
Also grasses and herbs



**Stiff stems Trees:** e.g. Cotton wood, black willow  
These plants grow upwards rapidly, spread their branches and shade out plants below leaving few stiff stems and room for bendy stems. They tend to have few stems per acre. They resist flood flows, deflecting water.

#### Flood Risk:

Hydraulic models are used to assess and design flow paths during floods. Using topography and vegetation distribution patterns, the models simulate water surface elevation, depth, velocity and shear stress gradients within the floodway. These simulations help identify hydraulic constrictions and can illustrate where critical flow paths may or should occur.

Riparian vegetation and flood protection don't have to be in conflict. When designed appropriately, plant structure and the hydraulic effects of plants can be used to steer flood flows and reduce stress on flood infrastructure. Likewise the use of these models can provide for higher success in planting efforts by predicting the appropriate locations for specific riparian species/communities.

