

# Integrated Environmental Management in the Colorado River Basin—A Dream, or Moving to Reality?

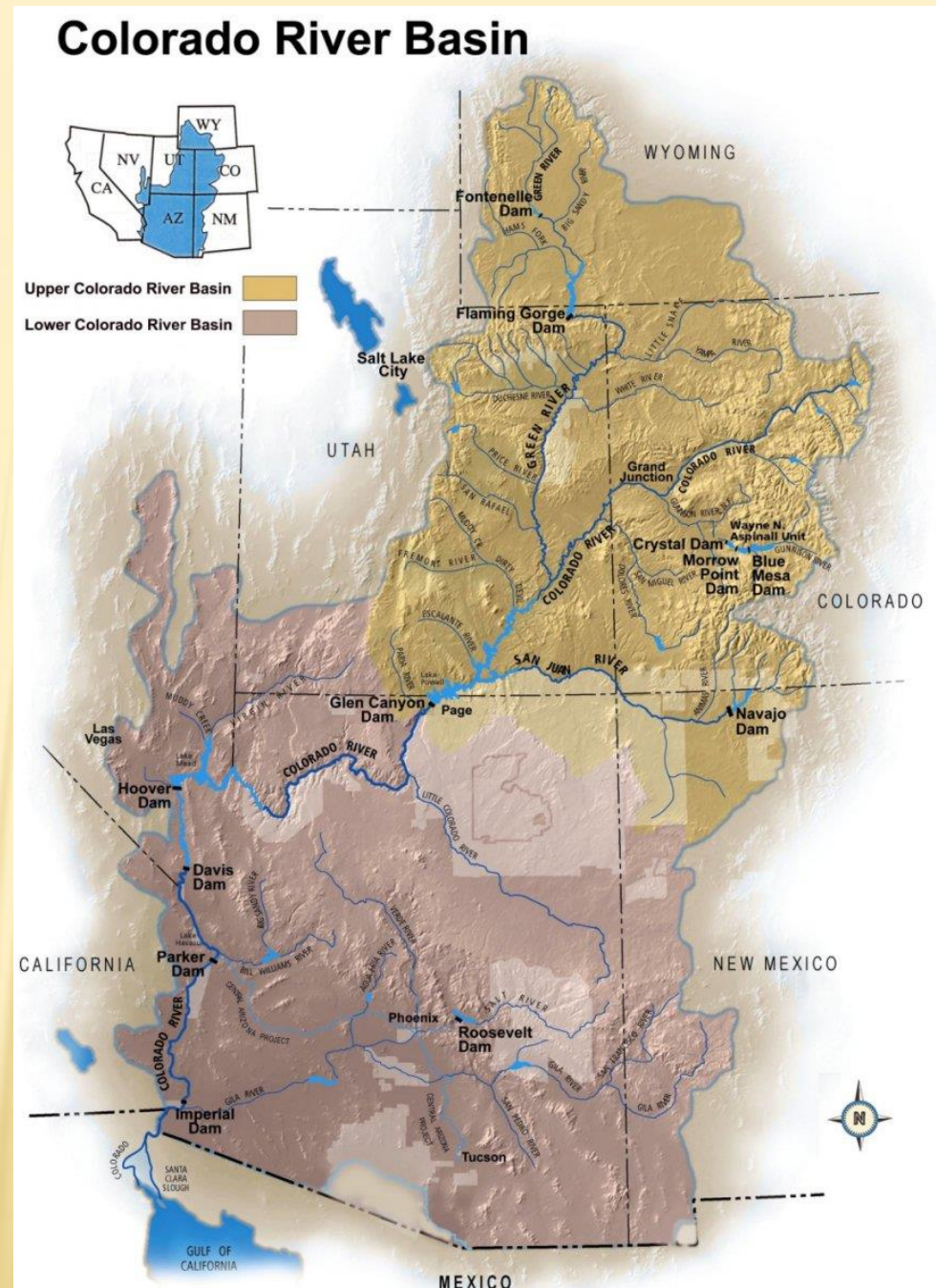


Chris Harris  
Deputy Director  
Colorado River Board of California





- 1922 Compact
- 1928 BCPA
- 1944 Treaty w/Mexico
- 60 MAF of storage
- Major diversions –
  - 40 million people
  - 5.5 million acres of agriculture
- Bankline & Levee construction



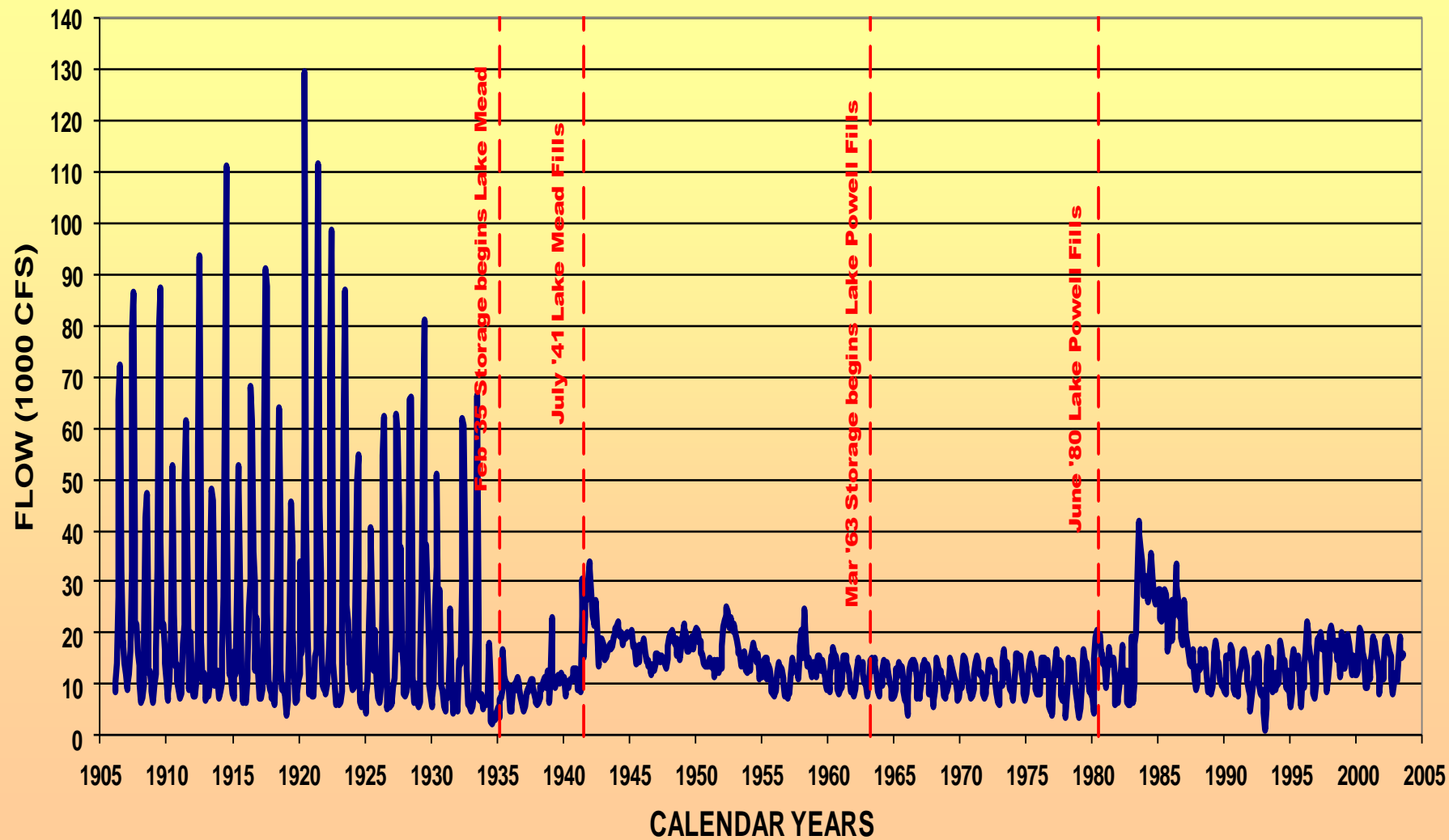


# Environmental Consequences—

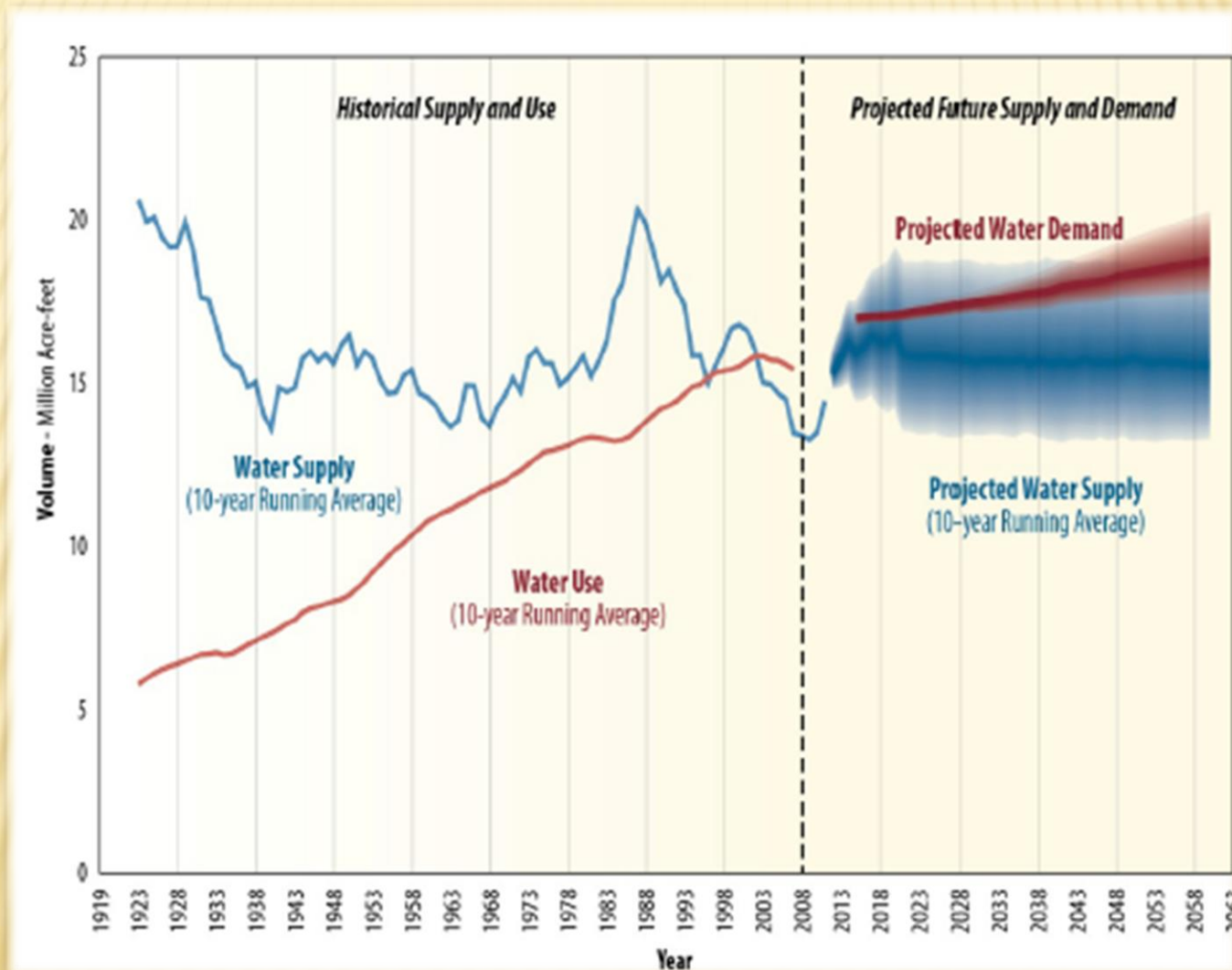
- ✗ Alteration of pre-development hydrograph
- ✗ Removal of native riparian vegetation
- ✗ Decoupling river from the floodplain (i.e., channelization and incisement)
- ✗ Habitat fragmentation
- ✗ Introduction of non-native aquatic and terrestrial species



# FLOW BELOW HOOVER DAM 1906-2003



# Historical & Future Projected Use and Demand—





# Environmental Programs in the Basin–



# Upper Colorado River Endangered Fish Recovery Program—



## San Juan River Basin Recovery Implementation Program—



## Virgin River Recovery Program—





# Glen Canyon Dam Adaptive Management Program–

- HBC conservation
- Rainbow trout mgt.
- Sediment conservation and redistribution
- Cultural resources preservation
- Adaptive management and experimentation



GLEN CANYON DAM

ADAPTIVE MANAGEMENT PROGRAM



# Lower Colorado River Multi-Species Conservation Program—



# The Road to the MSCP–

- ✖ 1994 “Big River” fishes critical habitat designation
- ✖ 1995 listing of southwestern willow flycatcher as endangered
- ✖ USBR initiated ESA Section 7 consultation for “routine LCR operations and maintenance activities”





# Stakeholder Groups—

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- × Federal Group—DOI agencies + WAPA
- × Non-Federal Group—State agencies and Ag., M&I, and Power entities
- × Native American Tribes
- × Other Public Interest Groups
- × Conservation Groups



# LCR MSCP Program Planning Area–

Full pool elevation of  
Lake Mead to SIB,  
including the historic  
floodplain





# Program Overview–

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- ✕ 50-year Program
- ✕ Program budget – \$626 million
- ✕ 31 species covered
- ✕ Creation/maintenance of 8,132 acres of –
  - + 5,940 ac. cottonwood-willow
  - + 1,320 ac. honey mesquite
  - + 512 ac. marsh
  - + 360 ac. Backwaters
- ✕ Stocking of razorback suckers and bonytail



# Covered Species–

- ✧ 26 “Covered Species”
  - + 12 *avian species*
  - + 4 *fish species*
  - + 1 *amphibian*
  - + 2 *reptiles*
  - + 4 *mammals*
  - + 2 *plants*
  - + 1 *insect*
- ✧ 5 “Evaluation Species”
  - + 3 *mammals*
  - + 2 *amphibians*





# Key Covered Species—



Razorback sucker



Bonytail

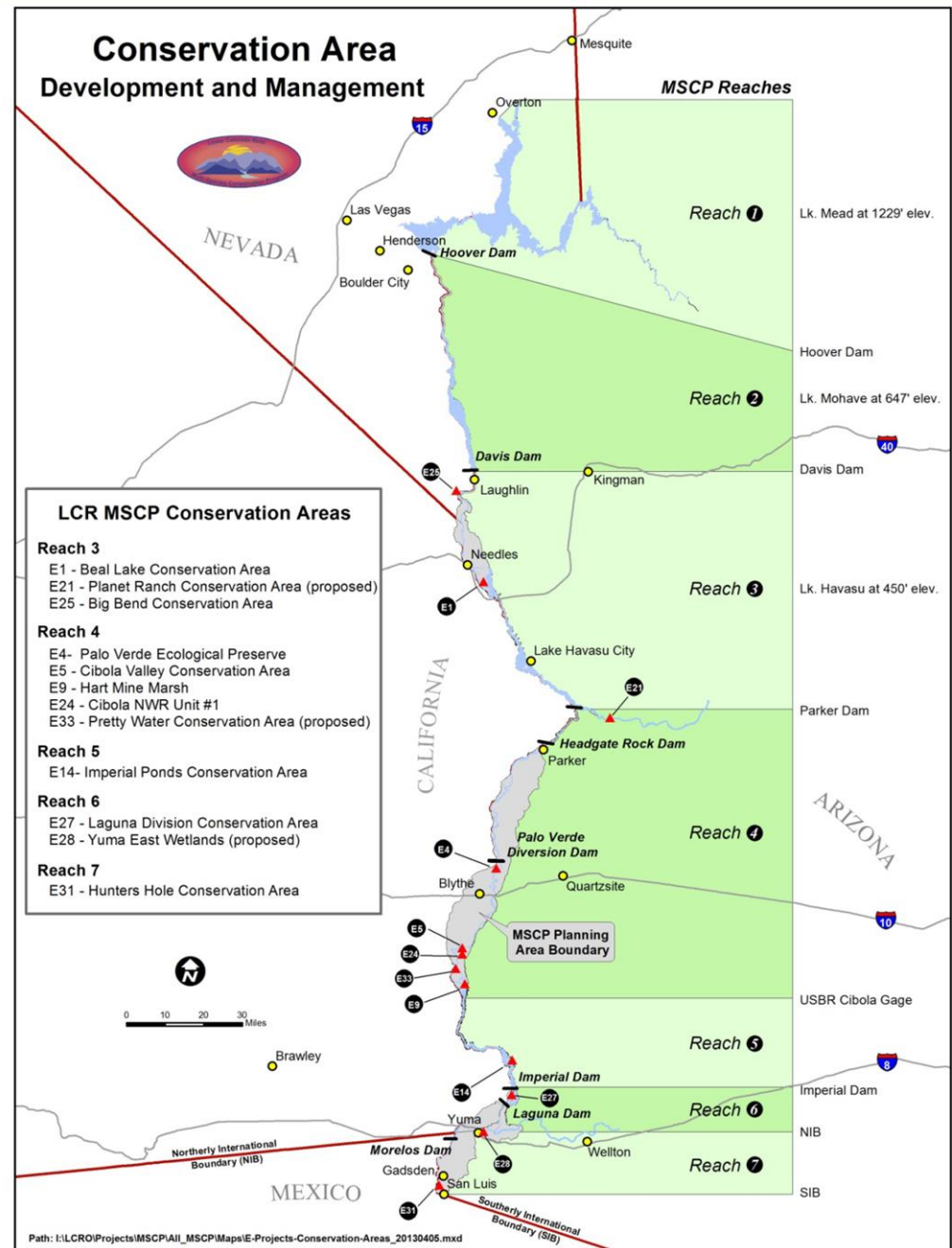


SW Willow Flycatcher

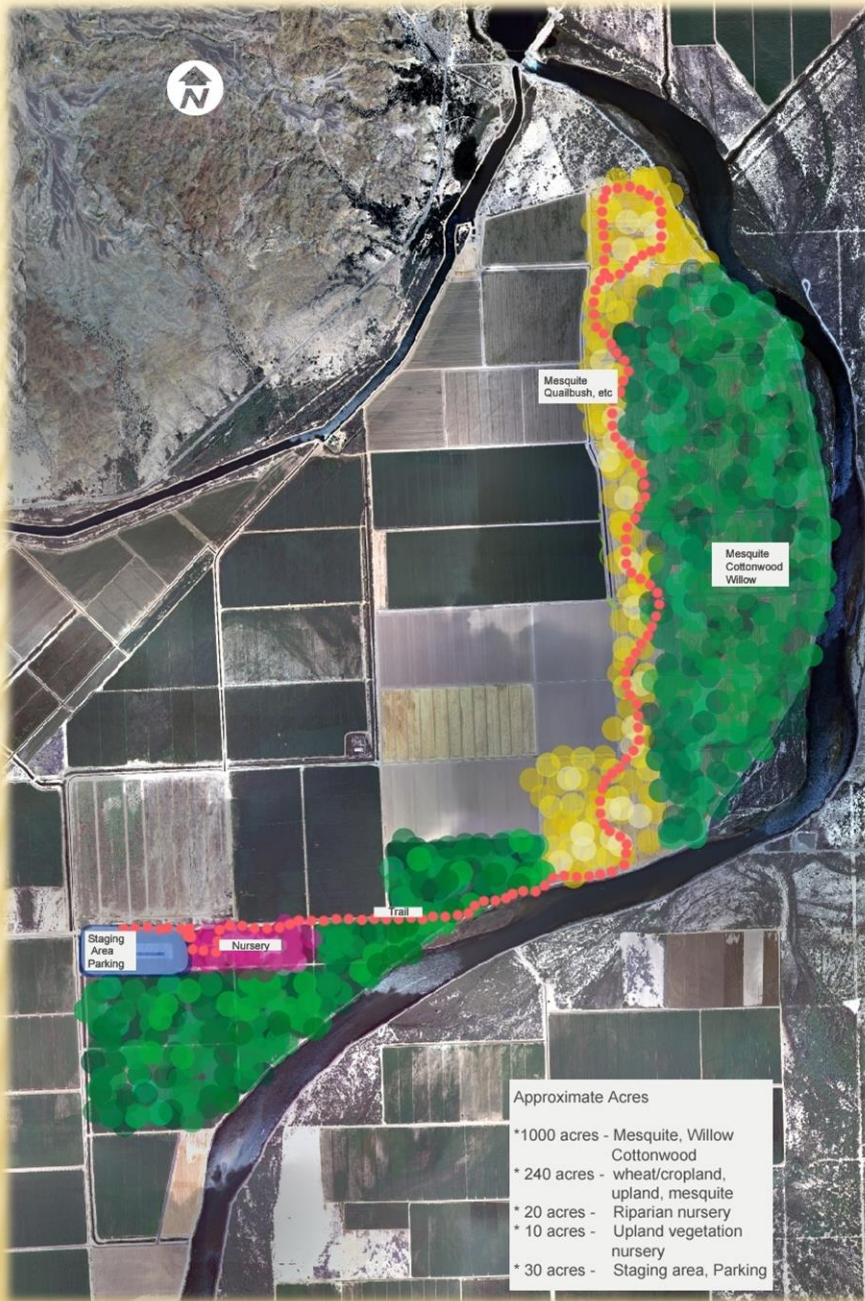


Yuma clapper rail

# LCR MSCP Conservation Areas through 2013







# Palo Verde Ecological Reserve—PVER

- Land is owned by California Department of Fish & Wildlife
- 1,300 acres restored with cottonwood-willow and mesquite habitat.
- Water available from the Palo Verde Irrigation District.



# Mass Planting Native Trees—





# Cibola NWR–Hart Mine Marsh–

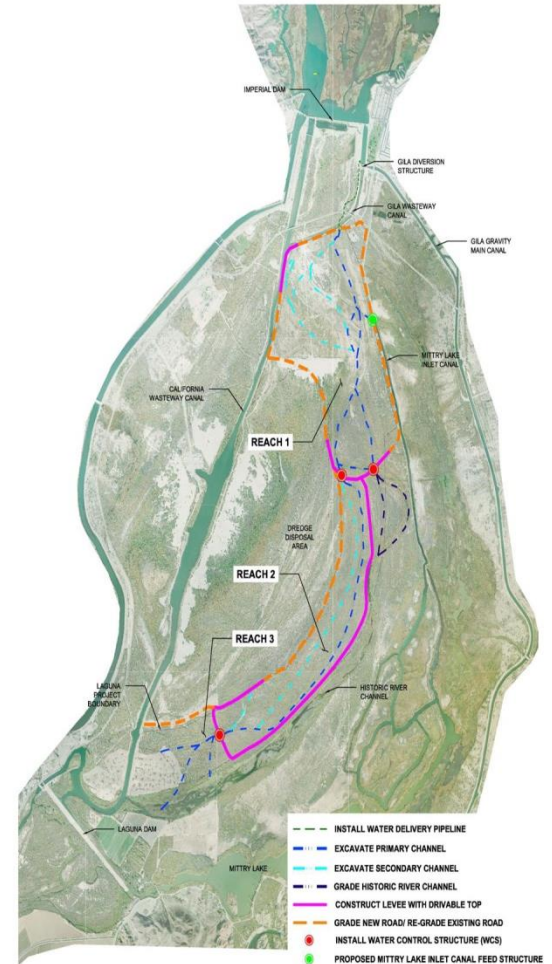




# Laguna Habitat Conservation Area–



## MSCP Laguna Division Conservation Area Design Concept





# Laguna Habitat Conservation Area



## Legend

Shallow Marsh Salt Grass	Mesquite Deep Pot
Shallow Marsh Three Square	Cottonwood
Deep Marsh	Gooding Willow
Open Water	Sandbar Willow
Upland Seed Mix	

### Reach 1

Mean Water Level = 158  
 Max Water Level = 160  
 Open water = 59.1 AC  
 Deep Marsh = 85.9 AC  
 Shallow Marsh *Scripus olneyi* = 19.9 AC  
 Shallow Marsh *Distichlis spicata* = 29.1 AC  
 Sandbar Willow = 22 AC  
 Gooding Willow = 27.2 AC  
 Cottonwood = 128.8 AC  
 Mesquite Deep Pot = 108.1 AC  
 Upland Seed Mix = 55.5 AC  
 Total Acreage Reach 1: 540.8 Acres

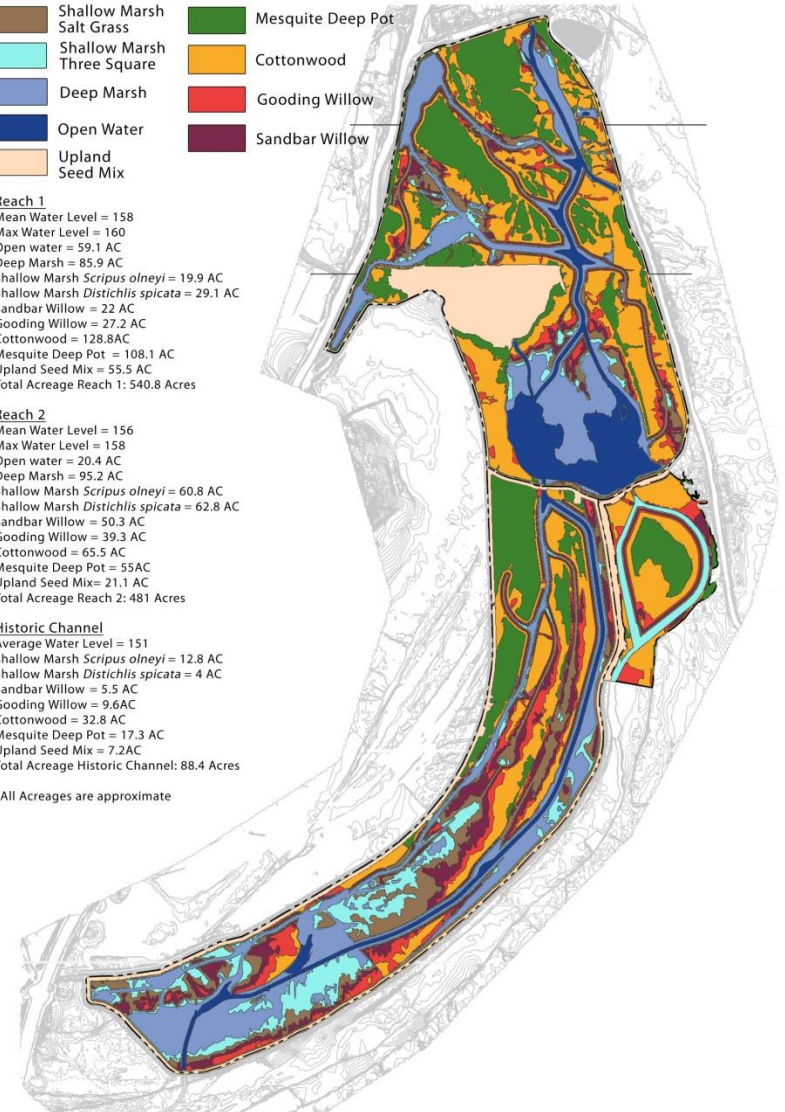
### Reach 2

Mean Water Level = 156  
 Max Water Level = 158  
 Open water = 20.4 AC  
 Deep Marsh = 95.2 AC  
 Shallow Marsh *Scripus olneyi* = 60.8 AC  
 Shallow Marsh *Distichlis spicata* = 62.8 AC  
 Sandbar Willow = 50.3 AC  
 Gooding Willow = 39.3 AC  
 Cottonwood = 65.5 AC  
 Mesquite Deep Pot = 55 AC  
 Upland Seed Mix = 21.1 AC  
 Total Acreage Reach 2: 481 Acres

### Historic Channel

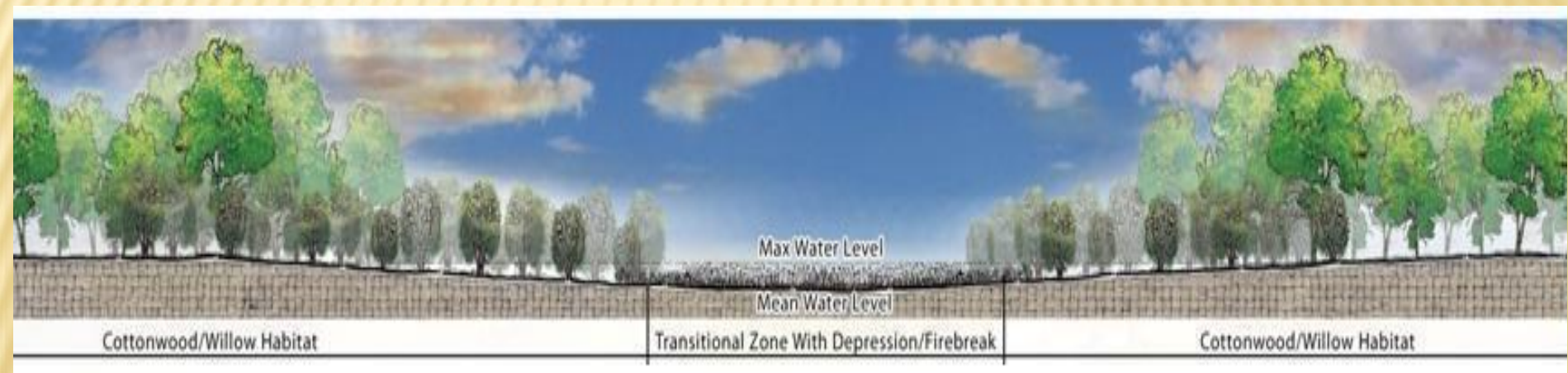
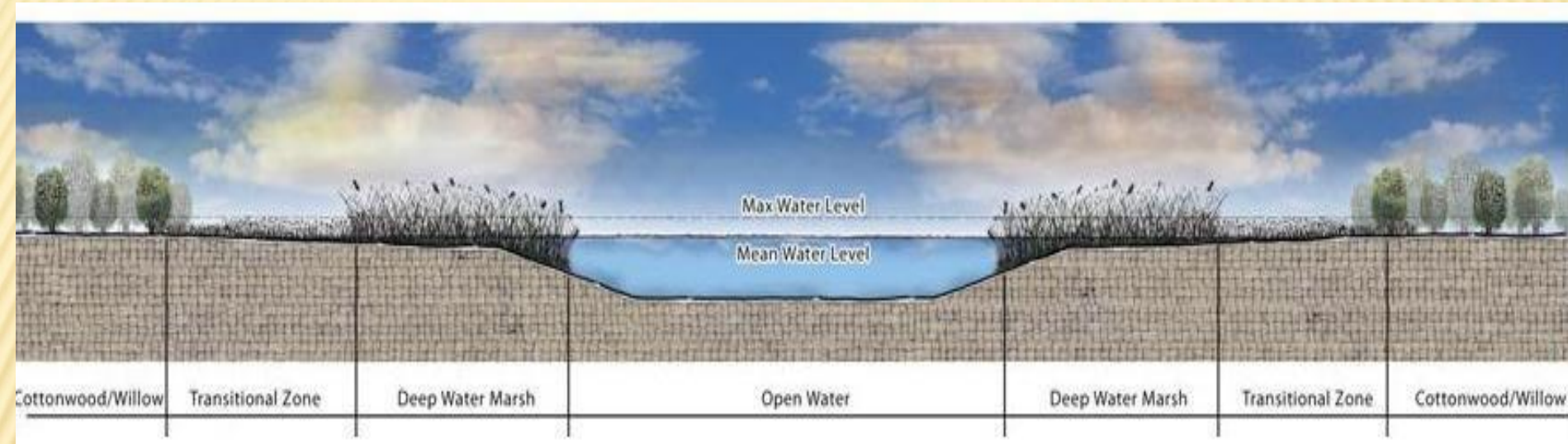
Average Water Level = 151  
 Shallow Marsh *Scripus olneyi* = 12.8 AC  
 Shallow Marsh *Distichlis spicata* = 4 AC  
 Sandbar Willow = 5.5 AC  
 Gooding Willow = 9.6 AC  
 Cottonwood = 32.8 AC  
 Mesquite Deep Pot = 17.3 AC  
 Upland Seed Mix = 7.2 AC  
 Total Acreage Historic Channel: 88.4 Acres

\*All Acreages are approximate





# Laguna Habitat Conservation Area





## Hunter's Hole Cons. Area

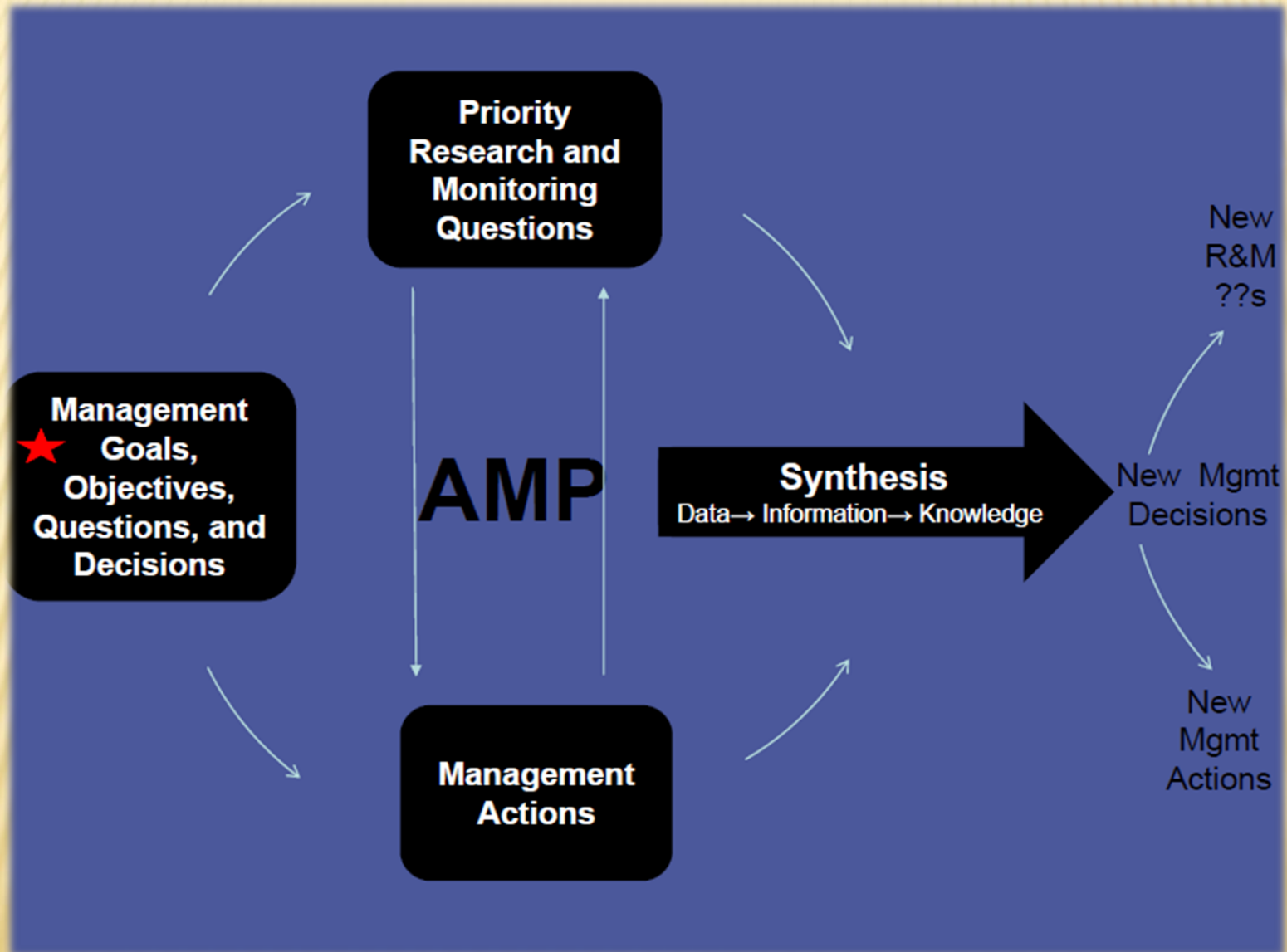


***Before***

***After***



# Monitoring/Research & Adaptive Mgt.—





# Current Status—

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- ✖ Program is spending \$25-35 million/year
- ✖ FY-2013 Work Plan/Budget is \$34 million
  - + California's share is \$8.6 million
- ✖ Total Land Cover Types created through FY-2012 –
  - + 2,447 acres of the total 8,132 acres required;
  - + 985 acres restored in California
- ✖ Native Fish stockings through FY-2012—
  - + 200,000 RASU
  - + 60,000 BONY

# **“Hits & Misses”—**

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## **✘ What’s Working—**

- + Long-term environmental compliance is in place ;**
- + Benefits to CA & LB States—QSA implementation, Water Banking, 2007 Interim Guidelines, etc.;**
- + Adaptive management process is successful;**
- + Knowledge gained about species , data collection and management, habitat restoration techniques;**
- + Public outreach & education;**
- + Sharing information with other efforts**

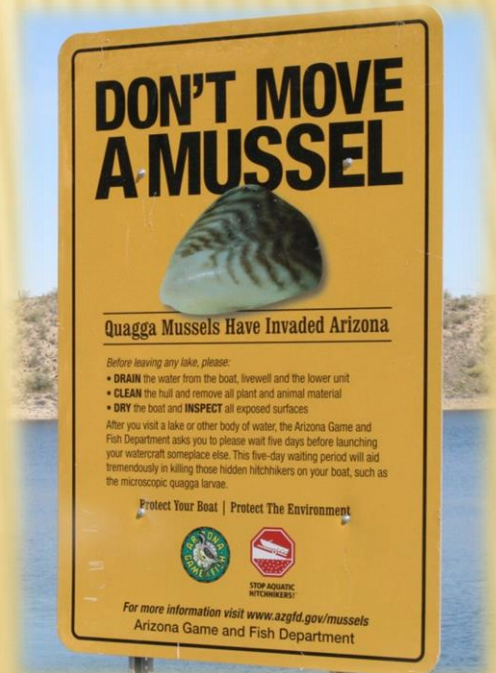
## **✘ What’s Not Working—**

- + Native/non-native fish interactions;**
- + Controlling non-native aquatic and terrestrial species;**
- + Finding suitable lands in CA for restoration**



# Current Issues of Concern–

- ✗ Quagga mussel infestations
- ✗ Salt cedar and Salt cedar beetle defoliation along LCR;
- ✗ Finding 2,000+ acres of land in CA
- ✗ Native/Non-native fish interactions



# Administration & Oversight—

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- ✕ LCR MSCP Steering Committee & Technical Work Group—
  - + Steering Committee provides policy-level oversight, approves Work Plan & Budget
  - + Technical Work Group provides technical assistance





[www.lcrmscp.gov](http://www.lcrmscp.gov)



Yellow warbler

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