



Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

**Balancing the use of the Colorado River water resources
with the conservation of native species and their
habitats through partnerships, planning and
adaptive management**



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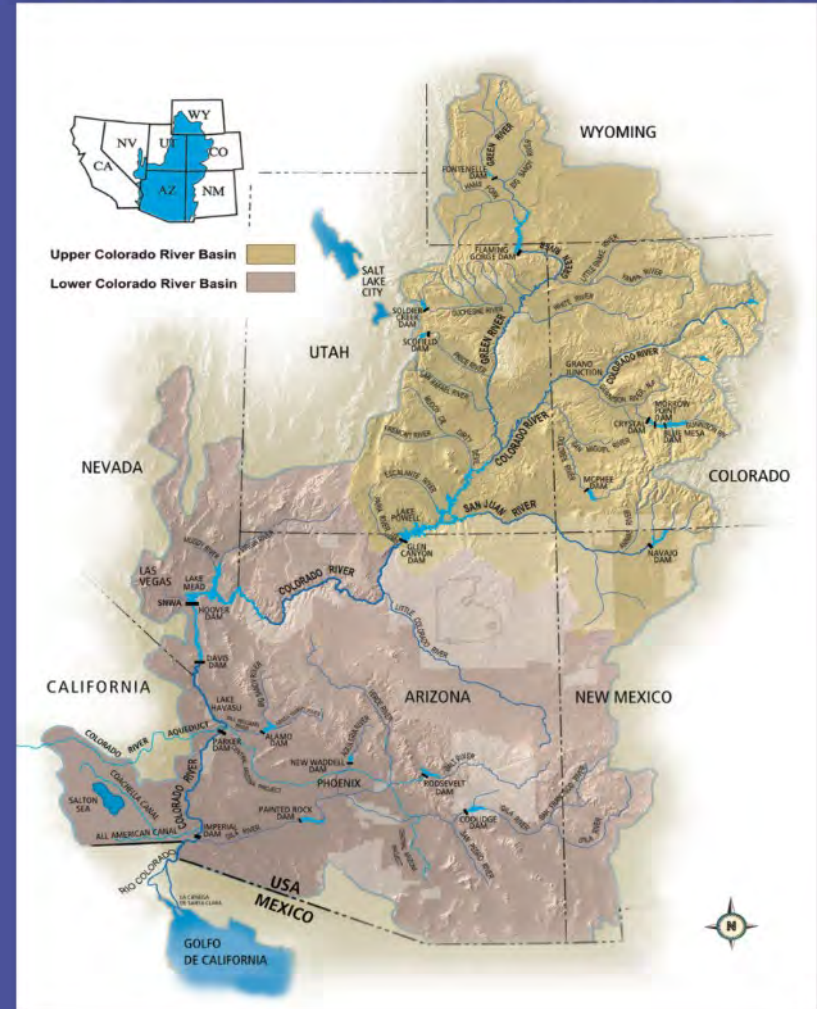


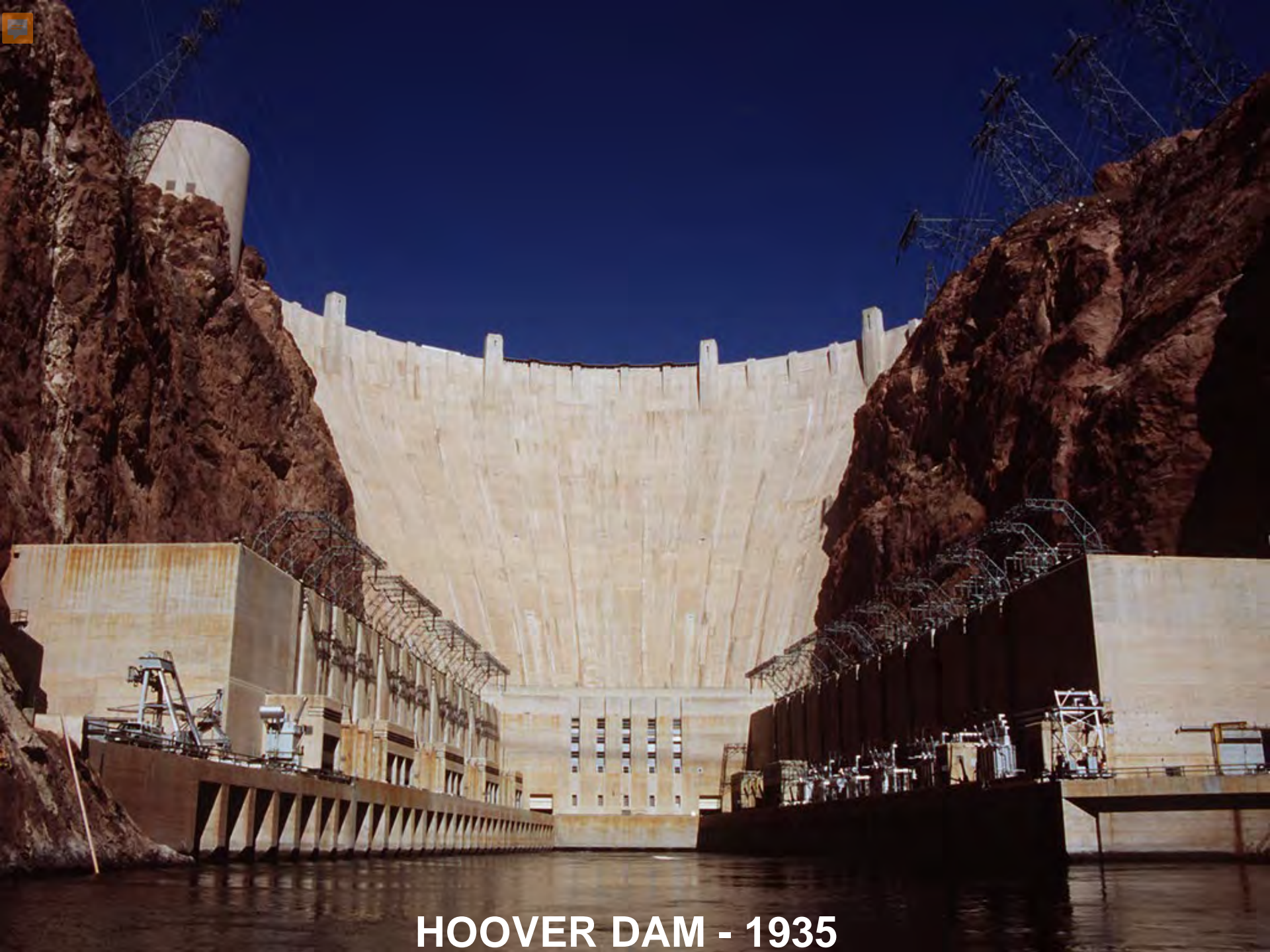
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COLORADO RIVER WATERSHED

- Length: approx. 1,400 miles (LCR is the last 400 miles in the U.S. in AZ, NV and CA)
- Drains 246,000 sq miles from 7 states
- Domestic needs - 23 million people
- Agriculture – over 2.5 million acres
- Hydroelectric powerplants at Hoover, Davis and Parker Dams annually generate 5-6 billion kilowatt-hours of hydroelectric power distributed in Arizona, Nevada and California





HOOVER DAM - 1935



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**COLORADO RIVER
NEAR BLYTHE,
CALIFORNIA**





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- 1967 – The Yuma clapper rail (bird) and humpback chub (fish) were listed as endangered.
- 1980 – The bonytail (fish) was listed as endangered.
- 1990 – The desert tortoise (reptile) was listed as threatened.
- 1991 – The razorback sucker (fish) was listed as endangered.
- 1994 – Areas of the lower Colorado River were designated as critical habitat for the bonytail and razorback sucker (fish).
- 1995 – The southwestern willow flycatcher (bird) was listed as endangered.
- 2004 – Areas of the lower Colorado River were proposed as critical habitat for the southwestern willow flycatcher (bird).



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PURPOSE

Multi-stakeholder Federal and non-Federal partnership responding to the need to balance the use of lower Colorado River water resources and the conservation of native species and their habitats in compliance with the Endangered Species Act.

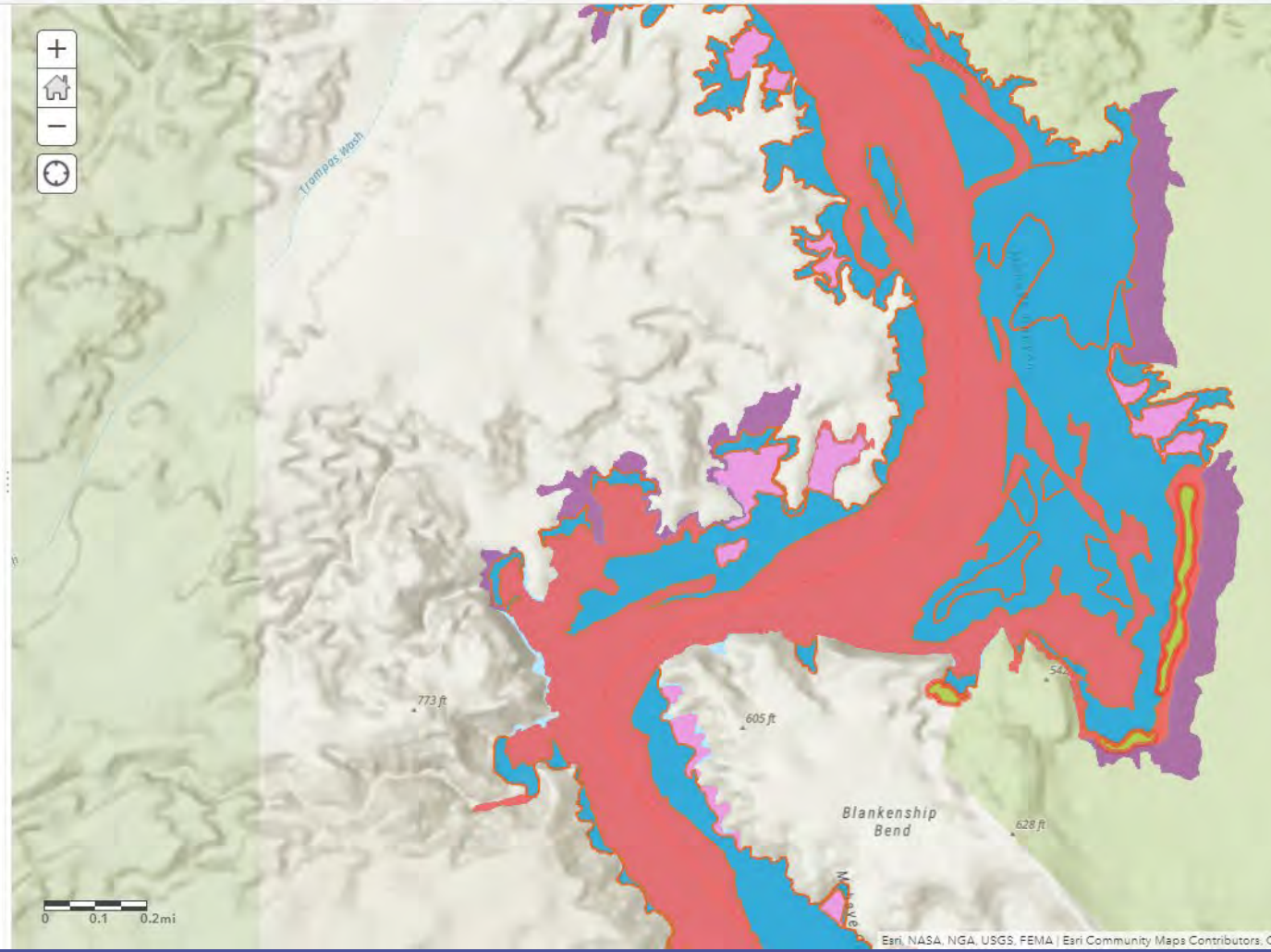




Legend

LCRMSCP_veg_classification_1997_CH2MHILL

- Saltcedar
- Marsh
- Cottonwood-Willow
- Saltcedar-honey mesquite
- Saltcedar-screwbean mesquite
- Arrowweed
- Open water
- Honey mesquite
- Undetermined
- Atriplex
- Creosote
- Structured open water
- River
- Agriculture





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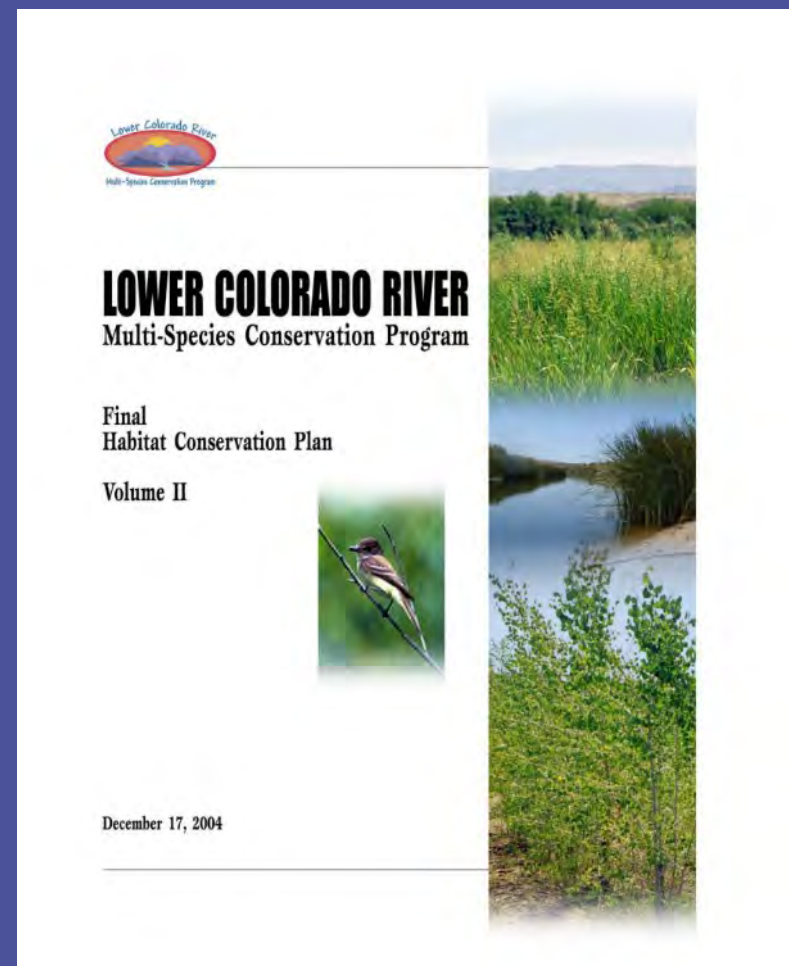
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50-Years of ESA and CESA Compliance

- Section 7 and Section 10 HCP

Covered Actions

- Delivery and Diversion of 9 million acre feet per year
- Movement of 1.574 million acre feet per year within the system
- Maintenance Activities





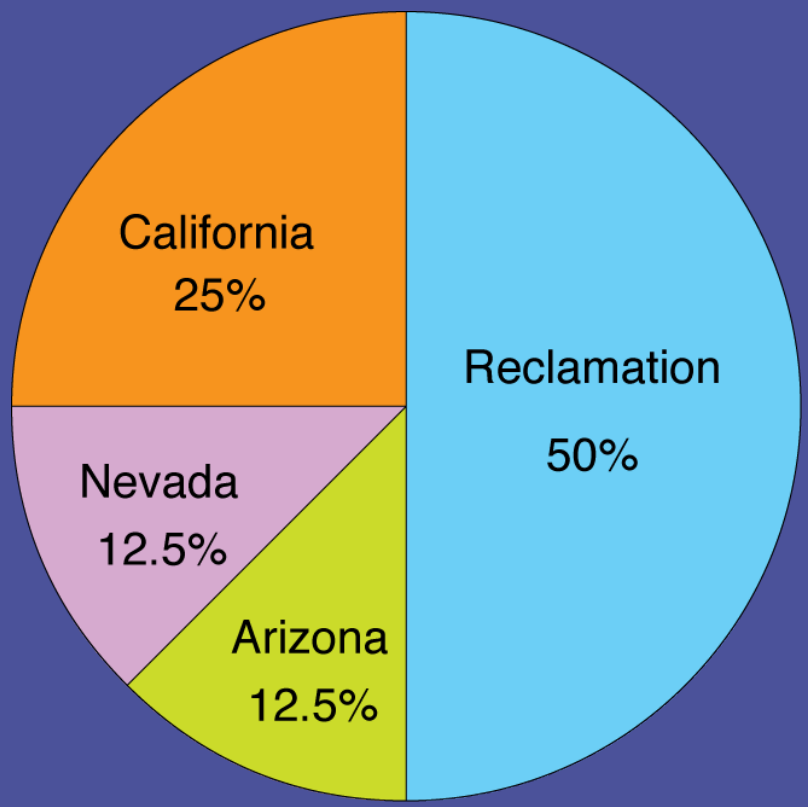
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COST SHARING

- **Total Program Cost**
\$626 million (2003 dollars and adjusted annually for inflation)
- **Federal / State Cost Share**
Split 50/50

2023 = \$34,828,626
2024 = \$38,845,008
- **Cost cap**





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COVERED SPECIES

- 8 threatened and endangered species
 - 3 birds, 3 fish, 2 reptiles



Yuma Ridgway's rail
(Yuma clapper rail)



southwestern willow flycatcher



yellow-billed cuckoo



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COVERED SPECIES

- 8 threatened and endangered species
 - 3 birds, 3 fish, 2 reptiles



bonytail



humpback chub



razorback sucker



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COVERED SPECIES

- 8 threatened and endangered species
 - 3 birds, 3 fish, 2 reptiles



desert tortoise



northern Mexican gartersnake



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COVERED SPECIES

- 19 other species
 - 4 mammals, 9 birds, 1 reptile, 1 amphibian, 1 fish, 1 insect, 2 plants
- 5 “evaluation species”*
 - 3 mammals, 2 amphibians

** Evaluation species are those which would qualify as covered species except sufficient information on their biology, habitat use, and occurrence within the project area are not sufficient at the time the HCP was completed*



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CONSERVATION AREA DEVELOPMENT AND MANAGEMENT GOALS

- Cottonwood-willow 5,940 acres
- Mesquite 1,320 acres
- Marsh 568 acres
- Backwaters 484 acres



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FISH AUGMENTATION GOALS

- 660,000 razorback suckers
- 620,000 bonytail





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PROGRAM COMPONENTS

- Species Research
- System-wide Monitoring
- Conservation Area Monitoring



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**Lower Colorado River
Multi-Species Conservation Program**

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**Five-Year Monitoring and Research Priorities
for the Lower Colorado Multi-Species
Conservation Program**

2023-2027



Work conducted under LCR MSCP
Work Task G4

April 2023

**Lower Colorado River
Multi-Species Conservation Program**

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**Final Implementation Report,
Fiscal Year 2024 Work Plan and Budget,
Fiscal Year 2022 Accomplishment Report**



June 2023



Cottonwood-willow

Goal: 5,940 acres

Created: 4,482 acres



Honey Mesquite

Goal: 1,320 acres

Created: 2,046 acres



Marsh Goal: 512 acres Created: 362 acres



Backwaters

Goal: 360 acres

Created: 158 acres

Habitat Creation Accomplishments

- LCR MSCP has established sufficient acres of habitat to complete conservation measures for:

Mammals

- Colorado River cotton rat (125 ac)
- Yuma hispid cotton rat (76 ac)
- western red bat (765 ac)
- western yellow bat (765 ac)

Birds

- Arizona Bell's vireo (2,983 ac)
- elf owl (1,784 ac)
- Gila woodpecker (1,702 ac)
- summer tanager (602 ac)

Insects

- MacNeill's sootywing (222 ac)





Habitat Creation Accomplishments

- Percentage of habitat created for the remaining species:

Birds

- California black rail (82%)
- Yuma Ridgway's rail (69%)
- Sonoran yellow warbler (63%)
- Vermilion flycatcher (63%)
- Least bittern (71%)
- Gilded flicker (63%)
- Southwestern willow flycatcher (23%)
- Yellow-billed cuckoo (63%)

Reptiles

- Northern Mexican gartersnake (8%)


Fishes

- Bonytail (42%)
- Flannelmouth sucker (92%)
- Razorback sucker (42%)



POST-DEVELOPMENT MONITORING

Conservation Area	Count of LCR MSCP Species Detected At Least Once Between 2005-2023
Beal Lake Conservation Area	20
Big Bend Conservation Area	8
Cibola National Wildlife Refuge Unit #1	12
Cibola Valley Conservation Area	12
Dennis Underwood Conservation Area	2
Hart Mine Marsh	5
Hunters Hole	8
Imperial Ponds Conservation Area	5
Laguna Division Conservation Area	8
Mohave Valley Conservation Area	2
Palo Verde Ecological Reserve	14
Parker Dam Camp	2
Planet Ranch	12
Pretty Water Conservation Area	2
Section 26	Under construction
Three Fingers Lake	Not yet under construction
Yuma East Wetlands	13
Yuma Meadows Conservation Area	Under construction

 Conservation Area	Yuma Ridgway's rail	Yellow-billed cuckoo
Beal Lake Conservation Area	X	X
Big Bend Conservation Area		-
Cibola National Wildlife Refuge Unit #1	-	X
Cibola Valley Conservation Area	-	X
Dennis Underwood Conservation Area	-	
Hart Mine Marsh	X	-
Hunters Hole	-	X
Imperial Ponds Conservation Area	X	-
Laguna Division Conservation Area	X	X
Mohave Valley Conservation Area		-
Palo Verde Ecological Reserve	-	X
Parker Dam Camp	-	
Planet Ranch		X
Pretty Water Conservation Area	-	
Yuma East Wetlands	X	X



Cibola Valley Conservation Area



One innovation was use of a mass transplanter



Yellow-billed cuckoos (YBCU)



Parametrix, Inc., and Southern Sierra Research Station. 2019. Yellow-billed Cuckoo Surveys on the Lower Colorado River and Tributaries, 2014 to 2018 Summary Report. Submitted to the Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Boulder City, Nevada, by S.E. McNeil, D. Tracy, J. Lisignoli, and J.R. Stanek under Reclamation contract No. R14PD0004.



Detections of YBCU on the BWR NWR 2006-2019





Yellow-billed Cuckoos

By 2015:

- 96% the 414 ha planted at Palo Verde Ecological Reserve was occupied
- Up to 80 breeding territories (at least 2 birds per territory) were estimated

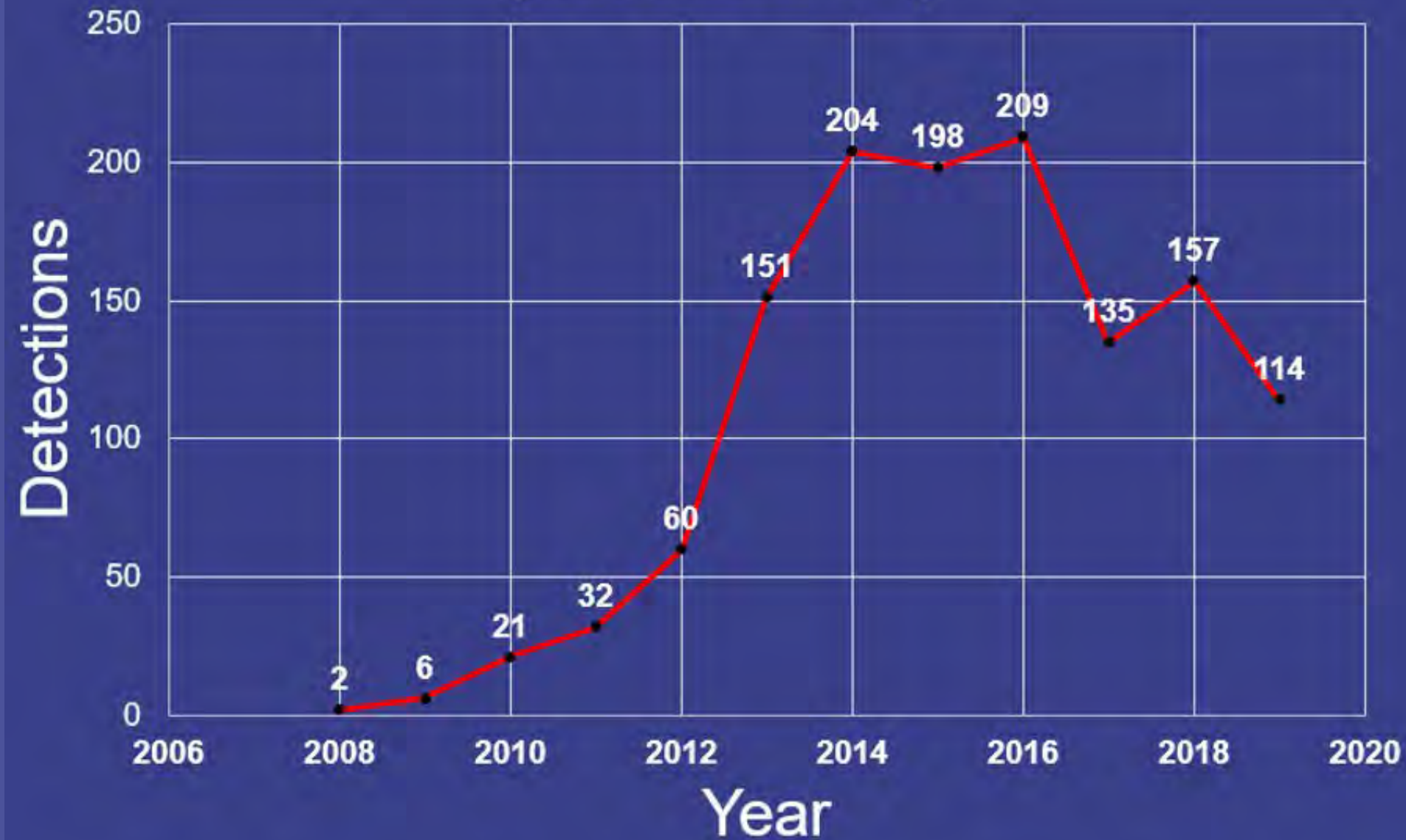




Yellow-billed Cuckoos

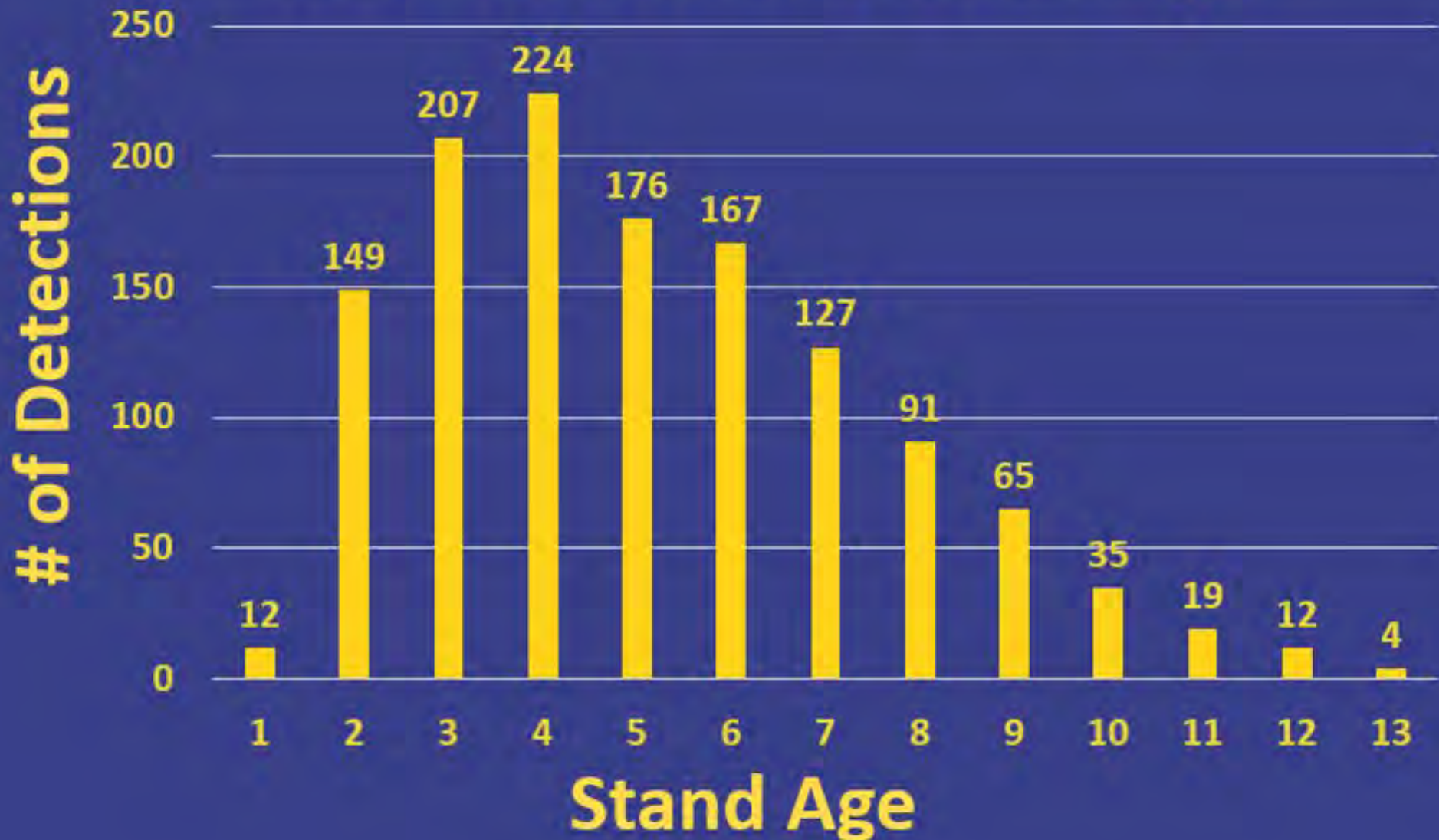
- Cuckoos were detected in conservation areas within 2 years after planting, some within 1 year
- Management Concern: By year 5 after planting, detections begin to decline, with cuckoos moving into more recently planted areas.

PVER: Year X Detections (2008-2019)



PVER Surveys 2008-2019

YBCU Detections x Stand Age



Results: Detections by age + size + age*size



Predicted survey detections by site age for sites 20, 50, and 80 ha.
95% predictive intervals are shown by grey shading around each line.



“Change is the only constant in life.”

- attributed to Heraclitus, a Greek philosopher



Adaptive Management

Learning (adapting) as you go:

- To address uncertainties
- Improve outcomes

A key concern is the recognition and measurement of success.

- *Adaptive Management: The U.S. Department of the Interior Applications Guide.*
Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.



Adaptive Management

Key issues in deciding when to use adaptive management are:

- whether there is substantial uncertainty about the impacts on management,
- whether it is realistic to expect that we can reduce uncertainty, and
- whether reducing uncertainty can actually improve management.

- *Adaptive Management: The U.S. Department of the Interior Applications Guide.*

Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.



Adaptive Management

But, not all resource management decisions can or should be adaptive.

- In some cases, there is no chance to apply learning.
- In other cases, there is little uncertainty about what action to choose, or there are irreconcilable disagreements about objectives, or no money.

Adaptive management can be useful in cases where natural resources are responsive to management, but there is also uncertainty about the impacts of management interventions.

- *Adaptive Management: The U.S. Department of the Interior Applications Guide*. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) (YBCU)
Basic Conceptual Ecological Model

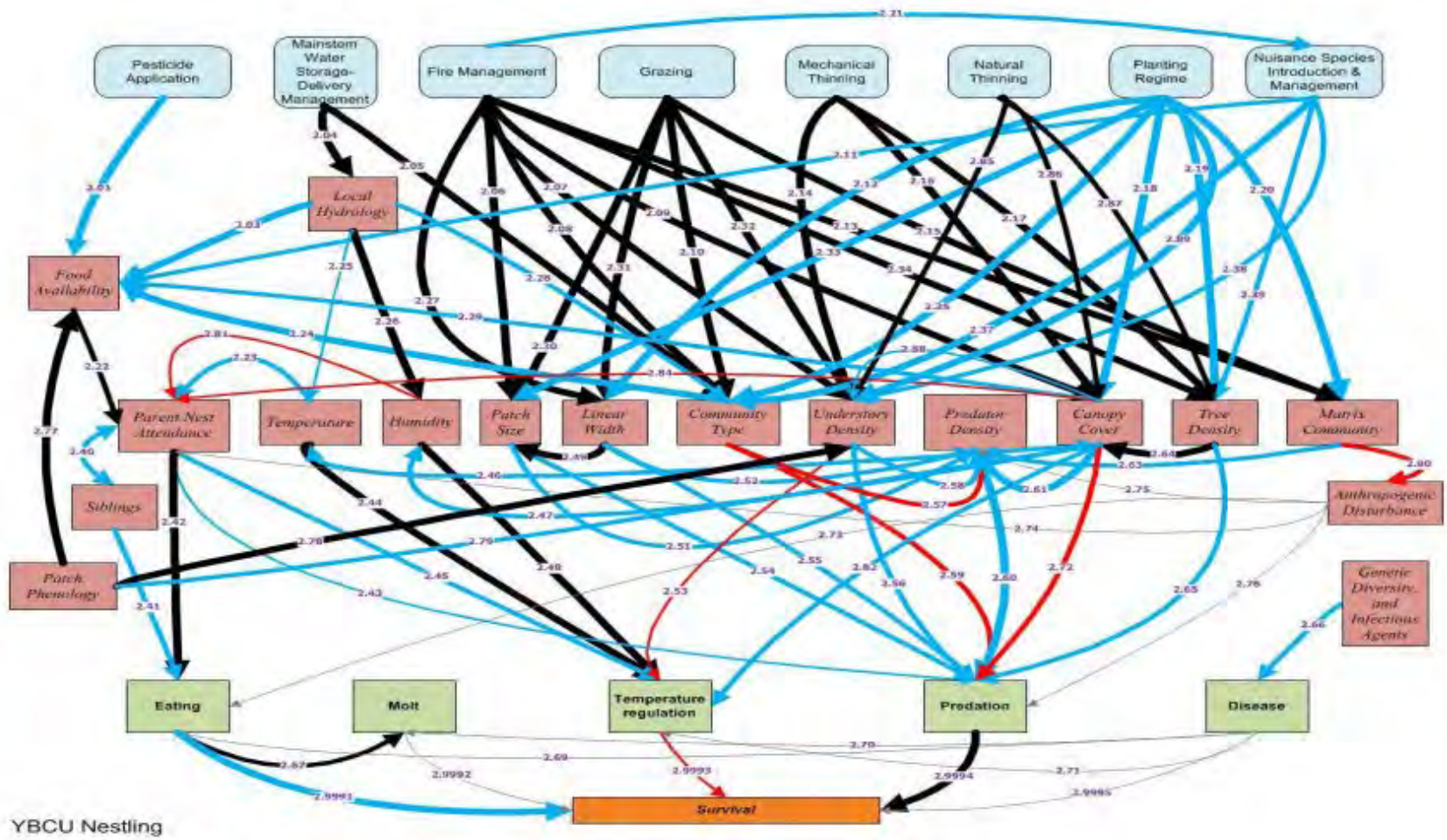
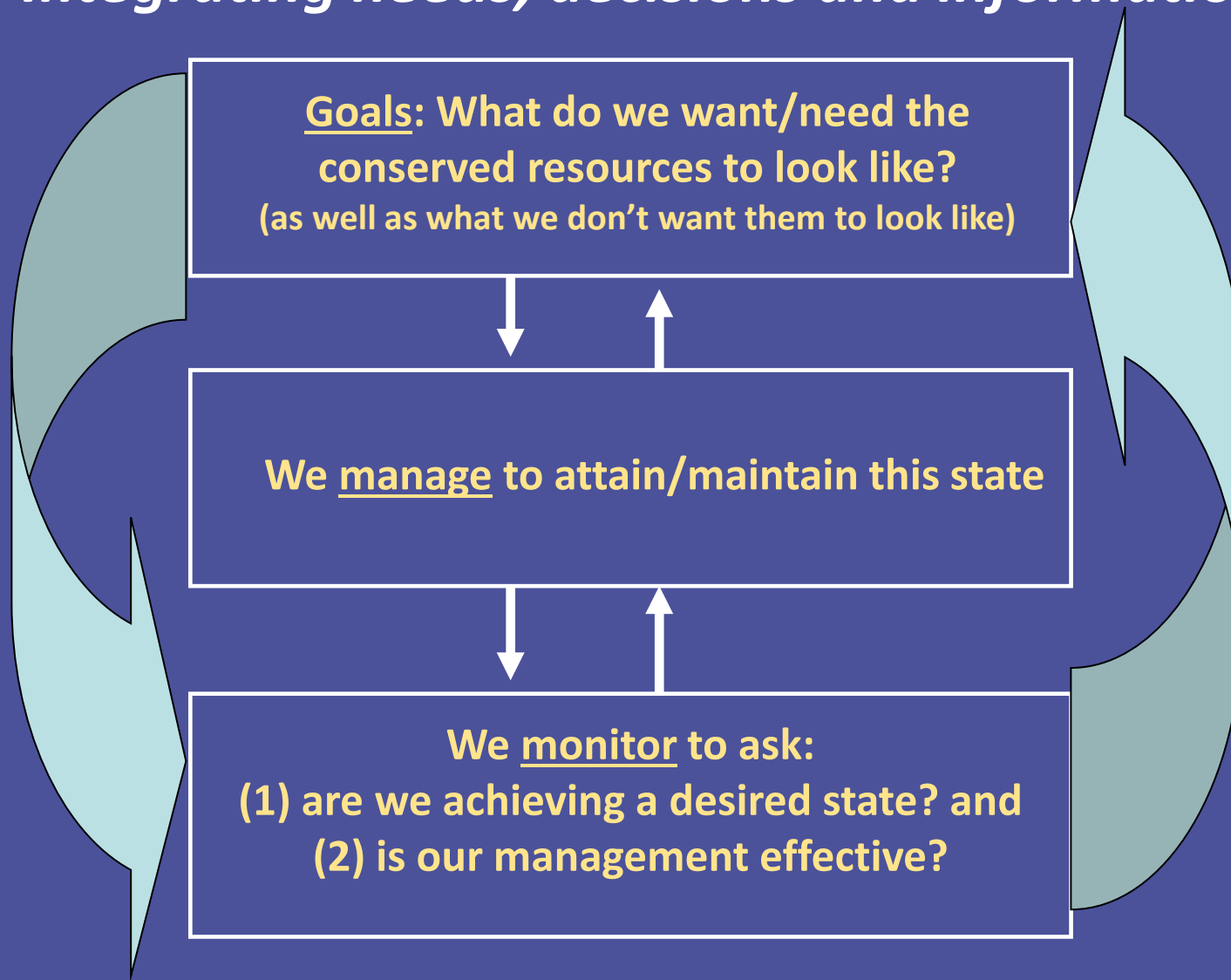


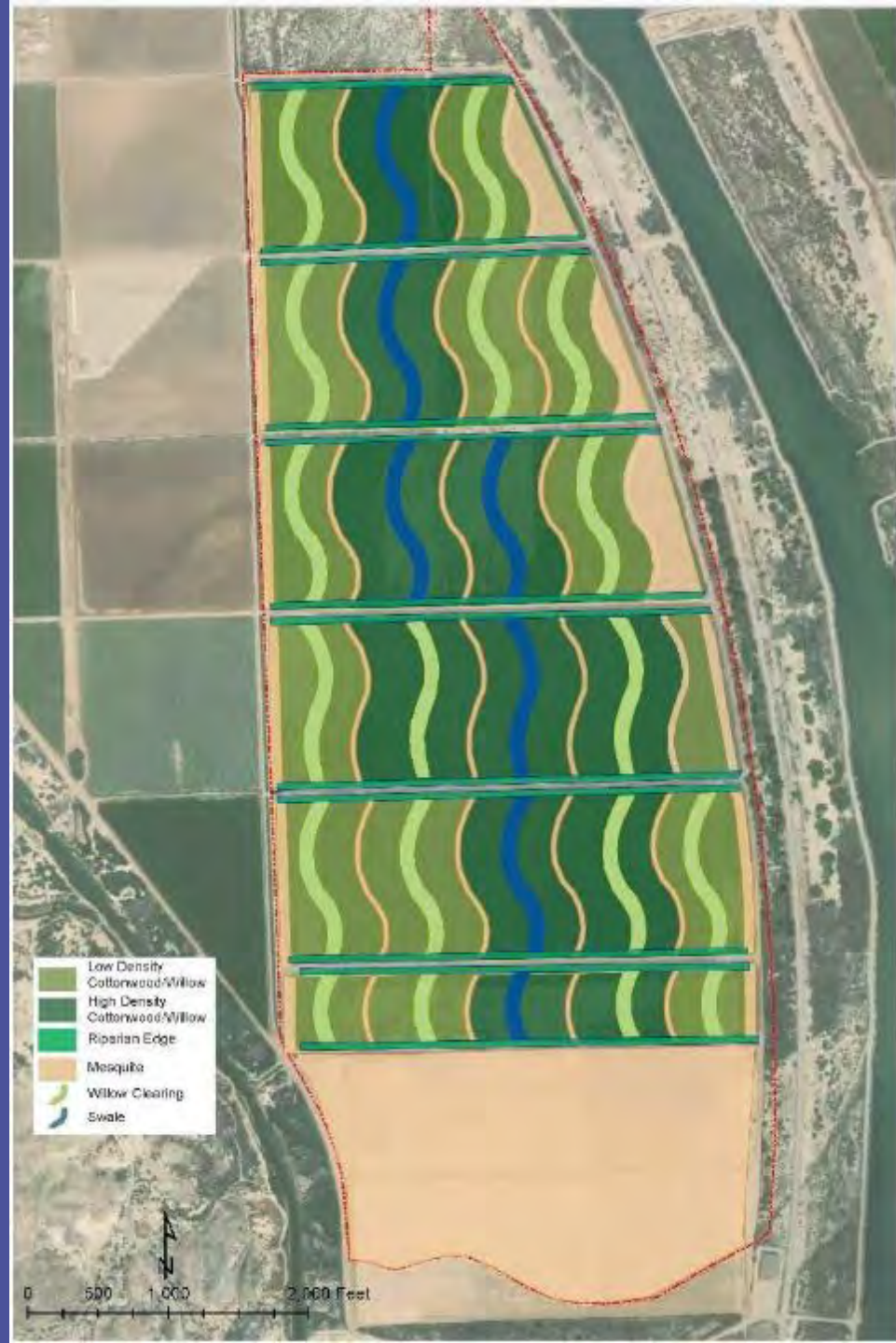
Figure 4.—Basic CEM diagram for life stage 2 – nestling.

Integrating needs, decisions and information



Dennis Underwood Conservation Area

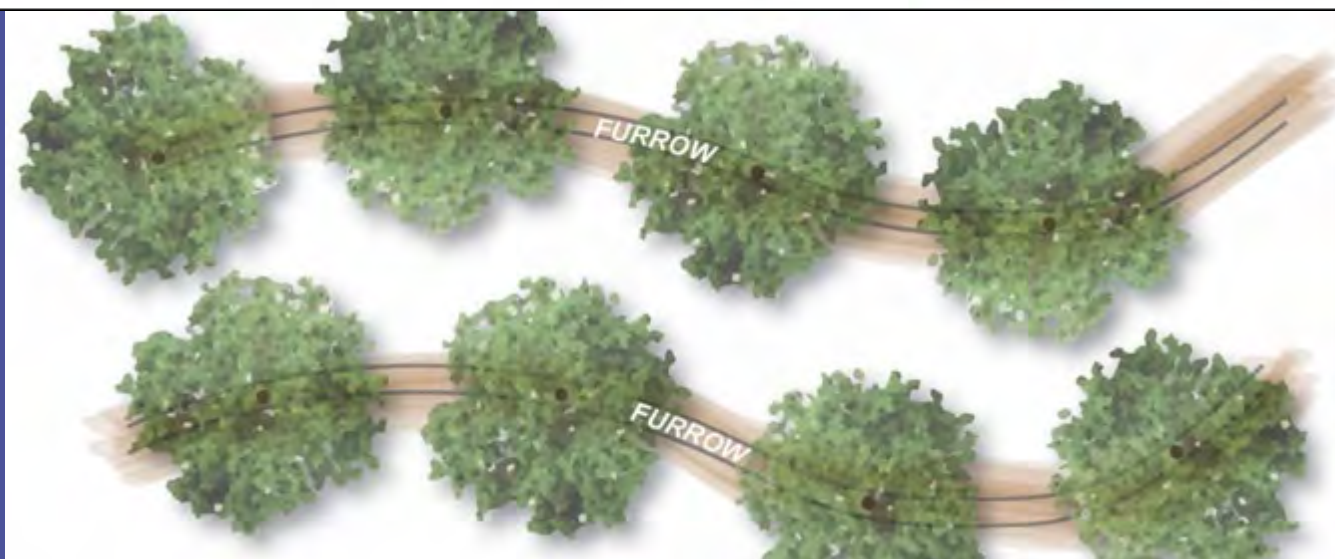
- 635 acres
- The habitat creation concept includes establishing approximately 506 acres of cottonwood-willow and 122 acres of honey mesquite land cover types.





- 1. Mesquite
- 2. Low density Cottonwood-coyote willow
- 3. Willow clearing

- 4. High Density Cottonwood, coyote, Gooding's Willow
- 5. Swale
- 6. High Density Cottonwood-Gooding's Willow



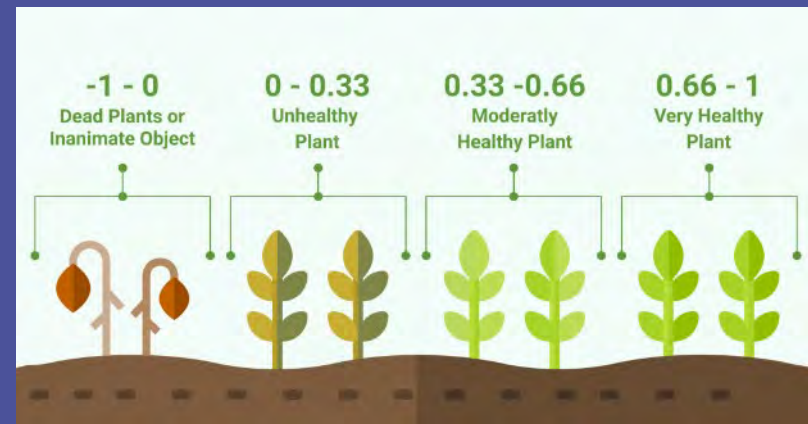
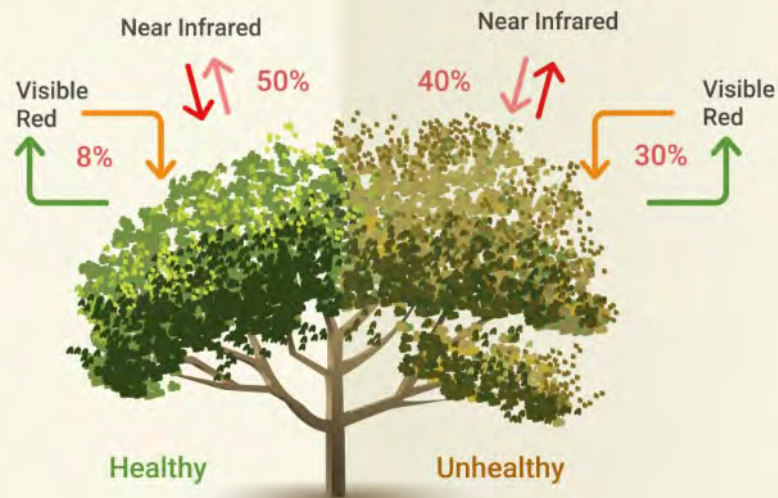
Habitat Management Phase

- Transition from census to sampled monitoring
- Bring most work in-house to increase flexibility to respond to changing habitat conditions and adaptive management needs
- Look for efficiencies like remote sensing between in-person monitoring visits



Habitat Management Phase

- Utilizing remote sensing tools and other technological advancements to analyze the vegetation to add to knowledge about habitat characteristics and monitor structural characteristics and vegetative health (such as lidar, Planetscope, and NDVI).





EVI September 2021



dEVI Apr-Sep 2021



dEVI 2020-2021



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ACCOMPLISHMENTS

- “Build it and they will come” - Most riparian and marsh species are responding to the created habitat
- Conservation Areas have been secured to meet the goals of the program
- Approximately 75% of the required habitat has been created in the first 15 years
- The flexibility in the program documents and the adaptive management approach have allowed us to meet challenges



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CHALLENGES

- Securing land and water in California to meet CESA requirements
- Developing long-term management guidelines for created habitats
- The “Unknown” (i.e., drought, climate change, invasive species)



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WHY DOES THE LCR MSCP WORK?

- The Program has a well-defined purpose, goals, and objectives
- The HCP has attainable conservation measures
- The flexibility in the program documents and the adaptive management approach allowed us to meet challenges
- The Steering Committee has been an active participant throughout implementation and is willing to compromise to move the program forward because a majority have a stake in its success



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www.lcrmscp.gov