Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

FY2008 Accomplishments

LCR MSCP FY2008 Funding Summary

Total Required Funding	FY2008 Approved Estimate	FY2008 Accomplishment	Cumulative Program Accomplishment
$13,311,018	$14,947,500	$15,797,675	$55,158,120

FY2008 Funding Credits

Funding Entity	Credits (Current FY $)
Reclamation	$876,677
San Diego County Water Authority	$3,298,070
The Metropolitan Water District of Southern California	$1,826,895

FY2008 Program Element Accomplishment

• Program Administration	$	965,660.35	(6%)
• Fish Augmentation	$	1,409,311.81	(9%)
• Species Research	$	1,619,072.73	(10%)
• System Monitoring	$	2,150,471.06	(14%)
• Conservation Area D&M	$	7,747,715.93	(49%)
• Post Development Monitoring	$	726,835.80	(4%)
• AMP	$	568,347.96	(4%)
• Habitat Maintenance Fund	$	593,500.00	(4%)
• Public Involvement	$	16,759.13	(*%)
• **TOTAL**	**$**	**15,797,674.77**	

2001 Biological Opinion

- SIA Conservation Measures completed by FY08
  - Stock 20,000 RASU (20,012 stocked in Reaches 5 & 6 by January 2007)
  - Create 44 acres of backwaters (Imperial Ponds-completed in FY07)
  - Provide $50,000 to secure larvae and fund Achii Hanyo (completed in FY04)
  - Create 372 acres of CW for SWFL (completed at CVCA & PVER in FY08)
  - Establish baseline soil moisture at 372 acres of occupied SWFL habitat & monitor for change (baseline established in FY05)

2001 Biological Opinion (cont)

- ISC Conservation Measures
  - Lake Mead Razorback Study: 10 year summary report complied
  - Provide rising spring water levels @ Lake Mead when practicable (N/A)
  - Continue Lake Mohave operations to benefit native fish for 15 years
  - Monitor Lake Mead levels and rear RASU if elevations reach 1,160 ft (began in FY05)

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

2008 Fishery Program Highlights and Status of Razorback Sucker and Bonytail Downstream of Grand Canyon

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

www.lcrmscp.gov

Fish work described in 3 documents:

- Fish Augmentation Plan
- Annual Implementation Rpt
- Science Strategy

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

FISH AUGMENTATION PLAN

Covers the what, when, where and how for stocking

Includes brood stock and rearing facility considerations

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

IMPLEMENTATION REPORT

Annual document that describes activities by work task including:

- **Past year accomplishments**
- **Current year's work**
- **Proposed work for next year**

Science Strategy

- Describes research and monitoring focus areas for fish, wildlife and habitats
- To be updated every five years

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Fish Group:

Group Manager – Tom Burke

Biologists: Ty Wolters, Jeff Lantow, Jim Stolberg, Andi Montony

Biological Technicians: Jon Nelson, Bonnie Contreras, Trish Delrose, Randy Thomas

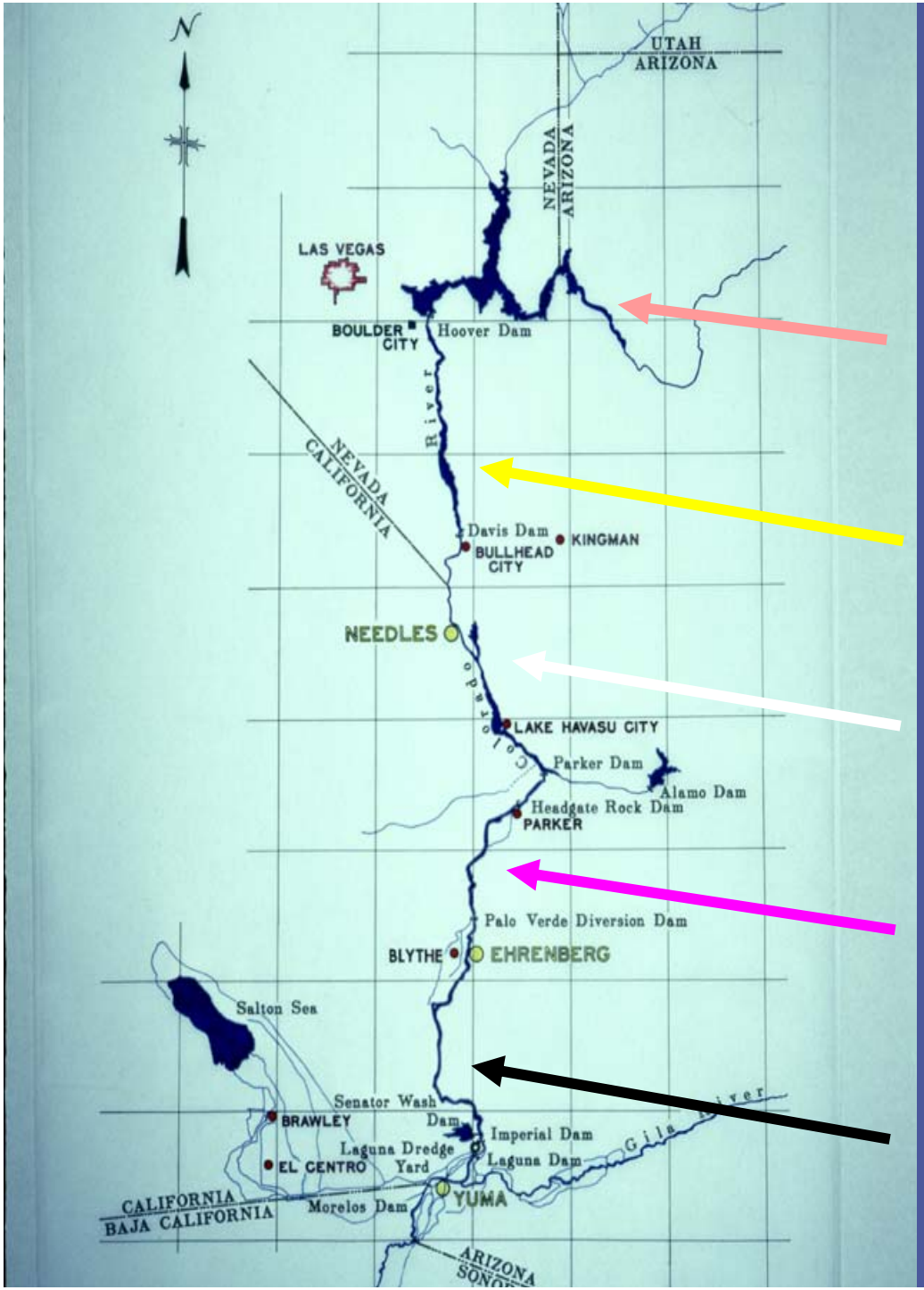
Students: Jeff Anderson, Ryan Finnegan

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Conservation Summary:

- Raise and stock 1.2 million fish
- Create 360 acres of backwaters
- Conduct monitoring and research
- Coordinate with other fish programs



Fish Program Activities in 5 of the 7 River Reaches

Reach 1 – Lake Mead

Reach 2 – Lake Mohave

Reach 3 – Lake Havasu

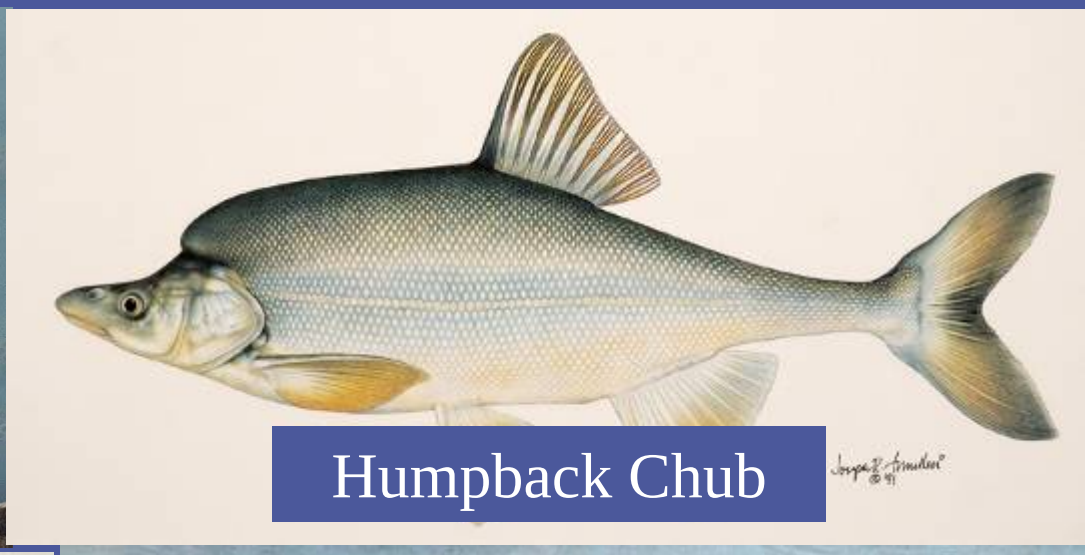
Reach 4 – Parker/Cibola

Reach 5 – Imperial

Because 95% of the flow is removed at Imperial Dam

Conservation Measures for Four Native Fishes

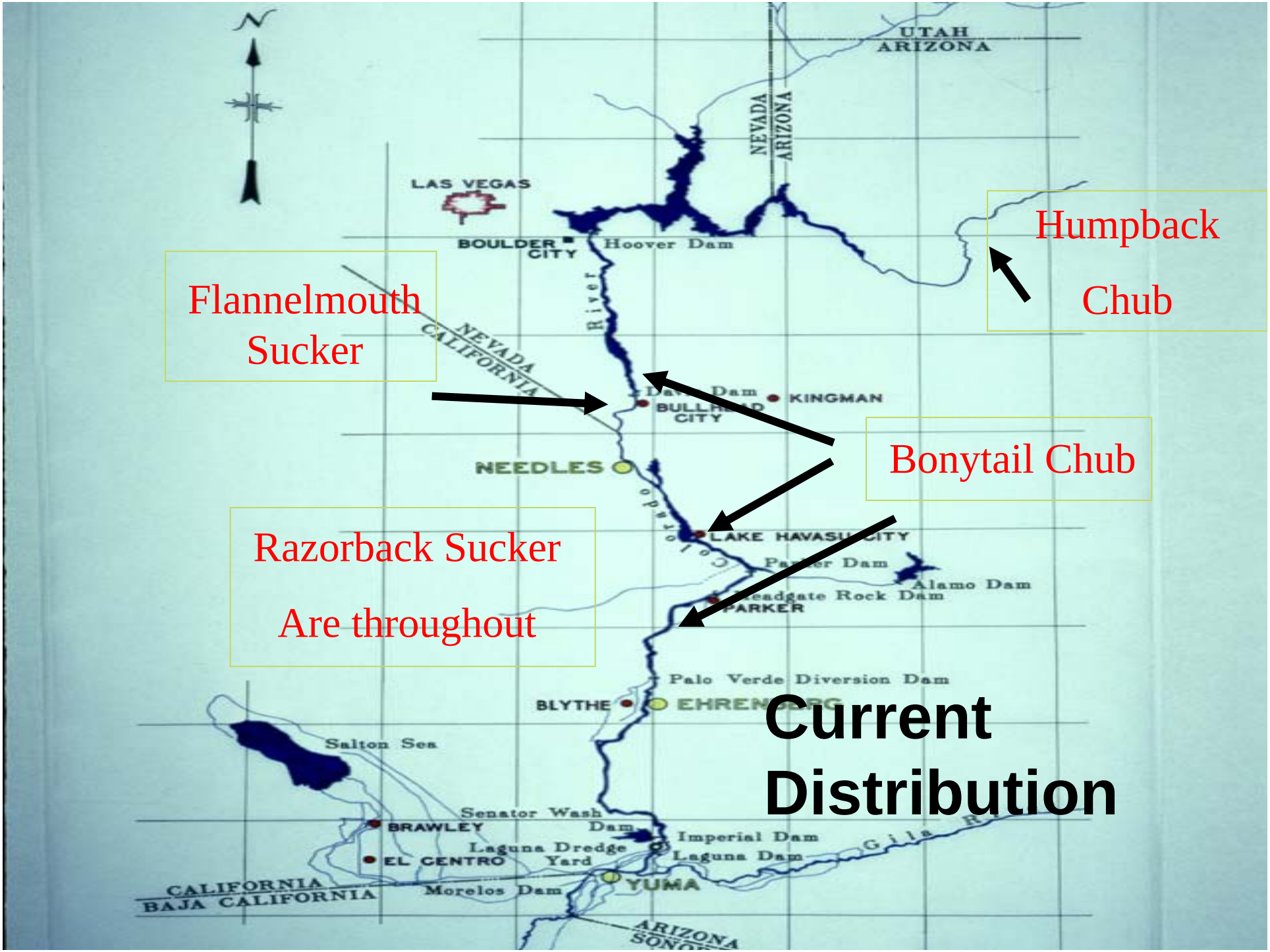
Flannelmouth Sucker



Humpback Chub

Razorback Sucker

Bonytail


Humpback Chub
Flannelmouth Sucker
Bonytail Chub
Razorback Sucker Are throughout
Current Distribution
UTAH
ARIZONA
NEVADA
ARIZONA
LAS VEGAS
BOULDER CITY
Hoover Dam
River
NEVADA
CALIFORNIA
KINGMAN
NEEDLES
Colorado
LAKE HAVASU CITY
Parker Dam
Alamo Dam
PARKER
Palo Verde Diversion Dam
BLYTHE
EHRENBERG
Salton Sea
Senator Wash Dam
BRAWLEY
Imperial Dam
Laguna Dredge Yard
EL CENTRO
Laguna Dam
Gila R.
CALIFORNIA
BAJA CALIFORNIA
Morelos Dam
YUMA
ARIZONA

CONSERVATION STRATEGIES FOR NATIVE FISH SPECIES

- FISH AUGMENTATION
- SPECIES RESEARCH
- SYSTEM MONITORING
- HABITAT DEVELOPMENT
- DATA MANAGEMENT
- ADAPTIVE MANAGEMENT
- COORDINATE WITH RECOVERY PROGRAMS

Limited Activities for Humpback Chub

- 2006-2008 Provided $10 k/yr to Willow Beach NFH to support captive management
- 2009-2012 Will provide $200 K to Dexter NFH to develop and maintain a refugia population

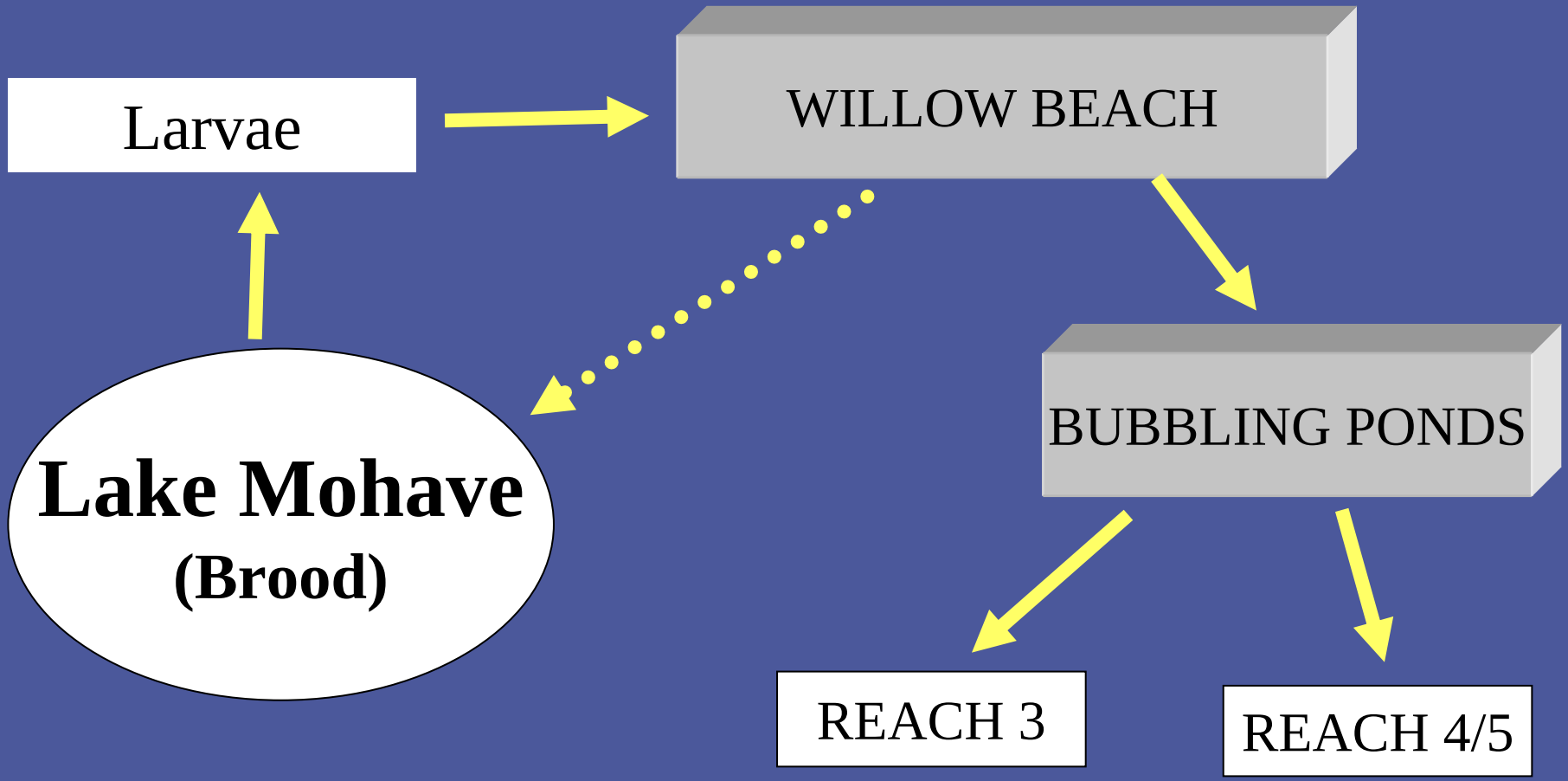
Limited Activities for Flannelmouth Sucker

Five year study of population dynamics, habitat use, and basic ecology of flannelmouth sucker below Davis Dam (2006-2011)

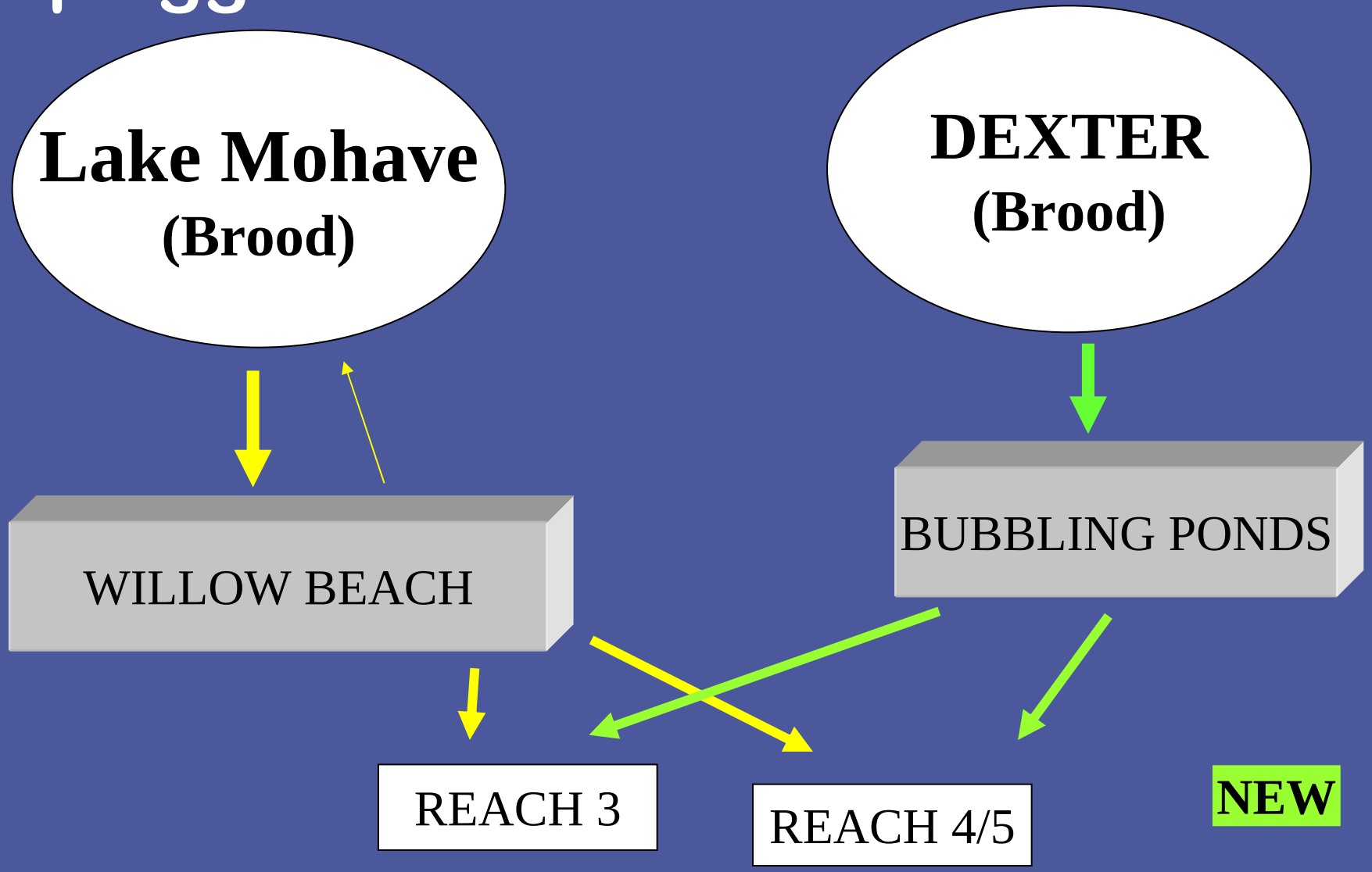
Current Native Fish Rearing Sites being used by LCRMSCP

- Willow Beach Hatchery (USFWS-AZ)
- Achii Hanyo (USFWS/CRIT-AZ)
- Lake Mead Hatchery (NDOW-NV)
- Dexter Fish Hatchery (USFWS-NM)
- Bubbling Ponds Hatchery (AGFD-AZ)
- Lakeside Ponds (Lake Mohave-AZ/NV)
- Uvalde Hatchery (USFWS-TX)

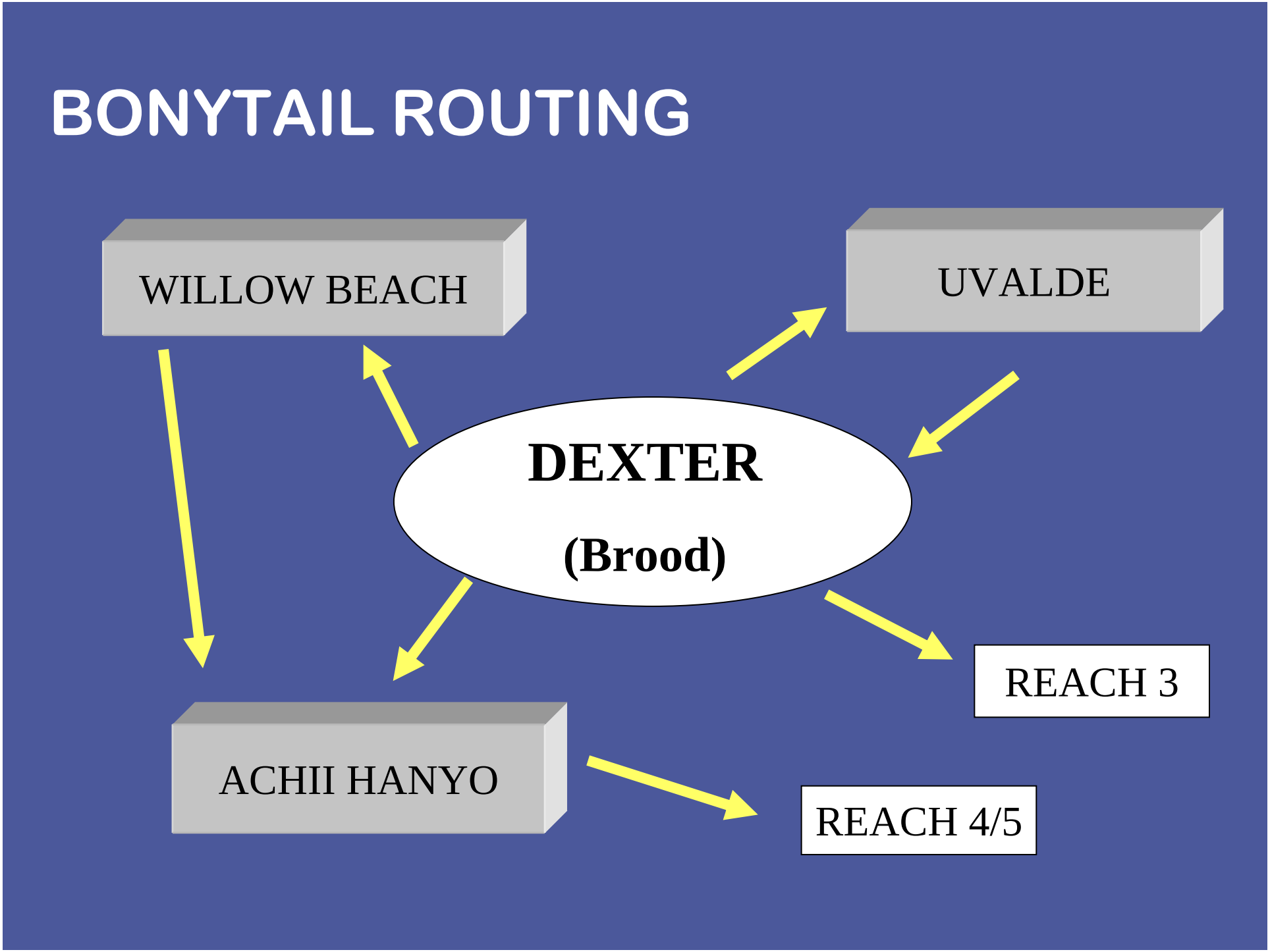
RAZORBACK SUCKER ROUTING (Original Plan)



Current Razorback Routing due to quagga mussel issues



BONYTAIL ROUTING



FISH AUGMENTATION

Rear and stock:

- 660,000 razorback sucker (12 “)
- 620,000 bonytail (12”)

10% to be released over 5 yr period for species research

- Ten active work tasks funded in 2008

2008 STOCKING

REACH	RAZORBACK	BONYTAIL
2	770	57*
3	9,536	4,594
4/5	9,127	535
SUB-TOTAL	19,433	5,186
TOTAL BOTH SPECIES	**24,619**	

***From lakeside rearing ponds**

STOCKING SUMMARY

(2005 – 2008)

REACH	RAZORBACK	BONYTAIL
2	25,597	57
3	22,884	20,485
4/5	38,146	8,560
SUB-TOTAL	86,627	29,102
TOTAL BOTH SPECIES	**115,729**	

SPECIES RESEARCH for native fish

18 SEPARATE ACTIONS IN 4 FOCUS AREAS:

- Fish Production (diet, growth, temperature)
- Rearing Techniques (poly-culture, multi-age class).
- Handling/Distribution (netting, tagging, transportation)
- Population Ecology (genetics, size, structure, movement)
- Monitoring Techniques (remote sensing, telemetry).

System Monitoring

GOAL: Gather enough information for each reach to understand population strength and trends.

- Gleaned information from ongoing research.
- Participated in interagency surveys.
- Conducted electro-fishing and netting surveys where coverage gaps existed.

(Results summarized in part 2)

Fish Data Management

- Raw field data, and stocking records kept in protected files in Boulder City.
- Electronic data records provided to ASU's Colorado River Fishes Database.
- Database allows interactive search of tag history.

ADAPTIVE MANAGEMENT

Simply put, the AMP is an assurance that the conservation will be accomplished.

a) Gauge effectiveness of conservation measures.

b) Propose alternative measures or modifications.

c) Address changed and unforeseen circumstances.

Current Focus:
Develop Tools for Future

Developing evaluation techniques not harmful to fish:

- Video and photographic tools.
- Ocular surveys.
- Remote tag reading and listening stations.

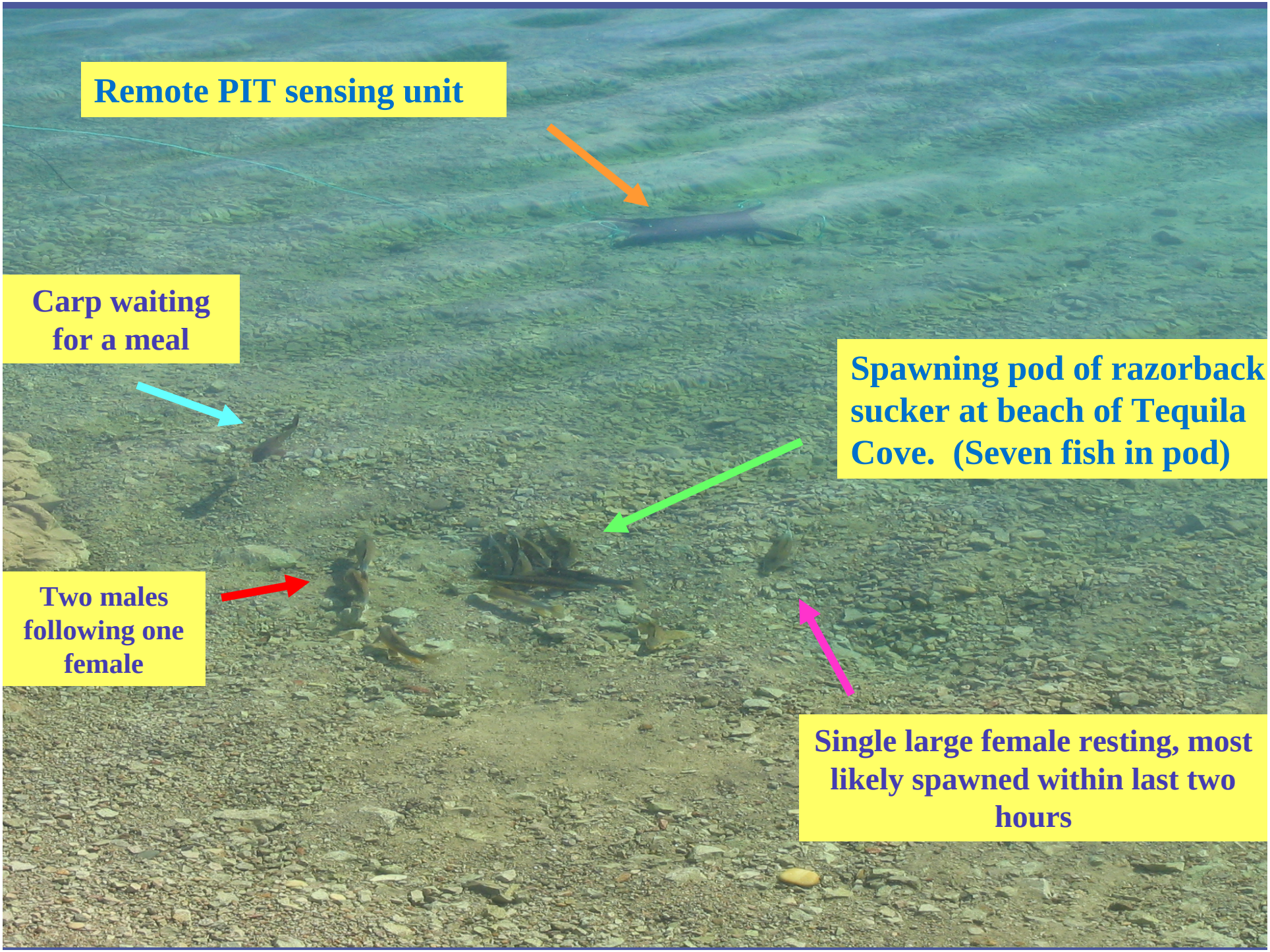
Conducting research to establish boundary parameters for early warning keys (tell us when to take compensation actions such as adding fresh water to ponds).

Remote PIT tag readers

- Now using 134 khz PIT tags which have a stronger signal and allow use of listening antennae
- Provides data without having to net, shock or otherwise handle the fish post-release
- Provide population estimates in ponds on Imperial Refuge

This is a flannelmouth sucker spawning site below Davis Dam. This is the first unit we built, and we contacted both razorback and flannelmouth suckers in the river.

During February and March we contacted 121 fish in Lake Mohave. Units are deployed while crews are out catching larvae


Remote PIT sensing unit
Carp waiting for a meal
Spawning pod of razorback sucker at beach of Tequila Cove. (Seven fish in pod)
Two males following one female
Single large female resting, most likely spawned within last two hours

At Imperial Ponds we were able to record more than 200 of the fish we stocked during last November's Dedication.

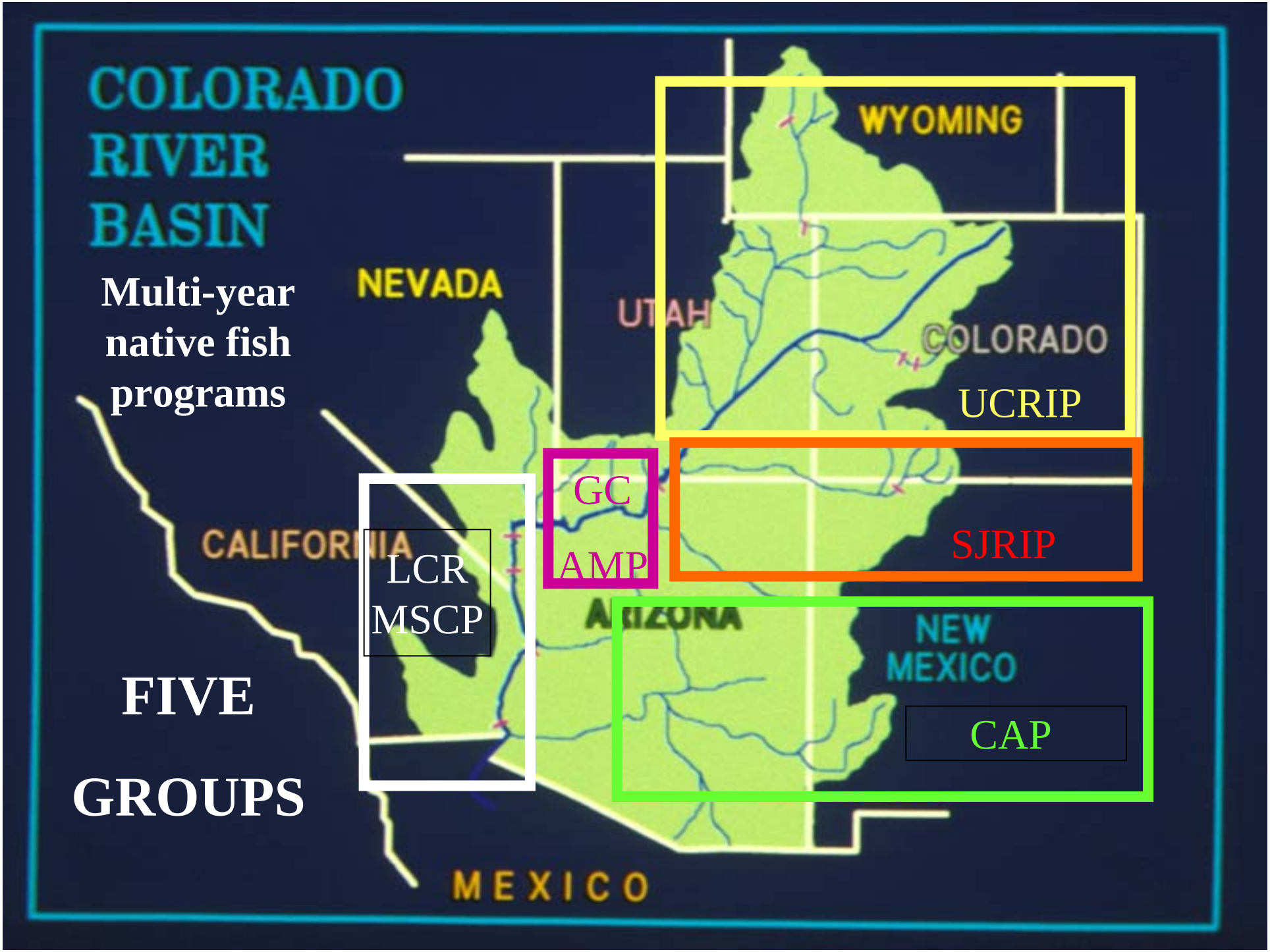
COORDINATE WITH OTHER CONSERVATION/RECOVERY PROGRAMS

- UCRRIP
- SJRRIP
- GCAMP
- CRAB
- CAP
- Lake Havasu Fishery Improvement Program


COLORADO
RIVER
BASIN
WYOMING
NEVADA
UTAH
COLORADO
CALIFORNIA
ARIZONA
NEW
MEXICO
MEXICO

ONE

BASIN

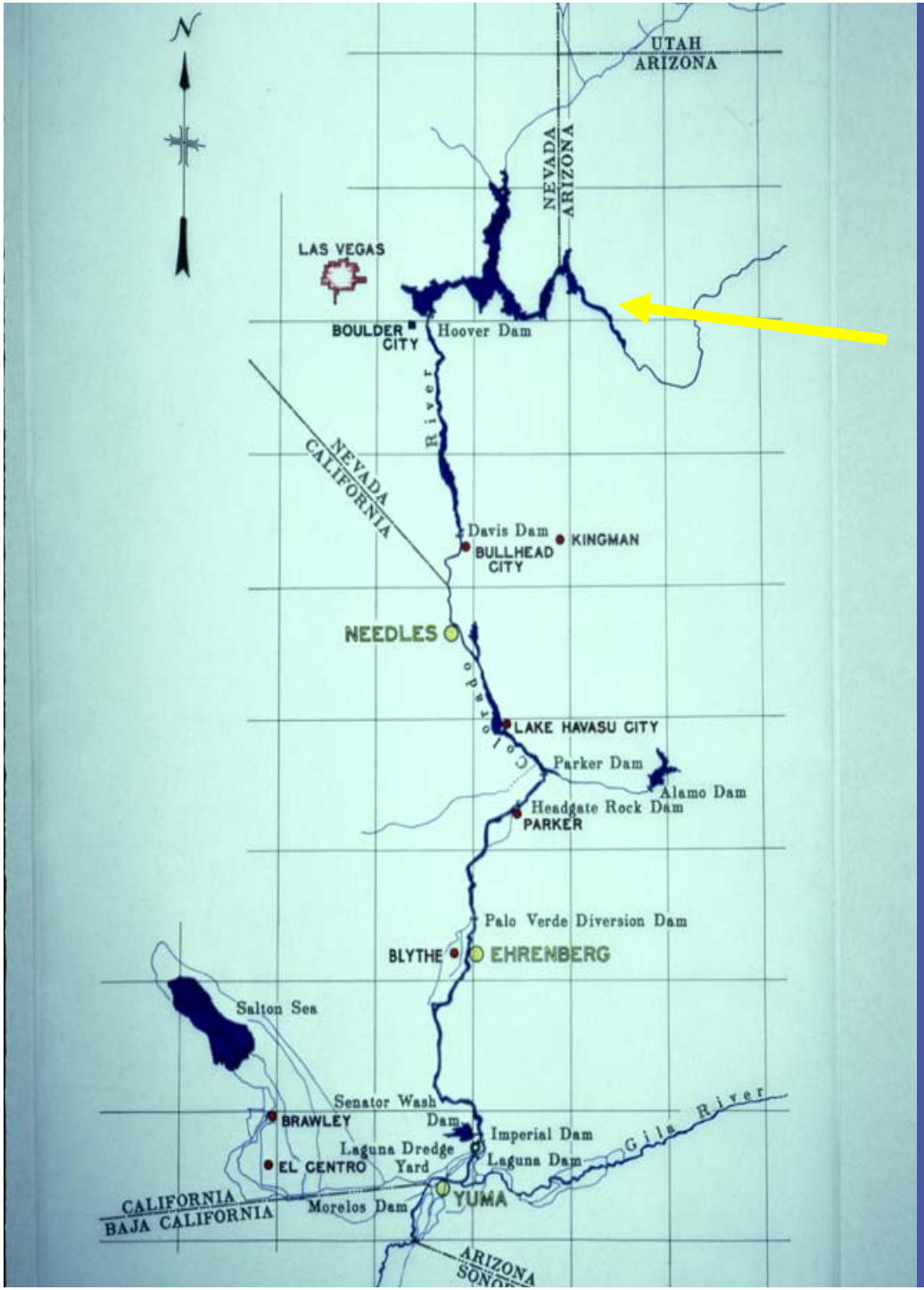

COLORADO
RIVER
BASIN
Multi-year
native fish
programs
FIVE
GROUPS
WYOMING
NEVADA
UTAH
COLORADO
UCRIP
GC
AMP
SJRIP
LCR
MSCP
NEW
MEXICO
CAP
MEXICO

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

(PART 2)

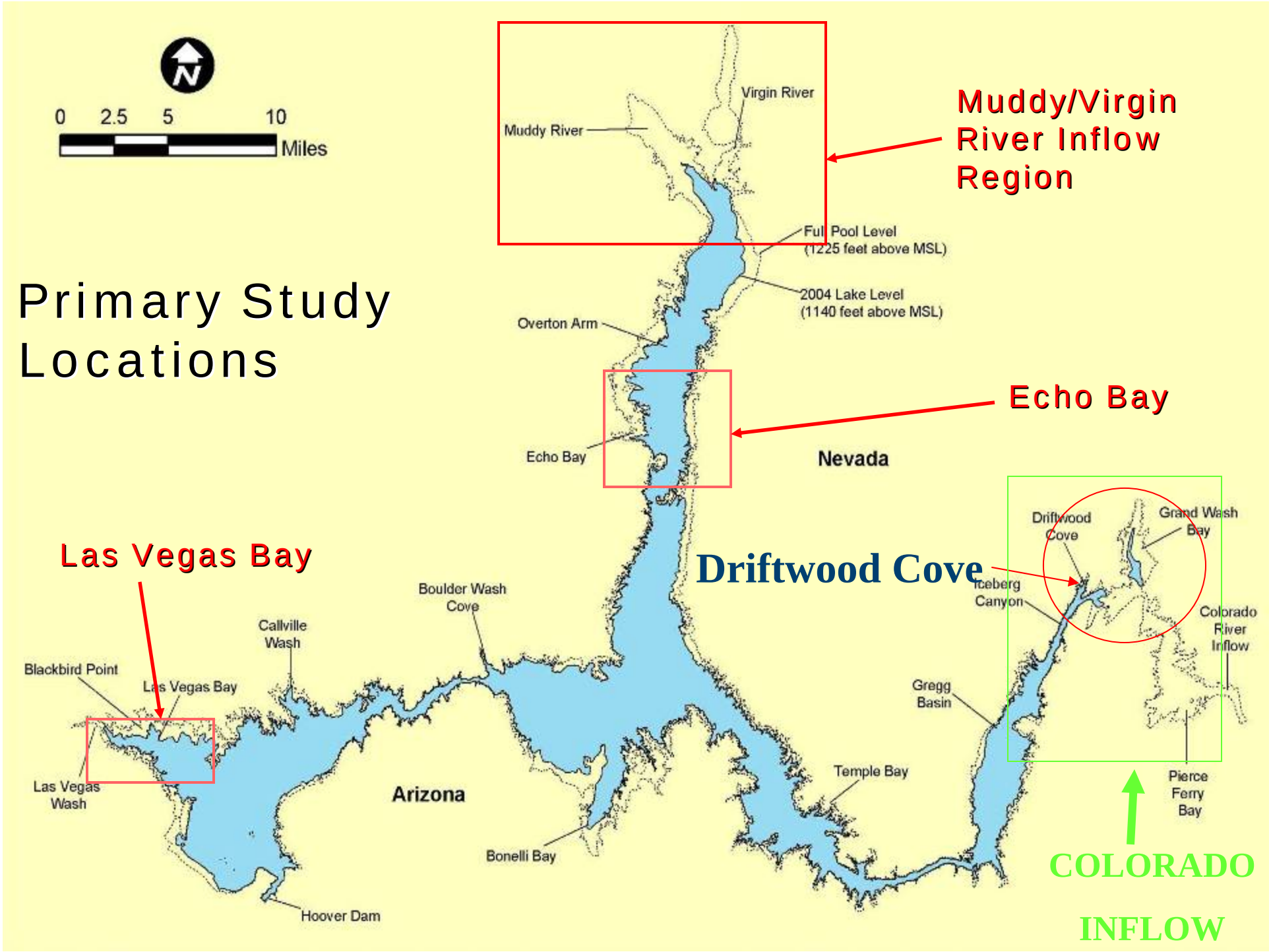
Status of Razorback Sucker and Bonytail Downstream of Grand Canyon



Reach 1 – Lake Mead

REACH 1 – Lake Mead

- 300-500 adult razorback sucker; no bonytail.
- Active monitoring and research conducted by Bio/West, Inc.
- Three active spawning areas.
- Documented recruitment every year between 1973 and 2004.
- Population small but stable.
- Larvae have been brought into captivity and are being reared at Lake Mead Hatchery.
- 10-year data summary available (pdf) on MSCP website.
- Looking to expand work to Colorado River Inflow area and collaborate with Grand Canyon AMP


0 2.5 5 10
Miles
Primary Study Locations
Muddy/Virgin River Inflow Region
Virgin River
Muddy River
Full Pool Level (1225 feet above MSL)
2004 Lake Level (1140 feet above MSL)
Overton Arm
Echo Bay
Echo Bay
Nevada
Las Vegas Bay
Driftwood Cove
Driftwood Cove
Grand Wash Bay
Iceberg Canyon
Colorado River Inflow
Boulder Wash Cove
Callville Wash
Blackbird Point
Las Vegas Bay
Las Vegas Wash
Arizona
Gregg Basin
Temple Bay
Pierce Ferry Bay
Bonelli Bay
Hoover Dam
COLORADO INFLOW

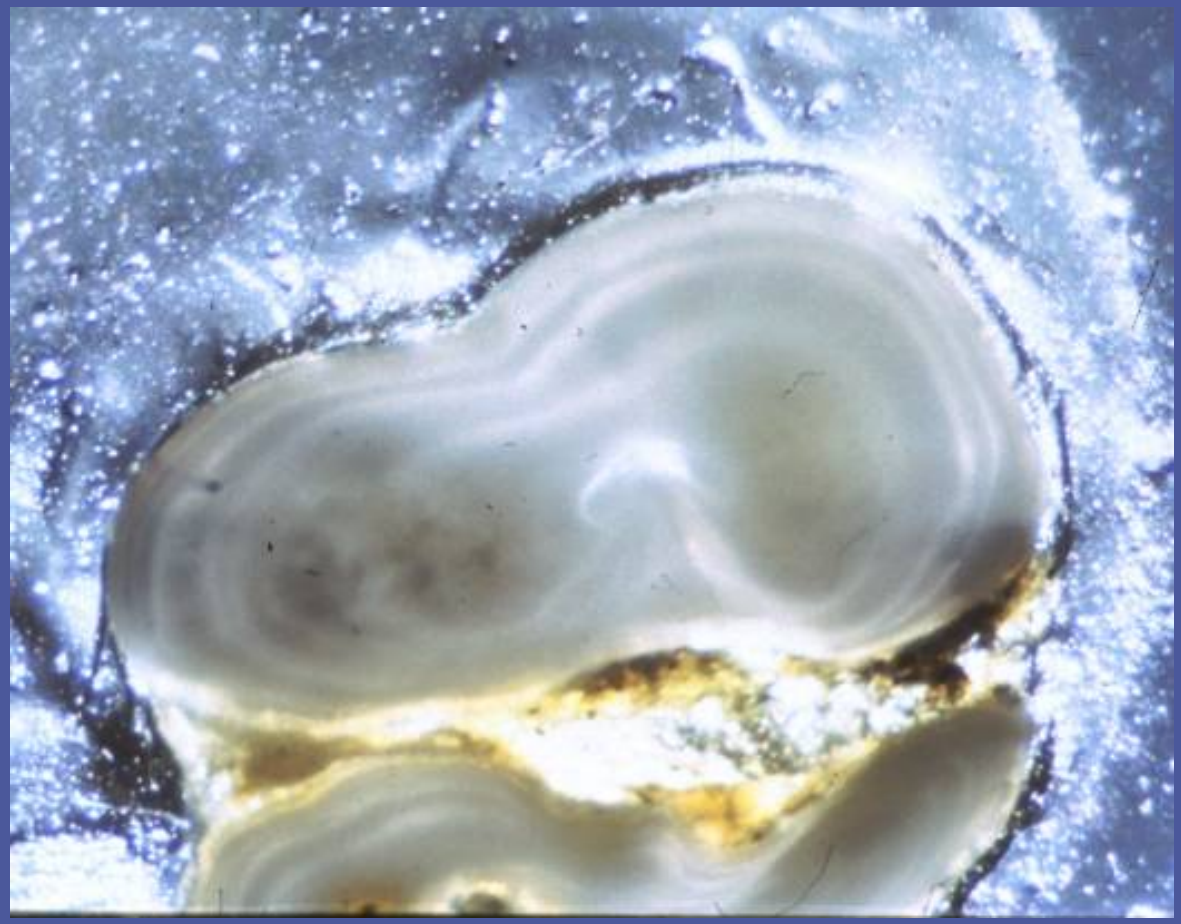
Lake Mead Razorback Sucker Aging :

1998-2007 - 132 razorback suckers aged by fin ray section

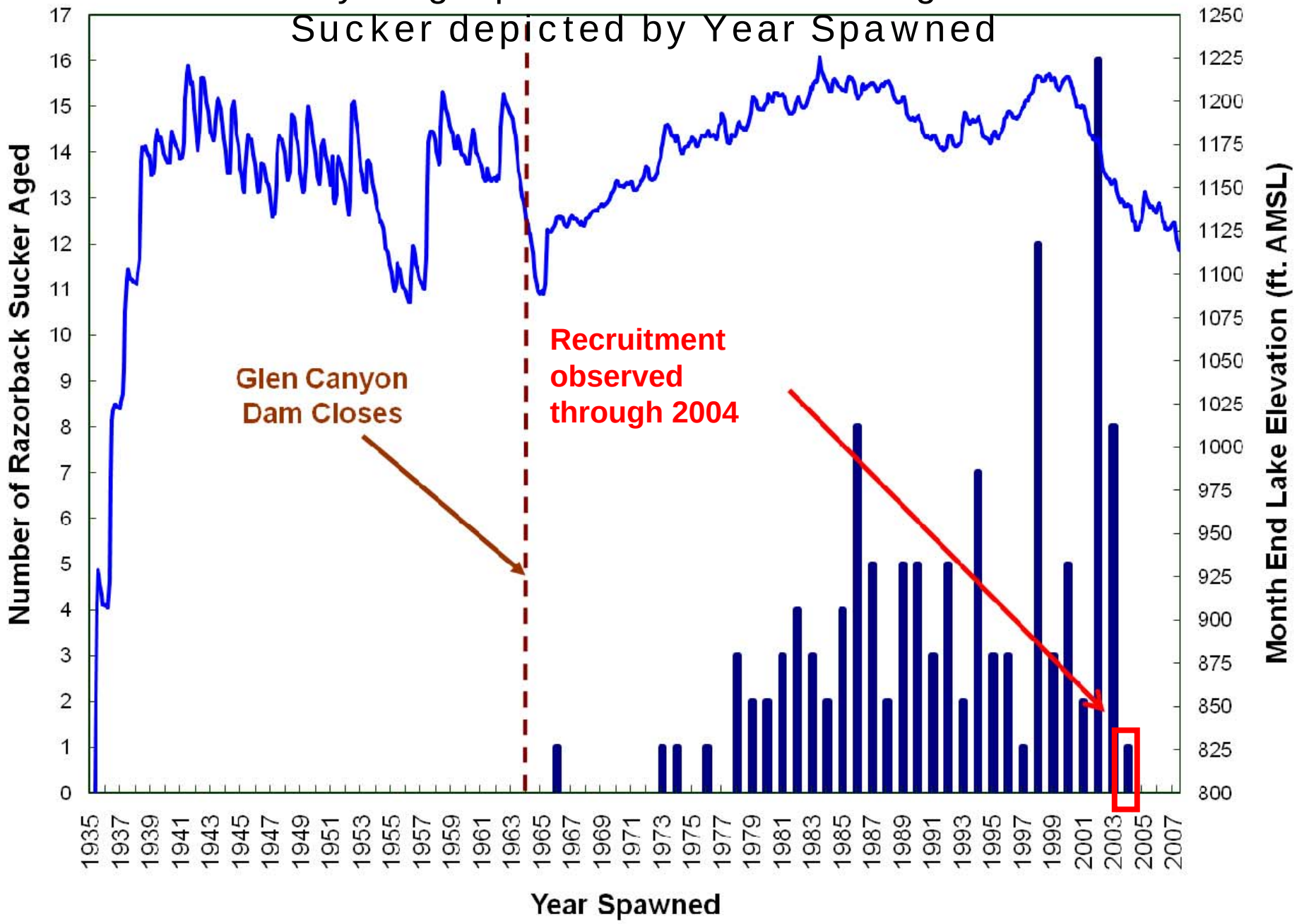
- 

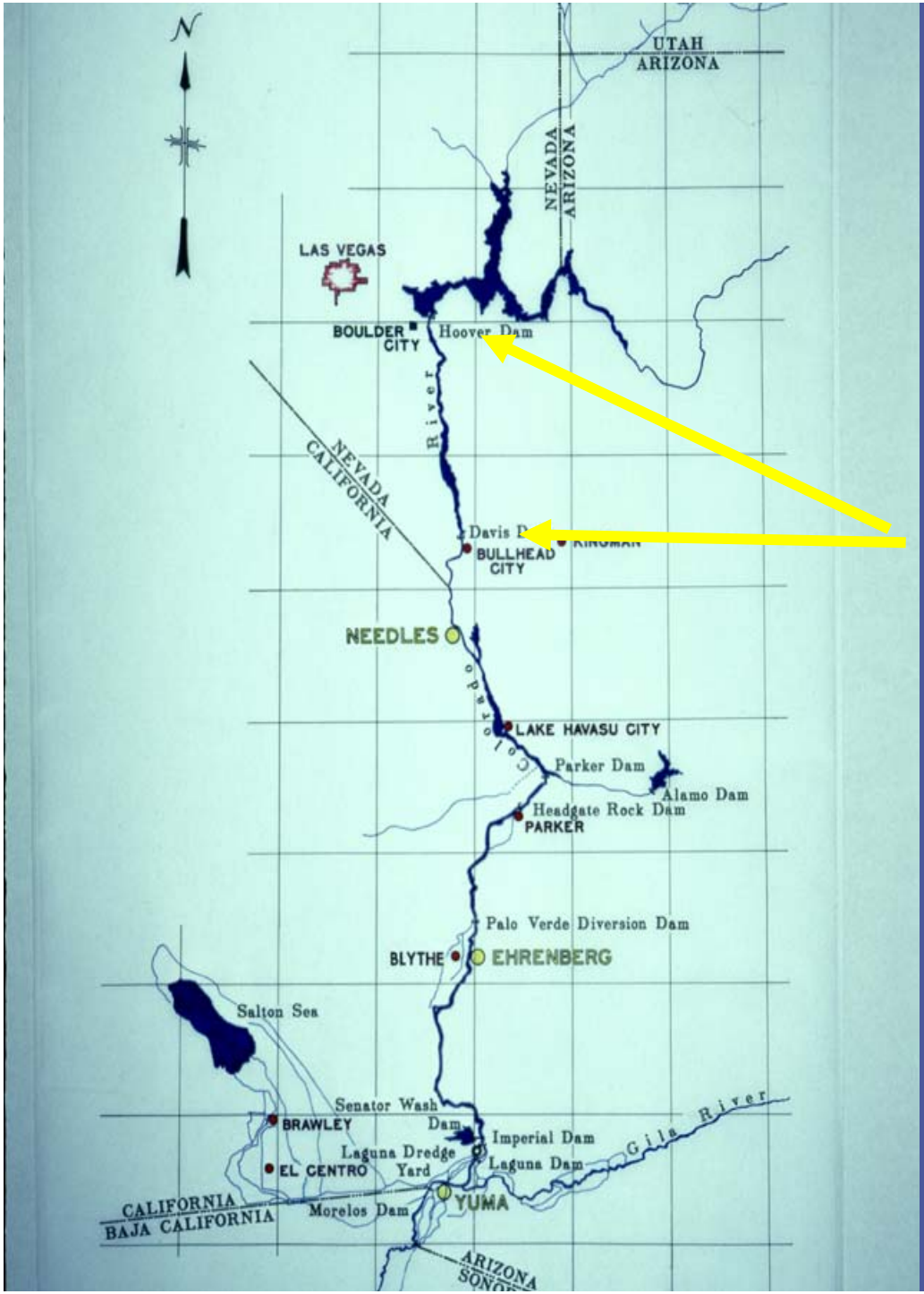
Lake Mead Razorback Sucker Aging

- **2006-2007 – 41 razorback suckers aged**
- **21 of the 41 fish (51%) were aged at 7 years or less**



Lake Mead Hydrograph with Number of Aged Razorback Sucker depicted by Year Spawned





Reach 2 – Hoover Dam to Davis Dam (includes Lake Mohave)

REACH 2 - Razorback Sucker

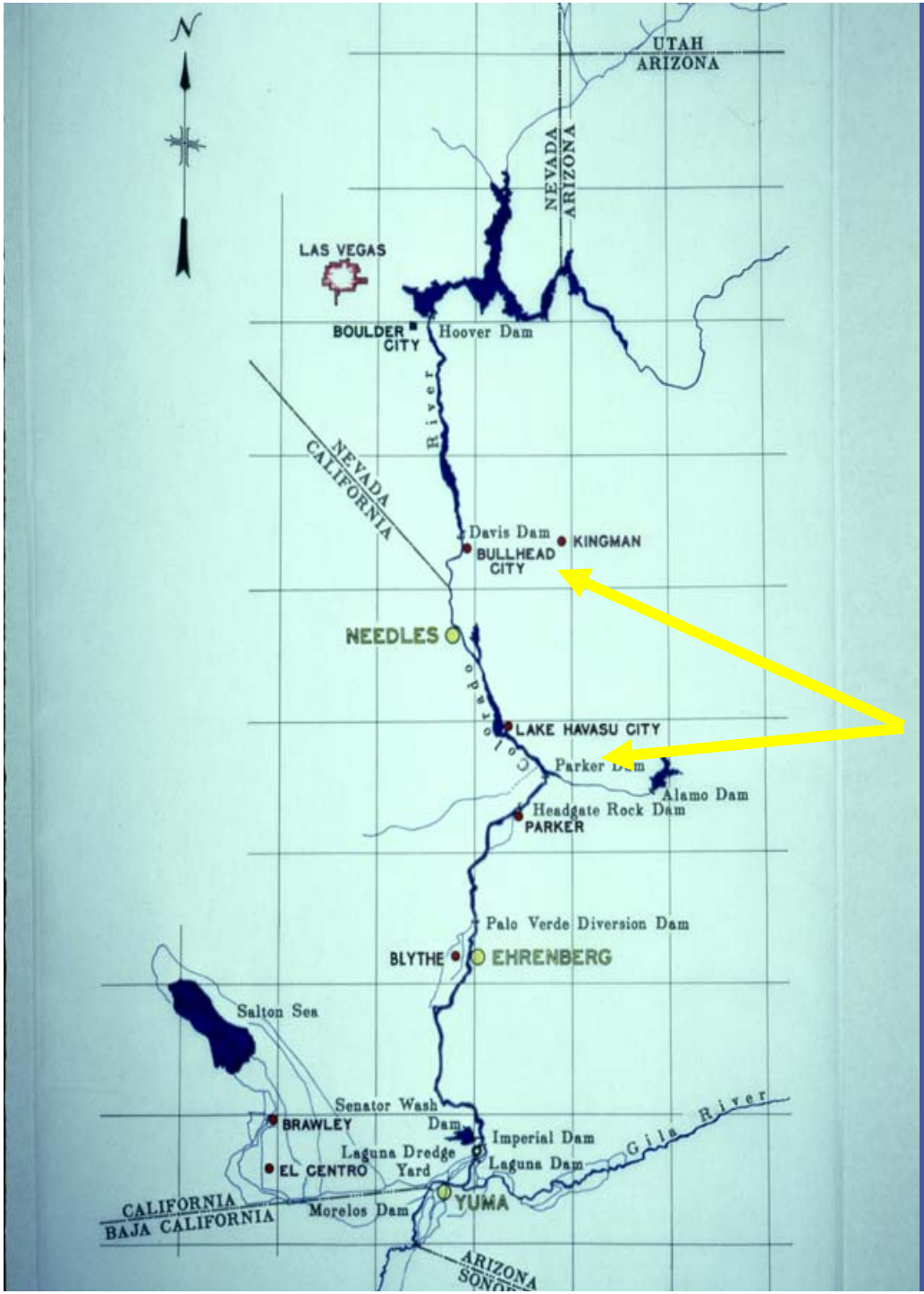
- Extensive monitoring and research.
- 120,000 subadults repatriated since 1992.
- 600,000 wild larvae brought into rearing program since 1994.

- Aggregation of 200-300 adults on gravel shoals immediately below Hoover Dam.

- 1500+ repatriated adults now spawning at four primary spawning sites.

REACH 2 – Bonytail

- Bonytail roundup held each May.
- No wild fish captured for last 5 years.
- Extremely poor survival of stocked fish.
- Recent stockings to river above Willow Beach Hatchery instead of lake.
- May be functionally extirpated from wild (i.e., no wild fish).



Reach 3 – Davis Dam to Parker Dam

(includes Lake Havasu)

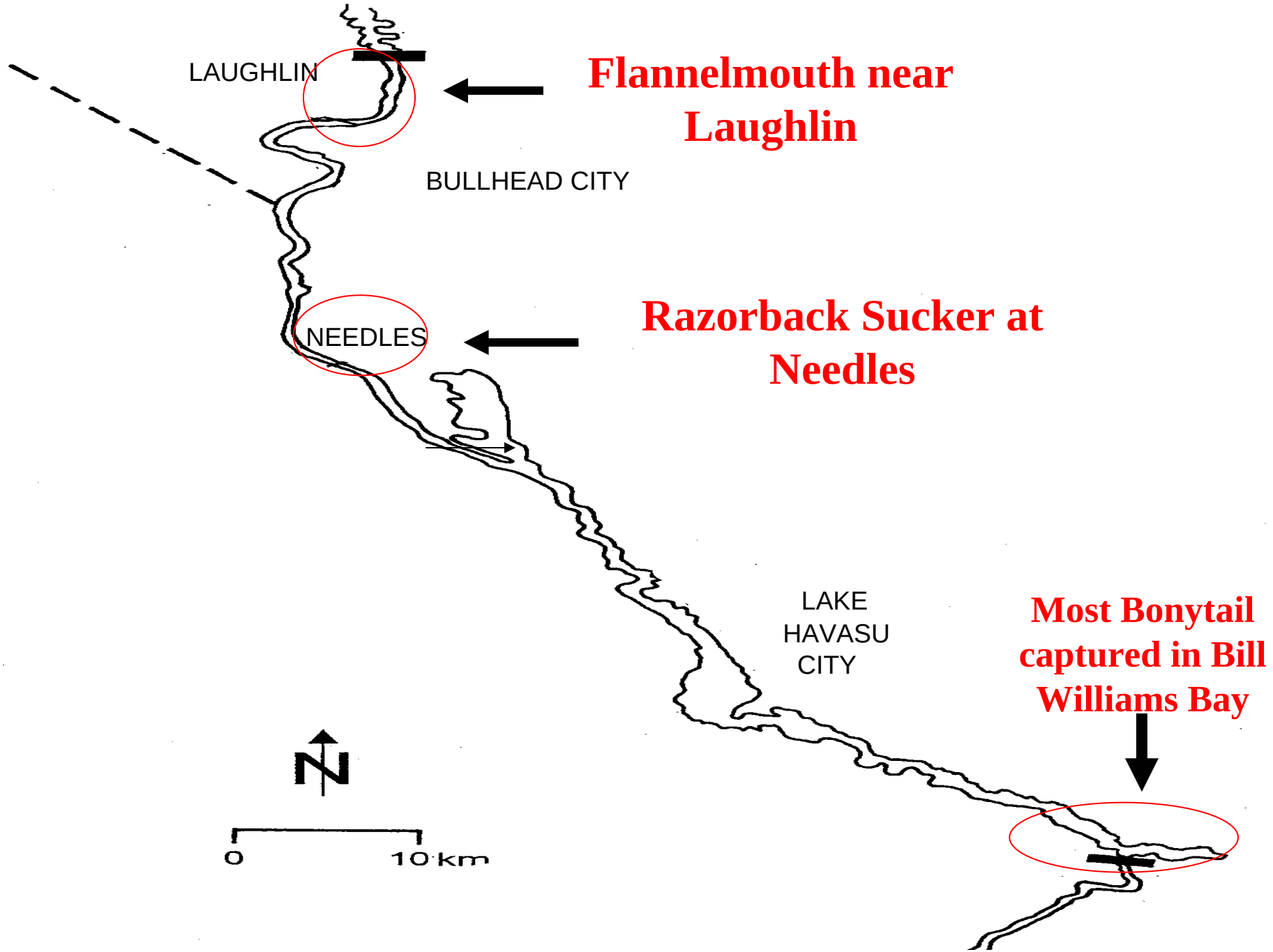
REACH 3 – Davis Dam to Parker Dam, includes Lake Havasu

FLANNELMOUTH SUCKER – Estimated 2500 adults in spawning population located within first 10 miles below Davis Dam. Larvae, juveniles, and adults captured annually.

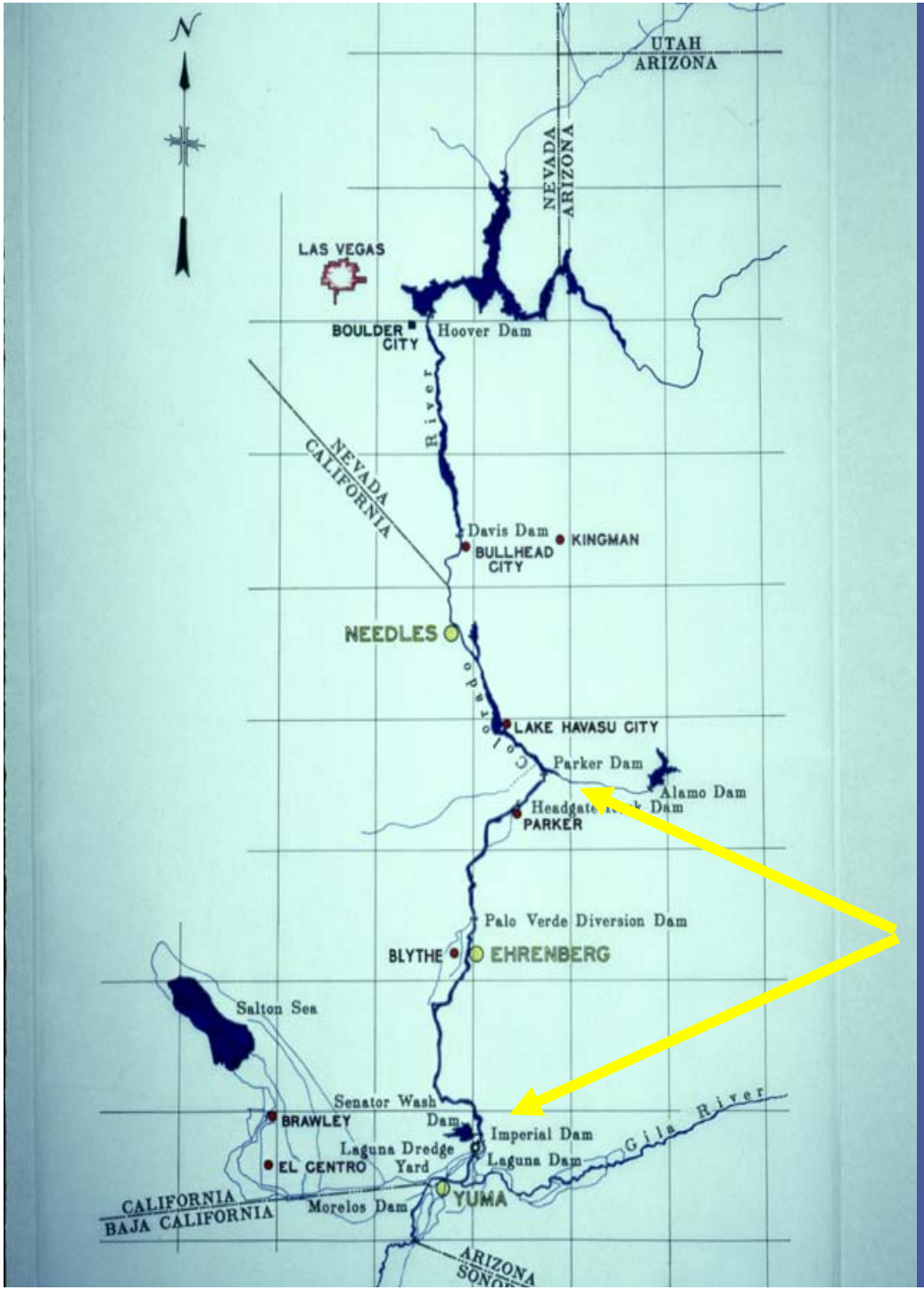
RAZORBACK SUCKER – Estimated 1500 adults in spawning population centered just above Needles, California. Adults and larvae captured each spring; no juveniles captured.

BONYTAIL – Fish are contacted each year; All stocked fish, generally at large for less than 1 year and most found in the lower part of the lake.

SPECIES USING DIFFERENT AREAS OF REACH 3




RAZORBACK SPAWNING
REACH ABOVE NEEDLES
NEEDLES BRIDGE



Reach 4 – 5
Parker Dam to Imperial Dam

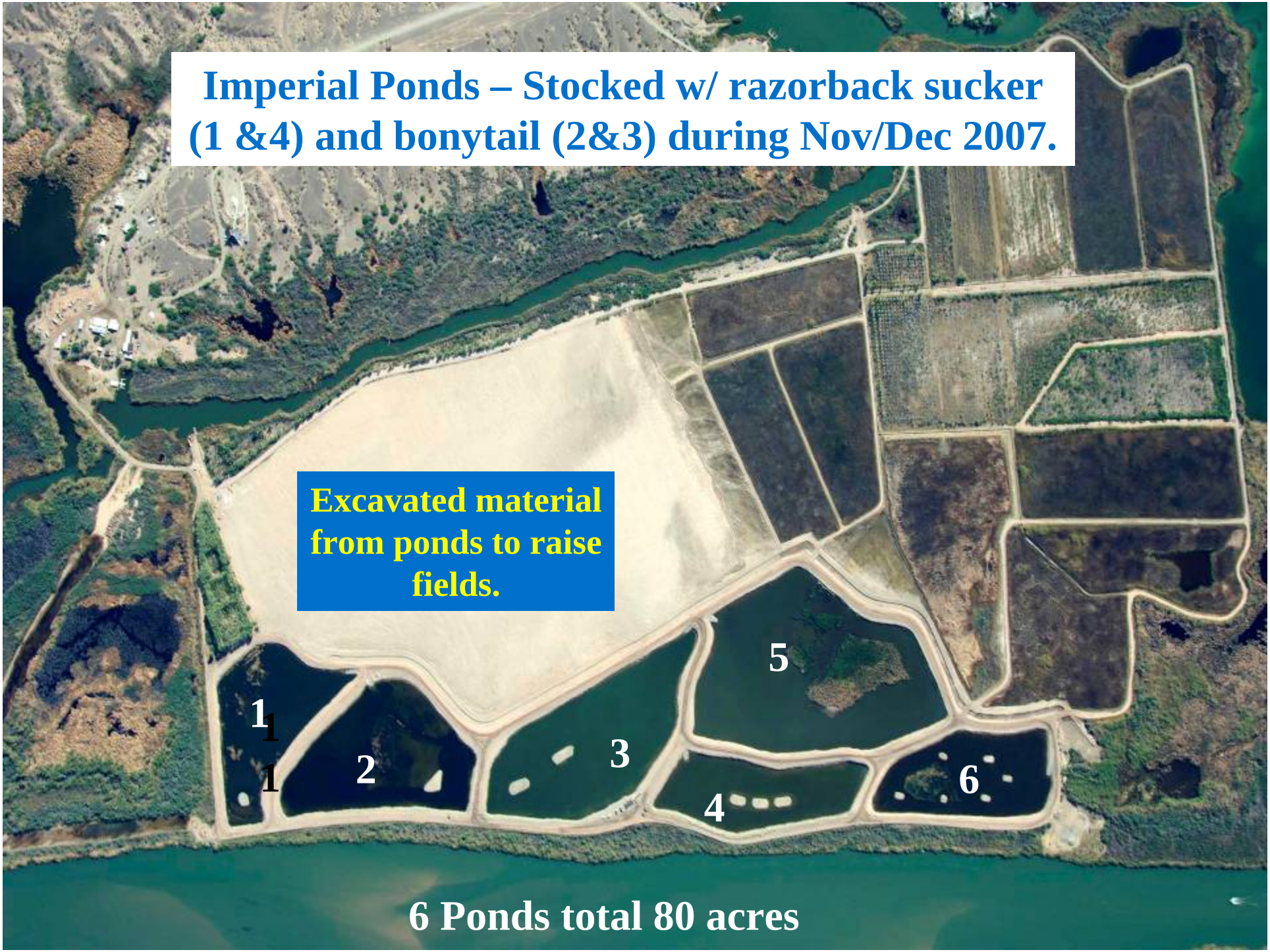
REACH 4/5 – Parker Dam to Imperial Dam

RAZORBACK SUCKER –

- 70,000 stocked since 1998
- Estimated first-year survival <10%
- Mammals, birds, and fish predators on stocked fish

BONYTAIL – 8500 stocked since December 2006.

IMPERIAL PONDS – 80 acres of newly constructed floodplain ponds on Imperial Refuge. Ultimately to be refugia, ponds will be a major research area for next 10 years.


Imperial Ponds – Stocked w/ razorback sucker (1 &4) and bonytail (2&3) during Nov/Dec 2007.
Excavated material from ponds to raise fields.
1
1
1
2
3
4
5
6
6 Ponds total 80 acres

Striped bass are the major predator in Lake Mead (Reach 1) and in Lake Mohave (Reach 2).

Flathead catfish are the major predator in Lake Havasu (Reach 3) and below Parker Dam (Reach 4/5).

2008 POPULATION ESTIMATE

(Hope to fill out over next 10 yrs)

REACH	RASU	BONY	FLSU
1	300-500	0	0
2	1500	?	0
3	1600	?	2500
4	?	?	0
5	?	?	0


Flying Razorbacks of the Colorado

Please visit our website: www.lcrmscp.gov

Topock Marsh,

Havasu Refuge

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Monitoring and Research for Terrestrial, Riparian, and Marsh Habitats and Associated Covered Species

- Species Research - Provide necessary information required to create and manage covered species habitats and populations.
- System Monitoring - Determine status of covered species and their habitats throughout the LCR planning area.
- Post Development Monitoring - Evaluate implementation of and response to habitat creation projects.
- Adaptive Management Program - Address uncertainties, propose new or modified conservation measures, or address changed or unforeseen circumstances.

Habitat Monitoring

- Vegetation surveys conducted at Beal Lake, Ahakav' Tribal Preserve, PVER, CVCA, and Cibola Unit #1.
- 119 survey plots established, monitoring height, dbh, canopy closure, density, vegetation volume, temperature, relative humidity, soil moisture, etc.
- Many trees now over 20 feet in height with dense canopy closure at PVER Phase 2 and CVCA Phase 1.

Sootywing Skipper

- Host plants (*Atriplex lentiformis*) were surveyed for eggs, larvae, and adults of MacNeill's sootywing (*Hesperopsis gracielae*) along the lower Colorado River from the inflows to Lake Mead to the Southerly International Boundary with Mexico.
- Stands of *A. lentiformis* were located at 102 localities and eggs, larvae, or adults of sootywings at 54 localities.
- Habitat requirement research is ongoing.

Marsh Bird Surveys

- Surveys were conducted during March, April and May at Section 10 Backwater, Topock Gorge, and Hart Mine Marsh
- In Topock Gorge, Yuma clapper rail (*Rallus longirostris yumanensis*), least bittern (*Ixobrycus exilis*), and Virginia rail (*R. limicola)* were detected.
- In Hart Mine Marsh -Yuma clapper rail, least bittern, and Virginia rail were detected.
- There were no detections of the above-listed species at the Section 10 Backwater.

Southwestern Willow Flycatcher

- Presence/absence surveys and site descriptions were completed at 77 sites in 16 study areas from the Pahranagat National Wildlife Refuge (NWR), Nevada, south to Yuma, Arizona.
- Willow flycatchers were detected on at least one occasion at 42 of these sites.
- 135 resident, breeding flycatchers were detected at 9 sites
- 72 territories were recorded at all monitored sites
- 62 willow flycatcher nesting attempts were documented
- 66 young fledged

Yellow Billed Cuckoo

- Five surveys each were conducted at 40 sites between southern Nevada and the US-Mexico border.
- Cuckoos were detected at least once during the season at all MSCP restoration sites. **Cuckoos nested at CVCA Phase 1 and fledged 3 young.**
- Approximately 58 birds were observed during the 2008 field season.
- Habitat, vegetation, and insect (prey) data was also collected.

General Bird Surveys

- MAPS and Winter Banding – 2 MAPS Sites, one at Havasu NWR and one at Cibola NWR. **Located a winter resident Bell's Vireo at Cibola NWR.**
- System-wide surveys conducted from Lake Mead to SIB – 70 rapid surveys completed and 10 intensives completed – 158 bird species detected. Four of the six covered species, but all lacked Gila Woodpecker and Gilded Flicker.
- Restoration bird surveys conducted at Beal Lake, Ahakav' Tribal Preserve, PVER, CVCA, and Cibola Nature Trail. Four of six covered species, presumed or confirmed breeders in post-development habitat creation sites.
- Elf Owl Surveys conducted. No Elf Owls located.

Bats

- System-wide surveys conducted at 72 sampling locations from Davis Dam to Laguna Dam in southwestern Arizona and southeastern California. Four permanent acoustic detector stations deployed. All 4 MSCP species detected.
- Mine surveys conducted at 14 mines.
- Post-restoration survey conducted at Beal Lake, Ahakav', Tribal Preserve, PVER, CVCA, Cibola Unit #1, Imperial Restoration, and Pratt Restoration. All 4 species have been detected acoustically at sites.
- Netting at Beal Lake, Ahakav' Tribal Preserve and Cibola Nature Trail. **Yellow bats and Red Bat captured. Red Bat first ever capture along Mainstem LCR at Ahakav' Tribal Preserve.**

Small Mammals

- Genetic and Distribution Study – 15 sampling sites, *Sigmodon* spp. captured at 4 sites with genetic samples taken. 15 and 14 individuals from AZ and CA, respectively of *S. arizonae* from the two sites sampled and 5 and 6 individuals of *S. hispidus* sampled from the other two sites.
- Cibola Unit #1 and Site below PVER both contain *S. arizonae*
- Restoration monitoring occurs at Beal Lake, PVER, CVCA, and Cibola Unit #1 with ***Sigmodon* spp. captured at Beal Lake and Cibola Unit #1.**

Adaptive Management

- Database Management
  - Data manager position was filled. Maintenance and modifications were made to document/calendar management system.
  - Tagging and stocking data for RASU and BONY was provided to ASU for inclusion into the Lower Colorado River Native Fishes database.
- Science Strategy
  - Final Five Year Research and Monitoring Priorities Plan completed.

Any Questions?

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Conservation Area Development and Management FY2008 Accomplishments

- Site Selection
- Research/Demonstration
- Development/Management

Site Selection

- RFP announced targeting:
  - HM in California
  - DETO
  - FTHL
- Appraisals
  - Planet Ranch ($8,300,000)
  - Big Bend Conservation Area ($872,000)
- Backwater site selection process underway for Reaches 5 & 6

Research/Demonstration

- Seed Feasibility Study
  - Small scale test plots using willow species

Conservation Area Development and Management

- Riparian habitat established in FY08
  - PVER: 84 acres (thru FY08 = 223)
  - CVCA: 105 acres (thru FY08 = 260)

CVCA Phases 1 & 2

PVER Phases 1, 2, & 3

Accounting for Acres in the Program

- Table 1-6
  - Prior reports: “Projected Acres”
  - Current report: “Managed Acres”

- Managed Acres more accurately describes what will eventually be habitat credit
  - Looks at site at a landscape level
  - Includes internal features (i.e. berms) that will be managed in the habitat mosaic

Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

FY2010 Work Plan and Budget

FY2010 Funding Requirements

Funding Entity	FY2010 Contributions	FY2010 Adjusted Contributions
Federal	**$7,261,065**	**$7,261,065**
Non-Federal	**$7,261,065**	**$7,261,065**
California	*$3,630,532.50*	*$3,993,585.75*
Arizona	*$1,815,266*	*$1,089,159.75*
Nevada	*$1,815,266.25*	$2,178,319.50
TOTAL	**$14,522,130.00**	**$14,522,130.00**

FY2010 Proposed Work Plans

• Program Administration	$ 1,313,220
• Fish Augmentation	$ 1,390,000
• Species Research	$ 2,972,000
• System Monitoring	$ 2,345,000
• Conservation Area D&M	$10,127,590
• Post Development Monitoring	$ 885,000
• AMP	$ 1,000,000
• Habitat Maintenance Fund	$ 647,500
• Public Involvement	$ 50,000
• **TOTAL**	**$20,730,310**

FY2010 New Project Highlights

- 4 new RASU and BONY research projects
- 2 new avian research projects
- 1 new bat research project
- 1 new restoration research project
- 3 new Conservation Area D&M projects
  - Laguna Division Conservation Area
  - Yuma East Wetlands
  - Desert Tortoise habitat acquisition

Lower Colorado River Multi-Species Conservation Program

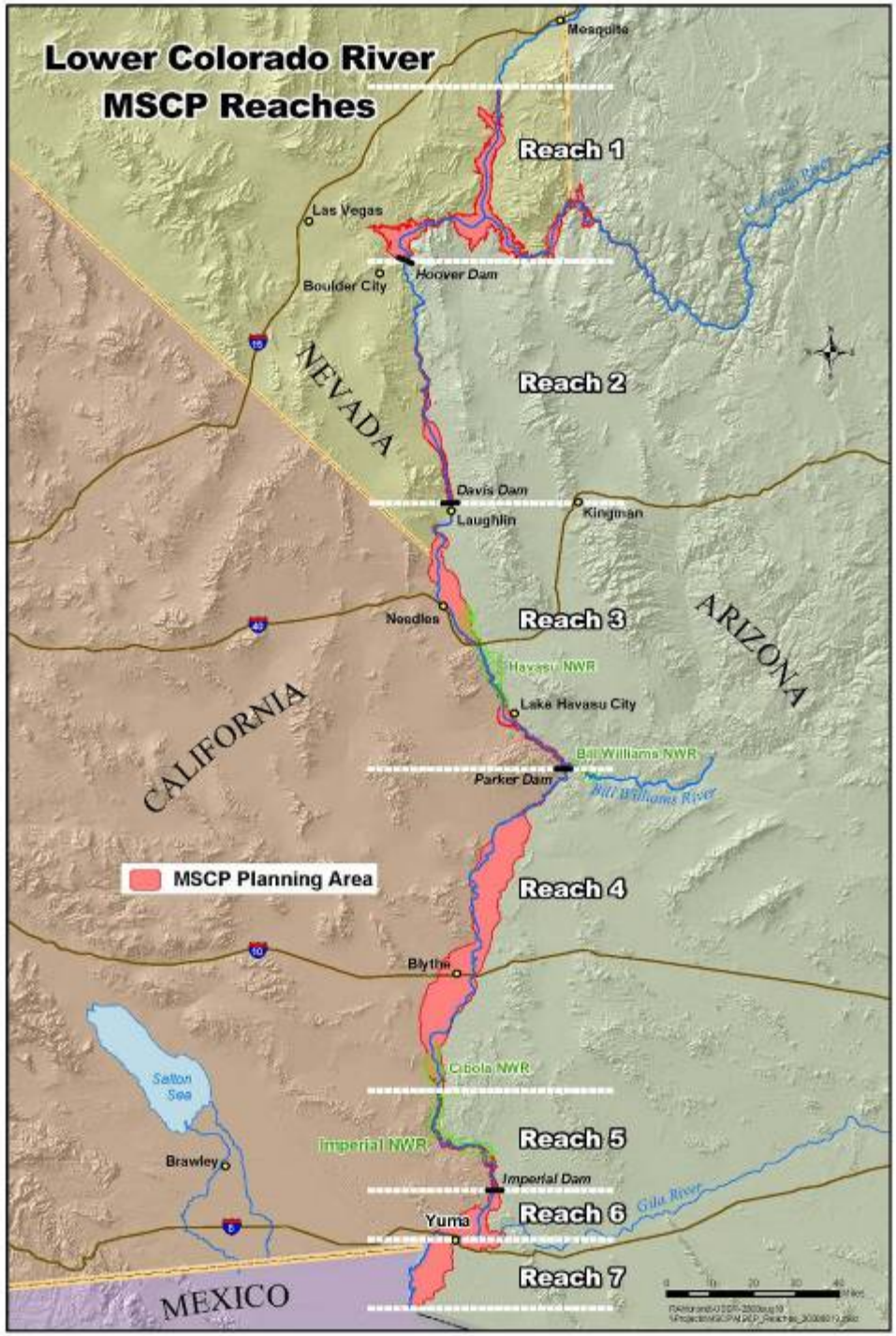
Balancing Resource Use and Conservation

PROJECT UPDATES FY2009

Backwater Habitat Creation Strategy

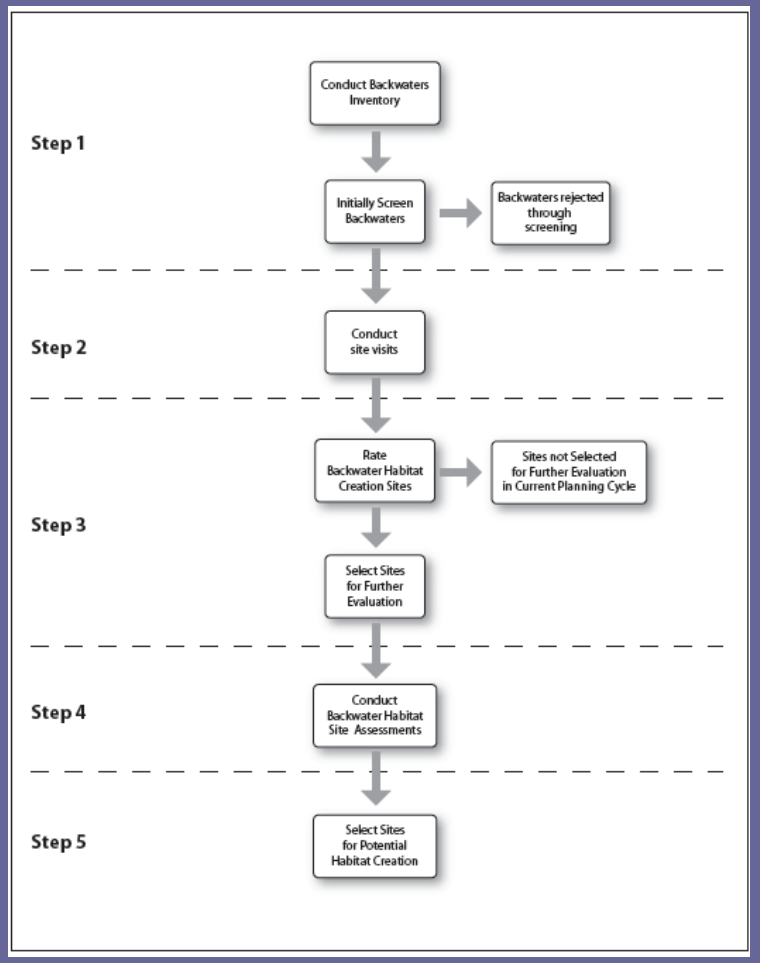
- Backwater Habitat Creation Requirements
  - 360 total acres in Reaches 3-6
  - 85 connected acres in Reach 3
  - 194 acres in California (CESA)

- Cost estimates based on combination of
  - Creating connected backwaters from existing backwaters
  - Creating disconnected backwaters from existing backwaters
  - Creating backwaters from scratch


Lower Colorado River
MSCP Reaches
Mesquite
Reach 1
Las Vegas
Boulder City
Hoover Dam
NEVADA
Reach 2
Davis Dam
Laughlin
Kingman
Needles
Reach 3
ARIZONA
Havasu NWR
Lake Havasu City
CALIFORNIA
Bill Williams NWR
Parker Dam
Bill Williams River
MSCP Planning Area
Reach 4
Blythe
Cibola NWR
Salton Sea
Reach 5
Imperial NWR
Brawley
Imperial Dam
Gila River
Yuma
Reach 6
Reach 7
MEXICO

5-Step Backwater Site Selection Process

- Systematic, repeatable method for identifying & prioritizing backwater sites
- Starting with all identified sites, lower potential sites are systematically rejected at each step



Step 1 – Identify Backwaters

- Review of GIS data and aerial videography to identify potential sites
- Consideration of current land use patterns and discussions with appropriate land managers
- Conduct aerial surveys during low flow cycles to assess
  - permanence of open water
  - approximate percentage of emergent vegetation
  - site access
- At the conclusion of step 1, approximately 25 sites are selected for further evaluation

Step 2 – Conduct Initial Site Visit

- Candidate sites are visited briefly (1-2 days) during summer when environmental conditions are likely to be the most stressful to fish.

- Physical and Biological parameters sampled:
  - water quality
  - cover
  - depth
  - presence of gravel substrate
  - bio-indicators (fish presence/absence)

Step 3 – Rate Backwaters for Further Evaluation

- Standardized model used to generate numerical biological suitability scores
- Scores are grouped into simple “Habitat Creation Opportunity Ratings”
  - Low
  - Moderate
  - High
  - Excellent
- 4-5 sites are then selected for further evaluation based on a combination of biological and other program considerations

Step 4 – Backwater Site Assessment

- Collect environmental baseline data for one year including the same parameters as with the initial site visits
- Create a Conceptual Habitat Creation Plan
- Develop a preliminary cost estimate, to include:
  - land and water
  - infrastructure improvements
  - habitat restoration
  - operation and maintenance cost
  - regulatory compliance

Step 5 – Select Backwater for Habitat Creation

- Based on habitat creation opportunity rating and preliminary cost estimates, a site will be selected for habitat creation
- New work tasks are initiated to account for habitat creation costs upon selection
- Land Use Agreements are signed prior to site development

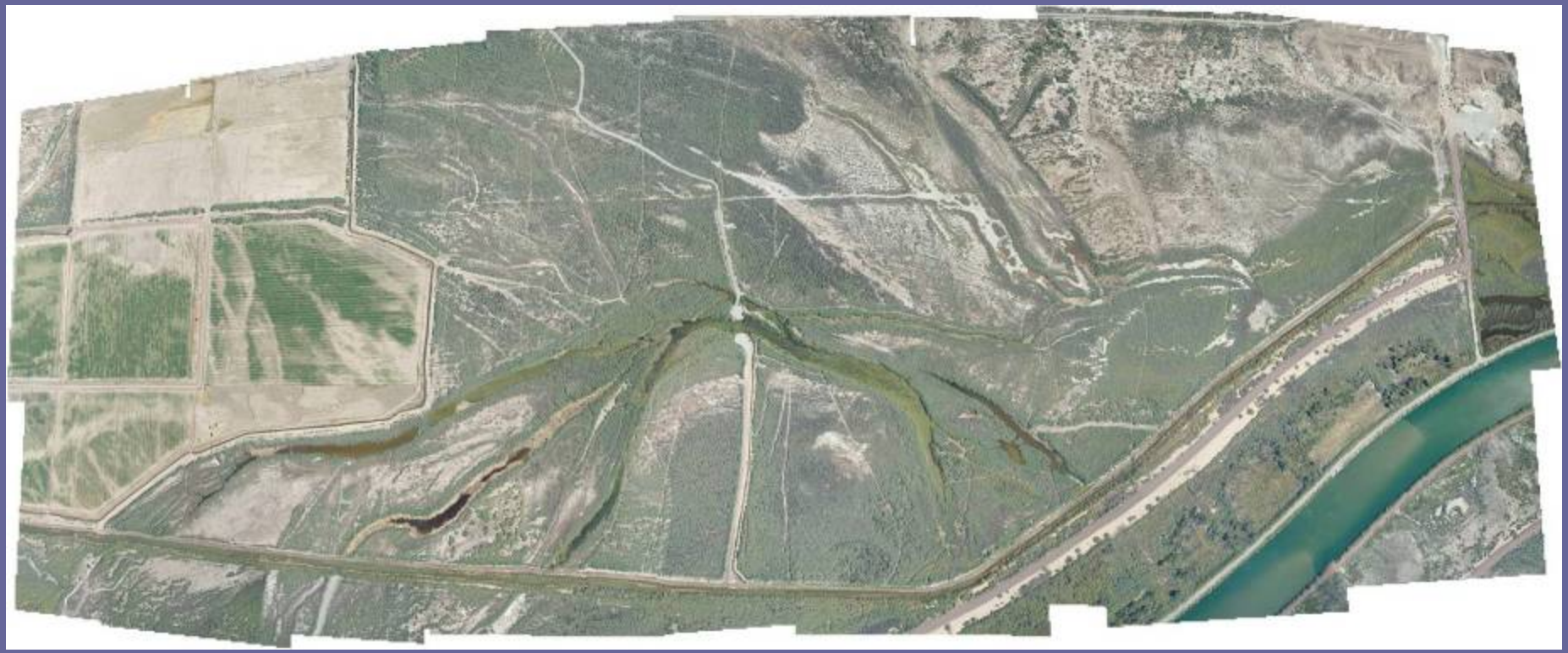
Program Accomplishments to Date

- Developed 80 acre scratch backwater @ Imperial NWR (Arizona)
  - 44 acres for SIA
- Protected 15 acres of existing connected backwaters @ Big Bend Conservation Area (Nevada)
- Began “fast track” process for disconnected existing backwater in Reach 5 & 6 (Two sites completed Step 4)

New Approach

- Develop comprehensive strategy for entire LCR MSCP Area
- Develop target acreage goals by Reach and State to meet HCP and CESA requirements
- Initiate Backwater Selection process for Reaches 3 & 4 (Step 1)
- Choose 4-5 existing backwaters in Reaches 3 & 4 plus 2-3 in Reaches 5 & 6 to proceed to Step 4
- NOTE: Data collection for existing backwaters doesn't preclude starting a Scratch Backwater

Hart Mine Marsh



Purpose

- Create marsh habitat for targeted covered species
  - Yuma Clapper Rail
  - Western Least Bittern
  - Colorado River Cotton Rat

Project Goals

- Create integrated mosaic of wetland habitats with emergent marsh vegetation (cattail, bulrush) and areas of open water
- Create water depths from 1 inch to 1 foot
- Maintain static water levels during the CLRA breeding season of wetland habitats
- Provide alternate discharge for HMM
- Utilize existing geomorphology
- Create cells that could be managed as separate units
- Provide flexibility in water management
- Ability to restore/mimic natural processes
- Actions would not inhibit future development of HMM

Conceptual Design

Construction Update (South Cell) FY09

68 Acres

Completed:

Clearing
Contouring
New outlet structures
Control structures
Channels

Pending:

Vegetation planting contract


South Cell
Completed in FY09

FY09 Budget Estimates

- FY09 Approved Estimate = $3,125,000
- Estimate for FY09 Expenditures = $2,125,000
- Cost reduction due to :
  - Design modifications
  - Increased efficiency
  - Site conditions

FY09 PLANTING SUMMARY

- Three Conservation Areas
  - PVER
  - CVCA
  - Cibola NWR Unit#1
- Total acres planting in Spring 2009 = 300 Riparian plus 200 stabilized at CVCA
- Total trees planting in Spring 2009 = 600,000

FARM ADVISORY BOARD

- Created in 2006 to provide a forum for idea exchange between the LCR MSCP and the local farming community
- Mission: To foster cooperation, trust, community awareness, and partnerships between the LCR MSCP and the local farmers and communities
- FAB meets on a regular basis

RECLAMATION

Managing Water in the West

Tamarisk Biocontrol

U.S. Department of the Interior
Bureau of Reclamation

Implications of Tamarisk beetles on Southwestern Willow Flycatcher breeding habitat

Photo courtesy of Pam Wheeler Utah Div. of Wildlife

RECLAMATION

Biocontrol

- Initial Releases of *Diohrabda* spp. began during summer of 1999 at 10 caged sites
- Releases outside of cages began in May of 2001 at initial 10 caged sites based on being greater than 200 miles from known SWFL breeding sites
- Releases expanded in 2005 to additional 7 states north of 38 Degrees latitude based on assumed poor survival below this latitude
- First release in known Southwestern Willow Flycatcher breeding habitat occurred at St. George Utah in 2006 at 37 degrees latitude
- Beetle populations in St. George exploded in 2008
- Beetles spread from St. George to Littlefield, AZ which is near 36 degrees latitude

Tamarisk Biocontrol Release Assumptions

- Beetles will not be released within 200 miles of occupied SWFL habitat. Later revised to occupied "Tamarisk" habitat.
- Beetles unlikely to survive/reproduce south of 38th parallel.
- Beetle dispersal likely to be slow.
- Beetle defoliation at southern edge of range likely to be minimal (38th parallel).

RECLAMATION

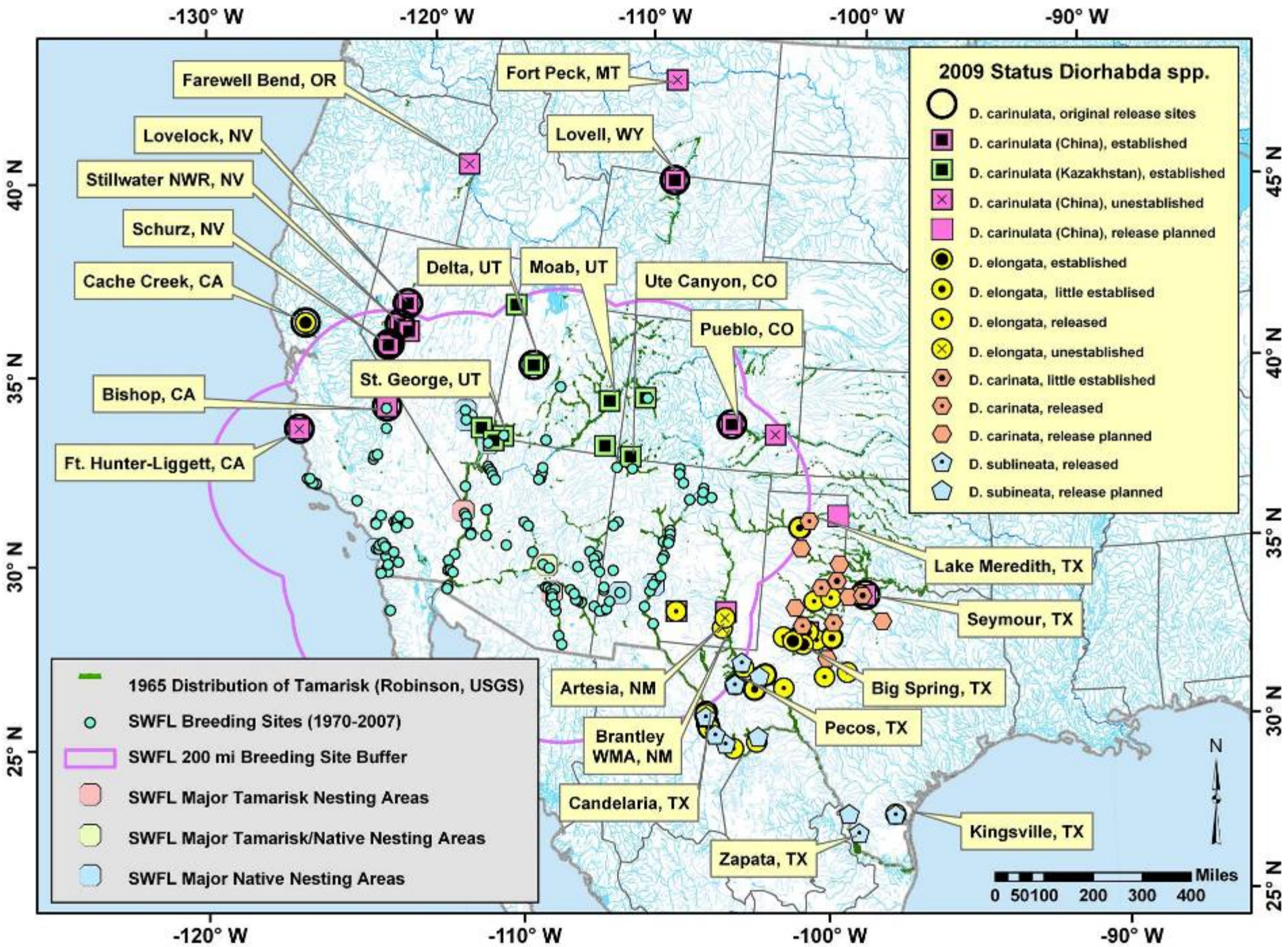

-130° W
-120° W
-110° W
-100° W
-90° W
40° N
35° N
30° N
25° N
45° N
Farewell Bend, OR
Fort Peck, MT
Lovelock, NV
Lovell, WY
Stillwater NWR, NV
Schurz, NV
Cache Creek, CA
Delta, UT
Moab, UT
Ute Canyon, CO
Pueblo, CO
St. George, UT
Bishop, CA
Ft. Hunter-Liggett, CA
Lake Meredith, TX
Seymour, TX
Artesia, NM
Big Spring, TX
Pecos, TX
Brantley WMA, NM
Candelaria, TX
Kingsville, TX
Zapata, TX
2009 Status Diorhabda spp.
D. carinulata, original release sites
D. carinulata (China), established
D. carinulata (Kazakhstan), established
D. carinulata (China), unestablished
D. carinulata (China), release planned
D. elongata, established
D. elongata, little establised
D. elongata, released
D. elongata, unestablished
D. carinata, little established
D. carinata, released
D. carinata, release planned
D. sublineata, released
D. subineata, release planned
1965 Distribution of Tamarisk (Robinson, USGS)
SWFL Breeding Sites (1970-2007)
SWFL 200 mi Breeding Site Buffer
SWFL Major Tamarisk Nesting Areas
SWFL Major Tamarisk/Native Nesting Areas
SWFL Major Native Nesting Areas
N
Miles
0 50100 200 300 400

Photo by Mary Anne McLeod, SWCA

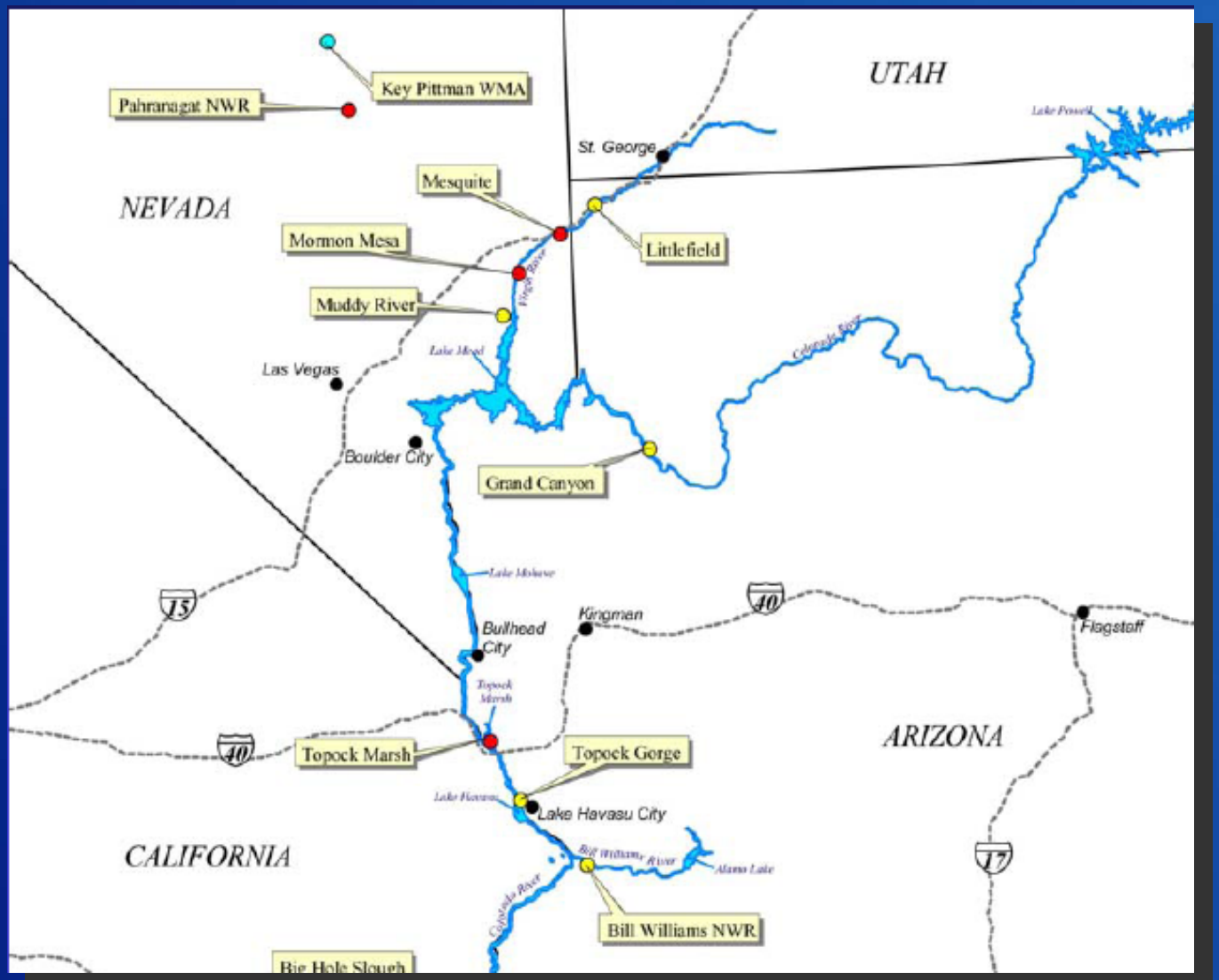
From USGS TMap web site

Beetle releases are required to be 200 miles from known SWFL breeding sites

- **Tamarisk distribution**

RECLAMATION

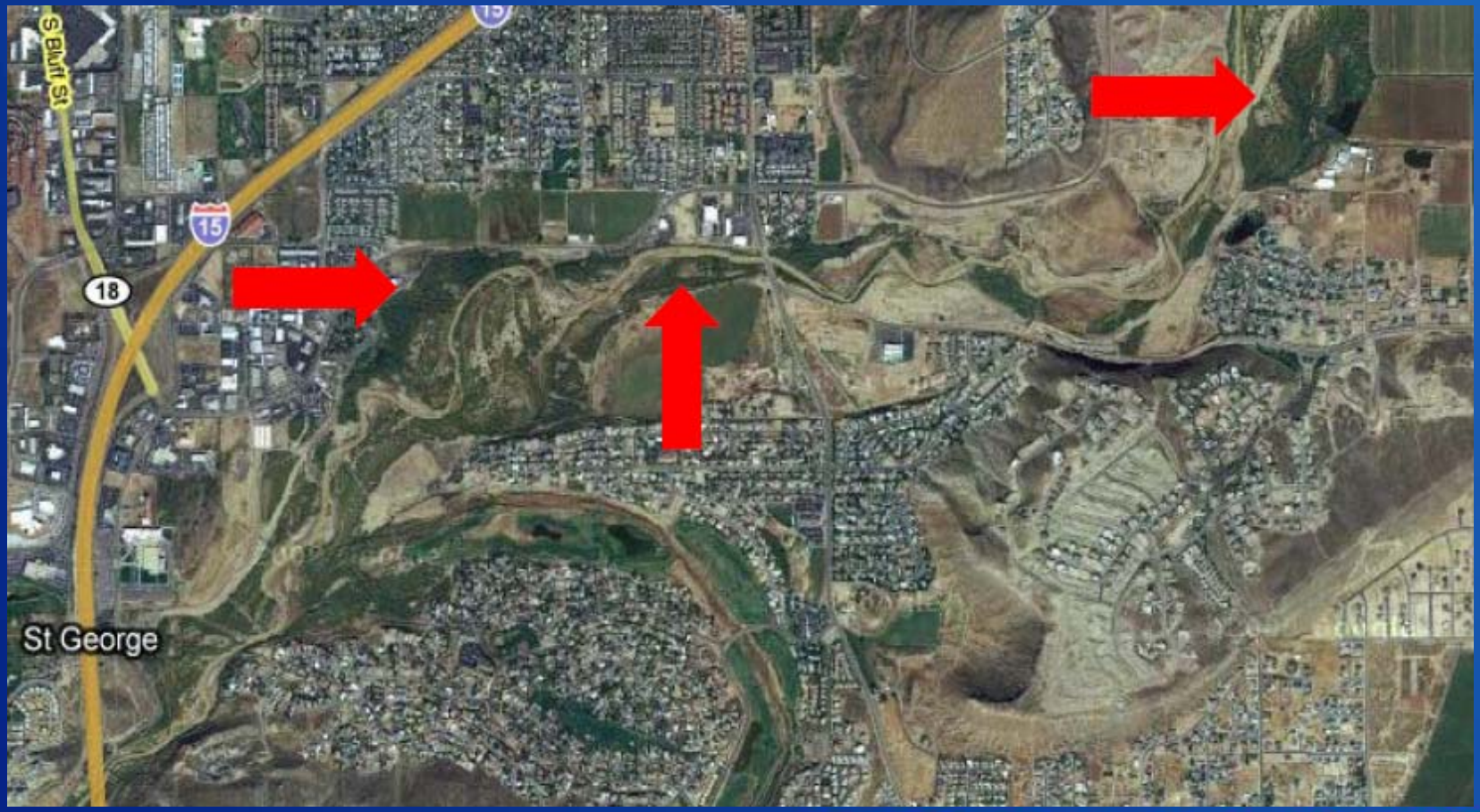
SWFL Breeding Locations along LCR



Map courtesy of SWCA Environmental Consultants

RECLAMATION

SWFL Sites on Virgin River, UT



RECLAMATION

SWFL Nest Monitoring on Virgin River, UT

16 Territories, 9 nests, 17 nestlings fledged, 10 eggs did not produce young

1 site defoliated by beetles with young in nest, young did Not develop.

2nd nest defoliated by beetles was abandoned at egg stage

Photo courtesy of Pam Wheeler Utah DWR

RECLAMATION

Tamarisk Beetles Near St. George

- **Defoliation during breeding season may have caused failure of at least one nest.**
- **Beetles spread downstream 30 miles to Littlefield, AZ in 2008; only 10 miles from the occupied Mesquite site.**
- **Beetles found at Meadow Valley Wash NV in 2008; 49 miles from the occupied Muddy River site.**

Photo courtesy of Pam Wheeler
Utah DWR

RECLAMATION

Percent Tamarisk at Main SWFL Breeding Sites along LCR and Tributaries

Site	Percent *Tamarisk*	Canopy Closure (%) nest sites	Canopy Closure (%) non-use sites
Pahranagat	2.1	92.8	79.3
Mesquite	32.7	92.3	71
Muddy River	46.7	93	84.9
Mormon Mesa	77.2	89.2	82.8
Topock Marsh	91.6	95.9	88.3

(Mcleod et. al. 2008 and SWCA unpublished data)

RECLAMATION

Potential Consequences of Tamarisk Defoliation along Virgin River and Lower Colorado Rivers

May result in fewer SWFL nesting pairs and successful nests, could create sink populations out of source populations

RECLAMATION

LCR MSCP Species that utilize Tamarisk

- Southwestern Willow Flycatcher (breeding)
- Yellow Billed Cuckoo (breeding)
- Yellow Warbler (breeding)
- Bell's Vireo (breeding)
- Summer Tanager (breeding)
- Sootywing skipper (butterfly) (nectaring)
- Western Red Bat, Western Yellow Bat, California Leaf-nosed bat, Townsends Big Eared Bat (Foraging)

RECLAMATION

Summary

- **Beetles are already reproducing below the 38th parallel and are adapting to longer photoperiod.**
- **Beetles are defoliating salt cedar on the Virgin River, including occupied SWFL sites, and are spreading rapidly downstream to the LCR.**
- **Defoliation occurs during the height of the SWFL breeding season and may cause nest failure.**

RECLAMATION

Implications to the LCR MSCP

- No anticipated changes to Conservation Measures
- Could affect existing habitat and populations of some covered species
- Emphasizes the importance of the Conservation Area Development and Management Program

RECLAMATION


Photo courtesy of Pam Wheeler Utah DWR