A Partnership to Control Giant Salvinia

Lower Colorado River

Arizona-California & Mexico

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http://www.lcr-anstf.org/

Partnership Fundamentals

- Establish central coordination
- Build on partnership authorities
- Recruit & include partners
- Collaboratively develop & implement adaptive controls
- Develop a system for universal accountability
  - Solid & Transparent
- Consistently track/prepare progress reports
  - Archive records for future management

Central Coordination & Partnership Authorities are linked in this case history because elements of coordination are part of the authorities.

The collaborative team developed for giant salvinia control in the LCR used the federal response to the zebra mussel invasion in Great Lakes mid-1980s as a model.

Ballast Water Exchanges into the Great Lakes

Prompted a national response to invasive species

Ballast water pathway introduced multiple species from all around the world .

Zebra mussels rapidly spread throughout Great Lakes on boats & equipment

Partnership to control & prevent spread

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Prolific zebra mussels are not large.

Nonindigenous Aquatic Nuisance Prevention & Control Act of 1990

- This legislation provides authority to agencies for coordinated aquatic invasive species (AIS) control.

1990 Legislation established the ANS (Aquatic Nuisance Species) Task Force

Comprised of 13 Federal agencies

USFWS – NOAA – USACOE – USDA/APHIS – EPA – BoR – BLM – Coast Guard – Dept of State – US GS – NPS – US DOT

www.ANSTaskForce.gov

The ANS Task Force has 12 Ex-officio Members

- International Association F & W Agencies
- Great Lakes Commission
- Native American F & W Society
- Am Water Works & Am Public Power Associations
- Smithsonian Environmental Research Center, and others

www.ANSTaskForce.gov

Task Force meets regularly to **coordinate** government efforts to control aquatic invasive species in the United States with those of the private sector and other North American interests.

- Prevention
- Detection
- Monitoring
- Control
- Support elements
  - Research, education, technical assistance

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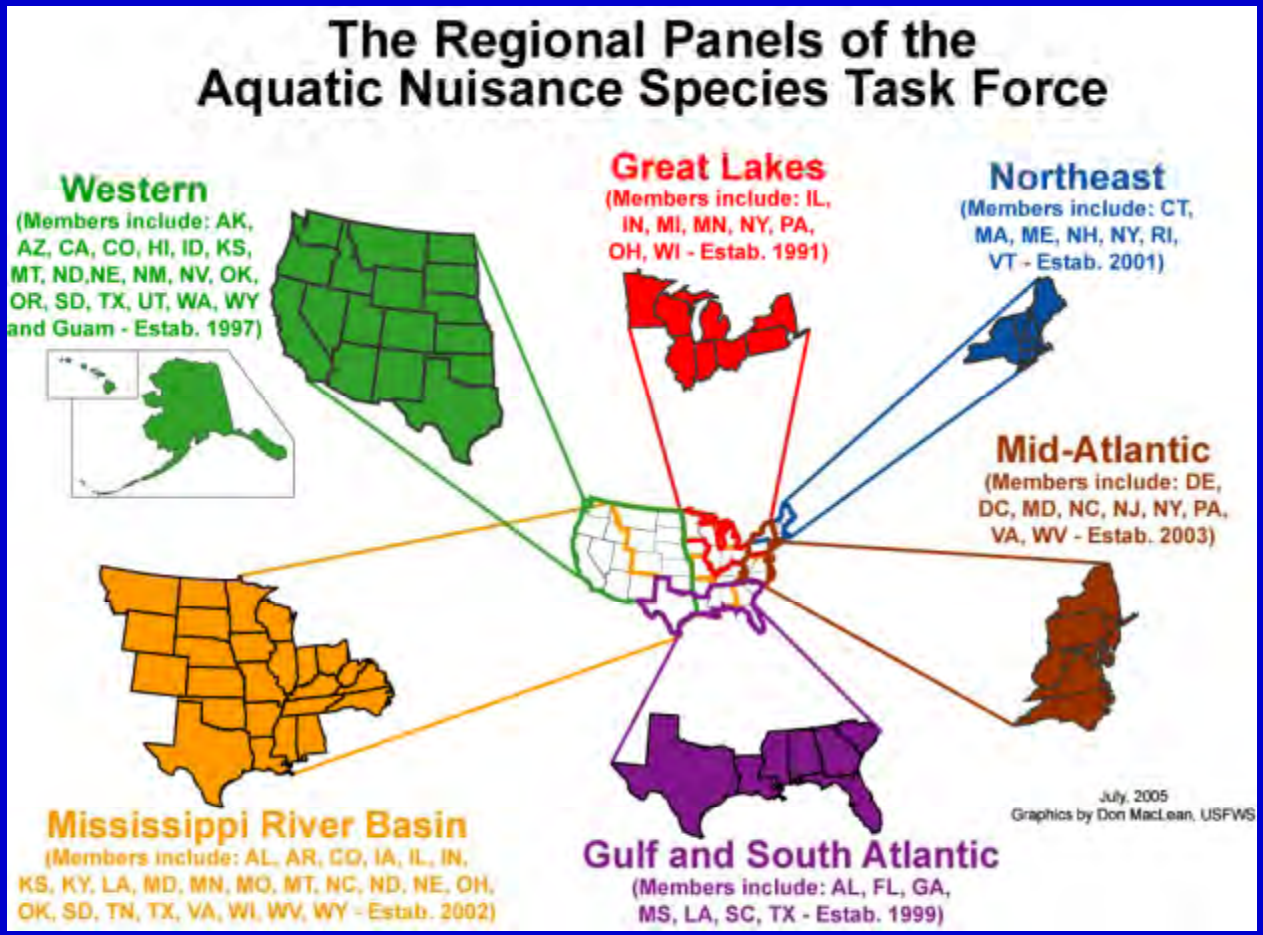
The Task Force (as legislatively authorized) established interlocking regional panels to coordinate and prioritize national/international issues & controls.



Review of pre-salvinia partnership building blocks

- All of the essential elements for a partnership invasive species control were in-place based on the 1990 legislation.
  - Structure, authority, models, guidance, funding links
  - Plus – practical, large scale partnership experience had been gained since early 90s

Due to ANS Task Force experience, all the basic components were in-place when giant salvinia was discovered in the Colorado River, Aug 1999.

Salvinia molesta is a floating fresh water fern native to Brazil. Introduced to North America from the aquarium trade. First detected in U.S. waters in 1998 near Houston, TX.

EXPLOSIVE growth characteristics were well known.

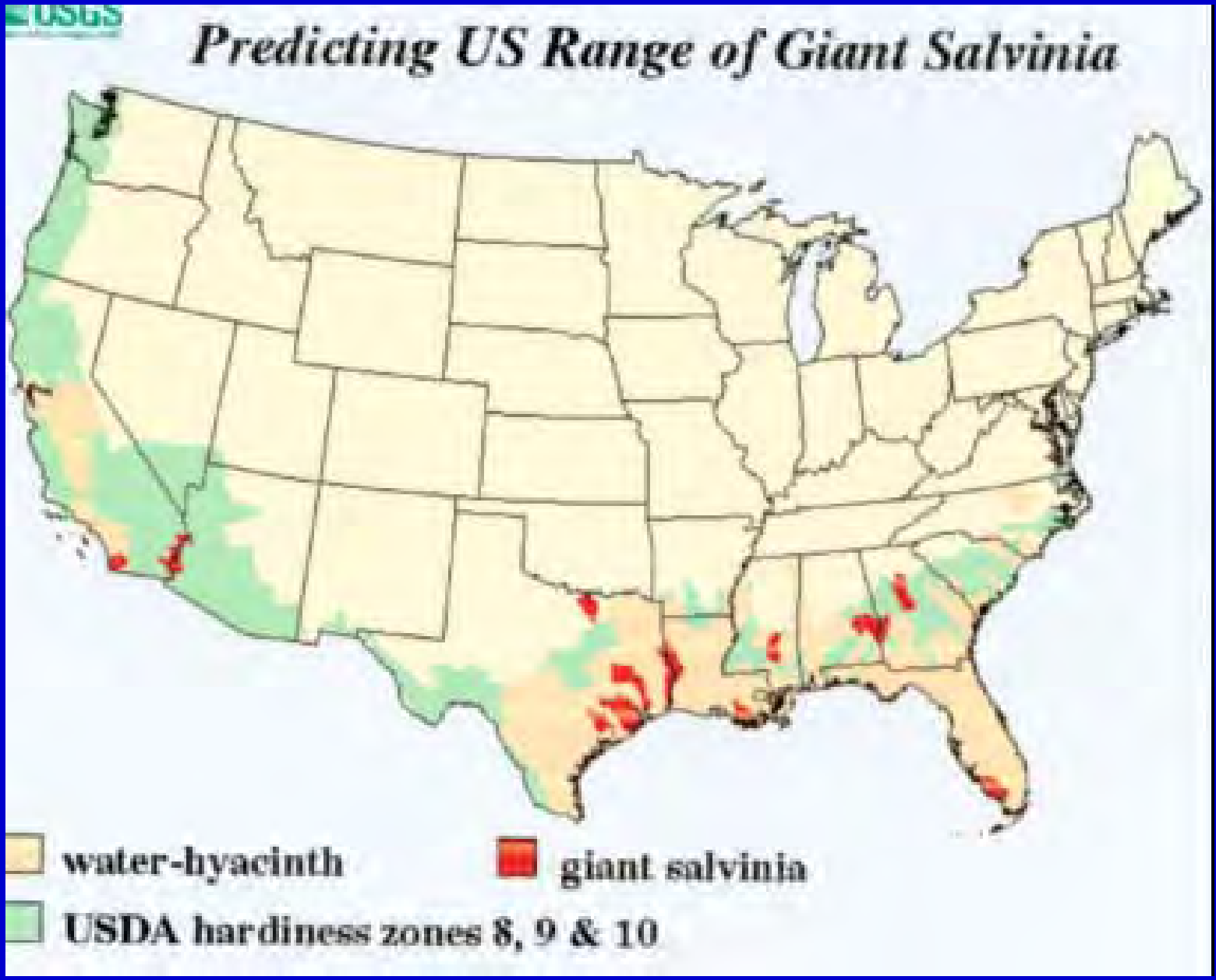
- Floating mats can double every 5 days
- thick mats block sunlight
- prevent water usage
- ruin property values
- easily spread by boats

Easy to see why it is an aquatic invasive species.

Property owners
wanted some answers

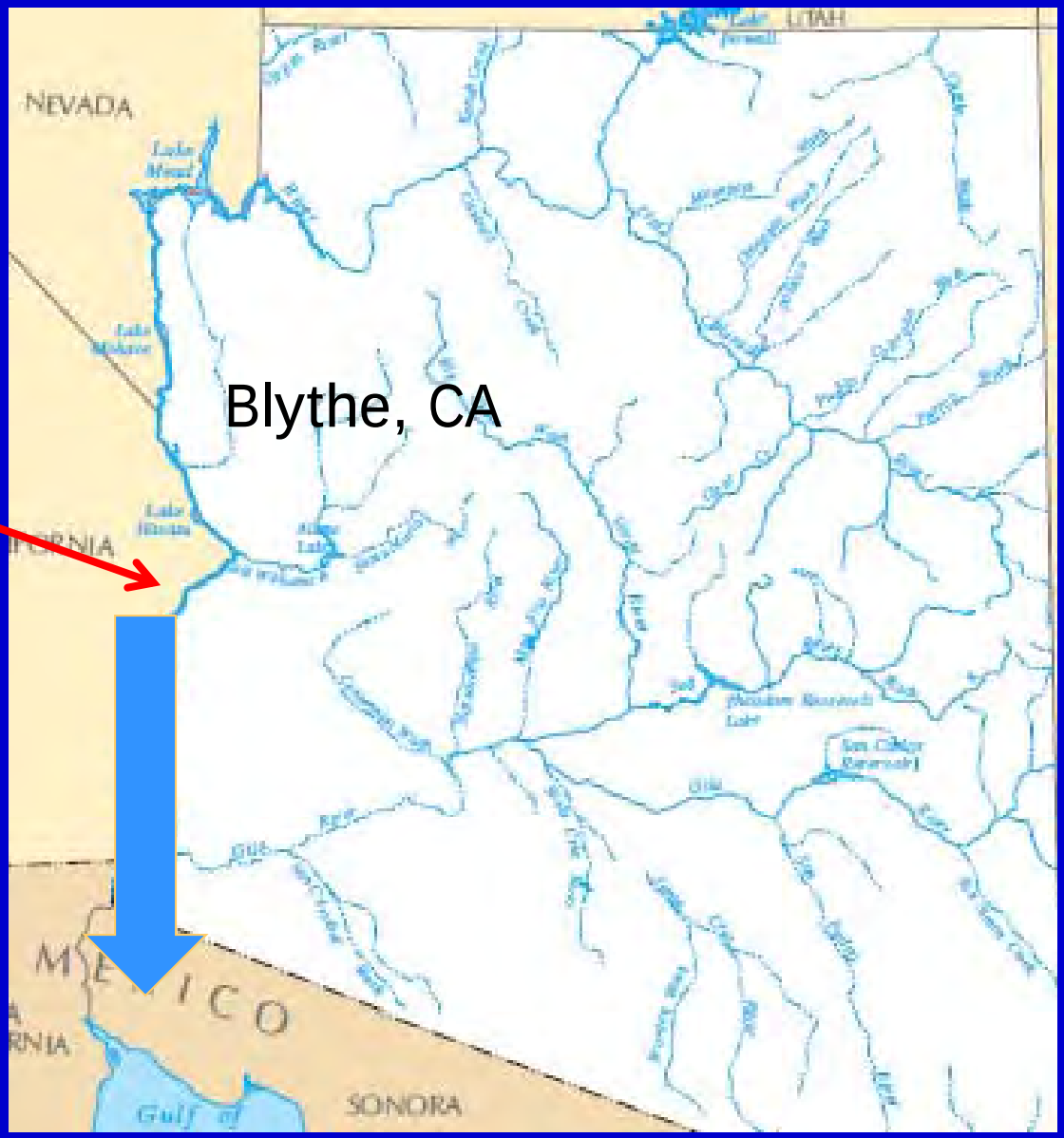
Harris Pond, TX

Mr. Harris


USGS
Predicting US Range of Giant Salvinia
water-hyacinth
giant salvinia
USDA hardiness zones 8, 9 & 10

Source - Palo Verde Irrigation District (PVID) – west side drain

Discovered in the Colorado River, Aug 1999



Recruit & Include Partners

- Giant salvinia's reputation was well known
- It had been federally listed as a prohibited species since the 70s
- It was prohibited in CA and listed in AZ soon after it was reported
- Key partners came together quickly to control giant salvinia and prevent spread

- Palo Verde Irrigation District (PVID)
- Bureau of Reclamation
- Fish & Wildlife Service
  - Cibola & Imperial Natl Wildlife Refuges
- USDA - APHIS
- Bureau of Land Management
- CA Dept of Food & Ag
- California Dept of Fish & Game
- AZ Game & Fish
- AZ Dept of Ag
- California Regional Water Quality Control Board
- University of Arizona
- International Boundary & Water Commission
- Mexico – International Boundary Water Commission

http://www.lcr-anstf.org/

First Actions

- Assessment by a scientific advisory panel
- Establish central coordination
- Identify work teams & assign responsibilities
- Draft an action plan
- Submit compliance permits for controls
- Hold public meetings – Outreach
  - Engage media & provide press releases
- Invite Mexico to participate on control team

Web-based Central Coordination

Coordination provided by FWS with support from the University of Arizona

http://www.lcr-anstf.org/

Initial pathway assessments were conducted. Giant salvinia was found in an upper part of the Palo Verde Irrigation District (PVID) drain adjacent to a well traveled highway north of Blythe. How did it get there?.

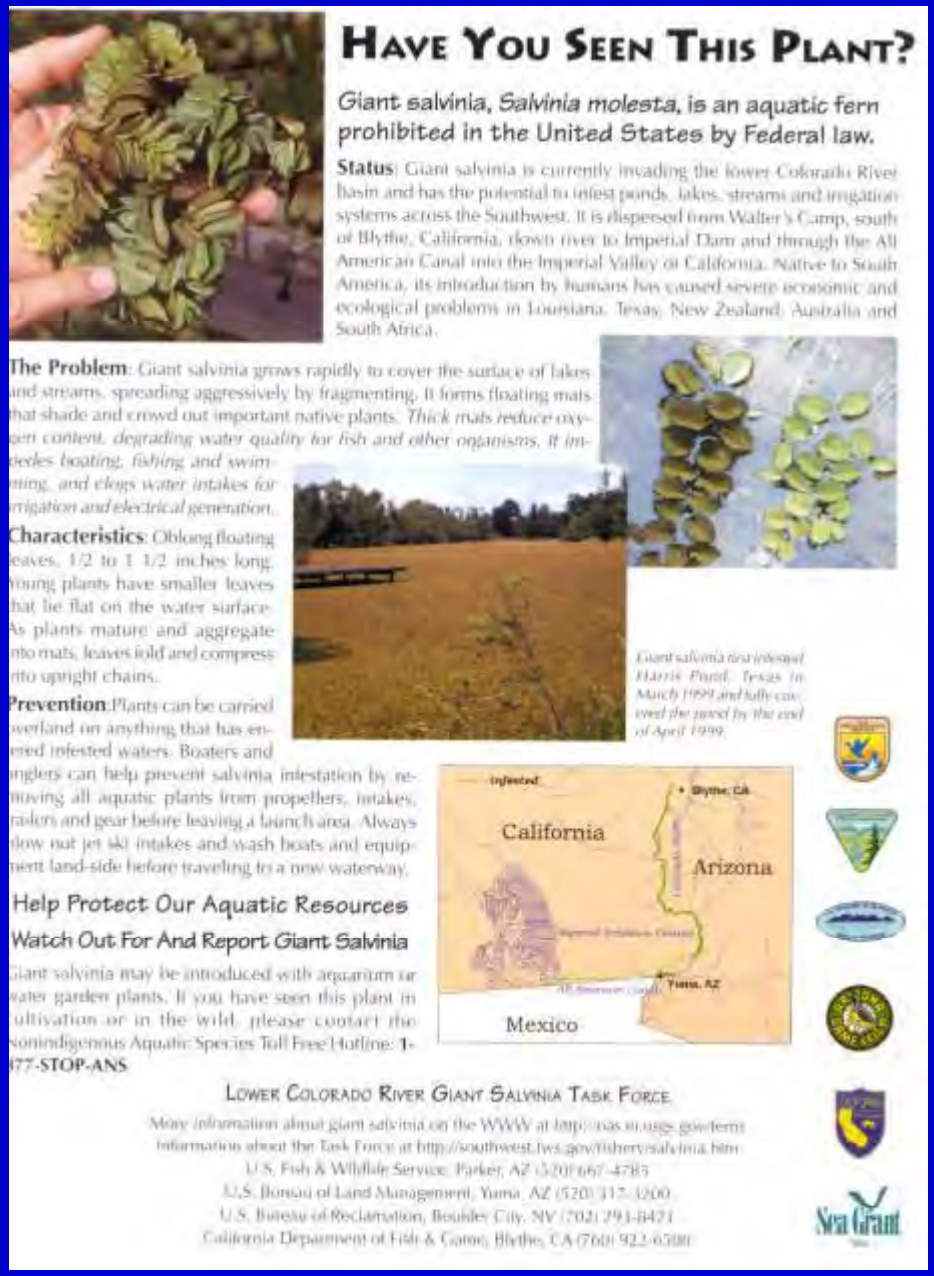
Possible aquatic-product pathways

- bait dealer & aqua-farm nearby
- or an aquarium dumping

Raise Awareness

Developed a standard message describing:

- The problem
- Where the problem is located
- What's being done about it
- Who's doing it
- Where to find information
- How they can help



Have You Seen This Plant?

Giant salvinia, Salvinia molesta, is an aquatic fern prohibited in the United States by Federal law.

Status: Giant salvinia is currently invading the lower Colorado River basin and has the potential to infest ponds, lakes, streams and irrigation systems across the Southwest. It is dispersed from Walter's Camp, south of Blythe, California, down river to Imperial Dam and through the All American Canal into the Imperial Valley of California. Native to South America, its introduction by humans has caused severe economic and ecological problems in Louisiana, Texas, New Zealand, Australia and South Africa.

The Problem: Giant salvinia grows rapidly to cover the surface of lakes and streams, spreading aggressively by fragmenting. It forms floating mats that shade and crowd out important native plants. *Thick mats reduce oxygen content, degrading water quality for fish and other organisms. It impedes boating, fishing and swimming, and clogs water intakes for irrigation and electrical generation.*

Characteristics: Oblong floating leaves, 1/2 to 1 1/2 inches long. Young plants have smaller leaves that lie flat on the water surface. As plants mature and aggregate into mats, leaves fold and compress into upright chains.

Prevention: Plants can be carried overland on anything that has entered infested waters. Boaters and anglers can help prevent salvinia infestation by removing all aquatic plants from propellers, intakes, trailers and gear before leaving a launch area. Always flow out jet ski intakes and wash boats and equipment land-side before traveling to a new waterway.

Giant salvinia was released Harris Pond, Texas in March 1999 and fully covered the pond by the end of April 1999.

Help Protect Our Aquatic Resources

Watch Out For And Report Giant Salvinia

Giant salvinia may be introduced with aquarium or water garden plants. If you have seen this plant in cultivation or in the wild, please contact the Nonindigenous Aquatic Species Toll Free Hotline: 1-877-STOP-ANS

Lower Colorado River Giant Salvinia Task Force

Many information about giant salvinia on the WWW at http://nas.er.usgs.gov/fact/
Information about the Task Force at http://southwest.fws.gov/fishery/salvinia.htm
U.S. Fish & Wildlife Service, Parker, AZ (520) 667-4785
U.S. Bureau of Land Management, Yuma, AZ (520) 317-3200
U.S. Bureau of Reclamation, Boulder City, NV (702) 293-8421
California Department of Fish & Game, Blythe, CA (760) 922-6580

Sea Grant

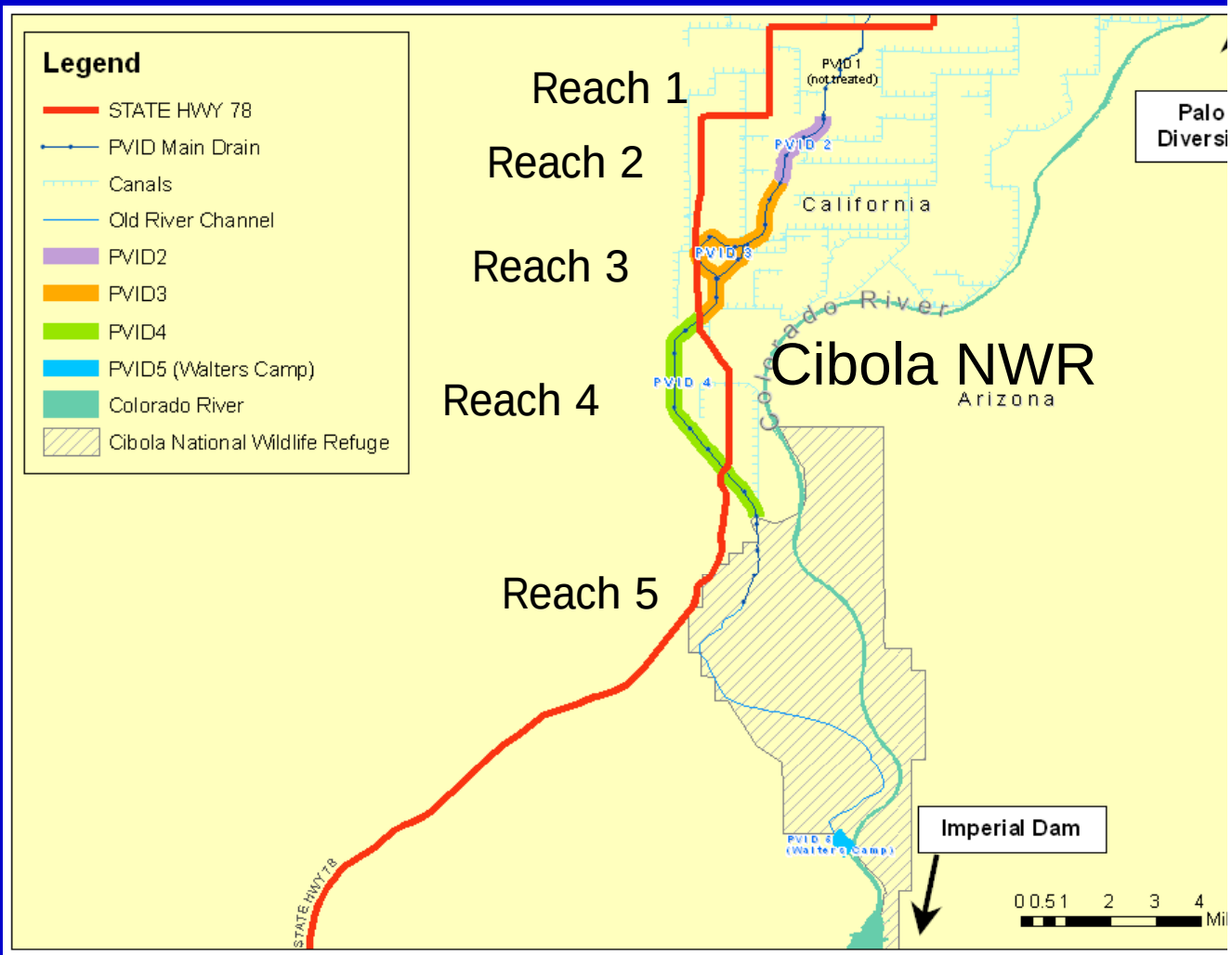
Develop & Implement Adaptive Controls

✓Regular team meetings (4, 3, 2/year) to assess effectiveness, propose changes & integrate control work.

Weed harvester provided from CA Food & Ag to BoR to mechanically remove floating plants to reduce spread from irrigation system into Colorado River. Sounded good but did not work.

PVID drain sections were identified for strategic and systematic eradication from source down to where the irrigation system waters return to the Colorado River.

About 35 miles of west-side drain



Adaptations for herbicide control.

Early spray efforts were unsuccessful due to bank vegetation.

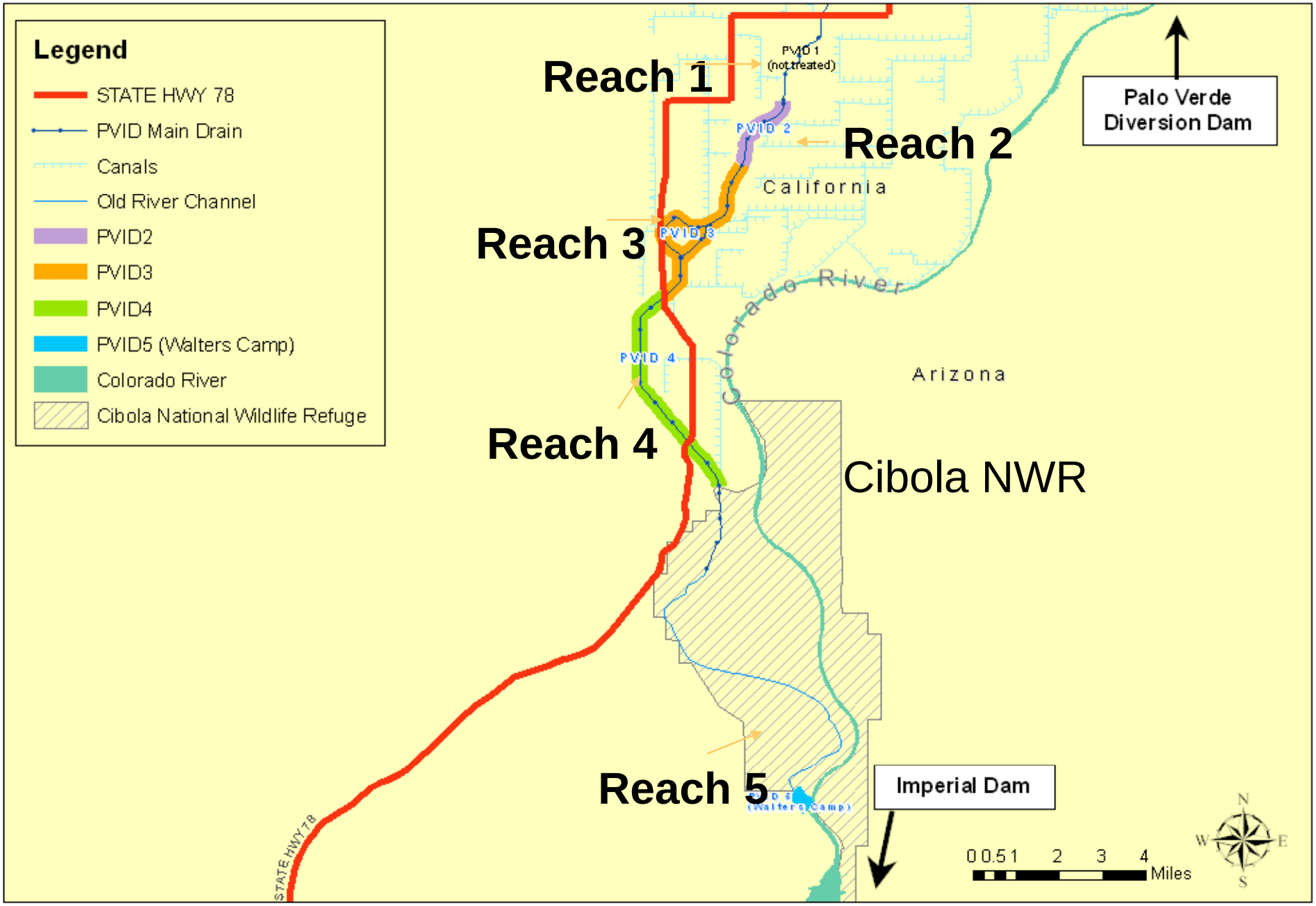
BoR & PVID worked together to clean banks for wall-to-wall spraying.

GOAL: Eradicate in Reach 1,2,3,4

Spraying – herbicide control moved down the drain after successful eradication in the upper sections.

Palo Verde Irrigation District outfall drain near the beginning of Control Reach 2.

Aquatic Pesticide Treatment Areas



Infamous “browns drain” opposite previous picture of spray crew.

Eradicated several times ... kept coming back.

Consistent Progress Tracking

Regular river surveys recorded giant salvinia levels in approximately 35 miles of irrigation system and 70 miles Colorado River. Mexico reported survey data from their extensive irrigation/water deliver system of 50+ miles. These critical reports progressively tracked control progress.

Developing & Implementing Effective Bio-control Program

Characteristic “egg beater” hairs covering giant salvinia complicate herbicide control.

Giant salvinia bio-control agent, *Cyrtobagous salviniae,* from S. America not impressed with egg beaters, provides effective control for the worlds worst weed.

Agency Collaboration

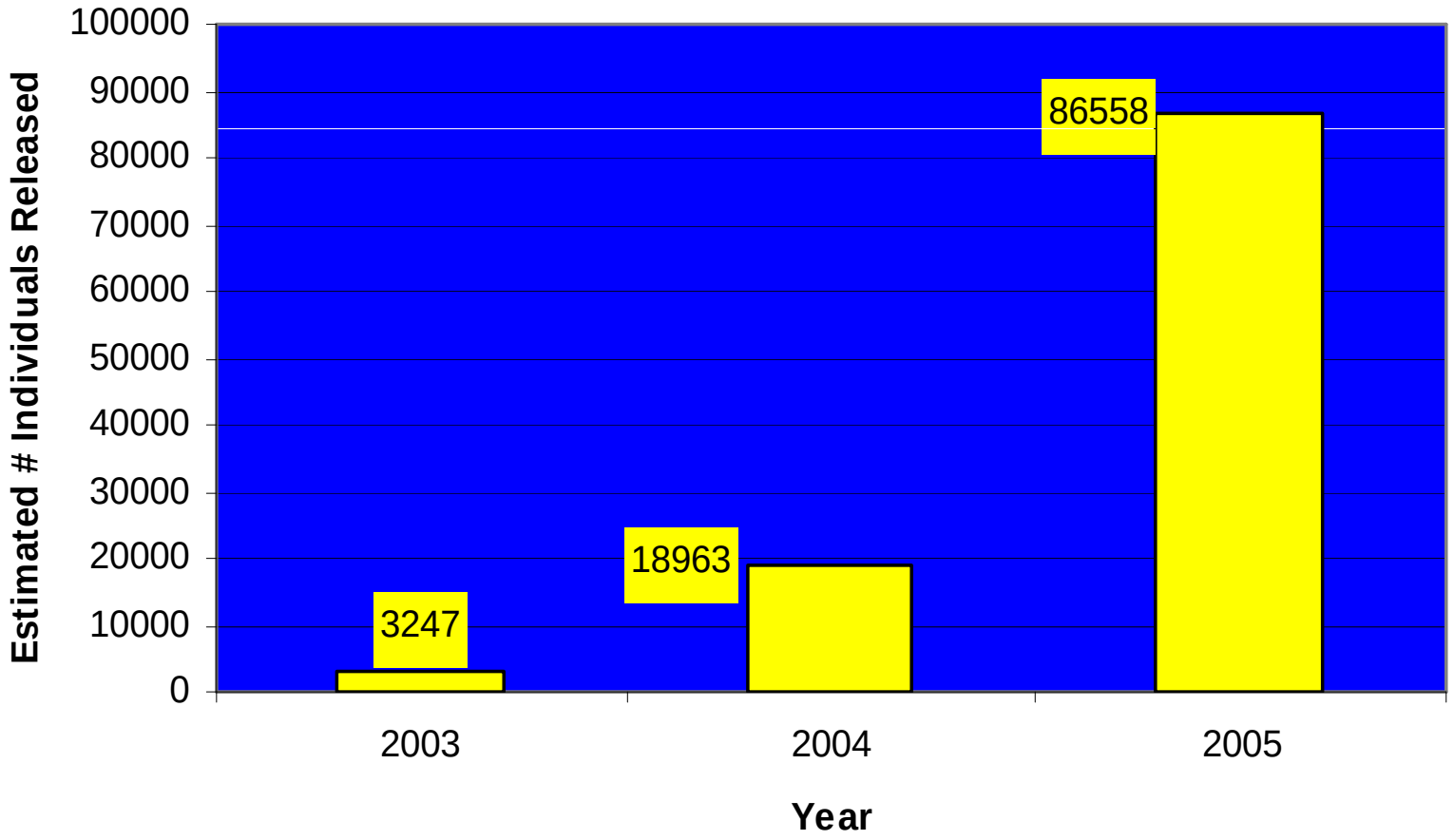
- The partnership team concept was important in integrating a bio-control program by USDA-APHIS-PPQ, with herbicide control and efforts to eradicate giant salvinia in upper sections of the PVID.


USDA, APHIS,
PPQ
Biological Control of Giant Salvinia
Earl Andress, Dewey Murray, Glen Ball
Photo by Dewey W. Murray
08.21.2003 14:57

Types of Biological Control

- Classical
  - Intentional introduction of exotic BC agents for permanent establishment and long-term exotic pest control.
- Conservation/Enhancement
  - BC agents not released; environment modified to enhance populations of existing natural enemies.
- Augmentative
  - Release of BC agents without the goal of permanent establishment.
  - Natural enemies such as fungi, bacteria and nematodes, bred up and applied in higher than natural doses. (Mass Rearing)

Annual Totals of *Cyrtobagous salvinia* Released on the Lower Colorado River



River mile 33 August of 2004.

August 2007

River mile 33 in summer of 2005.

Salvinia population infested with *Cyrtobagous salvinia*. Notice the brown coloration from decaying plant biomass.

Contact Information:

USDA, APHIS, PPQ

Dewey Murray – Domestic Program Coordinator (Arizona)

3658 East Chipman Road

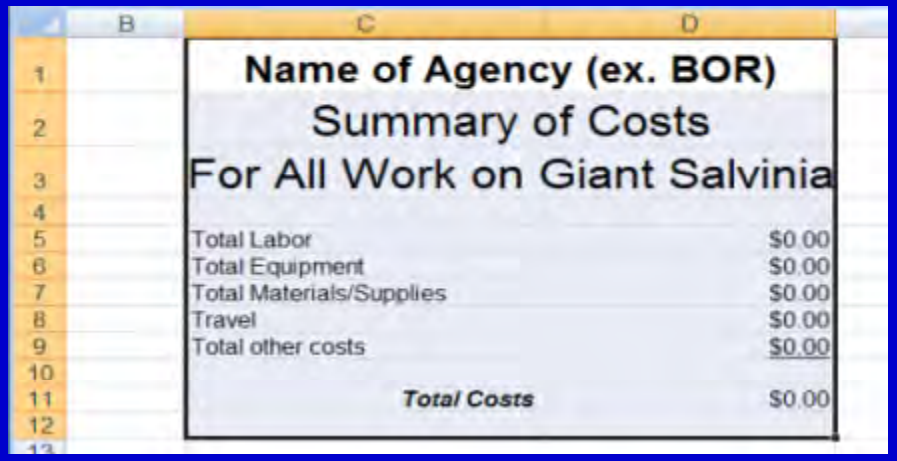
Phoenix, Arizona 85040

602-431-8930 ext. 207

Cell # 602-692-5515

USDA-APHIS-PPQ monitoring data of release sites and weevil populations which now actively join herbicide controlled sections in the PVID drain.

Collecting accountability information and cost estimates from agencies, organizations & stakeholders is difficult.

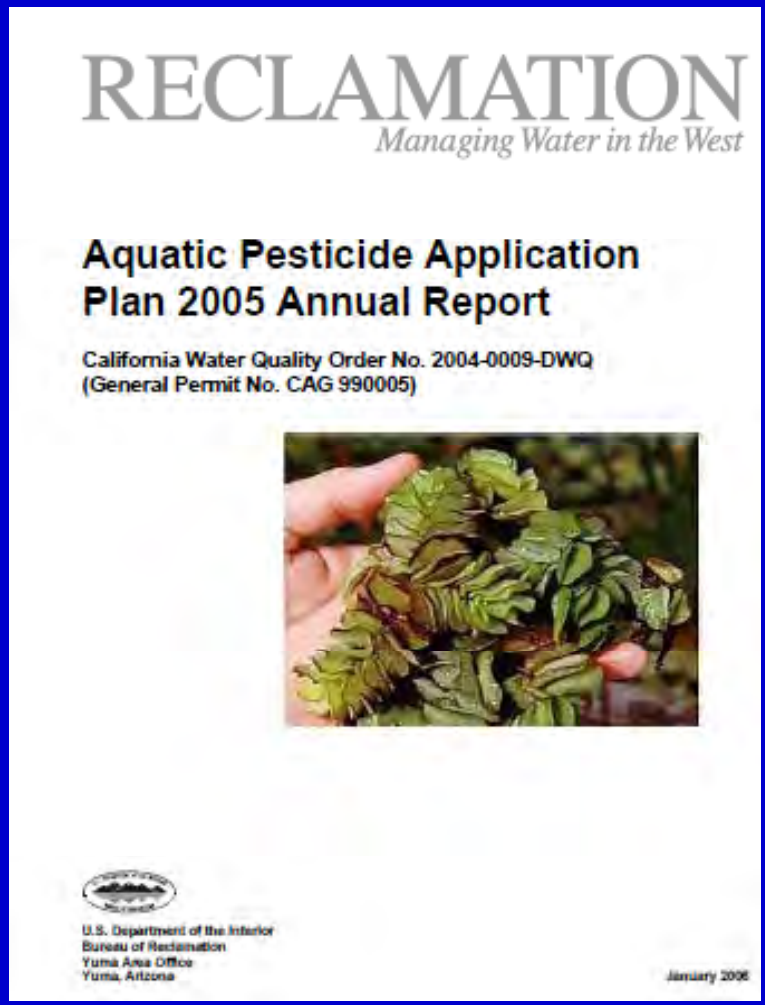


	B	C	D
1		**Name of Agency (ex. BOR)**	
2		Summary of Costs	
3		For All Work on Giant Salvinia	
4			
5		Total Labor	$0.00
6		Total Equipment	$0.00
7		Total Materials/Supplies	$0.00
8		Travel	$0.00
9		Total other costs	$0.00
10			
11		***Total Costs***	$0.00
12			

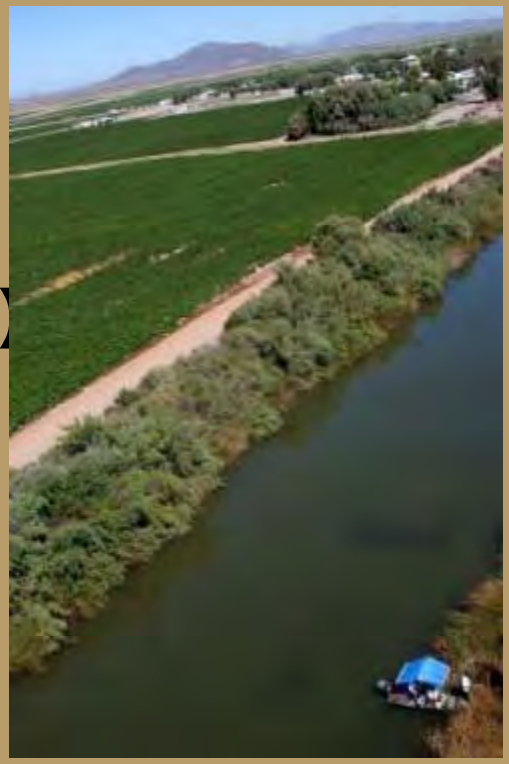
Simple spreadsheet to accumulate costs was almost never completed. Recommend developing a good strategy to do this at the beginning of a partnership control.

Records of compliance and the monitoring data to show compliance throughout the control are valuable for all members of the partnership.

Collective report archiving by a non-governmental agency is a plus. Future managers may need to know what was done, where and how well the control worked.



CA Water Quality Permit (NPDES); Permit expires August 2009, will need to re-apply



Monitoring
5 total treatment areas:
PVID 1-4 and Walters Camp (PVID5)

Pre-event, Event, Post-event; (3) samples each at minimum of two points (middle and bankline)

Water Quality Standards: Copper (25-50 ug/l), Hardness, Glyphosate (700 ug/l), Diquat (20 ug/l)
<u>No violations since 2004</u>.

RECLAMATION

Control records are archived at the University of Arizona, Tucson, by Dr. Kevin Fitzsimmons & students. Kevin and students have provided advice, field assistance, and maintained a central coordination website since the team developed in 1999.


www.100thMeridian.org
Bait bucket covered with zebra mussels.