

# Evaluation of a Secondary Filtration Technology for Nonnative Fish Exclusion at the Imperial Ponds, INWR, Arizona



Chris Karchesky (Normandeau Associates, Inc.)



# Background

- Lower Colorado River Multi-Species Conservation Program (LCR MSCP)
- 360 acres of backwater habitat dedicated to native fish along the LCR
- Backwaters can be connected or disconnect from the main river channel
- Advantage of disconnected backwaters is they can be managed as “predator free” habitats from nonnative fishes
- Challenges with disconnected backwater is maintaining adequate inflow to maintain water quality
- Reclamation has been exploring different surface water filtration technologies that can be used for developing disconnected backwater habitat

# Imperial National Wildlife Refuge



# INWR - Entrainment Evaluation (2009)

- Modified water delivery system to include 12-port sampling manifold
- 4-month period (April – July)
- Eggs and larvae of nonnative fishes were present in 97% of the samples collected across all 4 months



≠ 100%  
Exclusion



# Secondary exclusion technology?

## *Criteria:*

- Capable of providing filtration down to 100 microns
- Capable of filtering high flows (1,000's gpm)
- Can be adapted to existing water management system
- Operation and maintenance
- Robust to harsh environmental conditions
- Commercially available

# Gravity Sand Filters

- Long been used for water filtration for both organic and inorganic particles
- Available in all sizes and used in a variety of applications
- Media ranges in all size and is dictated by the desired level of filtration
- Can removed suspended solids down to 2 microns in size
- Limited information on effectiveness of removing fish eggs and larvae



# Sampling Methods



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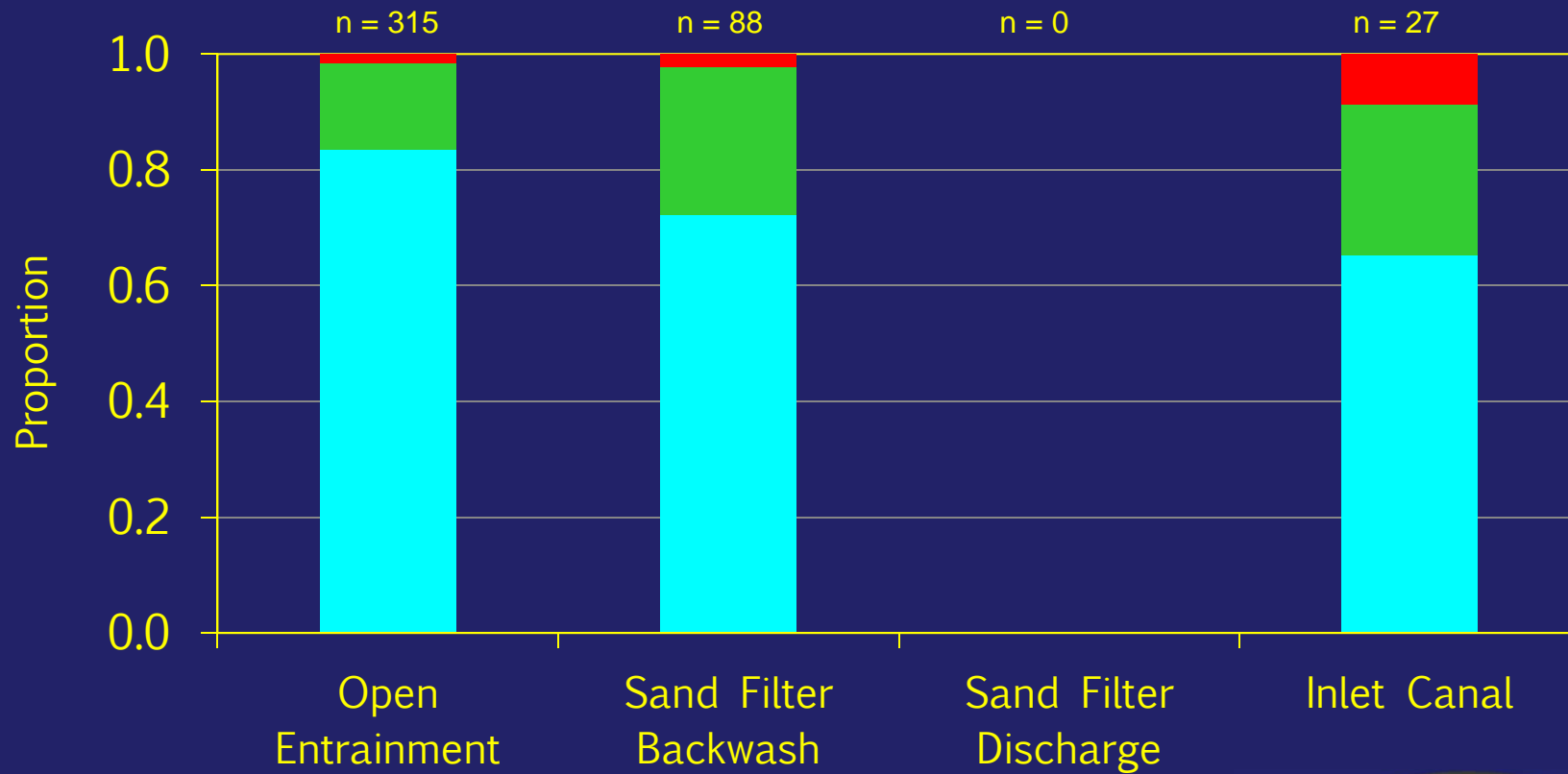


# Sampling Methods

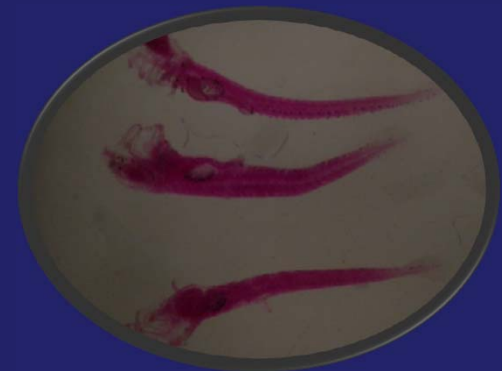
- Sampling occurred during late April 2011
- Eight 1-hour sampling trials
- Samples were collected at:
  - Primary manifold – wedge wire screen only
  - Secondary manifold – sand filter discharge
  - Sand filter backwash
  - Inlet canal – ichthyoplankton tows
- All samples were processed separately



# Results



■ Cyprinidae ■ Clupeidae ■ Centrarchidae



# Summary

- Results indicate that sand filter is a potentially viable technology for meeting a goal of 100% exclusion
- Other considerations regarding functionality over a longer temporal scale and benefit to the program should be considered and weighed against other options before implementation

# Final Report

<http://www.lcrmscp.gov>

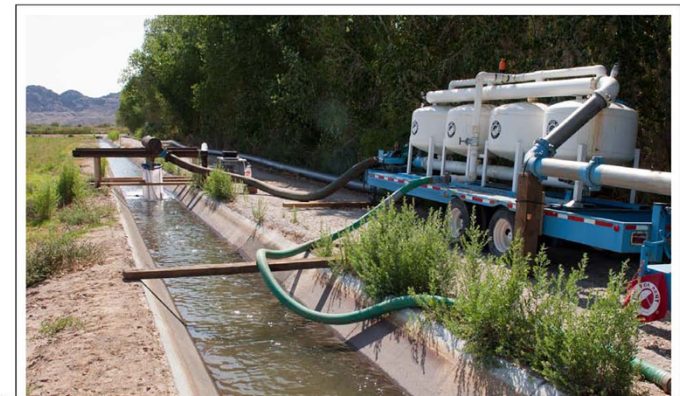
## Lower Colorado River Multi-Species Conservation Program



*Balancing Resource Use and Conservation*

### *FINAL REPORT*

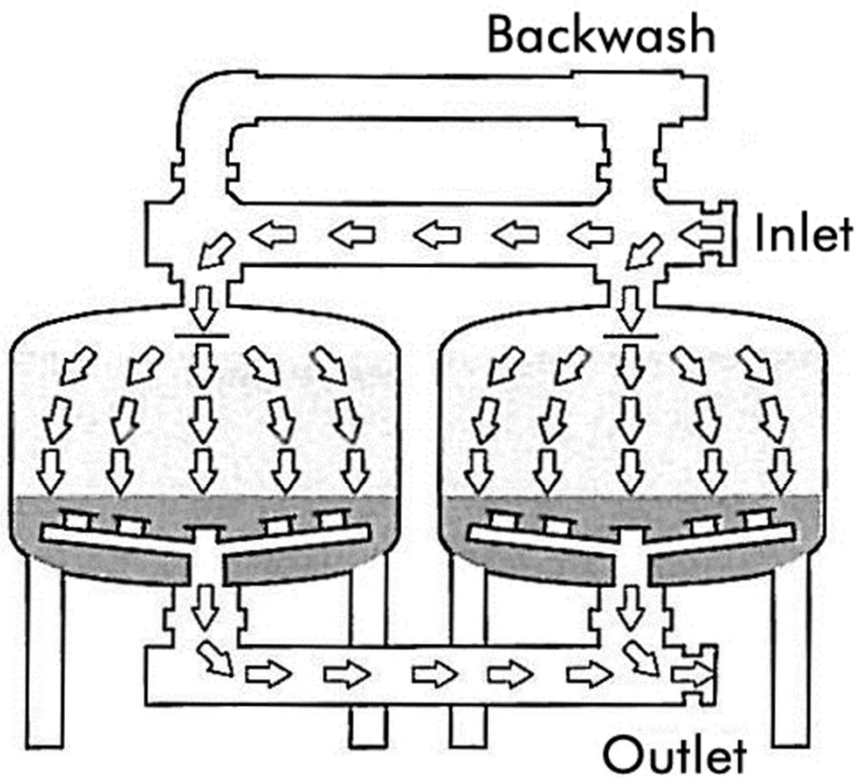
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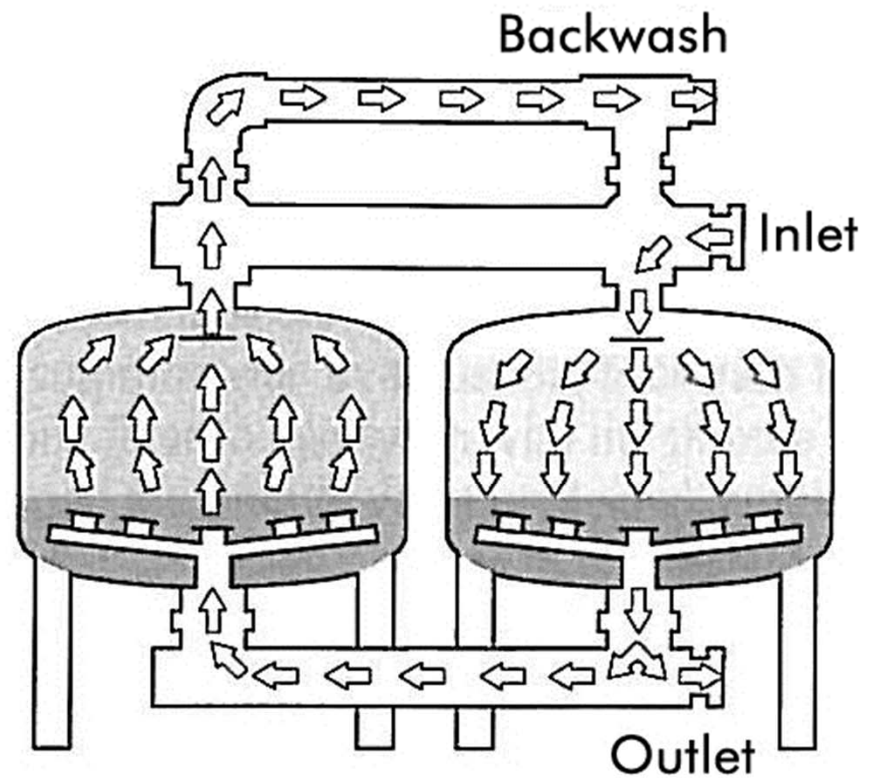
August 2011

# Filtration & Backwash Mode

**Filtration Mode**



**Backwash Mode**



# System Layout

