




Use of AFS Procedures for Investigation and Monetary Valuation of a Mussel Kill

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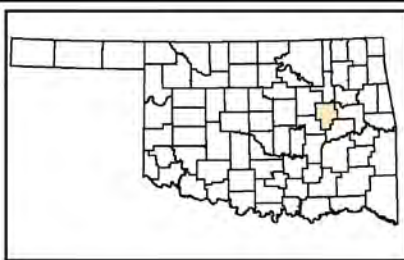
Oklahoma Ecological Services Field Office

Overview of Presentation

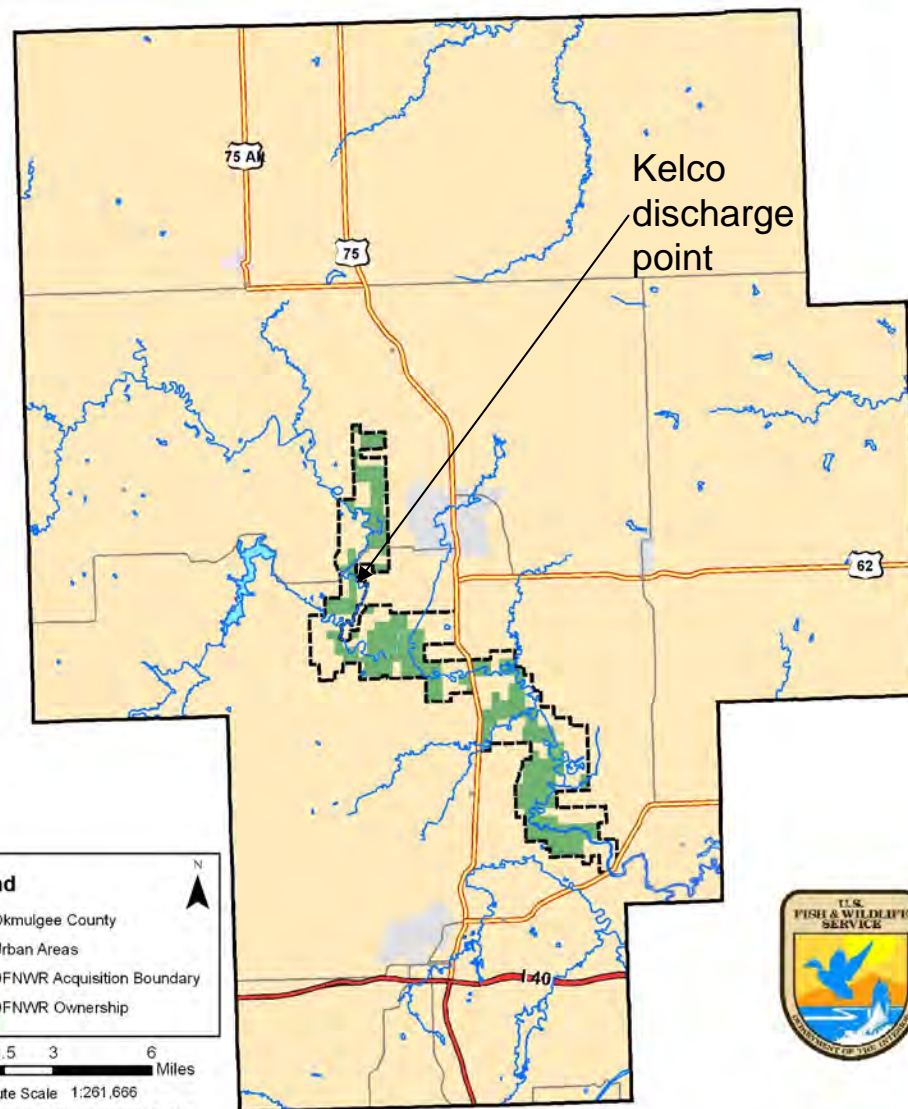
- Background of Mussel Kill
 - Mussel Kill Assessment, Including Application of AFS Guidelines
 - Settlement/Legal Issues
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- Decorative water ripples in the bottom right corner of the slide.

Background of Mussel Kill

- On August, 9 2005, a mussel kill was discovered immediately downstream and adjacent to CP Kelco's (Kelco) discharge point by the Service and Oklahoma Department of Wildlife Conservation (ODWC)
- The kill was upstream of the Deep Fork NWR and included ~ .2 mile of the Deep Fork River.



Deep Fork National Wildlife Refuge Okmulgee County, Oklahoma



Legend

- Okmulgee County
- Urban Areas
- DFNWR Acquisition Boundary
- DFNWR Ownership

0 1.5 3 6
Miles

Absolute Scale 1:261,666

Prepared by U.S. Fish and Wildlife Service
Oklahoma Ecological Services Field Office (CMO)
July 13th, 2006



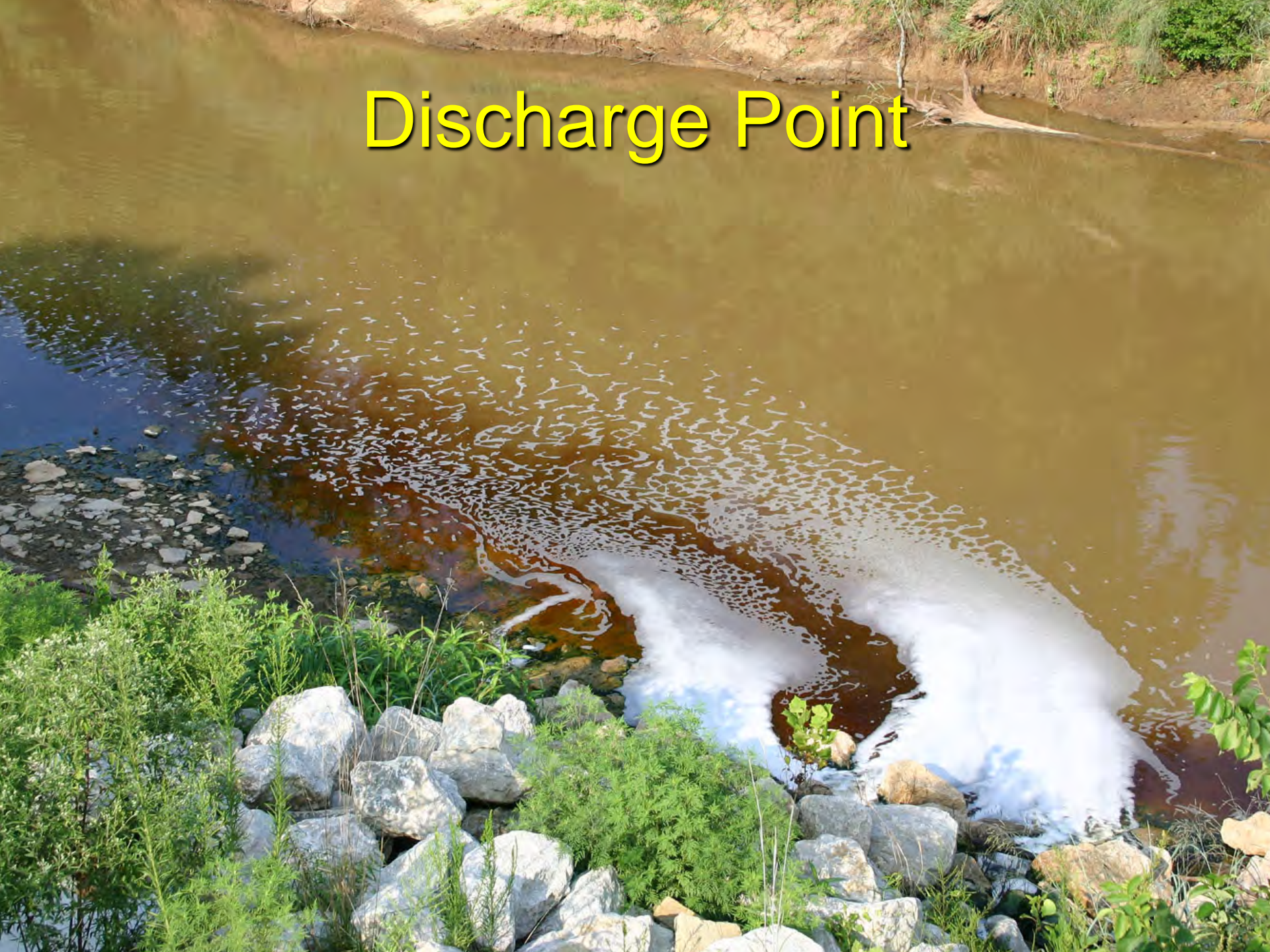
On Refuge Study Mussel Reconnaissance



Information on CP Kelco

- Kelco established discharge in July 2005 into Deep Fork River
- Xanthum producer
 - Xanthum is a food and pharmaceutical additive. It is a large molecule that is produced from a bacteria that grows on cabbage
 - Production produces ammonia and CBOD issue and can increase temperature of receiving streams

Discharge Point





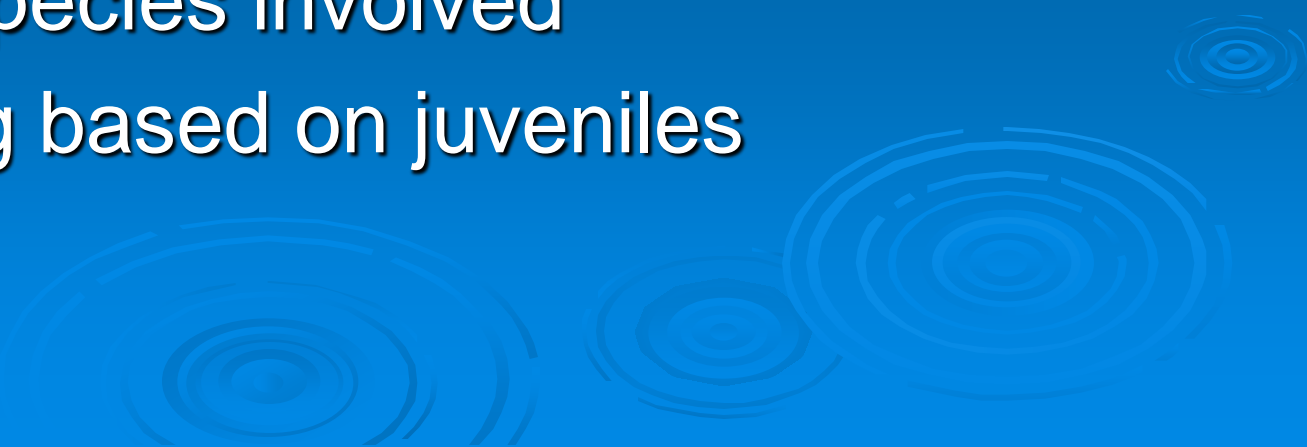
Mussel Kill Response

- Notifications (Refuge, Kelco, ODWC and ODEQ)
- Factors considered during the mussel kill assessment
- Applications of updated AFS guidelines for development of monetary damages for mussel kills

Notification



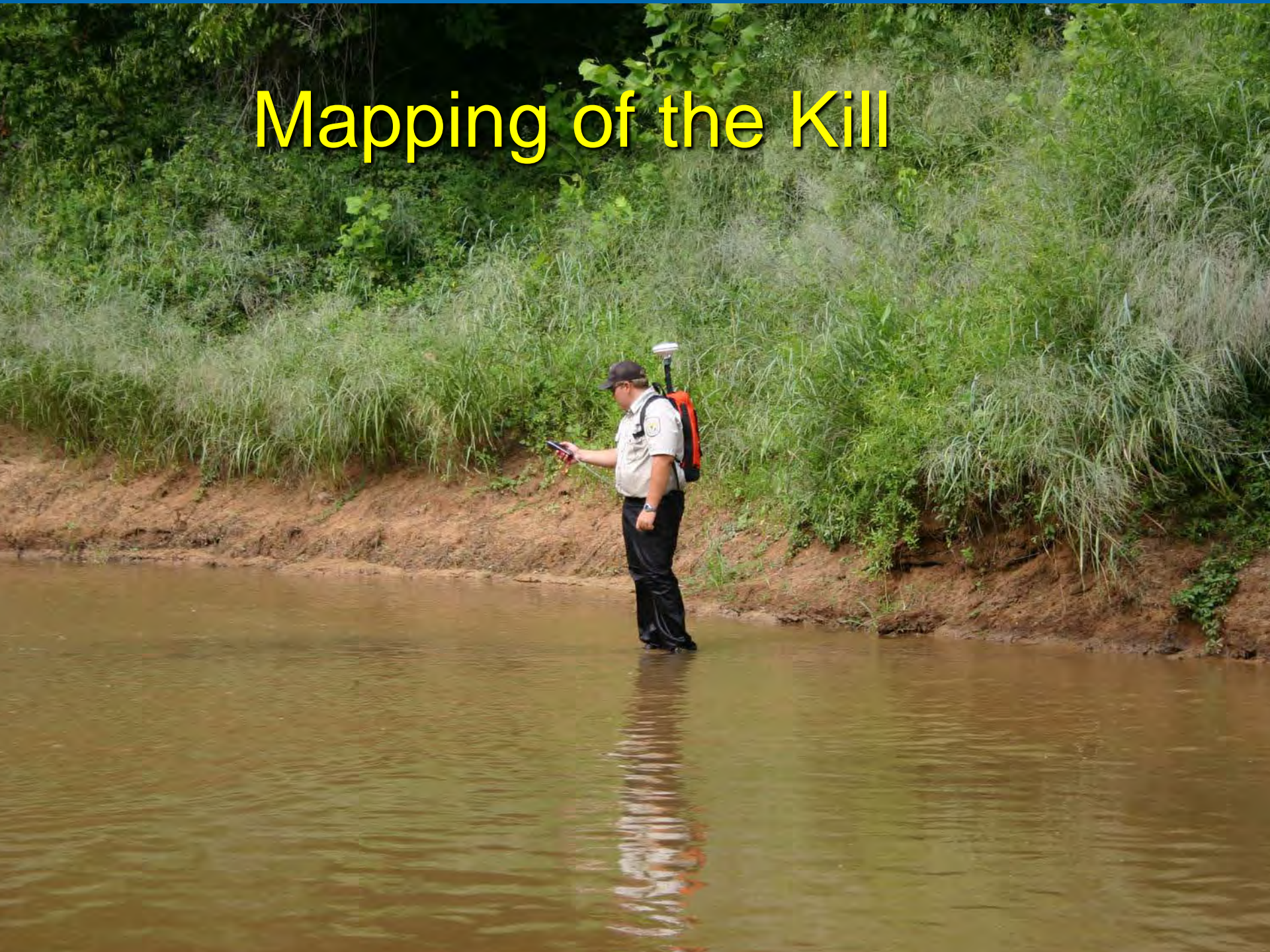
Factors Considered During the Mussel Kill Assessment

- Extent of kill and counting method
 - Searchable area
 - Mortalities associated with the discharge and background mortalities
 - Searching error
 - Different species involved
 - Restocking based on juveniles
- 



Survey of the Kill

Mapping of the Kill




Kelco Outflow Mussel Kill
Identified: 8-9-2005
Straight Length: 0.18 miles
Mussel Kill Area: 1.22 acres
Counted Area: 0.56 acres
Not Counted Area: 0.66 acres

DRAFT 8-24-2005



Legend
Estimated Mussel Kill Area

 Not Counted

 Counted

0 70 140 280
Feet



Legend

 DFNWR Acquisition Boundary
 DFNWR Ownership

Okmulgee County, Oklahoma
Deep Fork National Wildlife Refuge



Evidence of Pollution



Mussel Condition



Total Collection (all conditions)



Sorting by Condition



Background Mortality



Searching Error



Sorting by Species



Assessment Results

- 1,402 mussels killed of 10 native species
 - *Amblema plicata* (threeridge)
 - *Fusconaia flava* (Wabash pigtoe)
 - *Lampsilis teres* (yellow sandshell)
 - *Leptodea fragilis* (fragile papershell)
 - *Obliquaria reflexa* (threehorn wartyback)
 - *Potamilus ohioensis* (pink papershell)
 - *Potamilus purpuratus* (bleufer)
 - *Quadrula quadrula* (mapleleaf)
 - *Quadrula verrucosa* (pistolgrip)
 - *Truncilla donaciformis* (fawnsfoot)

Assessment Results (cont.)

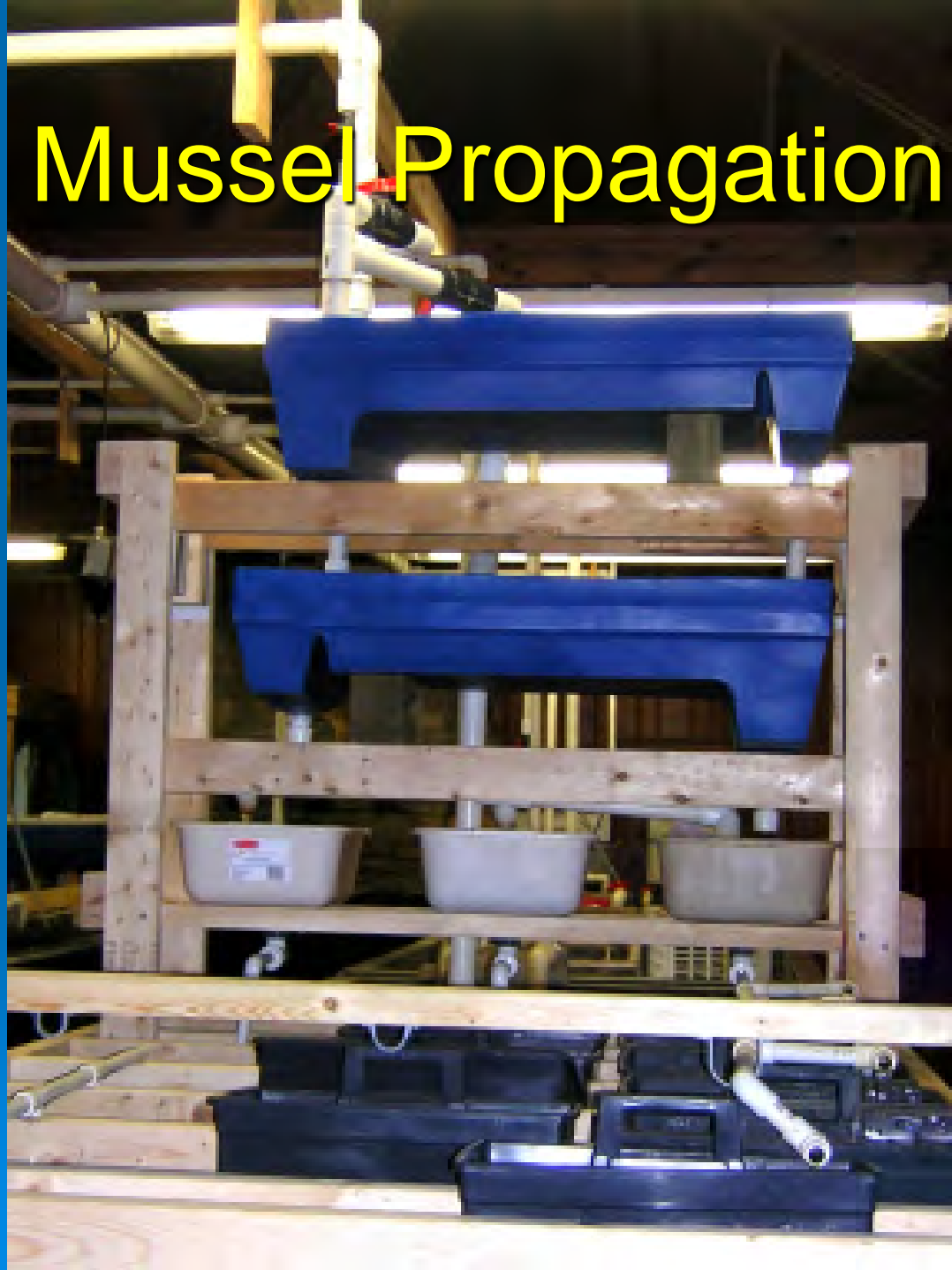
- Excluded from assessment
 - *Lasmigona complanata* (white heelsplitter)
 - *Megalonaias nervosa* (washboard)
 - *Corbicula fluminea* (Asian clam)
- No T&E species
- All affected species relatively easy to produce
- AFS methodology calls for restocking of juveniles (14,758) sufficient to replace adults

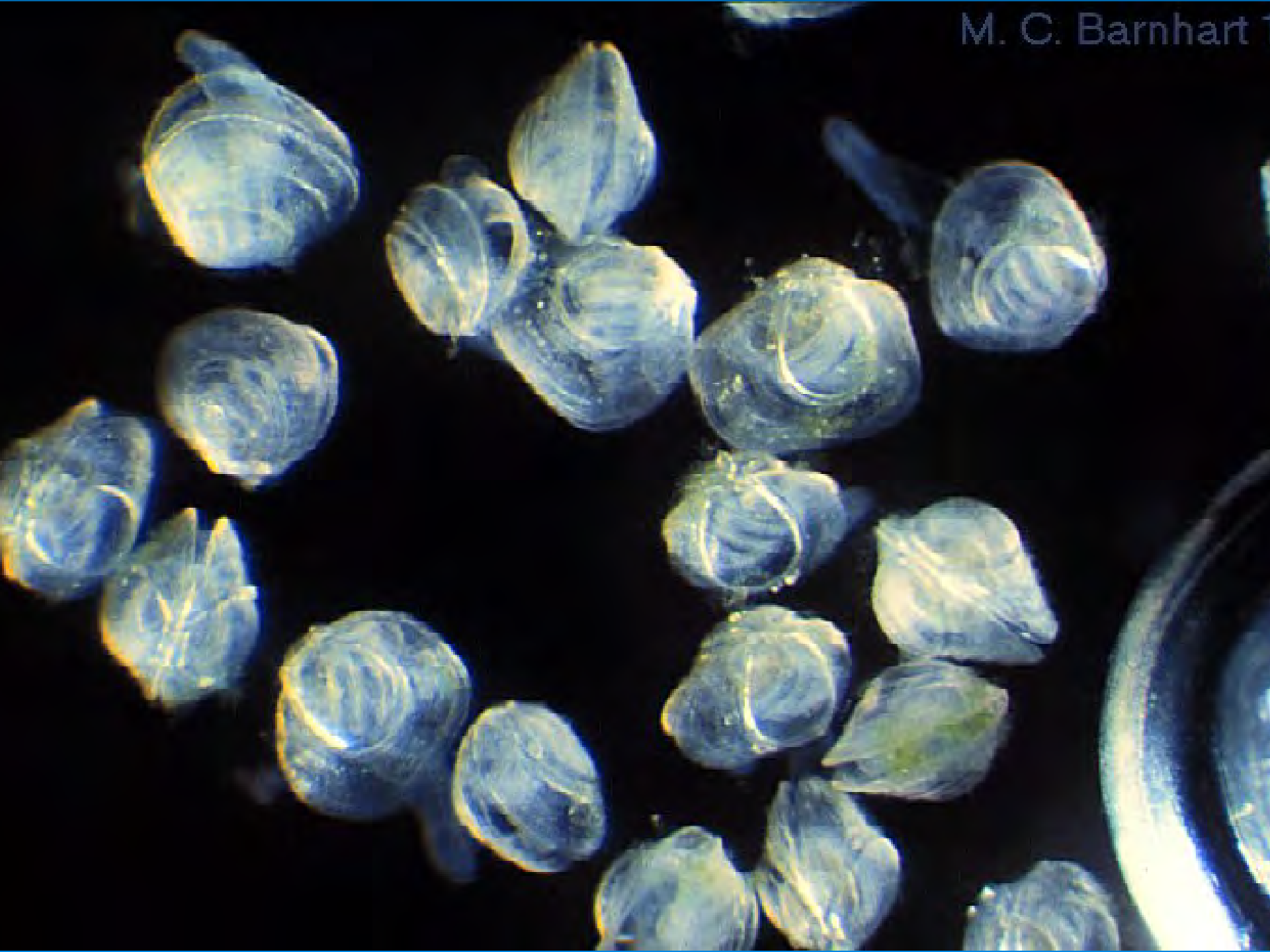
Monetary Damages

➤ Mussel replacement costs	11,242.99
➤ Investigative and administrative costs	14,161.36
➤ Investigative – ODWC	1,707.06
➤ Restocking costs	2,000.00
➤ Monitoring costs	30,000.00

Total restitution	59,111.41
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Mussel Propagation





Lessons Learned

- Be wary when a “willing” RP involves outside counsel
- Consider a Statewide MOU with co-trustees that address settlements outside “normal” NRDAR actions
- Chronic/long term impacts
- Effluent toxicity issues

Special Thanks

- Oklahoma Department of Wildlife Conservation
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