

# Mississippi River Hydrokinetic Energy Workshop

Vicksburg, Mississippi

August 26-28, 2009

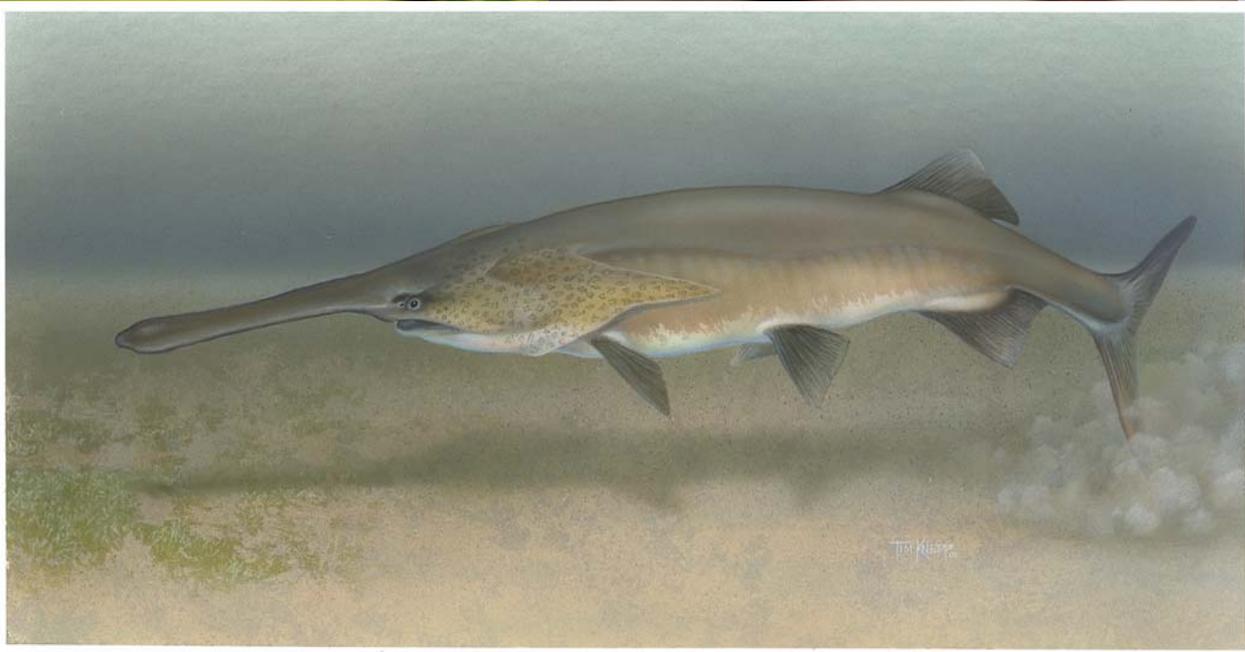


# Mississippi River Primer

- ▶ Fish, Wildlife and Habitat
- ▶ Other Unique and Competing  
Uses

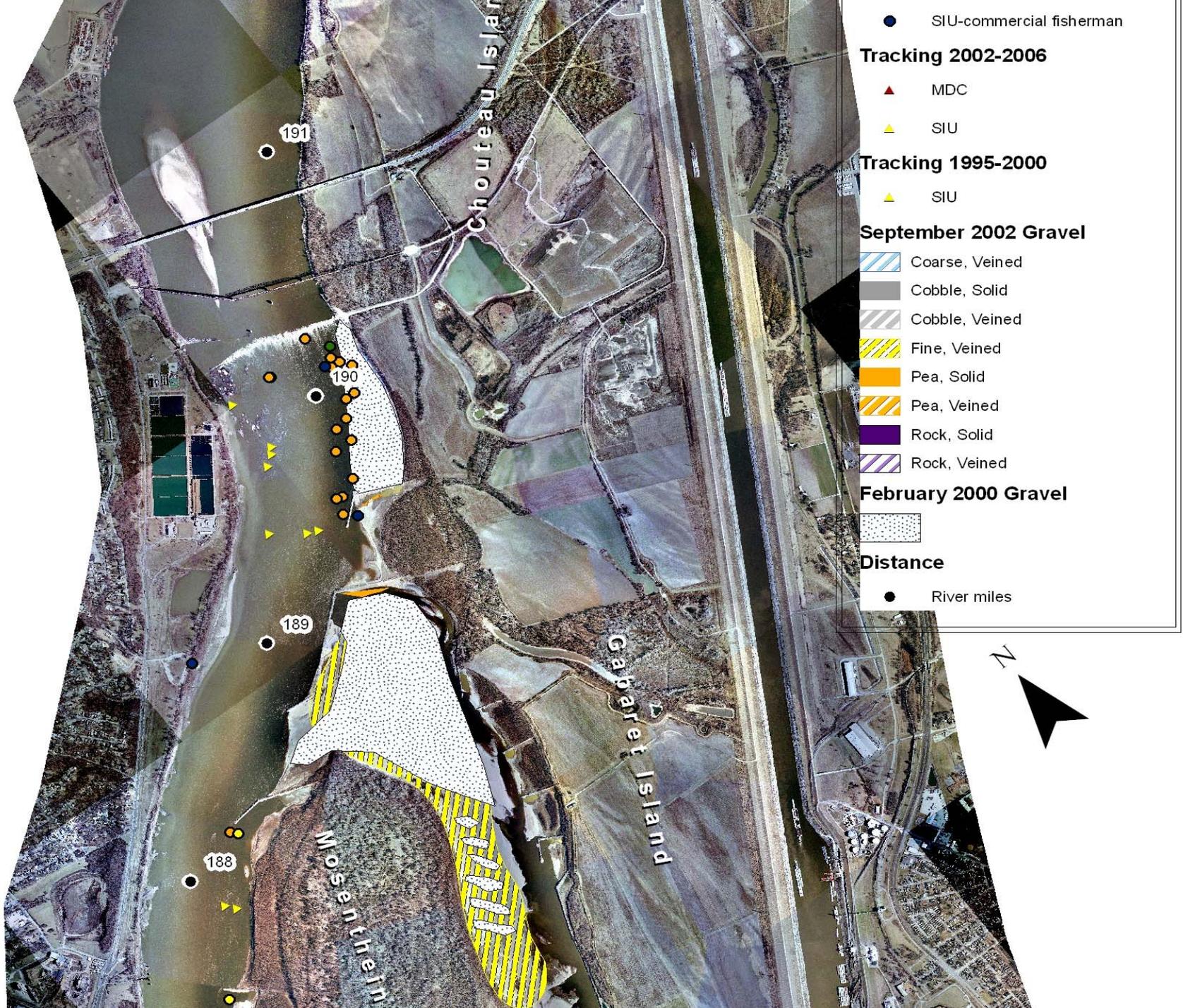
- » Home to at least 260 different species of fish, 25% of all North American fish species.
- » 40% of migratory birds use the river corridor during their Autumn and Spring migrations.
- » 60% of all North American migratory birds use the river basin as part of their flyway.
- » Home to at least 50 species of mammals.
- » Home to at least 145 species of amphibians and reptiles.
- » 38 species of mussels are found in the upper reaches of the river.
- » In the Lower Mississippi there are thought to be 60 separate species of mussels.

Collot (1826) wrote: *The Mississippi River has not only the inconvenience of being of an immense extent, of winding in a thousand different directions, and of being intercepted by numberless islands; its current is likewise extremely unequal, sometimes gentle, sometimes rapid; at other times motionless; which circumstances will prevent, as long as both sides remain uninhabited, the possibility of obtaining just data with respect to distances. But an insurmountable obstacle will always be found in the instability of the bed of this river, which changes every year; here a sharp point becomes a bay; there an island disappears altogether. Further on, new islands are formed, sand-banks change their spots and directions, and are replaced by channels; the sinuosities of the river are no longer the same; here where it once made a bend it now takes a right direction, and there the straight line becomes a curve; here ravages and disorders cannot be arrested or mastered by the hand of man, and it would be extreme folly to undertake to describe them, or pretend to give a faithful chart of this vast extent of waters, as we have done for the course of the Ohio, since it would not only be useless but dangerous.*



# Habitat Protection







Reilly Lake

Beaver Island

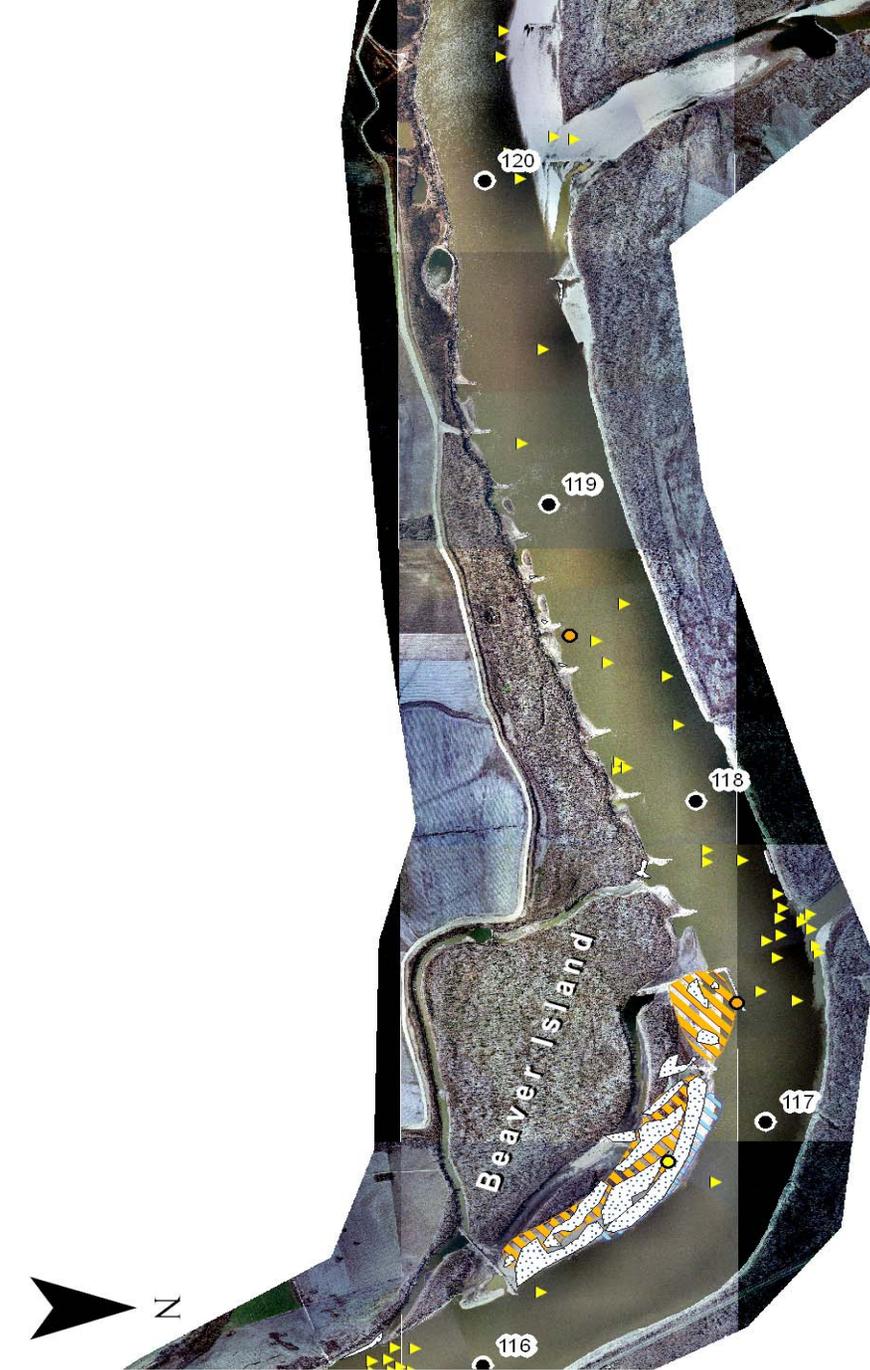
Fort

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Google™

Pointer 37°57'42.31" N 89°55'55.42" W elev 338 ft Streaming 100%

Eye alt 15917 ft



**Captures 2002-2006**

- CEWES
- CEWES-commercial fisherman
- MDC
- SIU
- SIU-commercial fisherman

**Tracking 2002-2006**

- ▲ MDC
- ▲ SIU

**Tracking 1995-2000**

- ▲ SIU

**September 2002 Gravel**

- ▨ Coarse, Veined
- Cobble, Solid
- ▨ Cobble, Veined
- ▨ Fine, Veined
- Pea, Solid
- ▨ Pea, Veined
- Rock, Solid
- ▨ Rock, Veined

**February 2000 Gravel**

- ▨

**Distance**

- River miles

0 1,200 2,400 4,800 7,200 9,600

# Habitat Enhancement and Restoration

















# Unique and Competing Uses

Recreational and Commercial Fishing

Recreational Boating

Clamming

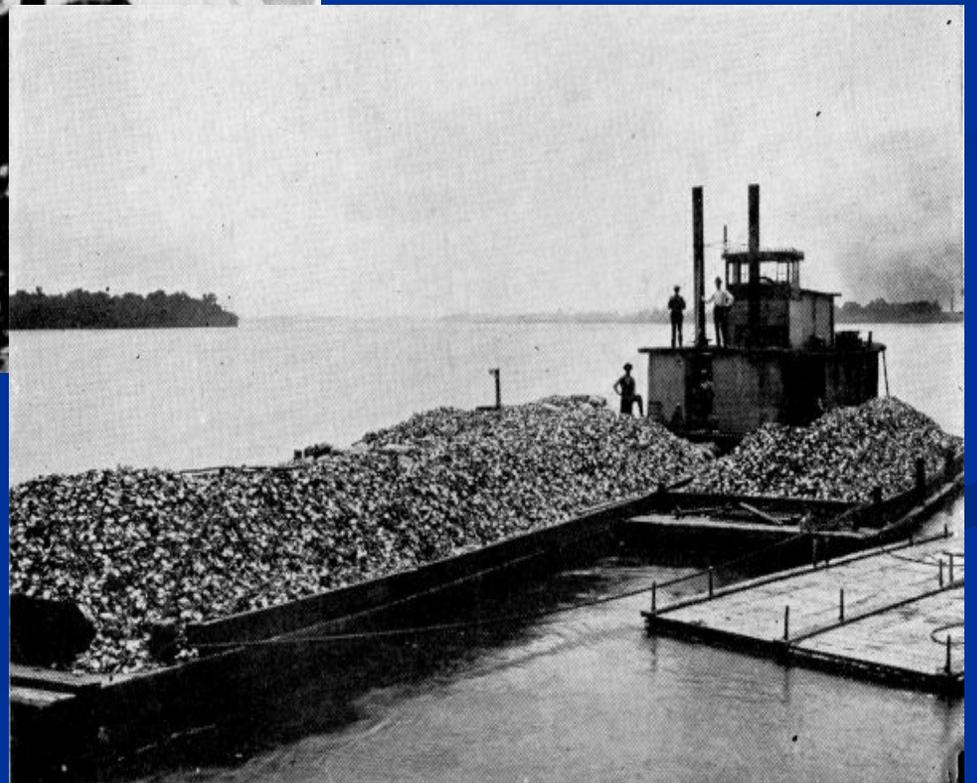
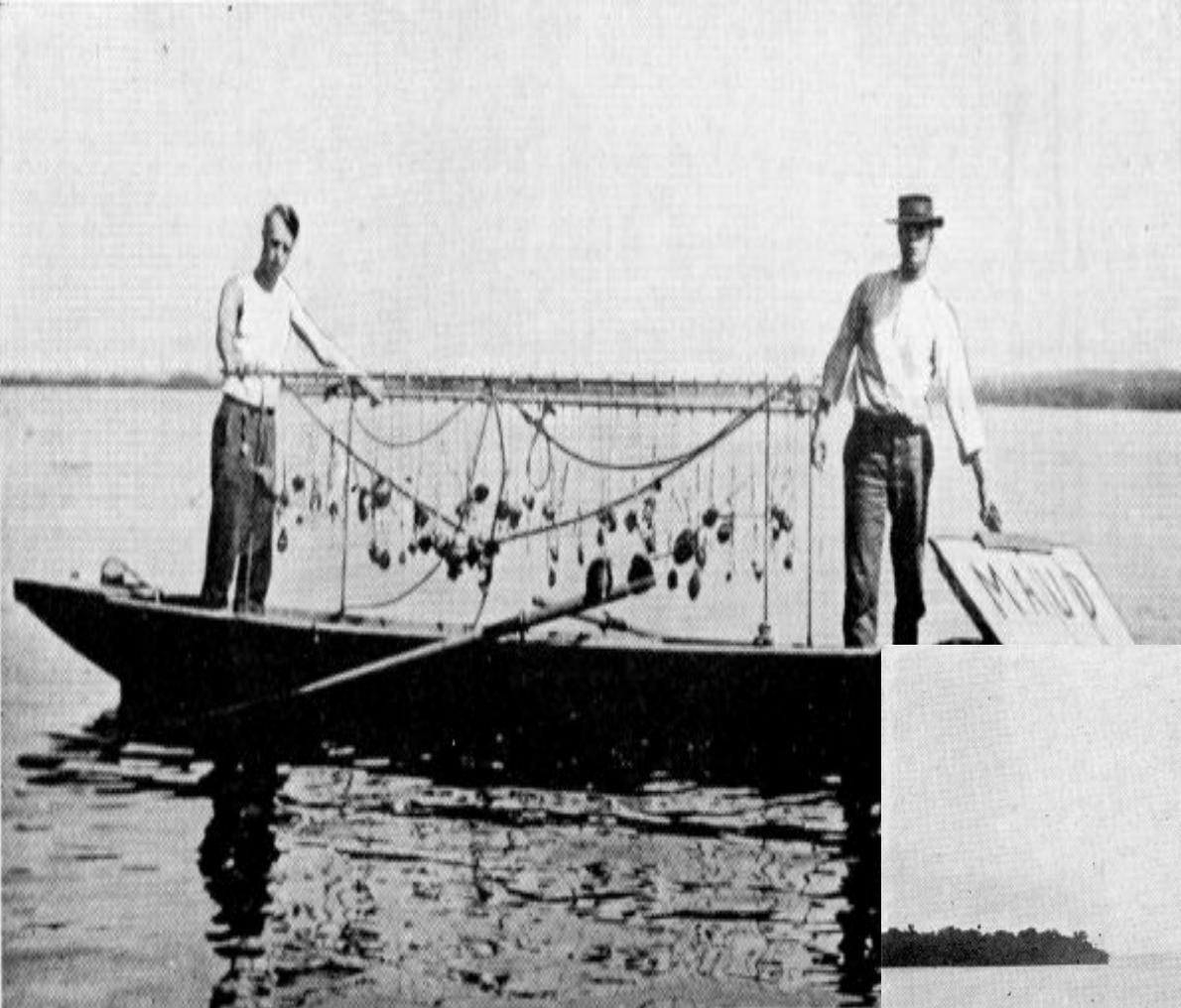
Hunting

Research











27th Outdoors Inc. Canoe & Kayak Race -  
May 03, 2008 - Memphis, TN

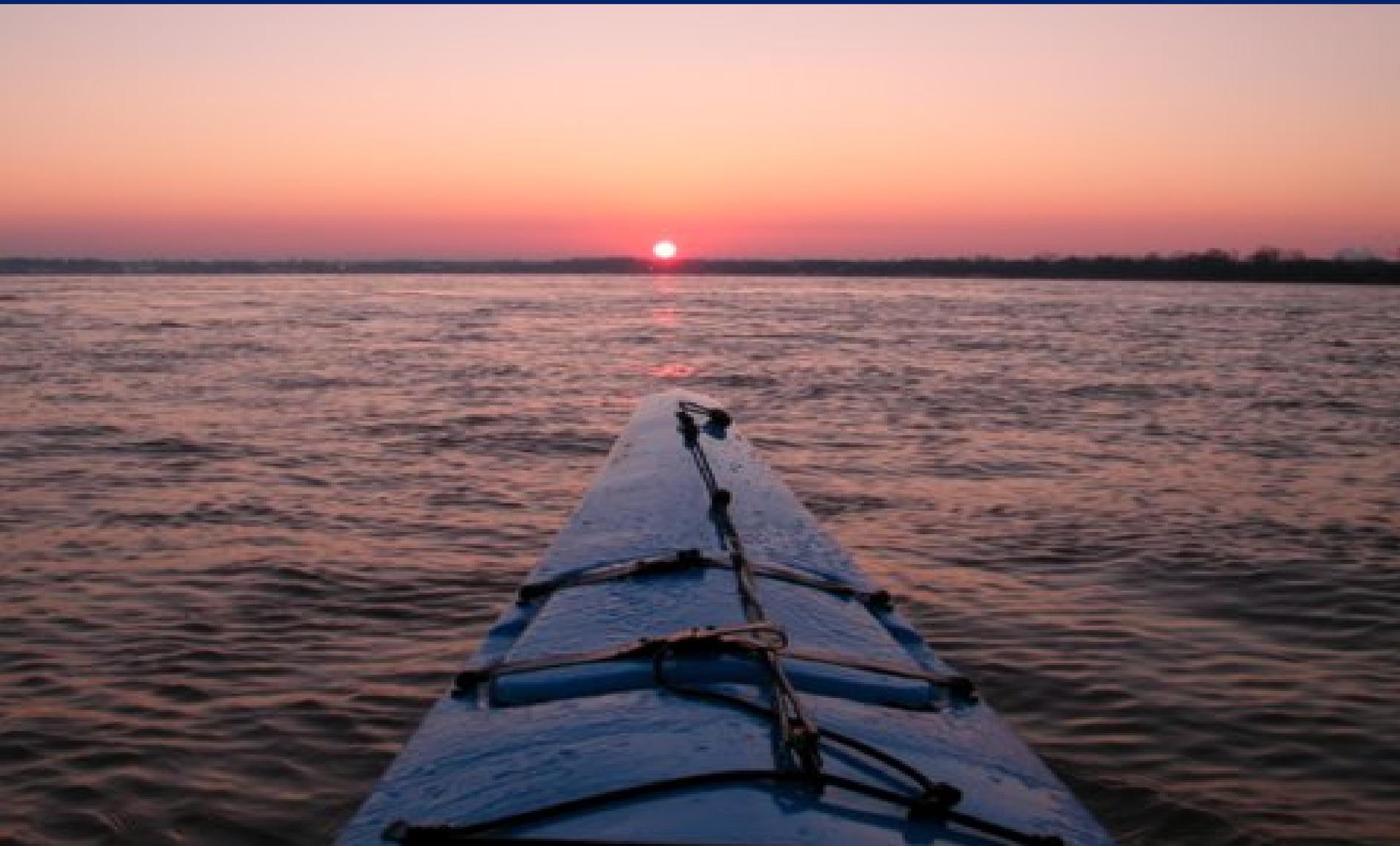


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ANY QUESTIONS?



# **Hydrokinetic Concerns From the U.S. Fish & Wildlife Service's Perspective**



**Vicksburg, MS  
August 26, 2008**

# Potential Impacts to the Overall River Ecology

- Impacts to fish, mussels, invertebrates
- Direct Mortality
  - Five hundred mile sushi bar

# Potential Impacts to the Overall River Ecology

- Physics of hydrokinetic generation
  - Converting kinetic energy to electrical energy
    - Increased sedimentation?
    - Potential impacts to mussels, invertebrates, spawning beds

# Potential Impacts to the Overall River Ecology

- **Habitat avoidance by fish**
  - Electrical generation/transmission produces weak electrical fields
  - Causes some level of sonic noise
  - Mussels depend upon host fish species for reproduction
  - May cause abandonment of spawning beds

# Potential Impacts to the Overall River Ecology

- At this point, we can only speculate on impacts
  - Direct mortality
  - Siltation
  - Habitat avoidance
    - Loss of spawning areas
    - Loss of host fish species
  - Adverse impacts will probably vary by species

# **Potential Impacts to the Overall River Ecology**

- **Cumulative impacts**
  - **Whatever the impacts are, when multiplied by the 160,000 turbines currently proposed, they could have a major impact on the river ecology**