

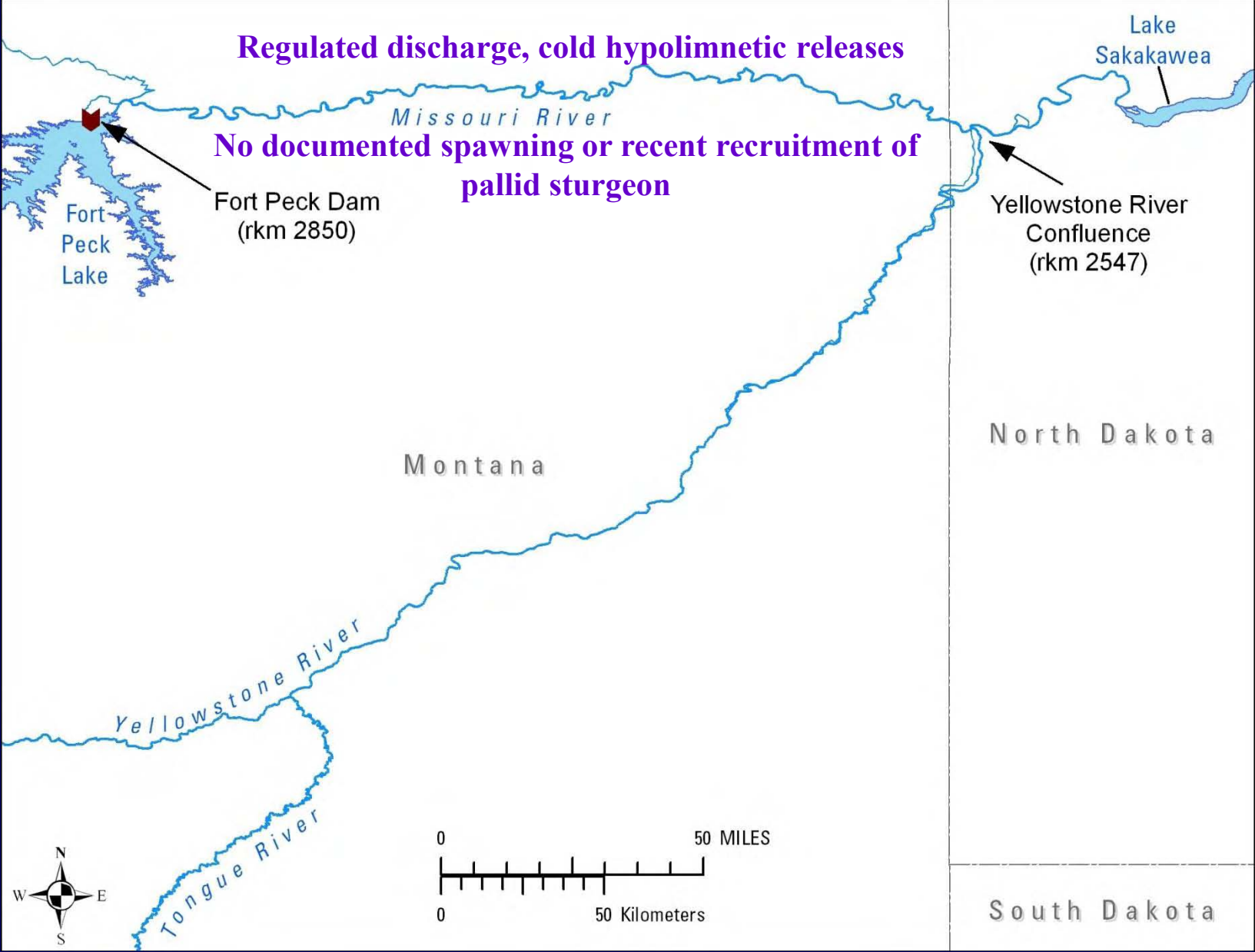
Fort Peck Flow Modification Biological Data Collection Plan: End of an Era

Patrick J. Braaten
U. S. Geological Survey
Columbia Environmental Research Center
Fort Peck Project Office
Fort Peck, Montana

David B. Fuller and Ryan D. Lott
Montana Fish, Wildlife & Parks
Fort Peck Fisheries Office
Fort Peck, Montana



Environmental Setting



History/Background

2000 Missouri River Biological Opinion

Higher discharges and warmer temperatures needed to improve environmental conditions for spawning and recruitment of pallid sturgeon and native fishes

Releases of reservoir water (max = 538 m³/s, 19,000 cfs) through spillway to achieve 18°C at Frazer Rapids (~ 40 km downstream from dam)

Mini-test in 2001
(or first year runoff
and reservoir elevation
criteria met)

Full-test in 2002
(based on runoff
and elevation criteria)

Monitoring and research
to evaluate responses



Fort Peck Flow Modification Project: Monitoring and Research

Long-term investigations

- 1) Temperature and turbidity regimes
- 2) Movements/migrations/river use of pallid sturgeon, shovelnose sturgeon, blue suckers, paddlefish
- 3) Spatial and temporal reproductive dynamics based on larval fishes
- 4) Sturgeon reproduction and recruitment based on young-of-year



Short-term investigations

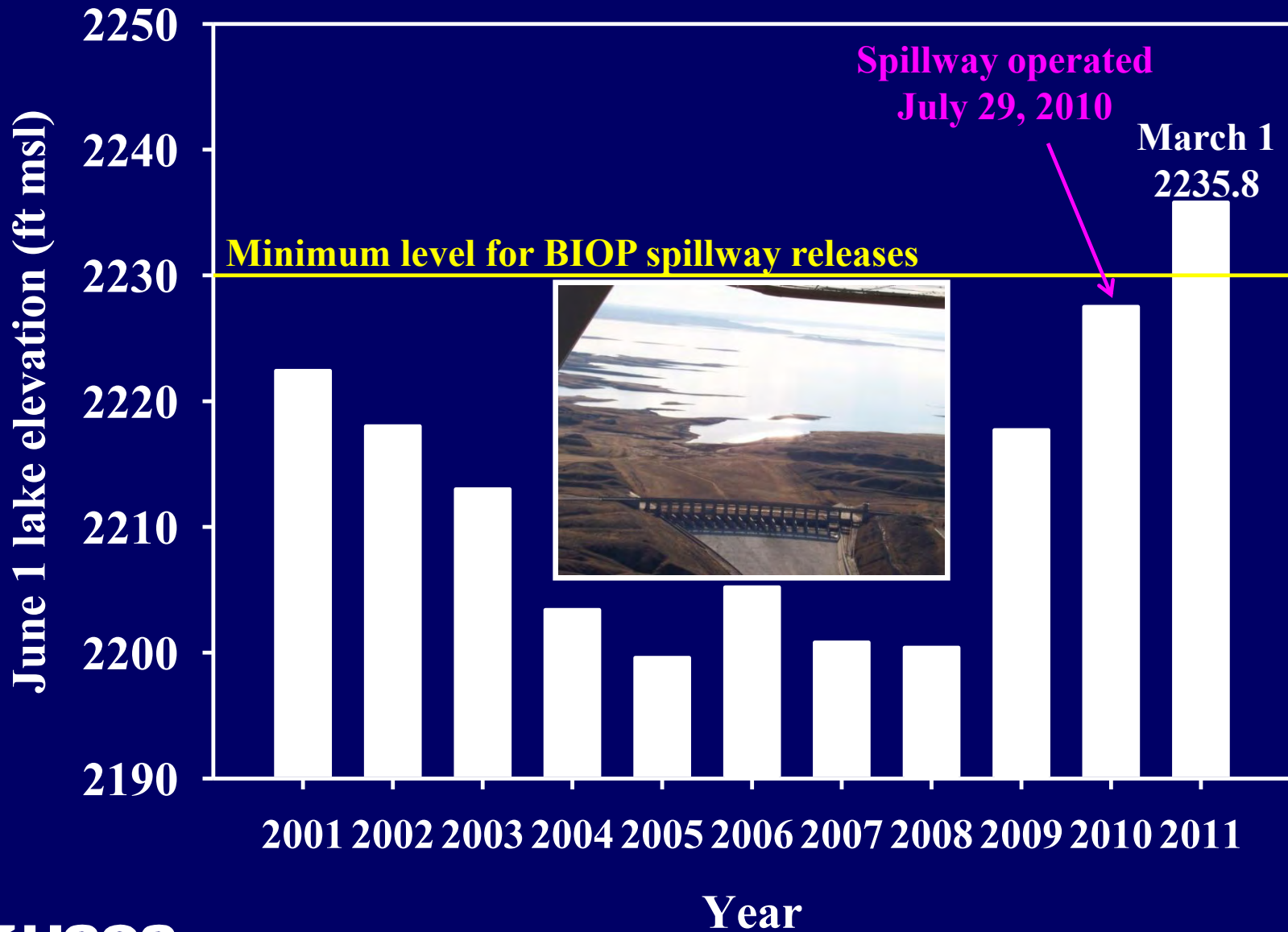
Side channel (2004) and mainstem (2007) larval drift experiments

Young-of-year sturgeon growth, feeding (2004-present)

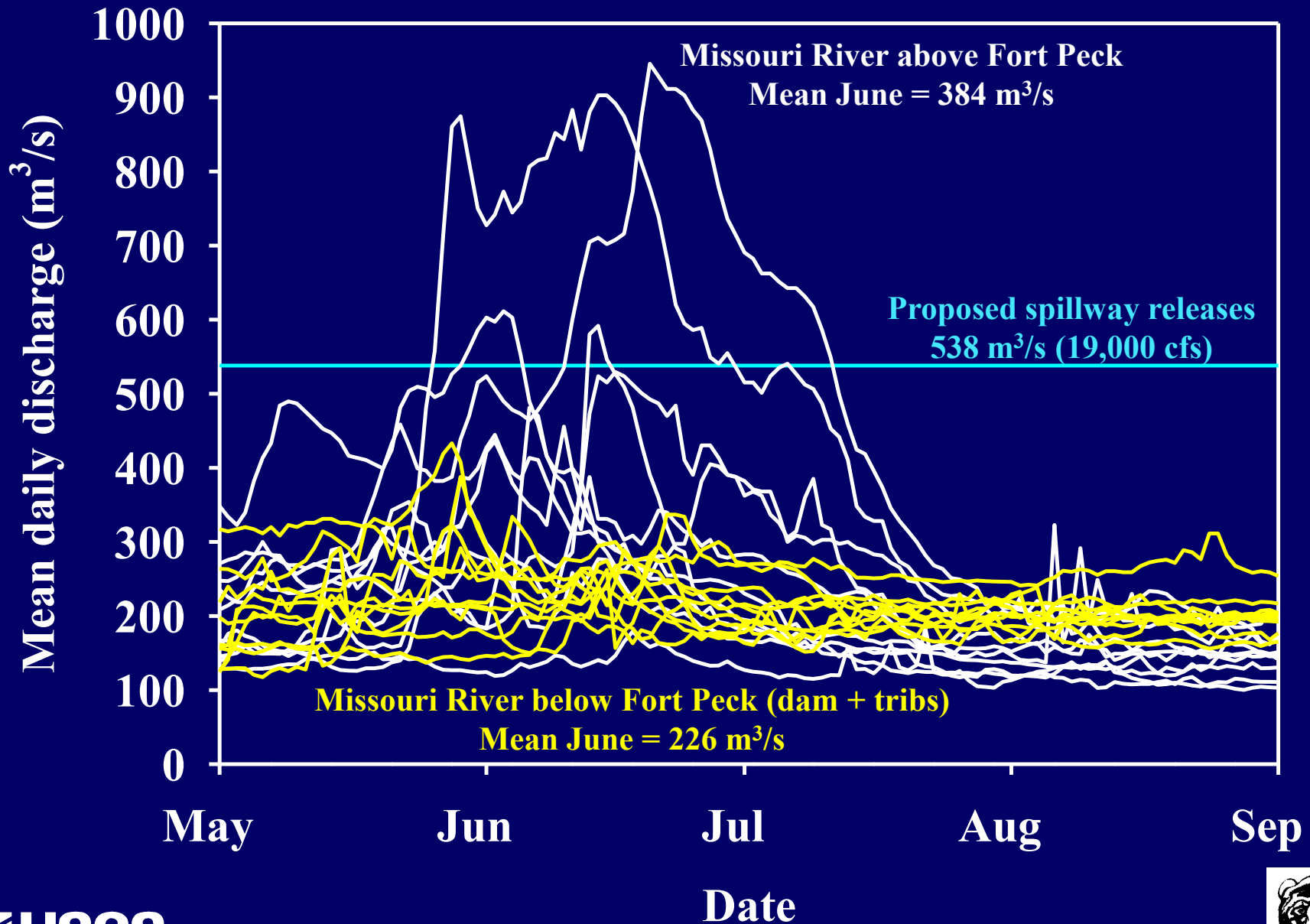
Food habits of potential piscivores (feeding on sturgeon; 2001, 2002)



Fort Peck Reservoir Elevations

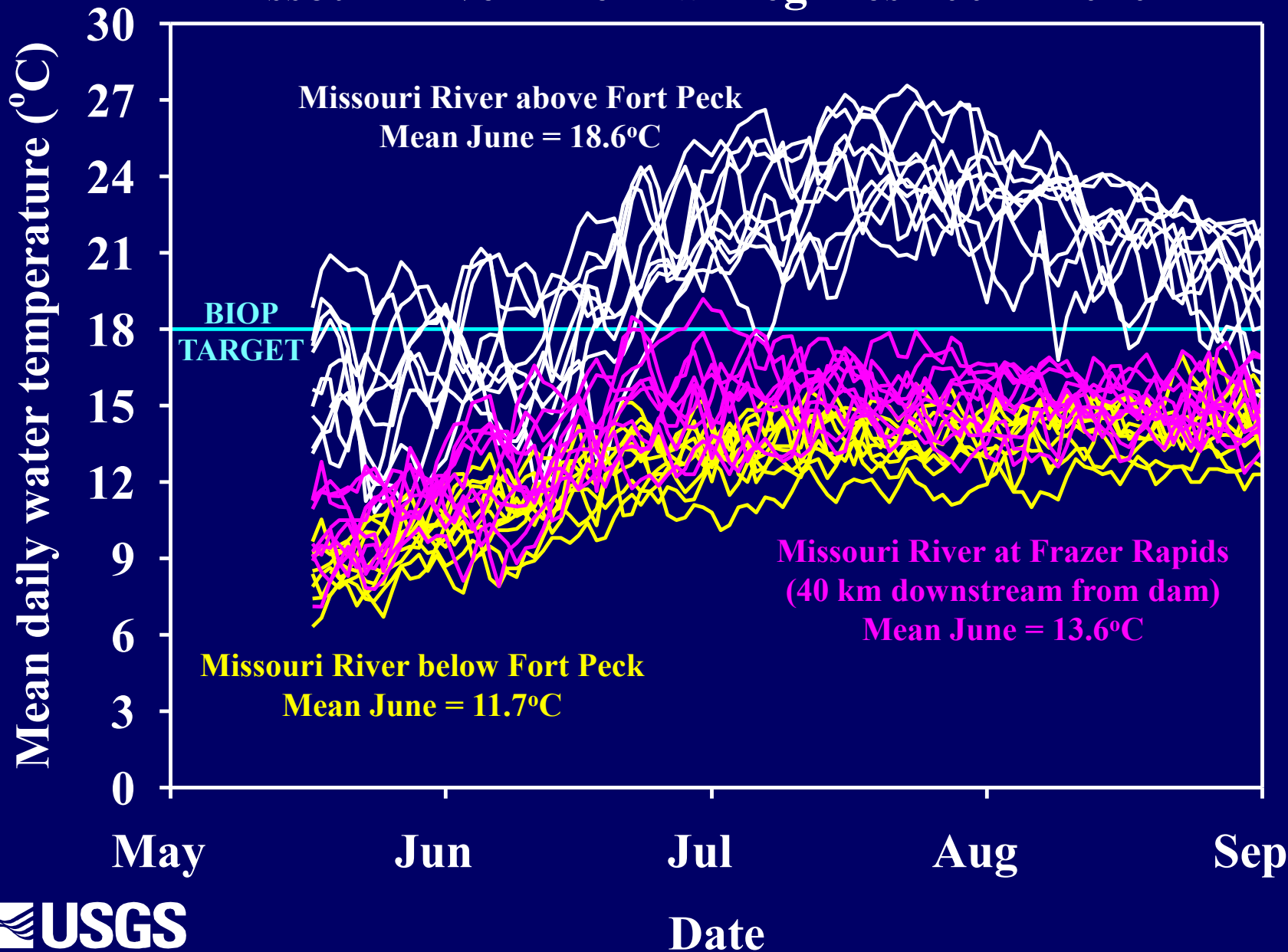


Missouri River Discharge Regimes 2001 - 2010



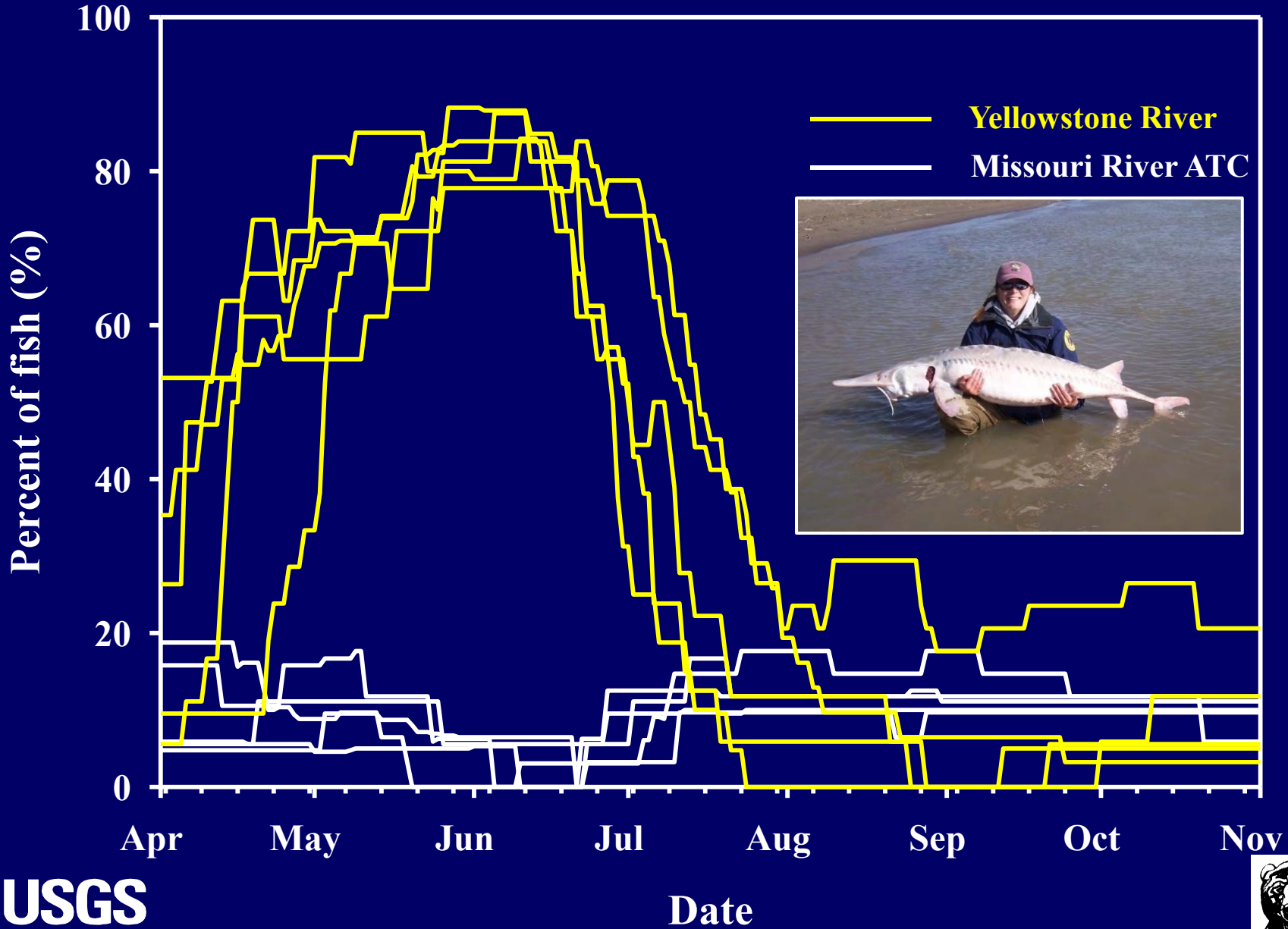
Component 1 – Temperature Regime

Missouri River Thermal Regimes 2001 - 2010



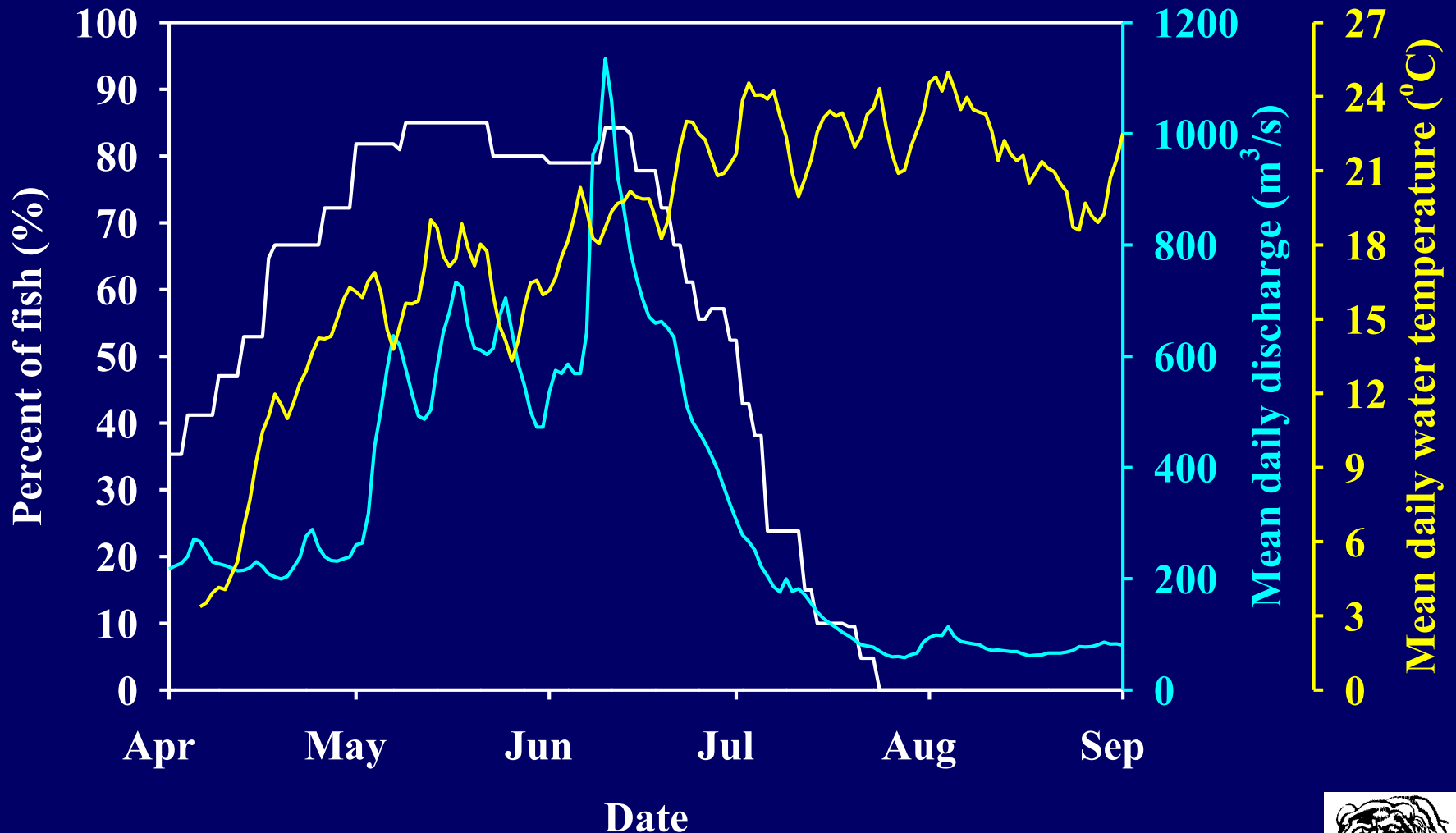
Component 2 – Movements, Migrations, River Use

Pallid Sturgeon Relocations and River Use 2005 - 2009



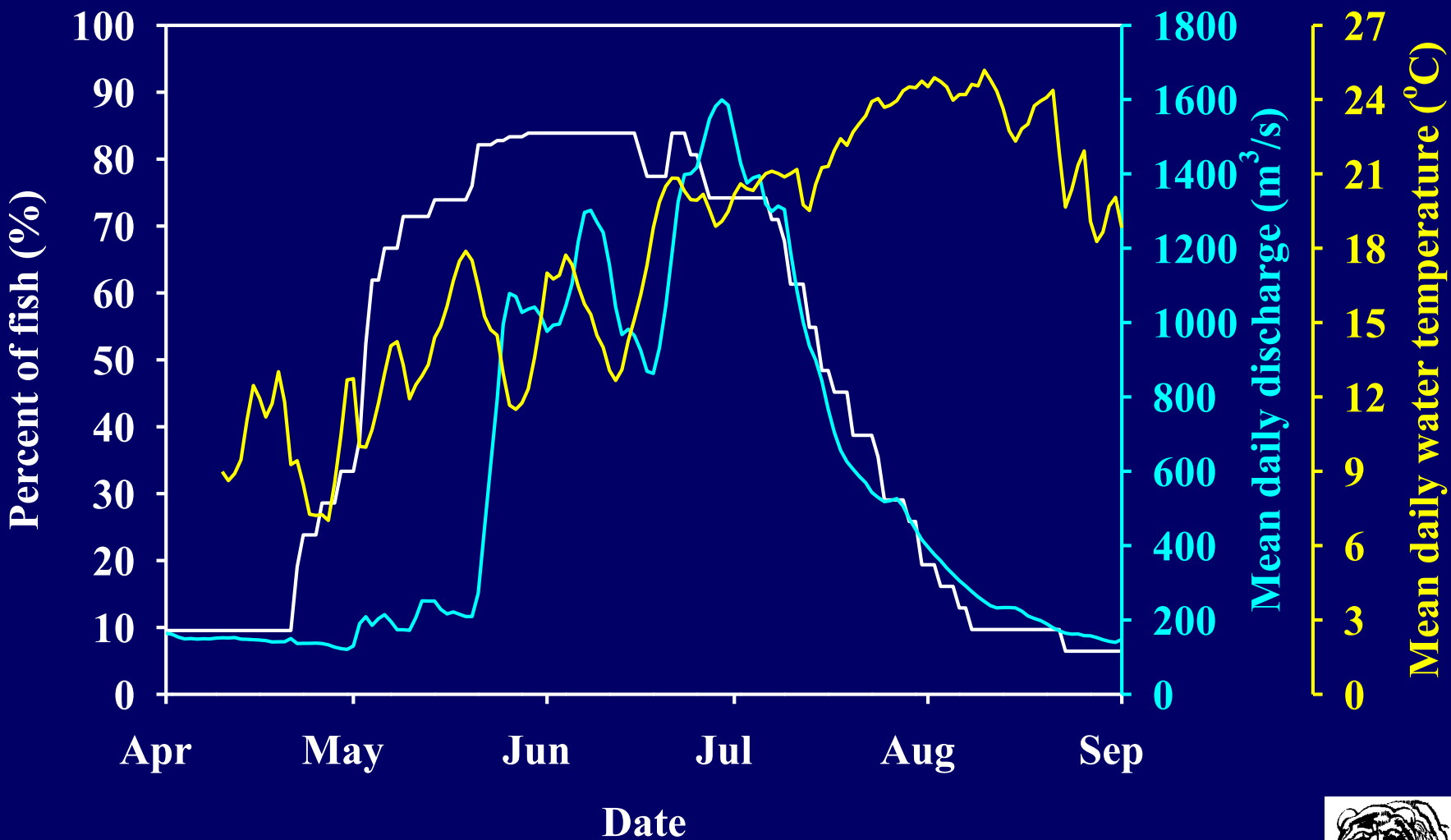
Component 2 – Movements, Migrations, River Use

Pallid Sturgeon Migration - Yellowstone River 2007

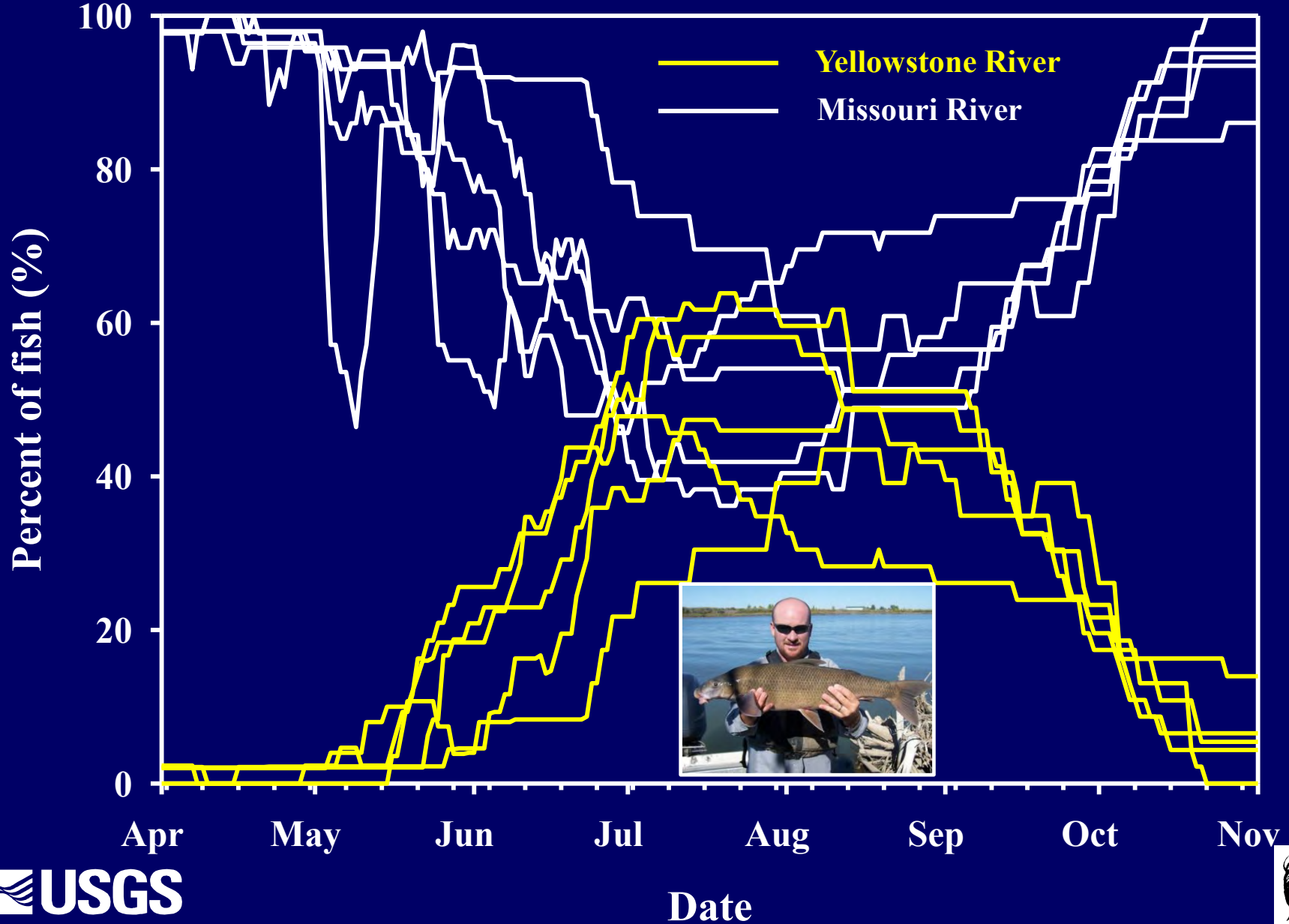


Component 2 – Movements, Migrations, River Use

Pallid Sturgeon Migration - Yellowstone River 2008

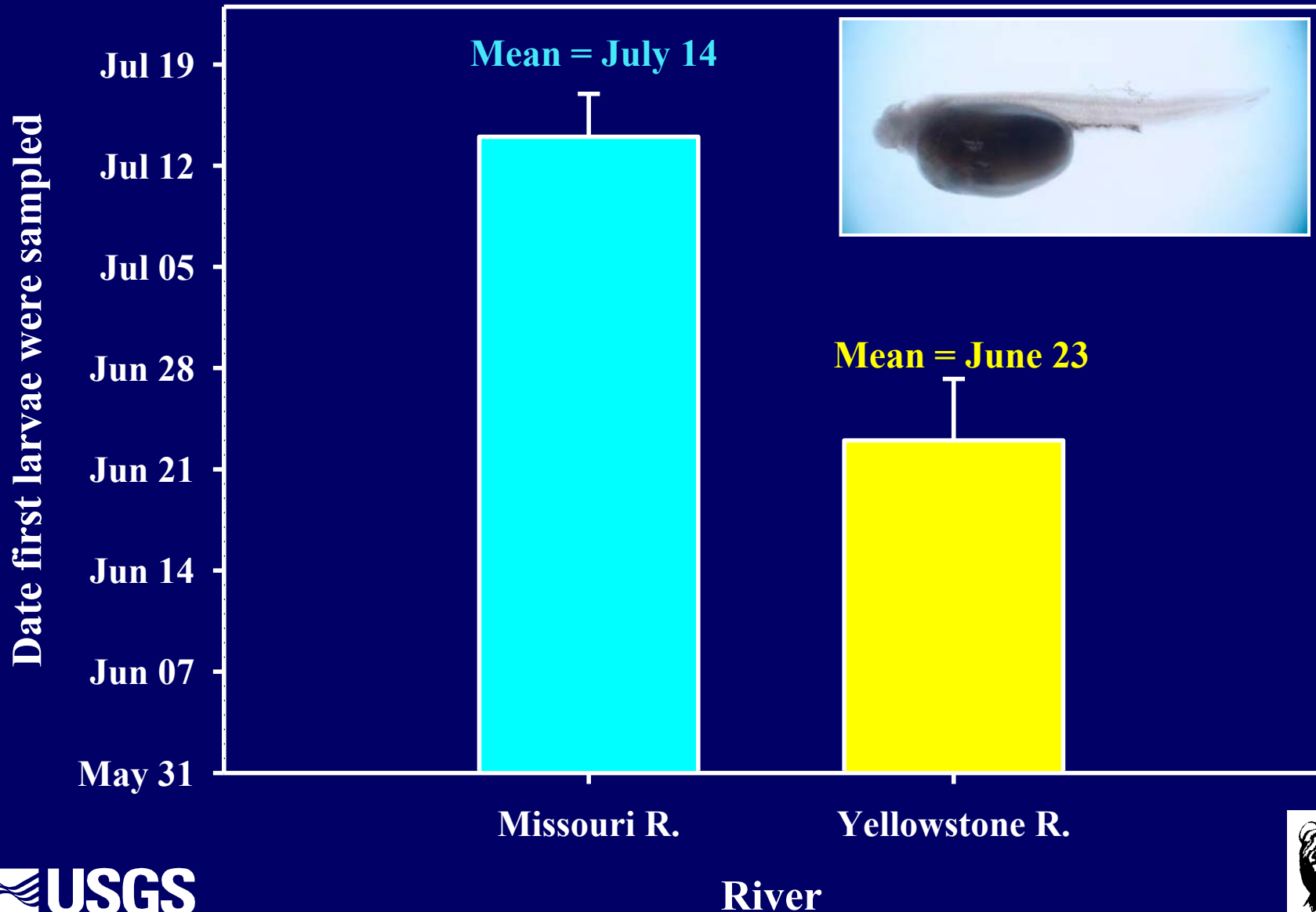


Component 2 – Movements, Migrations, River Use Blue Sucker Relocations and River Use 2005 - 2009



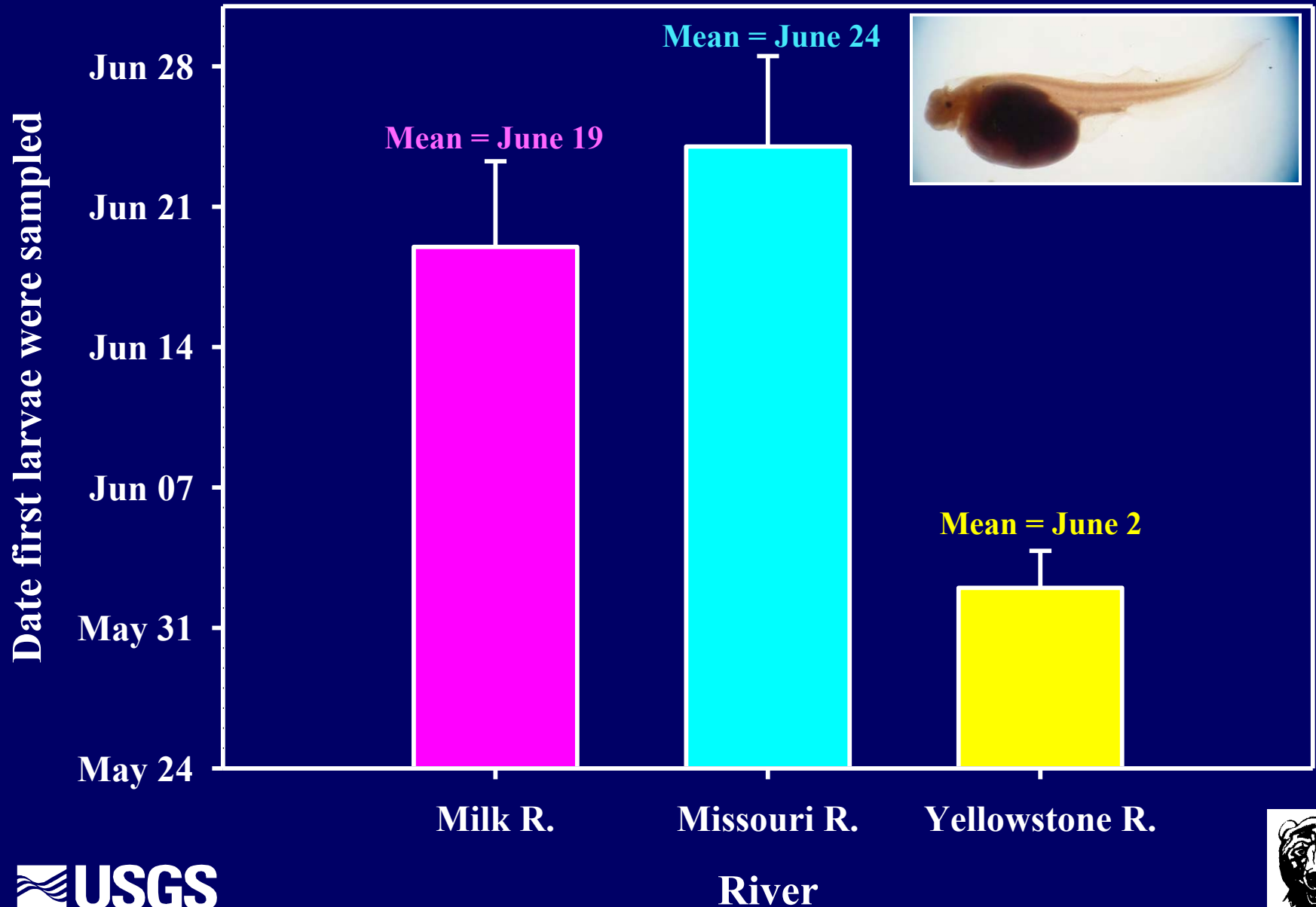
Component 3 – Reproductive Dynamics Based on Larval Fishes

Initial Occurrence of Shovelnose Sturgeon Larvae 2001-2009



Component 3 - Reproductive Dynamics Based on Larval Fishes

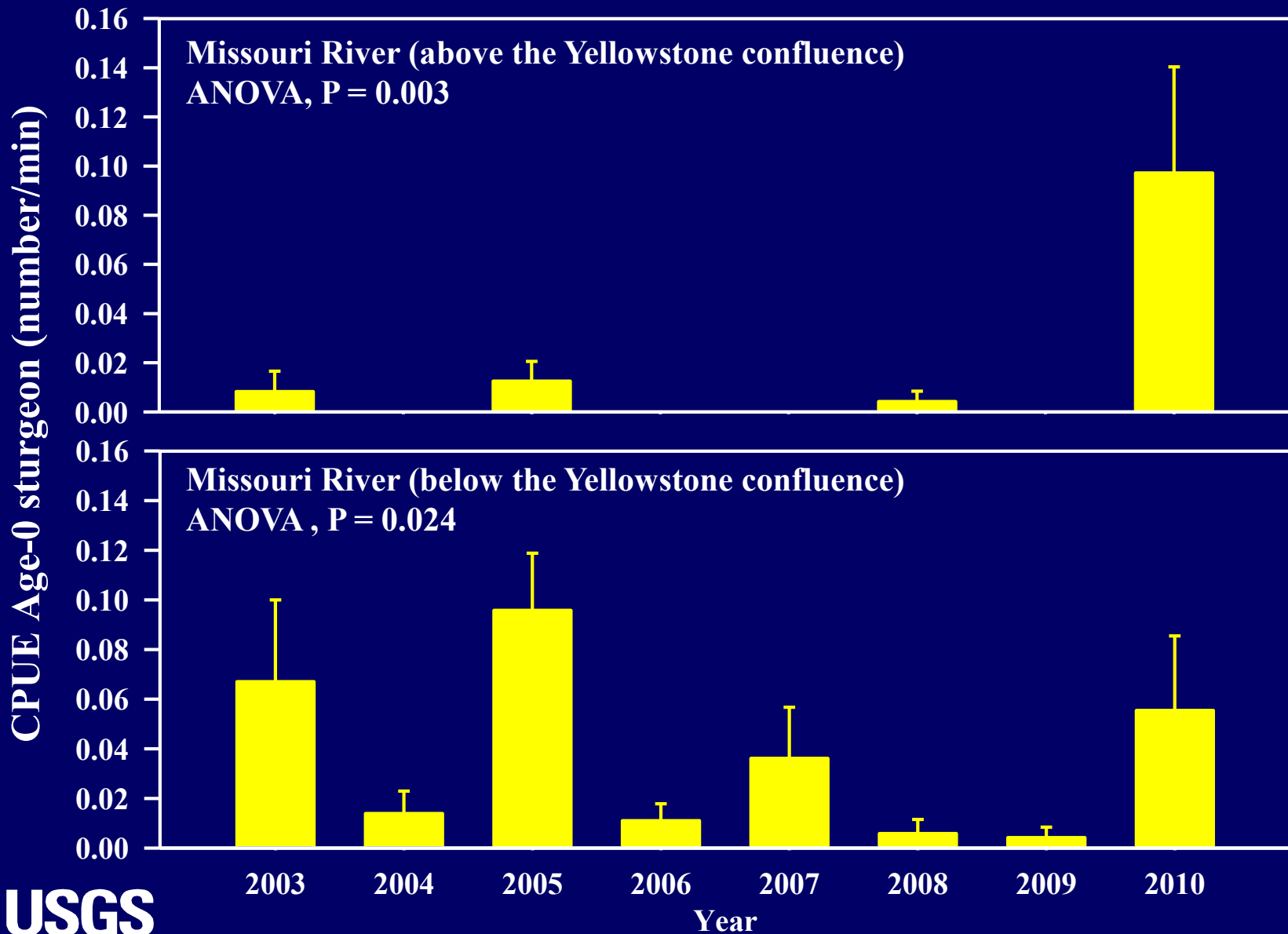
Initial Occurrence of Paddlefish Larvae 2001-2009



Component 4 – Sturgeon Reproduction and Recruitment

No Wild Age-0 Pallid Sturgeon Collected

Recruitment Variability in Shovelnose Sturgeon



Summary and Future Directions

In the absence of experimental releases from Fort Peck Dam to date, the multi-species x multi-component data sets provide a perspective of migrations, reproduction, and recruitment

Limited use of the Missouri River by pallid sturgeon

Lack of (undetectable) spawning and recruitment by pallid sturgeon

Delayed spawning (~ 3 weeks) by Acipenseriformes in the MOR

Variability in spawning and recruitment

Beyond raw data sets, the Fort Peck Flow Modification Project will conclude with analyses and final report (December 2011)

Examine the influence of environmental conditions (e.g., discharge, temperature regimes) on migrations, spawning, and recruitment

2011 - Yellowstone River studies (in collaboration with Montana FWP)

Pallid sturgeon migration pathways, spawning, habitat characteristics



Acknowledgments

**Funding for the Fort Peck Flow Modification Project provided by the
U. S. Army Corps of Engineers**

Additional support

U. S. Geological Survey

Montana Fish, Wildlife & Parks

U. S. Fish and Wildlife Service

North Dakota Game and Fish Department

Volunteers



Component 3 - Reproductive Dynamics Based on Larval Fishes

Catostomid Density in the Missouri River 2001-2009

