Effects of small reservoirs on downstream crayfish communities

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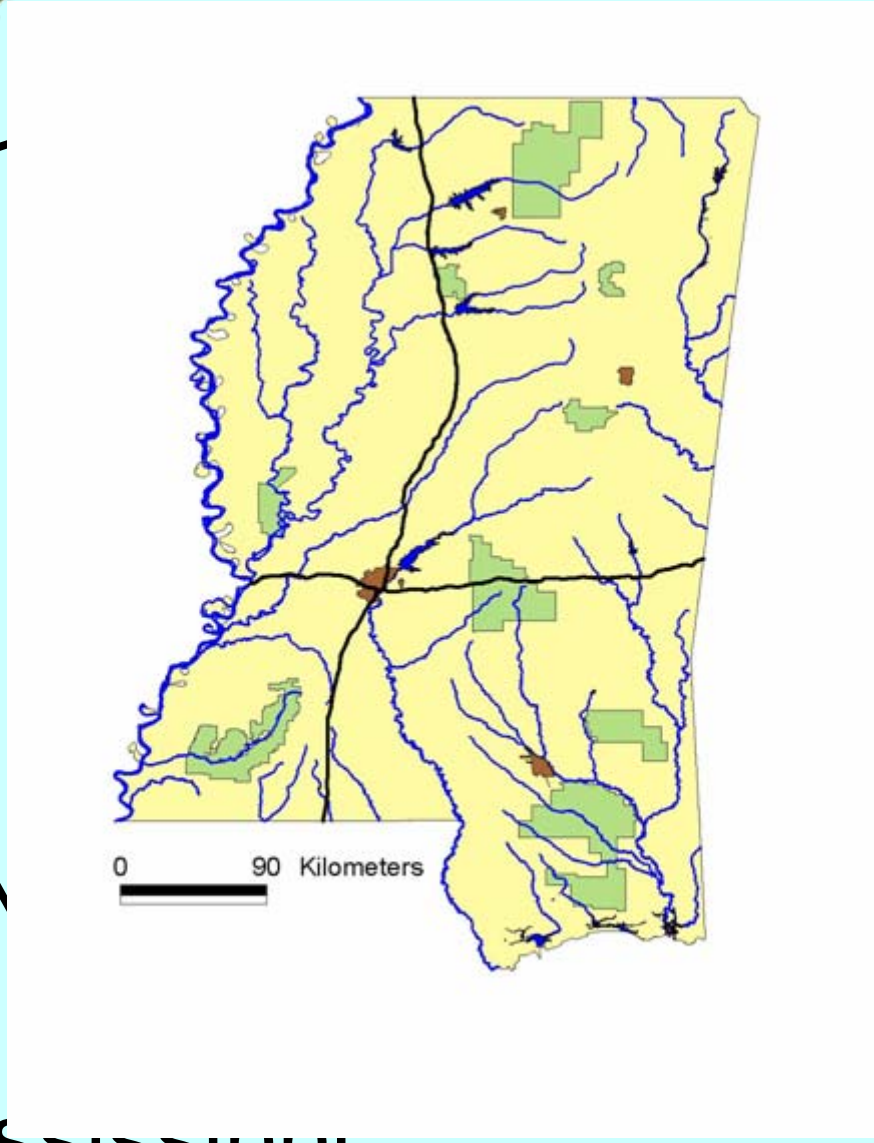
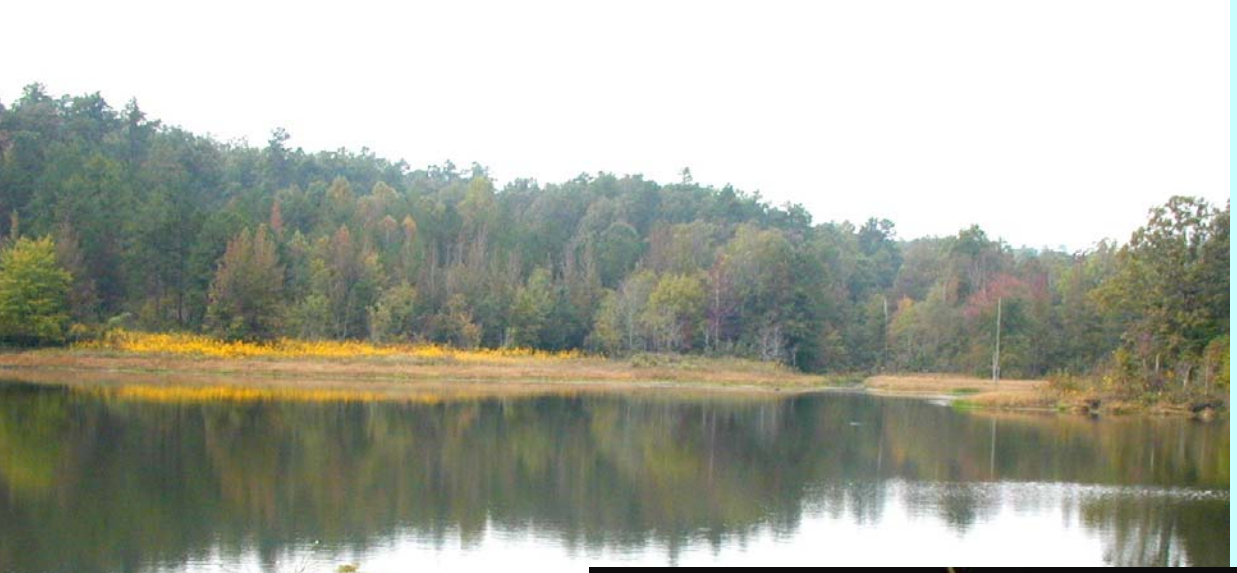
USA



Mississippi

Upstream effects

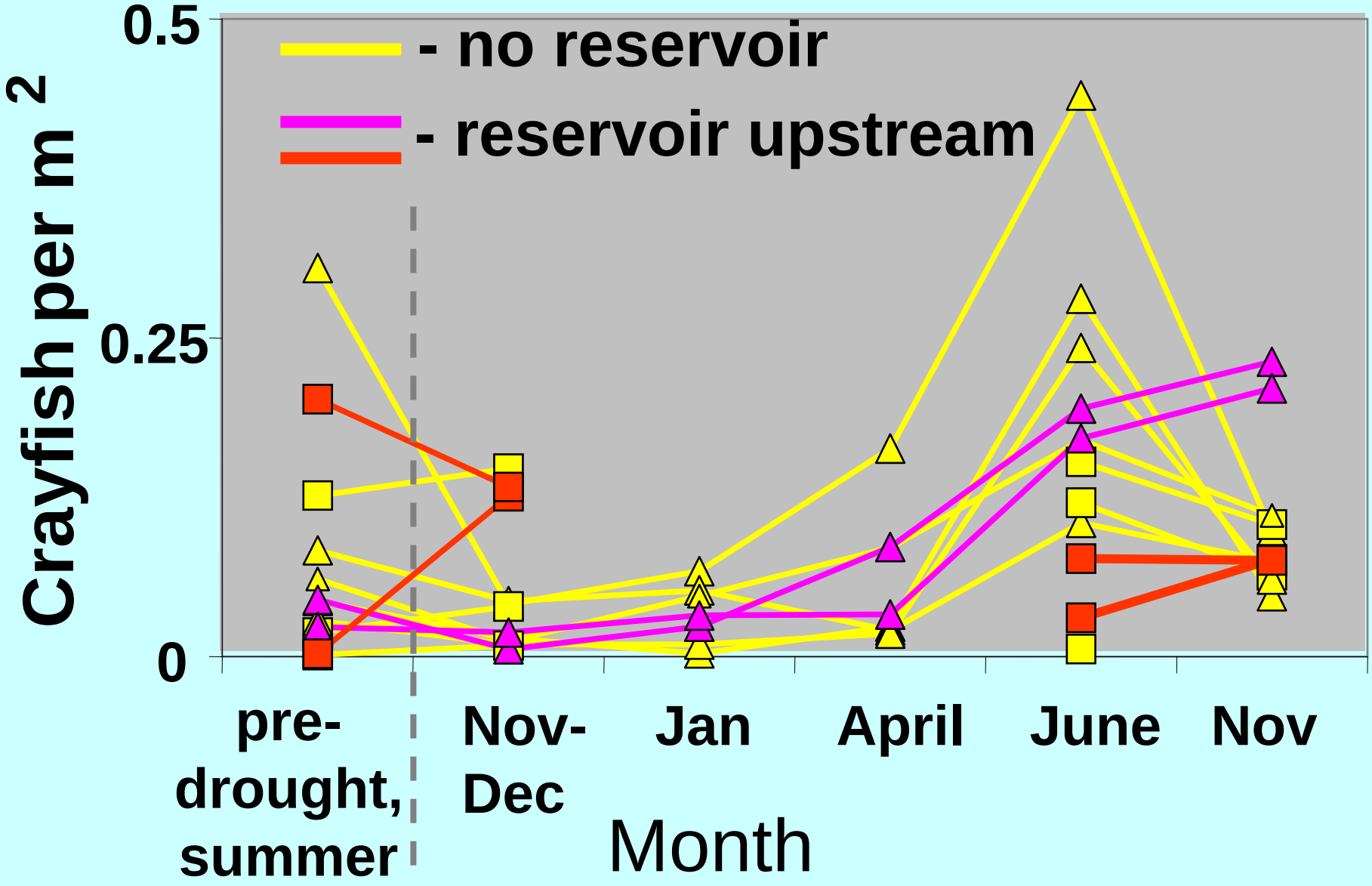
Upstream effects



Downstream effects

Downstream effects

Drought recovery study (Adams & Warren 2005)



Cambarus striatus ?

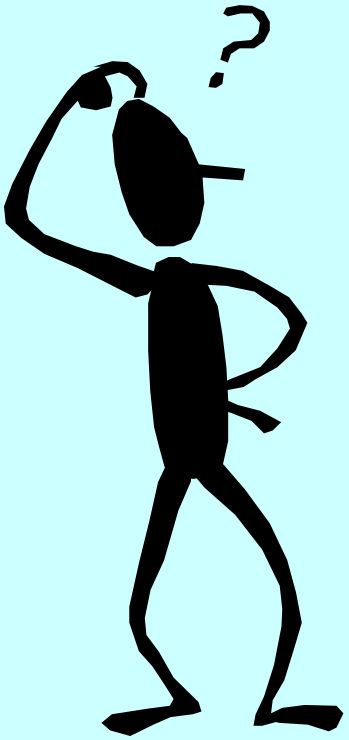
Procambarus hayi

Procambarus ouachitae ?

?

Procambarus vioscai

Orconectes chickasawae



Oxygen

Hydrology

Temperature

?

Predation

Food ?

Behavior / burrowing

Life history timing ?

Study Design

- 8 sites
  - 4 downstream of reservoirs
  - 4 not near reservoirs
- Sites ~160 m long (> 40 x mean width), divided into 4 subreaches

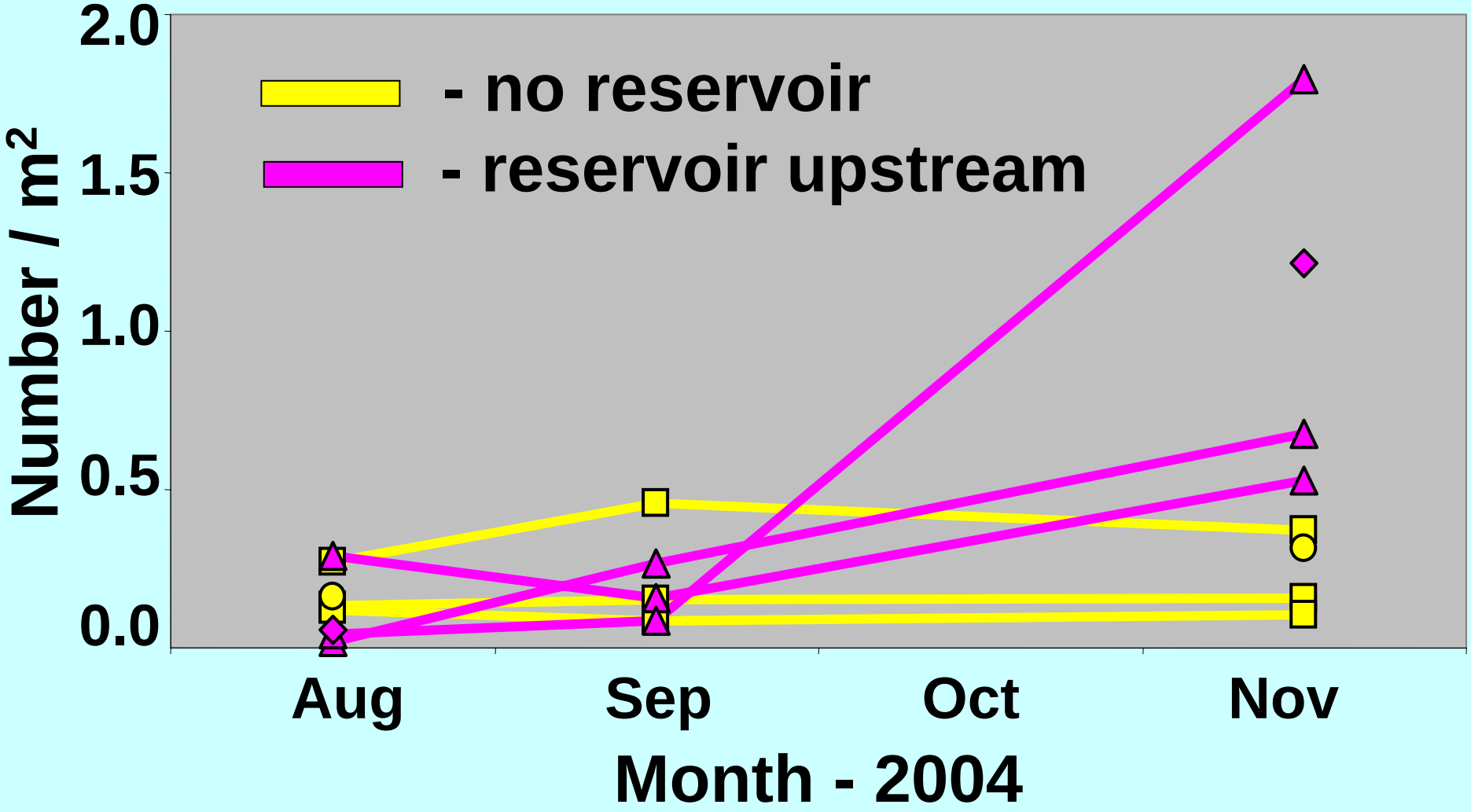
Electrofished 1.7 sec / m^2
(~1100 sec/site)

Seined 4 hauls/sets per subreach
(total = 16)

I.D., measure, release crayfish

Crayfish density

(e-fish + seine)



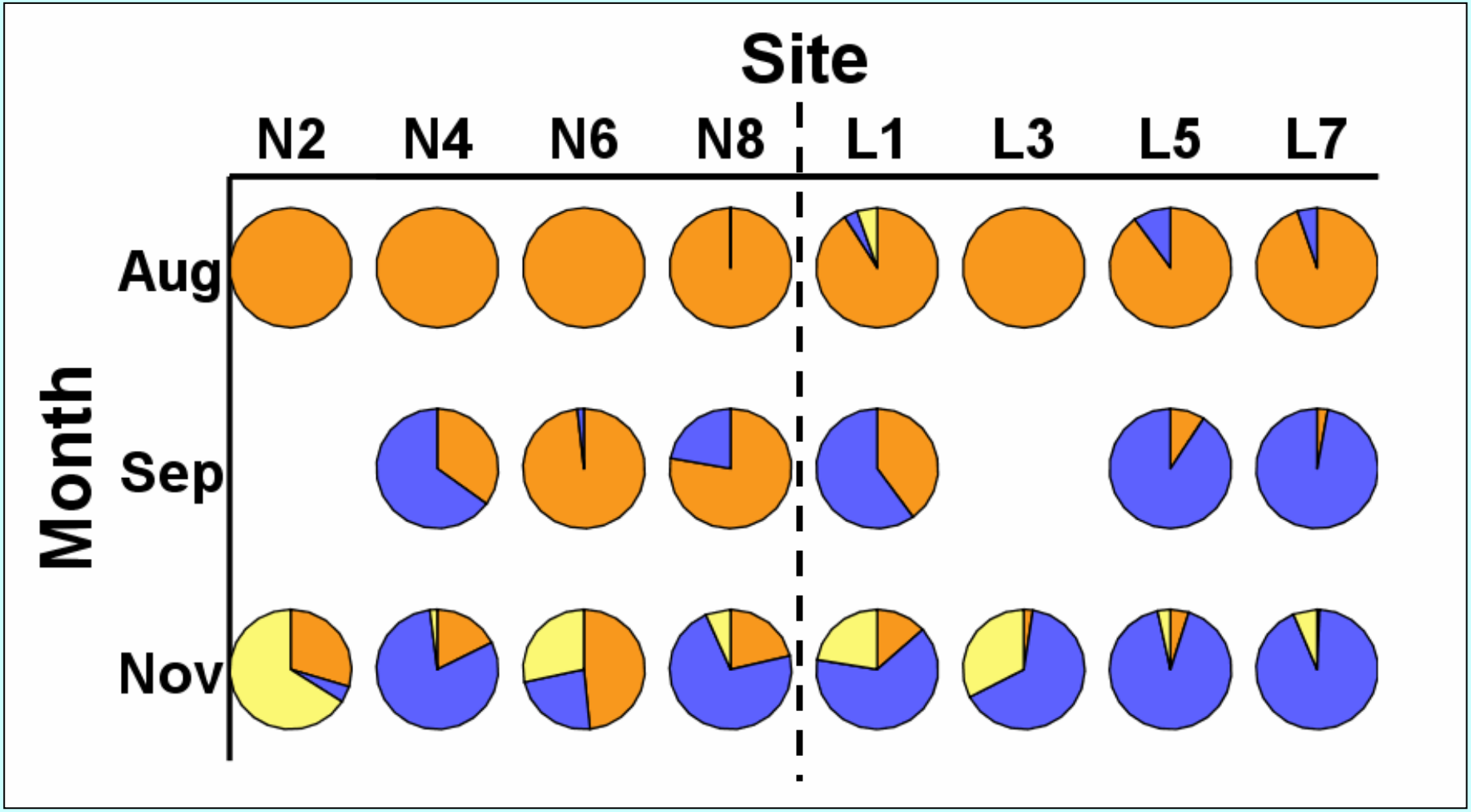
Orconectes chickasawae

Procambarus ouachitae

Procambarus hayi

Cambarus striatus

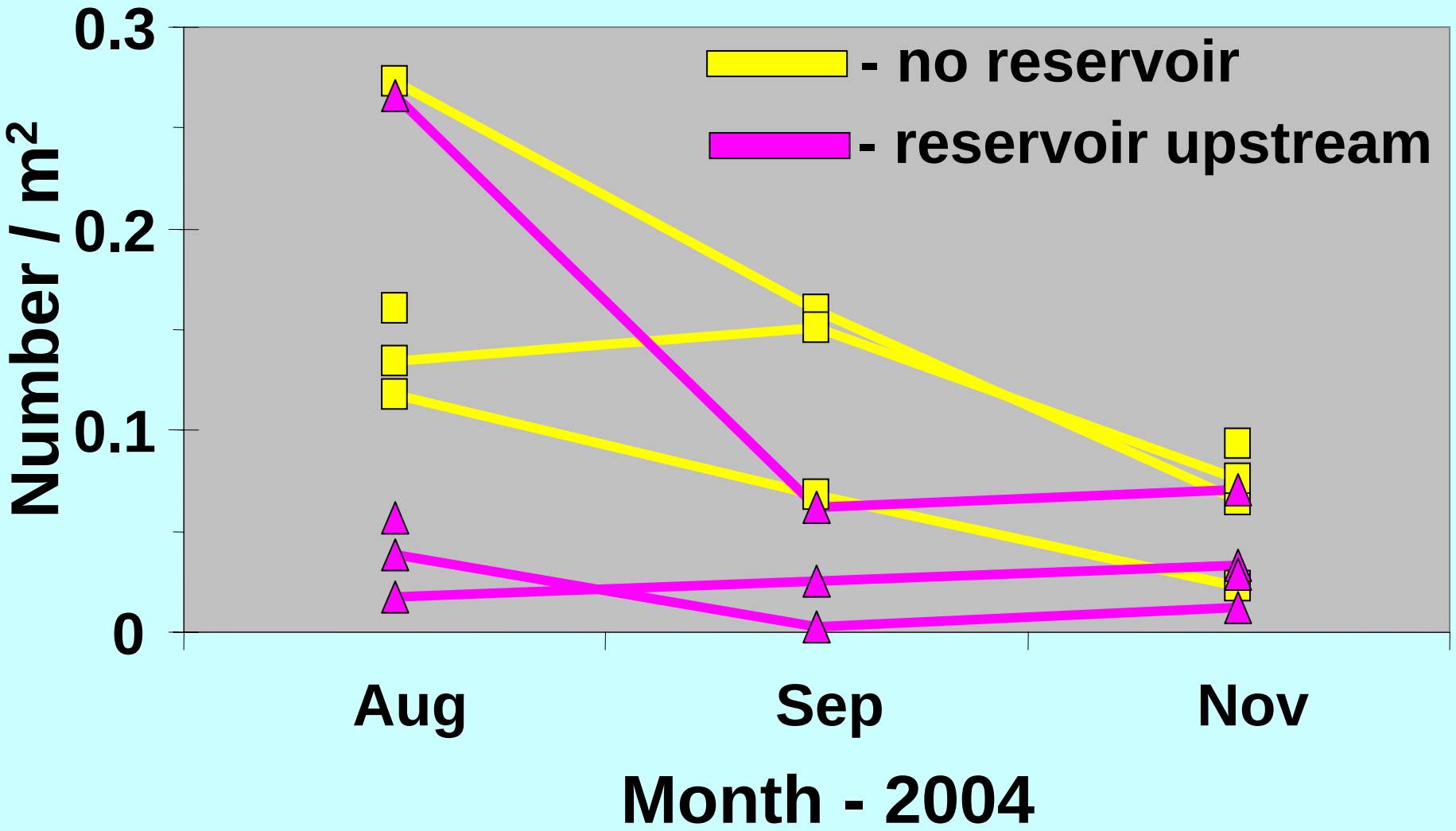
Genus composition



- *Orconectes* - *Procambarus* - *Cambarus*

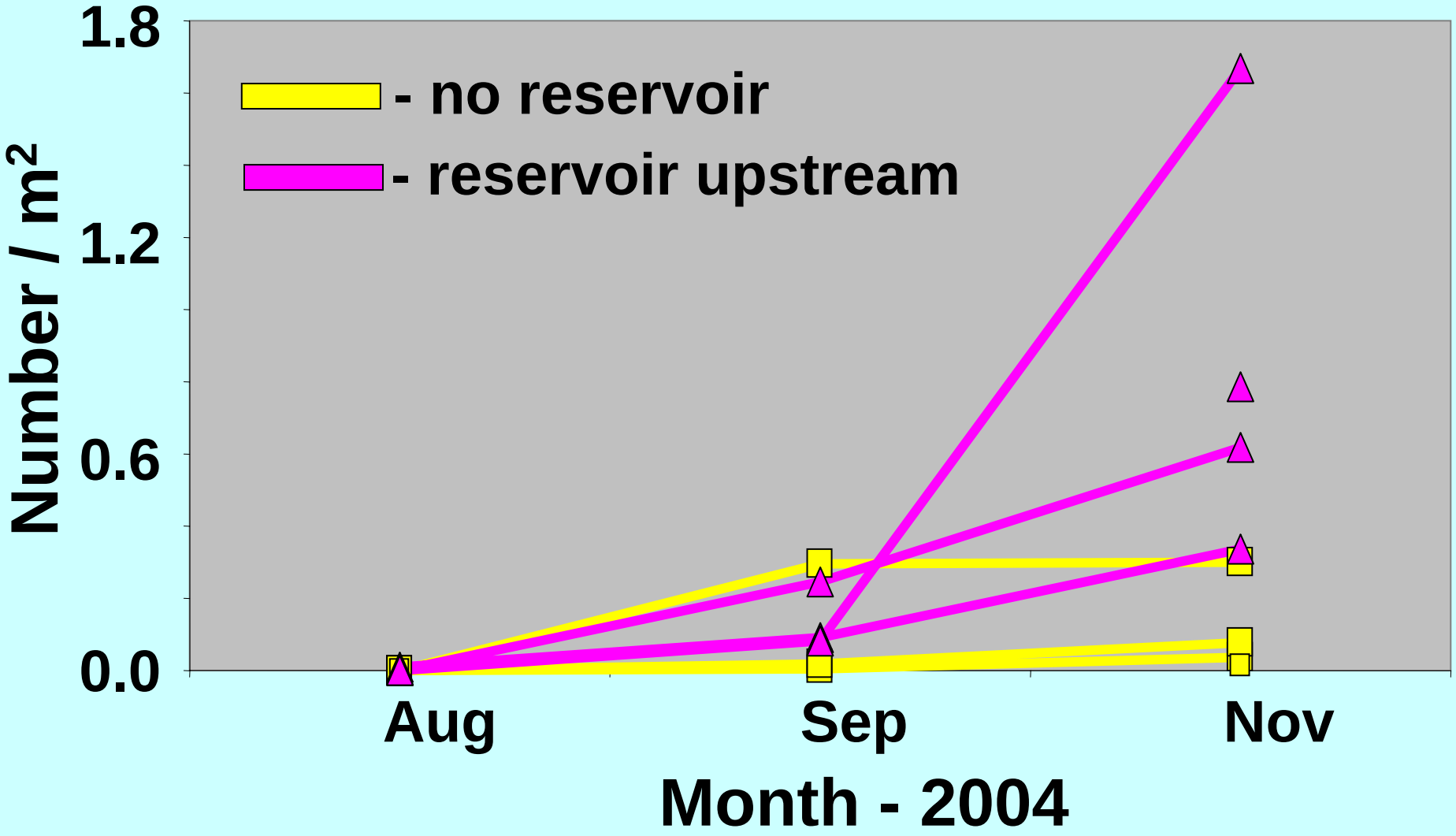
Orconectes density

(e-fish + seine)

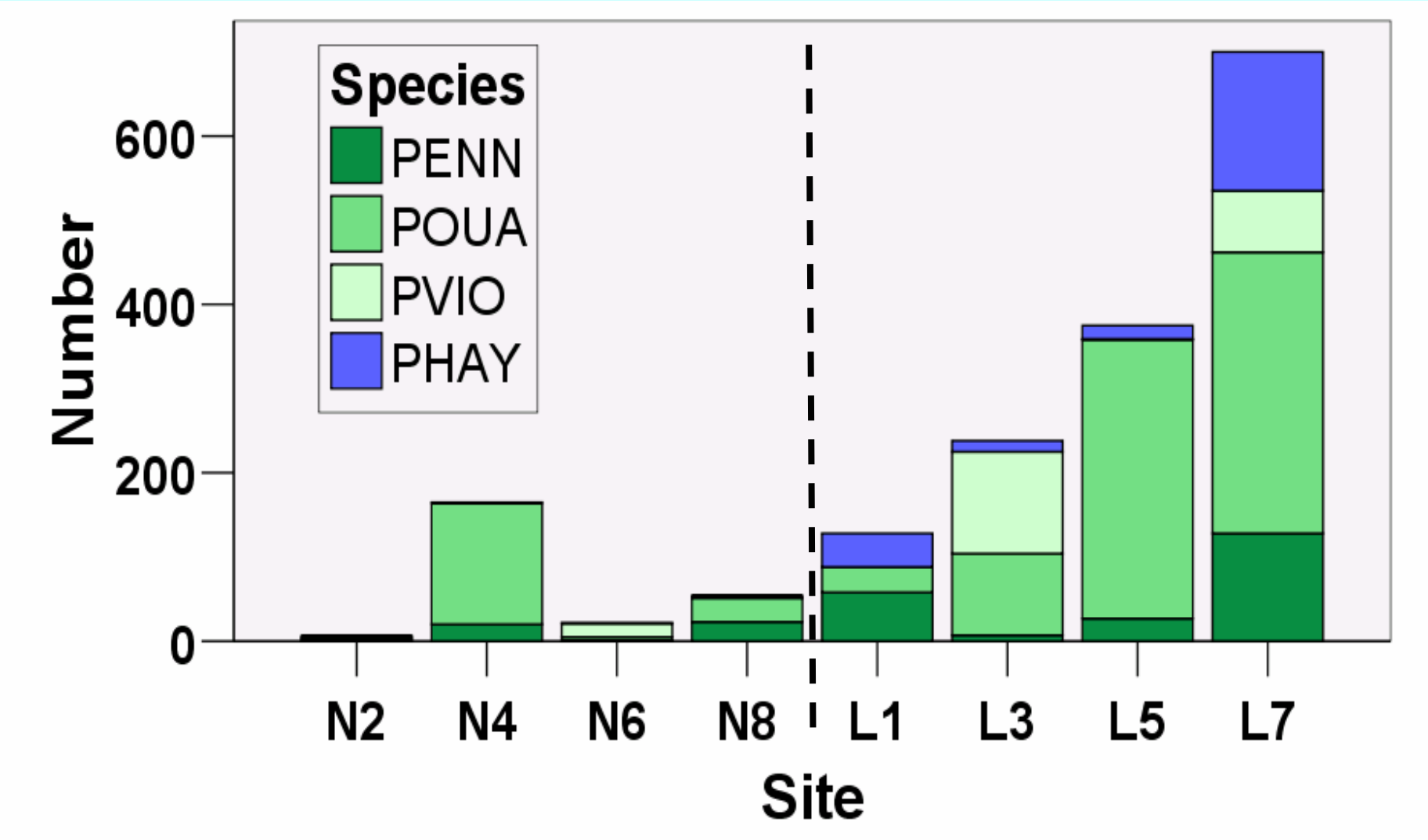


Procambarus density

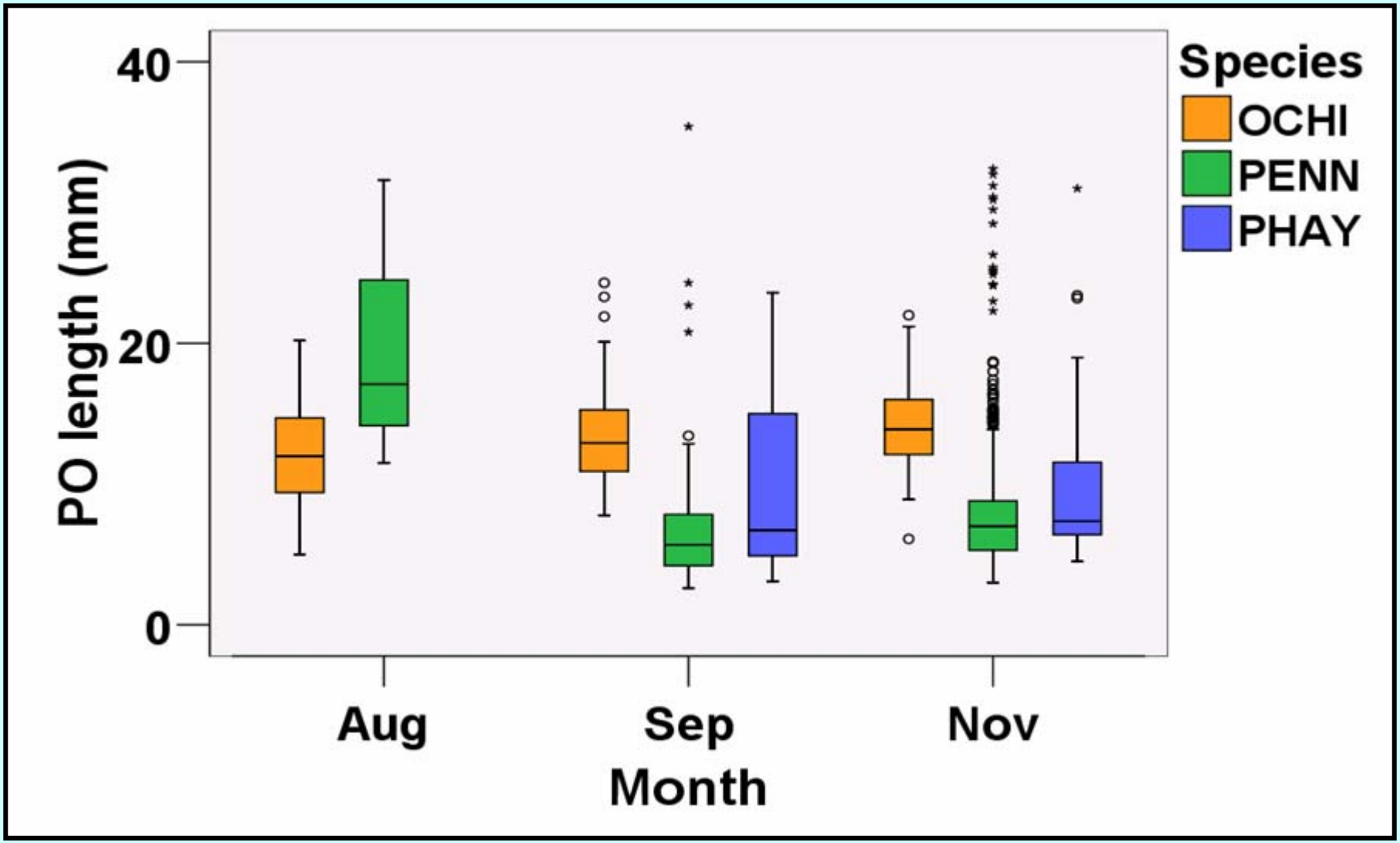
(e-fish + seine)



Procambarus spp. composition-November



Crayfish sizes over time



Physical habitat: P-values

Parameter	Aug	Sep	Nov
Mean monthly H20 temp.	0.36	0.25	0.24
Dissolved oxygen*	**0.04**	**0.03**	**0.09**
Conductivity	0.19	0.75	0.98
pH	0.57	0.51	0.08
Water discharge	0.84	0.87	0.90
Wetted width	0.23	0.62	0.17
Mean thalweg depth	0.19	0.68	0.08
Wet width:thalweg depth	**0.06**	**0.58**	**0.01**

*DO range 3.9 - 8.8 mg/l

Other possible influences

- **Substrate – more clay below reservoirs**
- **Leaf accumulation ↑ below reservoirs**
- **Predators – more below reservoirs??**
- **Nutrient differences**

Cumulative Effects

~142 Lakes.

If effects extend 1 km down- and 1 km upstream of dam, then 284 km of mostly 1st -3rd order streams influenced by small reservoirs in upper LT.

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- **Amy Commens for measuring a zillion tiny crayfish**
- **Chris Taylor, INHS, for general help on crayfish identification.**

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