Status of flathead catfish and Asian swamp eel in the Susquehanna and Delaware River Drainages

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Flathead catfish

Brown, J.J., J. Perillo, T.J. Kwak, and R.J. Horwitz. 2005. Implications of *Pylodictis olivaris* (Flathead Catfish) Introduction into the Delaware and Susquehanna Drainages. Northeastern Naturalist. 12(4):473-484.

Juvenile

Hancock, NY
Narrowsburg, NY
Susquehanna River
Delaware River
Lambertville, NJ
Harrisburg
York Haven Dam
Philadelphia
Gibbsboro, NJ
Conowingo Dam
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image PA Department of Conservation and Natural Resources-PAMAP/USGS
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Range Expansion in the Susquehanna River

- 1991 Speedwell Forge Lake (1 individual) (Brown et al. 2005)
- No other reports until 2002 (Brown et al. 2005)
- 2005 – found in lower and central Susquehanna River, reproducing (Brown et al. 2005)
- 2005 – Downstream of York Haven Dam (PAFBC website)
- 2009 – Dock Street Dam, Harrisburg (PAFBC website)
- 2010 – Current documented range – PA-MD border to Harrisburg(~65 miles), reported at Sunbury

Abundances in the Susquehanna River

(Mike Kaufmann – PAFBC, personal comments)

- No focused monitoring
- York Haven Dam to Holtwood Dam – "High Density"
- Above York Haven Dam – "low density"
  - Flathead passage not high but occurring
- Increased targeting by anglers (various fishing reports)

Range Expansion in the Delaware River Drainage

- 1997 - 1st documented in Blue Marsh Res. (Brown et al. 2005)
- 1999 - 1st documented at Fairmount Dam (Brown et al. 2005)
- 1999 - 1st documented in Lambertville, NJ (NJDFW website)
- 2009 - Current Range (entire mainstem – likely)
  - documented as far north as Narrowsburg, NY in 2009 (Mark Boriek - NJDFW, personal comments)
  - Likely in East and West Branches
  - Not documented or reported below the Delaware State Line (Craig Shirey - DNREC, personal comments)

Fairmount Dam Fishway Video Monitoring (Schuylkill River)

(data provided by Joseph Perillo of the Philadelphia Water Department)

- Fairmount Dam Fishway Video Monitoring

	# of Flatheads	Tot. fish obs.	% of obs.
2004 –	68	6,438	1.0
2005 –	43	8,017	0.5
2006 –	466	16,850	2.8
2007 –	616	18,685	3.3
2008 –		Closed for renovations	
2009 –	1416	36,000	3.9

Indications of low abundance Delaware River (mainstem):

-2001-02 ANSP Catfish Gut survey
-0 collected in 155+ min. of trawling (301C,5W,1B)
-0 collected in 19.3 hrs of boat electrofishing (55C,3W,2B)

-2006-07 ANSP eel survey
-0 collected in >3000 m of stream
10 tribs BP electrofished (9C,1W,13B)

-2007 Rutgers Univ. Catfish study
– 0 collected in 497 hoop nets (553C, 201W, 31B)

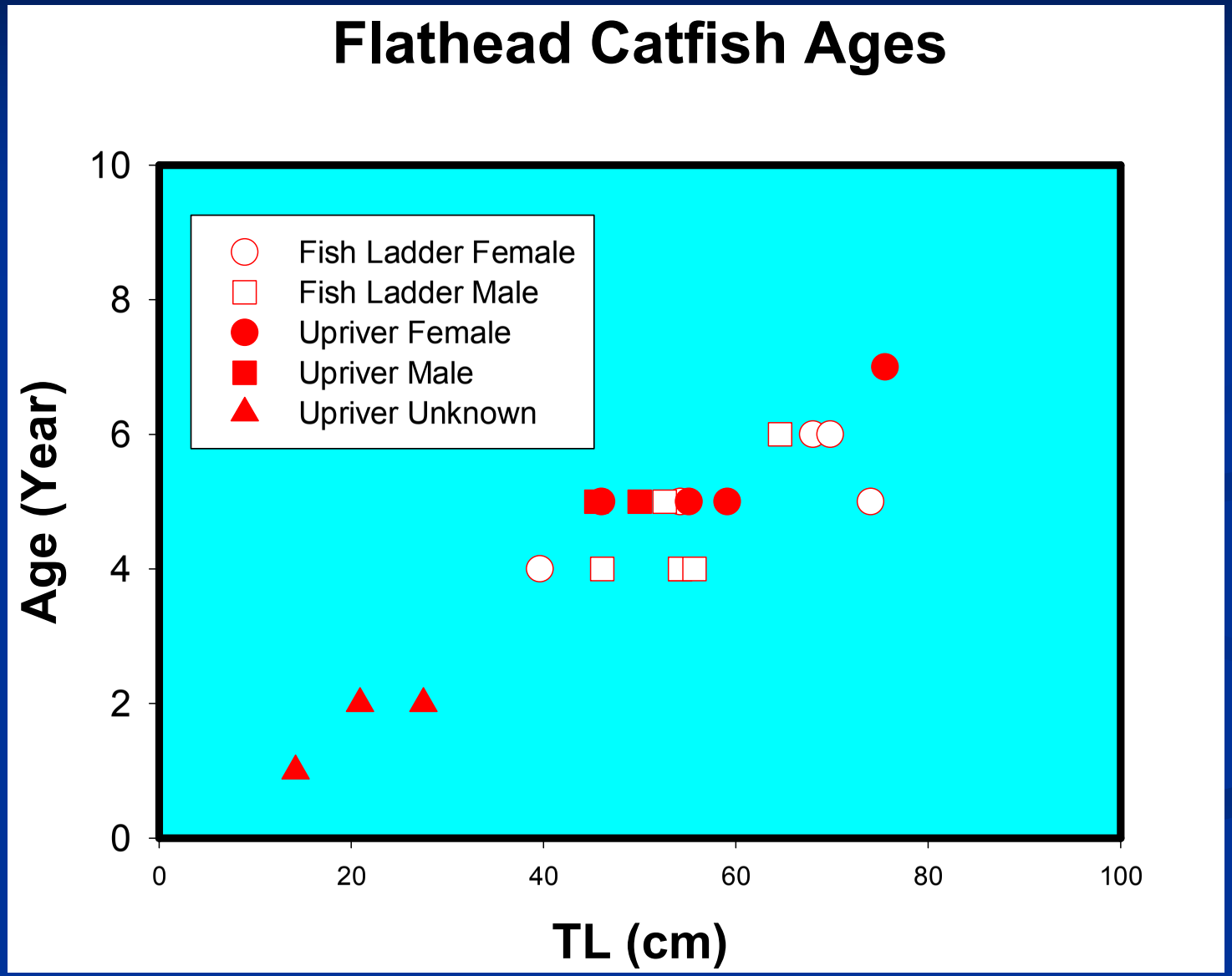
-2009 Consistently higher catch rates among anglers in Lambertville, NJ

-Outside of Schuylkill River and Lambertville, abundances appear low

Drainage comparison

- Susquehanna River
  - Doc. range ~65 mi, lower drainage
  - Targeted by anglers.
  - Seems to be more abundant than in Delaware River
  - Dams slowing expansion, limiting mobility?
- Delaware River
  - Doc. range ~220 mi. of mainstem, almost entire length
  - Minimal targeting by anglers but increasing
  - Less abundant (higher CPUE in impounded Schuylkill River)
  - No dams = free to expand range?
- Perception vs. Actual
  - Less targeted in Delaware River (i.e. may be more abundant than we think)

Schuylkill River (2000-2003)

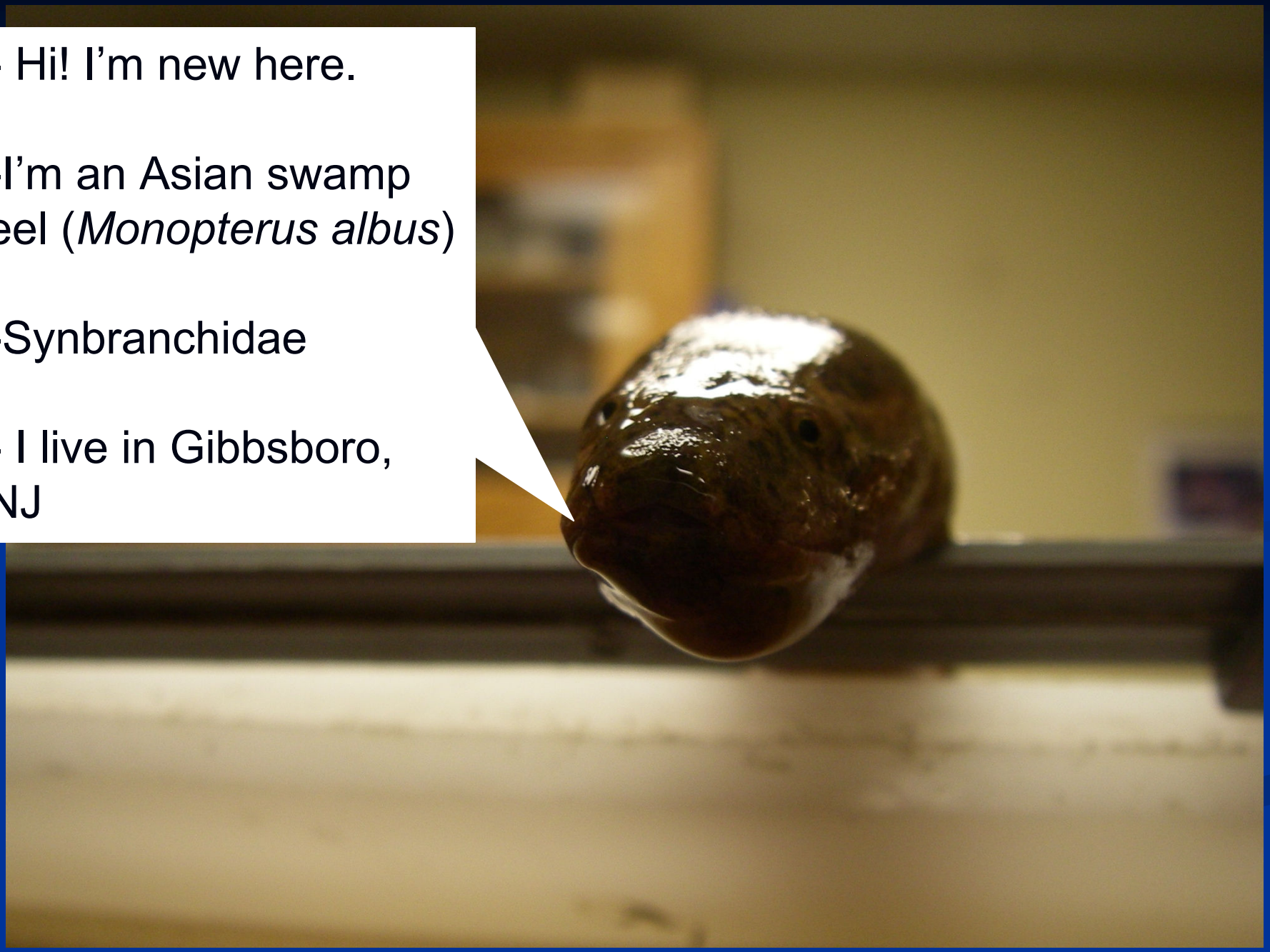


Flathead catfish – Current Work

- Brown et al. 2005 - NO directed work
- 2010 – NO directed work
  - Impacts on shad, trout, sturgeon, American eel?
  - Habitat use, movements, population characteristics?

- Video monitoring
- Fairmount Dam Fishway (Joesph Perillo – PWD, personal comments)
  - Preying on alosines (video and gut content evidence)
- York Haven Dam Fishway

- Since Brown et al. 2005
- increased abundances in Susquehanna and Schuylkill R., expanded ranges, developed following amongst anglers


- Hi! I'm new here.
-I'm an Asian swamp eel (*Monopterus albus*)
-Synbranchidae
- I live in Gibbsboro, NJ

-Hermaphroditic

-Obligate air breather

-Tolerates low DO
(can absorb O^2 via skin)

-Tolerates brackish water

-Burrows in mud

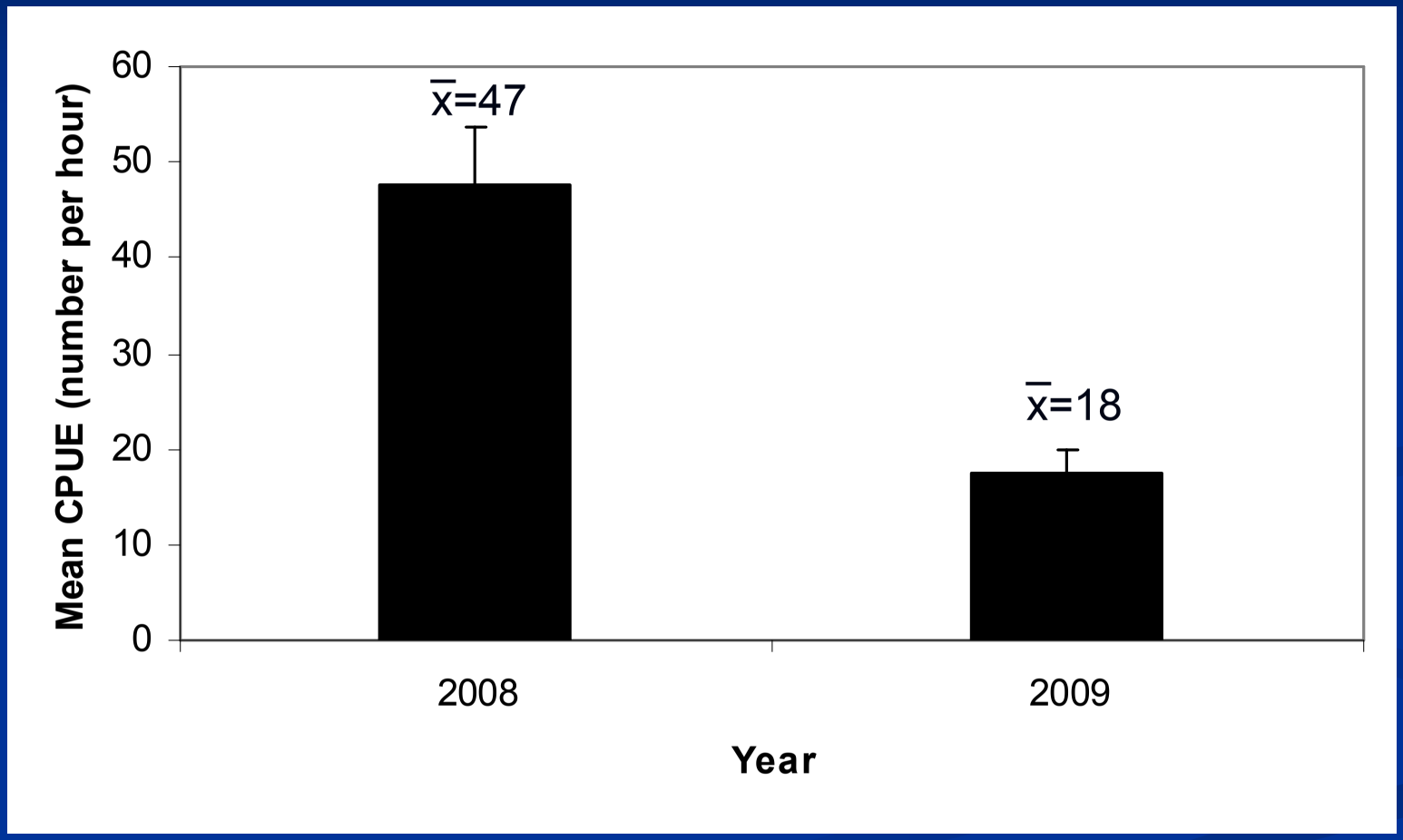
-Rotenone – mixed reviews

Asian swamp eel - History

- 2008 1st documented in Silver Lake, Cooper River drainage
- 2008 - no occurrences in downstream impoundments (9 sampled)
- 2009 continued monitoring
  - evaluated backpack electrofishing
- NJDFW working on removal plan for 2010
  - Not confident in rotenone
  - Range overlaps superfund site
  - Financial issues/man power

Annual Asian swamp eel CPUE

(preliminary data provided by Chris Smith of NJDFW)



Asian swamp eel mean number per hour (CPUE) collected by backpack electrofishing Silver Lake in June, July, and August of 2008 and 2009. Additional sampling in May and November not used in CPUE calculation.

2009 Preliminary Findings

(Chris Smith – NJDFW, personal comments)

- CPUE decreased from 2008 to 2009
- effect on size distribution not determined
- 500+ removed in 2 yrs. (17hrs of sampling over 21 days)
- CPUE decrease corresponded with seasonal cooling
- CPUE along shoreline corresponded to veg. die off (due to herbicide treatment)

Potential impacts of Asian swamp eel

- Known to feed on fish, crayfish, frogs, turtles and invertebrates
- In North America – impact relatively unknown

Control invasives or conserve natives?

- Freshwater Protected Areas
  - Identify areas with rare species and high native diversity
  - Promote/manage for natives
  - Remove non-natives (e.g., carp & black bass)
  - Consideration for dam removal
  - Examples:
    - Yellowstone National Park – total fish removal and seed native cutthroat trout
    - Delaware – Frostburg State Univ. relocating bass from ponds with blackbanded sunfish
  - PA candidates: headwaters, National Park Lands, drainages with natural or man-made impediments

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- Joseph Perillo (PWD)
- Mike Kaufmann (PAFBC)