DYNAMICS AND ROLE OF BLUE CATFISH IN VIRGINIA'S TIDAL RIVERS

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PROJECT UPDATE

April – September 2013 (HF & LF electrofishing)

- 4,983 BCF in the James, Pamunkey, Mattaponi, and Rappahannock rivers

- 183 sites along hundreds of kilometers of VA's tidal rivers, ranging from tidal fresh to mesohaline waters.

- April/May James River fall line sampling
  - *Alosines* regularly congregate here in the spring (Alan Weaver, VDGIF, personal communication)
  - Diets extracted from 226 BCF/FHCF

PROJECT UPDATE

Two diel feeding chronologies were conducted during August & September

Elliot and Persson (1978) model

- Omnivorous fish (Héroux and Magnan 1996)
- Works well in the field, particularly with intervals ≤ 3 h (Cochran and Adelman 1982; Kwak et al. 1992)

Estimate gastric evacuation rates & daily ration

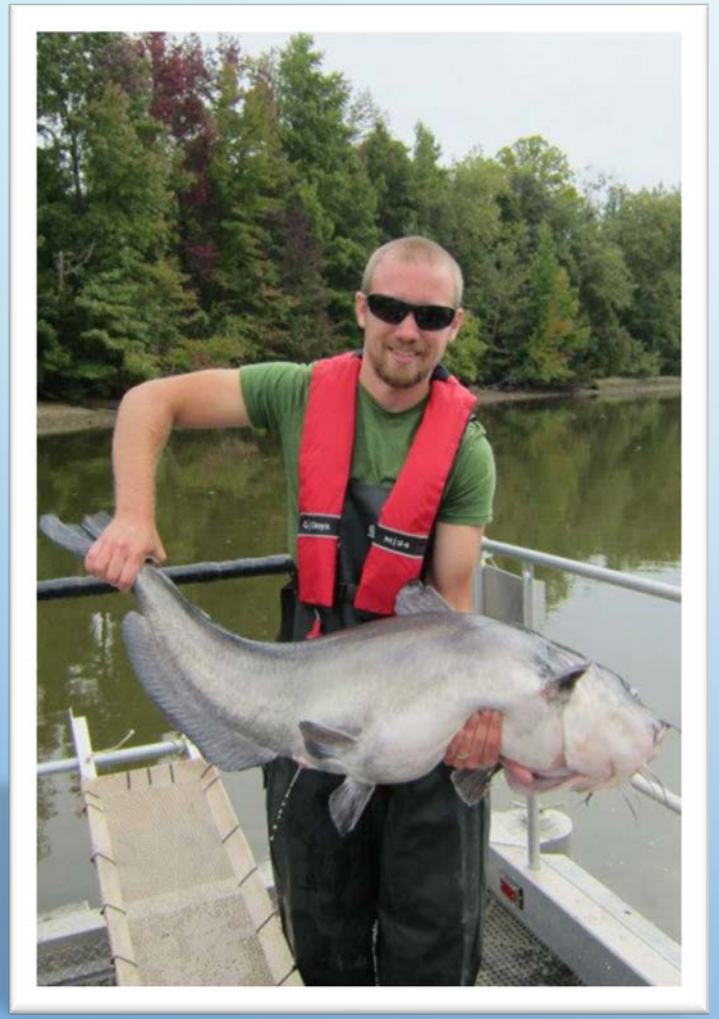
LAB UPDATE

In the lab, nearly 50% of our stomachs have been processed.

Diet content analysis will continue over the winter months

Sequencing of unidentified fish remains will commence this spring

WINTER FOOD HABITS?



Limited information on BCF diet during the winter

In native range, BCF more piscivorous during winter (Edds et al. 2002)

VIMS collected blue catfish stomachs during the juvenile fish survey, but only 70 – 300 mm FL blue catfish were vulnerable to the gear (Schloesser et al. 2011)

Winter sampling difficult due to EF gear limitations (Bodine and Shoup 2010)

WINTER FOOD HABITS IN VA

What are BCF eating during the winter? Particularly medium to large fish (400-1200 mm FL)?

How does diet change along the salinity gradient?

BCF sampling will continue during the winter using HF electrofishing and trotlines

- Trotlines may target actively feeding fish, so # of stomachs will be ignored
- Short soaks of 3 h or less should minimize unnecessary regurgitation

FUTURE RESEARCH

Laboratory estimates of gastric evacuation rates will begin this winter

Explore the effects of the following on gastric evacuation rates:

- Predator size
- Prey type
- Temperature

These variables have been shown to account for most of the variance in gastric evac. rates

(Jones1974; Macdonald et al. 1982; Hopkins and Larson 1990; Bromley 1991; Bromley 1994; Andersen 1999, Andersen 2001; Temming and Herrmann 2003)

Rates will be compared to field estimates and used to derive temperature-specific daily ration, which will be used to inform our consumption model

FUTURE RESEARCH

April – September 2014
BCF sampling will continue using our stratified random design

We will explore BCF selectivity (Chesson 1978) during the April/May

Are BCF actively selecting for *Alosines*, or are they feeding on them in proportion to their abundance in the environment?

See methods of Baumann and Kwak (2011)

FUTURE RESEARCH

Additional 24-h feeding chronologies

-differences by season

-differences by river

Winter trotline and HF electrofishing sampling will continue

“opportunistically” extract diet contents from flathead and white catfish

Explore niche overlap between blue and white catfish

CURRENT

- Introduced into coastal rivers of Virginia in 1970s and 1980s.
- Become well established.
- Previous research:
  - Demographic analysis. (e.g. Fisher et al. 1999; Goeckler 2003; Mauck 2004; Holley et al. 2009; Greenlee and Lim 2011)
  - Genetic analysis (e.g. Higgins 2002)
  - Diet analysis (e.g. Brown and Dendy 1961; Eggleton and Schramm 2004; Schloesser et al. 2011)
- The spatial and temporal features of blue catfish are still not clearly understood

DATA AVAILABILITY

- Low-frequency (15 pulses/s) electrofishing survey data for blue catfish provided by VDGIF (2001-2011)
- High-frequency (120 pulses/s) electrofishing survey data for fish communities by VDGIF (1996-2011)
- Juvenile trawl survey from VIMS (1981-2012)
- *Diet composition data by Joseph Schmitt and Jason Emmel (2012-)

PROJECT PLAN

- develop applicable models to standardize the catch rate of blue catfish in James, Pamunkey, Mattaponi, and Rappahannock rivers

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- develop length-structured model with spatial and temporal variance to investigate the vital rates in blue catfish life history
- apply multi-species models to analyze the impact of a range of management strategies to provide recommendations for population control of blue catfish.

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