

**Ecology and management of channel catfish
Ictalurus punctatus and flathead catfish
Pylodictis olivaris in the Middle Missouri
River, NE**

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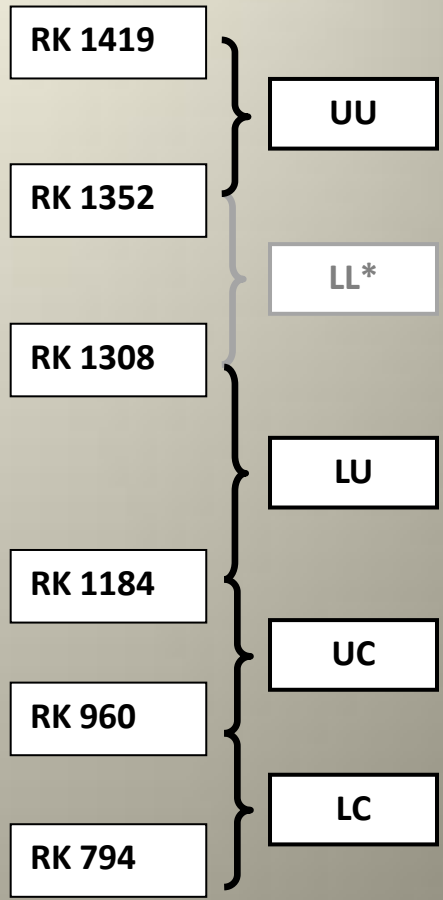
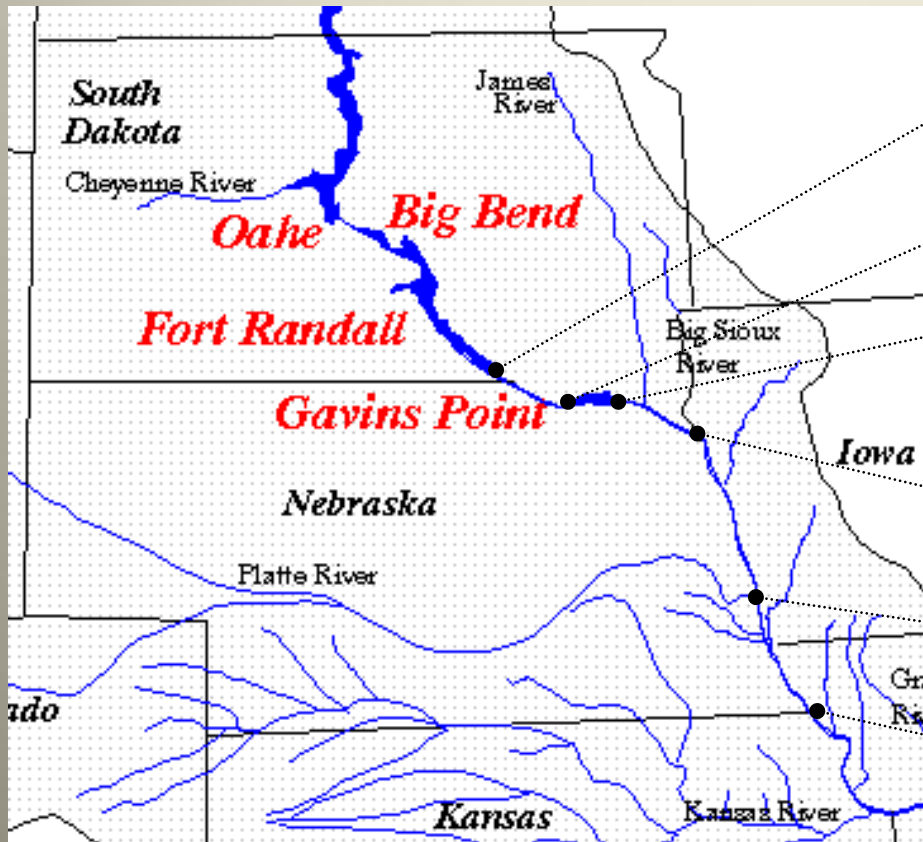
Purpose & Objectives

- Gain an understanding of catfish population dynamics to facilitate sportfish management in the Missouri River System
 1. Determine the present status of channel catfish (CNCF) and flathead catfish (FHCF) populations in the Middle Missouri River
 2. Determine importance of tributaries to CNCF and FHCF populations in the Missouri River

Research Questions

- Determine the present status of CNCF and FHCF populations in the Middle Missouri River (MMR)
 1. Are there differences in abundance, size-structure, mortality, growth-rates, and condition, of CNCF and FHCF populations between study segments of the MMR?
 2. Do habitat restoration efforts (bend modifications) have an effect on CNCF and/or FHCF populations?
 3. What are the estimated population sizes of CNCF and FHCF in the four study segments of the MMR?

Study Area

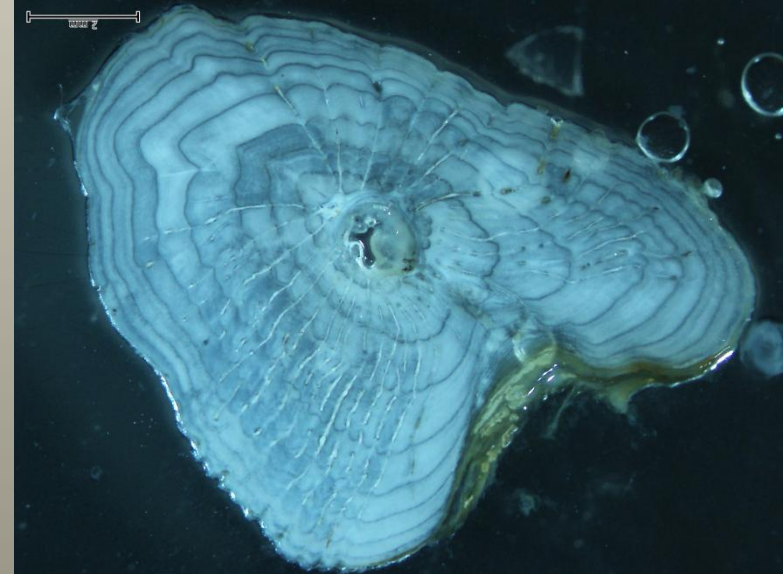


Methods

- Twelve randomly selected river bends within each segment
 1. Six bends: 8 runs - 15 Hz pulsed DC electrofishing (EF)
 - Four runs inside bend (ISB)
 - Four runs outside bend (OSB)
 2. Six bends: 8 – 25 mm mesh hoop-nets (SHN), 2 – 7 mm mesh hoop-nets (MHN) baited with scrap cheese
 - Five nets ISB: 4 – SHN, 1 - MHN
 - Five nets OSB: 4 – SHN, 1 - MHN

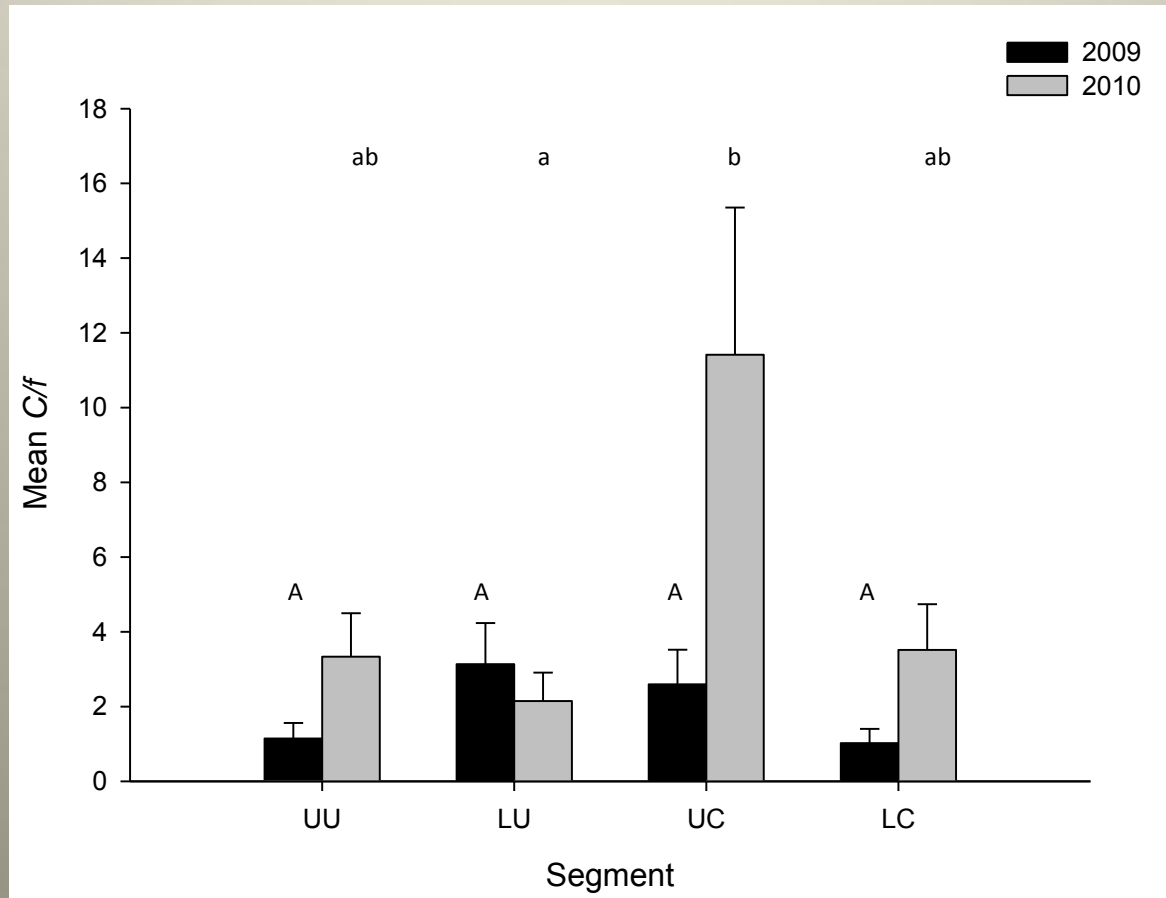
Methods

- All CNCF & FHCF measured (TL – mm) and weighed (g)
- CNCF & FHCF > 200 mm marked with t-bar tag (Floy) and adipose fin clip
- Left pectoral spine removed from subsample for age & growth



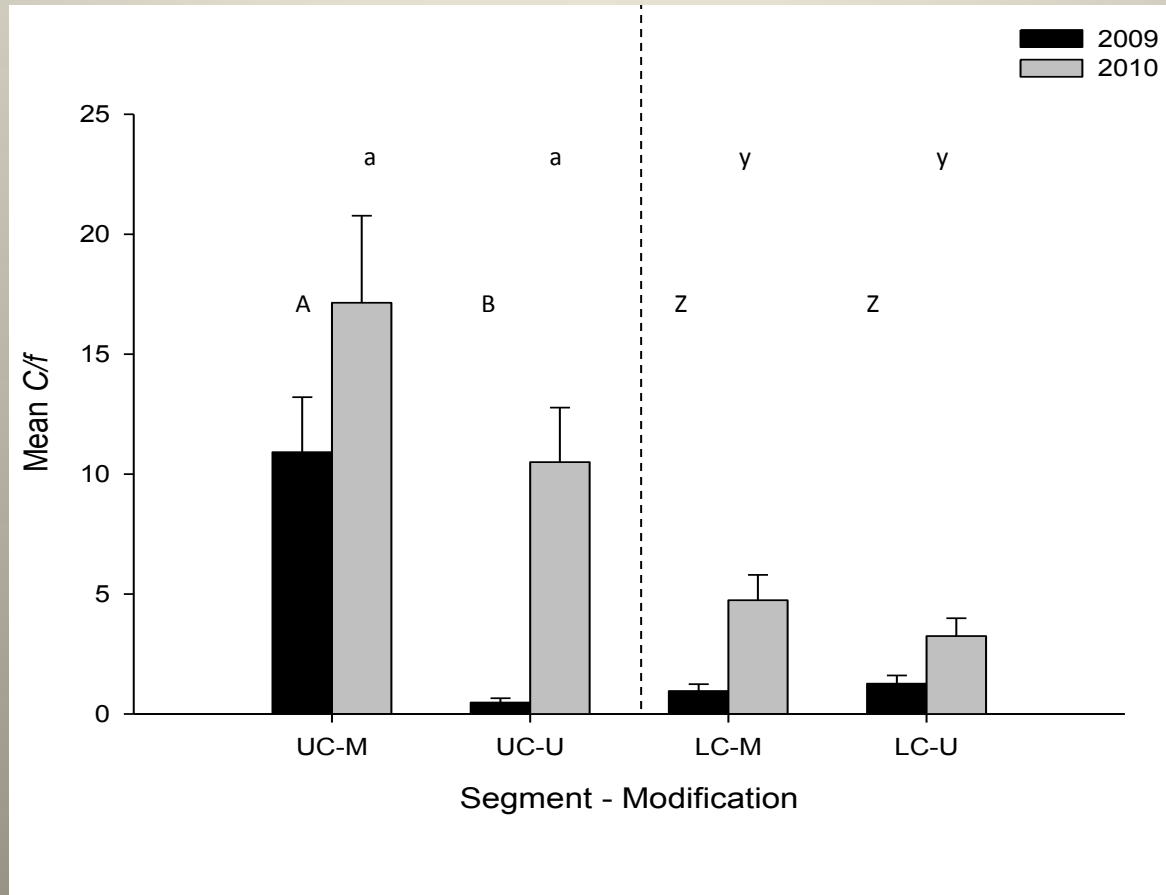
Results

CNCF Relative Abundance (C/f)



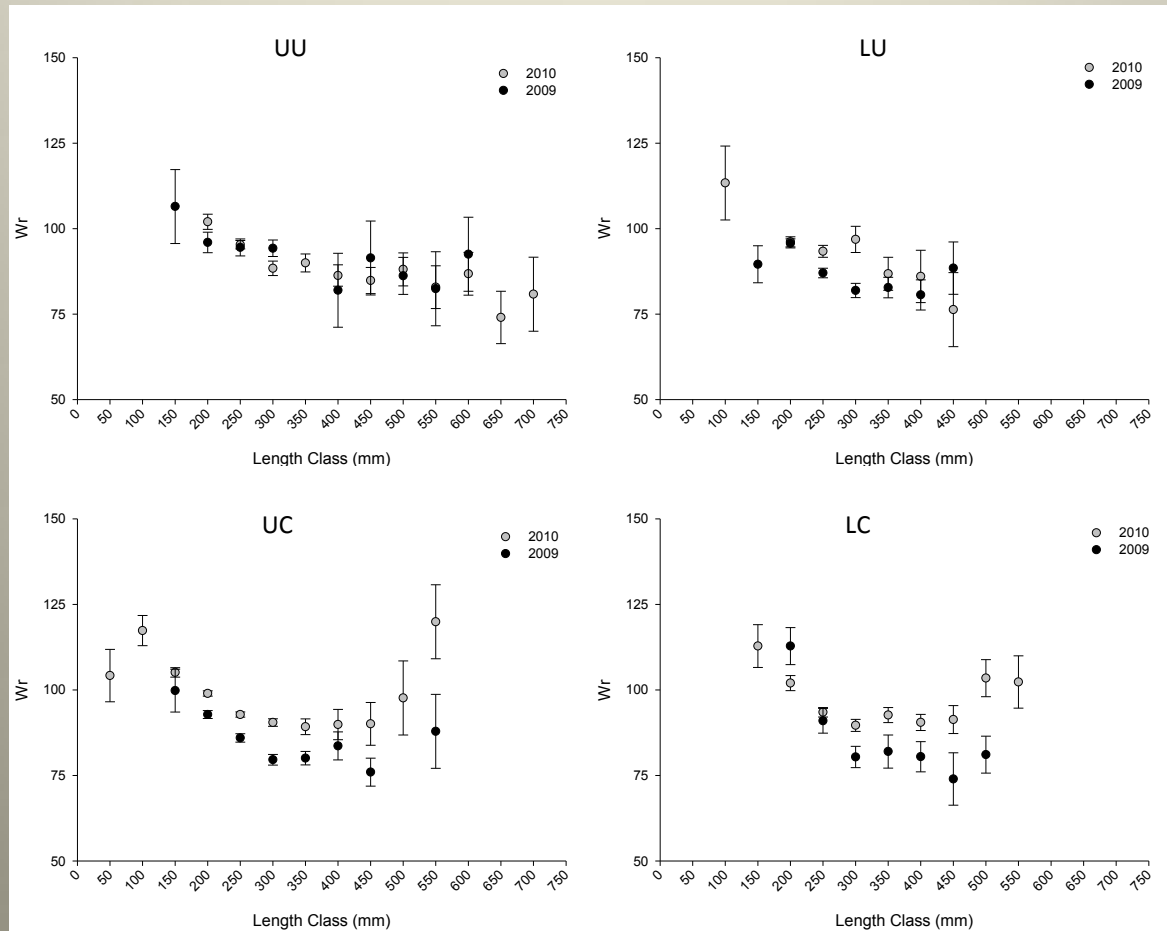
Results

CNCF Relative Abundance (C/f)



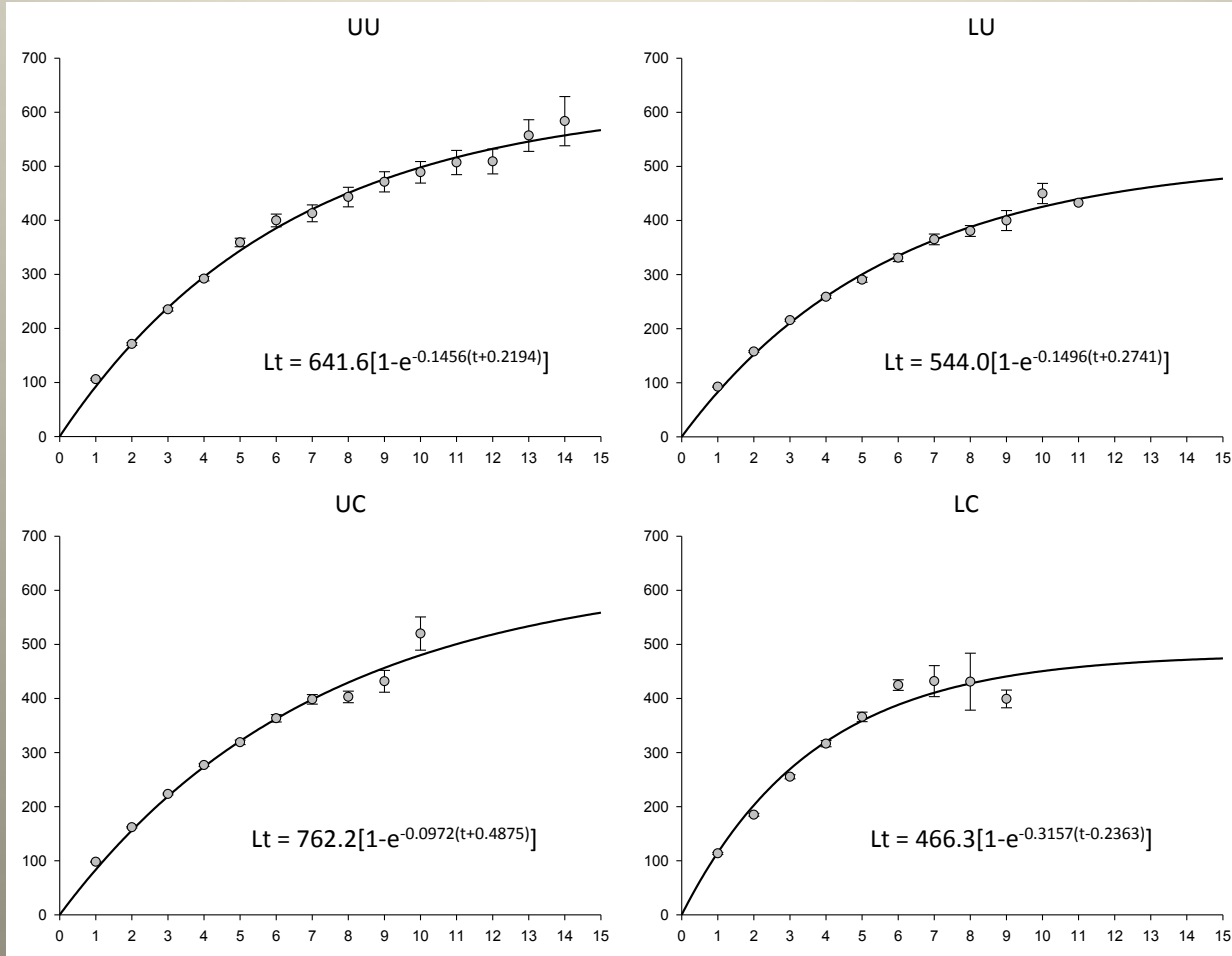
Results

CNCF Mean Relative Weight by 50 mm Length Group



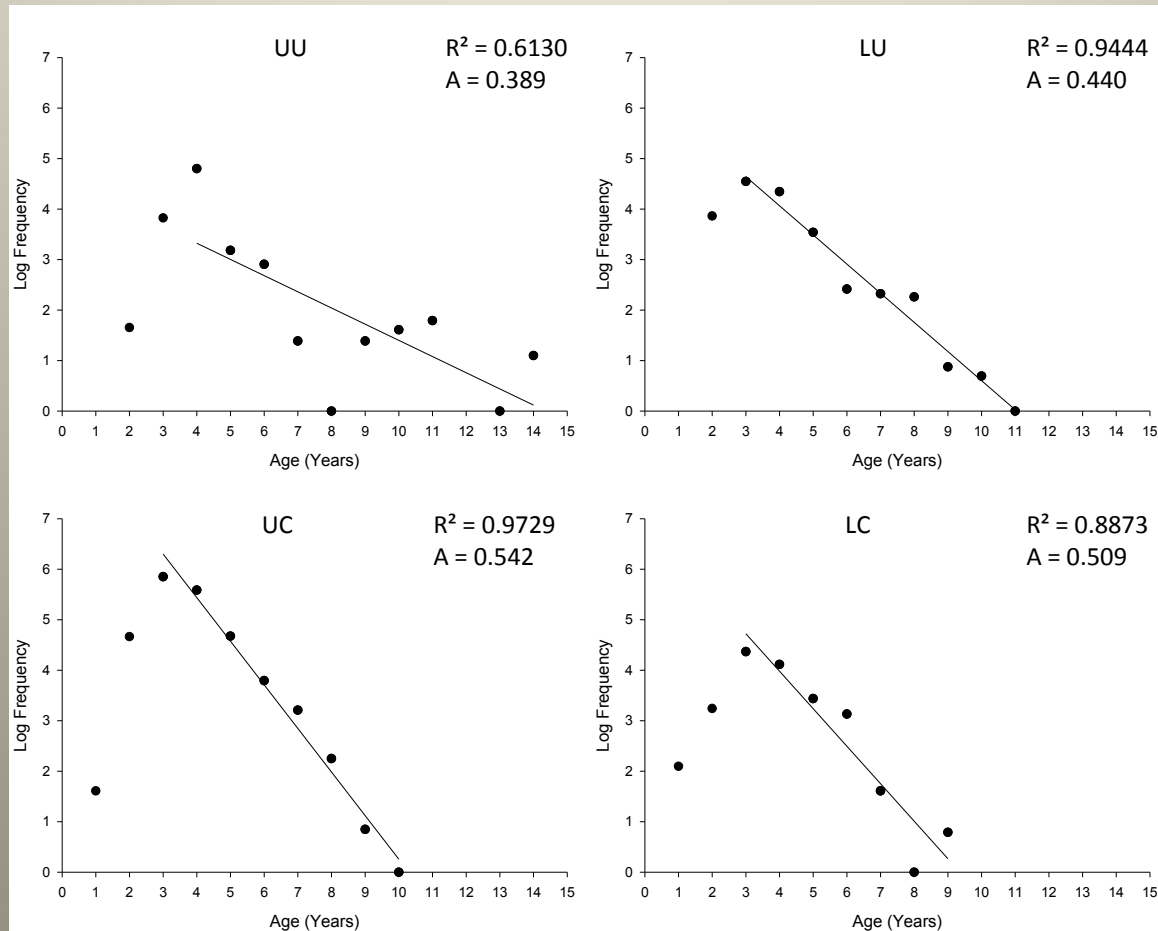
Results

CNCF Mean Back-Calculated Length-at-Age



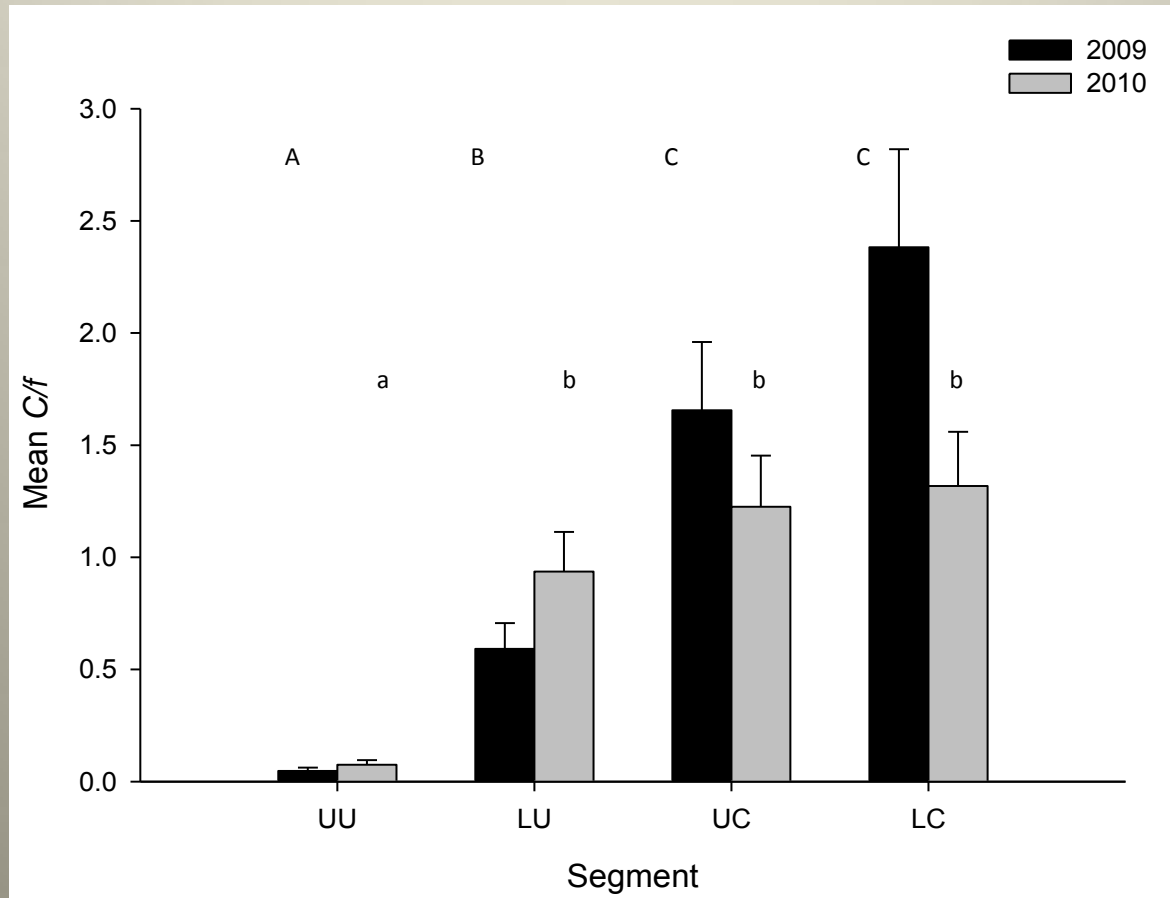
Results

CNCF Weighted Catch Curve Regression 2009 & 2010 SHN



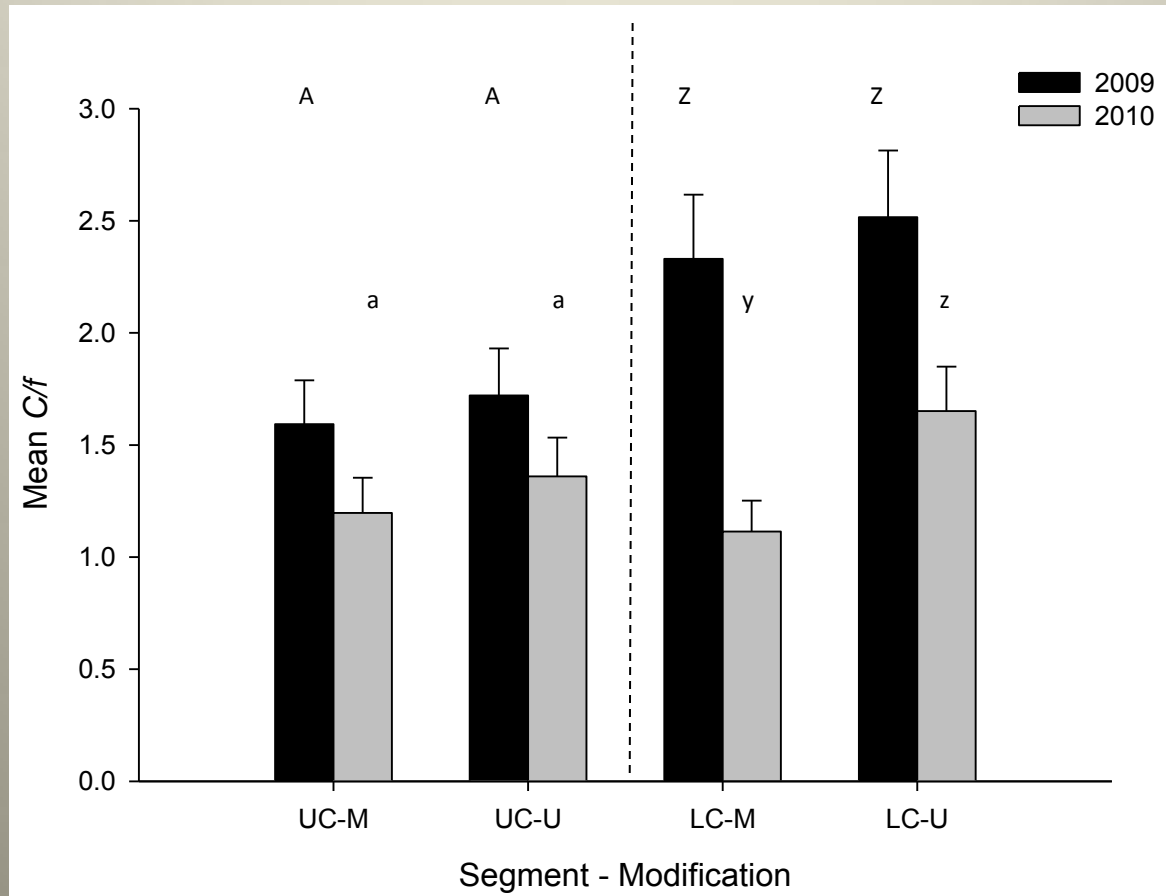
Results

FHCF Relative Abundance (C/f)



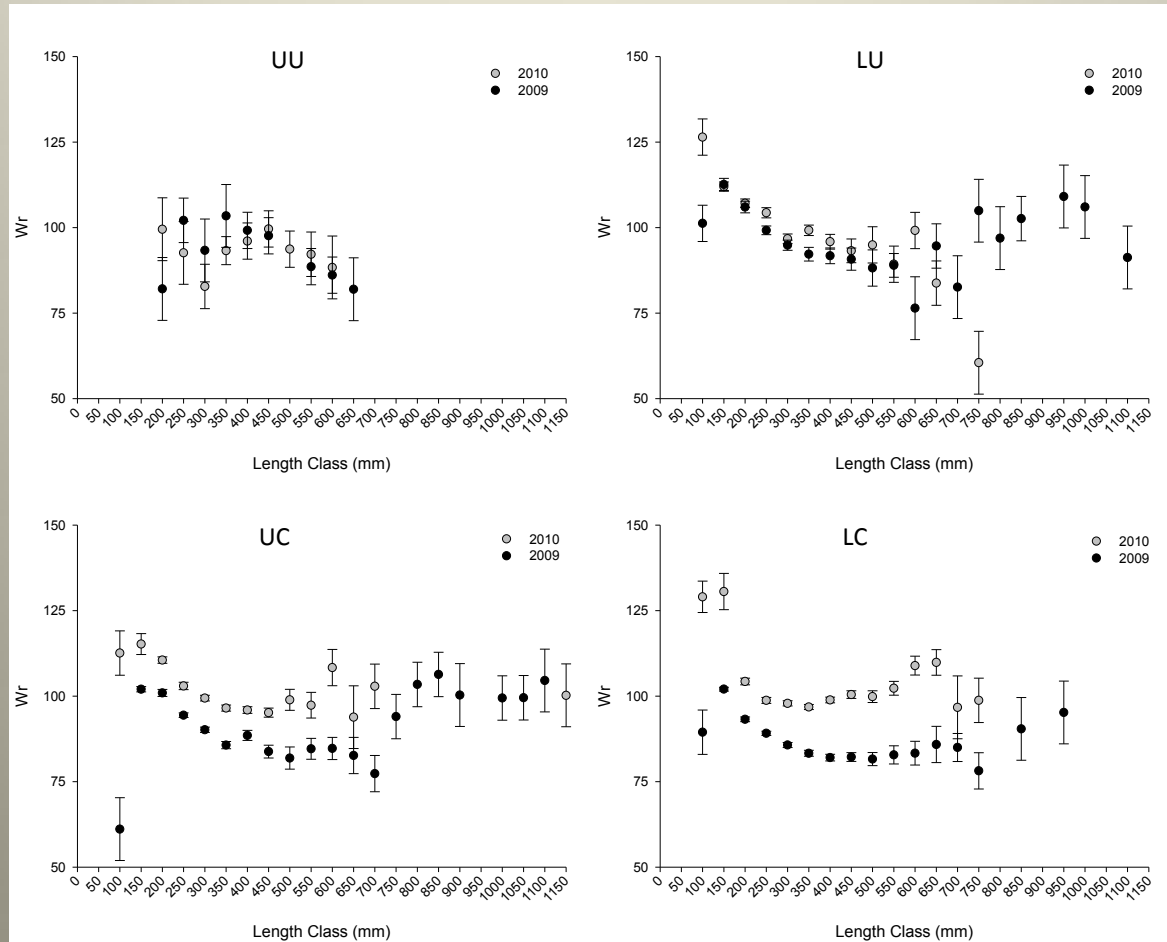
Results

FHCF Relative Abundance (C/f)



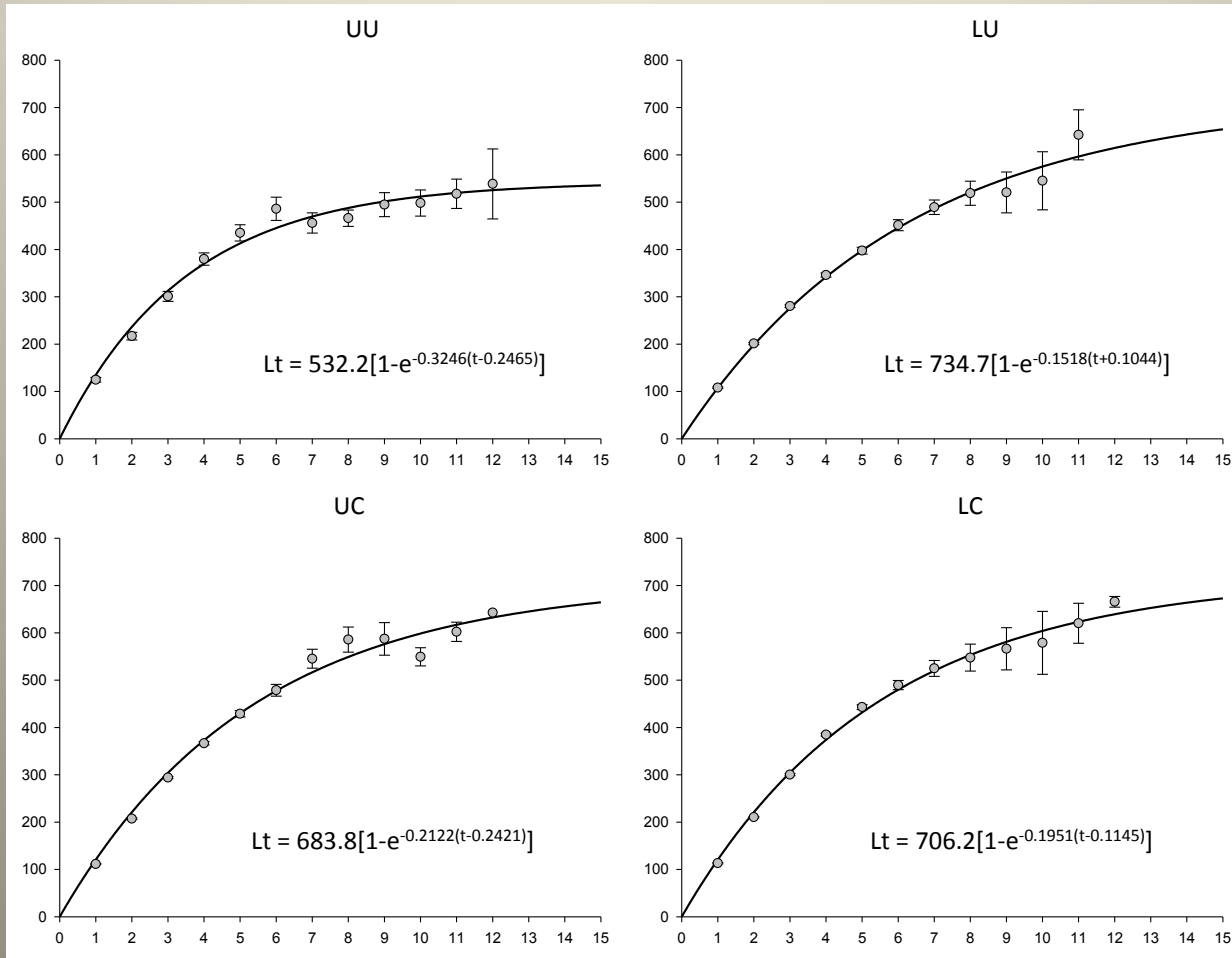
Results

FHCF Mean Relative Weight by 50 mm Length Group



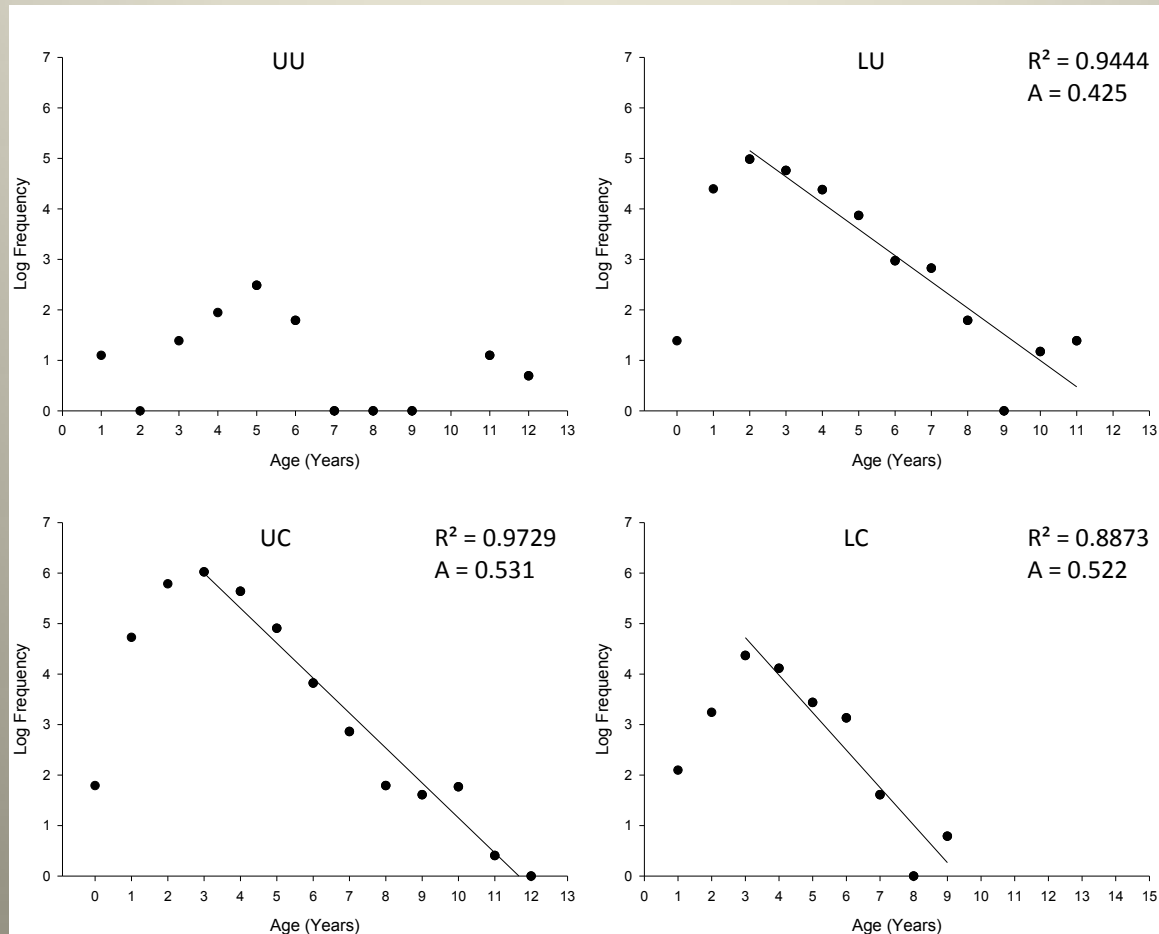
Results

FHCF Mean Back-Calculated Length-at-Age



Results

FHCF Weighted Catch Curve Regression 2009 & 2010 EF



Summary

- Are there differences in abundance, size-structure, mortality, growth-rates, and condition, of CNCF and FHCF populations between study segments of the MMR?
 - Some segment level differences
 - FHCF relative abundance lower in UU segment
 - CNCF relative abundance greater in UC segment in 2010
 - Differences in growth between study segments

Summary

- Do habitat restoration efforts (bend modifications) have an effect on CNCF and/or FHCF populations?
 - The jury is still out on this one.....
 - Greater relative abundance of CNCF on modified bends
 - 1 Year, 1 segment
 - Lower relative abundance of FHCF on modified bends
 - 1 Year, 1 segment

Research Questions

1. Determine the present status of CNCF and FHCF populations in the Middle Missouri River (MMR)
 - Are there differences in abundance, size-structure, mortality, growth-rates, and condition, of CNCF and FHCF populations between study segments of the MMR?
 - Do habitat restoration efforts (bend modifications) have an effect on CNCF and/or FHCF populations?
 - What are the estimated population sizes of CNCF and FHCF?

Methods

- One river bend selected for spatially replicated hoop-net sampling
 - UC bend # 17: RK 1122.8-1116.6
 - 20 SHN
 - ISB
 - 4 repeated sets / site
 - All CNCF > 200 mm marked with t-bar tag and adipose fin clip
 - Closed captures M/R analysis in Program MARK
 - Schnabel estimate



Photo Credit: Aaron Blank

Results

Schnabel Estimate

- **N = 23,948 CNCF > 200 mm**
- LCI = 18,011.01
- UCI = 39,119.99

Closed Captures (MARK)

- Best model: $\{c(t) = p(t), N\}$
c = recapture probability
p = capture probability
- **N = 25,816 CNCF > 200 mm**
- LCI = 23,565.93
- UCI = 28,296.58

Summary

- What are the estimated population sizes of CNCF and FHCF?
 - Closed population analyses indicate high abundance
 - ~ 24,000 – 26,000 CNCF > 200 mm in 6.2 RKM of river



Photo from Google Images: Keyword "lots of catfish"

Final Thoughts

- ~ 7,000 catfish tagged to date
 - Few recaptures from standard sampling
 - Angler reported recaptures provide useful movement information
 - With increased recaptures and capture occasions open population models can be used to estimate abundance, survival, and movement rates
 - Closed population modeling can be used to provide small-scale population estimates and baseline parameter data

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