Demographics of American Eel Collected in the Commercial Weir Fishery in the Upper Delaware River, NY

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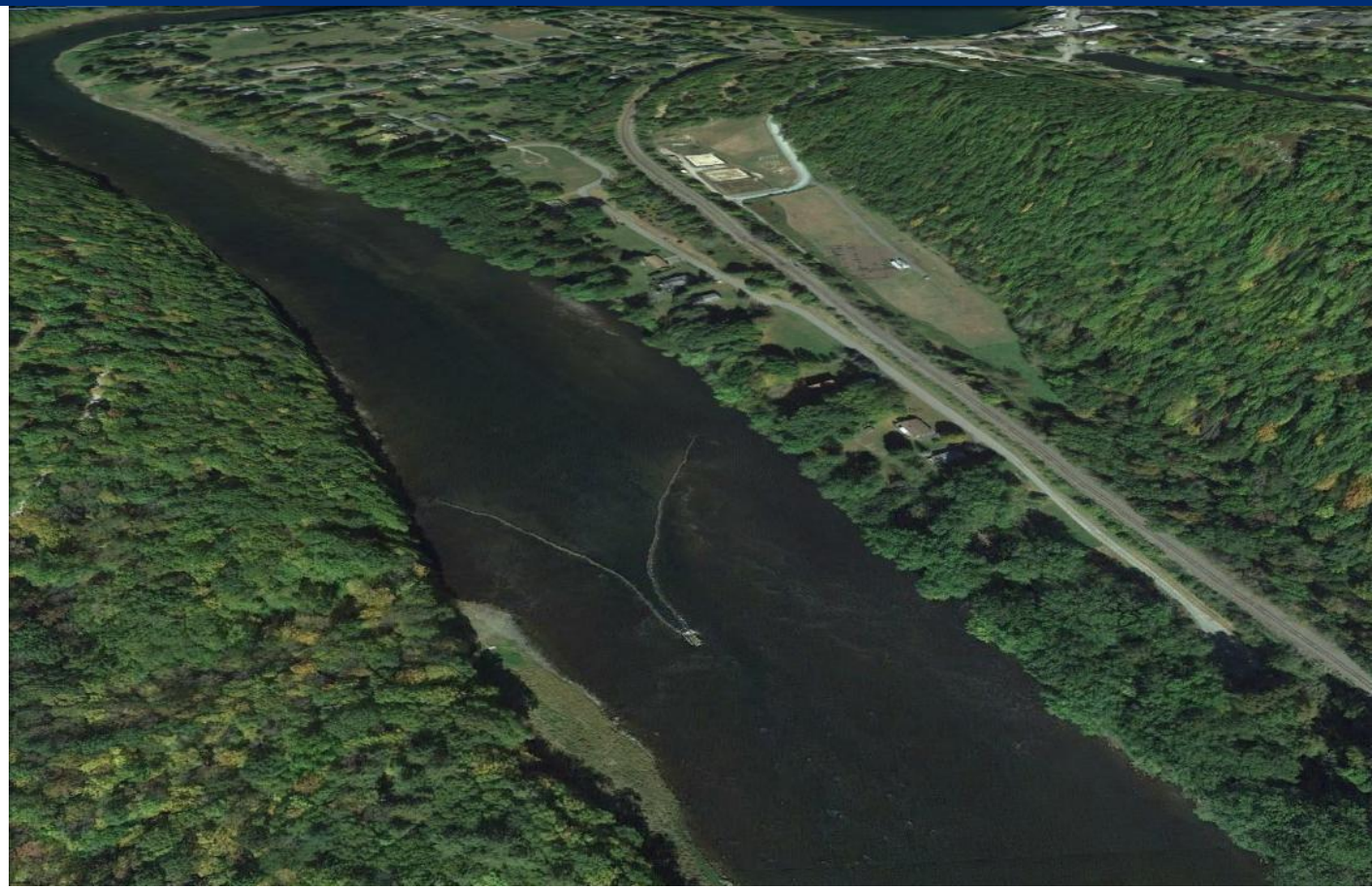
NEW YORK STATE OF OPPORTUNITY
Department of Environmental Conservation

Background:



- Eel weirs - historic fishery
- Mostly harvested for food
- Timeframe
  - Construction begins in June
  - Fishing: late August-October/November

Commercial Weir Fishery

- Species managed by Atlantic States Marine Fisheries Commission (ASMFC)
- Daily catches reported monthly to NY State
- Catches monitored by NYS DEC
- 2015 license cap
- 9 licenses
  - 6 weirs on Delaware River
    - 3 weirs on Neversink River (tributary)

Delaware River Watershed

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Study Background

- ASMFC
  - stricter management of eel harvest, research needs
- Only directed silver eel fishery on east coast
- Longest un-dammed river east of Mississippi
- Initial assessment of fishery left uncertainty with regard to assumption of all silver and all female

Study Objectives

- **Silver?**
- **Gender?**
- **Demographics?**
  (Size, prevalence of a. crassus, etc.)

Field collections

- 4 sample sites
- Target: 25-30 eels per sample
  3 samples per location throughout season
- Total of 327 samples

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Study Area

Study Area

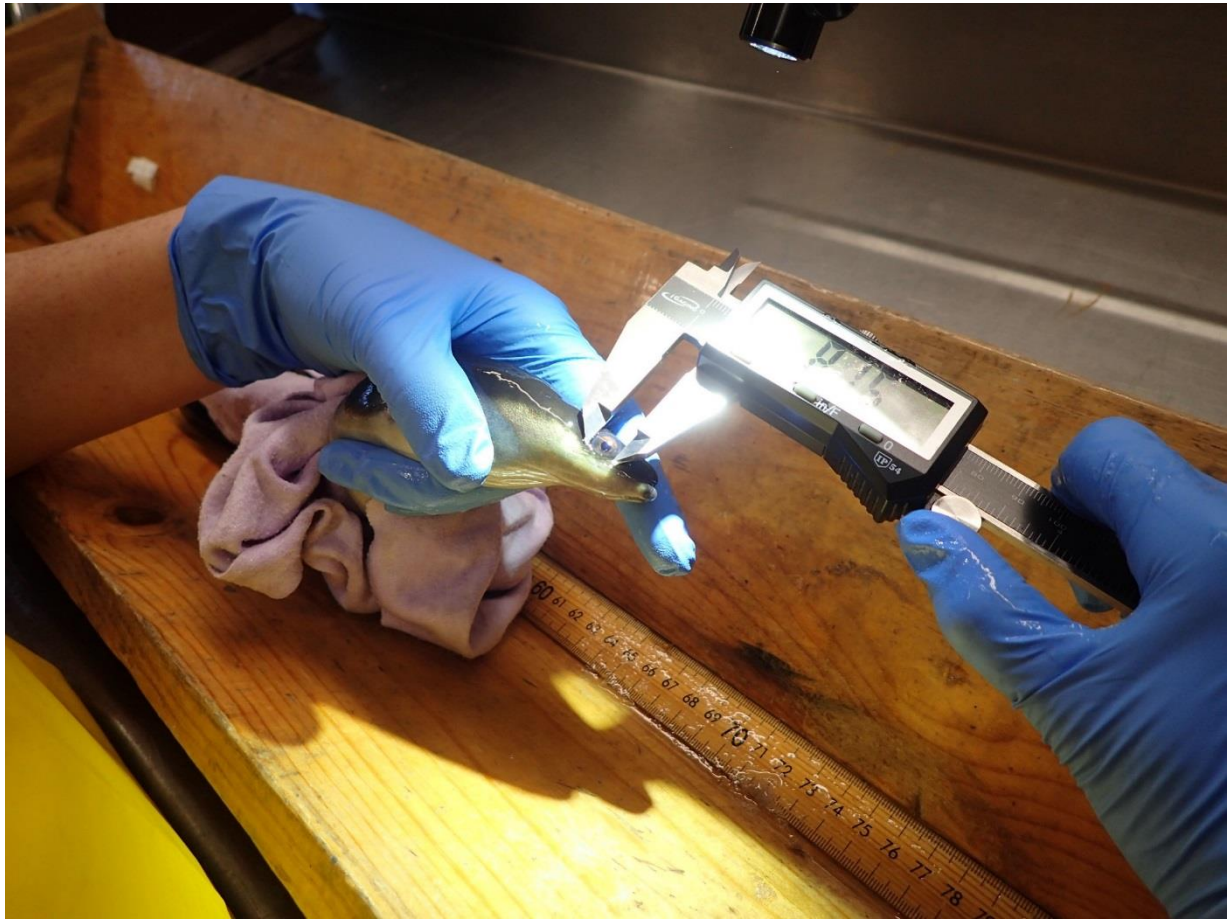
Weir ID


1
New York
2
Pennsylvania
Neversink River
3
Delaware River
4

Lab data collection

- Length
- Weight
- Left and right eye vertical and horizontal diameters (Pankhurst eye index-PEI)
- Left and right fin length (Pelvic fin index-PFI)
- Description of color/attributes
- Photo

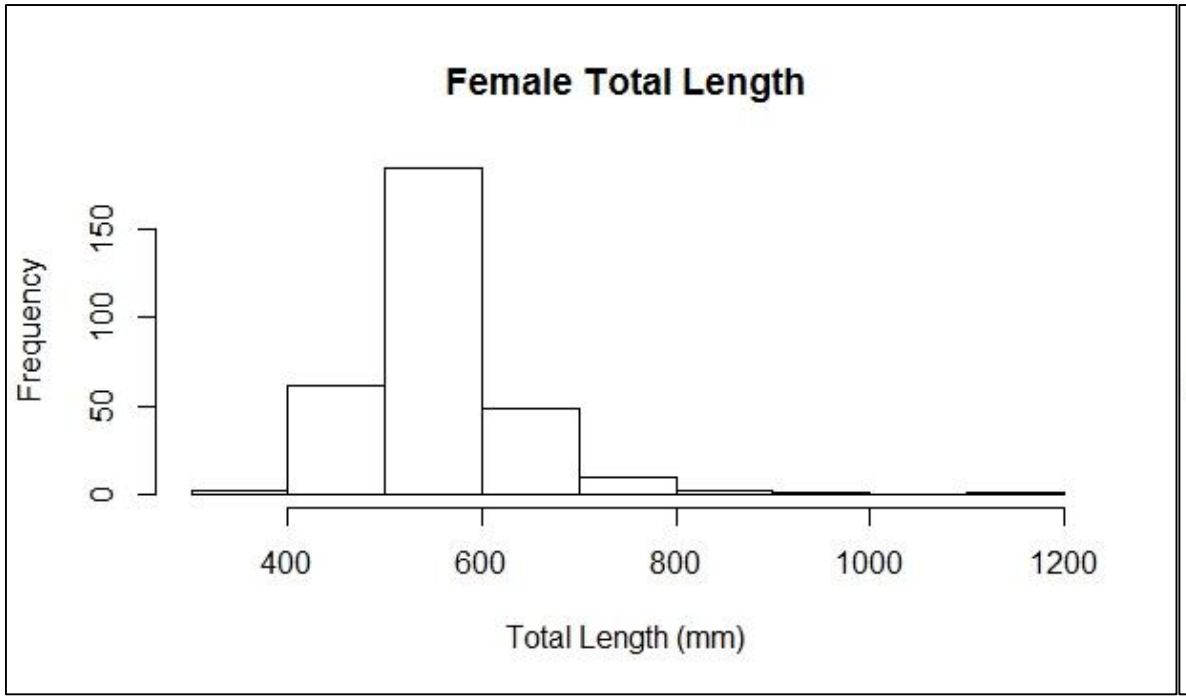
- Sex determination
- Stomach examination
- Swim bladder parasite count
- Gonad weight (gonadosomatic index-GSI)
- Stomach weight
- Otolith removal for age analysis

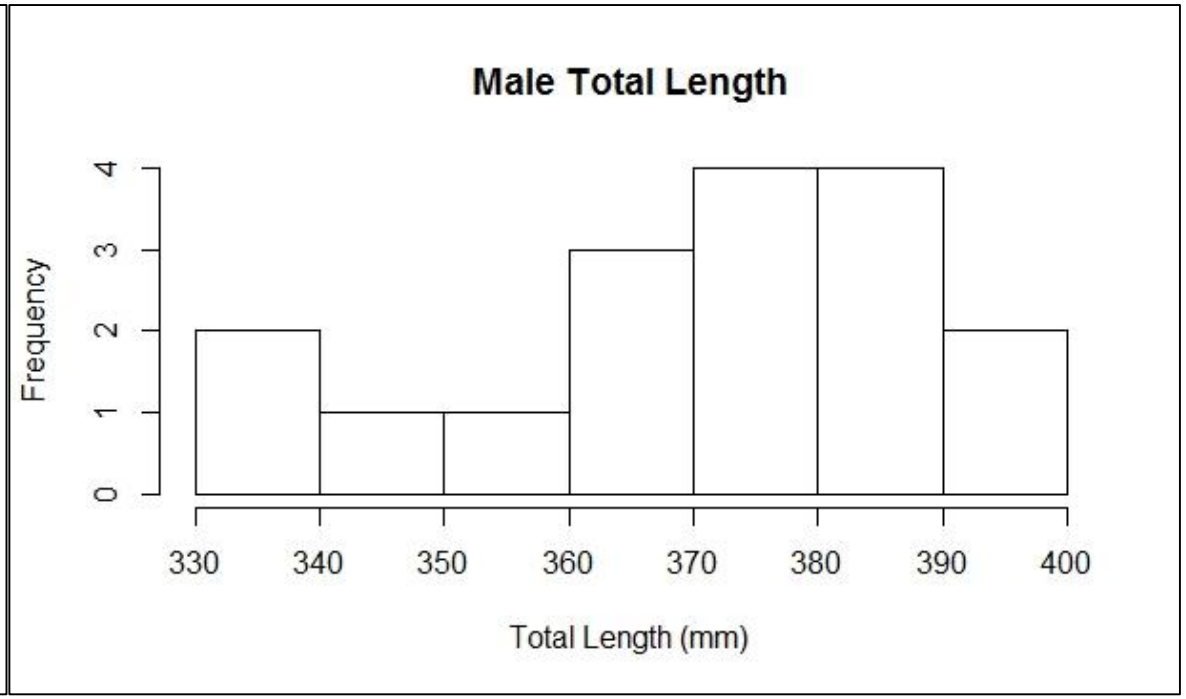



DESCHUTES
RIVERALE
NORTHWEST SESSION ALE
Ziploc

Results

- 327 eels examined: 310 female, 17 male
- Female: mean length=557 mm, mean weight=341.0 g
- Male: mean length=370 mm, mean weight=88.2 g



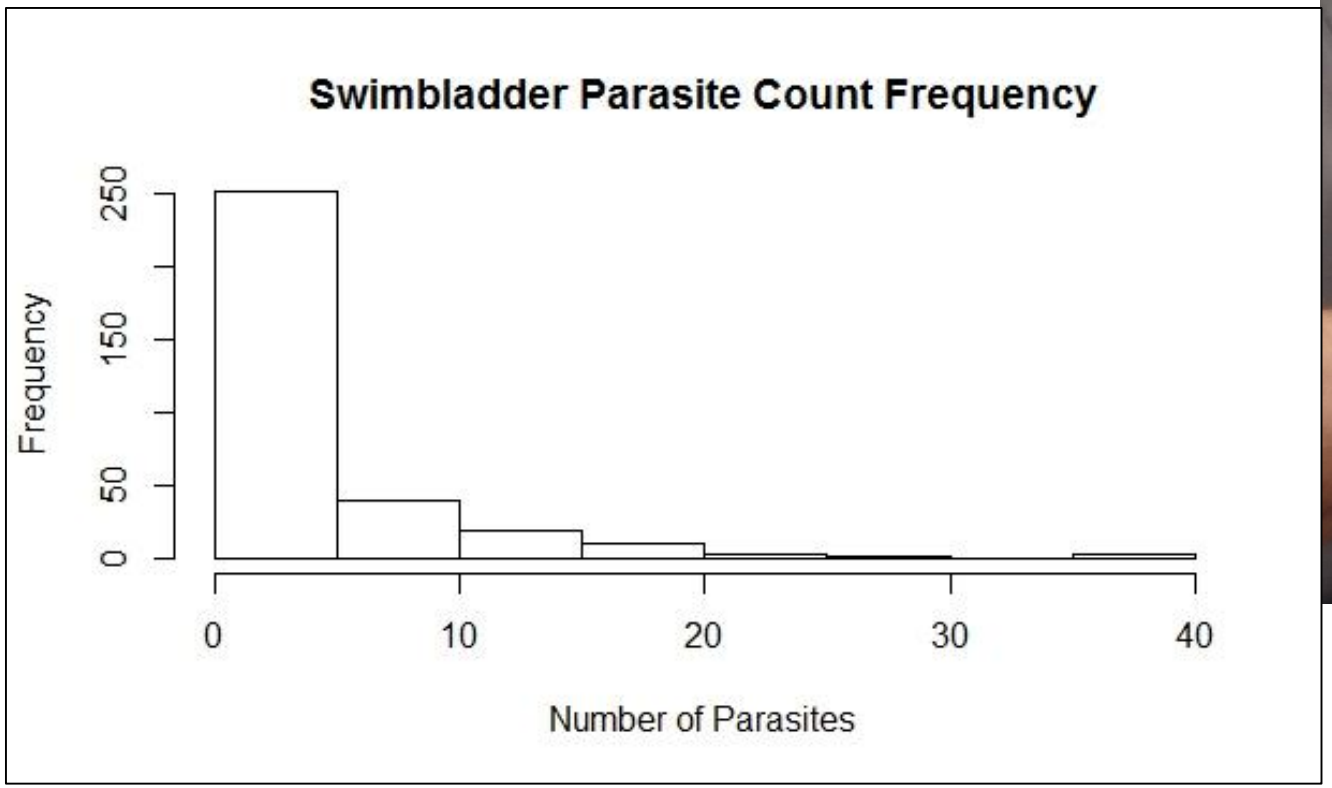


Results

Average swimbladder parasite count:

Female: 4.1 (max 40)

Male: 2.7 (max 10)



Results

Average gut weight:

- **Female- 4.71 g**
- **Male- 0.86 g**

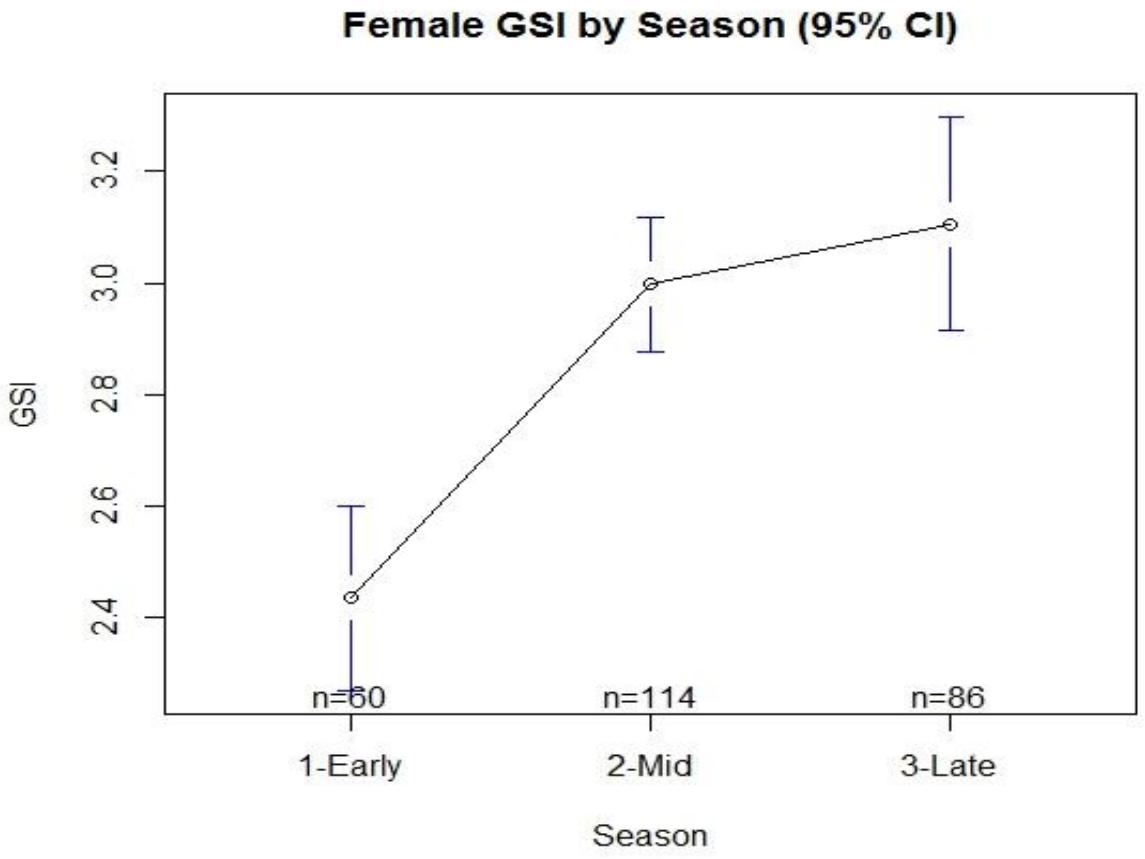
Stomach contents: 97% of stomachs were empty*

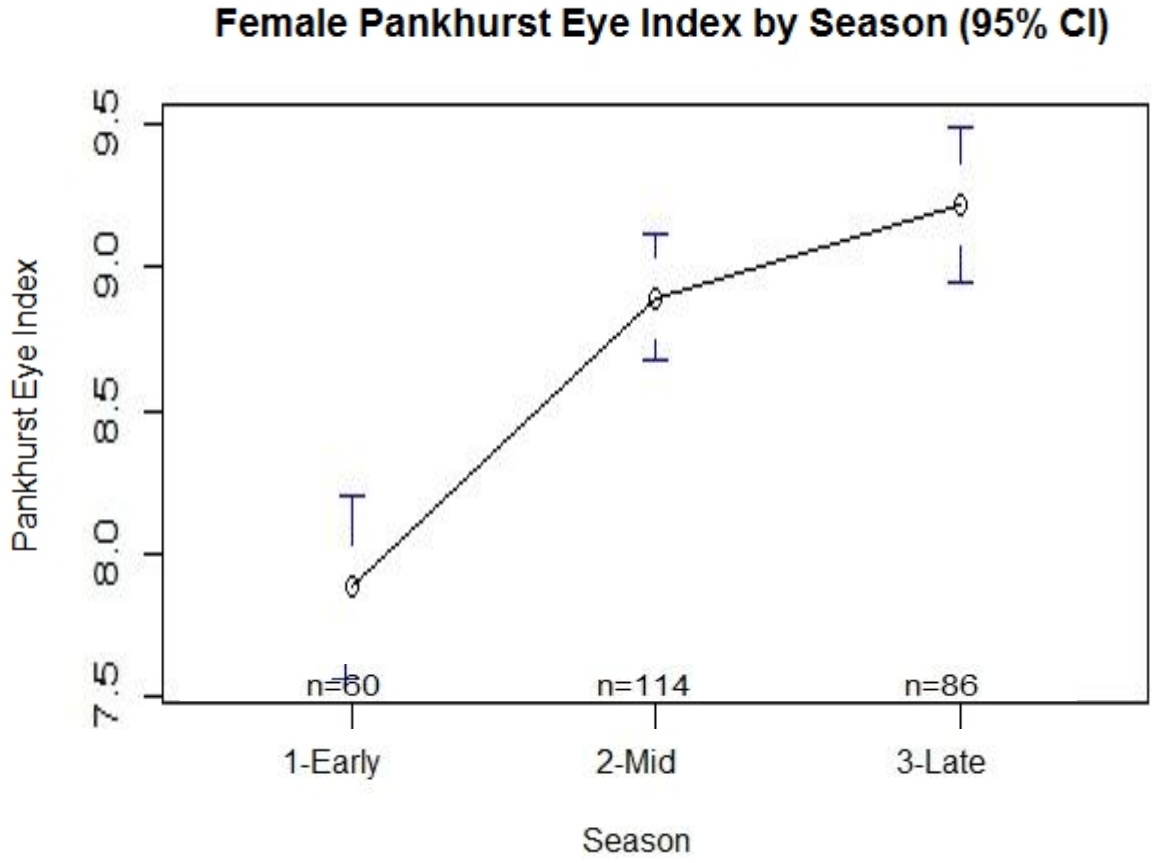
- **3 - fish**
- **3 - unidentifiable organic contents**
- **1 - a stick**
- **1 – rubber fishing lure**

***Varying holding times**

Seasonal Variation (Female)

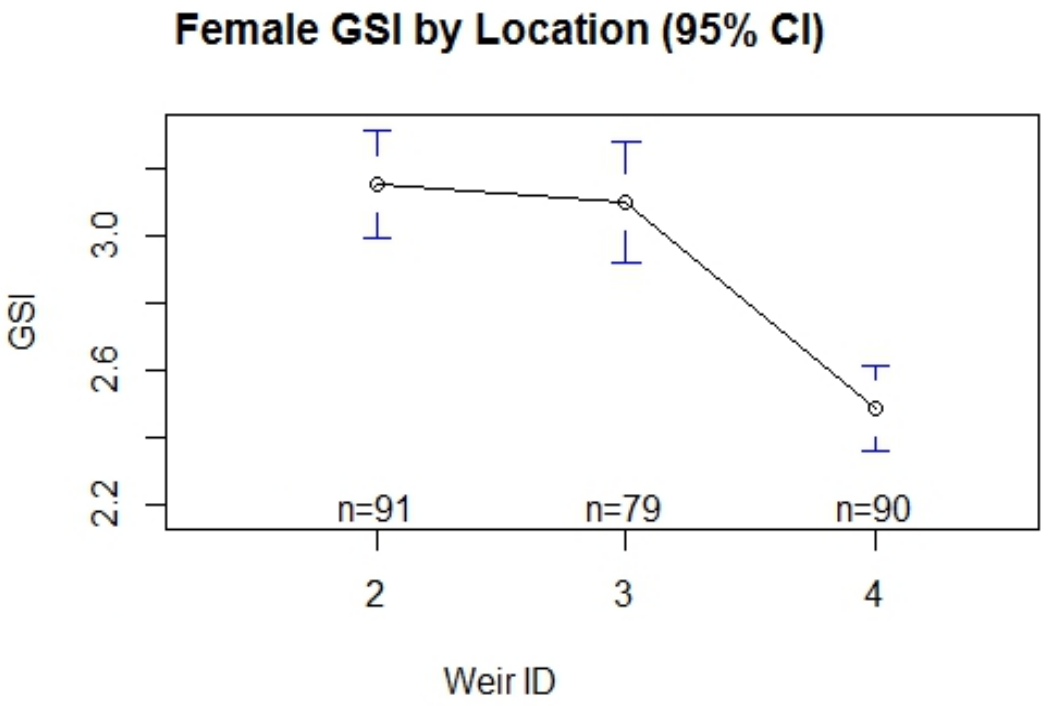
- **TL - No sig. change throughout season**
- **GSI - Early season sig. less than mid and late season**
- **PEI - Early season sig. less than mid and late season**

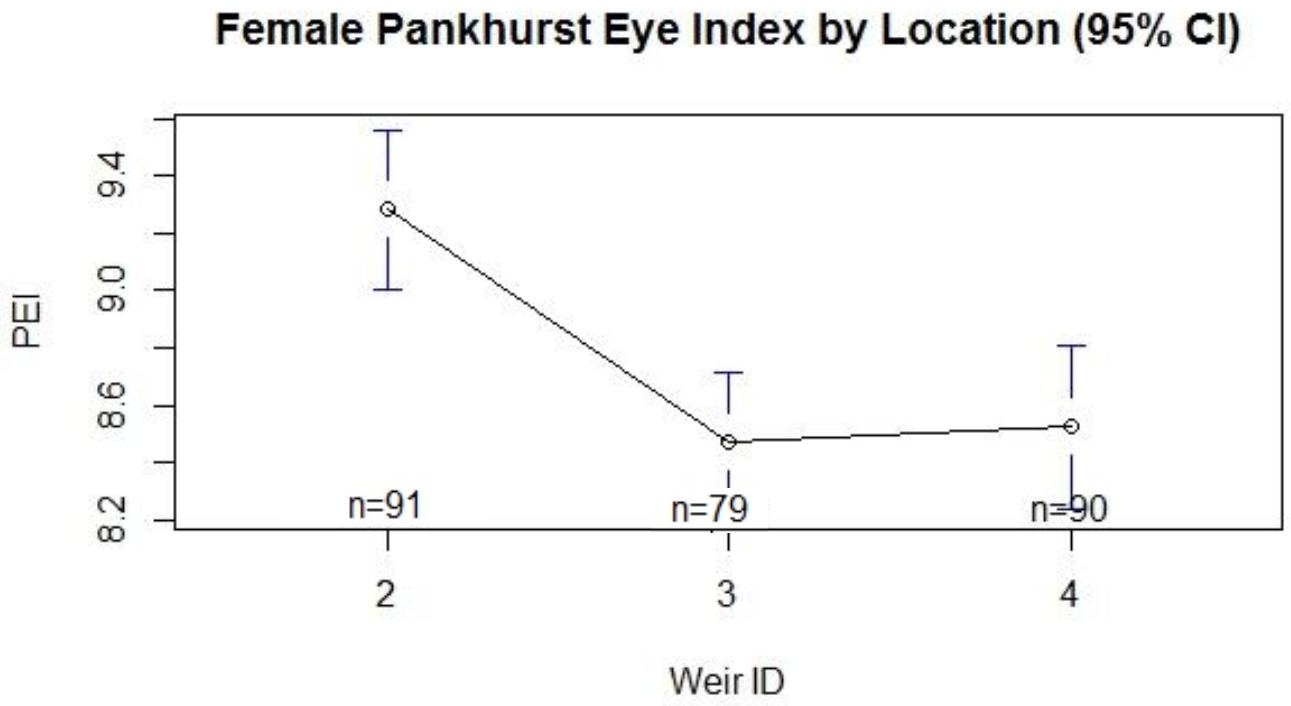




Location Variation (Female)

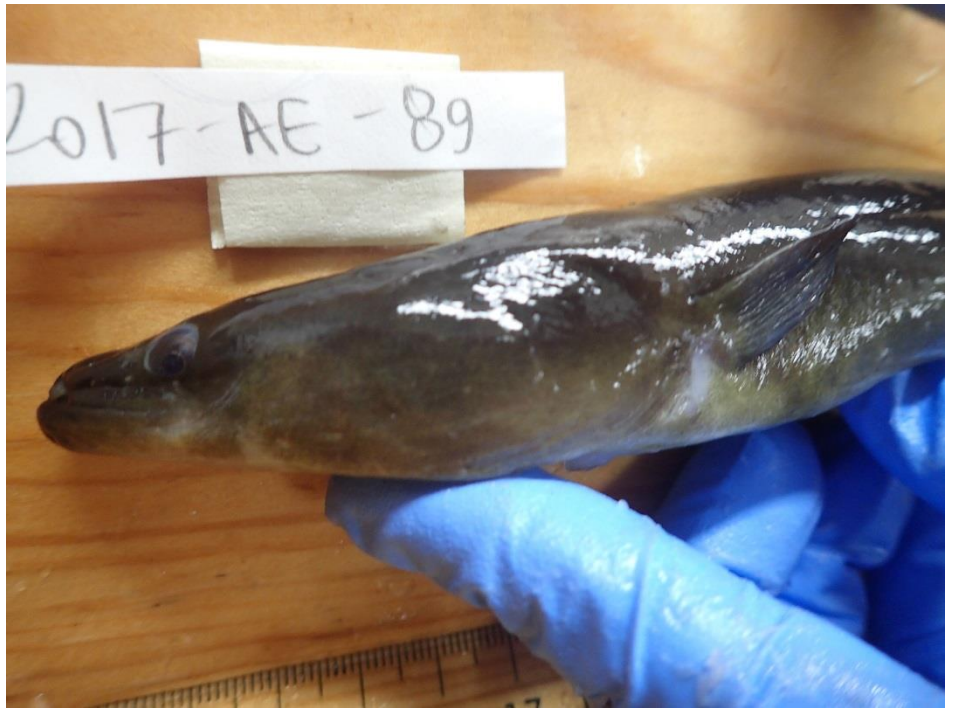
- TL – no sig. change between sites
- GSI – sites 2 & 3 similar (higher GSI)
- PEI –site 2 was different (higher) than 3 and 4, which were similar





Summary

- 95% female 5% male
- Females not very advanced in maturity
- Yellow eels rare
- Females not consistently large
- Some eels with a low GSI, had high PEI and Pectoral Fin Index values. The converse was also true



Conclusions

- Silver?→**Yes?**
- Female?→**Mostly**
- Demographics?→**Still puzzling**

What's next?

- Age otoliths and establish age structure of silver eel fishery
- Further examine temporal and/or geographical relationships
- Repeat study

Thank You

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- **Mo Grassi, Cornell University/NYS DEC**
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- **Cooperative weir operators**

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