Invasive catfish annual monitoring and focused research projects - Pennsylvania

Geoffrey Smith

Pennsylvania Fish and Boat Commission
Bureau of Fisheries, Division of Fisheries Management

Introduction

- Catfish management
  - Management plan
  - Routine monitoring
- Research projects
  - Study Area
  - Methods
  - Results
  - Ongoing/ proposed efforts

Catfish management

- State-wide catfish management plan (2012)
  - Treat native and invasive populations
    - Propose different allowable gear types, harvest parameters
  - Recommends survey and data objectives
    - Base-line data in most systems
      - Abundance
      - Population characteristics (e.g. age & growth)
    - Standardized survey techniques

Routine monitoring

- Baited, tandem hoop nets (1.2 m)
  - 16 sets per survey reach

- Assess each reach of large river
  - Abundance by reach
  - Age & growth by river

- Approximately 50% characterized in Susquehanna Basin

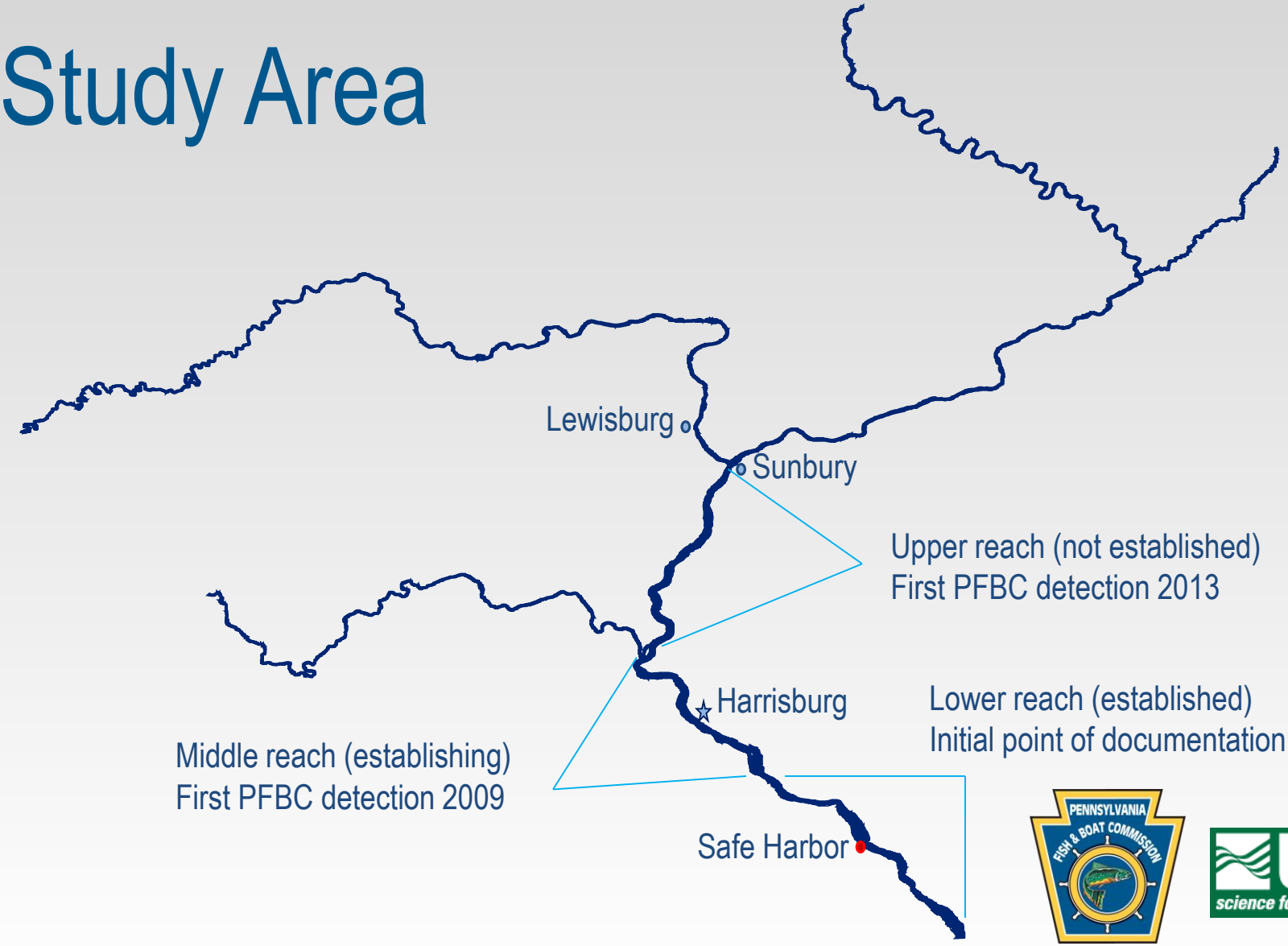
PENNSYLVANIA FISH & BOAT COMMISSION

USGS science for a changing world

Research project(s)

- PA SeaGrant funded project (2016)
  - Evaluating growth characteristics along a gradient of “establishment” levels
  - Three differing levels of establishment based on our incidental captures over time
    - Literature suggests difference in growth rates on individual and population level relative to time since introduction
    - Opportunity for us to “set the bar” to measure against

Study Area


Lewisburg
Sunbury
Upper reach (not established)
First PFBC detection 2013
Harrisburg
Lower reach (established)
Initial point of documentation (2002)
Middle reach (establishing)
First PFBC detection 2009
Safe Harbor

Methods – fish collection

- Baited, tandem hoop nets
  - 3 nets per series (1.2 m hoops)
  - 4 series per site
  - 72 hour soak time
  - Each net baited with ~ 1 kg of commercial catfish bait

PENNSYLVANIA FISH & BOAT COMMISSION

USGS science for a changing world

Methods – site selection

- Used GIS to delineate 50 accessible segments
  - Geomorphology dictates where we can and can't sample
  - Randomly selected three segments per reach to sample

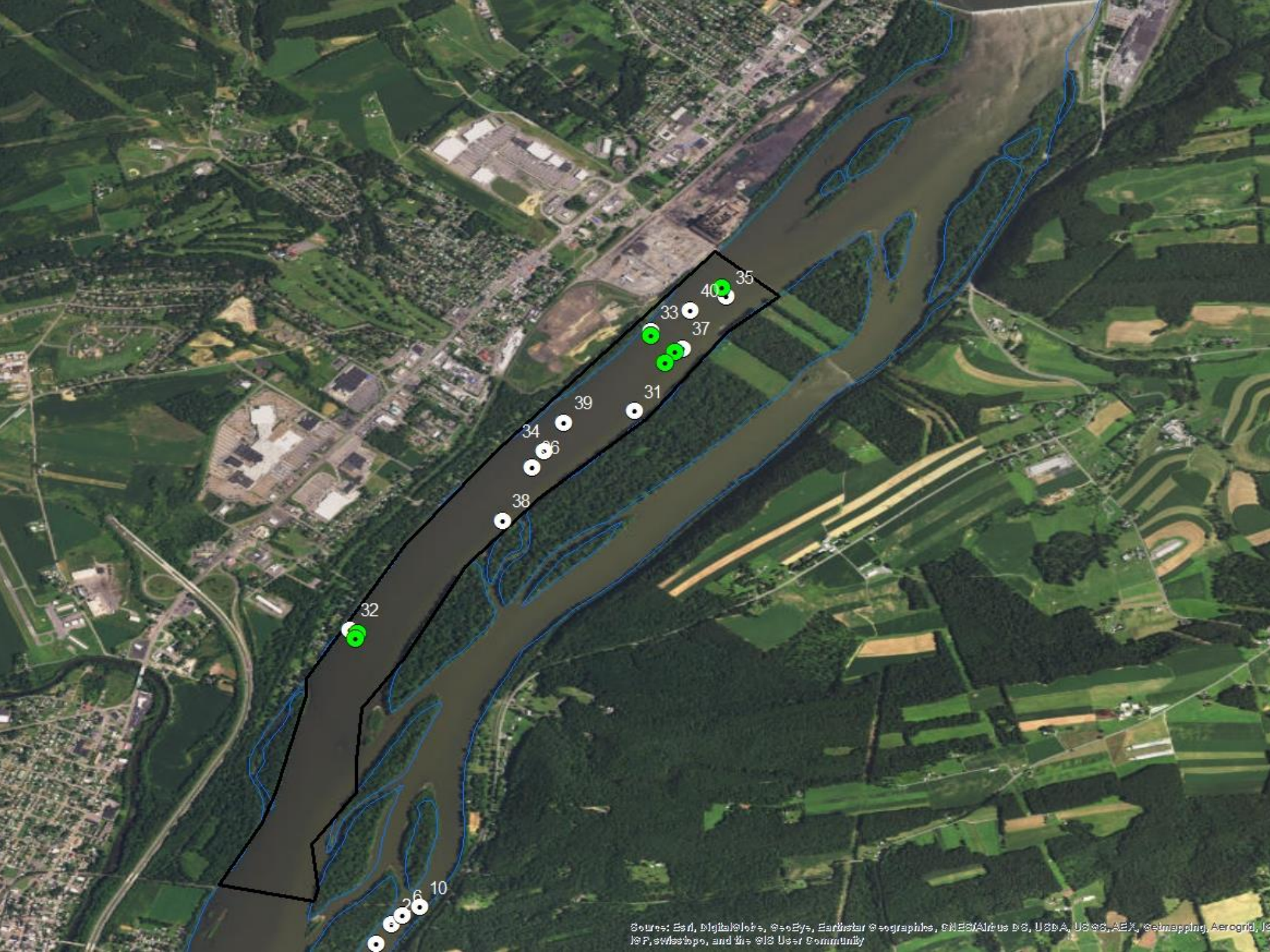
- Generated 10 random points within each reach

Methods

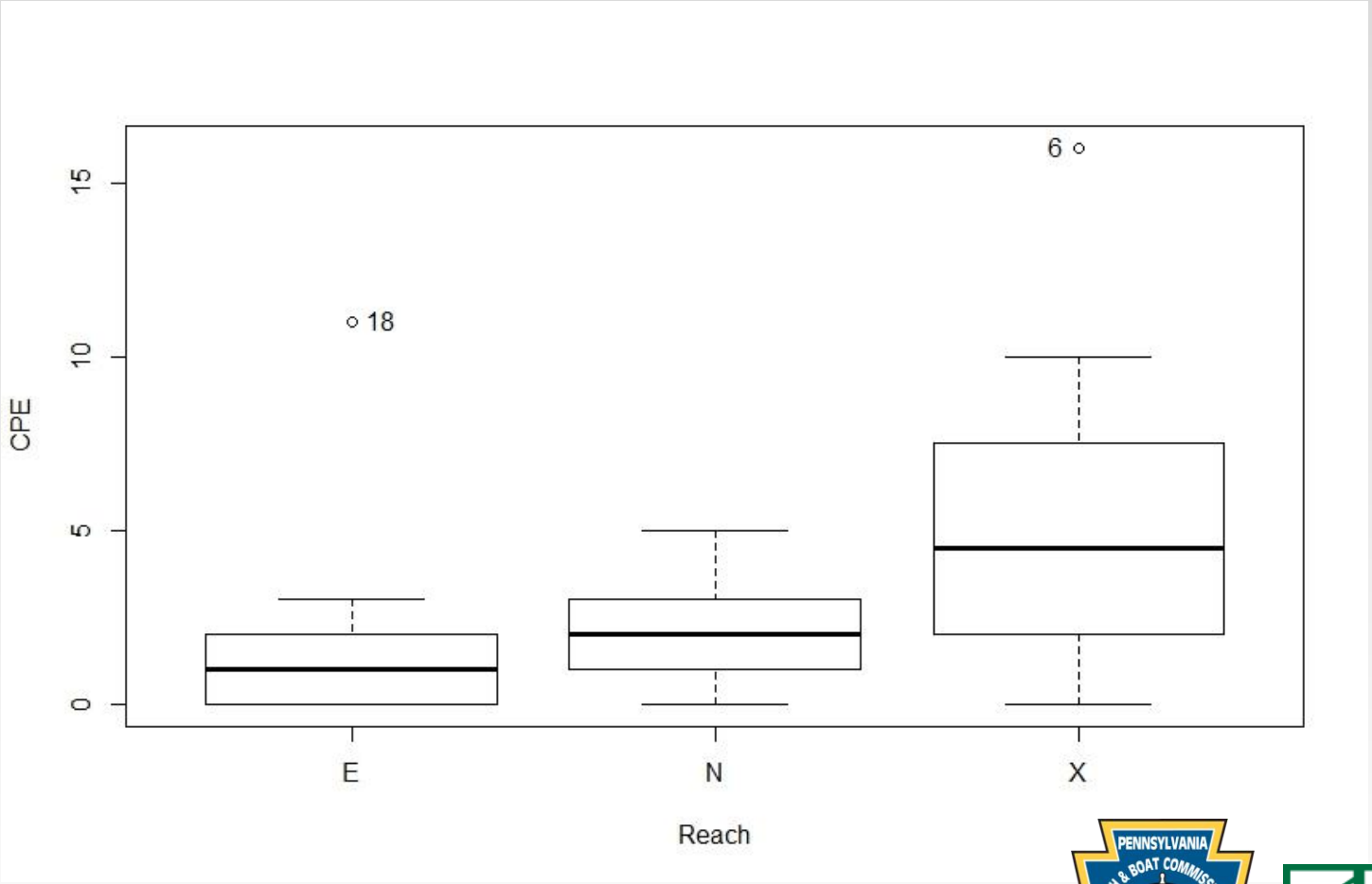
- Set nets at first 4 accessible locations
  - Depth ≥ 1 m
- Replicated two of four sets at two of three segments in each reach
  - Necessary for modeling framework
  - Will provide information on variability of CPUE in our surveys

PENNSYLVANIA FISH & BOAT COMMISSION

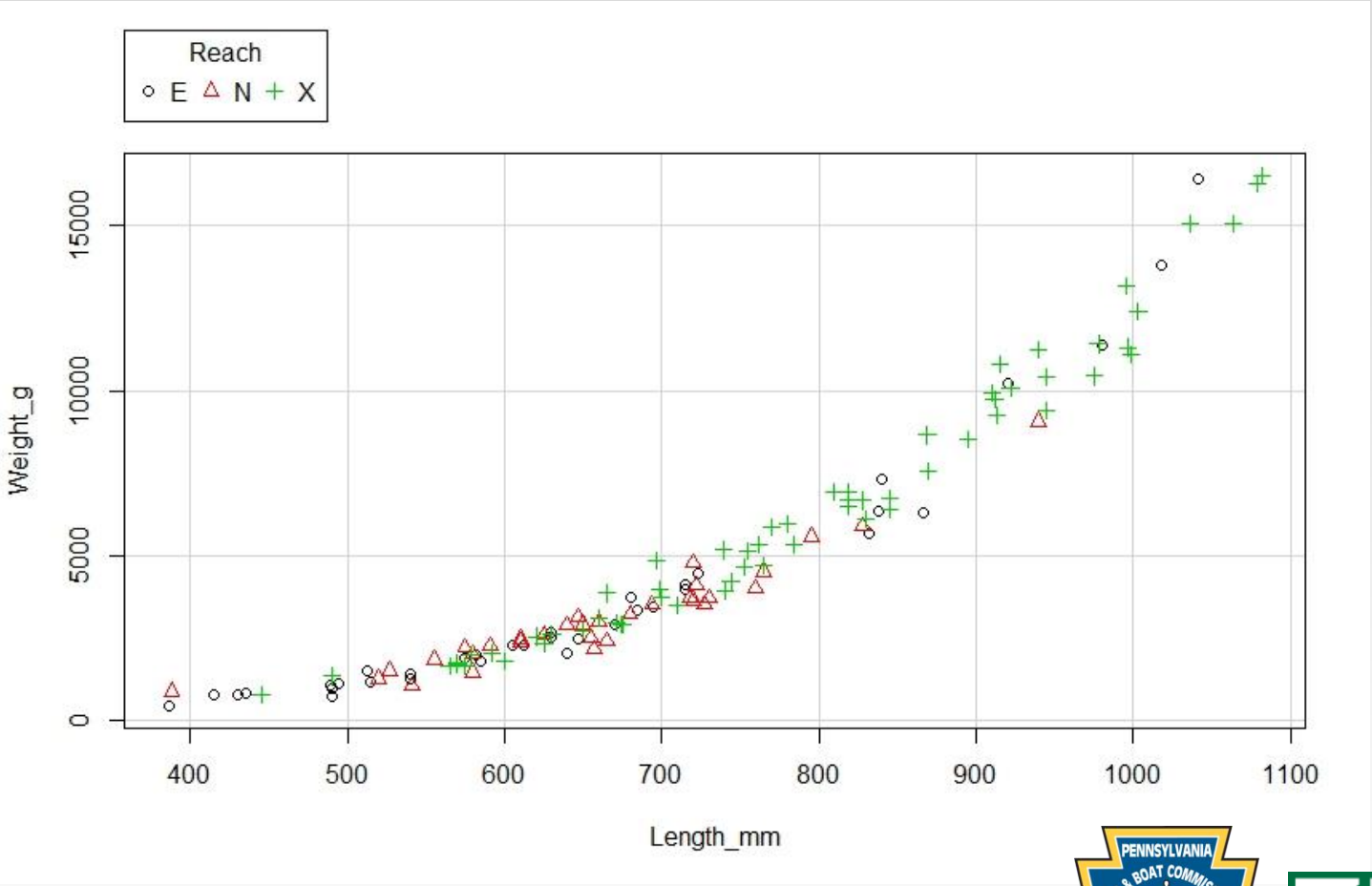
USGS science for a changing world


35
40
33
37
31
39
34
36
38
32
10
6
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

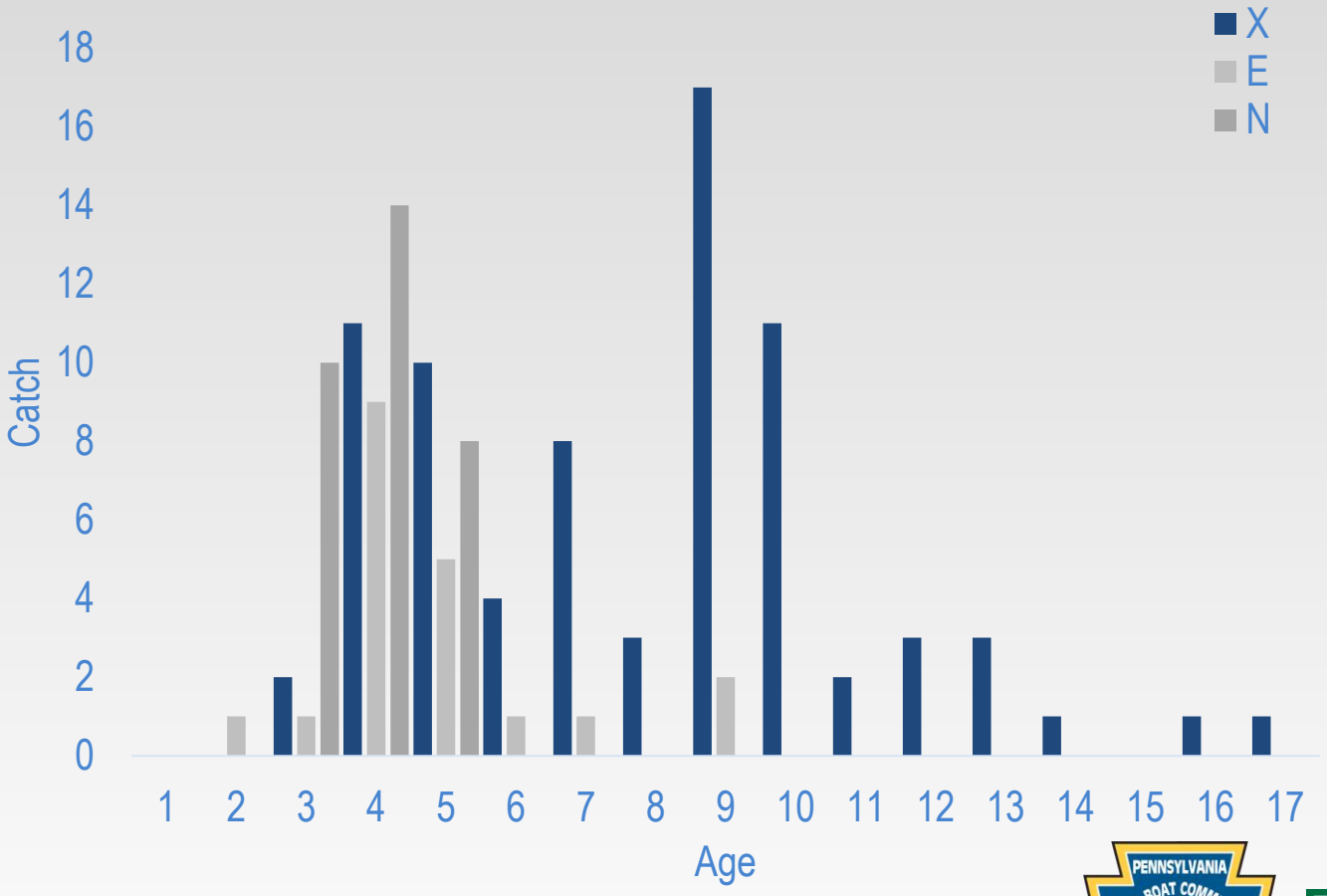
Results – CPE per reach



Results – length-weight



Results – catch at age



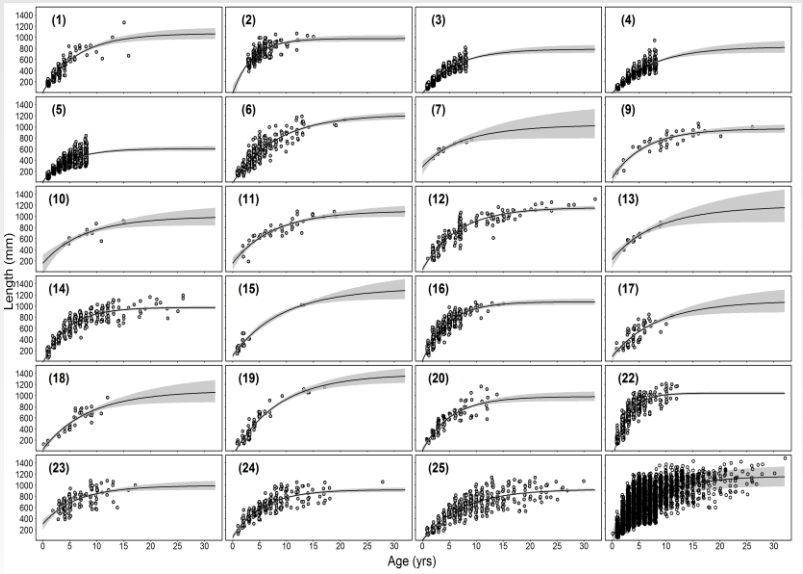
Research project(s)

- PA SeaGrant funded expansion of project to include other drainages (2018 – 2020)
  - Include low density pops and reaches without documentation
  - Meta-analysis comparing native and introduced populations
  - MD DNR picking up lower portion of Susquehanna River

Research project(s)

- Spatial variability and macroscale drivers of growth for native and introduced Flathead Catfish populations

Massie et al. (In Review) Transactions



Research project(s)

- Other potential topics
  - Diet
  - Contaminant burden (currently submitting for consumption advisories)
  - Determining level of effort necessary for “detection” of undeveloped populations
  - Determining accuracy, precision of gear/ technique
  - Assessing changes in growth parameters over time
  - Understanding habitat usage at different densities as range expansion and population growth occur

Questions