Lake Sturgeon in Buffalo Harbor and the Niagara River

Lori Davis, Rachel Neuenhoff, John A. Sweka, and Jonah L. Withers

U.S. Fish and Wildlife Service, Northeast Fishery Center

Great Lakes RESTORATION

Background

Aboriginal

↓

Bycatch

↓

Targeted

↓

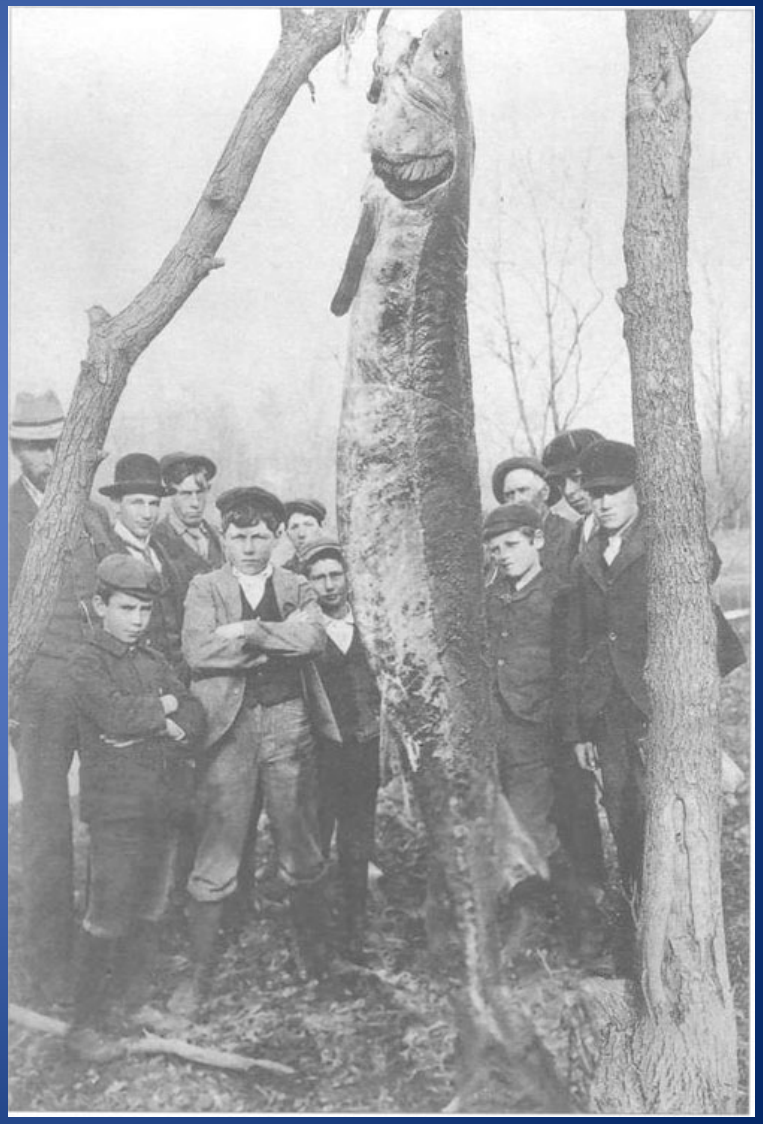
Closure

↓

Trade protections

↓

Listing



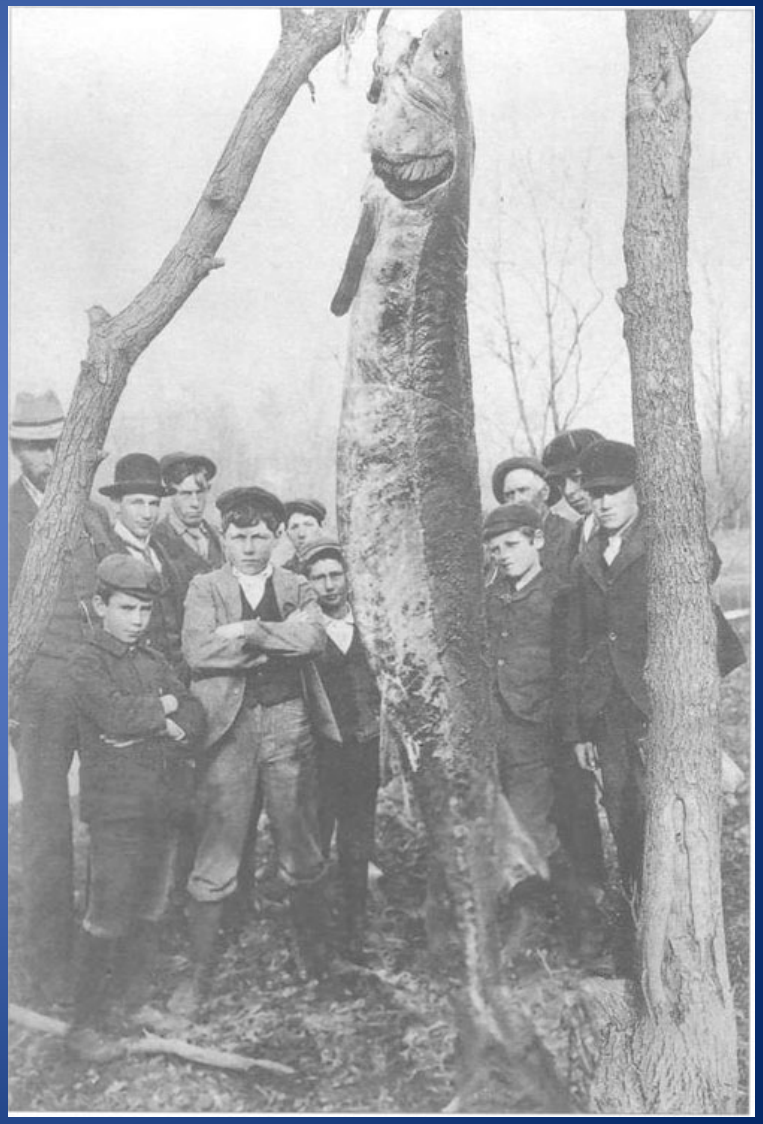
Background

Restoration (delisting)

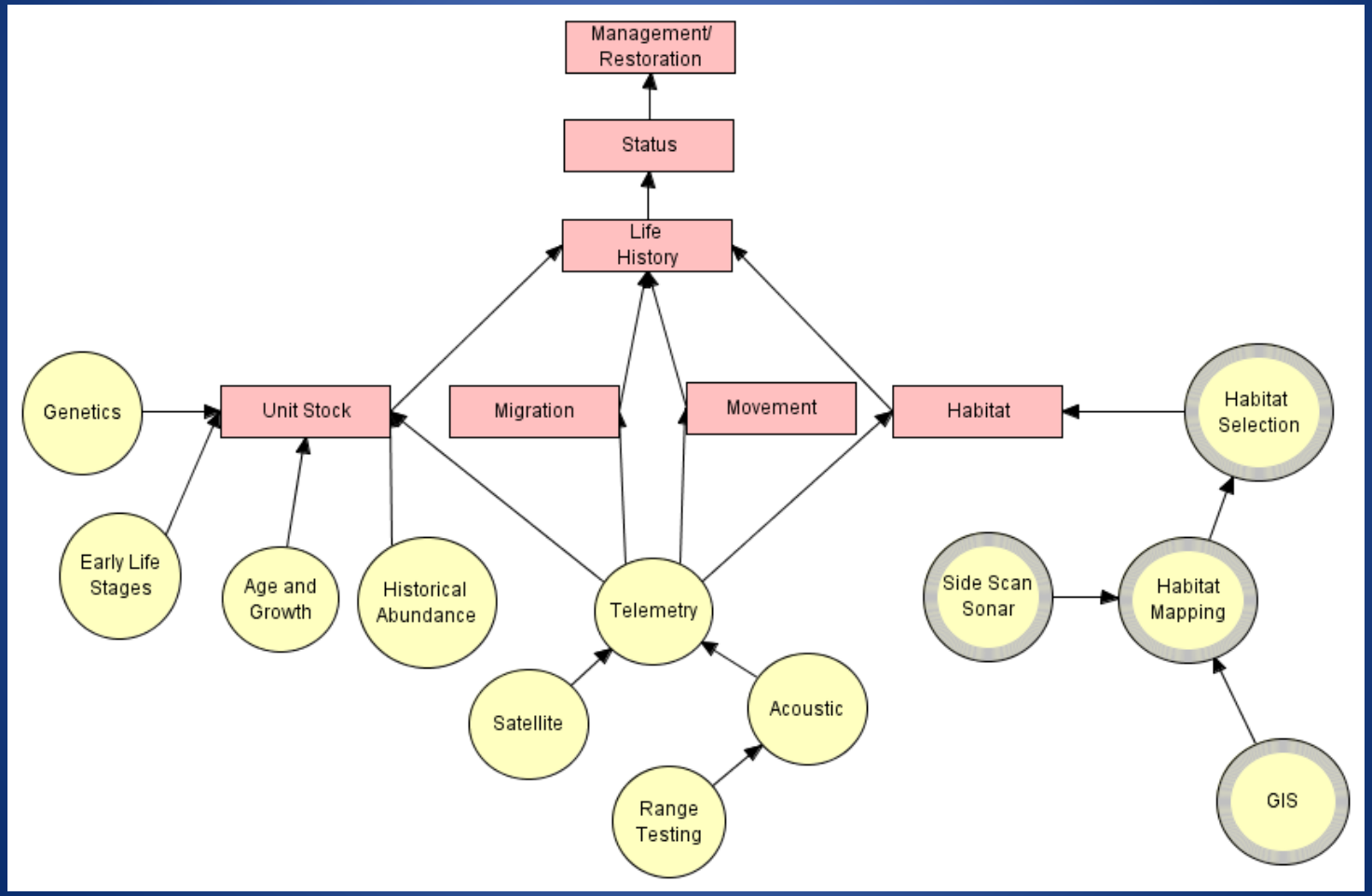
Knowledge Gaps:

Status

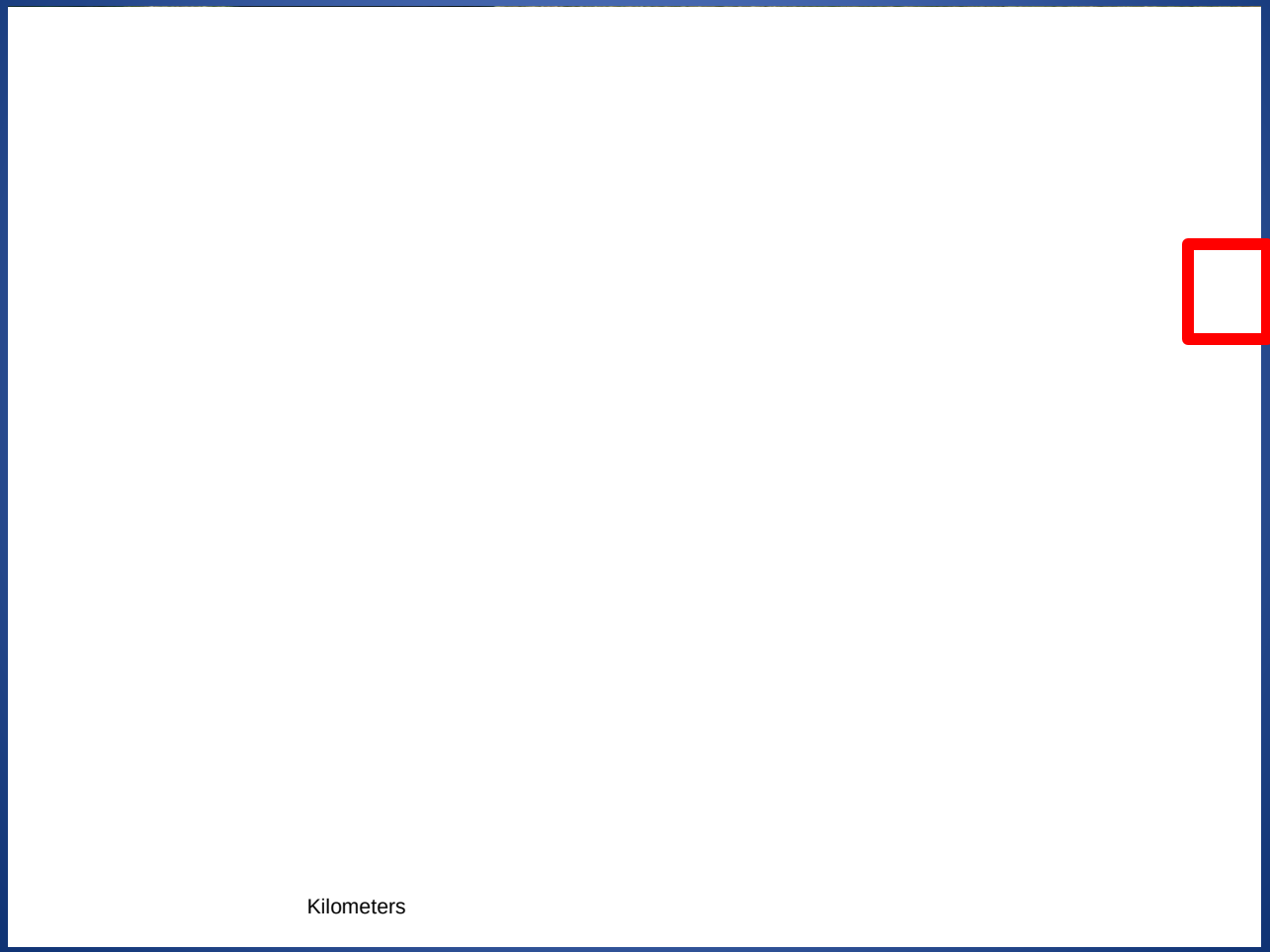
Life History



Objectives


Management/ Restoration
Status
Life History
Genetics
Unit Stock
Migration
Movement
Habitat
Habitat Selection
Early Life Stages
Age and Growth
Historical Abundance
Telemetry
Side Scan Sonar
Habitat Mapping
Satellite
Acoustic
Range Testing
GIS

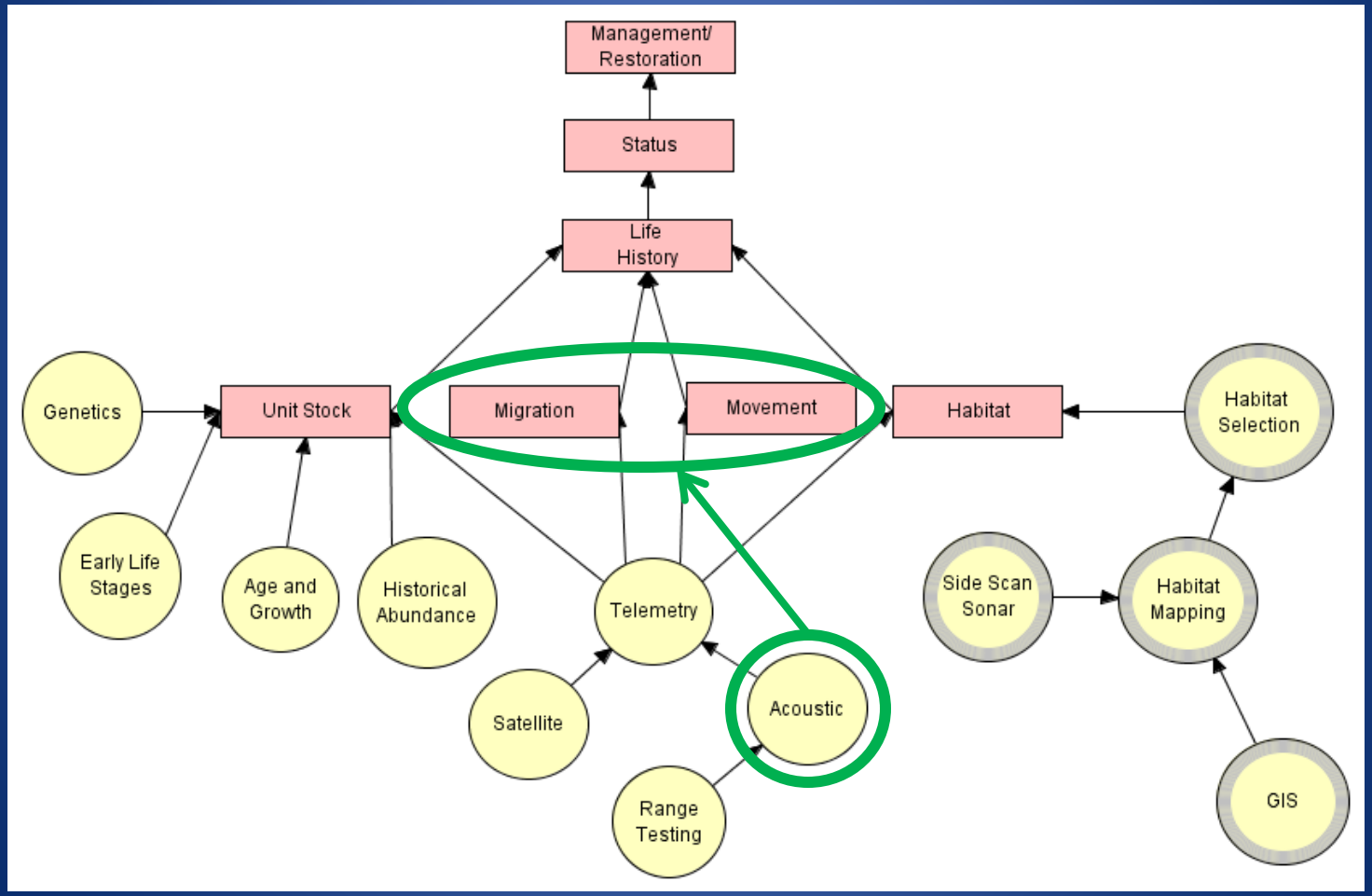
Study Area



Methods

- New York Department of Environmental Conservation
  - Gillnet
- US Fish and Wildlife Service
  - Gillnet & set line

Objectives

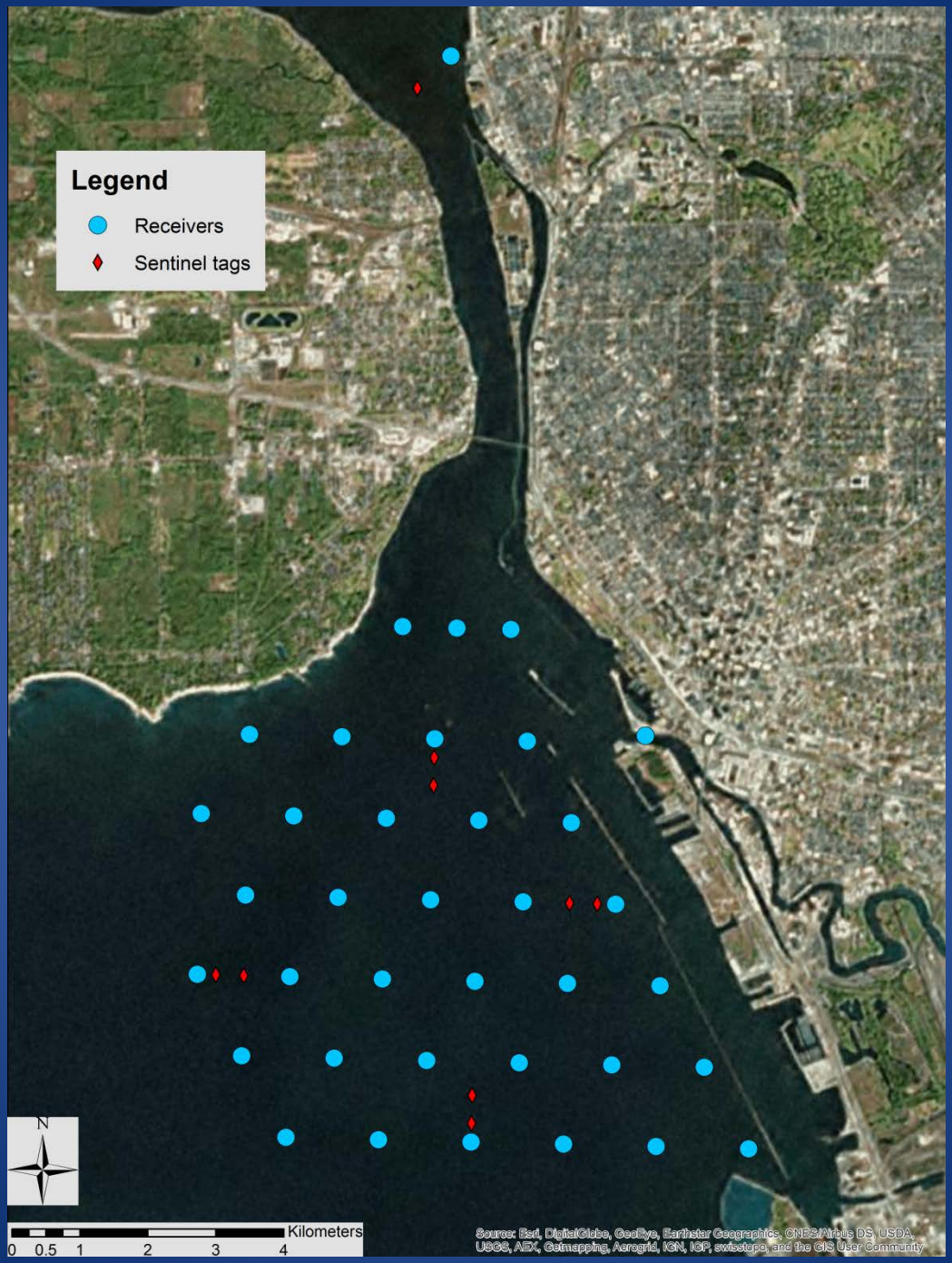

Management/ Restoration
Status
Life History
Genetics
Unit Stock
Migration
Movement
Habitat
Habitat Selection
Early Life Stages
Age and Growth
Historical Abundance
Telemetry
Side Scan Sonar
Habitat Mapping
Satellite
Acoustic
Range Testing
GIS

GLATOS

Methods

- Acoustic Telemetry
  - Vemco V16 transmitters
  - Vemco VR2W receivers

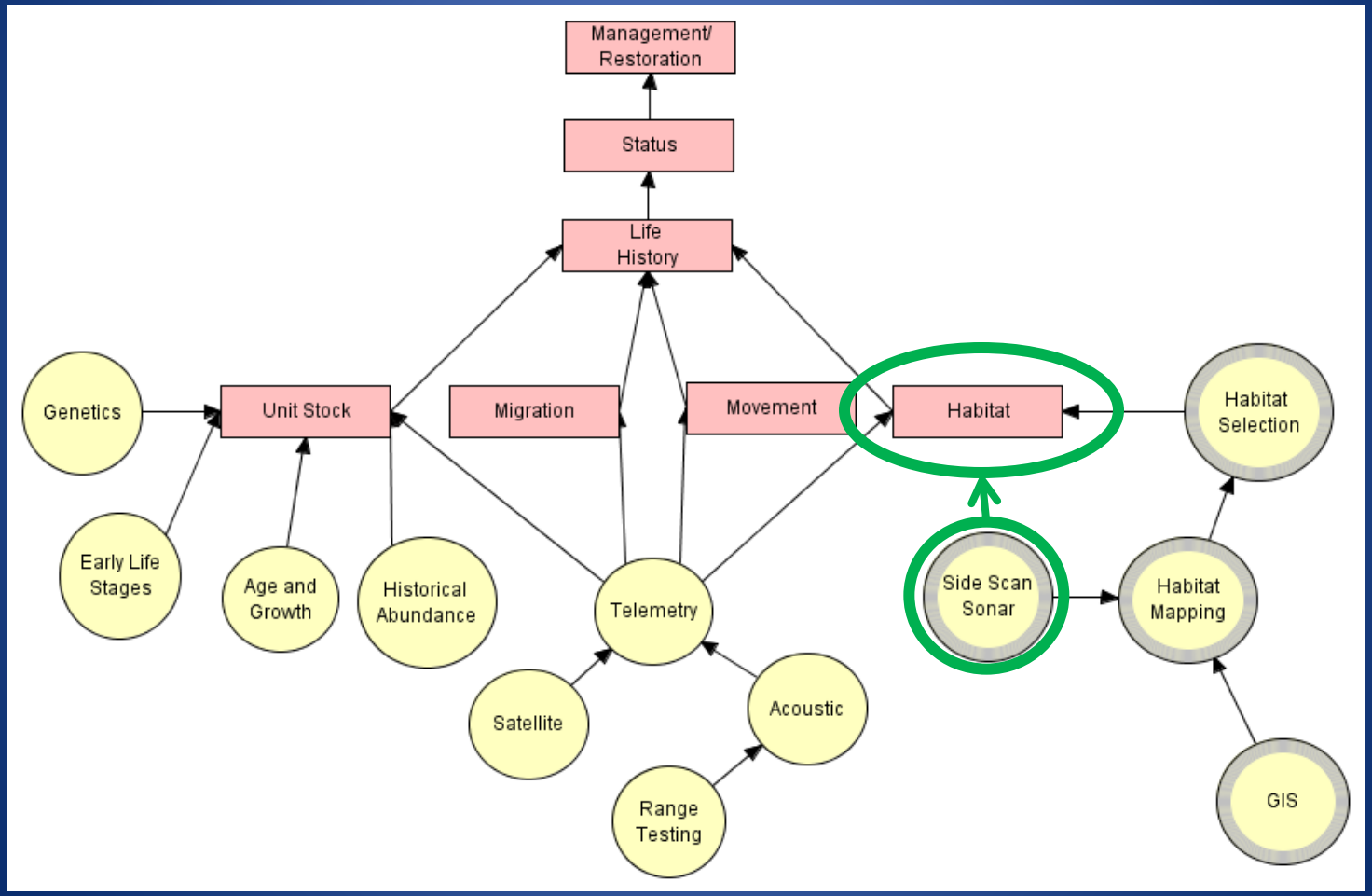
  - 2015
    - 19 transmitters implanted
    - Two females, 17 males


Legend
Receivers
Sentinel tags
N
Kilometers
0 0.5 1 2 3 4
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N
0 4 8 16 24 32
Kilometers
Legend
Sentinel tags
NEFC
NYDEC and LGL
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

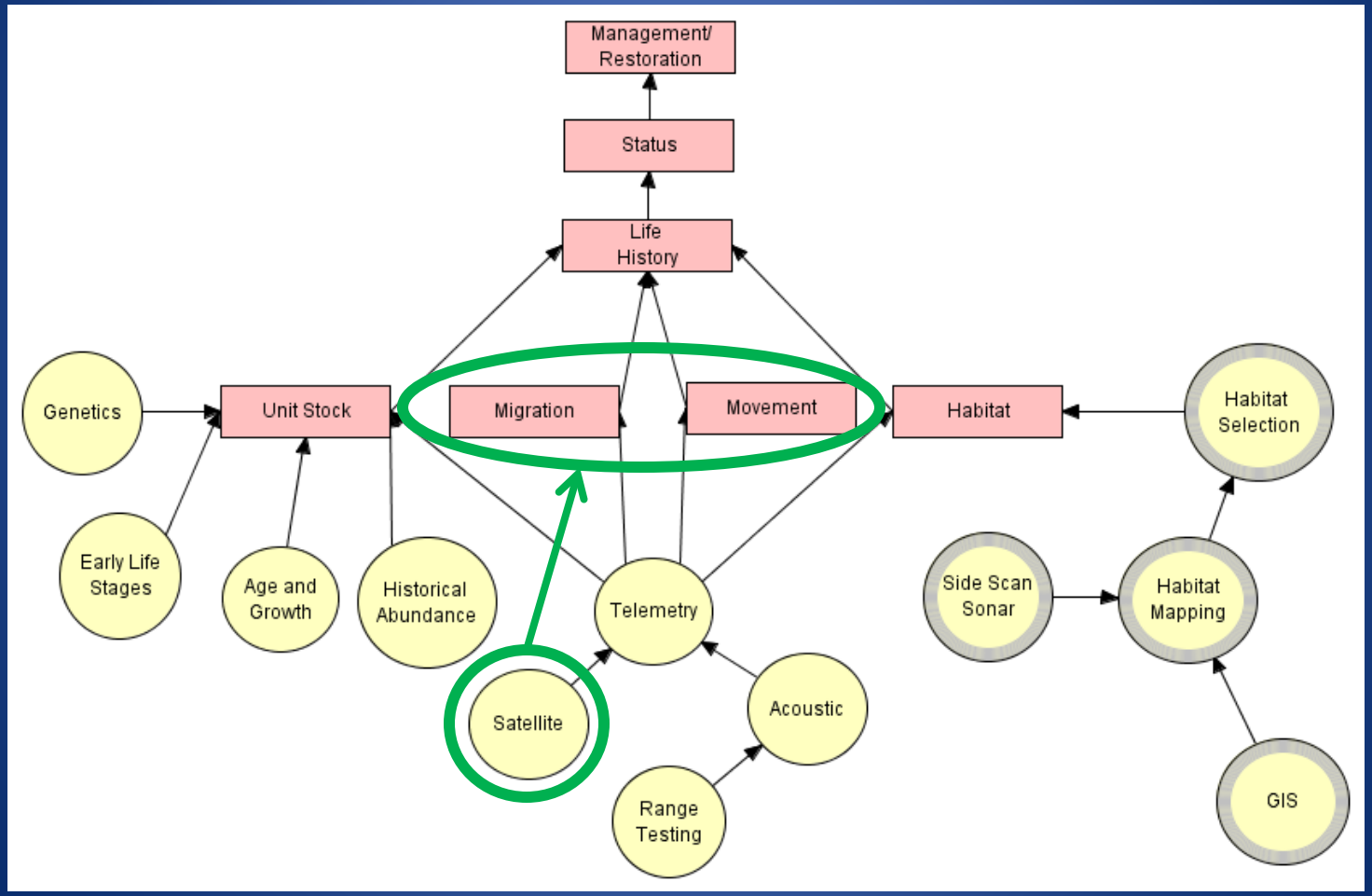
Methods

Objectives


Management/ Restoration
Status
Life History
Genetics
Unit Stock
Migration
Movement
Habitat
Habitat Selection
Early Life Stages
Age and Growth
Historical Abundance
Telemetry
Side Scan Sonar
Habitat Mapping
Satellite
Acoustic
Range Testing
GIS

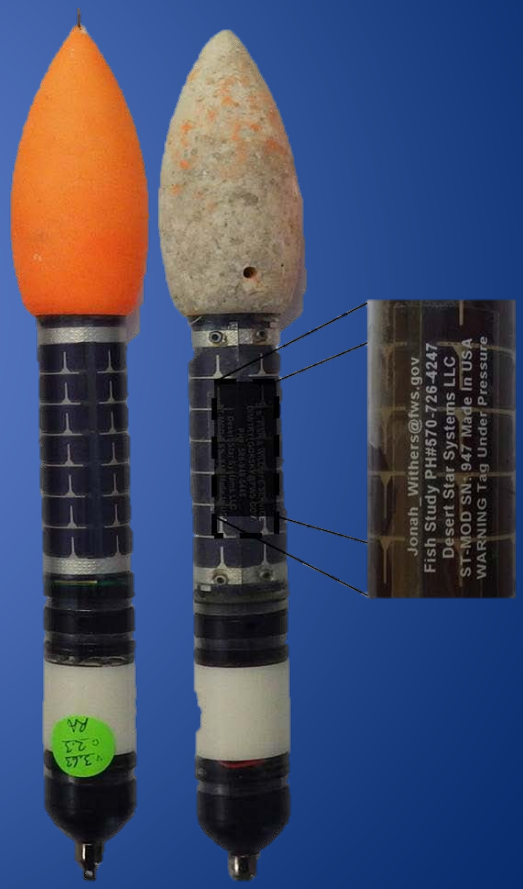
Legend
Receivers
Sentinel tags
N
Kilometers
0 0.5 1 2 3 4
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Objectives


Management/ Restoration
Status
Life History
Genetics
Unit Stock
Migration
Movement
Habitat
Habitat Selection
Early Life Stages
Age and Growth
Historical Abundance
Telemetry
Side Scan Sonar
Habitat Mapping
Satellite
Acoustic
Range Testing
GIS

Methods

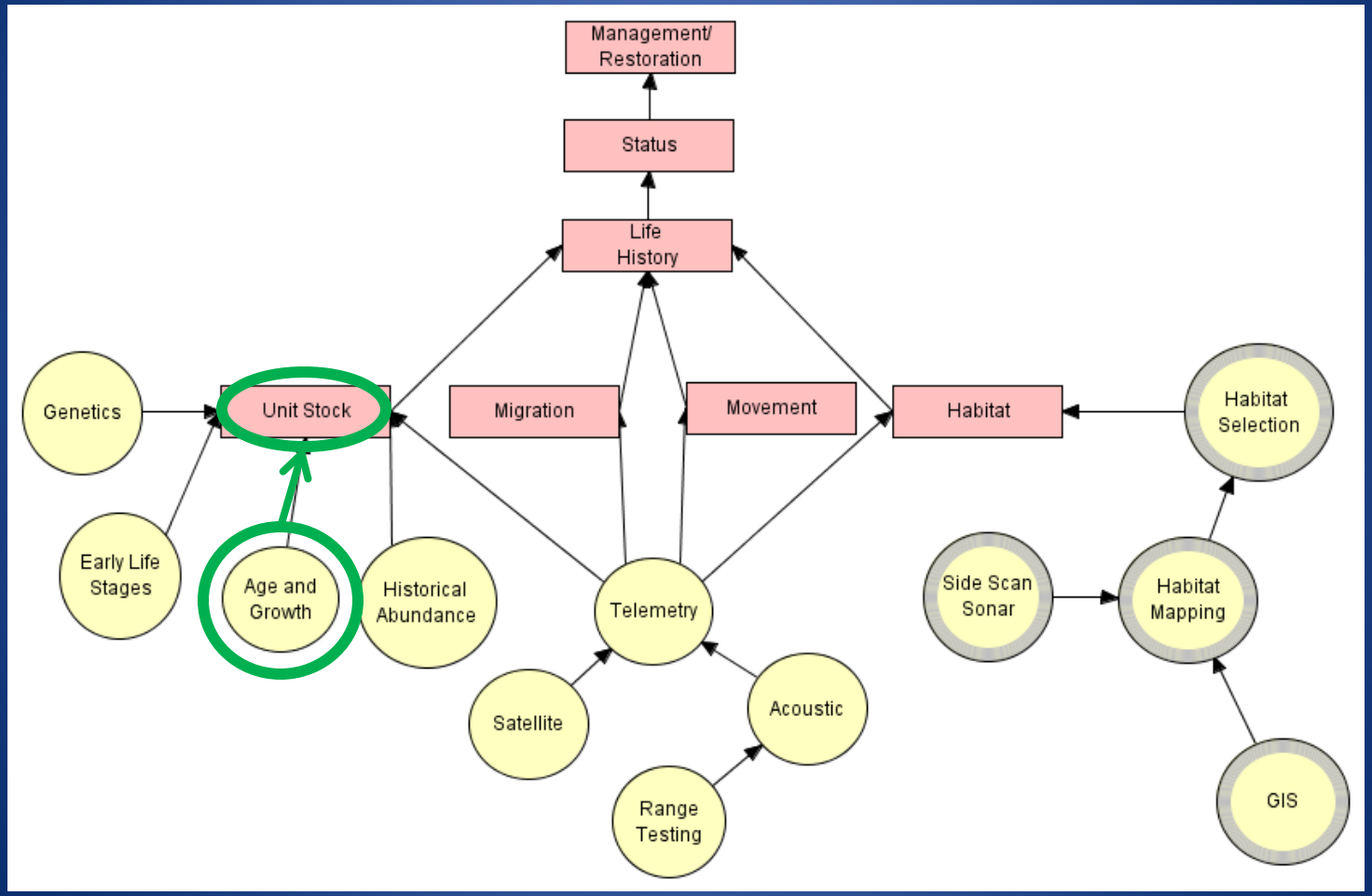
- Pop-up Satellite Archival Tags
  - SeaTag-MOD
    - Sampling interval: 4-minutes
    - Positions: GPS & Magnetometer/Light-based
    - Sensor Data: Depth, Temperature, Acceleration



Methods

- Nine Transmitters deployed in 2015
  - Two Females, 7 Males
  - Three to release on 15 October 2015
  - Six to release on 10 May 2016

Objectives

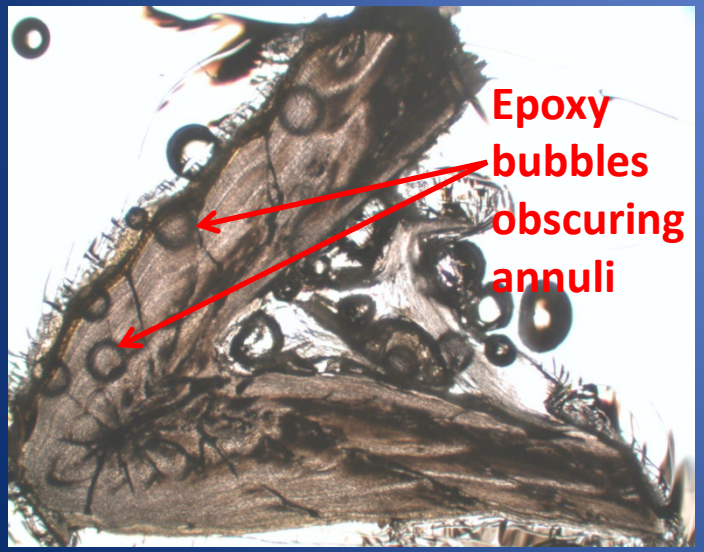

Management/ Restoration
Status
Life History
Genetics
Unit Stock
Migration
Movement
Habitat
Habitat Selection
Early Life Stages
Age and Growth
Historical Abundance
Telemetry
Side Scan Sonar
Habitat Mapping
Satellite
Acoustic
Range Testing
GIS

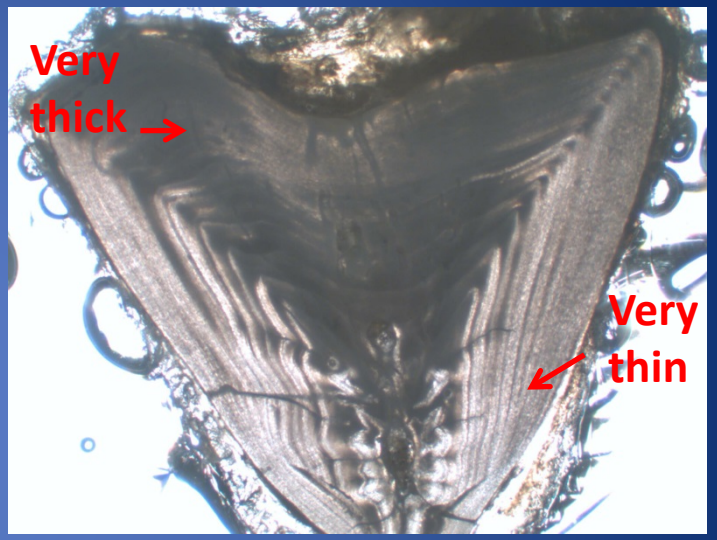
Methods

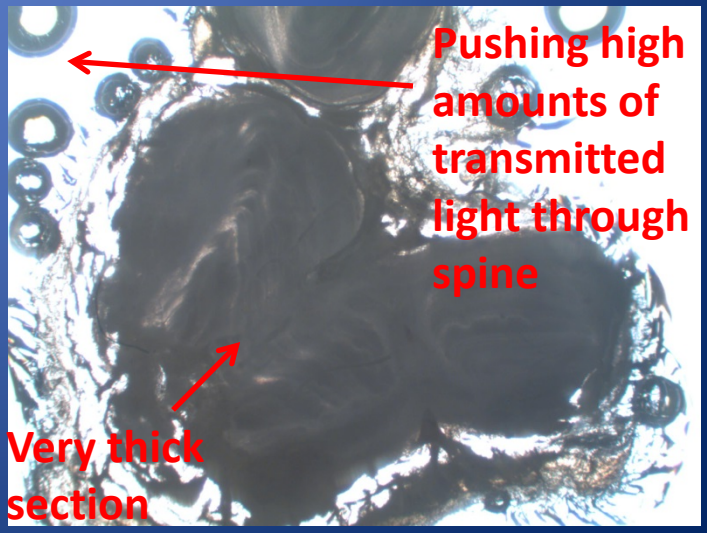
- Age and growth

Methods

- Age and growth







Methods

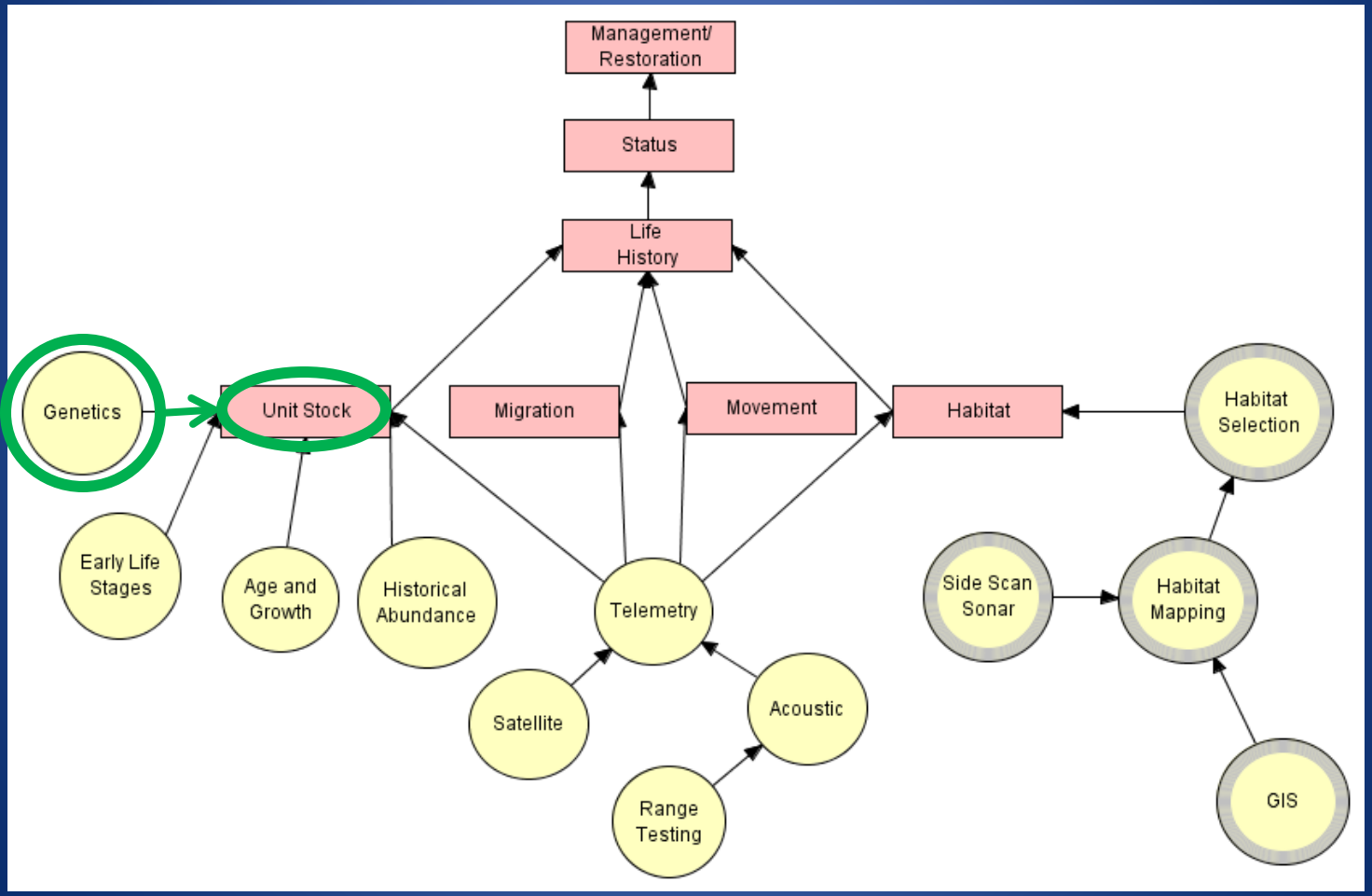
- Age and growth

Methods

Methods

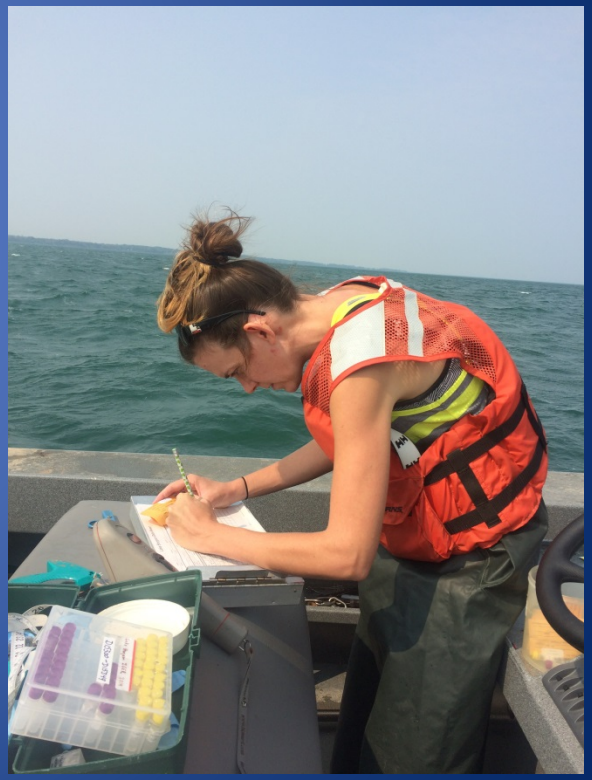
- Partial age validation
  - Oxytetracycline (OTC)
  - Floy tag
  - Passive Integrated Transponder (PIT)

Objectives

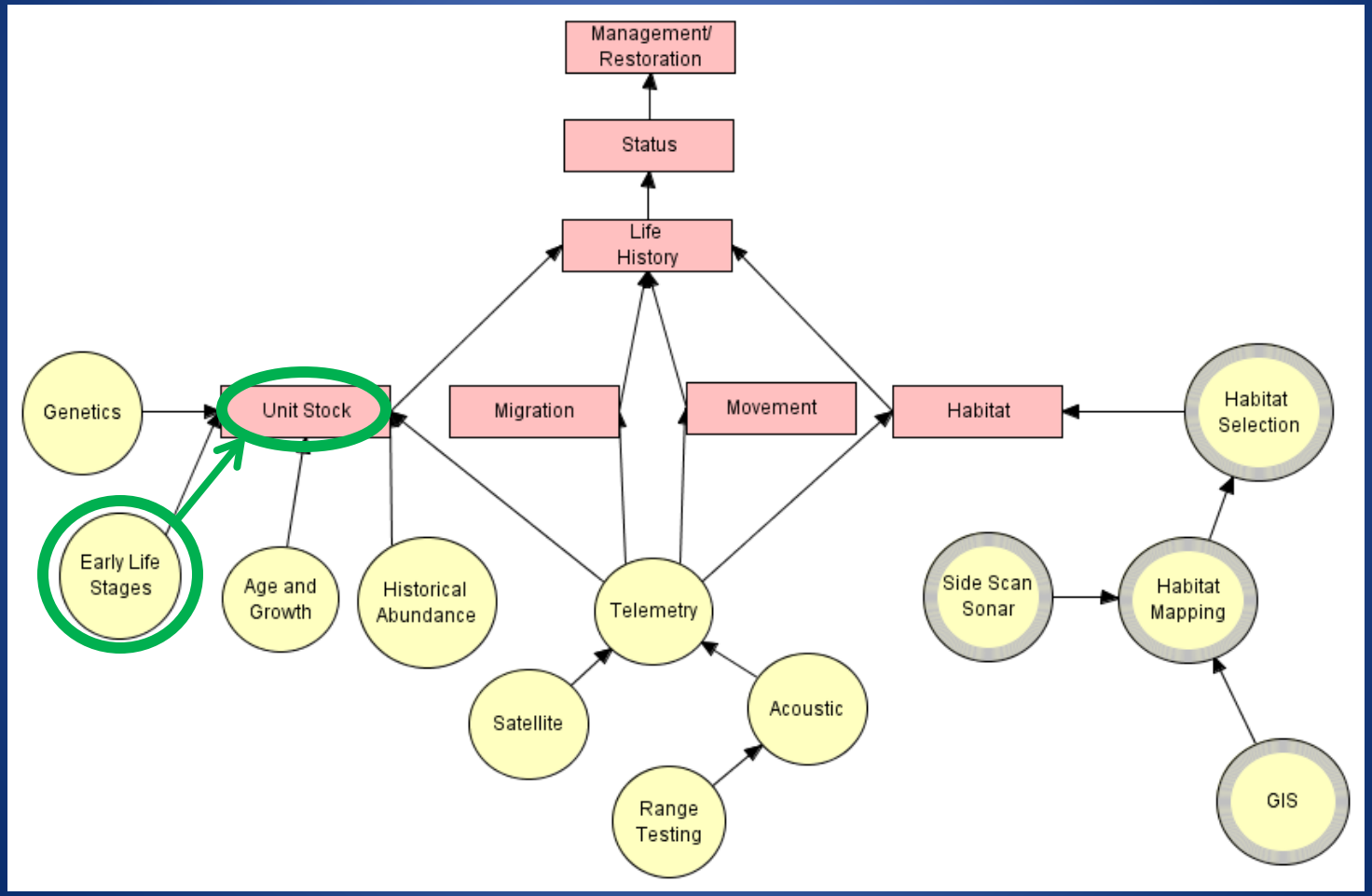

Management/ Restoration
Status
Life History
Genetics
Unit Stock
Migration
Movement
Habitat
Habitat Selection
Early Life Stages
Age and Growth
Historical Abundance
Telemetry
Side Scan Sonar
Habitat Mapping
Satellite
Acoustic
Range Testing
GIS

Methods

- Genetics
  - Buffalo Harbor & Niagara River
    - Tissue samples
    - Processed by NEFC Conservation Genetics Lab

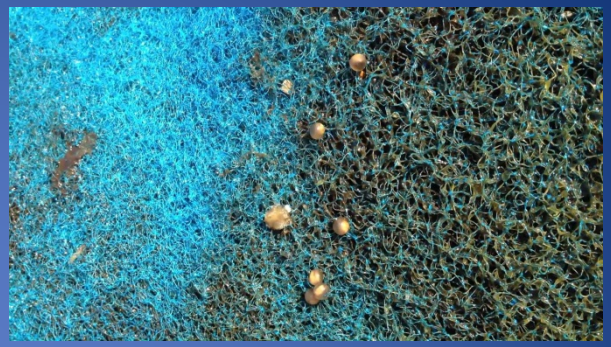


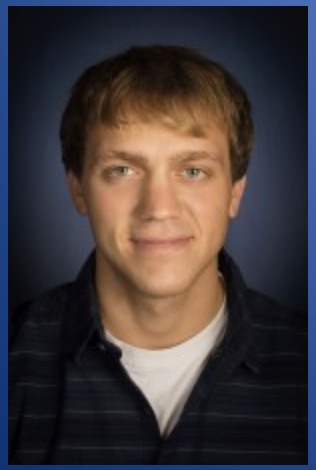
Objectives


Management/ Restoration
Status
Life History
Genetics
Unit Stock
Migration
Movement
Habitat
Habitat Selection
Early Life Stages
Age and Growth
Historical Abundance
Telemetry
Side Scan Sonar
Habitat Mapping
Satellite
Acoustic
Range Testing
GIS

Methods

- Early Life Stages
  - Eggs
  - Larvae
  - Juveniles
    - Gillnets & Set lines





Acknowledgements

- Great Lakes Restoration Initiative (GLRI)
- Great Lakes Acoustic Telemetry Observation System (GLATOS)
- Buffalo State University of New York
- Michigan Department of Natural Resources
- New York State Department of Environmental Conservation
- Ohio Department of Natural Resources
- Ontario Ministry of Natural Resources
- Pennsylvania Fish and Boat Commission
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Fish and Wildlife Service, Alpena Fish and Wildlife Conservation Office
- U.S. Fish and Wildlife Service, Lower Great Lakes Fish and Wildlife Conservation Office