Creating a Science-based Strategy to Manage Chesapeake Bay Forage

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Outline

- Outcome and Management Approach
- Timeline
- STAC Workshop results
- Forage Indicator Study (GIT funding)
- Next Steps
- Discussion

Forage Outcome

Continually improve the Partnership's capacity to understand the role of forage fish populations in the Chesapeake Bay. By 2016, develop a strategy for assessing the forage fish base available as food for predatory species in the Chesapeake Bay.
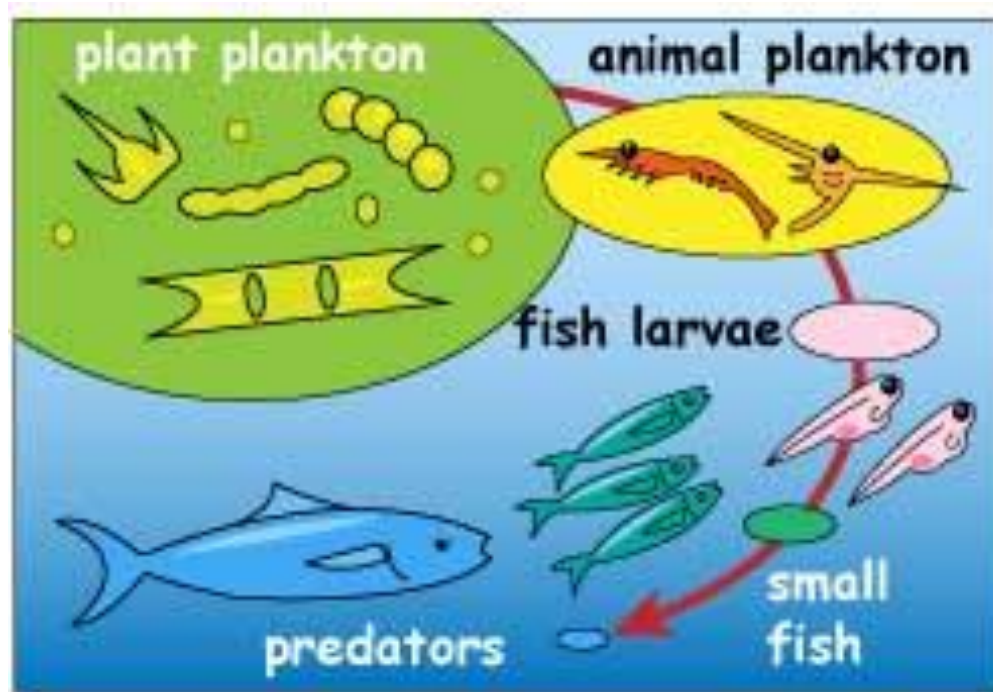
Management Approach

- Define forage species and what comprises the forage base

- Determine the status of the forage base including a definition of "balanced" state

- Inform management decisions to better address sustainability of the forage base

- Maximize the efficiency of monitoring programs and build on existing efforts

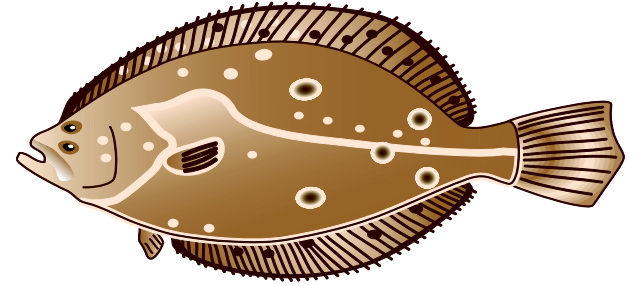# Chesapeake Bay Program
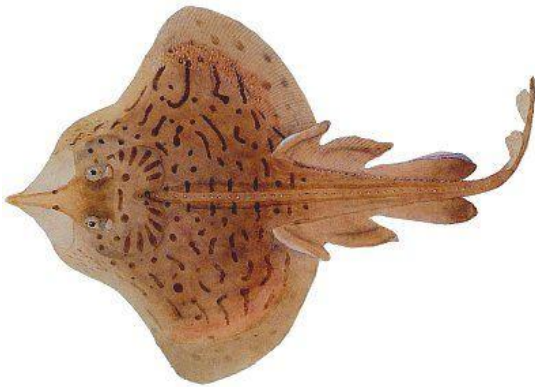
GIT Funded Projects
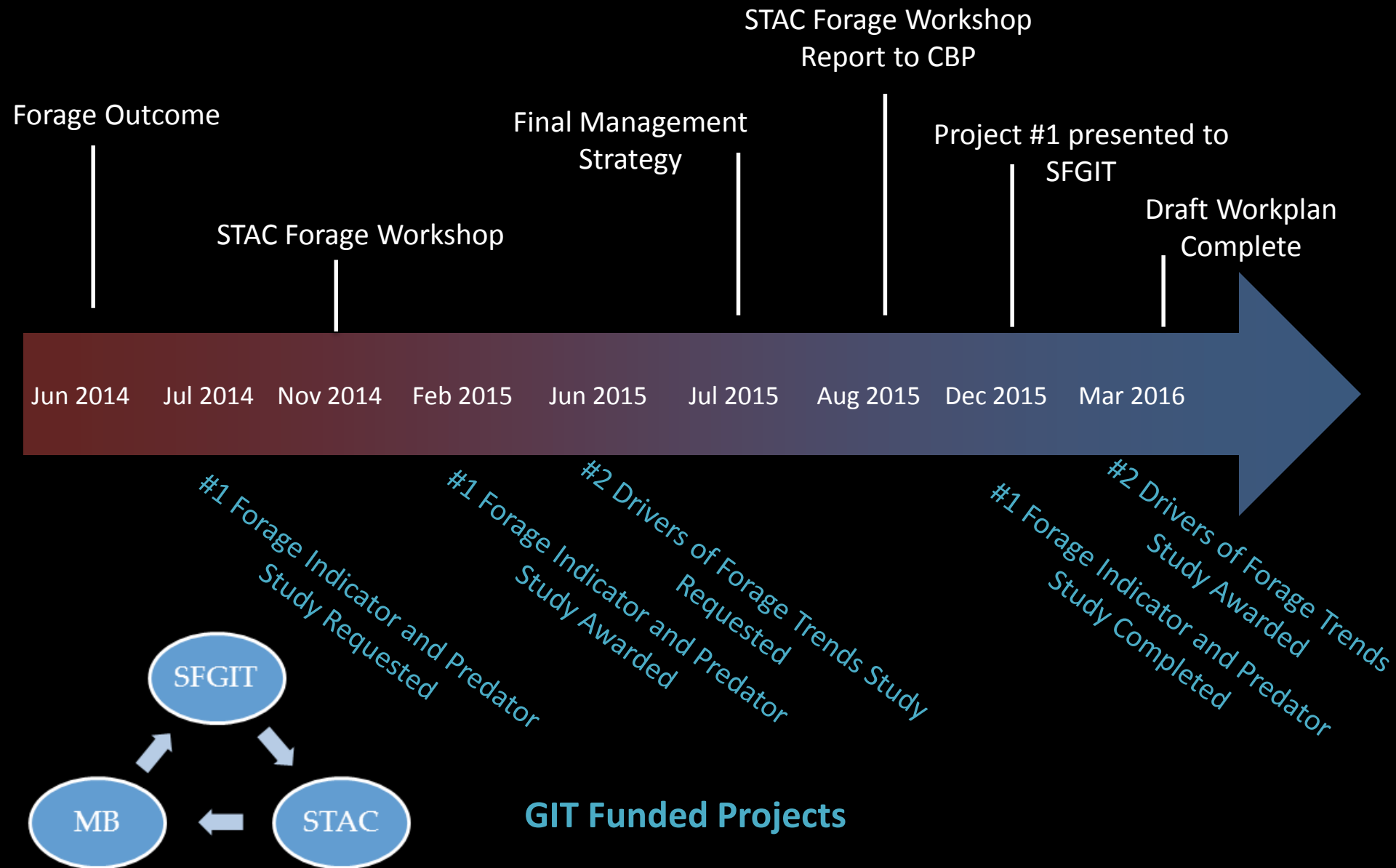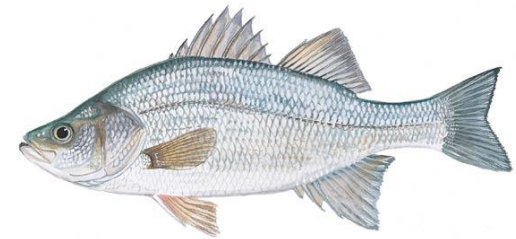
Indicator Predators
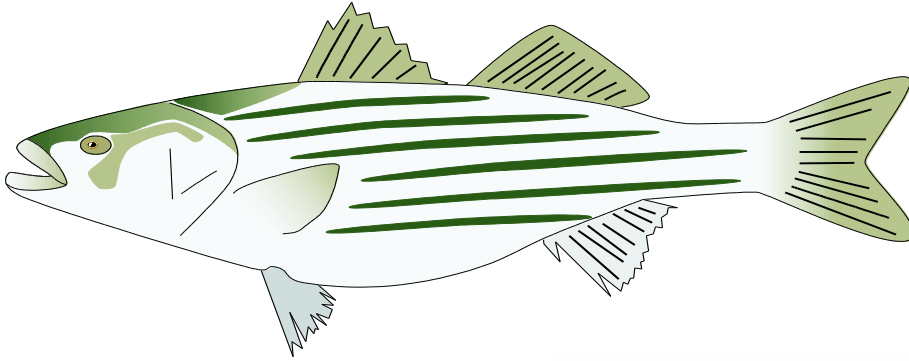
Pelagic Piscivore

Benthic Piscivore

Benthic Predator

Lower Bay

Upper Bay

2014 STAC Workshop Results

Key Forage Species / Groups:

- **Bay Anchovy**
- **Polychaetes**
- **Mysids**
- **Razor clams**
- **Amphipods and isopods**
- **Weakfish (juveniles)**
- **Spot (juveniles)**
- **Mantis shrimp**
- **Sand shrimp**
- **Atlantic croaker (juveniles)**
- **Macoma clams**

Based on wet weight of prey in stomach analyses from ChesMMAP (VIMS)

- **Atlantic menhaden**
- **Blue crab**
- **Shad & river herrings**
- **Small bivalves**
- **Atl.Silverside**
- **Mummichog**

Managed forage species

Historically Important

Upriver

- ½ species are invertebrates
- Many not usually "forage"

Factors Influencing

- Habitat
- Shoreline hardening/ armoring / protection
- Land use and watershed development
- Climate change and sea level rise
- Water quality
- Predation (including birds)
- Food resources for forage species (including plankton)
- Fishing and catch removals
- Socioeconomic factors (including perceived value)

Indicators/Metrics

Developed a list of 13 types of indicators/metrics that:

1) reflect the status and trends of forage and inform setting targets and thresholds

2) are linked to trends in habitat and water quality

3) are collected routinely (emphasis on existing data sets)

4) are actionable (i.e. inform management actions)

Prioritized Recommendations:

1   Strategic review and data-mining of all available current data to support forage quantification

2/3   Re-establish zooplankton monitoring to develop an index of feeding conditions for key forage (e.g., Bay Anchovy, Menhaden) and to develop abundance indices for key forage taxa (e.g., mysids);

2/3   Develop a standard set (suite) of metrics and indicators

4   Relate forage trends to predator trends

5   Improve understanding of forage dynamics & trends, especially those with limited or no current data (e.g., mysids), system-wide & habitat-specific scales

6   Establish shallow water monitoring of forage in soft-bottom, marsh, and SAV habitats (including up-tributary habitats)

Other Important Findings

- Connect with Habitat GIT to study, map, and manage habitats and areas critical to forage

- Define formal management objectives: (targets and thresholds)

- Align efforts with Atlantic States Marine Fisheries Commission and Mid Atlantic Fishery Management Council

- Develop integrative models

- Improve communications to show importance of forage (video; web)

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Forage Indicators Study Year 1

4 Indicators of Forage Status & Trends:

- Relative prey abundance / biomass

- Diet-based indices

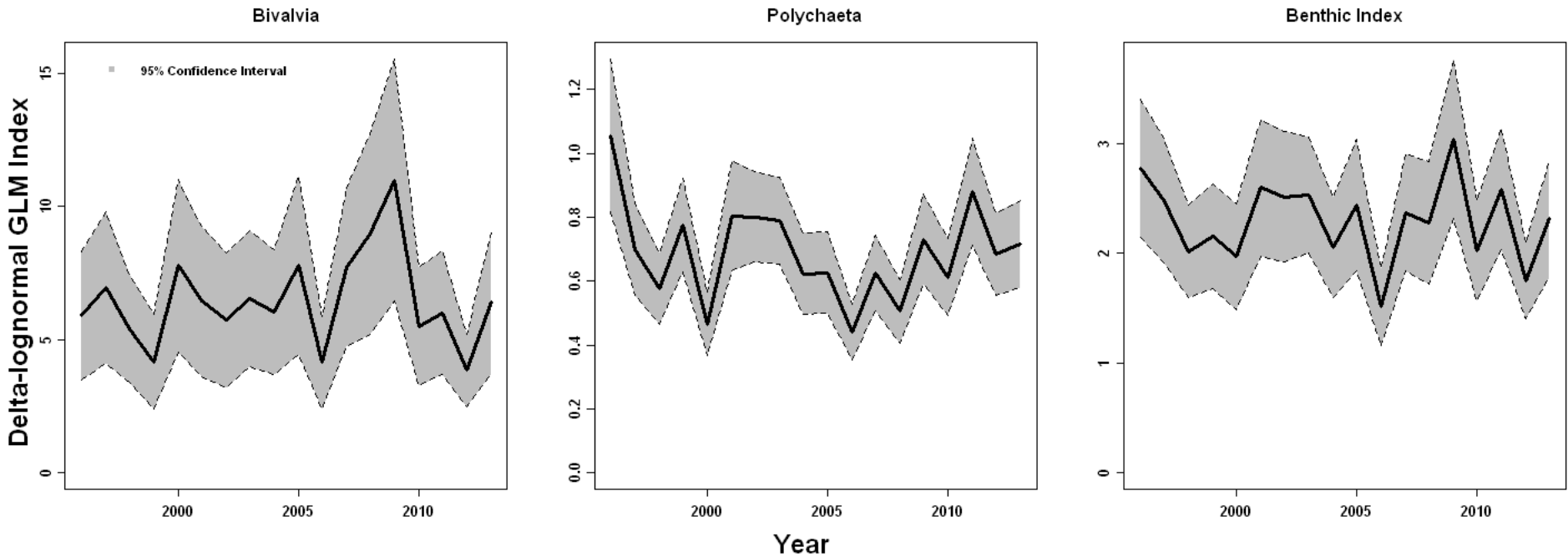- Prey / Predator ratios

- Consumption / Prey ratios

Forage Indicators Study Year 1

Relative Prey Abundance Through Time
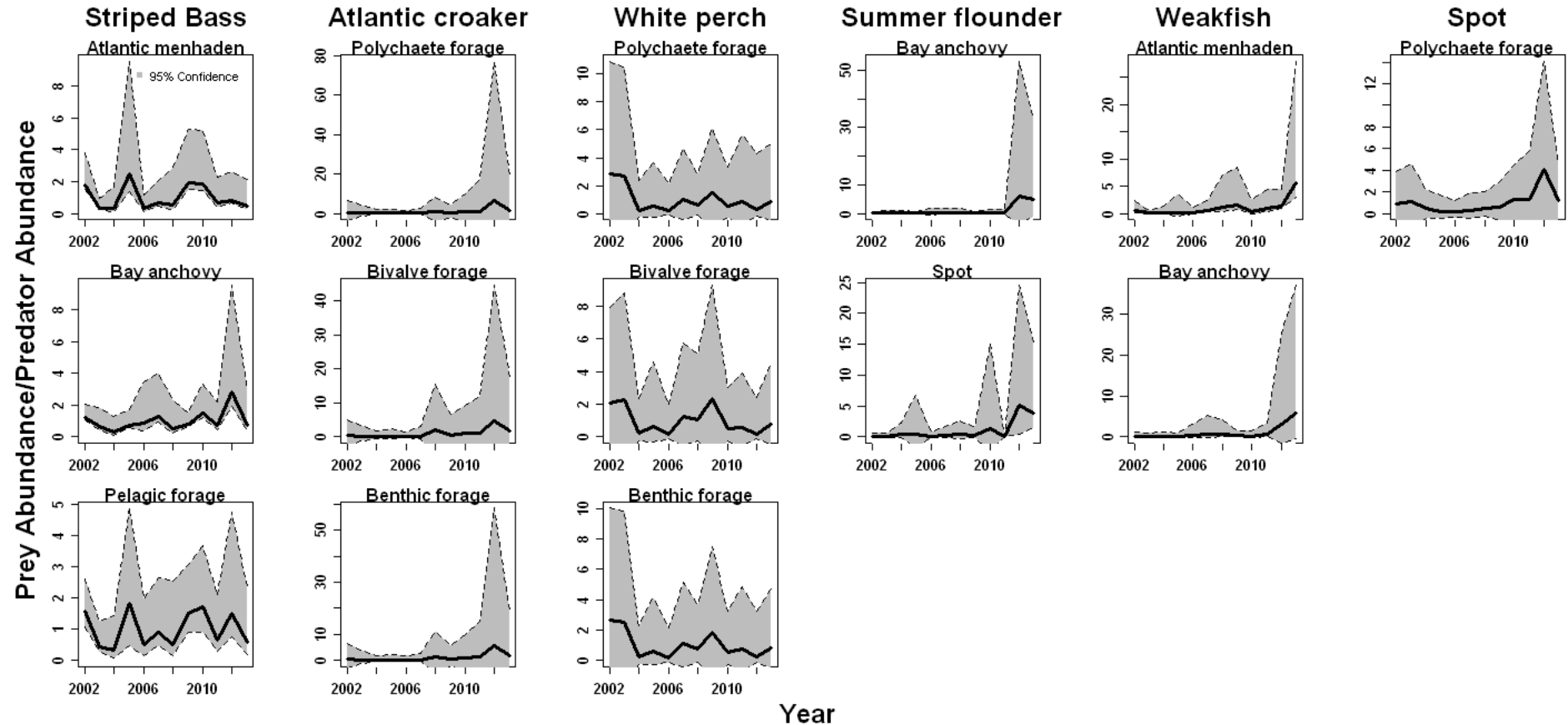
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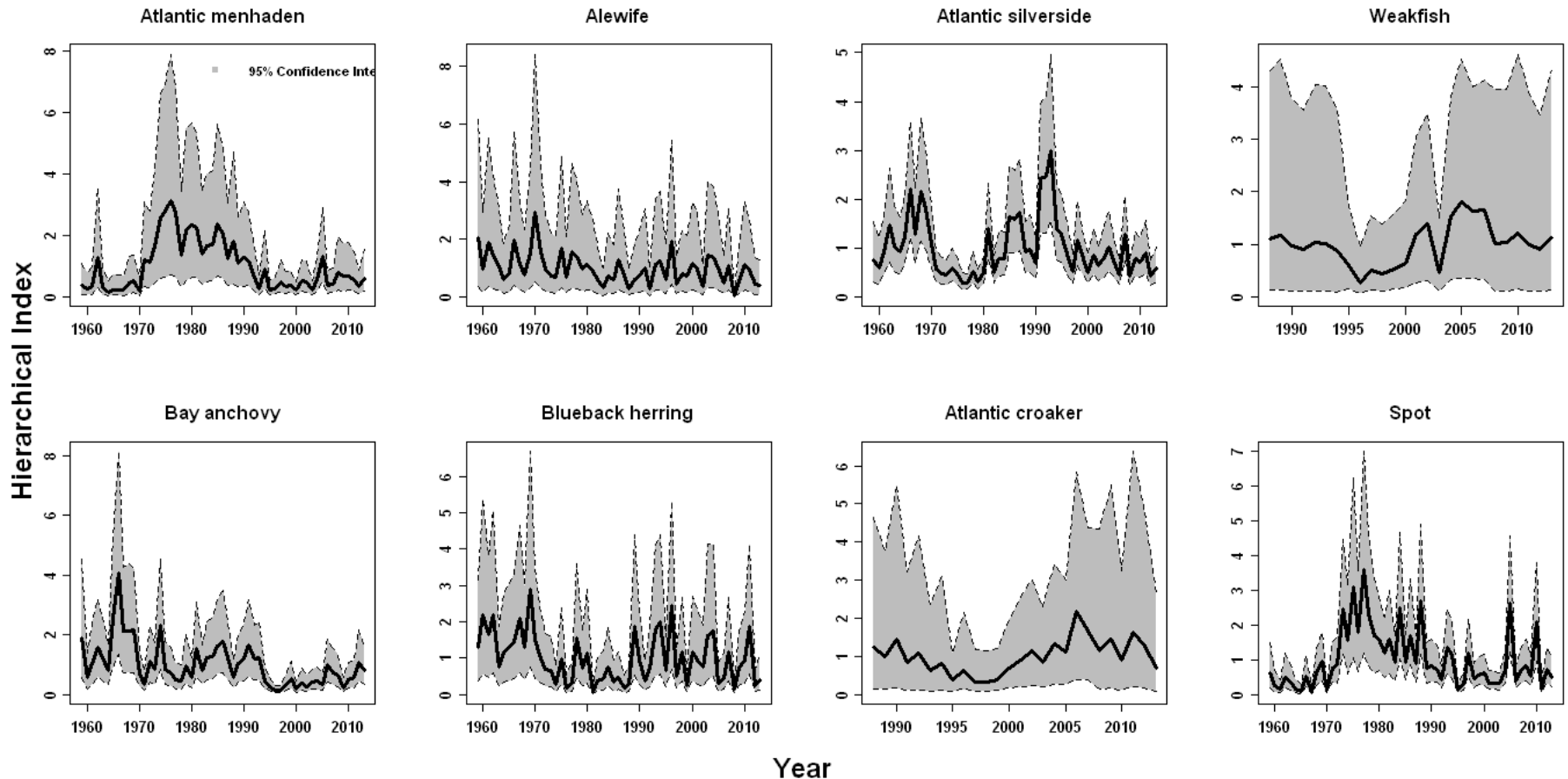
Forage Indicators Study Year 1

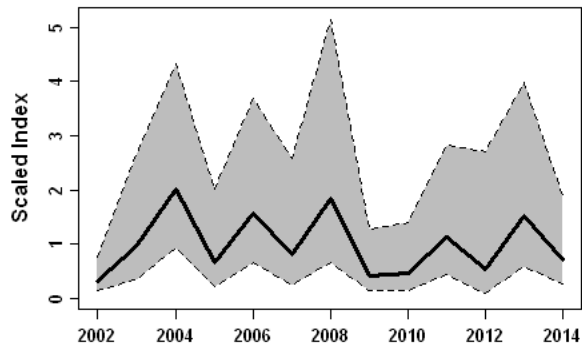## Relative Prey Abundance Through Time

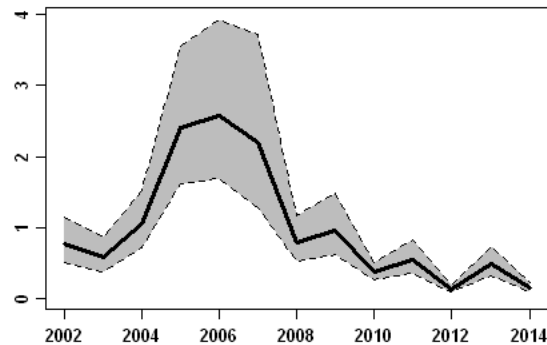# Forage Indicators Study Year 1

Prey to Predator Ratio

UMCES

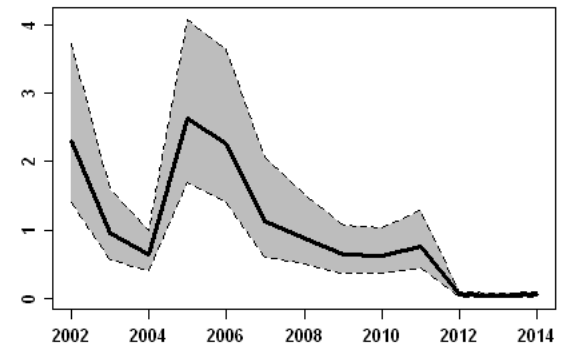# Forage Indicators Study Year 1

Predator Abundance Over Time
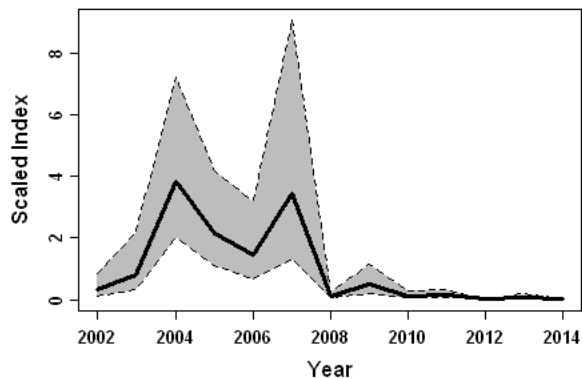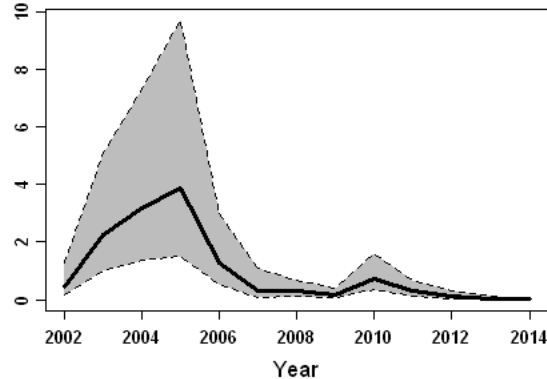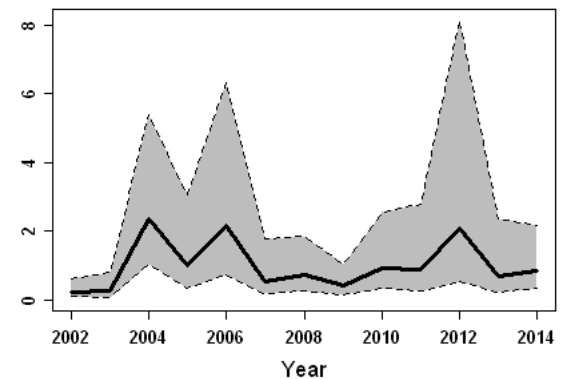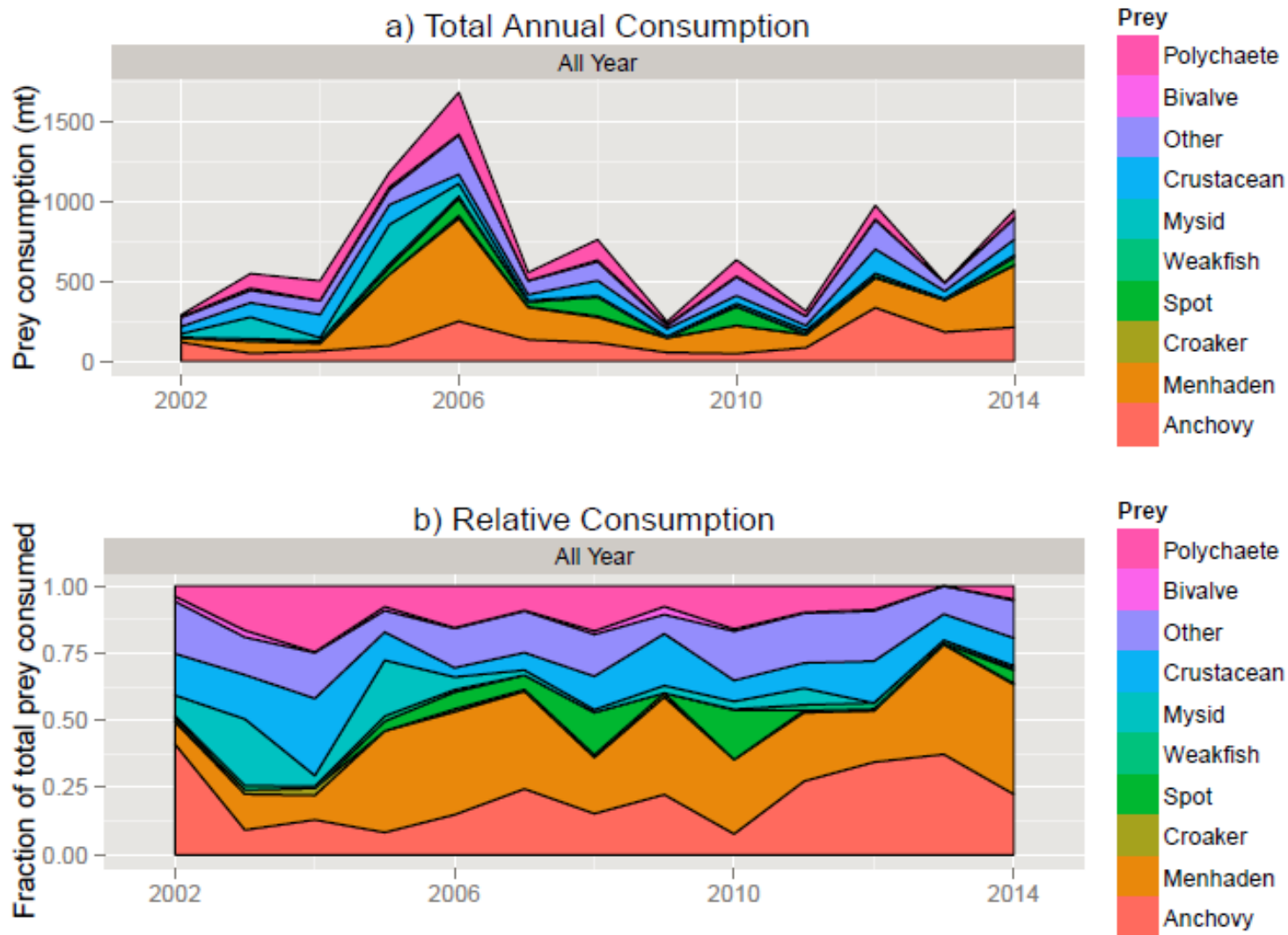
UMCES
Forage Indicators Study Year 1

Striped Bass − Total Annual Consumption

Forage Indicators Study Year 2

- Variability – effect on predators

- Environmental drivers related to/causing variability

Next Steps

- Apply indicator and metric results to workplan

- Define formal management objectives

- Communicate results to Bay partners

- Identify collaborative opportunities with other GITs

Issues for Management Board

- Environmental factors (habitat loss, climate change)
- Monitoring (plankton and shallow water)
- Cross-GIT connections
- Communication and education

Questions