

A JOURNEY THROUGH 20 YEARS OF FISH COMMUNITY TRANSFORMATION ALONG THE WATERFRONT

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Toronto and Region
Conservation
Authority

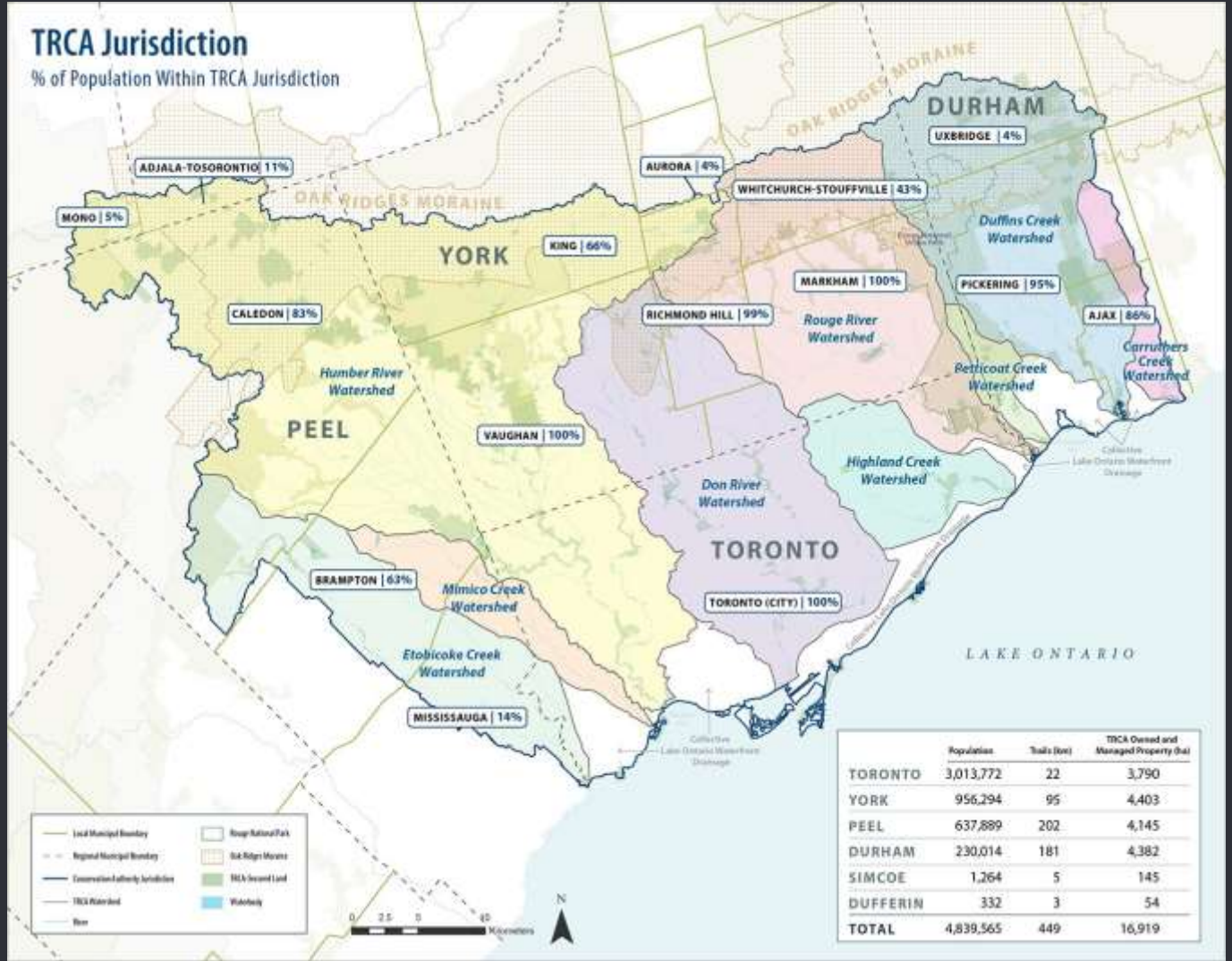
TRCA work and role along the Toronto waterfront



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‘MULTI-DECADE COLLABORATIVE EFFORT BETWEEN NGOs, GOVERNMENT, UNIVERSITIES, CITY OF TORONTO...’

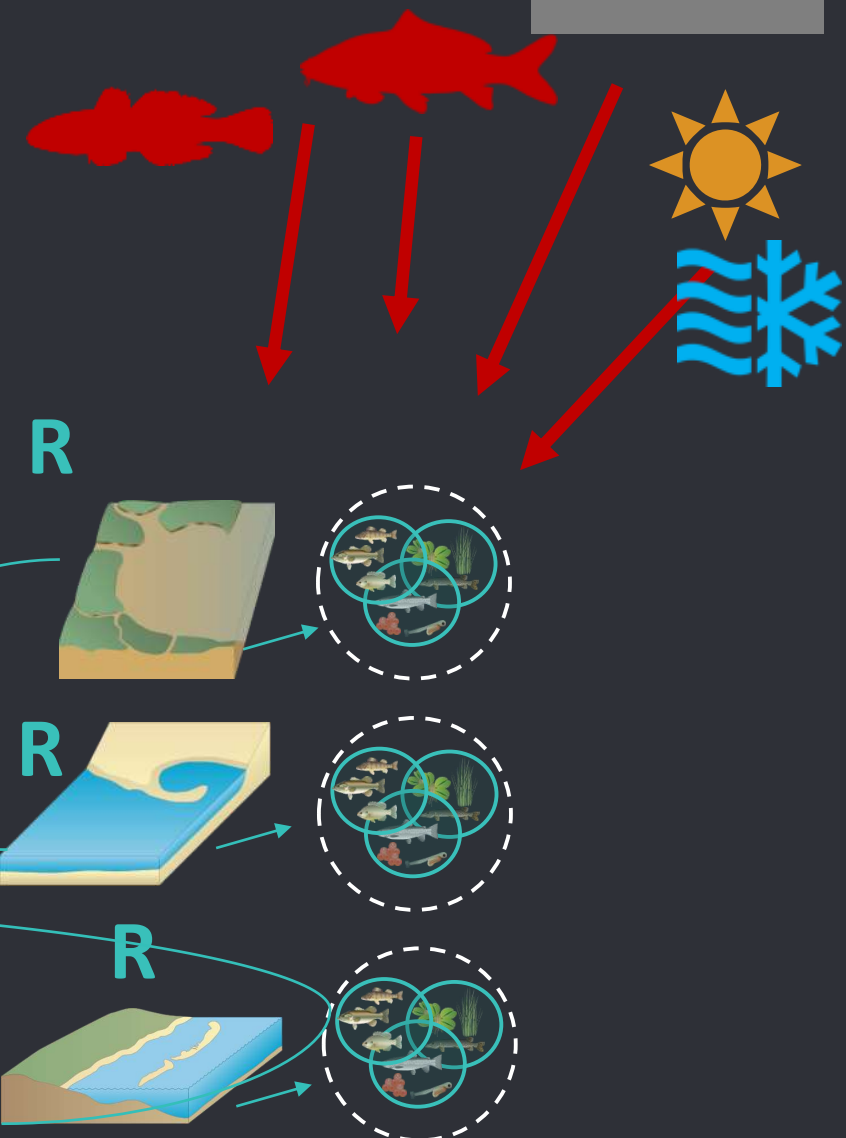
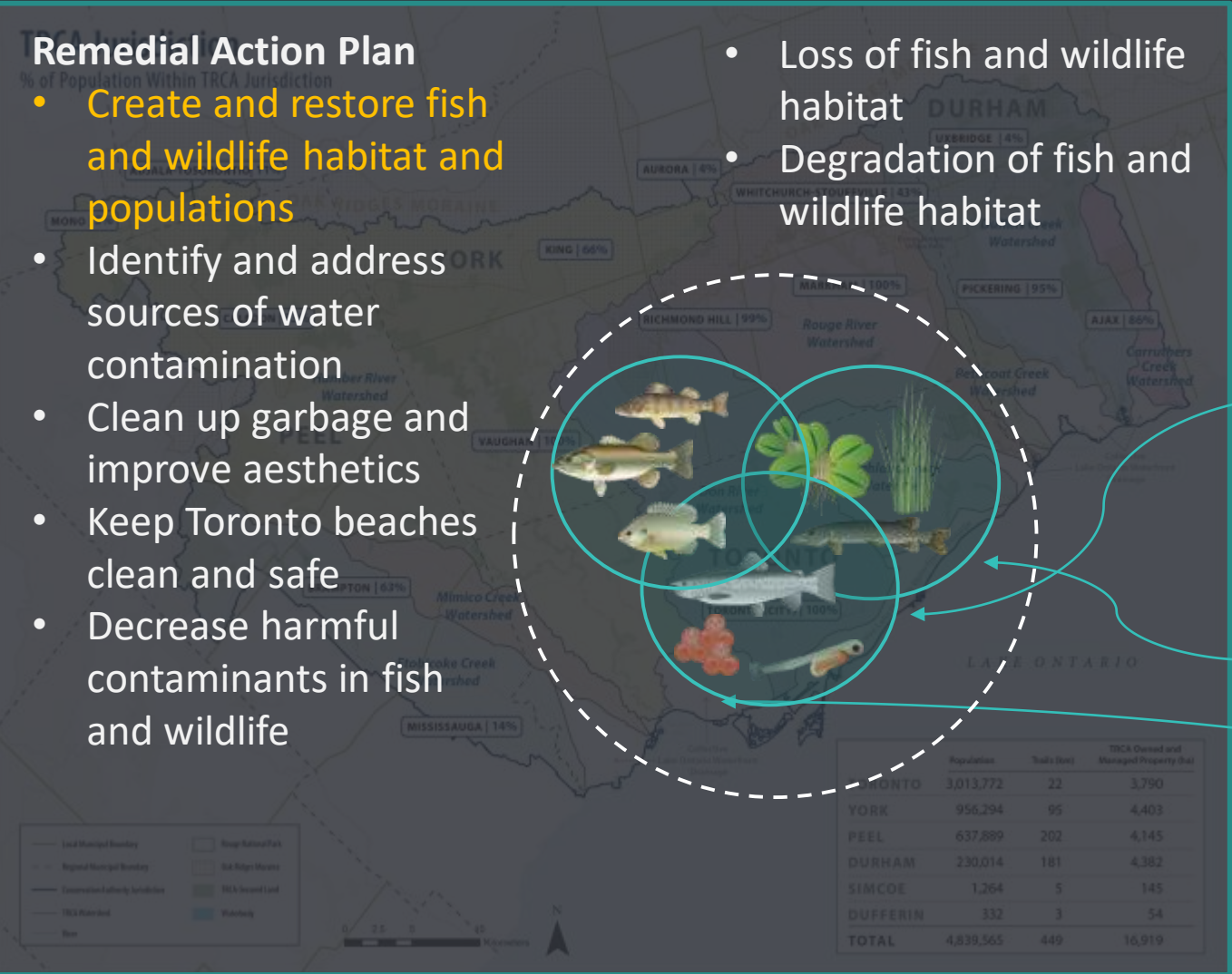
72 kilometers of shoreline that falls within TRCA jurisdiction

Changing communities along the waterfront

Remedial Action Plan

- Create and restore fish and wildlife habitat and populations
- Identify and address sources of water contamination
- Clean up garbage and improve aesthetics
- Keep Toronto beaches clean and safe
- Decrease harmful contaminants in fish and wildlife

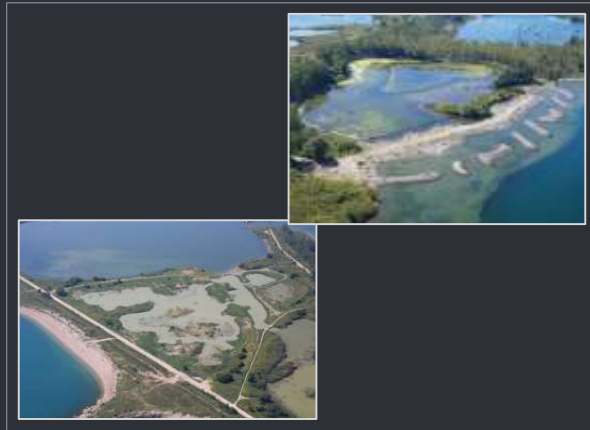
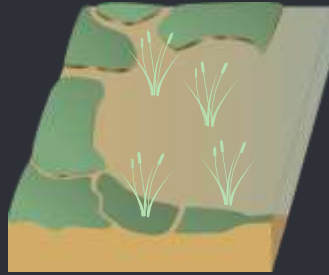
- Loss of fish and wildlife habitat
- Degradation of fish and wildlife habitat



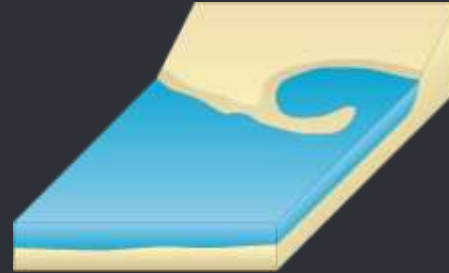
COMMUNITY CHANGES



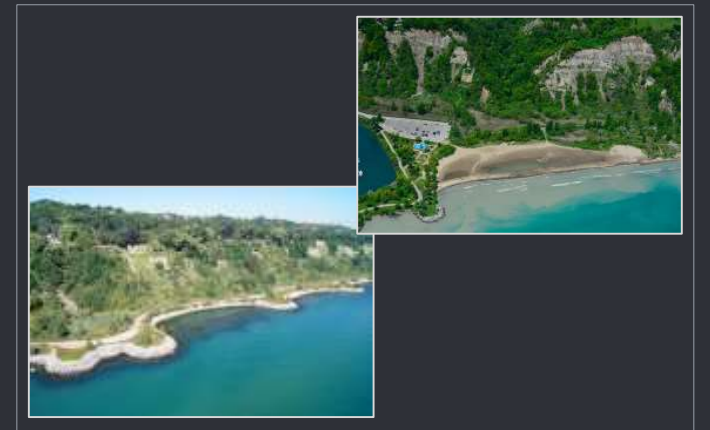
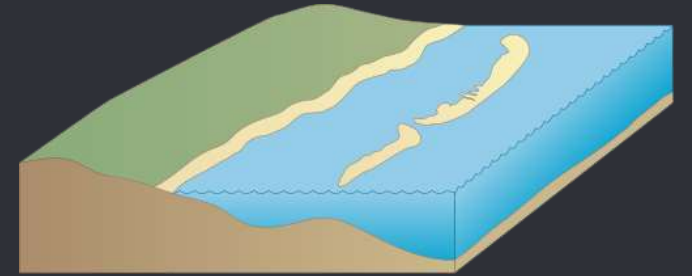
Coastal Wetland



Embayment



Open Coast



COMMUNITY CHANGES



- ABUNDANCE



- BIOMASS



- COMMUNITY



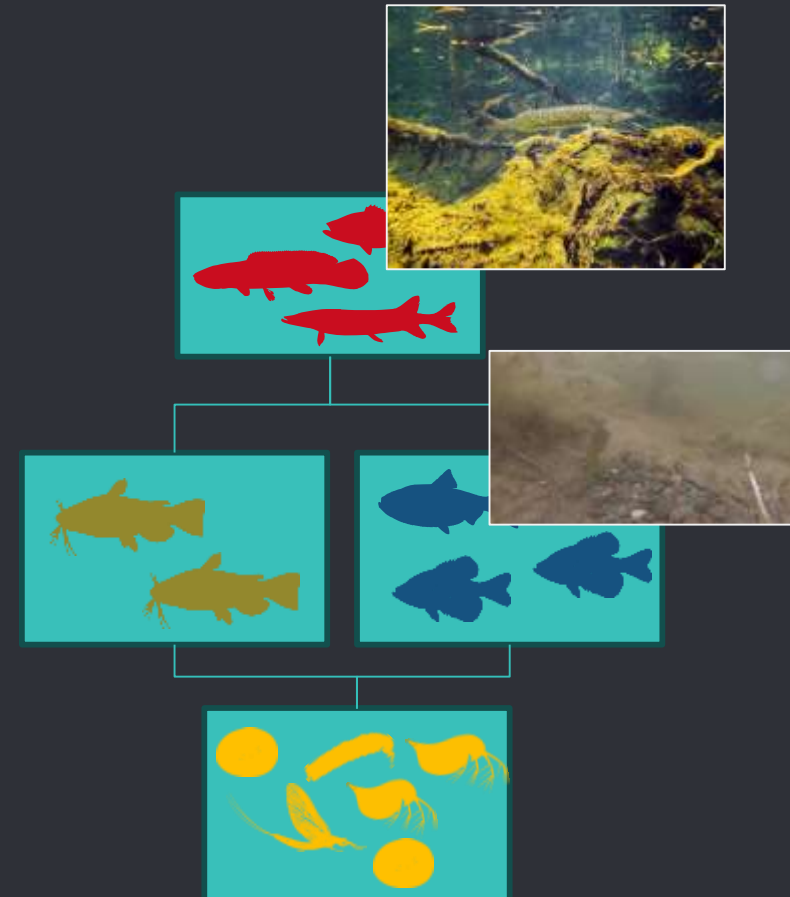
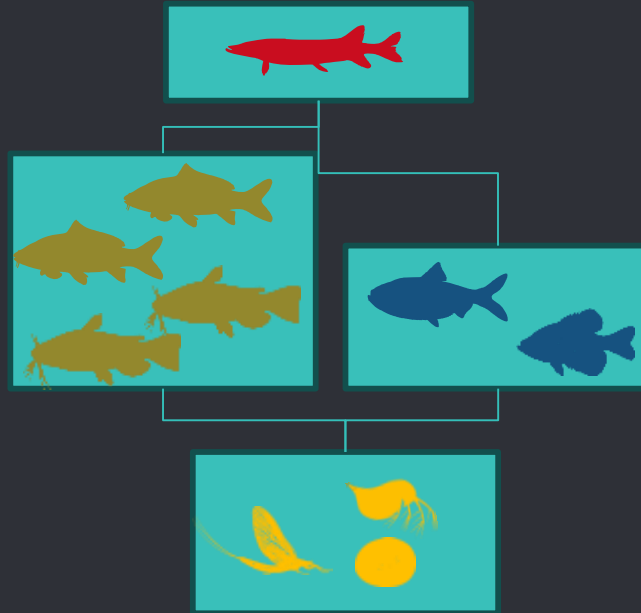
Remedial Action Plan (RAP)

COMMUNITY METRICS

- Native species
- Piscivores
- Specialists
- Thermal guild
- Vegetation & cover

SPECIFIC TARGETS

- 20% piscivore biomass
- 40% specialist biomass

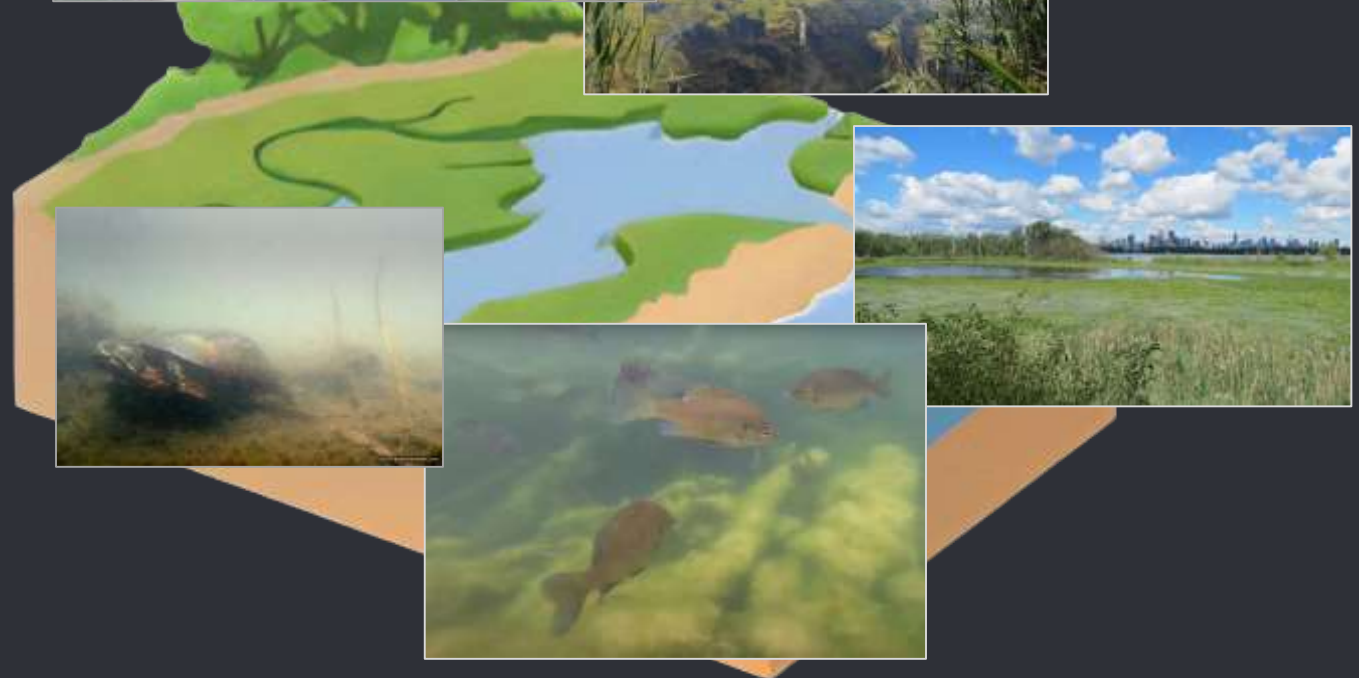




‘HOW HAVE FISH COMMUNITIES CHANGED?’

'COASTAL WETLANDS – CRUCIAL FOR HEALTH AND FUNCTION OF LAKE ONTARIO

- Water quality improvement
- Flood protection
- **Habitat/ biodiversity**
- **Nursery grounds for fish**
- Carbon sequestration
- Recreation and tourism
- Erosion control





‘ABUNDANCE’

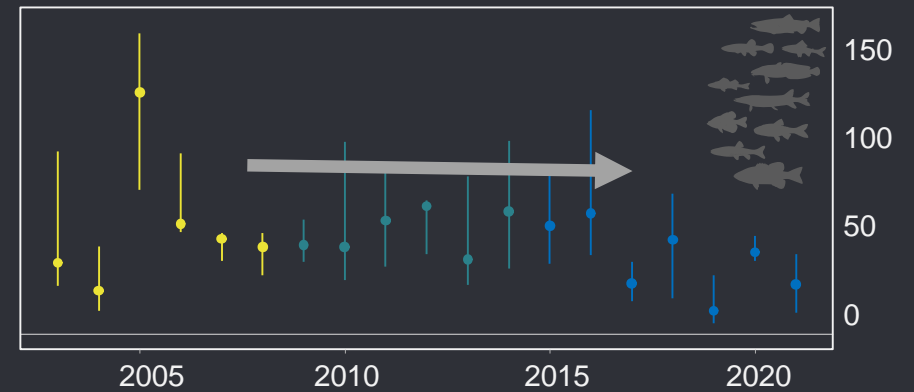
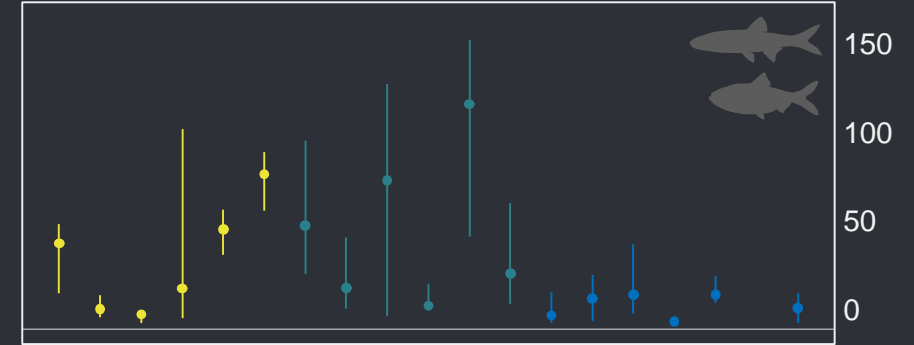
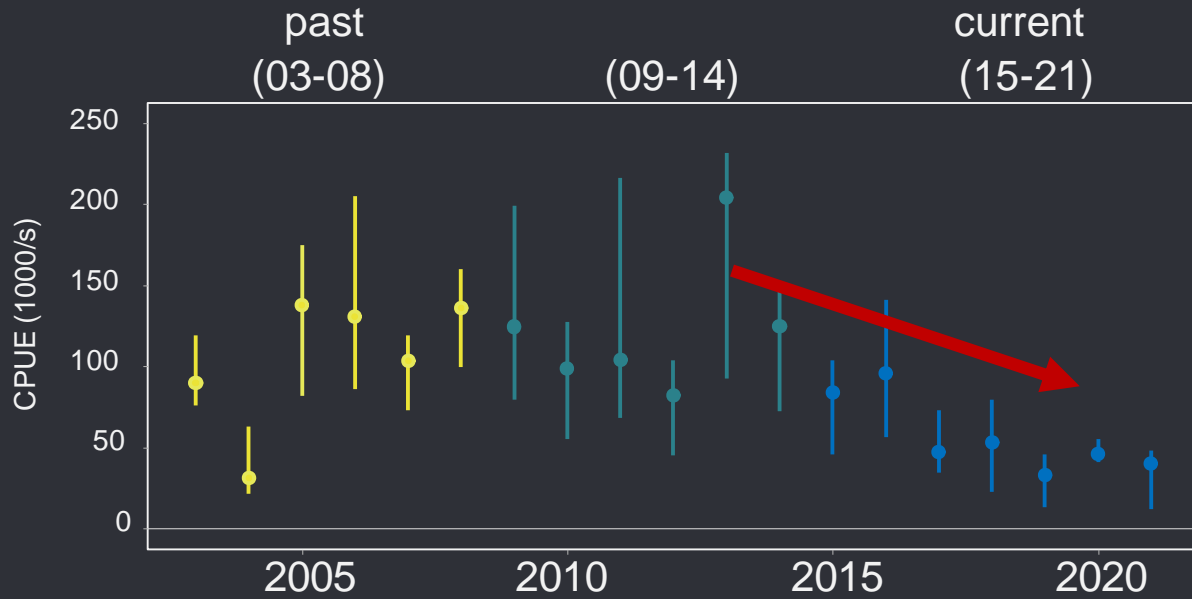
ABUNDANCE TRENDS OVER TIME



Coastal Wetland



Abundance



'DECLINES DRIVEN BY ALEWIFE/ EMERALD SHINER'

SOURCE: IAN.UMCES.EDU

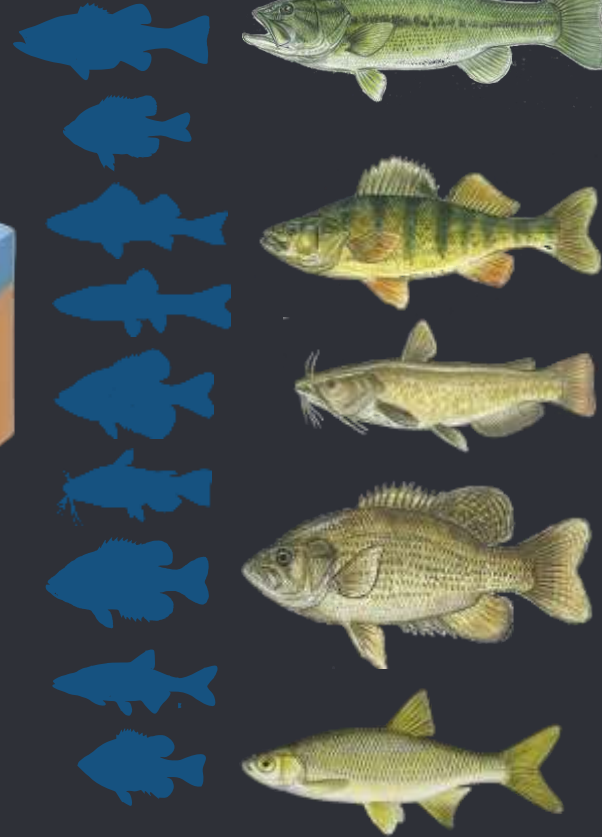
COMMUNITY CHANGES BASED ON ABUNDANCE



Coastal Wetland



Abundance



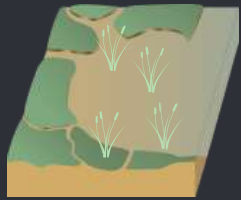
Community abundance change to:

- Warmwater
- Vegetation & cover association
- Piscivore
- Native



‘BIOMASS’

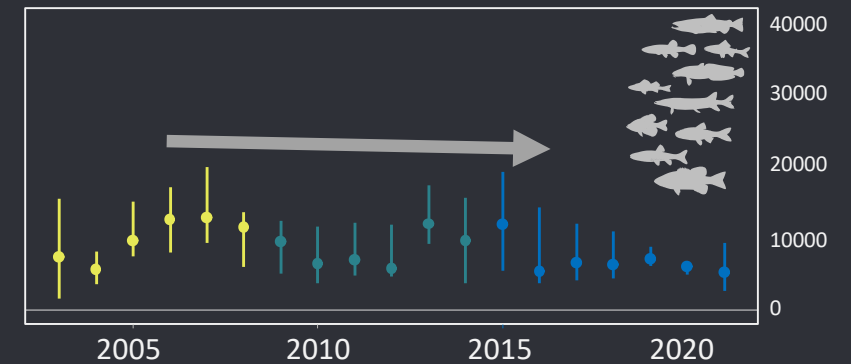
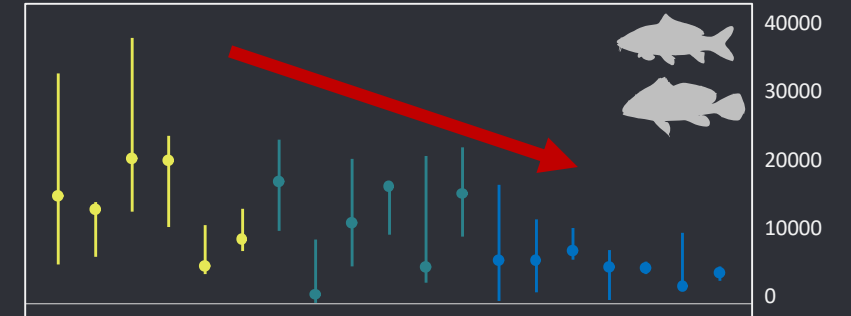
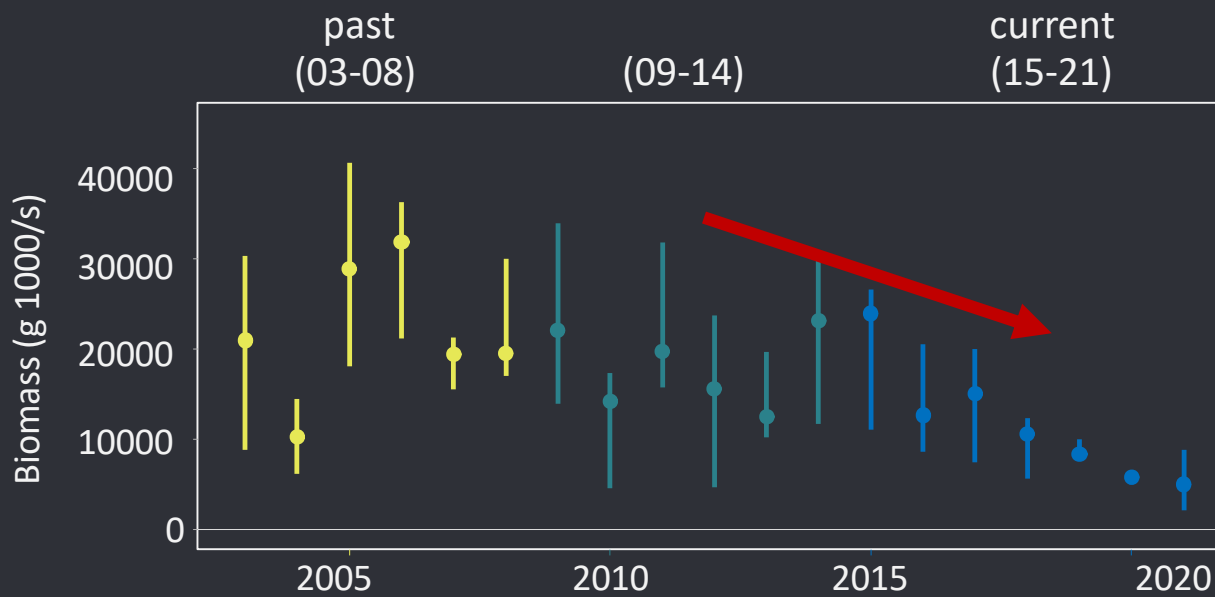
BIOMASS TRENDS OVER TIME



Coastal Wetland



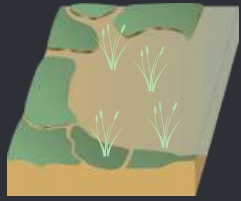
Biomass



'BIOMASS DECLINES DRIVEN BY COMMON CARP/ FRESHWATER DRUM'

SOURCE: IAN.UMCES.EDU

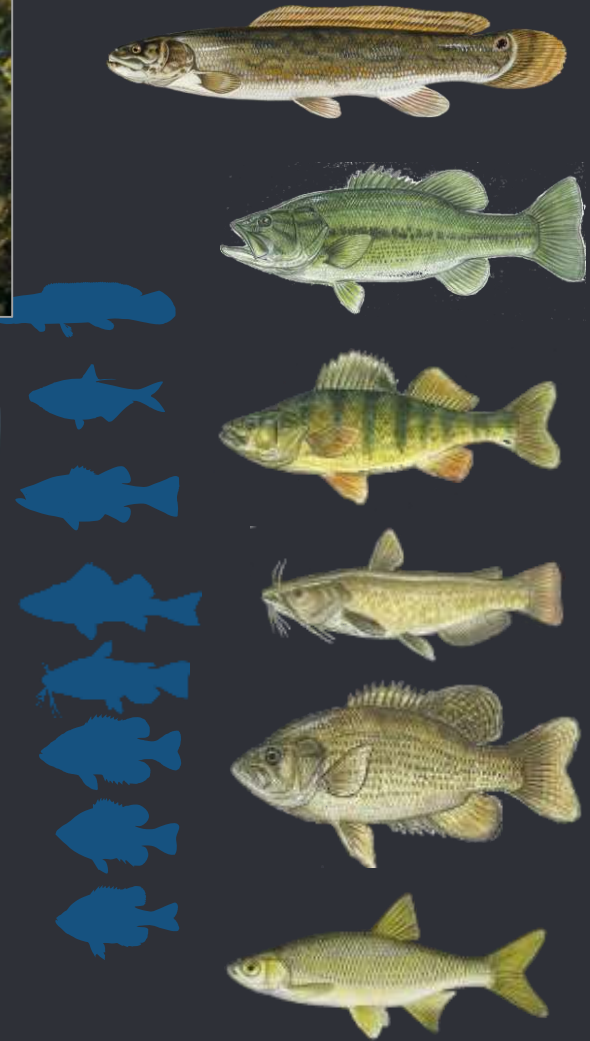
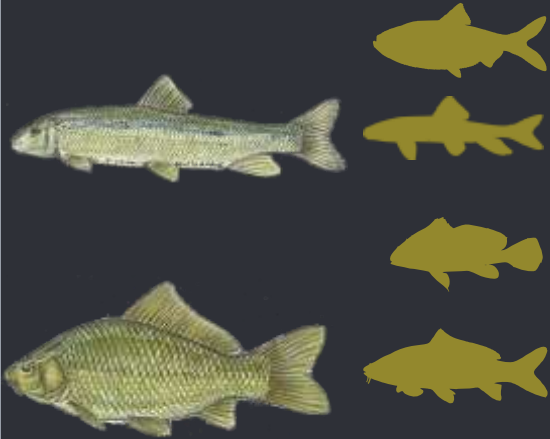
COMMUNITY CHANGES BASED ON BIOMASS



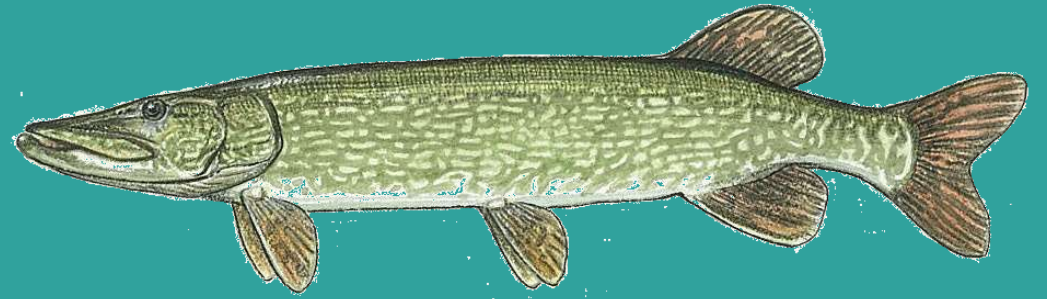
Coastal Wetland



Biomass



- Community biomass change to:
- Warmwater/ coolwater
 - Vegetation & cover association
 - Piscivore
 - Native



'PISCIVORE TARGETS FOR THE REMEDIAL ACTION PLAN



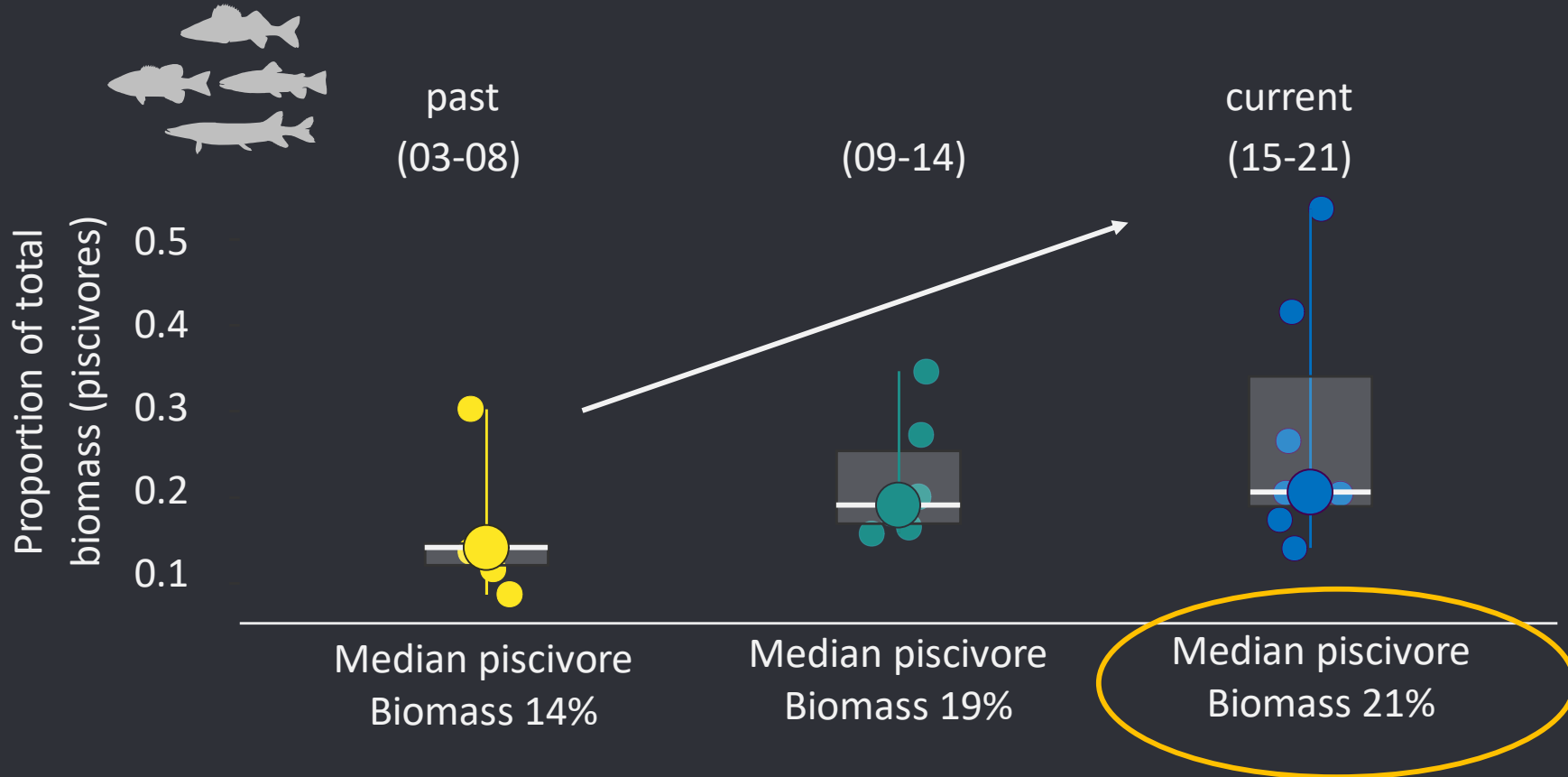
PISCIVORE BIOMASS



Coastal Wetland

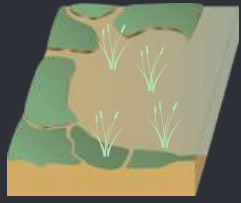


Biomass



‘INCREASE IN PISCIVORE BIOMASS PROPORTION’

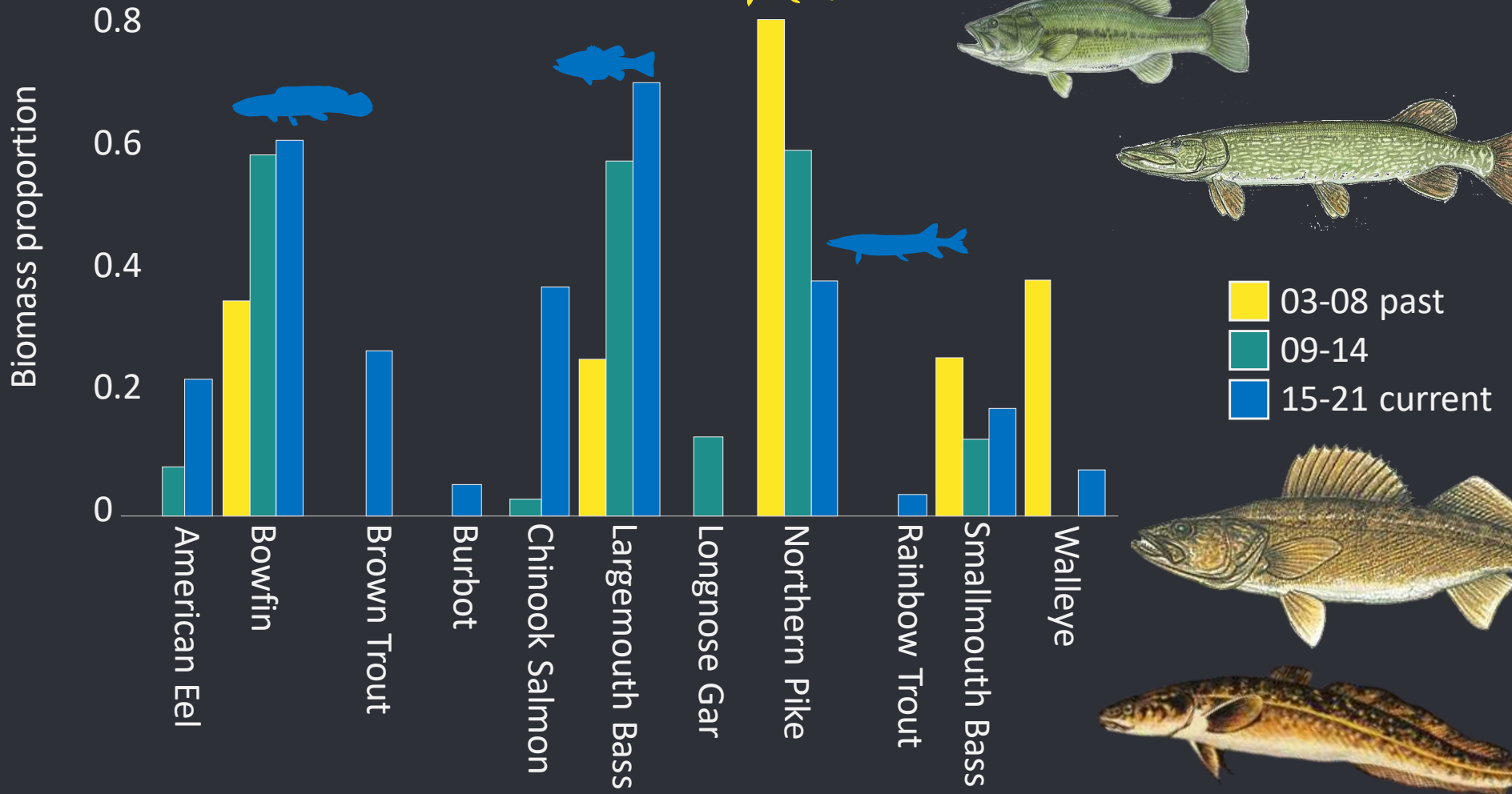
PISCIVORE BIOMASS DISTRIBUTION



Coastal Wetland



Biomass



‘OVERALL SHIFT IN BIOMASS DISTRIBUTION AMONG PISCIVORES AND INCREASE IN RICHNESS’

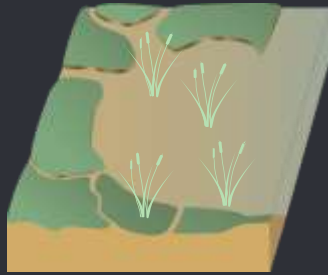
Coastal Wetlands



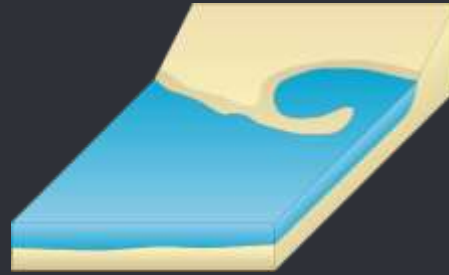
- Biomass and abundance stable
 - Declines driven by carp, freshwater drum/alewife, emerald shiner
- Change towards **warmwater** species
- **Native** species predominant
- Piscivorous fish present
- Strong association with **vegetation and cover**
- **21% piscivore biomass** across 10 species
- **25% specialist biomass** across 20 species



Coastal Wetland

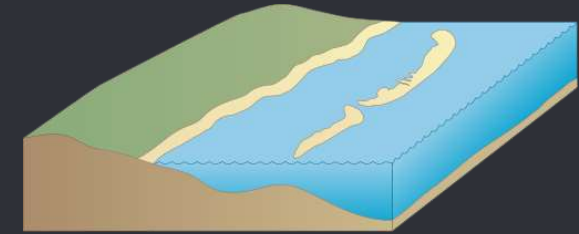


Embayment



- 15% piscivore biomass (+/-1%)
- 11 species
- 40% specialist biomass
- 29 species

Open Coast



- 19% piscivore biomass (+9%)
- 10 species
- 52% specialist biomass
- 26 species

‘EVIDENCE FOR COMMUNITIES APPROACHING DESIRED TARGETS — FLUCTUATIONS AND DECLINES MAINLY LINKED TO LAKE-WIDE PROCESSES AND NOT RESTORATION TARGETS’

SOURCE: IAN.UMCES.EDU

Acknowledgments



'We thank the regional municipalities of Peel, York, and Durham, and the City of Toronto for continued funding of waterfront fisheries monitoring and aquatic ecosystem research programs.'

