Sustaining the Saco

Biddeford Comprehensive Plan Advisory Committee
October 30, 2014
Christine Feurt PhD, University of New England &
Wells National Estuarine Research Reserve

Sustaining Quality of Place and Ecosystem Health in the Saco River Estuary 2009 - 2014

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"Sustainability Science" A New Approach to Science

1. Knowledge is created collaboratively
2. Considers both society and natural systems
3. Motivated by a sense of urgency
4. Engages non-scientists and local knowledge
5. Integrates natural and social science
6. Cares about how knowledge is used to solve problems

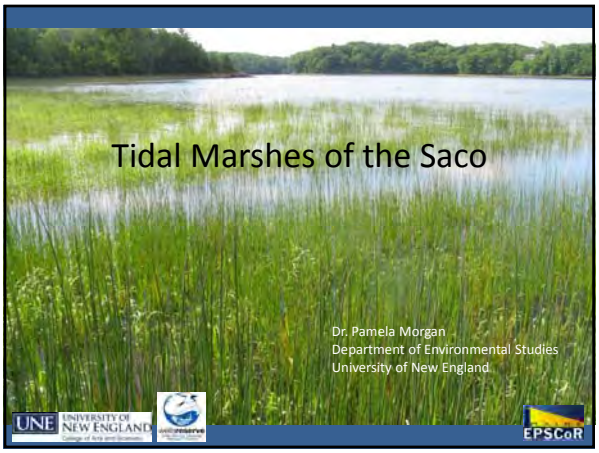
Sustainability Science on the Saco Estuary

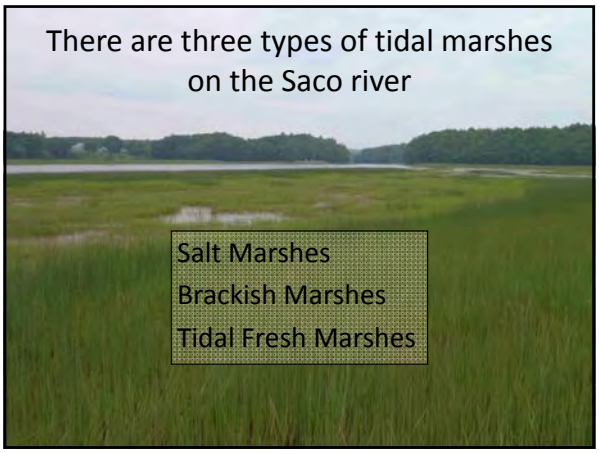
2009 - 2014

1. Tidal wetlands: extent, composition, invasives impacts
2. Bird species diversity and distribution
3. Fish diversity and habitat use, including larval fish
4. Invertebrates as indicators of ecosystem health
5. Food web relationships
6. Water quality
7. Land use change
8. Survey of estuary dependent businesses
9. Characterization and engagement of stewardship network active in the region
10. Linking science-management-policy to sustain what people care about

Stewardship Network Engaged by UNE Student Researchers

1. Saco River Corridor Commission
2. Saco River Salmon Club
3. Citizens of Biddeford & Saco
4. Biddeford-Saco Chamber of Commerce and Industry
5. Biddeford Planning Board
6. Biddeford Open Space Committee
7. Biddeford Conservation Commission
8. Saco Planning Board
9. Saco Conservation Commission
10. Heart of Biddeford
11. Saco Valley Land Trust
12. Biddeford Pool Land Trust
13. Friends of Wood Island Lighthouse
14. Biddeford Pool Improvement Association
15. Blandings Park Wildlife Sanctuary
16. Saco Coastal Waters Commission
17. Waste Water Treatment Facilities
18. Biddeford Saco Water/Maine Water
19. Rachel Carson NWR
20. Business owners on the Saco Estuary





Most common plant species

Salt Meadow Hay
(*Spartina patens*)

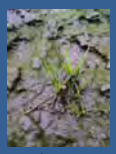
Black Grass
(*Juncus gerardii*)

Smooth Cordgrass
(*Spartina alterniflora*)

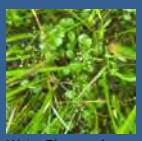
Rare plant species

Lilaeopsis
Lilaeopsis chinensis (T)

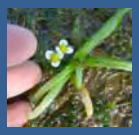
Parker's Pipewort
Eriocaulon parkeri (SC)



Mudwort
Limosella australis (SC)



Water Pimpernel
Samolus valerandi (SC)

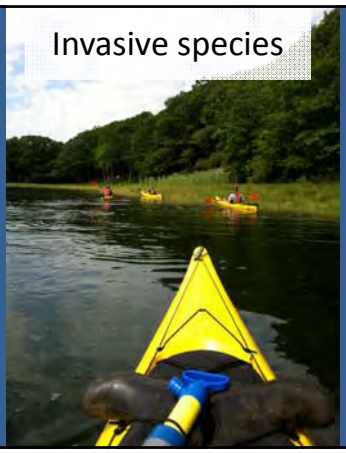


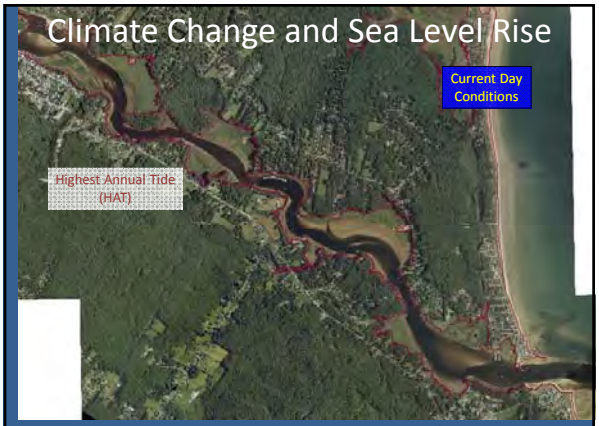
Spongy Arrow-head
Sagittaria calycina (SC)

Estuary Bur-marigold
Bidens hyperborea (SC)

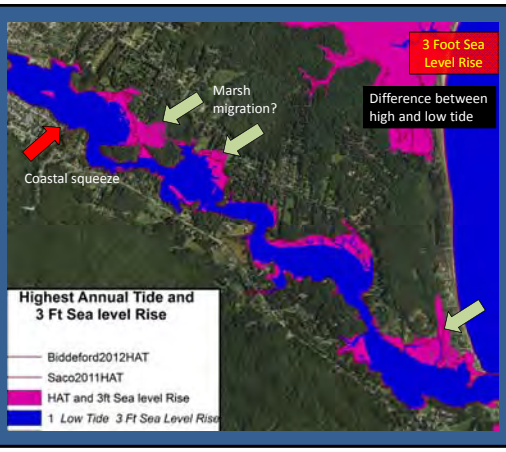
What are the current and future threats to the marshes?

- Pollutants
- Watershed and shoreline development
- Invasive species
- Climate change
  - Sea level rise
  - Changing freshwater inputs





Maps by Mike Esty, Dept. of Biological Sciences, UNE

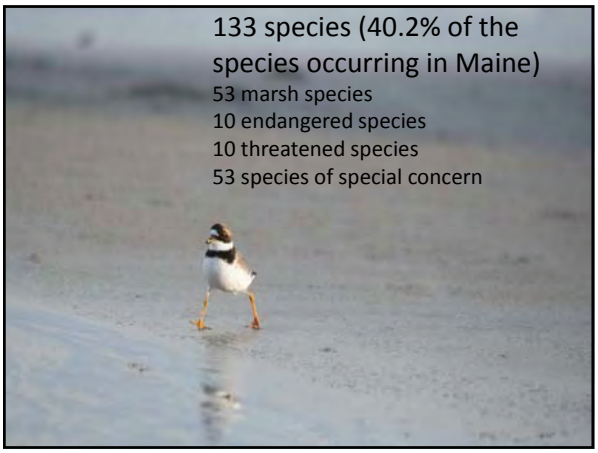


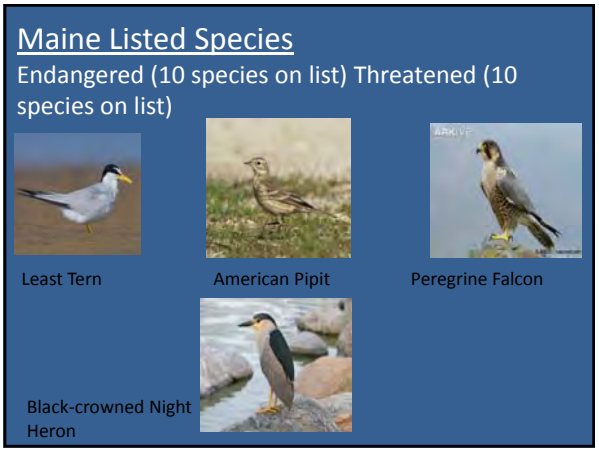
Challenges for stewardship

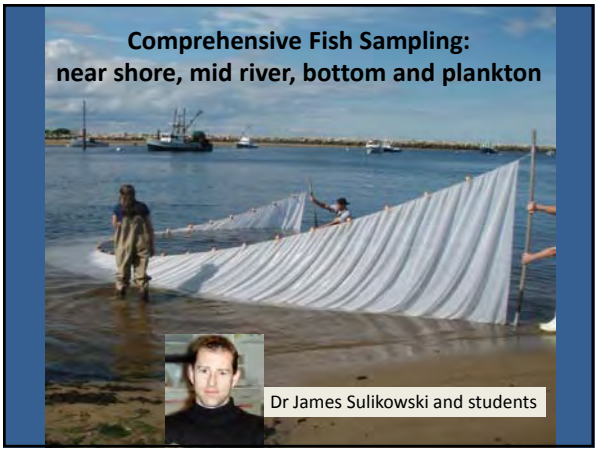
- With sea level rise, we will lose marshes and marsh area in the Saco estuary
- Some marshes could “migrate” landward
- We can plan for marsh migration by targeting areas for conservation

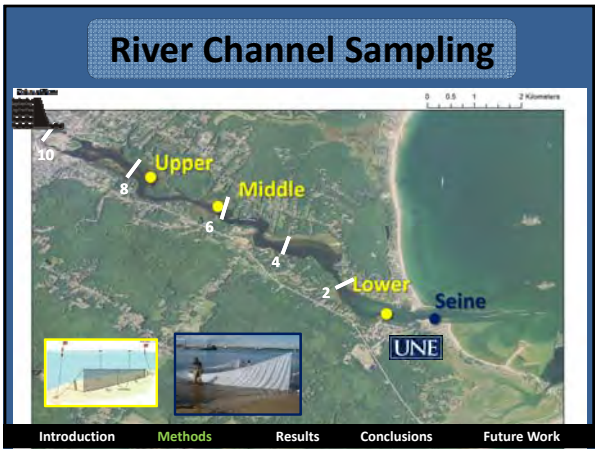
What else is at stake?

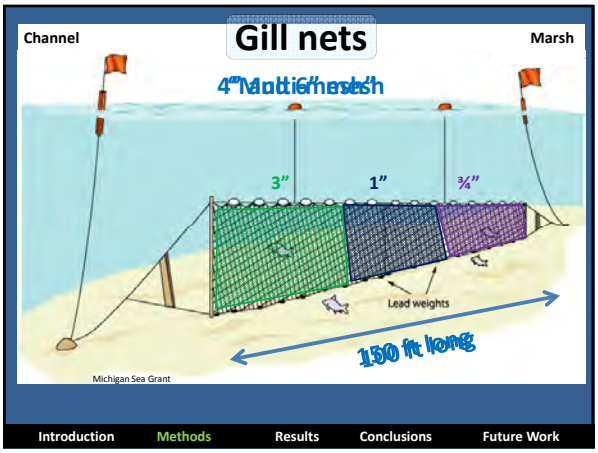
Assessment of the bird community that uses the Saco River's tidal marshes
Noah Perlut PhD
Department of Environmental Studies
University of New England


133 species (40.2% of the species occurring in Maine)
53 marsh species
10 endangered species
10 threatened species
53 species of special concern


Maine Listed Species
Endangered (10 species on list) Threatened (10 species on list)
Least Tern
American Pipit
Peregrine Falcon
Black-crowned Night Heron


Comprehensive Fish Sampling:
near shore, mid river, bottom and plankton
Dr James Sulikowski and students


River Channel Sampling
10
8
Upper
6
Middle
4
2
Lower
Seine
UNE
Introduction
Methods
Results
Conclusions
Future Work


Channel
Gill nets
Marsh
3"
1"
¾"
Lead weights
150 ft long
Michigan Sea Grant
Introduction
Methods
Results
Conclusions
Future Work

Beach Seining

2010-13

Introduction Methods Results Conclusions Future Work

Fyke Netting for Marsh Fish

Dr. Kristin Wilson
Dr. Michele Dionne

Species Using The Tidal Wetlands For Habitat

The Saco Estuary is a Significant Nursery Ground

- **33 fishes and 4 crustacean species**
  - Gill nets (13), Beach seines (28)
- **5 federally-listed species**
  - **Endangered** (shortnose sturgeon)
  - **Threatened** (Atlantic sturgeon)
  - **Species of Concern** (blueback herring, alewife, and rainbow smelt)
- **4 species of recreational importance**
  - largemouth and striped bass, pumpkinseed, bluefish
- **3 species with commercial fisheries**
  - Atlantic herring, winter flounder, red hake

Introduction Methods Results Conclusions Future Work

Saco Estuary has more fish diversity than any estuary in Maine

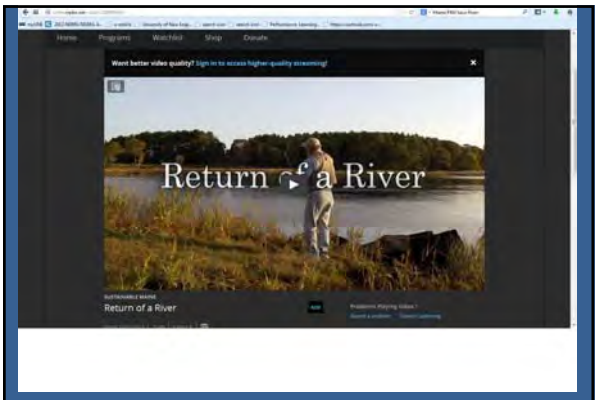
- **Since 2007, (60) species have been observed in the SRE and Bay**
  - Little River **(33)**
  - Kennebec Point **(27)**
  - York River **(24)**
  - Wells Harbor **(24)**
  - Weskeag River **(10)**
  - Penobscot River **(35)**
  - Penobscot Bay **(22)**
  - Casco Bay **(25)**
  - Muscongus Bay **(24)**

(Orrniger et al. 2005; Lazzari et al. 1996; Dionne et al. 2006; Ayvazian et al. 1992; Kiraly et al 2014 Lazzari 2002; Lazzari and Tupper 2002; Lazzari et al. 2003)

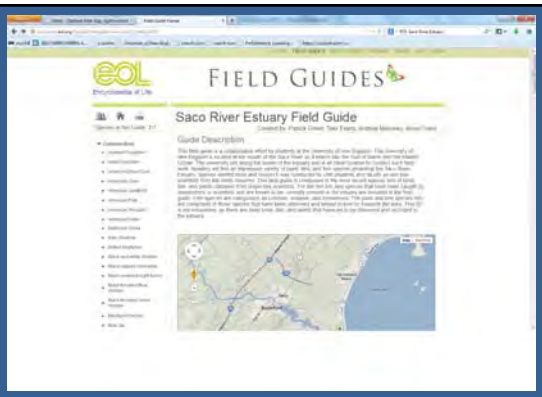
Introduction Methods Results Conclusions Future Work

Biddeford has a story to share about the return of a river

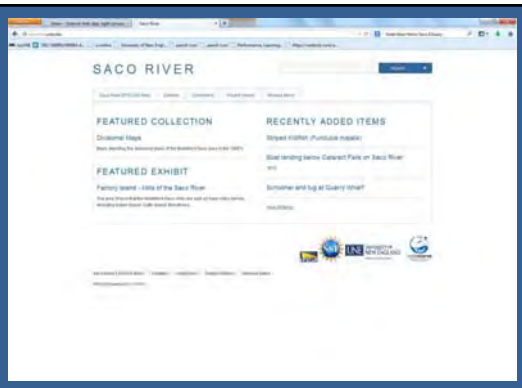
This is a success story about people who have taken action. About the power of land use planning, shoreland zoning, conservation and water quality improvements.



Google **Maine PBN Saco River: http://video.mpbn.net/program/sustainable-maine/**



***Google*:** **EOL Saco Estuary Field Guide**



Digital Archive of Saco Estuary Project http://sacoriver.une.edu/

LIKE US **on Facebook and link your work to others who care about the River**

This is an important time for the people and wildlife who depend on the River

Thank you for the work you are doing to sustain the qualities of the Saco River that we all care about!

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