



## **SALTMARSH HABITAT & AVIAN RESEARCH PROGRAM:**

*The information to protect tidal marshes in our changing land & seascapes*

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### **I. Principal Investigators (alphabetical):**

Jonathan Cohen (SUNY – ESF), Chris Elphick (Univ. Connecticut), Thomas Hodgman (Maine DIFW), Adrienne Kovach (Univ. New Hampshire), Brian Olsen (Univ. Maine), and Greg Shriver (Univ. Delaware)

### **II. Principal Project Objectives (funded and in process):**

- A. Identify focal areas for six, tidal-marsh-obligate birds across the Northeastern US (Maine – Virginia), and generate distribution and abundance maps for 26 SGCN marsh-birds
- B. Identify regions and species that are most sensitive to land and seascape changes
- C. Conduct PVA for multiple focal species
- D. Distinguish among alternative models for the impact of accumulated stressors
- E. Describe the spatial patterning and landscape predictors of marsh resilience
- F. Determine the short-term resilience of the tidal marsh bird community to Hurricane Sandy
- G. Assess the efficacy of restoration efforts on federal lands
- H. Develop decision-support tools for prioritizing marsh conservation at state and regional scales
- I. Document the speed and progression of marsh migration into the upland with sea-level rise (Long Island Sound only)
- J. Provide data to assess freshwater impoundment conversion to tidal wetlands on wildlife refuges (Delaware only)

### **II. Funding:**

- A. USFWS through the National State Wildlife Grants Competition, Northeast Regional Conservation Needs Grant, and Region 5 Division of Migratory Birds (2011 – 2015)
- B. National Science Foundation (2013 – 2015)
- C. USFWS Hurricane Sandy Relief (two awards: 2014 – 2016)

### **III. Target Species**

#### **Birds**

- Seaside Sparrow
- Saltmarsh Sparrow
- Nelson's Sparrow
- Willet
- American Black Duck
- Clapper Rail

#### **Plants**

- *Spartina alterniflora*
- *Spartina patens*
- *Distichlis spicata*
- *Juncus gerardii*

### **IV. Data Collection:**

- A. Extensive surveys using a probabilistic GRTS draw with a two-stage cluster sample:  
~1,500 sampling locations visited 3 times per year in all years to estimate avian abundance and plant community composition  
(2011 – 2014) [http://www.tidalmarshbirds.org/?page\\_id=1295](http://www.tidalmarshbirds.org/?page_id=1295)
- B. Intensive sampling to assess broad geographic trends in demography:  
22 demographic sites from New Jersey – Maine to estimate fecundity and survival  
(2011 – 2015) [http://www.tidalmarshbirds.org/?page\\_id=1392](http://www.tidalmarshbirds.org/?page_id=1392)
- C. RTK at 260 locations to measure elevation (2012 & 2014)
- D. Baseline plant surveys for marsh migration into the upland along Long Island Sound (2013)  
~130 randomized sampling locations to estimate upland community change with sea-level

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## VII. Application of Results

- A. A **consistent, sub-continental-scale platform** for monitoring change in tidal marshes
- B. Standardized methods to **assess local and regional marsh resilience** to change
- C. Methods to **rank regional marsh importance** to tidal-marsh endemic birds
- D. **Predictions of tidal-marsh bird viability** in the face of changing landscapes
- E. Specific conservation priorities to guide **actions to maximize endemic biodiversity**

## VI. Future Potential Directions (*grants in development or in review*):

- A. Develop sub-marsh-scale management techniques to maintain bird-suitable high marsh habitats in the face of sea-level rise (*e.g., tree-cutting, tidal booms, floating islands, tide gate manipulation, runnel cutting*)
- B. Experimentally test methods to convert marsh-adjacent agricultural lands into bird-suitable high marsh (*To develop an NRCS program for adaptation to sea-level rise*)
- C. Experimentally test the impacts of nutrient subsidies on the resilience of marshes to sea-level rise, and trace the landscape sources of such subsidies (*To rank marshes at risk of eroded resilience and provide actions for increasing local marsh resilience*)
- D. *Quantify the ecosystem services of restored and unrestored marshes (and regional marsh complexes) using methods comparable to service estimators in other systems world-wide*
- E. *Expand our state-level decision-support tools to optimize tidal marsh conservation for the entire region, combining our biological knowledge with social science data and modeling*
- F. *Collaborate with identified investigators from the Southeastern US to implement a consistent platform for tidal marsh conservation from the Gulf of Mexico to the Gulf of Maine*
- G. *Trial Saltmarsh Sparrow husbandry techniques to allow for the quick and successful development of a breeding program, should it become necessary*

## VII. Current Graduate Student Projects

### Ph.D.

Alyssa Borowske (UConn) ~ Seasonal survival and migration ecology of tidal-marsh sparrows

Meaghan Conway (UMaine) ~ Niche differentiation between tidal-marsh sparrows

Mo Correll (UMaine) ~ Decadal changes to the tidal-marsh bird communities of the Northeast US

Chris Field (UConn) ~ Survival and Population Viability Analyses of tidal-marsh sparrows

Becky Kern (UD) ~ Importance of different causes of nest failure in tidal-marsh sparrows

Alison Kocek (SUNY-ESF) ~ The impacts of marsh restoration on tidal-marsh sparrows

Kate Ruskin (UMaine) ~ Geographical gradients in tidal-marsh bird fecundity

Emma Shelly (UConn) ~ Mating systems of tidal-marsh sparrows

Jen Walsh (UNH) ~ Genetic patterns of differentiation and hybridization in tidal-marsh sparrows

Whitney Wiest (UD) ~ Mapping tidal-marsh endemic focal areas and forecasting their loss

### M.S.

Bri Benvenuti (UNH) ~ Methods for maintaining high marsh in the face of sea-level rise

Laura Garey (UMaine) ~ Community ecology and trophic cascades in the high marsh

Sam Roberts (UD) ~ Foraging ecology of tidal-marsh sparrows

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