

Avian community Response to Tidal Restoration along the North Atlantic Coast of North America



Greg Shriver, University of Delaware

Russ Greenberg, Smithsonian Migratory Bird Center

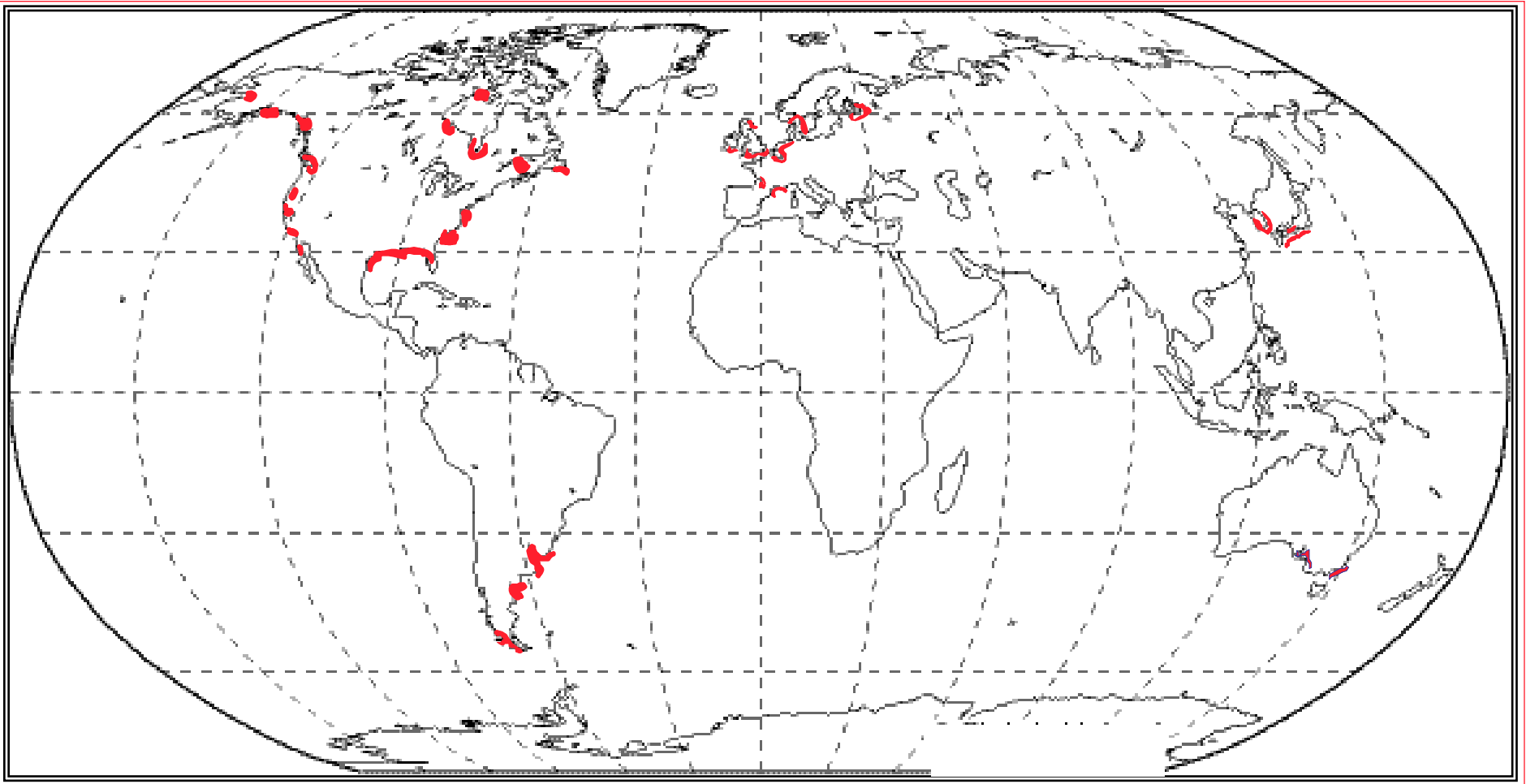
Restoring Tidal Flows to Salt Marshes: A Synthesis of Science and Management

Society for Ecological Restoration International Books
The Science and Practice of Ecological Restoration Series
highlights

C. Roman and D. Burdick, editors



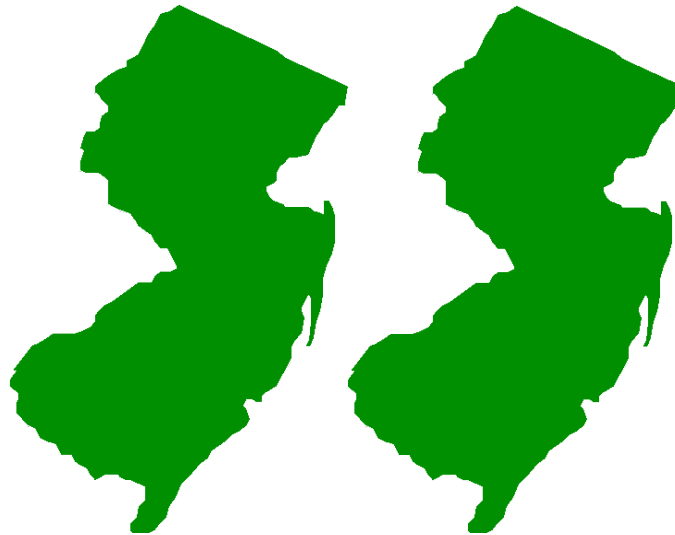
Globally, tidal marshes are restricted



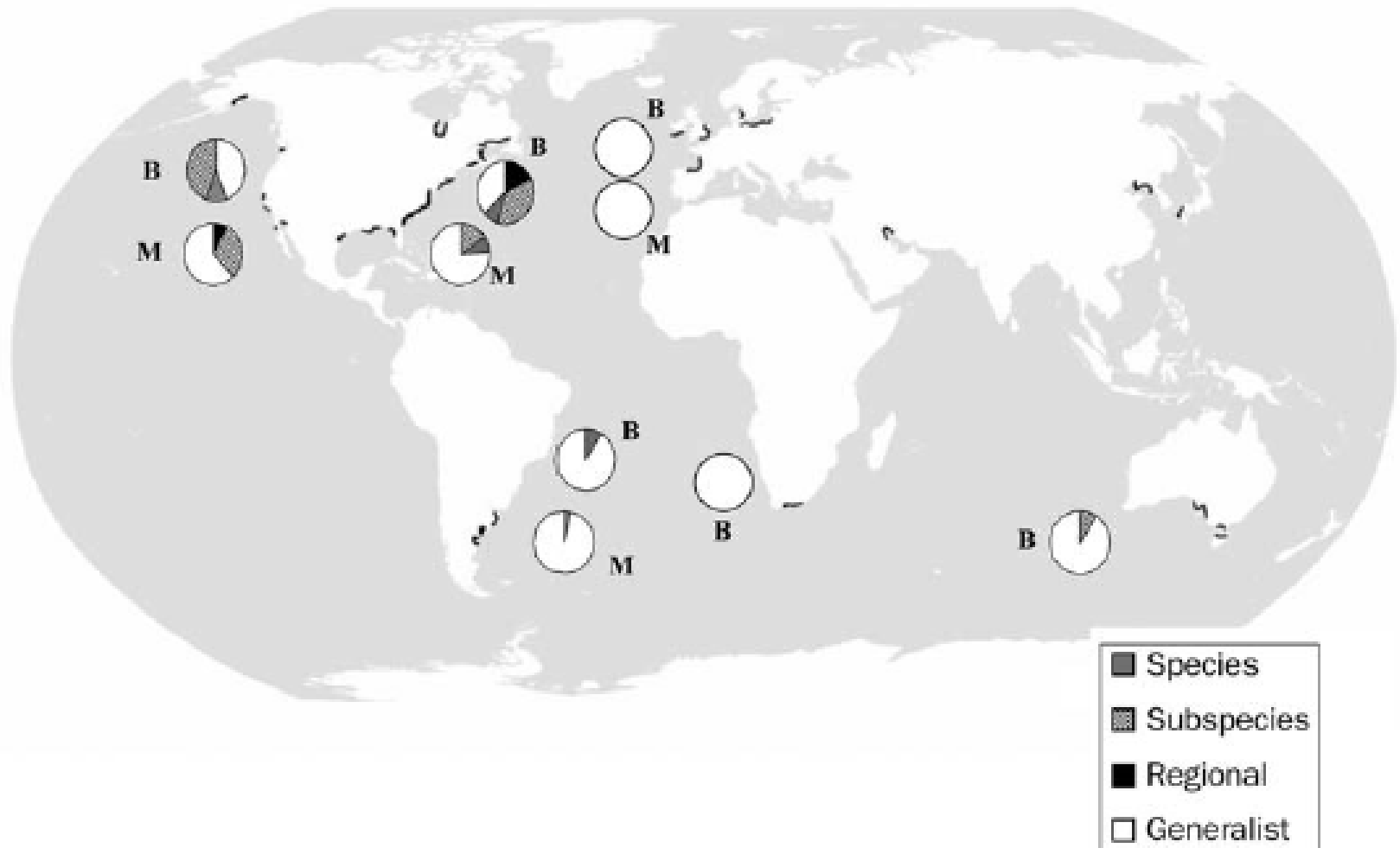
Modified from Chapman, 1975

Global extent of tidal marshes

Global extent
~45,000 km² = ~2x's the size of NJ



Eastern North America has Greatest Endemism



Greenberg, R., J. Maldonado, S. Droege, and M. McDonald. 2006. Tidal marshes: A global perspective on the evolution and conservation of their terrestrial vertebrates. *BIOSCIENCE* 56:675-685.

Conservation Priority Species

Salt Marsh Obligates

- Seaside Sparrow (*Ammodramus maritimus*)
- Saltmarsh Sparrow (*A. caudacutus*)
- Nelson's Sparrow (*A. nelsoni*)
- Clapper Rail (*Rallus longirostris*)
- Willet (*Tringa semipalmata*)

Secretive Marsh Birds

- Black Rail (*Laterallus jamaicensis*)
- King Rail (*R. elegans*)
- Virginia Rail (*R. limicola*)
- Sora (*Porzana carolina*)
- Purple Gallinule (*Porphyryula martinica*)
- Common Moorhen (*Gallinula chloropus*)
- American Coot (*Fulica americana*)
- Pied-Billed Grebe (*Podilymbus podiceps*)
- American Bittern (*Botaurus lentiginosus*)
- Least Bittern (*Ixobrychus exilis*)

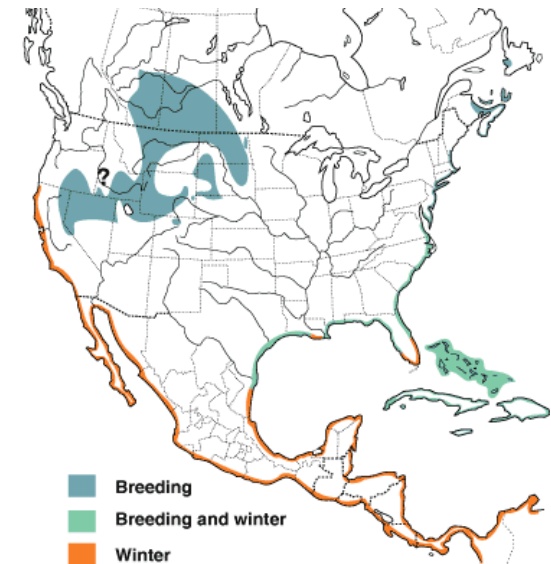


Obligate Saltmarsh Birds

Clapper Rail



Willet



Obligate Saltmarsh Birds

Saltmarsh Sparrow



Seaside Sparrow



Studies

Reference	Location	Timing of survey in relation to restoration event
Slavin and Shisler 1983	New Jersey	
Burger et al. 1982	New Jersey	
Brawley et al. 1998	Connecticut	14 yrs post
Warren et al. 2002	Connecticut	5 yrs post and 15 yrs post
DeQuinzo et al. 2002	Rhode Island	5 yrs pre and 1 yr post
Seigel et al. 2005	Meadows, NJ	
Konisky et al. 2006	Gulf of Maine – Review	1 yr post and 2 yrs post
Raposa 2008	Rhode Island	2 yrs pre and 1 and 2 yrs post

Avian Response to Tidal Restoration

Short-term effects (0 – 5 yrs):

- increase habitat for waterfowl
- the formation of tidal flats can provide opportunities for foraging shorebirds
- increase the availability of fish for piscivorous species
- can increase the diversity and abundance of prey species

- limits nesting habitat for obligate breeding species

Long-term effects (5 + yrs):

- changes in vegetation composition favors salt marsh obligate breeders
- increase in marsh area provides more habitat overall

Challenges and Recommendations

Challenges:

Inherent variability in avian community make a signal difficult to detect

Most projects are relatively small in size

Vegetation communities change over time

Recommendations:

Adhere to standardized sampling protocols

including guild definitions

Monitor avian response for longer time intervals post restoration

(2 yr, 5 yr, 7 yr, 10 yr, 12 yr, 15 yr)

Integrate more robust analyses

occupancy modeling, estimating detection probability

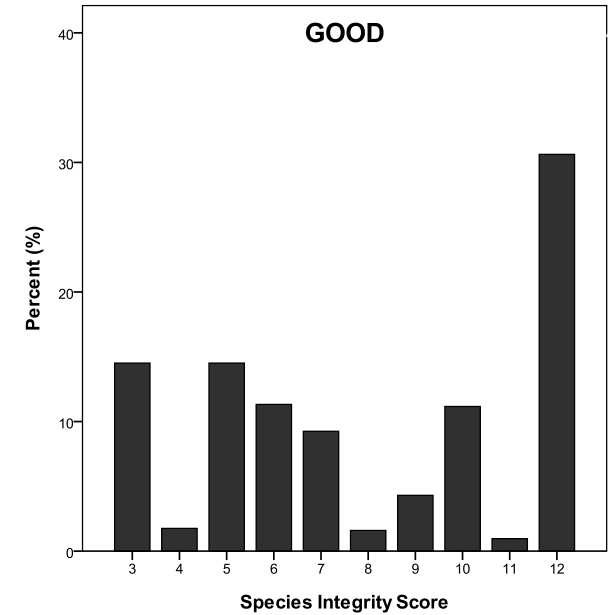
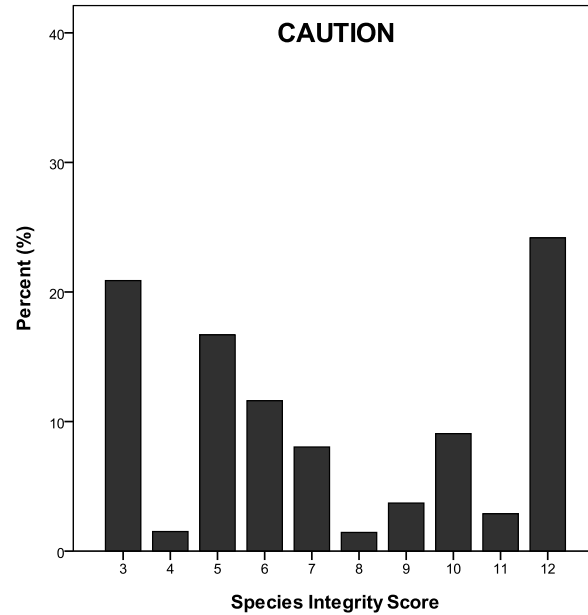
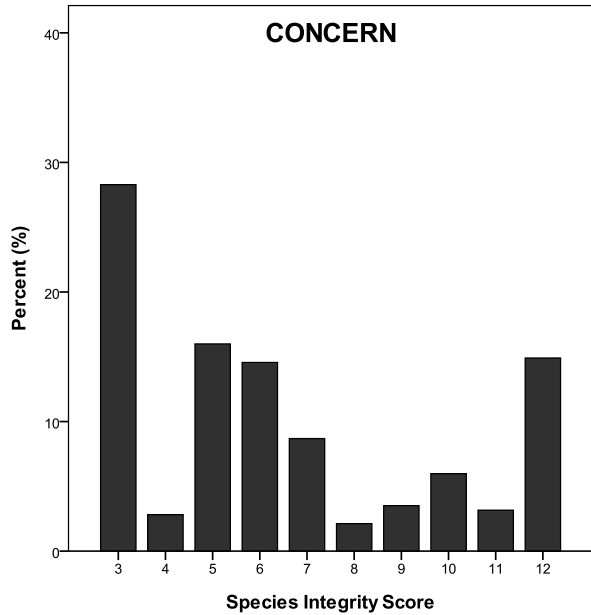
Use an Index of Avian Community Integrity as a metric

Index of Marsh Bird Community Integrity

Species Attribute	Score				
	Generalist		Specialist		
	1	2	2.5	3	4
Foraging habitat	habitat generalist		marsh facultative		marsh obligate
Nesting habitat	non-marsh nesting		marsh vegetation		marsh ground nesting
Conservation rank	unranked		moderate		highest high concern



Monitoring Avian Community Integrity



(0%)

(50%)

(85%)

(100%)

The Saltmarsh Habitat and Avian Research Project



The State Wildlife Grant Proposal
"Power of Partnerships" Conference
~ Plymouth, MA, 19th - 21st Oct, 2010
Data-Sharing Portal
~ Collaborator Password Required



<http://www.tidalmarshbirds.org/>



R. Kern