Life on the edge: Louisiana Seaside Sparrows

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THANKS!
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Seaside Sparrow

Ammodramus maritimus
Seaside Sparrow distribution and subspecies

Coastal Louisiana is the stronghold of Gulf populations
Threats to Seaside Sparrows

Dynamic geomorphology
Storms
Relative sea level rise
Mangrove establishment
Freshwater diversion
Contamination-
Oil spills
Mercury
The Mississippi delta over the past 4600 years

from Frazier 1967
Hurricane Isaac
28-30 August 2013

NWS image prepared by the
University of Wisconsin
Cooperative Institute for
Meteorological Satellite
Studies
Regions defined by Louisiana’s Comprehensive Master Plan for a Sustainable Coast
Regions defined by Louisiana's Comprehensive Master Plan for a Sustainable Coast

Lower Barataria

Grand Isle

Port Fourchon area

40 km
Flooding to 1-4m for 2-3 days
USGS storm surge monitoring

36 hours > 1 m at this site
Lower Barataria –
How many Seaside Sparrows were displaced?
<table>
<thead>
<tr>
<th>Veg Group ID</th>
<th>Vegetation Name (ID)</th>
<th>2012</th>
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<tr>
<td>Bare Ground</td>
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<td>Fresh Marsh</td>
<td>Cutgrass (CTG)</td>
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<td>Delta Splay (DSP)</td>
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<td>Sawgrass (SWG)</td>
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<td>Paspalum (PSP)</td>
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<td>Submerged Aquatic Vegetation (SAV)</td>
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<tr>
<td>Not Modeled</td>
<td>Not Modeled (NOT)</td>
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</tr>
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</table>

Units: Square Kilometer

How many birds in this area of marsh?
Point count estimates from June 2012:

low: 7.3 birds/ha (mean - sd)
medium: 9.7 birds/ha (mean)
high: 12.0 birds/ha (mean + sd)

N = 6 plots
Lots of birds in Lower Barataria:

low: 550,000
medium: 735,000
high: 915,000

What happened to them when the marsh flooded?
Where did they go?
Location data during and after the storm available from eBird
Observations September - December 2012: Birds are back

10 October-25 birds
1 recapture
Where did they go? Not many good options
Abundance changes between 2012 and 2013-
Data from sweep samples and point counts
Dramatic reduction in abundance of breeding Seaside Sparrows following Isaac
Seaside Sparrow populations took a tremendous hit
Many birds returned, sometimes to the exact same spot.
They can find suitable habitat following disturbance
Hurricanes are old news to Seaside Sparrows

But... Salt marsh will replace other vegetation at the coastal interface

http://Geology.com/sea-level-rise
Seaside Sparrow habitat in Lower Barataria for 50 years

KM² Seaside Sparrow habitat

2012 2022 2032 2042 2052 2062

0 100 200 300 400 500 600 700
Seaside Sparrow habitat in Lower Barataria for 50 years

KM² Seaside Sparrow habitat

No diversion

With diversion according to the Master Plan
Mangroves replace salt marsh in warmer water
Mangrove expansion and salt marsh decline at mangrove poleward limits

Mangroves in Lower Barataria for 50 years

KM²
mangroves

No diversion

Diversion
The Mercury Cycle

- Mercury is emitted to the atmosphere.
- Mercury is deposited in rain and snow and as gases and particles.
- Mercury accumulates in lakes, reservoirs, and forests.
- Methylmercury bioaccumulates in food webs.
- Mercury is transported through watersheds and converted to methylmercury.

From the US Forest Service
http://webcam.srs.fs.fed.us/impacts/mercury/
A word about mercury from North Carolina—Potential costs to salt marsh sparrows

7:10.1371/journal.pone.0044446.
Disasters pay the bills
Regions defined by Louisiana's Comprehensive Master Plan for a Sustainable Coast

Lower Barataria

- Grand Isle
- Port Fourchon area

40 km
Contamination in Lower Barataria
Oil reached the marsh
2012 data suggest an effect of oiling on abundance.

2013 data also suggest an effect of Isaac.
Nest success data—

Maybe total productivity was not affected by Isaac?
Risk of repeated exposure to oil?
If Seaside Sparrows were rodents, they would be Marsh Rice Rats.
These birds are made for life on the edge

Good thing, because the edge is getting thinner
Thanks!

Seaside Sparrow photos:
http://www.flickr.com/photos/stoufferlsu/sets/72157633316990341/