

## Introduction

- Habitat loss and degradation have been identified as two of the leading causes for the decline of many migrant songbird species (Robbins et al. 1989; Walk & Warner 2000; Holmes 2007).
- Although capped landfills are common features in contemporary landscapes, few studies have examined landfills as stopover sites for songbirds.
- Surveys could prove critical to help understand how much songbird activity occurs on capped landfills during migration. In addition, research should address whether these sites are beneficial to the birds.
- This study surveyed the songbird community on one capped landfill in the New Jersey Meadowlands over five Fall migration seasons. The value of the landfill to songbirds was evaluated based on body mass gain while at the site (sensu Seewagen & Slayton 2008).

## Objectives

- Document abundance and species composition of songbirds at Erie Landfill during the 2008-2012 Fall migration seasons.
- Determine if songbird body mass tends to increase during stopover at the landfill.

## Methods

- Study Site: Erie Landfill, Lyndhurst, New Jersey - located along the Atlantic Flyway (Figure 1).
- Songbirds surveyed via mist netting.
  - 33 - 38 survey days (up to 2798 net hours) per Fall season.
  - Three primary habitats: shrub/herbaceous vegetation; a black locust tree (*Robinia pseudoacacia*) patch; an eastern cottonwood tree (*Populus deltoides*) patch.
- Body mass gain in 2011 and 2012 was evaluated for birds that were recaptured at least 3 days after initial capture.
  - The three most commonly recaptured species: Yellow-rumped Warbler (*Dendroica coronata*), Swamp Sparrow (*Melospiza georgiana*), Song Sparrow (*M. melodia*).

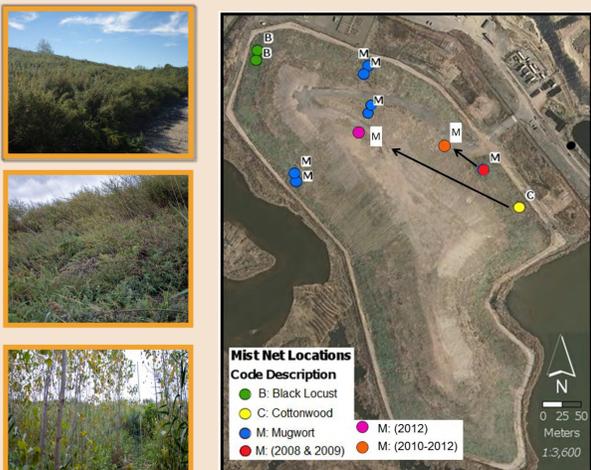


Figure 1. Aerial photo of Erie landfill; mist net locations shown by circles.

	2008	2009	2010	2011	2012	Total
Dates	9/3-11/3	9/1-11/3	9/2-11/3	8/31-11/3	9/5-10/26	-
# Field Days	38	35	37	38	33	181
Total Captures	2058	2721	2153	3334	3244	13,510
Total Species	70	62	69	70	67	92

Table 1. Survey summary

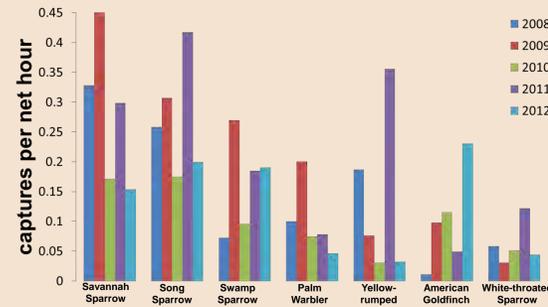


Figure 2. Total captures per net hour of the seven most abundant species, 2008-2012

Species	N	RD	Species	N	RD
Song Sparrow	2830	19.60%	Eastern Phoebe	68	0.5%
Savannah Sparrow	2746	19.0%	Northern Mockingbird	64	0.4%
Swamp Sparrow	1677	11.6%	Northern Waterthrush	63	0.4%
Yellow-rumped Warbler	1438	10.0%	Yellow Warbler	51	0.4%
American Goldfinch	1167	8.1%	American Redstart	42	0.3%
Palm Warbler	975	6.8%	Nashville Warbler	39	0.3%
White-throated Sparrow	671	4.6%	Blue Jay	39	0.3%
Common Yellowthroat	306	2.1%	Magnolia Warbler	38	0.2%
Grey Catbird	273	1.9%	Connecticut Warbler	33	0.2%
Ruby-crowned Kinglet	264	1.8%	Northern Cardinal	29	0.2%
White-crowned Sparrow	235	1.6%	Swainson's Thrush	27	0.2%
Blackpoll Warbler	188	1.3%	House Wren	26	0.2%
Dark-eyed Junco	171	1.2%	Downy Woodpecker	22	0.2%
Indigo Bunting	166	1.1%	Vesper Sparrow	22	0.2%
Lincoln's Sparrow	155	1.1%	Black and White Warbler	16	0.1%
Field Sparrow	127	0.9%	American Kestrel	15	0.1%
Trail's Flycatcher	120	0.8%	Fox Sparrow	15	0.1%
Hermit Thrush	111	0.8%	Tufted Titmouse	11	0.1%
American Robin	106	0.7%	European Starling	8	0.1%
Golden-crowned Kinglet	76	0.5%	Tennessee Warbler	7	0.0%

Table 2. The forty most common species captured at Erie Landfill, 2008-2012; n = total number of birds caught over five years, RD = relative density.



Photos above: mist net surveys; body mass surveys.

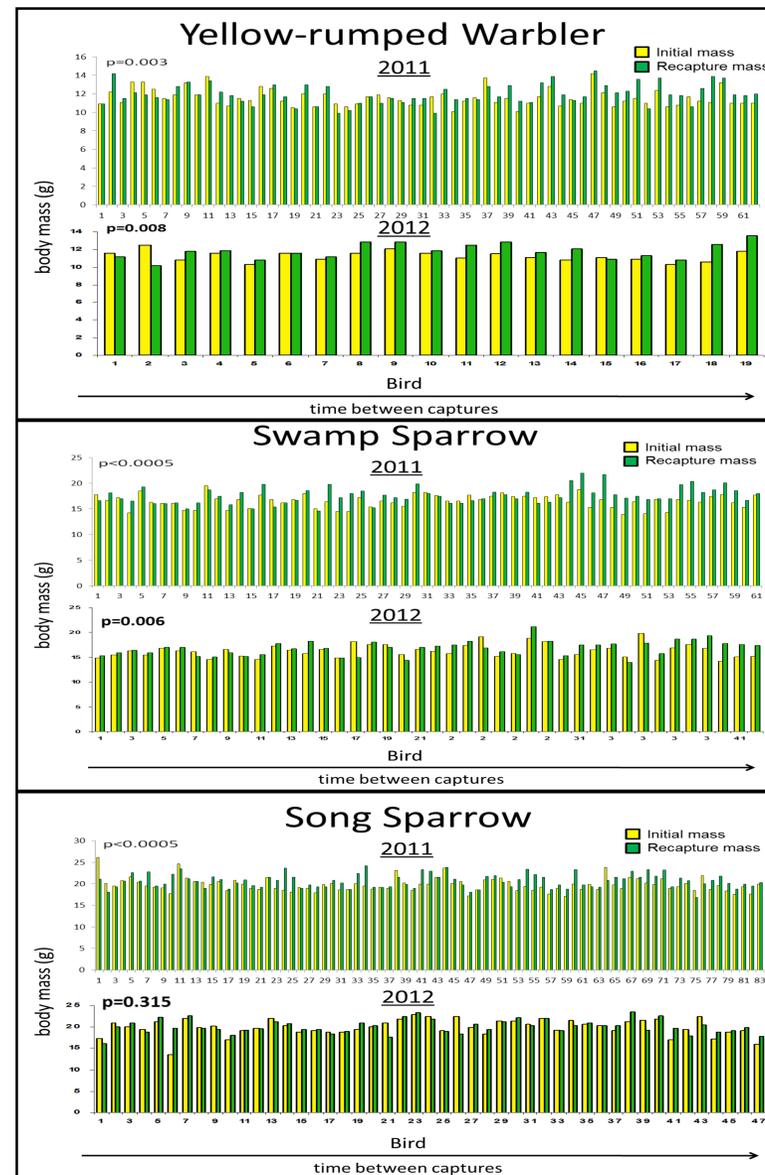


Figure 3. Body mass data of the three most commonly recaptured species. The Wilcoxon Signed Ranks Test was used to test for a significant increase in body mass.



Yellow-rumped Warbler *Dendroica coronata*



Palm Warbler *Dendroica palmarum*



Swamp Sparrow *Melospiza georgiana*



White-throated Sparrow *Zonotrichia albicollis*



American Goldfinch *Spinus tristis*



Song Sparrow *Melospiza melodia*



Savannah Sparrow *Passerculus sandwichensis*

Photos above: The seven most abundant bird species.

## Results

- Erie Landfill is used by a wide variety of songbird species during Fall migration (Tables 1 and 2).
- Overall, sparrow species accounted for 58.7 % of captures; warblers accounted for 19.3 % (Table 2).
- Species relative densities tended to fluctuate dramatically across the five study years (Figure 2).
- Exception: Savannah Sparrow and Swamp Sparrow
- Body mass trends (Figure 3):
  - Yellow-rumped Warbler and Swamp Sparrow: statistically significant increase in body mass both years;
  - Song Sparrow: statistically significant increase in body mass in 2011; no statistically significant trend in 2012.
- This survey included several species that are endangered, threatened, or of special concern in New Jersey:

Species	Status	N
Northern Harrier	endangered	1
Sharp-shinned Hawk	special concern	1
American Kestrel	threatened	15
Black-billed Cuckoo	special concern	1
Savannah Sparrow	threatened	2746
Bobolink	special concern	25
Gray-cheeked Thrush	special concern	3
Saltmarsh Sparrow	special concern	3
Vesper Sparrow	special concern	22

## Implications

- Capped landfills in the New Jersey Meadowlands likely serve as important stopover sites for songbirds migrating along the Atlantic flyway.
- In general, migrating songbirds may tend to gain body mass on capped landfills.
  - Given the possibility that capped landfills could be ecological traps, ecotoxicological studies seem warranted.
- Additional research should examine how widespread the use of capped landfills is as stopover sites by migrant songbirds.

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