



Birds@SWAMP

The Duke University Wetland Center
Nicholas School of the Environment
Durham, NC

The Effects of Urban Stream and Riparian Restoration on Summer and Winter Avian Populations

R. Scott Winton, Randy L. Neighbarger, and Curtis J. Richardson

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Abstract

It was hypothesized that restoration of degraded riparian wetlands in the Duke University Wetland Center's Stream and Wetland Assessment and Management Park (SWAMP) should increase bird density and diversity due to improved habitat. To test this assumption point counts were conducted at four Sandy Creek sites that have been restored within the past 5 years and one site due for restoration within the next year. We also surveyed two reference sites: one site on a Sandy Creek tributary, and another site at nearby Mud Creek. Both winter and summer counts were completed. We found greater summer bird diversity and greater bird abundance in both summer and winter at restored SWAMP sites compared to reference sites. We recorded observations of nearly 1600 individuals representing 11 orders of birds and 67 species at the seven sites. Because much of SWAMP lies adjacent to popular public cross-country and fitness trails, a greater and more diverse bird population confers both conservation and aesthetic value. To facilitate bird observation, a blind and viewing platform are being constructed with educational signs identifying species of interest.



The effects of urban stream and riparian restoration on summer and winter bird populations

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Motivating Questions

1. Do local bird populations change in response to stream and wetland restoration?
2. From the "birds' perspective" is the restoration successful?

Study Area



Duke Forest Stream and Wetland Assessment and Management Park (SWAMP), Durham, NC



Methods

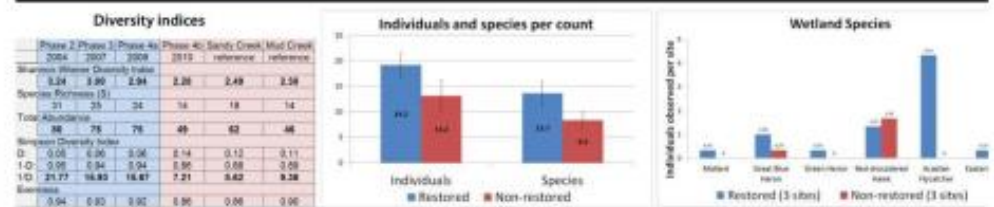
- Ten-minute point counts between dawn and 11 am
- Four replicate counts per site spaced at least 5 days apart during summer (June/July) and winter (Jan/Feb) seasons.

References: Gregory, R. D. et al., 2004; Carlton, C., 2009

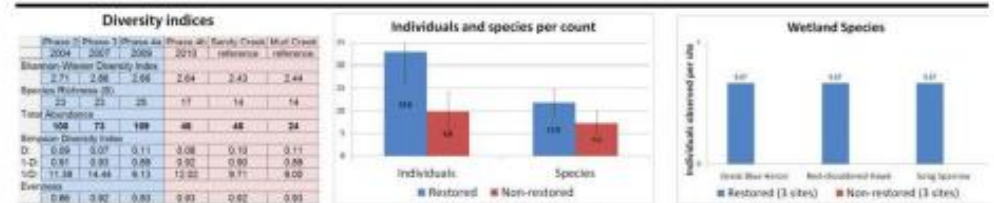
Acknowledgements: Funding was provided by the Duke Wetland Center Endowment

Results

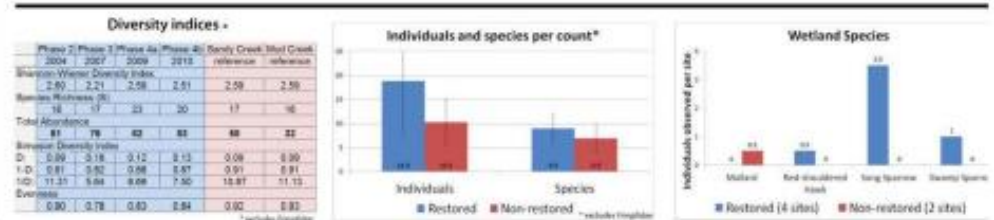
Summer 2009



Winter '09-'10



Winter '10-'11



Conclusions

- Greater species richness and diversity in restored streams in summer
- Greater bird density in restored streams
- More wetland species in restored streams

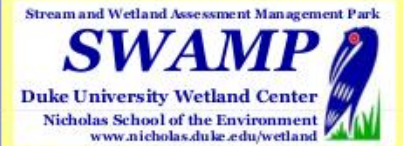
Future Plans

- Analysis of summer 2011 data
- Continue collecting through 2012
- Chronosequence of restored sites
- Spring and Fall counts to detect transients



Wetlands are for the Birds!

Birds in the Duke Forest Wetland



Water Birds



Megascops alpeyon

Belted Kingfisher



Anas platyrhynchos

Mallard



Ardea herodias

Great Blue Heron



Butorides virescens

Green Heron

Does restoration affect native bird species?

The effect of stream and wetland restoration can vary depending on the bird species and their habitat requirements.

Positive Effects: In this restoration project, a retention pond was created that provided a more suitable habitat for some water bird species that would not have been able to use this area previously. Additionally, increasing the quality of the ecosystem through improvements in water quality and riparian vegetation can positively impact higher levels of the food web, including birds.

Negative Effects: During the restoration process, heavy machinery is often used that can disrupt the existing vegetation. Additionally, large trees may need to be removed in the process of reshaping the stream channel. These processes can have a negative effect on species that require large trees and dense overstories until the vegetation has had time to redevelop.

Song Birds



Thryothorus ludovicianus

Carolina Wren



Cardinalis cardinalis

Northern Cardinal



Sialia sialis

Eastern Bluebird



Melospiza melodia

Song Sparrow

Raptors



Buteo lineatus

Red-Shouldered Hawk



Buteo jamaicensis

Red-Tailed Hawk

What did you see?

Nearly 100 bird species have been seen along the SWAMP trails and by the bird blind here at the pond. You can contribute to citizen science by reporting the bird species you see at SWAMP. For more information, visit

www.nicholas.duke.edu/wetland/swampbird.html

SWAMP is listed as a birding hotspot on eBird.org.

Woodpeckers



Melanerpes carolinus

Red-bellied Woodpecker



Picoides pubescens

Downy Woodpecker

COMMON BIRDS SEEN NEAR THE BIRD BLIND



Mallard (20-28") The Mallard is the most common duck in the eastern U.S. Both the green-headed male and the brown female have bright blue, white, and black wing patches.



Great Blue Heron (39-52") The largest of the North American herons is a solitary hunter, wading and foraging for fish.



Red-shouldered Hawk (17-24") This common forest dweller favors woodlands near water while hunting for small mammals, reptiles, amphibians, and insects.



Belted Kingfisher (11-14") The Kingfisher uses its oversized, heron-like beak to aggressively dive for fish. Only the female has the rusty-colored breast band.



Eastern Bluebird (6.5-7") Once seriously threatened by pesticides and habitat loss, the Eastern Bluebird's recovery is one of conservation's great success stories.



Song Sparrow (6") One of the many small, brown sparrows found in shrubby or grassy wet areas, the Song Sparrow is a year-round resident of North Carolina.

 **Duke University Wetland Center**

**A Checklist of the Birds of
The Stream & Wetland Assessment
Management Park
(SWAMP)**



A mother Mallard herds her brood across the SWAMP pond during a springtime swim.

Photo by Mengchi Ho

Ever since the 1962 publication of Rachel Carson's book *Silent Spring*, scientists have recognized that bird populations provide an easy-to-read barometer of the pressures that human activities bring to bear on the world's biodiversity. Birds—whether in our backyards, our cities, or our parklands—are a familiar part of our daily lives. People who might not recognize other indicators of an environment in crisis will notice that the numbers and variety of birds are slipping away. Since the Duke University Wetland Center undertook the restoration of Sandy Creek and its flood plain in 1998, birders have been keeping track of the birds seen in the restoration area now known as SWAMP. If you would like to report your bird sightings at SWAMP, send an e-mail to randyn@duke.edu.

ANSERIFORMES

Canada Goose
Mallard
Hooded Merganser

PODICIPEDIFORMES

Pied-billed Grebe

COLUMBIFORMES

Rock Pigeon
Mourning Dove

CUCULIFORMES

Yellow-billed Cuckoo

CAPRIMULGIFORMES

Common Nighthawk
Chuck-will's-widow

APODIFORMES

Chimney Swift
Ruby-throated Hummingbird

CHARADRIIFORMES

Killdeer
Spotted Sandpiper
Solitary Sandpiper
Ring-billed Gull

SULIFORMES

Double-crested Cormorant

PELECANIFORMES

American Bittern
Great Blue Heron
Green Heron

CATHARTIFORMES

Black Vulture
Turkey Vulture

ACCIPITRIFORMES

Osprey
Sharp-shinned Hawk
Cooper's Hawk
Red-shouldered Hawk
Red-tailed Hawk

STRIGIFORMES

Barred Owl

CORACIIFORMES

Belted Kingfisher

PICIFORMES

Yellow-bellied Sapsucker
Red-headed Woodpecker
Red-bellied Woodpecker
Downy Woodpecker
Hairy Woodpecker
Pileated Woodpecker
Northern Flicker

FALCONIFORMES

Merlin

PASSERIFORMES

Eastern Wood Peewee
Acadian Flycatcher
Eastern Phoebe
Great Crested Flycatcher
Eastern Kingbird
White-eyed Vireo
Yellow-throated Vireo
Blue-headed Vireo
Red-eyed Vireo
Blue Jay
American Crow
Fish Crow
Northern Rough-Winged Swallow
Barn Swallow
Carolina Chickadee
Tufted Titmouse
Red-breasted Nuthatch
White-breasted Nuthatch
Brown-headed Nuthatch
Brown Creeper

Updated August 23, 2018

House Wren
Winter Wren
Carolina Wren
Blue-gray Gnatcatcher
Golden-crowned Kinglet
Ruby-crowned Kinglet
Eastern Bluebird
Veery
Swainson's Thrush
Hermit Thrush
Wood Thrush
American Robin
Gray Catbird
Brown Thrasher
Northern Mockingbird
European Starling
Cedar Waxwing
House Finch
Purple Finch
Pine Siskin
American Goldfinch
Chipping Sparrow
Field Sparrow
Fox Sparrow
Dark-eyed Junco
White-crowned Sparrow
White-throated Sparrow
Savannah Sparrow
Song Sparrow
Swamp Sparrow
Eastern Towhee
Yellow-breasted Chat
Orchard Oriole
Red-winged Blackbird
Brown-headed Cowbird
Rusty Blackbird

Common Grackle
Ovenbird
Worm-eating Warbler
Louisiana Waterthrush
Northern Waterthrush
Blue-winged Warbler
Black-and-white Warbler
Prothonotary Warbler
Tennessee Warbler
Nashville Warbler
Common Yellowthroat
Hooded Warbler
American Redstart
Northern Parula
Magnolia Warbler
Blackburnian Warbler
Chestnut-sided Warbler
Blackpoll Warbler
Black-throated Blue Warbler
Palm Warbler
Pine Warbler
Yellow-rumped Warbler
Yellow-throated Warbler
Prairie Warbler
Black-throated Green Warbler
Wilson's Warbler
Summer Tanager
Scarlet Tanager
Northern Cardinal
Rose-breasted Grosbeak
Blue Grosbeak
Indigo Bunting
House Sparrow



The Red-bellied Woodpecker's barred back and red cap makes it unforgettable. Learn the Red-bellied's rolling call and you'll notice these birds everywhere.