



# Audubon OF FLORIDA

Urban Oases for Migrating Songbirds  
Fall 2009 Songbird Survey Report  
February 12, 2010

## Introduction

Audubon of Florida launched the Urban Oases program to improve the value of urban and suburban green spaces as stop-over habitat for Neotropical migratory songbirds. The primary objectives of the Urban Oases program are to (1) elevate awareness of the stress on long-distance migratory songbirds caused by loss of high-quality stopover habitat, especially in coastal and urban environments; (2) document and quantify the importance of urban and suburban parks and gardens in Florida as stopover habitat for migratory songbirds; (3) identify the most important food plants for migratory songbirds; and (4) promote the use of these plants in landscaping in urban/suburban environments. We are working with citizen scientists – volunteer birdwatchers – to collect data on the usage of urban green spaces by migratory songbirds and the species of plants in which they prefer to feed. This report summarizes the results of the pilot season of the Urban Oases Songbird Survey in the fall of 2009. Additional information on the Urban Oases program is available at [www.audubonofflorida.org/urbanoases.html](http://www.audubonofflorida.org/urbanoases.html).

In this program, long-distance migratory songbirds include most flycatchers (especially kingbirds, pewees and empidonax species), vireos, thrushes, catbirds, warblers, tanagers, orioles, grosbeaks and buntings.

## Background

Long-distance migratory songbirds are facing an increasing number of stresses on their nesting and non-nesting (wintering) grounds, and during lengthy migrations. While considerable efforts have been made to resolve adverse habitat and other issues in regions where these birds nest and winter, the transitory existence of migrating birds has made conservation efforts during this phase of the lives of these birds much more difficult to define and prioritize. Yet there is a growing body of scientific literature that is showing that stresses during migration can, in and of themselves, have population effects. Thus, a comprehensive conservation strategy for migratory songbirds must address problems encountered by these birds in all three portions of their annual cycles.

For migrating songbirds, the stresses include long, over-water flights, collisions with human-made structures, and food limitations at stopover sites. Recent studies dealing with migration ecology and related conservation issues are thoroughly reviewed in chapters 5 & 27 in Newton, 2008; also Moore et al., 2005, and Woodley et al. 2005). Relevant messages in this literature pertaining to the ecology and conservation of migrating songbirds are as follows:

- Long-distance migrating songbirds burn body fat and loose weight during flights, and replenish body fat and gain weight at stop-over habitats that are spaced along their migratory routes.

- Migratory birds need about twice as many calories during migration as during non-migration activities (e.g., nesting and wintering).
- When migrating songbirds do not quickly find adequate food at stopover sites, they delay migration until enough food is found.
- Birds that arrive comparatively late and underweight on nesting and wintering grounds often end up occupying sub-optimum habitats; female birds may lay fewer eggs and successfully raise fewer young; these “late” birds may also have lower annual survival rates.
- Reasons why songbirds may have problems obtaining adequate food at stopover habitats include reduced extent of stopover habitats, fragmentation of habitats, reduced quality of habitats, competition with resident birds, unfamiliarity with stopover habitats, and predation by migratory raptors concentrated in the same limited stopover habitats.
- Places where migrating birds may have the greatest difficulty finding suitable stopover habitat are along coastlines where food demands may be highest, and in urban/suburban environments where stopover habitats may be of poorer quality and quantity. The combination of urban and coastal may be especially challenging for small migratory songbirds.

Although a growing body of evidence points the important role stop-over habitats play in sustaining populations of Neotropical migrants, there is little information on the specific characteristics of high quality stop-over habitats that are required by priority birds. The Urban Oases songbird program is designed to demonstrate the importance of urban green places for migratory songbirds, and to determine characteristics of high quality urban habitats by identifying the most important food plants used by migratory songbirds in these urban environments. The results of these surveys will be used to guide landscaping and management practices in urban and suburban parks, gardens and yards.

## **Methods**

The field methodology for the Urban Oases Songbird Surveys was field tested in Miami-Dade and Monroe counties, Florida, between 25 August and 3 November. The field testing was performed in order to evaluate and refine field survey protocols and to establish the types of data that may be collected with citizen scientists. The fall survey was conducted by Audubon of Florida staff biologists, as well as citizen scientists from Tropical Audubon Society and biologists from Miami Dade County Park and Recreation Department.

Information on migratory songbirds and their important food plants was collected in two ways:

### **Songbird Surveys**

Volunteer birders and naturalists conducted censuses of all birds encountered along pre-determined survey routes located in urban/suburban green places. The Fall 2009 songbird surveys were done weekly between late August and early November, in Matheson Hammock County Park and Fairchild Tropical Botanic Garden, in Miami-Dade County. Each route required between 1.5 and 2.5 hours to complete, depending on the abundance of birds encountered. Lists of all species of birds encountered during each survey, and the number of individuals of each, were entered into the Cornell University Laboratory of Ornithology’s eBird database. Records were kept of the total duration of each survey, and for Fairchild Garden, records were also kept of the length of time spent in each of five sub-plots (Arboretum,

Rainforest, Keys Coastal Hammock, Bahamas, Pinelands). Information on the duration of each full survey or subplot survey was used to calculate a “birds per hour” value for the cumulative total of all migratory songbirds encountered during each survey, or for all surveys combined for each location. These calculations were used to compare the overall “attractiveness” of different urban habitats for migratory birds.

### **Surveys of Important Food Plants**

Information was collected on the specific trees and shrubs that were important food plants for migrating songbirds. Any tree or shrub that had one or more migratory songbird (families/species listed above) that were actively feeding in that plant for > 60 seconds was recorded as an important food plant. For each of these plants, the following information was collected: (a) location and date, (b) species of plant, (c) species of songbirds and number of each feeding in that plant, (d) condition of plant (e.g., fruiting, flowering, insects), (e) what the songbirds appeared to be feeding on, (f) other birds present (e.g., resident, etc.), and (g) observers. Information on important food plants was collected routinely during the weekly songbird surveys, and at three other non-survey locations in Miami-Dade and Monroe counties (Palm Lodge Tropical Grove, Castellow Hammock County Park, and the Dagny Johnson Key Largo Hammock Botanical State Park).

## **Results for Fall 2009**

### **Songbird Surveys**

A total of 35 species of migratory songbirds were detected at all locations combined (Matheson Hammock County Park, Fairchild Tropical Botanic Garden, Palm Lodge Tropical Garden, Key Largo Ecological Reserve). Where weekly, fixed route songbird surveys were conducted, a total of 27 species of migratory songbirds were found at Matheson, and 26 species at Fairchild.

The number of migratory songbirds detected per unit of survey time was 13.5 songbirds per hour of observation at Matheson, and 8.4 songbirds per hour at Fairchild. Within Fairchild, there were differences in the abundance of migratory songbirds among the five different survey sites. Highest abundance was in the Arboretum (14 birds per hour of observation), followed by the Keys Coastal Habitat (9.3 birds per hour), the Bahamas Habitat (9.0 birds per hour), the Rainforest (1.4 birds per hour), and the Pinelands (0.4 birds per hour).

The total number of species (migratory songbirds and seasonal/annual residents) detected during all Matheson surveys combined was 73, and for all Fairchild surveys combined was also 73.

### **Food Plant Surveys**

During the fall 2009 surveys, there were 113 records of songbirds feeding in plants for > 60 seconds. These plants represented 27 species of native trees and shrubs, and 14 species that are not native to south Florida. Information was collected on food plant preferences for 29 migratory songbird species. Table One lists 42 species of songbird preferred food plants (some combined) and 29 species of migratory songbirds. The value in each cell represents the number of separate observations of a given species of bird feeding in a given species of plant (not the abundance of birds). For each plant species, the table shows the species of birds observed feeding in it, and the recorded (or suspected) food that the plant was providing for migrating songbirds.

The more important **native** plants that attracted the largest numbers of feeding migratory songbirds during fall 2009 (2 or more observations per plant species; average of 2.0 birds or

higher per observation) were (in no special order): Gumbo Limbo, Strangler/Short-leaf figs, Trema, Virginia Creeper, Live Oak, Satinleaf, Soldierwood, Wild Lime, Buttonwood, Lysiloma, and Red Bay. Also of note was the Chiggery Grape, a little known native that attracted several birds during a single observation. Among the native species of plants that were unexpectedly attractive for migrating songbirds were the Soldierwood (great also for butterflies) and False Mastic.

The most important **non-native** plants for migrating songbirds, using the same criteria, were (in no special order; some scientific names provided for trees not commonly known in south Florida): West Indian Catalpa, three species of non-native ficus (banyan, *F. racemosa*, *F. subcordata*), Manilkara sp., White Man-Jack (*Cordia sulcata*), and Mamey Sapote. Also note the high number of birds attracted to the Caimito during a single observation. When in bloom, the Mamey tree was consistently the strongest songbird magnet we documented, among both native and non-native plants.

## **Discussion**

It is important to recognize that information collected from the initial set of surveys during fall 2009 is preliminary, both regarding patterns of songbird occurrence and abundance, and for the food plants that were detected. No major interpretations should be attempted at this early time in the Urban Oases program. In spring 2010, we will increase the number of sites surveyed in southern Florida, and will also survey sites in temperate regions of Florida in partnership with Audubon chapters and county agencies. Statistical analyses will be performed after data are collected for two fall and two spring migration seasons, in both tropical and temperate regions of Florida. We will then use the data to develop lists of the most important food plants for migrating songbirds in each of these two regions.

## **Partnerships and Collaboration**

The Urban Oases program is designed to be a collaborative endeavor by the staff of Audubon of Florida, Audubon chapters, other NGO conservation organizations, Disney's Animal Programs and Environmental Initiatives, native and flowering plant societies, garden clubs, botanical gardens, city and county municipalities, county, state and federal resource agencies, and the commercial plant growers associations. Each of these partners can bring different skills and capacities to the collective efforts to: (1) identify and protect important urban stopover habitats for migratory songbirds, (2) identify the important food plants for these songbirds, (3) educate people about the conservation issues associated with long-distance migratory songbirds, and (4) promote and implement landscaping practices that will improve urban and suburban environments for migratory songbirds. Overall coordination of these partnerships is being led by John Ogden, Director of Bird Conservation, and Michelle Frankel, Conservation Biologist, with Audubon of Florida.

During fall 2009, an initial cooperative arrangement was established in southeast Florida for the purpose of "field-testing" the Urban Oases program. This collaborative effort involved Audubon of Florida, Tropical Audubon Society, the Miami-Dade County Park and Recreation Department, and Fairchild Tropical Botanic Garden. In addition, partnerships with Disney, the Key West Tropical Forest and Botanical Garden and the Bahamas National Trust were established as important next steps in collaborative planning and for expanding this program beginning in spring 2010. Other partnerships are being explored with Audubon chapters in Florida, including South Florida Audubon (Broward Co.), Audubon of the Everglades (Palm Beach Co.), Martin County Audubon, Hendry-Glades Audubon and Oklawaha Valley Audubon.

## **Next Steps in 2010**

Based on information learned during the fall 2009 pilot season, the field methodology is being revised and the surveys will be expanded to other areas of Florida for the spring 2010 migration season. The specific activities that are planned for 2010 include:

- Implement songbird surveys in 6 or more new locations in Florida, including locations in more temperate central and northern Florida regions.
- Repeat and expand surveys in Miami-Dade and Monroe counties.
- In all survey locations, have local Audubon chapters or other environmental or resource agencies/organizations assume lead responsibility for conducting and coordinating local surveys.
- Beginning in Miami-Dade and Monroe counties, develop a working partnership among Audubon and other conservation and resource organizations and agencies, and garden clubs, botanical gardens, and plant growers and distributors, for advocating and implementing landscaping programs using important songbird “food plants”.
- Initiate songbird surveys at one or more locations in the Bahamas, through a partnership between Audubon of Florida and the Bahamas National Trust.

The pilot surveys conducted with citizen scientists this past fall in Miami Dade and Monroe counties, and the effective partnerships we have developed to apply the results to on-the-ground conservation efforts, serve as a successful model to expand the program to other key regions across Florida and eventually, all along the Atlantic Flyway.