Final Report for CBM 2010 Grant-Deliverables

I. Title and Organization/Author:

"One Bird, One World: Geolocation Monitoring to Help Children Map the Routes of Dane County Neotropical Migrants"

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II. Abstract:

Over 60 percent of Dane County's birds are long-distance migrators or neotropical migrants presenting a unique opportunity to educate Wisconsin's children about bird migration and the importance of preserving habitat. This project uses cutting-edge geolocation technology to map the routes of smaller passerines. During the first two phases of the research project we captured and banded passerines, and placed geolocators on them (target species is the Gray Catbird, *Dumetella carolinensis* because this species is highly visible and audible, often demonstrates a high level of site fidelity, and migrates to Latin America). When the birds return from Latin America in the summer of 2012, we will retrieve the data in order to create maps and educate the public about bird migration and the need to protect habitat. Our study area is on Madison's Northside where 60% of school age children are from low-income families and a growing number of children are Latin American.

III. Introduction/Goals:

Our main goal is to raise public awareness about bird migration by monitoring common urban passerines that are accessible (i.e. living in urban parks), and thus easily observed by children. Our specific goal is to teach under-served Northside children where our birds migrate to in the wintertime.

One of the past problems with mapping migration routes of long-distance migrators has been that most passerines are too small to carry long-term tracking devices. Passerine migration mapping to date has been based on radar, banding, and stopover ecology studies, which all determine the route of a species, rather than the exact path of an individual bird that a child can observe and study. Ornithologist Bridget Stutchbury of York University solved this problem by pioneering the use of

geolocator instruments placed on the backs of passerines. These solar geolocator devices collect and store data on the bird's location in relation to the sun's position. Once the bird is recaptured and the device is removed, the researcher downloads the information and can determine the bird's stopover sites and route within approximately 180 miles. This new system was developed by engineers at the British Antarctic Survey to use on tracking albatrosses; only in 2006 did they develop a device light enough to use on passerines. In 2007, Stutchbury pioneered this technology in North America for the first time, attaching the devices to 34 neotropical migrant passerines in Pennsylvania. Her study "Tracking Long-Distance Songbird Migration by Using Geolocators," was published in the journal *Science* on February 13, 2009: http://www.sciencemag.org/cgi/content/short/323/5916/896 and http://www.nytimes.com/2009/02/13/science/earth/13webbirds.html?emc=eta1.

This geolocation monitoring project is part of the UW-Madison Gaylord Nelson Institute's new Bird Buddies program—a community-based education program that began in September, 2010. As a teaching assistant for the Nelson Institute, I created a new undergraduate course called "Birding to Change the World." During this course, UW environmental studies students are paired with Sherman Middle School students in a birding-mentoring relationship. College student and middle school student spend the semester learning about birds, exploring the study area (Warner Park), and learning to take field notes. By the end of the semester, students use their field notes to generate information to educate the public about Warner Park. First-year participants created a "Treasure Map of Warner Park" for public display. Students also completed a community service project during which they researched, built and installed bird houses in Warner Park.

The data obtained from this particularly geolocation project will be used to create migration maps that students will use as another tool for public education. Since many of Dane County's neotropical migrants winter in Latin America, I hope to use these maps to work with children in both Spanish and English. I also hope to help teachers at Sherman Middle School use these maps to teach geography, history, math, biology and science.

IV. Study Period:

This study has three phases: 1) Phase I: Territory mapping to identify target birds for geolocation; 2) Phase II: Geolocation; and 3) Phase III: recapture of geolocated birds, data retrieval, and public education using maps generated. Phase I began in May 2010, with an initial summer banding and monitoring study of the target species. Our original goal was to complete both Phase I and II during the summer of 2010, and to geolocate the catbirds later that first summer. Unfortunately, the geolocation devices we needed to use were still too heavy for our target species (this technology is evolving monthly). The geolocation company recommended waiting one more year so that the devices would be lighter (our threshold was 3% of the bird's total weight). So we had to postpone phase II and the actual geolocation until the summer of 2011.

In the summer of 2012, when the birds return to Madison, we will recapture them, remove the devices, download the data and generate the maps.

V. Study Area:

Warner Park is at the north end of Sherman Ave. on the northeast side of Madison in Dane County, Wisconsin. The majority of the park is owned by the City of Madison, with a wetland owned and protected by the DNR. This park has over 115 species of birds either nesting or migrating through due to the variety of habitats—marsh, meadow, and woods. Children participating in this Wild Warner Project will also learn about bird habitat in either Mexico or Central America, depending on the neotropical migrants' wintering grounds. They will do this via computer, not by physical field study, so this project has both a field study (Warner Park) and virtual field study (Latin America) component.

VI. Methods:

During Phase I we carried out a territory mapping study to prepare for geolocation. We used Colin Bibby's methodologies in "Bird Census Techniques" for the catbird territory mapping. During Phase II in the summer of 2011, Dr. Pidgeon, a federally-certified master bird bander, geolocated 15 catbirds in Warner Park with the assistance of Trish O'Kane and three other graduate student researchers. Researchers also color-banded the birds and recorded data on their weight and health condition. Federal banding protocols were observed and we utilized Stutchbury's methodology for geolocation. During the geolocation phase, several catbirds that had been geolocated were recaptured (they flew back into the nets several days later). These birds were all healthy and the devices had not moved so we believe that the initial geolocation was successful. I am continuing to monitor the birds before they leave for Latin America (although they are very difficult to observe in late summer as they are shrub birds and hide in thickets).

VII. Results:

A. Field Guide Maps:

One of the goals in the original proposal was to publish geolocation maps in a field guide to the birds of Warner Park. This field guide would have been written by the children participating in this project. However, once we began the program in Sherman Middle School, we realized that there was not enough time during the weekly field trips to write and edit, as well as learn about birds and nature. Every Monday afternoon from 3:00pm to 4:30pm, the Bird Buddies walk from Sherman Middle School to Warner Park to study the birds and then return to school. In discussions with our community partner, Sherman Middle school administrators stressed the need for walking field trips and exercise. We also discovered that the children have very little recess time during the day and spend over 90% of their day inside. We decided that walking and running in the park was more important

than sitting at a computer. We have not abandoned the field guide but we realize that it was overly ambitious to start with—the community partner's needs must come first.

B. Phase I Summer 2010 Monitoring Results: Online Species List Published

Two researchers (a graduate student-Trish O'Kane) and an undergraduate student spent the summer of 2010 monitoring and studying the birds of Warner Park, particularly Gray Catbirds. Dr. Anna Pidgeon of UW-Madison Wildlife and Forest Ecology department also banded and color-banded the birds to help with the territory mapping. During this baseline study, researchers produced a species list which was published on Wild Warner's website, see www.wildwarnerpark.org. With the participation of other citizen monitors, 115 species have now been found in Warner Park. Without this initial summer baseline study, this species list could not have been compiled. In April, 2011, UW's Bird Buddies program brought award-winning African American ornithologist John Robinson to Madison to work with the Bird Buddies students in Warner Park. Robinson and the children found species #100 on the day he took them birding, see the Capitol Times' story online: http://host.madison.com/ct/news/local/education/blog/article_05e09904-6b84-11e0-b134-001cc4c002e0.html. Since this story's publication, other citizen monitors have helped to find new species and the online species list has become a more valuable public education tool. In June, a new citizen monitor found species #114 in the park—*Empidonax traillii*, a species of special concern in several states. This bird is breeding in Warner Park.

During the summer 2010 monitoring study researchers also banded and studied another member of the Mimidae family that is a species of special concern in Wisconsin: *Toxostoma rufum*, the Brown Thrasher. Researchers discovered at least one breeding pair of thrashers in Warner Park. The WDNR recommends protecting this species' shrub habitat. One of the researchers testified before the Madison Board of Parks Commissioners about this species specific habitat needs in Warner Park.

C. Children's Migration Study published on Wild Warner website:

Boaz Fink, a Sherman Middle School Bird Buddy participant, conducted his own research study on the birds of Warner Park and their migratory routes. Inspired by what he learned during the Bird Buddies program, this enterprising sixth-grader decided that he needed to know where our birds go in the winter. He sat down with his father one December day and used Cornell University's "All About Birds" website to look up every single bird species in Warner Park. Then he created an excel spread sheet to share his data and a powerpoint presentation. Boaz has now given this presentation to children, senior citizens and at the UW-Madison's 2011 Science Symposium. During the summer of 2011 geolocation

phase of this project, Boaz Fink also helped during a field day and held a bird in his hands for the first time.

D. Phase II Summer 2011 Geolocation Monitoring:

During the summer of 2011, Dr. Anna Pidgeon and Trish O'Kane geolocated 15 catbirds in Warner Park. We will not have the data results until the birds return to Madison in the spring of 2012. While doing the geolocation, Dr. Pidgeon measured the length that the geolocation harnesses need to be. She is giving this information to the geolocation company. This technology is still in its infancy and we had to create the thread harnesses ourselves. Because we geolocated 15 birds and measured them all, we were able to determine an average advisable length for harnesses for this particular species so that the company can improve on the technology.

E. Video for Public Education:

During the summer 2011 geolocation study, a videographer filmed some of the fieldwork. The videographer, Jim Carrier, is the director of the Wisconsin Film School and an award-winning documentary filmmaker, see: http://wpt.org/directorscut/107carrier.cfm. Carrier also interviewed Dr. Pidgeon and O'Kane. The researchers hope to use this footage to make a short documentary for classroom use once the geolocation study is over. The video could be used to teach both schoolchildren and college students about geolocation technology and bird migration. We will finish the video during the summer of 2012.

F. Media Coverage:

Although this project is still underway, it has already generated two newspaper stories: the "100 Birds" story mentioned in "B" and a story on catbird geolocation that the Northside News will publish in print and on the web in October 2011. We hope to secure funding to complete a short video documentary film on this project that can be shown in classrooms and on public television (see "E").

Dr. Anna Pidgeon geolocates a Warner Park catbird, July 13, 2011