

NEIGHBORHOOD NESTWATCH

Science in the City

by Peter P. Marra
and Robert Reitsma

BIRD ENTHUSIAST PAULA SCHAFFER eagerly peers through the kitchen window of her Washington, D.C. home. She sees gray catbirds foraging on the lawn, house wrens carrying nesting material into their nest boxes, and a male northern cardinal, crest raised, bolting out his familiar song. This year, however, there's something different about these birds. They all have unique combinations of color-bands on their legs, identification bracelets that will allow Paula to identify these birds year after year. Paula and the birds that share her yard are part of a growing network of about 200 urban, suburban, and rural backyard study sites included in Neighborhood Nestwatch, a program of the Smithsonian Environmental Research Center (SERC). Neighborhood Nestwatch is a part-science, part-educational outreach project that encompasses the Washington, D.C., Maryland, and northern Virginia region. Nestwatch uses the backyard setting to heighten our understanding of how urbanization



affects the survival and reproduction of migratory and resident birds. At the same time, it seeks to teach citizens about bird biology through hands-on learning, right in the backyards of volunteers like Paula Schaffer.

As natural landscapes are developed, wildlife habitat becomes more isolated and degraded. This is especially true in the increasingly urbanized eastern United States where habitat fragmentation has long been recognized as a major threat to forest-dwelling, migratory songbirds (Robbins et al. 1989, Robinson et al. 1995). Habitat fragmentation results in higher nest depredation and brood parasitism, which can nega-

PHOTO: A backyard cardinal receives a leg band from Neighborhood Nestwatch founder Peter Marra (left) and a volunteer.

tively impact bird populations. Although some species persist, many species of migratory and resident birds have already been extirpated from humanized areas.

Ironically, we know alarmingly little about the biology of these species, even though they are literally in our backyards—probably because ecologists prefer to study birds in more undisturbed settings, and also because of the difficulties posed in attempting to access backyards and other types of private property for a typical scientific study. The research objectives of Nestwatch focus on two important ecological questions. First, how well do species that live along an urban/suburban/rural land-use gradient reproduce and survive? Second, what elements of the local (for example, shrub density and number of trees) and regional (for example, impenetrable surface area, forest cover) landscape best explain variation in reproduction and survival of birds living within urban and suburban environments?

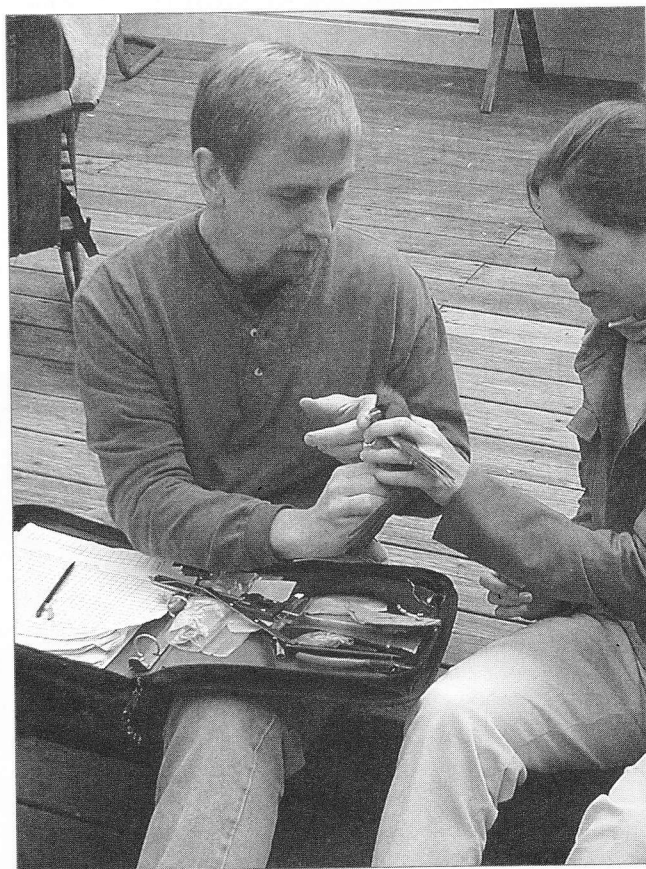
People living in areas of increasing urbanization and habitat destruction seem to feel more detached from Nature. Their opportunities to experience wildlife on a day-to-day basis become increasingly difficult and are often limited to occasional glimpses of raccoons, skunks, gulls, and crows. This increased isolation from Nature may serve to reduce concern for the environment and reinforce more economic development that is ecologically destructive. One approach to this problem is to bring citizens into contact—literal, physical contact—with birds in their backyard, and to teach them how to monitor the activities of these birds year after year. To accomplish this, we created Neighborhood Nestwatch, a research-based, mentored learning program that offers citizens a lens into how science works, as well as a home study course in current conservation issues that may affect wildlife.

PARTICIPANTS ARE RECRUITED in a variety of ways, such as speaking engagements, our website, blurbs in newsletters and newspapers, and word of mouth. Participants range from families to girl scouts, and from home-schoolers to senior citizens. Each volunteer receives a packet containing information about observing color-banded birds, nest-finding, nest monitoring, and general natural history information on the eight common birds which are the focus of the study (see table next page).

The first task of the participants is to determine which of the targeted species can be found in their yard or neighborhood. Next, a SERC staff member visits the house, explores

the yard with the participant, conducts a bird census, and decides where to place a mist net to capture as many target species as possible. Mist nets are made of fine, almost transparent nylon mesh stretched between two poles, and are approximately six feet in height; they can harmlessly catch a flying bird. On the ground near the middle of the net, we place a stuffed bird on a stick, and a speaker wired to a tape recorder about 15 or 20 feet away. Because all of the Nestwatch study species defend their territories against individuals of the same species, they can be lured by a broadcast of their song and duped into the net when they start attacking the intruder (i.e., the decoy on a stick). Nestwatch participants help with the entire process.

Once birds are captured, they receive a unique color-band combination on their legs composed of one U.S. Fish and Wildlife Service aluminum band and two colored bands. This allows participants to identify each individual bird so it can be re-sighted in the future. We measure a leg, a wing, and the bill, then we weigh the bird and check for reproductive activity. A small blood sample is taken to test



COURTESY OF NEIGHBORHOOD NESTWATCH

for West Nile virus. As the visit ends, the backyard study site is geographically referenced using a Geographic Positioning System (GPS) so that vegetation and landscape variables obtained from a Geographic Information System (GIS) database can be assigned to that exact location. Every step of the way, the SERC staff member describes the scientific methods of the project and answers questions, thus establishing a dialogue with the participant that often continues by phone and e-mail; additional information on the ecology of each Nestwatch species and “backyard biology” are also provided on our website. After the visit, “Nestwatchers” continue to make observations on “their” color-banded birds, find nests, monitor nest success, and search for their banded birds the following spring.

JUDY SEIDLING AND HUSBAND STEVEN from Silver Spring, Maryland, enthusiastically describe the soap opera they have just witnessed between three house wrens. “The female with the red band over the blue band on the left leg and an aluminum band on the right leg successfully raised three young with a banded male. We observed that same male copulate with an unbanded female on our back deck and they are now building a nest in our other nest box. I never thought I would learn so much about the birds in my neighborhood. Participating in this project has opened my eyes to parts of a bird’s life I never would have [otherwise] experienced.”

Observations such as this by Nestwatch volunteers are common and often lead into more sophisticated discussions

about extra-pair paternity and other behavioral traits found in birds. The high degree of direct contact between participant, scientist, and study animal makes Neighborhood Nestwatch unusual among citizen science projects. First, citizens identify with individually color-banded birds year after year, adding a sentimental flavor to participation. Second, this project relates data on specific individuals, such as reproduction and survival, to landscape-level features in human-modified environments, providing insight into the mechanisms that underlie population change. Finally, Nestwatch is a community-based effort involving citizens from varied backgrounds and skill levels, and represents an effective way to engage the public in natural history observations with a direct link to scientific research. ☺

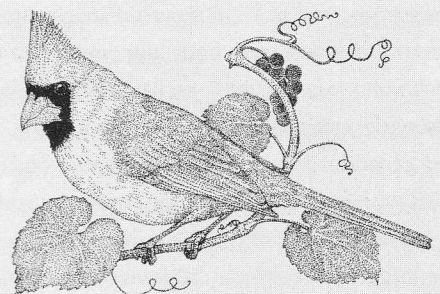
Peter Marra (marra@serc.si.edu) is a senior scientist and **Robert Reitsma** a research technician at the Smithsonian Environmental Research Center in Edgewater, Maryland (P.O. Box 28, Edgewater, MD 21037; 443-482-2224). ☞ For more information on the Smithsonian Environmental Research Center, visit www.serc.si.edu. For more information on Neighborhood Nestwatch, visit www.nestwatch.si.edu.

SOURCES CITED

- Robbins, C. S., D. K. Dawson, and B. A. Dowell. 1989. Habitat area requirements of breeding forest birds of the Middle Atlantic States. *Wildlife Monographs* 103: 1–34.
- Robinson, S. K., F. R. Thompson, T. M. Donovan, D. R. Whitehead, and J. Faaborg. 1995. Regional forest fragmentation and the nesting success of migratory birds. *Science* 267: 1987–1990.

NEIGHBORHOOD NESTWATCH STUDY SPECIES

Common Name	Scientific Name	Migratory Status
Carolina chickadee	<i>Poecile carolinensis</i>	year-round resident
Carolina wren	<i>Thryothorus ludovicianus</i>	year-round resident
house wren	<i>Troglodytes aedon</i>	short-distance migrant
American robin	<i>Turdus migratorius</i>	short-distance migrant
gray catbird	<i>Dumatella carolinensis</i>	long-distance migrant
northern mockingbird	<i>Mimus polyglottos</i>	year-round resident
northern cardinal	<i>Cardinalis cardinalis</i>	year-round resident
song sparrow	<i>Melospiza melodia</i>	short-distance migrant



©DIANA DE TYLER