BIRD CONSERVATION

FOREST BIRD SURVEY COMPLETE

The last forest bird survey of southwestern Connecticut took place at Squantz Pond State Park in New Farifield.

The last field season of the *Forest Bird Survey of Southern New England* drew to a close on a cold but sunny late February day this past winter. The location was Squantz Pond, New Fairfield, where the mountainous slopes remained encased in ice despite the disappearance of most snow in open a- eas. With the exception of a few duplicate surveys to be run for statistical purposes this summer, the field portion of the eight-year long project is now complete.

Next comes the analysis phase, which is likely to take years, in large part because the volume of in- formation collected is immense. Even perform- ing simple tasks like proofreading becomes a daunting undertaking, because the number of bird observations made is close to 50,000.

The first portion of the survey data, that from *(Continued on page 2)*

> *"Such observed variation points out the need for large, statistically based samples that can uncover patterns within the "noise" that exists in natural systems."*

American goldfinches and their cousins, pine siskins (above), are usually un-common winter residents of forests. However, they were extremely abundant this winter.

eastern Connecticut and Rhode Island, is, however, already compiled completely . Analysis of it has led to preparation of a research report (see *Bird Conservation* vol. 11, issue 1). Results of more analyses of this portion of the data will be coming in the months ahead.

Once all the data are compiled, we will begin preparation of a comprehensive forest bird atlas for southern New England. This atlas will detail the distributions, populations and habitat use of all forest bird species inhabiting the region. In addition, we will be using satellite imagery of regional forest habitats to discover if large scale patterns in forest fragmentation shows any relationship to locally observed composition of bird communities. Early indications are that differences between communities of fragmented vs. unfragmented landscapes exist, despite the fact our surveys concentrated on larger forest tracts.

During this past winter, patterns observed for southwestern Connecticut were largely consistent with those initially reported in the last issue of *Bird Conservation*. Population densities of birds appeared lowest in the mountainous, northern portions of the region and highest in coastal locations. However, several notable exceptions to that rule were uncovered. Isolated forests in suburban Fairfield were surprisingly lacking in birds, for example. Such observed variation points out the need for large, statistically based samples that can uncover patterns within the "noise" that exists in natural systems.

"Winter finches," present abundantly in early winter, also remained common throughout the study period. Goldfinches, pine siskins and redpolls were present in particularly great numbers. As of the first week of April, some remain present commonly in our region.

THE RETURN OF FIELD TRIPS

No, it's not Tarzan and Jane; neither is it Fred and Ginger. It is our own Barbara Lussier and Robert Craig, doing some extreme field-tripping to the tropical Pacific. The same dynamic duo will be leading more tame trips through our local area in the coming months.

"Trips are usually designed to be half-day events and are free of charge for members."

We've tried re-starting our field trip program several times in recent months, and indeed we have held several invitation-only trips for trustees and guests. However, the stresses and time commitments of the *Forest Bird Survey* have con-sistently conspired to thwart our attempts to re-start field trips for members and friends.

With the close of the survey, we have committed our-selves to hosting our long dormant trips. E-mails will be sent to all on our lists. Please let us know if there is anyone you would like us to add to those lists.

Trips are usually designed to be half-day events and are free of charge for mem-bers. All from beginner to expert are invited. You'll be hearing from us soon ... (promise).

POWERPOINT PRESENTATIONS: MAKING MATH UNDERSTANDABLE

Exponential Equations

• The exponential population growth equation is usually written in this form (right):

• The slope of this equation, known in Calculus as its derivative, is (right):

• An equation like this that tells how a variable changes over time is called a differential equation. This one tells us the rate of population growth at any point in time.

$$N(t) = N(o)e^{rt}$$

@ time = t — Exponential growth rate — Time
@ time = 0 — Base of natural logs = 2.72

$$dN/dt = rN$$

Change in numbers over time — Number of individuals in the population — The contribution of each individual to population growth

Above is a slide from our PowerPoint, *Populations*. It and all our presentations are available through the Publications tab of our web site, www.birdconservationresearch.org.

Mathematical models in ecology provide ways to clarify our understanding of natural systems and ways to predict the behavior of these systems. They are increasingly at the heart of modern ecological research. Because of this, it is important that science students gain some basic understanding of model building techniques and the mathematics they are based on. We have, therefore, developed PowerPoint presentations that lead students through simple examples of model building.

The above PowerPoint slides (*this and the next page*) illustrate several features of model building– defining variables, characterizing the relationships between variables and making assumptions about the characteristics of natural systems. They examine a core concept in ecology, the growth rate of populations.

A separate series of slides available on the same presentation, *Populations*, explores another core concept– population growth where some environmental factor is in limited supply, leading to a habitat having a "carrying capacity."

POWERPOINT PRESENTATIONS: CONTINUED

Deriving dN/dt = rN

- Make a flow diagram (right) showing the influence of all factors on population growth rates:
- Express the diagram in words: a change in numbers (N) over time is the difference of the effects of birth (b) and death (d) rates on the population (assume these rates are constant).
- Express the words as symbols:
  - $dN/dt = bN - dN$

- Simplify through factoring:
  - $dN/dt = N(b - d)$

Birth rate: bN

Number of individuals: N
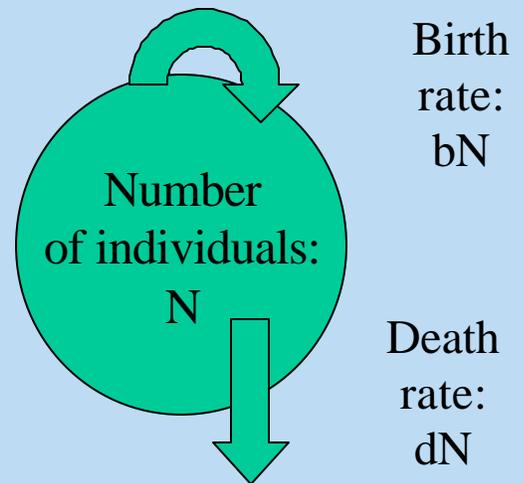
Death rate: dN

- Rearrange and replace: (b – d) with the symbol r, which stands for the overall rate of population growth as influenced by birth and death rates:
$$dN/dt = rN.$$

A PowerPoint slide from *Populations* that demonstrates how a sophisticated equation can be derived using techniques from elementary algebra.

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Bird

Conservation Research, Inc.

Membership

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www. birdconservation research.org

So, what bird is this? It will be coming through on migration any day now. E-mail us and let us know what you think.

MEMBERSHIP DRIVE

It is time once again to renew your membership. Please support us by returning the member renewal form that comes with the printed version of this newsletter. Memberships provide a large part of the funds necessary to conduct our research and public education activities.

In order to continue providing these services, we need your continued support! Membership applications and payment options are also available at www.birdconservation-research.org