

NET HOURS: A COMMON DENOMINATOR FOR THE STUDY OF BIRD  
POPULATIONS BY BANDERS

By Chandler S. Robbins

I was shocked by the title of Mabel Warburton's paper in the July-August 1967 issue of EBBA News, "Net Hours: The Myth of their Importance". I was shocked also by the implication that the principal use of net hours is to compare gross seasonal totals between stations or over a period of years at the same station.

A study of Figures 3 and 6 and Tables 4 and 5 in the 1958 Operation Recovery summary by Baird, et al. (Bird Banding 30(3): 143-171, 1959) will reveal several practical uses of the net-hour denominator. By expressing all bandings in terms of birds per 1000 net hours, the authors have been able (1) to trace the effects of a specific weather pattern on migration at different banding stations; (2) to compare day-to-day abundance of a given species throughout its migration period and correlate this with changes in temperature; and (3) even to compare migration sampling by television towers with migration sampling by banding. In each case the use of birds per 1000 net hours instead of raw banding totals greatly increased the validity of the comparisons.

The experienced research bander is well aware of the value of recording his net hours each day. He realizes that this measure of his activity can and should be refined. Some banders, for instance, use nets of different lengths and record net-meter-hours. I submit that if we record only the banding totals with no measure of netting effort it is impossible to pinpoint even the peak movement of a particular age-sex group of a given species through a series of stations or to correlate migratory activity with weather conditions.

The purpose of my rebuttal is two-fold. First, I wish to point out to the beginning banders that net hours are no myth - that despite their shortcomings they are an essential part of the records of any bander who has more than a hobby interest in banding. Second, I'd like to stimulate the more advanced bander to think in terms of making his banding records more usable for research purposes.

Mrs. Warburton has very helpfully pointed out some of the shortcomings of "raw" net-hour data, especially when lumped together for an entire season without regard to the dates or the uniformity of effort throughout the season. She mentioned eight factors that could result in a low banding total for a particular day. If we agree at the outset that we are not trying to compare the catch of ducks or of flickers with the catch of warblers, we find that Mrs. Warburton's eight factors are of relatively minor importance and that we can compensate for them in an analysis provided the bander is willing to take a couple of minutes to record a few basic facts about the way he operates.

Let's discuss very briefly her eight factors, any one of which could result in a low number of birds per net hour.

1. Not many birds present. This is what we would like a low birds-per-net-hour figure to show.
2. Placement or orientation of nets was changed. Any major change in arrangement of nets can be documented on paper in much less time than it takes to move the nets.
3. Nets had skimpy pockets or strung too tightly. Why not determine optimum spacing of trammels (number of inches apart), write this down for a permanent record, and instruct your assistants to adhere to it as closely as possible! In other words, standardize your procedures to assure maximum netting efficiency as well as consistency of operation.
4. The birds that day were largely flickers, which got out of the nets. If only small mesh nets are being run, many flickers escape every day. When a big flight of flickers arrives it will be detected even if many birds escape. If other species are absent, or are present only in small numbers, on the day in question, we would want this fact to be reflected in a low birds-per-net-hour figure for that day.
5. The birds on that date were all small species; my nets had medium to large mesh and the small birds went through. We cannot expect to sample all species uniformly because of size, habits, and other variable factors. No O.R. station captures enough gulls, ducks, herons, nighthawks or rails to make a detailed study of these groups of birds. Similarly, some species of small birds are poorly sampled, while for others the nets are extremely efficient. As long as we take care not to jump to unwarranted conclusions, such as comparing the number of hummingbirds that fly past Island Beach with the number of Northern Waterthrushes, based on the number banded per net hour, we need not be too concerned about the birds we fail to catch. If we wish to obtain a better sample of gnatcatchers and Yellowthroats we can include a certain number of 30 mm. nets in our sampling plan. Similarly, if we want to be sure to detect the peak of the cuckoo migration we would include some 2½ inch nets. Preferably, we should figure out our sampling plan in advance and then stick to it as closely as possible, so as to measure the relative abundance of each species throughout its migration period.
6. The wind was too strong; or rain kept the birds from moving. Wind is a real problem to netters, as high wind always reduces one's catch. Wind interference cannot be measured accurately as so much depends upon the degree to which individual nets are sheltered, on whether the nets are tethered, on the gustiness, and on whether or not the loose mesh becomes entangled around poles or against trees. However, the fact that wind speed was high on a particular day can always be ascertained from the weather bureau, and as late as a decade or even a hundred years later,

a biologist with an electronic computer can still compensate to a certain extent for unfavorable weather. Of course, the more detailed notes the bander leaves for posterity, the better the analyst can make adjustments. I shall not comment upon the effect of rain, since banders generally close their nets when it is raining, and enter this fact in their records.

7. The birds on this date were the high-flying species and went over the nets. As pointed out earlier, we don't sample the high-flying species anyway. Just because we never catch Chimney Swifts is no reason for failing to record net hours for the species we do catch. On some days conditions are such that swallows fly lower than usual; or perhaps on a slow day banders will move some of their nets to places where they have a better chance of catching swallows - if there is nothing else to catch. Such departure from the standard routine should be entered in the records, as it may create an artificial peak for the swallow figures even though it may have little effect on the birds-per-net-hour data that are applied to the other species.

8. I got up too late and missed the morning flight. We are just entering the computer age in the analysis of banding records. There is almost no limit to the type of information that can be programmed into and detected by a computer. It is quite conceivable that, a decade or two hence, the technician studying your banding data can detect and even compensate for any minor irregularity in the operation of your station, provided all the basic information requested on your Operation Recovery forms has been supplied.

Mrs. Warburton points out that several of the larger O.R. stations operate on a part-day schedule: Mariedor Sanctuary operates until about 10 a.m., then again from about 4:30 to dark; Brookhaven operates mornings only; Tiana Beach runs six days a week and closes after the early morning flight except on good days. Others, such as Ocean City, Damsite, and Kent Point, operate dawn to dark every day unless forced to shut down during rain. The more consistently a station is operated, the easier it is to interpret their catch; but without keeping a record of net hours, the catch cannot be interpreted at all and most of the value of the station is lost.

I think it is time for each one of us to take a long, hard look at our individual banding programs to see whether the effort we are expending is channeled where it will do the most good. Some banders feel that the year has been a success if they band more species or more individuals than the previous year, or if they break into print as having banded more of species X than anyone else reporting from EBBA territory, or if they catch a 6-year-old chickadee, or get a recovery of a grosbeak from Kalamazoo. Admittedly, such thrills as these help keep the banding program alive. But how much do they contribute to knowledge? The sad story is that the majority of banders die before they publish any results of their banding. The schedules and the recoveries are placed safely on file at the Migra-

tory Bird Populations Station; but, except for the O.R. bandings, no record of netting or trapping effort is available. Accordingly, research workers are unable to interpret the annual changes in the numbers of bandings or recoveries of a given species. Net-hours, like nation-wide opinion polls, will never tell the whole story; but despite their shortcomings they have great practical applications. I am sure the day will come when one of the requirements of a banding program will be to place on record a day-by-day estimate of netting or trapping activity. This is not by any means a new idea. If you search through your old files of EBBA News, prior to the advent of the mist net, you will find references to documenting the number of trap hours (rating a single cell as 1, compared to a count of 5 for a maze type trap that takes several birds at once).

I'd like to make a special plea to Operation Recovery banders to set the best possible example for others. Your records form the initial backlog of quantitative data and will most assuredly be used extensively by research workers of the future. We shall find many ways to improve the uniformity of our banding activities and our record keeping and of compensating for many of the variable factors that presently prevent highly refined analyses. But we already have the basic foundation upon which we can build.

I am glad to report that the backlog of Operation Recovery data has now been put on punch cards and will soon be available on magnetic tape for analysis. Are your records included? They are if you have taken your banding seriously and have aged, measured, or weighed most of your birds.

Unaged birds were punched in the early years of O.R., as long as measurements and/or weights were included. In the future, however, unaged birds will not be punched unless the great bulk of the other birds from your station are aged. In other words, we shall process the complete record from your station only if 90 percent or more of your birds are aged and measured. We shall, of course, continue to process any individual species for which complete data are supplied. We strongly urge, however, that each station operator consider very seriously cutting down his operation to the point where he will be able to process completely nearly all of the birds he handles. The value of having your whole station record available permanently on magnetic tape will greatly outweigh the few hundred additional bandings that you may have to sacrifice.

In summary, I'd like to discourage the defeatist attitude that net hours are unimportant just because they do not give a precise measurement of banding effort. They are actually a big step forward in the right direction. They will become increasingly valuable over the years as we individually and collectively (1) standardize our activities, (2) keep a careful permanent record of exactly how we operate, and (3) refine our procedures for analyzing the results of our banding efforts.

Operation Recovery banders who report all their bandings on the O.R.

forms already have a system for informing the Patuxent computer which days they banded, and during which hours, and what their normal pattern of captures is throughout the day. If station "M" operates all day on some days and only until 10 a.m. on other days, the computer can be programmed to detect this irregularity and either to disregard all bandings after 10 a.m. or compensate for the daily variations in activity. If foul weather forces closing nets for much of the day, this too can be detected by the computer and the resulting small samples can be identified or disregarded.

A new daily banding activity form developed by Ted Van Velzen was tested at Ocean City this fall and will be available to O.R. banders next fall. By means of this form, local weather conditions, time of opening and closing nets, and other pertinent information concerning netting effort will become a matter of permanent record. This form will, if properly filled out, provide information from which the new computer can compensate for the major difficulties mentioned by Mrs. Warburton and thus permit the O.R. banding data to be analyzed more critically.

Plan now for better standardization of your banding effort in 1968. If you use nets, decide upon a standard number and arrangement, at least for normal minimum operation. Record the size or sizes of nets you are using (length, mesh size and source), whether tethered, their general condition (new, or operating at what estimated efficiency if in poor condition). Get into the habit of computing your daily number of net hours, between sunrise and sunset; the Weather Bureau will send you a sunrise-sunset table on request. Remember, on days when you deviate from your standard sampling plan, it takes much less time to make a permanent record of the changes in netting activity, or to take a separate sheet of paper for those birds caught in an additional net, than it takes to change the net itself.

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#### LONG POINT BIRD OBSERVATORY

The Long Point Bird Observatory will be conducting a continuous program of observation and banding of migrant and resident birds from April 1st to October 31, 1968 at Long Point on the Ontario shore of Lake Erie. The Observatory is situated at the eastern end of the point, about 18 miles from the nearest road. Last year about 16,000 birds of 160 species were banded at the Observatory. Most of the birds are trapped in the Observatory's five Heligoland traps. Accomodation is available at the Observatory for a limited number of experienced observers or banders who are willing to assist in the work of the Observatory for periods of one week or longer. Accomodation includes bunks and cooking facilities, but visitors must bring their own sleeping bags, air mattresses and food. A fee is charged for accomodation and transportation on Long Point. Further details may be obtained from: Mrs. J. Woodford, 76 Glentworth Road, Willowdale, Ontario, Canada.