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An Educational Experience using Bird Banding as a Laboratory Exercise

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INTRODUCTION

In 1991 a summer course in field ornithology was offered by the Longwood College Biology Department at Longwood, Virginia. From 1991 through 1996, I gave guest presentations and demonstrations on bird banding to the class.

The histories, theories, and techniques used by ornithologists are traditional academic subjects and generally are presented in a college classroom via lectures. Netting live birds and subsequent banding in the field may be similar to a traditional college laboratory experience. This dichotomy posed an interesting challenge to the organization of materials for a bird banding presentation and demonstration. The two objectives of this paper are to examine the educational value of bird banding in a field ornithology course and to evaluate the presentation method used during the bird banding portion of the course.

METHOD

The demonstrations and presentations were held at two locations in south central Virginia within ten miles of Appomattox, the physiographic Piedmont region of the state. The nets were set up in a residential area, using nearby bird feeders to lure the birds into the net area. For the first four years, two nets were placed between bird feeders and an adjacent area containing small trees and bushes. For the last two years, nets were set up on a property that had bird feeders placed in a small open area partially bordered by pine trees. Both locations were suitable for establishing an outdoor classroom and a banding station.

Preliminary Preparation - First, permission was obtained to set up the bird banding operation and presentation on private properties. Each afternoon

before a presentation, the banding net(s) were set up, furred, tied with engineering tape, and left overnight.

The following morning, the bander/presenter arrived prior to the students, opened the mist nets, set up a portable banding unit (Underwood and Hansrote 1990), and arranged the seating so the students could observe "flip charts" displayed on a tripod. The station was operational when the class arrived. Birds netted prior to the class were held until the class arrived.

Presentation - For the out-of-doors classroom, the presentation sequence of subject matter and topics listed in Hansrote (1992) was used. In place of a standard lecture, a question-answer method was used. This learning method establishes the level of the need-to-know for the students and the presenter. Leading questions were directed toward the students in a non-threatening manner. This style of presentation is based upon the educational theories used in the Leadership Development Program of the Boy Scouts of America called "Wood Badge." The strength of this presentation technique is to give a shy, bored, or an unmotivated student sufficient reason for wanting to become involved with the material being presented. Sometimes, as a result of this question-answer process, student-generated questions arose. All student questions were addressed.

Previously prepared flip charts containing relevant definitions and information were available for use by the presenter. These charts helped to keep the presenter on track and also served as support for the compulsive student note-taker. In addition, the prepared charts helped the presenter remain

Table 1. Class enrollment and station data.

No. of Students/Visitors	Time Nets Open	Number of Nets	No. of Birds Netted	Date
8	4 hrs 20 min	1	9	24 Jun 1996
12	4 hrs 3 min	1	6	26 Jun 1995
12	8 hrs 20 min	2	5	11 Jul 1994
10	8 hrs 46 min	2	10	14 Jul 1993
5 stud / 3 visitors	7 hrs 56 min	2	8	29 Jun 1992
7 stud / 2 visitors	5 hrs 5 min	2	8	8 Jul 1991

organized when student-generated questions were asked concerning topics that would appear later in the scheme of the presentation.

This style of presentation gives the presenter freedom for flexibility. To illustrate: During the presentation, the presenter can occasionally pause and ask the class questions that reinforce material covered elsewhere during the field observation segment. For example, the question, "What birds do you hear?" not only reviews material presented in the field work but also prompts students to listen and recognize the birds present around the net area.

The presentation lasted from three to four hours, depending upon the number of birds captured and the weather. At the end of the presentation, the class reviewed the steps used in the banding procedure.

The Banding Demonstration (The Laboratory Experience) - For the reader who has not visited a bird banding station, the process of bird banding can be summarized as a sequence of events: After being safely removed from the net, the species of bird is identified, a band attached to its leg, its wing chord measured, then its plumage and physiology examined to determine age and sex. All data are recorded in a station log and the bird released.

Table 2. Birds banded by year.

1996 - 1 Carolina Chickadee 3 American Goldfinches 4 House Finches 1 Red-eyed Vireo	
1995 - 8 House Finches 3 Tufted Titmouse 1 House Wren 1 Common Grackle	1 Car. Chickadee 1 Chipping Spar. 1 Br. Thrasher
1994 - 2 House Sparrows 1 House Finch 1 Carolina Wren 1 Common Yellowthroat	
1993 - 2 House Finches 5 Gray Catbirds 1 American Robin 1 House Wren 1 Red-eyed Vireo	
1992 - 2 House Finches 1 Carolina Wren 2 American Robins 1 Blue Jay	
1991 - 1 House Finch 2 Gray Catbirds 4 House Sparrows 1 Carolina Wren	

DISCUSSION

During 36.50 hours of net time in six years of presentations, 54 individual birds were banded. The station netted 1.52 birds per net hour, a reasonable value for a small banding operation. During the six presentations, 15 bird species were banded. All the banded species can be found in Virginia residential areas. The banding sessions took place in either June or July, which is the nesting season for most of the birds banded. No local or foreign retraps/returns have been caught, which is not unusual in such a small sample of birds.

Birds were aged as hatching year, after-hatching year, or unknown. The sample of banded birds contained individuals in all three categories. Students were directly involved during the age determination of each netted bird. Subtle differences in the plumage and physiology between adult and recently fledged immature birds were pointed out. These important differences cannot be seen easily in the field with either the naked eye or when using binoculars.

EDUCATIONAL EXPERIENCE

Jones (1990) lists the following learning principles related to birding and natural history. His learning principles are exclusive of the traditional teaching tenets that are taught in college education courses.

- Learning results from stimulation through the senses.
- Learning requires activity.
- Learning is based upon past experience.
- Interest is essential to effective learning.
- Challenging problems stimulate learning.
- Early success increases chances for effective learning.
- Knowledge of our purpose, use for, or application of anything makes learning more effective.
- The more vivid and intense the impression, the greater the chances of remembering.
- Effective learning is likely to occur when a logical relationship exists between subjects and lessons.
- The most effective learning results when initial learning is followed immediately by application.

The banding demonstration served to illustrate the application of Jones' learning objectives in the overall presentation. The first bird netted was removed by the bander who demonstrated to the class how to best remove the bird from the net and how to hold the bird safely. The bird was taken to the banding table where standard bird banding procedures used for ageing, sexing, banding and recording data were demonstrated.

With the bander's help, netted birds were removed by those students who expressed interest in handling live specimens. Each captured bird was taken to the banding station and the banding process initiated. During this phase of the demonstration, members of the class were asked to participate in one or more functions of the banding process. Many students took advantage of the hands-on opportunities. This opportunity for individual involvement is governed by the number of birds banded and the number of students in the class. Repetitive involvement by individual students gave them sufficient experience to build confidence in handling a live specimen. As additional birds were netted, some students commented that handling live specimens became easier and more natural. The result of this hands-on involvement served to intensify student interest in the bird banding process. Evaluations of the subject matter and topics used in the presentation are made more difficult because the suggested sequence of the topics presented were adjusted frequently due to the need to band and immediately release a netted bird.

It has been suggested that this presentation and demonstration required much work for such a small return in the numbers of birds banded. However, the primary objective of the presentation and demonstration was not to band a large number of birds. Hopefully, there would be sufficient numbers of birds netted so interested students could be involved personally in the banding process. A hands-on approach is the strongest exposure to the techniques used in bird banding. Individual student involvement in the banding process reinforced interest in later discussions concerning the importance of banding research in the fields of ecology, wildlife conservation, and biology.

The teaching method used in the bird banding presentations supported the idea that the banding portion of the course specifically addressed nearly all ten of Jones' learning principles. Jones made the suggestion that "Students from grade levels K thru 12 can learn to identify birds. Younger students may learn only a few families or species while older ones can learn species identification keys, migration patterns (geography), nesting habits, feeding, and habitat needs. Birding is an excellent way to become more interested in and involved with nature and gain an appreciation of the interdependency of a wide variety of different life forms."

RESULTS

How did the students feel about the demonstration and presentation portion of the field course?

Bird banding demonstrators should be aware that not everyone accepts banding birds, even when the result is to produce scientific information. Consequently, careful demonstrations and thoughtful presentations should be prepared and delivered. Student evaluations and written comments concerning the banding presentation and demonstrations are not available. Both course instructors were laudatory in their praise of the banding presentation; and on a second-hand basis, they shared with me positive comments from the students. A photograph showing a student in the initial class removing a bird from the mist net was used by Longwood College on the cover of a promotional flier about the course. One student later served as a volunteer at the Virginia Eastern Shore banding location. These observations suggest that the presentation and demonstration were relevant for the students.

How did the students respond to the subject matter presented?

A method for evaluation of the banding presentation subject matter was sought in the course examination. A copy of the 1996 field ornithology final examination contained a question which asked students to "briefly describe bird banding techniques. What kinds of information can be obtained through bird banding studies?"

How is banding regulated in the United States?" Based upon more than thirty years of college teaching experience, I rated the individual answers to the banding questions as more than adequate coverage. The course instructor rated the overall class performance on the final examination as well above average.

SUMMARY

A summer college-level field ornithology course has been offered in Virginia for six years. During this time, approximately 60 students and interested persons were introduced to Virginia avifauna in the field. A flexible, adaptive style of demonstration and presentation of the subject of bird banding has been developed and used for six years. Initial evaluations suggest the students were receptive to the techniques used in the bird banding demonstration. Student performance on the class final examination revealed adequate coverage of subject matter using this style of teaching.

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