

## IMPACT OF AN UNDERGRADUATE COURSE IN ORNITHOLOGY ON THE ATTITUDES OF WEST INDIAN STUDENTS TOWARD BIRDS

FLOYD E. HAYES

*Department of Life Sciences, University of the West Indies, St. Augustine, Trinidad and Tobago; and Department of Biology, Caribbean Union College, PO Box 175, Port of Spain, Trinidad and Tobago; e-mail: floyd\_hayes@hotmail.com*

*Abstract.*—On six occasions from 1994-2000, I taught an undergraduate course in ornithology to 144 students (mostly West Indian nationals) at Caribbean Union College in Trinidad. During the last two courses I used a questionnaire to assess the attitudes of 34 students toward birds, both at the beginning and end of the course. Students were most interested in learning about the ecology and behavior of birds, and least interested in learning about their origin and evolution. Their interest in watching and learning about birds and their interest in studying birds as a hobby increased, though not significantly. Few students expressed an interest in studying birds for a career, though three have studied birds for a master's degree. Academic achievement in the course was significantly correlated with the overall attitude toward birds at the end of the course.

*Resumen.*—EL IMPACTO DE UN CURSO EN LA ORNITOLOGÍA EN LAS ACTITUDES DE ESTUDIANTES CARIBEÑOS HACIA LAS AVES. En seis ocasiones desde 1994-2000, he dado cursos de ornitología a 144 estudiantes (la mayoría caribeños) en el Caribbean Union College de Trinidad. Durante los últimos dos cursos yo utilicé un cuestionario para determinar el interés de 34 estudiantes hacia las aves, tanto al principio como al final del curso. Los estudiantes estuvieron más interesados en aprender sobre la ecología y el comportamiento de las aves, y menos interesados en conocer sobre su origen y evolución. Su interés en observar y aprender sobre las aves y su interés en estudiar las aves como pasatiempo se incrementó, pero no significativamente. Pocos estudiantes expresaron interés en estudiar aves como carrera, pero tres ya estudiaban aves para un obtener una maestría. El éxito académico en el curso estuvo relacionado con el interés general hacia las aves al final del curso.

*Key words:* attitude, education, ornithology, undergraduate course

### INTRODUCTION

ALTHOUGH MANY EDUCATIONAL INSTITUTIONS in North America regularly offer an undergraduate course in ornithology (Burt and Wilson 1999), to my knowledge only one educational institution within the English-speaking Caribbean has offered such a course (Hayes 1997). On six occasions from 1994-2000, I taught an undergraduate course in ornithology for four quarter credits to West Indian students studying for a Bachelor of Science degree in biology (from Andrews University, Michigan) at Caribbean Union College (CUC) in Maracas Valley, Trinidad.

To evaluate the impact of my course on the attitudes of students toward birds, I designed a questionnaire which I submitted to students taking my course during 1998 and 2000 (Appendix 1). In this paper I evaluate the responses of the students to the questionnaire and discuss the potential impact of an undergraduate ornithology course in recruiting bird enthusiasts and ornithologists within the region.

### METHODS

*Curriculum.*—Although the curriculum of my course was briefly described earlier (Hayes 1997),

the lecture topics and laboratory assignments of my most recent course are presented in Table 1. During the last two courses (1998 and 2000) the students participated in a greater variety of lab exercises than in previous years (Hayes 1997). In addition to a lab exercise devoted to capturing, processing and color

Table 1. Outline of lecture topics (some require two or more lecture periods; two midterm exams are also given) and laboratory exercises of my most recent courses (1998, 2000) in ornithology at Caribbean Union College.

---

LECTURE TOPICS: Introduction; Field methods: observing birds; Field methods: trapping and banding; Field methods: survey techniques; Origin and evolution of birds; Phylogeny; Classification: non-passerines; Classification: passerines; Feathers; Flight; Physiology and the environment; Feeding adaptations; Demography; Biogeography; Nervous system and visual communication; Vocalizations; Seasonal efforts, migration and navigation; Reproduction; Nests and incubation

LABORATORY EXERCISES: Field identification (campus); Mist-netting, morphometrics and banding; Mockingbird ecology and behavior (5 weeks; 1998 only); Independent research project (5 weeks; 2000 only); Field trip (all day); Analysis of results and writing of research report

---

banding birds, students spent just one lab rather than two identifying birds on the campus, did not conduct a population survey using point counts, and instead spent 2-3 lab exercises studying the biology of birds on the campus at their own convenience. In 1998, students were given structured projects for studying a color-banded population of the Tropical Mockingbird (*Mimus gilvus*) on the campus; in 2000, students selected their own research projects on other species while working alone or in groups of up to three. For the all-day field trip, we explored coastal sites where we saw a greater diversity of birds than we did during previous trips to the Asa Wright Nature Centre.

*Student backgrounds.*—The questionnaire (see Appendix 1) inquired whether each student: (1) was from a country in “the West Indies” or “outside the West Indies”; (2) was interested in pursuing a career in “medical sciences,” “environmental sciences” or “primary or secondary school teaching”; and (3) had previously “participated in an ornithological research project” with me, either in Trinidad or Tobago.

*Attitudes toward birds.*—The questionnaire inquired whether each student was “most interested in learning about the”: (1) “origin and evolution of birds”; (2) “anatomy and physiology of birds”; (3) “identification and classification of birds”; and (4) “ecology and behavior of birds.” The questionnaire asked each student to rate the following statements on a scale of 1 (no) to 5 (yes): (1) “I like birds”; (2) “I enjoy watching and learning about birds”; (3) “I am interested in preserving the habitat of birds”; (4) “I am interested in studying birds as a hobby”; and (5) “I am interested in studying birds for a career.” Overall attitudes for each student were computed by summing all five scores.

To assess changes in attitudes resulting from the course, the questionnaire was filled out by each student at the beginning of the course and a second time, without access to their previous responses, after the final exam was taken at the end of the course. At the end of the course in 2000, students were further asked whether they preferred “conducting an independent research project” or “conducting a structured, supervised research project”; overall attitude at the end of the course was compared between the two groups. To test whether academic achievement in the course was correlated with overall attitude toward birds, I compared the final percentage upon which grades were based for each student with overall attitude at the end of the course.

*Statistical analysis.*—Mann-Whitney *U* tests ( $z$  statistic; Zar 1984) were used to evaluate whether there were any significant differences in the re-

sponses of students before and after the course and to compare the overall attitudes of students preferring to conduct an independent or structured research project. A Spearman rank correlation coefficient ( $r_s$  statistic; Zar 1984) was computed to assess the relationship between academic achievement and overall attitude. The data were analyzed using Statistix 3.1 software (Anonymous 1990).

RESULTS

*Student backgrounds.*—From 1994-2000, 144 students took my course; all but one passed, though four with a “D” grade. Of 37 students enrolled in the course during 1998 and 2000, all of whom passed, 34 (91.9%) satisfactorily filled out both questionnaires. Of these, 30 (88.2%) were nationals from West Indian countries (three were from North America and one from Africa). Roughly two-thirds of the students (64.7%) expressed an interest in pursuing a career in the medical sciences; the remaining students expressed an interest in pursuing a career in the environmental sciences (20.6%), teaching primary or secondary school (5.9%), either medical or environmental sciences (2.9%), either environmental sciences or teaching primary or secondary school (2.9%), or none of the above (2.9%). Roughly a third of the students (32.4%) had previously assisted me with ornithological research (usually for credit in another course) in Trinidad or Tobago; the remaining students had no previous experience in ornithological research.

*Attitudes toward birds.*—Students were most interested in learning about the ecology and behavior of birds, followed by the identification and classification of birds (Table 2). The anatomy and physiology of birds was less appealing and students were least interested in learning about the origin and evolution of birds (Table 2). Because several students listed more than one subject that they were “most interested in learning about,” especially before the course

Table 2. Frequency of responses by West Indian undergraduate students ( $N = 34$ ) to the statement “I am most interested in learning about...” Note that several students listed more than one subject, especially before the course.

Subjects	Before	After
“Origin and evolution of birds”	2	2
“Anatomy and physiology of birds”	10	3
“Identification and classification of birds”	12	9
“Ecology and behavior of birds”	21	22

Table 3. Responses of West Indian undergraduate students ( $N = 34$ ) on a scale of 1 (no) to 5 (yes) to statements before and after taking a course in ornithology.

Statement	Mean	SD	Range
“I like birds” <sup>a</sup>			
before	4.24	0.85	2-5
after	4.21	0.98	2-5
“I enjoy watching and learning about birds” <sup>b</sup>			
before	3.79	1.04	1-5
after	4.21	1.04	1-5
“I am interested in preserving the habitat of birds” <sup>c</sup>			
before	4.32	1.12	1-5
after	4.29	0.94	2-5
“I am interested in studying birds as a hobby” <sup>d</sup>			
before	2.91	1.33	1-5
after	3.35	1.23	1-5
“I am interested in studying birds as a career” <sup>e</sup>			
before	1.79	1.07	1-5
after	2.03	1.00	1-4
Overall attitude (sum of scores) <sup>f</sup>			
before	17.06	4.02	6-24
after	17.97	4.20	7-24

<sup>a</sup> $z = 0.07, P = 0.94$

<sup>b</sup> $z = 1.80, P = 0.07$

<sup>c</sup> $z = 0.49, P = 0.62$

<sup>d</sup> $z = 1.31, P = 0.19$

<sup>e</sup> $z = 1.12, P = 0.26$

<sup>f</sup> $z = 0.97, P = 0.33$

than afterward, I did not subject the data to statistical analysis. However, students appeared to have lost interest in the anatomy and physiology of birds (Table 2).

Students consistently responded that they liked birds and were strongly interested in preserving the habitat of birds; there were no significant changes in attitude either before or after the course (Table 3). By the end of the course, students enjoyed watching and learning about birds nearly significantly more than they did at the beginning of the course (Table 3). Students expressed a fair interest in studying birds as a hobby, which improved by the end of the course, though not quite significantly (Table 3). Relatively few students were interesting in studying birds as a career, though there was a slight but non-significant increase of interest by the end of the course (Table 3). Overall attitudes improved slightly but not significantly by the end of the course (Table 3).

Students completing the course in 2000 were equally divided over whether they preferred to conduct an independent research project (50%,  $n = 16$ ) or a structured, supervised research project. Overall attitudes did not differ significantly between the two

groups ( $z = 1.16, P = 0.25$ ). Academic achievement in the course was significantly correlated with the overall attitude toward birds ( $r_s = 0.40, P = 0.02$ ).

#### DISCUSSION

Burt and Wilson (1999) analyzed the course content of undergraduate ornithology courses in North America and listed the most successful and least successful parts of courses based on comments provided by instructors. However, no direct feedback was provided by students in their study (though this should be incorporated by future studies). West Indian students were clearly more interested in learning about the ecological and behavioral adaptations of birds than their anatomy and physiology; this was consistent with the responses of North American instructors to the most successful and least successful parts of their course (Burt and Wilson 1999). Burt and Wilson (1999) also listed systematics among the least successful parts of ornithology courses. Although West Indian students expressed a relatively strong interest in "identification and classification of birds," based on my subjective observations they were far more interested in identification than classification. Student feedback should be important in

designing the content of an ornithology course, which could represent a tradeoff between what students find most interesting after completing the course and what the instructor feels is necessary to understand the subject.

In 1998, a multinational group of participants at a Society of Caribbean Ornithology workshop concluded that “environmental education and public outreach” should be the society’s first avian conservation priority (Walker 1998). Furthermore, Walker (1998:77) stated that “The region is in need of more ornithologists and therefore courses in ornithology, conservation biology, and ecology should be considered in the curricula of West Indian universities.” Courses in conservation biology and ecology have indeed been incorporated into the curricula of the University of the West Indies (UWI) campuses, but regrettably a course in ornithology has not (and is unlikely to be introduced any time soon). This study demonstrates that West Indian students generally have a strong appreciation of birds and a desire to preserve bird habitats, and that their interests in watching, studying and learning about birds can potentially be increased through an undergraduate course in ornithology.

Can an undergraduate course in ornithology recruit more bird enthusiasts and ornithologists within the region? Several of my students developed a serious interest in birds, though their interests were piqued in part by lab exercises in other courses, on-campus research projects, field trips and research expeditions to other parts of Trinidad and Tobago during their undergraduate tenure at CUC. A few students developed into fairly serious birders who have subsequently submitted reports of birds from St. Croix, Trinidad and Tobago to the weekly Southeastern Caribbean Bird Alert (Trinidad and Tobago Field Naturalists’ Club 2000). Of 107 students who completed my course in ornithology from 1994-1997, at least three (2.8%) have studied birds for a master’s degree in American universities. Comparative data from beyond the region are lacking. That these students chose to continue their studies outside the region suggests that West Indian universities need to become more competitive in attracting graduate students. It remains uncertain whether these students will ultimately return to the region.

That few West Indian students expressed a strong interest in studying birds for a career likely reflects the perceived lack of employment opportunities within the region. However, bird enthusiasts and or-

nithologists should benefit from increased opportunities for employment resulting from regional increases in ecotourism, the expansion of tertiary education (both new and established institutions), and the proliferation of environmental legislation requiring environmental impact assessments of development projects.

The major goals of an ornithology course should simply be to engender an appreciation of birds and to nurture an awareness of environmental issues. Clearly the more students receiving advanced training in ornithology the more allies we will have among the next generation of leaders in future political battles over environmental issues that ultimately will decide the fate of West Indian birds.

#### ACKNOWLEDGMENTS

This study could not have been achieved without the cooperation of students who participated in this study and the administrators of Caribbean Union College who allowed me to teach a course in ornithology. Binoculars and a field guide were generously donated by North American birders via B. Petersen of the Manomet Observatory for Conservation Sciences Birders’ Exchange. N. Nathai-Gyan of the Forestry Division provided permits for capturing and banding birds. R. Lee-Quay provided affordable transportation during field trips. I thank E. H. Burt, Jr., for reviewing the manuscript.

#### LITERATURE CITED

- ANONYMOUS. 1990. Statistix manual. Analytical Software, St. Paul, Minnesota. 280 pp.
- BURT, E. H., JR., AND W. H. WILSON, JR. 1999. A survey of undergraduate ornithology courses in North America. *Wilson Bull.* 111:287-293.
- HAYES, F. E. 1997. Ornithological education and research at Caribbean Union College, Trinidad. *Pitirre* 10:17-18.
- TRINIDAD AND TOBAGO FIELD NATURALISTS’ CLUB. 2000. Southeastern Caribbean Bird Alert. <http://www.wow.net/ttfnr/rarebird.html>
- WALKER, M. 1998. Avian conservation priorities for the Caribbean region and priorities for the Society of Caribbean Ornithology. *Pitirre* 11:76-79.
- ZAR, J. H. 1984. *Biostatistical analysis*. 2nd ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc..

APPENDIX 1. Questionnaire used for my ornithology course, modified slightly by excluding a list of environmental courses taken at Caribbean Union College (not analyzed in this paper).

---

---

The following questionnaire is designed to evaluate the impact of a tertiary level ornithology class on student attitudes toward the environment in general and birds in particular. The questionnaire will be given at the beginning and at the end of the course. The results of the questionnaire will be anonymous and will NOT influence your final grade. However, to compare scores before and after the class, you must provide your student number.

- A. My student identification number is:
- B. I am from a country in:
1. \_\_\_ the West Indies
  2. \_\_\_ outside of the West Indies
- C. I have participated in an ornithological research project under the supervision of a professor for the following amount of time:
1. \_\_\_ never
  2. \_\_\_ 0-1 weeks
  3. \_\_\_ 1-2 weeks
  4. \_\_\_ more than 2 weeks
- D. I am interested in pursuing a career in:
1. \_\_\_ medical sciences
  2. \_\_\_ environmental sciences
  3. \_\_\_ primary or secondary school teaching
- E. I am most interested in learning about the:
1. \_\_\_ origin and evolution of birds
  2. \_\_\_ anatomy and physiology of birds
  3. \_\_\_ identification and classification of birds
  4. \_\_\_ ecology and behavior of birds

On a scale of 1-5, please circle the appropriate number for the statements below:

	NO-----	-----	-----	-----	YES
F. I like birds.	1	2	3	4	5
G. I enjoy watching and learning about birds.	1	2	3	4	5
H. I am interested in preserving the habitats of birds.	1	2	3	4	5
I. I am interested in studying birds as a hobby.	1	2	3	4	5
J. I am interested in studying birds for a career.	1	2	3	4	5

---