INSTRUCTOR:
Dr. Chris Moorman
Professor and Coordinator – Fisheries, Wildlife, and Conservation Biology Program
Turner House
Phone: (919) 515-5578
Email: chris_moorman@ncsu.edu
Office hours: by appointment

Co-Instructors: Dave Davenport (EcoQuest Travels)

~90-MINUTE CLASSROOM MEETING TIME: To Be Arranged

LOCATION: To be Arranged

COURSE PRE-REQUISITES/CO-REQUISITES: None
GENERAL EDUCATION COURSE: No

STUDENT LEARNING OUTCOMES:
1) Students are able to describe key processes and attributes of tropical ecosystems.
2) Students are able to identify primary threats to conservation of wildlife in the American tropics.
3) Students are able to describe sustainable approaches to reduce or mitigate negative effects of human activities on tropical wildlife.
4) Students are able to characterize the role that the United States and other historical influences have played in shaping Hispanic cultures in the western hemisphere.

REQUIRED READINGS: At least 14 research papers on topics related to tropical forest ecology (preferred emphasis on wildlife), sustainable agriculture, Hispanic culture and history, nature-based tourism (preferred emphasis on the developing countries), or other topics proposed by students and approved by the instructor.

TEXTBOOK: None required, but strongly recommended:

TRIP TO ECUADOR
EcoQuest Travel handles all planning, arrangements, and payments for the Ecuador trip from 6 March through 15 March, 2020. Estimated cost for the trip is approximately $4,117 (includes airfare), plus cost of passport, immunizations, $5 arrival tax, personal purchases, and meals in airports. There also is a fee to apply through the Study Abroad office. In country, all meals, lodging, entry into national parks, and transportation will be provided at no additional cost. Scholarships through the NCSU Study Abroad Office, Department of Forestry and Environmental Resources, and College of Natural Resources will be available.
Ecuador offers a unique destination for study of tropical wildlife. A central focus of the trip is to begin the establishment of a bird banding station at Yacuma Lodge in the eastern slope foothills along the Napo River outside of San Pedro, Ecuador. We hope that a systematic mist-netting station will help us gather data that leads to improved scientific understanding of Neotropical resident birds, more effective conservation, and local education programs. We also plan to survey mammals with camera traps and Sherman live traps, again adding to the based of natural history information in the region. Yacuma is also situated near a local Quechua village that produces coffee and cacao. Yacuma has comfortable accommodations and terrific Ecuadorian food. Students also will be immersed in Ecuadorian culture, learn about the importance of ecotourism in the country, and explore the natural history of the high Andes and vast rainforests of the Amazon basin.

**Course Overview**
The course addresses the challenges of natural resource conservation in a Latin American country and the sustainable approaches that may be used to conserve wildlife and other natural resources there. During a 11-day trip to Ecuador, students will tour natural areas, discuss conservation strategies, and employ various wildlife sampling techniques, including use of mist nets to monitor tropical birds. A fee, which covers the cost of the trip to Ecuador, is required to participate in the course. A combination of pre-trip discussions and presentations, field activities and experiences in Ecuador, and post-trip reports form an integral part of the course.

**Grading System**

<table>
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<th>Percentage</th>
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<tr>
<td>Class Presentation</td>
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<tr>
<td>Summary of Presentation Topic</td>
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<tr>
<td>Journal</td>
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<td>FW 405</td>
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<td>FW 595</td>
<td>30%</td>
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<tr>
<td>Trip Summary Report</td>
<td>20%</td>
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<tr>
<td>Post-trip Presentation (FW 595 Only)</td>
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**Grade Equivalents**
All assignments and tests will be graded on a 0 to 100% scale. Final letter grades will be assigned based upon the grading system above as follows:

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<td>A</td>
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<td>B</td>
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COURSE POLICIES

1. **Academic Integrity.** Students are required to complete their own work. However, that doesn’t mean students cannot talk to others about an assignment; in fact, I encourage interaction. However, a student cannot copy another person’s work and submit it as his/her own. In general, students should follow the Code of Conduct at (http://policies.ncsu.edu/policy/pol-11-35-01) particularly the sections on Academic Integrity. I will refer violations to the Academic Integrity Board of the Office of Student Conduct. Violations can result in a failing grade for an assignment, or suspension from the University.

2. **Students with Disabilities.** Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653. For more information, see http://policies.ncsu.edu/regulation/reg-02-20-01.

3. **Attendance.** Students must attend the trip to Ecuador to receive credit for the course. Also, students are expected to attend all on-campus classes on time unless prior arrangements have been made. However, one unexcused absence is allowed. For specific information, see the NC State University attendance policy at http://policies.ncsu.edu/regulation/reg-02-20-03. Note: Excuses for unanticipated absences must be reported to the instructor no more than one week after the return to class.

4. **Late Assignments.** Students are expected to turn in assignments during class on the scheduled day unless prior arrangements have been made or a valid excuse is presented ASAP but not more than one week after the return to class. Late assignments will be reduced a letter grade for every class period late.

5. **Credit Only.** Students electing to take this course for credit only (pass/fail) must complete all required activities and meet the attendance policy. A grade of 70 or higher will be considered passing. A grade of 69 or less will result in a U.

6. **Incomplete Grade:** An incomplete grade (IN) will be given in cases in which the student is unable to complete work, not due to his or her own negligence, in a course when the student's record in the course supports a projection that passing the course is possible upon completion of the work. Assignments must be made up before the end of the next regular semester in which the student is enrolled and in no case may be made up more than 12 months after the end of the semester in which the IN is awarded. Make up work is to be limited to accomplishing the work not completed.

7. **Statement on Safety or Risk Assumption:** Students will be advised regarding safety and risk why travelling to and within Ecuador. While outdoors in Ecuador, students will be expected to wear long pants and closed-toed shoes. A safety plan for the trip to Ecuador will be filed with the NCSU Study Abroad Office.

8. **Non-discrimination Policy:** NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person
who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at http://policies.ncsu.edu/policy/pol-04-25-05 or http://www.ncsu.edu/equal_op/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.

**COURSE TOPICS**
Avian ecology, tropical ecology, tropical wildlife, nature-based tourism, sustainable agriculture, shade-coffee production, avian sampling techniques, keystone tree species, national parks, land use change, Ecuadorian history, Ecuadorian biomes, cultural and language emersion experiences, taxonomic specific ecology

**ASSIGNMENTS**
1. Students will attend all class meetings before and after the trip (1 unexcused absence allowed). Students must attend the trip to Ecuador.
2. Students will make a 20-30 minute presentation (Powerpoint presentations are encouraged) of their topic during a class period prior to the trip. A rubric, provided to students, will be used to grade presentations. Topics may include:
   - Wildlife use of coffee plantations
   - Shade-grown coffee production
   - Nature-based tourism in tropical countries
   - Keystone tree species
   - Avian ecology or migration
   - Mist netting as a wildlife sampling technique
   - Live trapping small mammals as a wildlife sampling technique
   - Wildlife in tropical forests – focused on specific taxa
   - Ecuadorian history
   - Ecuadorian culture or foods
   - Basics of Spanish language
   - Biomes of Ecuador
   - Others approved by instructor
3. Students must submit a summary (at least 3 pages double-spaced) of their presentation topic (due on date of presentation). The presentation summary should include a description of the topic or issue, a literature review, and relevance to the course. Additionally, each student also must choose a reading (e.g., journal article, popular article, report), related to their presentation topic, that will be assigned to the class the week before each presentation.
4. Students will participate in all activities during field study in Ecuador.
5. Students will maintain a journal (supplemented with photos) during the entire study tour, making sure to record wildlife species, ecological relationships noted, role of humans in the environment, ideas on sustainable agriculture or nature-based tourism, personal thoughts, etc.
6. Students will submit a 5-page summary (double-spaced) of the 11-day trip and their journal on the first day of class after the trip. Students should use their journal entries to guide writing of the summary report. Summary reports should describe trip activities, key observations or thoughts related to natural resources conservation, sustainable land use, or culture in Ecuador, and constructive suggestions for course and trip improvement.
7. Students enrolled in FW 595 will lead a presentation to a public group (e.g., Conservation Ecology Group, Leopold Wildlife Club, Wake County Audubon Chapter). The presentation
will include a summary of trip activities and experiences with a specific emphasis chosen by each participating student.

**Schedule (All Class Sessions Are ~90 Minutes)**

- Class 1: Introductions and Trip Overview – with Dave Davenport
- Class 2: Student Presentations
- Class 3: Student Presentations
- Class 4: Student Presentations
- Class 5: Student Presentations
- Class 6: Student Presentations
- Class 7: Student Presentations; Last minute preparations

**6-15 March 11-day Trip to Ecuador**

- Class 8 (TBA): Trip Review, Lessons Learned; Course Evaluation: Journal and Trip Summaries Due
- Class 9 (TBA): FW 595 Student Presentation to Public Audience

**Draft Schedule for Ecuador Trip (March 5-16)**

**Day 1 – Friday, March 6: Raleigh to Quito, Ecuador**

A late morning flight from Raleigh takes us to our US gateway city (likely Miami, Atlanta or Houston) for our connecting flight to Quito, Ecuador. Please arrive at Raleigh/Durham International Airport no later than 2 hours prior to our scheduled departure time. Once in our gateway city we will transfer to our flight to Quito. After clearing immigration and customs and gathering our luggage in Quito, we will transfer to our accommodations at the Anahi Hotel.

**Day 2 – Saturday, March 7: Quito City Tour and Equator Museum**

Today is a recovery day after our international flights and a chance to explore Ecuador’s capital city of Quito. We will have a leisurely breakfast this morning before departing for our morning tour of the city. Quito is an old and vibrant city with many beautiful and historic sites to visit, particularly in the Old Town section. After visiting these sites, we will have lunch before visiting the Equator Museum. We will return to our hotel in the afternoon before having an authentic Ecuadorian dinner. After dinner we will settle back into our hotel for the evening. (B,L,D)

**Day 3 – Sunday, March 8: Antisana Ecological Reserve and on to Papallacta Pass**
This morning we will depart early, with a packed breakfast, to drive south and east across the Andean highlands toward the spectacular cloud forests of the eastern slope. If we have a clear day, the views of the snow-clad volcanic peaks of Antisana and Cotopaxi will be staggering. Our first stop will be at Antisana Ecological Reserve. From the village of Pintag, we will drive through a barren landscape known as paramo. Despite its appearance, the paramo does contain wildlife and we will be on the lookout for Black-faced Ibis, Ecuadorian Hillstar, Blue-mantled Thornbill, Many-striped Canastero, Black-winged Ground-Dove, Stout-billed Cinclodes and Andean Tit-spinetail. We’ll watch out for the Andean Condor soaring overhead. There is also a high altitude lake here called La Mica where hopefully will see Andean Teal, Yellow-billed Pintail, Andean Duck and Silvery Grebe. After a couple of hours to bird this unique area we will travel back to the highway heading east toward Papallacta Pass. Eventually we will reach Papallacta Pass, at 13,700 feet the highest point in our journey. Once at the pass we will travel up a dirt road leading through Cayambe-Coca Reserve. We use this road to get quite high as we search for Rufous-bellied Seedsnipe, Tawny Antpitta and perhaps if we are lucky a Spectacled Bear. After traversing the Cayambe road we will continue to the Hotel Thermales where we can enjoy a soak in the hot springs before dinner. (B,L,D)

Day 4 – Monday, March 9: To Yacuma Lodge
This morning will begin at dawn as we wind through the eastern slope cloud forests and drop in elevation all the way to the foothills near Tena. From there we will follow the Napo River until we reach the small village of San Pedro where our boats will be waiting for us. We will board our boats for the short journey downriver to Yacuma Lodge. Once at Yacuma we will settle into our rooms and have lunch. After lunch we will have an excursion to a nearly oxbow lake. This lake is home to many species of birds including the prehistoric Hoatzin, Black-capped Donacobius and a variety of kingfishers, flycatchers and tanagers. After dinner we may have a night hike to look for reptiles, amphibians and nocturnal birds and mammals. (B,L,D)

Day 5 – Tuesday, March 10: Bird Capturing and Village Visit
Today we will begin bird banding as we open up a series of mist-net stations in the local village’s coffee and cacao plantations and the surrounding forest. We will open up the nets early in the morning and begin capturing birds before taking a break for breakfast. After breakfast we will continue to bird capture until it gets too hot. After lunch, we will visit the local Quechua indigenous
village to learn about their customs and see how they produce coffee and cacao. If enough time permits we can visit the local school that Yacuma Lodge supports. After a full day we will have dinner and may do a short night hike. (B,L,D)

**Day 6 – Wednesday, March 11: Yacuma Lodge – Bird Capturing & Explorations on the Napo**

This morning we will once again band birds until it becomes too hot to do so. This will be our first mist-netting effort in Ecuador so it will be interesting to see what we capture and to see whether we catch any Neotropical migrants. In the late afternoon/early evening we will take a boat ride through the many channels of the Napo River looking for wildlife. (B,L,D)

**Day 7 – Thursday, March 12: Yacuma to Coca and on to Sacha Lodge**

Today will be a fairly long day of travel. After breakfast we will depart by boat and travel back upriver to San Pedro where we will pick up our vehicles for the drive to Coca. Once we arrive in Coca we will transfer to the boat docks on the Napo River. Once we have loaded our gear aboard the boat, and had a snack, we will find our seats for the ride downriver to Sacha Lodge. This journey will feel a little like expeditions of old as we board our boats for a 2-hour, 50-mile ride, down the muddy Napo River. Once we arrive at Sacha Lodge’s dock we will hike on a raised boardwalk through a flooded palm forest. Our luggage will be transported to the lodge for us as we spy monkeys and birds along the trail. The trail eventually leads to Pilchicocha Lake where we will board dugout canoes for the final phase of our journey. We could spot all sorts of wildlife as we are paddled across the lake to the lodge. After a welcome drink and lunch we will settle into our rooms during the heat of the day. In the late afternoon we will begin our explorations of the surrounding environments. Monkeys and many species of birds frequent this area and we should observe many species in and around the lodge area. Sacha Lodge will be our home for the next two days and was built in harmony with nature. The forests and trails around the lodge are home to an incredible variety of wildlife. The rooms are comfortable, the food is excellent and the staff is friendly and attentive. It will truly be a privilege to spend time in the Amazon at this first class facility. (B,L,D)

**Days 8 & 9 – Friday & Saturday, March 13 & 14: Sacha Lodge**

We will have 2 full days to explore the wildlife wonders of the Amazon north of the Napo River! From our comfortable base at Sacha Lodge we will hike the many trails that ribbon their way through various community types. We will also use boats to access the lakes and waterways that are such an important part of this ecosystem. The idea is to maximize our chances of seeing the greatest diversity of wildlife. Many of the mammals are difficult to see, but we should see plenty of monkeys, including large troops of Squirrel Monkeys, huge Red Howler Monkeys and the tiny Pygmy Marmoset. Agoutis could be seen as they search for fruit on the forest floor and Brown-throated Three-toed Sloths could be seen in the canopy. If we are lucky we could see larger mammals such as White-lipped Peccary or Red
Brocket Deer, and if we are really lucky perhaps even one of the phantoms of the forest – a Puma or Ocelot. Reptiles and amphibians are abundant in the Amazon and we could see Spectacled Caiman, poison-dart frogs, various treefrogs and lizards and maybe even a Boa Constrictor or Anaconda. There have been 587 species of birds recorded at Sacha Lodge including the rare Zigzag Heron and dozens of colorful toucan, trogon, cotinga and oropendola species. Even the huge Harpy Eagle occasionally makes an appearance. We will have access to one of the most unexplored regions in the Amazon – the rainforest canopy. Sacha Lodge has a canopy tower situated 135 feet above the ground in a giant Ceiba tree. Sacha also has a fantastic canopy walkway that is 940 feet long, held aloft by three towers and averages 94 feet above the ground. These structures will allow us unparalleled access to the canopy and the amazing wildlife. Each day will begin early and will be packed with exploring and activities – Piranha fishing anyone? The morning of the second day we will transfer by boat along the Napo River to Yasuni National Park to witness the incredible spectacle of hundreds of parrots feeding on clay from an exposed river bank. We will sit in a blind for close views of the many parrot species that come in to feed at the clay lick. From there we will visit another clay lick deep within the forest that attracts different species of parrots – especially Cobalt-winged Parakeets and Scarlet-shouldered Parrotlets. At night we will likely have several hikes to look for reptiles and amphibians as well as arthropods, nocturnal birds and mammals. (B,L,D)

**Day 10 – Sunday, March 15: Sacha Lodge to Coca, back to Quito and on to the US**
Today we begin the long journey home. After breakfast we will depart Sacha Lodge and travel back upriver to Coca. Once at Coca we will board our bus for the five-hour drive to Quito. Once we arrive in Quito we will settle into our rooms at the Anahi Hotel and have a chance to repack and freshen up prior to dinner. After dinner we will transfer to the airport for our overnight flight back to our US gateway city. (B,L,D)

**Day 11 – Monday, March 16: Arrival in the US and Fly Home**
We will arrive in the US this morning and once we clear immigration and customs we will transfer to our flights back home.