Ornithology on the Highlands Plateau
15-27 June 2026
Highland Biological Station
Dr. Rob Bierregaard

Class starts at 09:00 Monday morning.

Mornings will be spent in the field, learning bird identification and field techniques. Afternoon sessions will consist of lectures and videos probably covering:

- Birds of the World, with an emphasis on North America (and especially North Carolinian) taxa.
- Avian Diversity, Speciation and Adaptive Radiation: Where did all those birds come from?
- Communication in Birds: Songs, Calls, and Visual Displays.
- Migration.
- Conservation: Why are we losing species and what can we do about it?

We will be out in the field early each morning. Students will need some sort of clothing with pockets for your field guide and field notebook. A fishing vest or painter's pants are good options. You'll have your field guide, field notebook and binoculars all competing for your attention, and you'll need both hands on your binoculars, so you'll need pockets that can hold the field guide and your field notebook. A small daypack will be useful to carry a water bottle and some snacks.

Assignments:

Two exams, both open book. Each on Saturday, due on the following day.

There will be a lab quiz on the final Friday. It will be part song identification and part identifying birds—either skins or photos.

Each student will present a summary of the natural history and conservation status of a bird we've seen during our census work during the afternoon list compilation.

A "Term paper" will be a review of one or a couple of papers published in the scientific literature about virtually any aspect of avian biology or conservation that is of interest to the student. Students will present a summary of their topic to the class on the first Saturday.

A term project will be completed and presented to the class on the second Saturday. These projects can be done in teams or alone. Possible projects include:

1. Eco-morphological analyses of raptor skeletons.

2. Analyses of Osprey migration data. Possibilities include analyzing feeding data for birds based on cell-tower data or preparing a narrative of one bird's travel from South America to its breeding grounds in North America.
3. Analyses of trends in bird populations based on data from census data generated by past and current ornithology classes.
4. Sound analyses using Raven Lite software. Possibilities include:
    a. Compile an auditory field guide to the voices of the birds of the Highlands Plateau based on our recordings
    b. Pick a common species (Song Sparrows or Eastern Towhees are likely candidates) and document and quantify the diversity of songs in the local population.
    c. Focus on one individual Catbird—how many phrases in its repertoire?

Daily schedule:

06:45 – meet at the van for the morning's excursion. (If it's raining at 7:00, we'll meet in the classroom at 08:00). We're usually back btn 11:00 and 12:30.

2 hours after we return to the station, we'll assemble in the classroom for lecture, compilation of the daily census, presentation of a "species bio," a "song of the day," and lab work.

Field Excursions:

- **Monday – Hospital**
- **Tuesday – HBS station for bird banding and recording practice**
- **Wednesday/Thursday (weather depending) – Wild turkey chase down the (oxymoronic) Flat Mountain Rd. and Mirror Lake or Peregrine watch at Whitesides Mountain.**
- **Friday – Turtle Pond Rd and High Meadow**
- **Saturday – Symposium**
- **Sunday – Midterm break**
- **Monday – Rich Gap Rd and Mt. Trashmore**
- **Tuesday – The Coves/Cheney Rd.**
- **Wednesday – Glen Falls/Chinquapin Mt.**
- **Thursday –Bull Pen Rd/Chattahoochee River**
- **Friday – Cliffside Lake/Flat Mountain Ranger Loop**

Day 1: Mirror Lake and "city birds."

The remaining days' schedule will be flexible depending on weather, but will probably follow this sequence:

HBS Station. On our second day of class, researchers will be trapping and banding birds on the station. While banding is going on, we will be learning how to record bird vocalizations and census the botanical gardens and trails around Lindenwood Lake and the Coker Rhododendron Trail.

Turtle Pond Rd and high meadow. Starting at the Cullasaja River, we work up away from the river, stopping at an old beaver pond that is now well along in the successional process. We wind up in a high meadow, where we'll get some birds we may not see elsewhere.

Glen Falls to Chinquapin Mt. Great hike up through extensive rhododendron stands to a high elfin oak forest atop Chinquapin.

Rich Gap Rd to Highlands Landfill. Down in Horse Cove we'll start at an enormous Yellow Poplar tree and work this predominantly hardwood forest down to the landfill, which always provides interesting birds.

Whitesides and Horse Coves. We start down at a pretty low elevation in a largely white pine/hemlock forest down on Walkingstick Rd and work up the road back to some open country in the coves, sampling a diversity of habitats along the way.

Whitesides Mt. This is a weather dependent trip. We need a clear day so we don't end up atop Whitesides in the middle of a cloud. Highlight here is a rather adventurous trail down to a rocky outcrop that looks back at the section of the cliff where the most productive pair of Peregrine Falcons in North Carolina has been nesting for many years. If the pair is successful, we should see both adult and juvenile Peregrines.

Flat Mountain Ranger Station – This hike begins atop Flat Mt and works down to Rangers Falls. Habitats sampled include a 1.5 hectare clearcut now about 7 years along the successional pathway, some old pastures maintained as clearings for wildlife (turkeys like this area), and both mature and young (30 yrs past selective harvesting) forest.

Iron Bridge Trail – We hike along the Chatooga River through extensive rhododendron stands beneath a towering canopy of white pine and hemlock, the latter sadly suffering seriously from the invasive hemlock woolly adelgid.

Open country birds – Buck Creek Rd wetland, Cheney Rd, upper Mirror Lake.

Lectures:

Most of the 1st week will be spent learning about the diversity of birds. This requires a very brief review of some of the adaptations that birds have evolved as they took to the air. Topics covered will include adaptive radiations, the ecological niche, and competition.

We will end the week and begin the second week learning about communication in birds. How do birds make all those sounds? And what are they talking about? We will be recording bird songs and calls throughout our morning census excursions and analyzing these recordings in lab.

We will also learn about avian migration using a 17-year data set of satellite telemetry data following the annual migrations of 108 Ospreys as an example.

Finally, we will close with a section on conservation. What are the issues confronting birds on a planet whose ecosystems are being radically altered by our own species? What is being done to protect and restore species in danger of extinction?

Laboratory Work:

Lab Day 1: Spectrograms and skins.

Lab Day 2: Anatomy: Chicken dissection and skeletons

Lab Day 3: More skeletons?

Lab Day 4: Migration data

Lab Day 5: Continuation of earlier labs, begin paper review presentations.

Statement on Accommodations for students with disabilities:
Accommodations for Students with Disabilities: Highlands Biological Station (administered by Western Carolina University) is committed to providing equal educational opportunities for students with documented disabilities and/or medical conditions. Students who require reasonable accommodations must identify themselves as having a disability and/or medical condition and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact the WCU Office of Disability Services for more information at (828) 227-3886.

Binoculars!

The text below was prepared by one of the students in the '06 class at the Highlands Biological Station who did not bring a good pair of binoculars and was so frustrated that she got a replacement pair at the nearest Walmart after four frustrating days with pocket "bins." The bottom line is that pocket-sized bins are inadequate for our needs. That's the polite way of saying they suck. They have a very narrow field of view, which makes it hard to locate a bird in a tree up above you. You should have at least 8 power (that's the first number) and an objective lens diameter of 35 or higher—this would be 8 x 35. I don't recommend higher than 10 x and do not recommend zoom binoculars. This is just one more thing that can—and will—break. As with many things in life, the fewer moving parts the better! Also, don't buy "perma focus" binoculars. They'd be OK for sporting events, but would be pretty useless for birding because they won't focus close enough for bird work.

You can spend less than $50 and get a pair of bins that will do the job. The short-coming of bins at the low end of the price scale is life-expectancy. Spending a bit more now will get you a pair of binoculars that will last a lot longer.

For more on binoculars, here's a page that reviews "entry-level" binoculars. Prices may be different, as this page is a few years old:

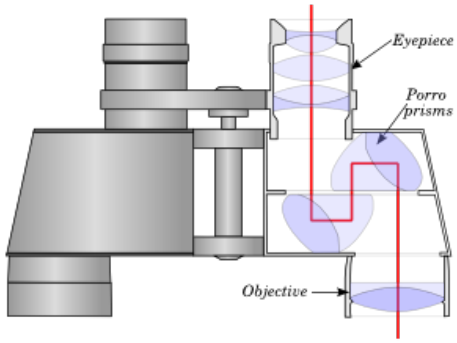
https://www.audubon.org/news/category-get-game

Viewing the Birds

Emily Sisk
Highlands Biological Station
June 2006

The best way to view birds as a nestling ornithologist is to have a pair of binoculars. In my expedition through birding I found that I was not prepared to learn about birds and their unique characteristics with the pair of binoculars I had. I began this expedition with a pair of pocket-sized 12X24 binoculars that I used in the comfort of my home and on trips for the past 5 years to seldom view birds, stragglers, trash, and waterfalls during my encounters at my home and on hiking expeditions. On many of my hiking trips I would carry these binoculars on my chest harness strap to "appear as though I knew what I was doing" while I attempted to look at things on the trails. In one instance these binoculars worked great to see wild ponies at a distance while hiking in the Grayson Highlands State Park in Virginia. In other cases, such as an expedition to Whiteside Mountain recently, I found that these binoculars made it very difficult to 1. find my object of interest and 2. to distinguish its true characteristics.

Binoculars are designed to meet various needs and applications in our world today. Some applications include birding, observing fish and other species in the water and on land, to scout out surveying locations, and to view neighborhood events are just a few. Binoculars have very distinct features that make them very useful for these purposes. Their design is shown in the diagram and courtesy of Wikipedia online dictionary:



The diameter of the objective lenses determines the amount of light resulting in resolving power of the binoculars. The magnification is a ratio of focal lengths of the objective and ocular lenses. Therefore larger magnfications give a more acceptable resolution but this also causes a greater susceptibility to shake when hand held. I began the class with 12 X 24 which means the magnification was 12 diameters and the objective lens diameter was 24 mm. This provided a highly magnified, relatively narrow diameter of view. The binoculars made it difficult to find objects and once found, very difficult to hold steady.

On the fourth day of class I scurried the internet to understand more about binoculars and to find local businesses that carried an assortment to choose from. On my list of internet binocular research, I wanted to find a site with the most economical options as well. After researching, I found that for my price range Wal-Mart had the best selection and value. I traveled to Wal-Mart of Franklin, NC and was excited to find various brands and range of binoculars. I was presented with 8X22 digital camera binoculars ($59.99), 10x 24 ($19.99), 10x42 ($29.86), 8x42 ($39.99), and various models with anti-fog lenses, automatic magnification and more (all with higher prices as well). My purchase was the Bushnell 10x42 binoculars for $29.86 + 7% tax.

I brought these binoculars to our field observations the next day and my birding hobby and lifestyle will never be the same. These 10x42 binoculars made locating and easily viewing birds much easier. I was also highly impressed with the ability to distinguish colors on the birds and to see my objects quickly and steadily. I have also viewed binoculars with an 8x42 range and they work very well keeping the object still and easily viewable. Binocular strength and anatomy is a major factor in various applications and in the abilities possessed by the user. For example, on a long hiking trip where weight is a factor, smaller and lighter weighted binoculars would be a choice. For an ornithology class, 8x42 or 10x42 magnification would be most appropriate for not only a nestling ornithologists but a mature one as well!