

**William Henri Lewis**  
**Charlie Blumenstein Stewardship Internship Final Report**  
**Carpenter Ranch Preserve, Hayden, Colorado**  
**Summer 2023**

## **Introduction**

In the summer of 2023, I had the privilege of living and working on The Nature Conservancy's Carpenter Ranch Preserve in Northwestern Colorado. While there, I worked on a number of different projects, tasks, and other responsibilities each day, and was able to spend a lot of time learning about the inner workings of the ranch, TNC, and other parts of the world that I knew nothing about before.

About myself, I am an Organismal Biology and Ecology major at Colorado College, with a specific interest in Wildlife and Conservation Biology. I am also a Museum Studies minor, with an interest leaning towards Natural History museums, as well as both of these interests meeting around animals. Additionally, I have an interest in Environmentalism as well, as I run an environmental club on campus and am very active in environmentalism in my personal life. In my role at Carpenter Ranch, I was able to pursue many of these interests, and it ended up being a perfect experience for allowing me to do many different tasks and learn many new and interesting things.

## **Daily Tasks**

Some of the typical tasks that I would work on in a given period were mowing lawns, fixing fences, welcoming visitors, and other things of that sort. Each of these tasks taught me new and very practical skills that have and will go on to be very useful in life. The general maintenance tasks for areas around the house and yards, such as mowing, weed whacking,

weeding, and maintaining rooms after visitors had come through the ranch, made me much more capable with doing regular chores and having tasks and responsibilities to take care of. Being trusted with taking care of these responsibilities on my own also allowed me to gain a lot of leadership and control of myself in a setting where I do not have direct leadership. This is not to say, however, that I was without leadership, as ranch manager Matt Ross provided me with a very kind and helpful voice whenever necessary, and made sure to always be available to me as I worked on each of the tasks he gave to me.

As I would work on doing some of the more hands-on tasks around the ranch, such as building and mending some of the fences that needed fixing, I learned a lot of new skills and things that I didn't know before. Learning about how this type of construction and other tasks was done, I feel that I gained a lot of experience in how this type of work can be done as well as how to do more work with my hands and be capable of building things in a way that I hadn't known how to do previously. All in all, I would say that I gained a lot of experience and knowledge through my time at Carpenter Ranch, and all of these new, or enhanced, skills will greatly benefit me.

## **Youth Groups**

One responsibility that I would regularly be a part of was to help organize the different youth groups that would come and visit the ranch. These groups of children would regularly consist of about 10 or so kids, usually from the Rocky Mountain Youth Corps, who would come and volunteer on the ranch every other week. When they were there, I was often solely in charge of assigning tasks, fetching them equipment, and making sure they were remaining safe and on task. They were typically asked to do things like spread mulch on paths, weed garden beds, or paint fences, picnic tables, and whatever else needed a new coat

of paint. Working alongside the instructors that came along with them, I gained experience in working with children and in leading a group to perform tasks, which is something I had never done before and which I think will help me a lot in future endeavors.

## **Monitoring Projects**

As part of my experience at Carpenter Ranch, I worked with a number of different teams within the umbrella of The Nature Conservancy (TNC) Colorado to monitor a number of different aspects of the natural ecosystem. These included monitoring water levels, bird populations, and wildlife cameras that were set up around the ranch. Each of these was linked to important data points that let us understand more about the ranch in terms of its natural areas, agricultural production, and the connections between each of these different identities that make up Carpenter Ranch.

For the project that had me collecting water-focused data, I would track the amount of water flowing through the ranch's irrigation ditches each day based on cubic feet per second (cfs) levels as tracked with devices placed in the ditches. Each day, I would walk out to and record these levels, and would place them in a table alongside data from the USGS tracking flow rates to give context for how much water was being removed from the river and taken into irrigation ditches for the ranch and other water users. By keeping track of this data, we can have context on how much we may be affecting the Yampa river ecosystem that the ranch is alongside, as well as what we need in terms of water levels for agricultural production. Doing this work also allowed me to be alongside different people from the water team at TNC, which helped me get to know more about different aspects of the organization and how to view an ecosystem in all of its system parts.

One other major monitor project that I was tasked with during my time at Carpenter Ranch was to look at populations of nesting birds in the agricultural fields of the ranch. Specifically, I looked at the presence of Bobolinks, which are a species of ground nesting bird often found in pastures in the United States. Bobolinks are also an endangered species, which means they have special protections to ensure that their populations don't decline further. They are primarily at risk due to nesting in agricultural fields, which leads to nest destruction when farmers hay their fields. In order to limit this happening at Carpenter Ranch, I was tasked with going out each morning in the beginning of July and observing whether or not Bobolinks were still present, as well as if they were displaying nesting behaviors. This monitoring allowed us to push back the original dates of haying from the lessee who is in control of hay production further to wait until all nesting birds had left the fields, and prioritize the health of these endangered birds. To do this, I was working alongside members of the TNC science team, as well as with data from previous studies on the ranch and elsewhere in North America to better understand Bobolinks, scientific practices around understanding their ecology, and other metrics to better understand how they may be living on the ranch.

The last monitoring project that I engaged in on the ranch was looking at populations of wildlife via camera traps, which allowed us to better understand what kind of wildlife is on the ranch, as well as during what times. Working alongside Chelsea Beebe from TNC's science team, we set up 6 cameras in different parts of the ranch to look over different areas and get a feel for the species that are around. These cameras ended up posing us with some difficulties, as a few failed to function at all, and others had difficulties with their sensitivity settings. Even despite this, we were able to pick up a number of species on the cameras that were spread around, such as Elk, Deer, Bear, Coyote, Crane, and Skunk. With the Elk especially, we were able to determine where they are on the ranch at different times, and see

more patterns around their movements through the riparian areas of the ranch. I learned a lot more about how to deploy and sample cameras, as well as how to quantify the data they record and use it to understand species distributions better.

## **Events, Conferences, etc.**

As part of my time at Carpenter Ranch, I was invited to attend a number of different events on the ranch or nearby that allowed me to gain a better feel both for TNC and the inner workings of the ranch, as well as for the community surrounding it. These events included a ‘visioning session’ where TNC employees spent time envisioning what the future of the ranch may look like, a float down the Yampa river with TNC and other water-focused nonprofits from the area, meeting with TNC donors, and more such events. Each of these allowed me to gain a much better sense of what kind of work goes on at a large organization like TNC, as well as how an area like Carpenter Ranch interacts with the surrounding community, and how engagement may play a role.

## **Independent Research Project**

For my independent research project as part of the Charlie Blumenstein Stewardship Internship, I took a biological approach focusing my research on Bats at Carpenter Ranch. To do this, Chelsea Beebe from TNC’s science team and I deployed two ultrasonic monitors on Carpenter Ranch and the neighboring Yampa River Preserve in order to gain some data about species that are present in the area. By knowing what species of Bat are present in these areas, I worked to establish a plan around how to best prepare and be wary of the effects of the fungus that causes White-Nose Syndrome (WNS) in Bats. This disease has had an

extreme effect on Bats from the East Coast, and has killed a large number of individuals from a few particular species. The disease has now been seen to be moving further west, and has recently crossed the continental divide, and has been recorded within Routt County and elsewhere near Carpenter Ranch. This is especially concerning because there is a colony of Little Brown Bat, a species that is particularly susceptible to WNS.

By collecting the acoustic data, I have been able to establish a profile of the different species that seem to be present in the Carpenter Ranch area, and look at different metrics to determine how to best catalog the numbers in which each species occurs. I have also been able to research studies from other scientists to determine which of these species may be the most vulnerable to WNS, which species may be transmitting it between locations, and what other factors may be beneficial to look at when thinking about management and conservation strategies. Due to the recent discovery of WNS in the area, the fact that this research can be conducted during the early stage of the fungus' invasion provides for a great jumping off point for TNC and other local agencies to begin working towards making sure the Bat populations of the area remain healthy.

Conducting this research allowed me to gain a lot of experience in running biological experiments, as well as being in charge of and responsible for myself. Without the ability to do this I would not have been able to become as comfortable as I am now in a research setting, and would not have become as invested in conservation biology. Additionally, my research into this project is ongoing, and I am able to continue working with both TNC and Colorado College's Organismal Biology and Ecology department. My research will continue to provide answers to a lot of questions about how these Bats may survive into the future with the appearance of WNS. It has informed my experience of what I am interested in doing in biology, and has helped me gain a lot more experience with real research.

## Conclusion

All in all, my experience at Carpenter Ranch for the Charlie Blumenstein Stewardship Internship gave me a lot of experience in learning about biology, practical skills, leadership, and about working in a nonprofit. This internship was able to teach me so much that I couldn't have learned anywhere else, and allowed for me to grow a lot as a person and in so many other ways. As part of this experience, I would like to give thanks to everyone who helped me throughout my experience, including:

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and everyone else who was there to support me.

Without this experience, I would not have been able to grow and learn in the same ways that I was able to this summer, and I feel that it has allowed me to become a much better biologist, student, and person moving forward.