Weminuche Audubon Society

Mexican Spotted Owl Monitoring, Bull Creek, HD Mountains

Lois Webster Fund Final Report -- October 30, 2023

Since 1993, Mexican Spotted Owls (MSO, *Strix occidentalis lucida)* have remained a federally listed subspecies protected as threatened under the federal Endangered Species Act (ESA). Mexican Spotted Owls are limited by nesting habitat and their historic range is shrinking due to disturbances which have included timber removal practices, wildfire, and oil and gas development. A warming climate presents additional challenges for the survival of this subspecies.

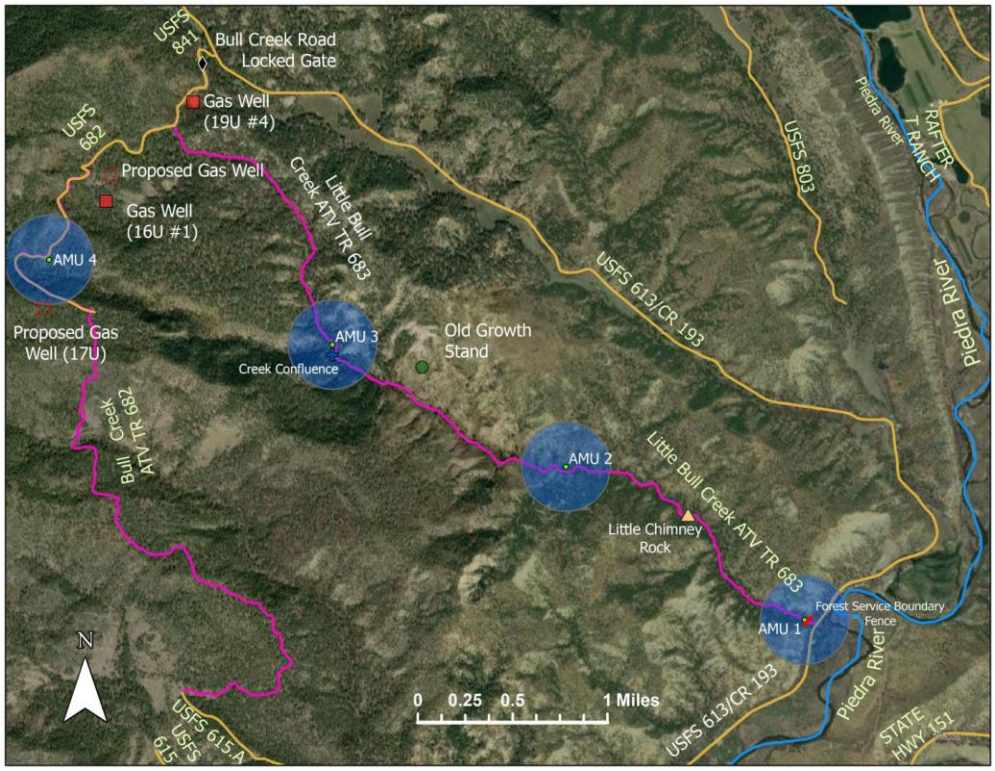
Objectives

- Provide experience in conducting field research using Autonomous Recording Units (ARUs).

- Document presence of MSO in an area of the National Forest with suitable habitat and historical occurrence. Secure habitat protections in accordance with ESA requirements for any MSO found.

Method

1. Map locations of potential nesting habitat (fall 2022). Landscapes used by these owls as nesting habitats, dense multi-layered mixed-conifer forests, occur on steep north-facing slopes in the HD Mountains in the Columbine Ranger District of the San Juan National Forest, between Bayfield and Pagosa Springs, CO. Our initial survey focused on Bull Creek, an intermittent tributary of the Piedra River on the east side of the HD's.
2. Obtain research permit from the San Juan National Forest Service (February 2023)
3. Program and test ARU's (away from study site) using recorded calls. Initially the units were programmed to record calls from 7PM through 10PM and 3AM through 6AM, the periods of peak calling activity of breeding and nesting owls. Paint unit exteriors for camouflage. (February 2023)
4. Deploy ARUs at 4 sites (early March 2023). The ARUs we used are the Swift 1, available from the Cornell Lab of Ornithology, which we consulted with on their use. Specifically, Connor Wood, PhD, provided invaluable help in defining the work that needed to be done and with instructions for the software used for data analysis. These units are non-invasive, only recording owl calls produced without prompting, and they create a permanent verifiable record of calls saved on SD cards.



GIS Map generated by Matt Young of Fort Lewis College.

5. Check and reset units, retrieve and replace SD cards and unit batteries monthly, during April, May and June. Unit recording times were lengthened to 10 nighttime hours in May and 24 hours in June.
6. Analyze data stored on SD cards and external hard drives for calls of MSO using Raven Pro software developed by Cornell Lab of Ornithology's K Lisa Yang's Center for Conservation Bioacoustics. (ongoing, spring through fall, 2023)
7. Retrieve units from the field during the first week of July. In mid-July, deploy units in new locations within the watershed, thought to be favorable habitat for pinyon jays.

Fort Lewis College SEEDS Ecology club members strap an ARU to a tree in the HD Mtns.

Results

- Experience gained. This survey was completed by a small group of very dedicated volunteers, whose unwavering commitment saw the project through to completion. All involved gained first-hand experience in conducting a field study. Two of these volunteers, Matt Young and Ian Crews, are students at Fort Lewis College and according to an article published in the FLC Newsletter, "are members of FLC's Strategies for Ecological Education, Diversity & Sustainability Club, and the excursion provided valuable insight into their future careers as land management professionals." The article goes on to say that, "Regardless of the team's retrieval of spotted owl evidence in the area, the SEEDS Club members are making inroads with potential employers and building skills through hands-on practice with real-world technology." Young stated, "that these are skills he will use in his future career as a conservationist", and that, "One of my goals is to go into public land management. This project has been a great way to network and get to know Keith (Bruno, Audubon Rockies SW Community Naturalist), who spent days teaching me how to use this equipment. There are many Mexican spotted owl surveys that the U.S. Forest Service performs whenever there are proposed logging and mining operations or even prescribed burns. So, it's really helpful to learn these skills."
  Snow Studies Series: FLC's SEEDS has a hoot in the wilderness | Fort Lewis College

  Other members of the SEEDS Club, Lucas Brown and Ashley Jorgenson, learned to identify species through sound analysis with Ravenpro software.

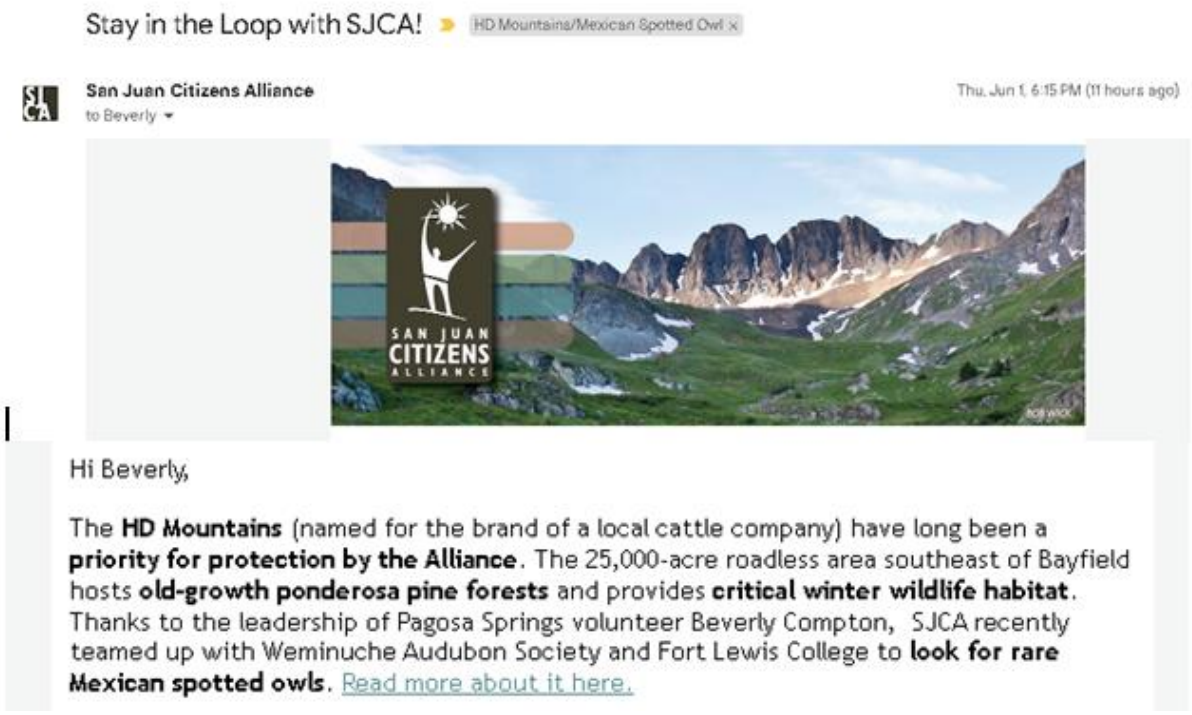
- 9 volunteers and 2 staff members of partner organizations contributed over 700 hours of volunteer effort to the project. These included members of San Juan Citizens Alliance, Weminuche Audubon Society, Audubon Rockies and students and recent graduates of Fort Lewis College. Through the month of June approximately 896 GB of audio data corresponding to about 3665 hours of recording were analyzed.

- No MSO were detected during the survey period. This was disappointing to the volunteers who have put so much energy into the project, and who hoped that documenting the occurrence of the owl would require habitat protections in this area. Looking for an endangered species requires a long view and commitment. As our outstanding FLC senior student and volunteer Matt Young said, "Species are on the Endangered List because there are very few of them. If we don't keep looking for them, we will not find them." We will continue to look.

Media Coverage

-Fort Lewis College did an in-depth online story (with a readership of 30,000) of the project and their students that played an invaluable role in its completion.

-San Juan Citizens Alliance included a link to the Fort Lewis College story in their own membership email newsletter (reader list of 3,800).



Stay in the Loop with SJCA! » HD Mountains/Mexican Spotted Owl ×

San Juan Citizens Alliance
to Beverly

Thu, Jun 1, 6:15 PM (11 hours ago)

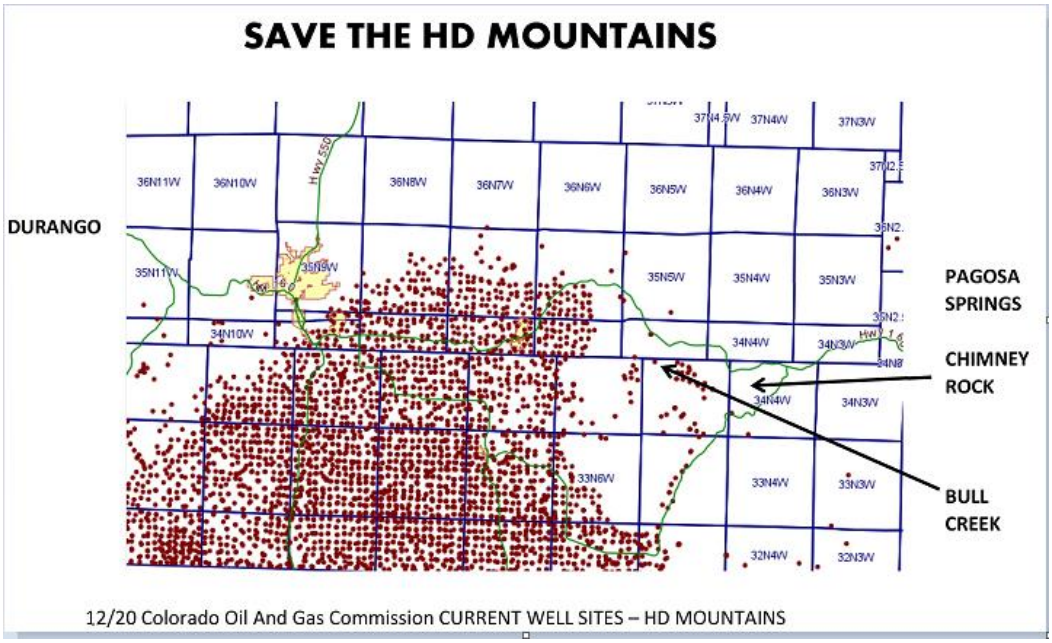
Hi Beverly,

The **HD Mountains** (named for the brand of a local cattle company) have long been a **priority for protection by the Alliance**. The 25,000-acre roadless area southeast of Bayfield hosts **old-growth ponderosa pine forests** and provides **critical winter wildlife habitat**. Thanks to the leadership of Pagosa Springs volunteer Beverly Compton, SJCA recently teamed up with Weminuche Audubon Society and Fort Lewis College to **look for rare Mexican spotted owls**. Read more about it here.

-Volunteer and Weminuche Audubon member Kurt Huffman gave a well-received presentation on the analysis of bird calls using the software and data from this project during the regular September Audubon chapter meeting. In his presentation he also talked about the importance of the MSO Project, the addition of pinyon jay calls to current data being analyzed, and potential future uses by the chapter for this technology. Attendees were able to see spectrograms and hear calls of pinyon jays captured on a recording.

Discussion

The HD Mountains where Bull Creek is found is part of the second largest and oldest natural gas field in the lower 48 states. Much of it has become overrun with gas wells, pumping stations, and pipelines. New wells are proposed within the area of our study. Finding ways to protect this small watershed from future development is critical to protecting its value as wildlife habitat.



Challenges/Lessons Learned

- Conducting field research in a heavy snow winter presented obstacles to data retrieval. Impassable roads, short days, and changing ground conditions between snow, ice, mud, and bare areas made travel by vehicle and on foot difficult and field days much longer than anticipated. Safety was always a concern. Future ARU locations will be adjusted to take into account the difficulties of reaching them last winter.
- Unit batteries and SD card storage space lasted longer than predicted, allowing fewer trips to suffice.
- Scheduling field trips among volunteers was complicated by other time commitments and weather predictions. Two volunteers traveled a longer distance to the survey site than others. Long hours in the field took away from jobs, studies, and families.
- Data processing – In order to process hours of audio data, personnel (Kurt Huffman and students from FLC) became familiar with Raven Pro software. Sound analysis was initially very slow and difficult to sift through with efficiency. Thus, Kurt solicited help from Connor Wood at Cornell's Bioacoustics dept. He provided valuable guidance. Additionally, the availability of a new machine-learning tool allowed for quicker processing. We underestimated the amount of time and expertise warranted for this important portion of the project.

Recommendations

At the end of the breeding season for MSO in July, when they are less likely to be calling, the ARUs were relocated to habitat in the watershed more favorable to pinyon jays, another species suffering alarming population declines. Data is currently being analyzed for calls of both MSO and pinyon jays. The units will be retrieved before forest service road access is closed. It is anticipated that the project will resume in February 2024, listening for the calls of Mexican spotted owls and pinyon jays, with the addition of analysis for the calls of other bird species of concern.

Allocation of Lois Webster Funds

4 ARUs (Swift One Units) from Cornell Lab of Ornithology	$1438.28
Cost of SD card reader, SD cards, Raven Pro software for FLC students, batteries, hard drive storage, Garmin In Reach (for Backcountry Safety) subscription	$1431.90
Partial Coverage of Cornell Lab's Raven Pro software for Sound Analysis lead	$129.82
Total Lois Webster Funds	**$3000.00**

Acknowledgements

We are grateful for the financial support of Denver Audubon through The Lois Webster Fund which gave us the ability to purchase the technology to conduct these surveys. Other partners of the Weminuche Audubon Society who supported this project include San Juan Citizens Alliance, Audubon Rockies, Fort Lewis College SEEDS Ecology Club, and The Cornell Lab of Ornithology K. Lisa Yang Center for Conservation Bioacoustics. Also, thanks to Project Leader, Beverly Compton, whose commitment to and oversight in this project played a vital role in its completion.

Weminuche Audubon Society

Jean Zirnhelt & Keith Bruno, Board Members

Beverly Compton

Project Leader & SJCA Volunteer

PARTNERS

Weminuche Audubon Society

San Juan Citizens Alliance

Audubon Rockies

Seeds esa

Ft. Lewis College Ecology Club

The Cornell Lab of Ornithology

A team member looks out over the Bull Creek drainage at our 4th Monitoring/ARU Location.

The view looking down Bull Creek to Chimney Rock

National Monument and the South San Juan Mountains.