

Seeing Movement: Documenting Sonoran Wildlife Migration with Two Technologies

Alex Turner, MFA Photography Candidate

jturne12@gmail.com

Student Grant

University of Arizona

Report

The scope of my research changed upon arranging an agreement with the San Rafael Valley State Natural Area. Long considered a major passageway for migrating wildlife, the San Rafael Valley State Natural Area is a protected grassland on the US/Mexico border featuring the pristine headwaters of the Santa Cruz River. The preserve is under threat from border fence construction, encroaching development, resource extraction and climate change, however it was not being monitored or studied by US Fish and Wildlife or the University of Arizona's biology team, of which I am a citizen scientist. Working with preserve ranger Alan Clemans, I identified several locations on the banks of the Santa Cruz river near the border to install motion-triggered infrared cameras to monitor wildlife movement, study the impact of summer water level changes, and substantiate the valley's role in protecting an in-tact ecosystem and migration corridor from outside influence. Because this arrangement was not part of the UA biology/USFW project, no funding was provided. The N-GEN award went towards the purchase of several motion-triggered infrared cameras and corresponding security equipment.

Time is a major factor in the monitoring of wildlife and human patterns in this region. In addition to gradual changes due to human presence, the Santa Cruz River can fluctuate wildly in volume depending on seasonal rainfall. This conversely affects wildlife movement, and my project monitored changes in activity levels during the dry and wet months (May-September) of the 2019 summer season.

Preliminary results indicate minimal wildlife migration through this riparian region during both the 2019 dry and monsoon seasons. Historically, this region has been considered an important corridor for Pronghorn Antelope, White-Tailed Deer, Black Bear and Mountain Lions, however these results were not unexpected. Lack of sightings of these species by rangers and citizen

scientists in recent years was reinforced by my data and suggests human presence and development may be a cause. Data from several camera sites, placed in close proximity to the border fence, indicate more human activity than wildlife. Aside from humans, only two species (white-tailed deer and white-nosed coatis) were captured. There was no significant change in activity levels between dry and wet seasons. Because these cameras were newly installed, no previous data was available for comparison.

Additionally, two new camera locations in the Patagonia Mountains, west of the San Rafael Valley, indicate similar findings. These new locations suggest significant human presence in close proximity to the border fence (within one mile). Historically, this range featured established populations of apex predators including mountain lions and black bears, as well as occasional sightings of Jaguars and Ocelots. Neither of these new sites recorded any mountain lions, black bears, jaguars or ocelots. Instead, the most frequent species were humans, ranch cattle, Collared peccaries (javelinas) and Mearns' coyotes.

Two additional cameras purchased independently of USFW funding allowed me to 'scout' new locations for potential future monitoring in the Patagonia Mountains. These cameras were frequently moved and installed in new locations throughout the year. Each of these cameras captured black bears and mountain lions in multiple locations and suggest habitats at water sources above 5,000 feet in elevation and at least 5 miles north of the border. As a result, several new USFW/UA-funded cameras are being considered for long-term monitoring.

As an artist, my intent is to design new visual frameworks for viewing wildlife corridors and any changes that may take place over time. Additionally, I am utilizing photographic equipment and software that allows me to create highly detailed panoramic images from the viewpoint of my infrared cameras. By layering infrared images on to these panoramas, I can emphasize patterns and fluctuations of movement not detectible in any single image capture. Aesthetically, infrared footage is characterized by a distinctive luminosity that distinguishes it from the surrounding landscape and highlights areas of frequent passage. In addition to creating artistic depictions of the region with this footage, this project provided valuable data for both the wildlife reports of the state park and USFW/UA biology team.

Conclusions and Next Steps

Upon reviewing the data provided by these cameras during the 2019 calendar year, it appears that human presence along the US/Mexico border has negatively impacted wildlife activity, both in riparian (San Rafael Valley) and mountain (Patagonia) habitats. Artistically, layered infrared images combined with panoramic landscape photographs highlighted corridors of activity and provided geographic and geologic data to correspond to each of the camera sites. Newly established camera sites in both the San Rafael Valley and Patagonia Mountains will continue to generate footage to provide more comprehensive sets of data going forward. This will also allow me to create new artistic renditions of the same camera sites in order to visualize changes over time.