

TETON COUNTY FLAMMULATED OWL SURVEYS

2017 Teton Raptor Center Report

Teton Raptor Center, funded by Teton Conservation District in 2016 and the Meg and Bert Raynes fund in 2017, initiated Flammulated Owl (*Psiloscoops flammeolus*) surveys in a portion of Teton County in 2016 and continued surveys in 2017. The Flammulated Owl is a small, nocturnal, migratory owl whose population status in Wyoming remains unknown. No nest sites have ever been located in Teton County, and prior to surveys conducted in 2016, there were little data verifying whether Flammulated Owls occur in the county. Following 2016 surveys conducted by Teton Raptor Center, there were 18 detections of Flammulated Owls and 14 potential nesting territories in Teton County, indicating the presences of breeding-aged individuals in this region of northwest Wyoming.

Our 2017 Project Objectives were:

- Conduct pre-treatment surveys within areas slated for 2017 forest treatment through the Teton-to-Snake Fuels Management Project
- Verify known territories and locate additional ones throughout the valley by conducting play-back surveys
- Confirm the presence of breeding individuals by locating nest sites
- Assess productivity by monitoring nests
- Conduct prey surveys at nest sites during the breeding season

Our Long-Term Project Objectives are:

- Assess pre- and post-treatment occupancy and nesting within the Teton-to-Snake Fuels Management Project area
- Create a nesting habitat model based on nest site locations
- Investigate nest site fidelity by banding or deploying PIT tags
- Understand seasonal migration movements through the use of 1 gram GPS transmitters

Methods

We followed the Partners In Flight Flammulated Owl call-back survey protocols (Fylling et al. 2010). In short, surveys consisted of a two-minute listening period, followed by a 30-second call, two-minute listening period, 30-second call, two-minute listening period, 30-second call and a final two-minute listening period, for a total survey time of 9.5 minutes of at each location.

Our survey locations were determined using our knowledge from the 2016 surveys as well as Geographic Information System (GIS) and Teton County and Bridger-Teton National Forest vegetation cover layers. Using these data with any pertinent data from published work, we created a predictive habitat model to help find potential nesting habitat.

In order to meet our 2017 study objectives, we utilized two technicians to conduct fieldwork focused on Flammulated Owls during the summer season.

Surveys:

From mid-May through mid-June, team-members conducted play-back surveys four nights/week within areas scheduled for 2017 forest treatments throughout the Teton-to-Snake Fuels Management Project and additional habitat in Teton County predicted as potential habitat from remote GIS vegetation layers. Crews also conduct play-back surveys at known territories as well as in other areas of suitable habitat.

If owls were detected, we deployed automated recording units (ARUs) at and around the detection site. Flammulated Owls can fly to areas as far as 1km to respond to playback calls. Our intent with deploying ARUs was to better define territory centers from unsolicited calling over a week period. We also were interested in creating a call library from which we could make our own automated software detector for the species to facilitate reviewing recordings from other areas.

Nest Searching:

Following play-back surveys, technicians spent a minimum of 3 field days (or nights) / week focusing on locating nest sites within territories. Nest-searching involved locating trees containing suitable cavities during the day. In order to check nests, technicians scratched on nest trees to flush nesting birds, viewed inside cavities via a small camera attached to an extendable pole (when the cavity is accessible), and/or observed the cavity for ~15min after dusk for a food delivery or for begging vocalizations.

At all survey locations, we recorded dominant tree species and average tree diameter at breast height (DBH). We recorded all owls detected to species, gender (if known), call type (e.g., territorial, contact, etc.), estimated direction of the call, and estimated distance to the owl. We later calculated the “actual” location of the owl using these estimates and used the calculated location for reporting purposes.

Results

We conducted night callback surveys at 179 points (Figure 1), resulting in 23 potential Flammulated Owl territories, five of which were also occupied in 2016. We investigated the utility of using automated SoundScout recorders at 37 locations. Using calls from three known territories, we created an automated detector in sound analysis software, Kaleidoscope. Using this detector and manual analysis of recordings, we detected Flammulated Owls we found an additional territory not found by callback surveys in the Mosquito Creek area.

Using remote sensing data in buffers around owl and survey locations, we found that owls tended to use coniferous forests more than expected in our study area (Table 2). When looking at tree type measured during the surveys, mixed aspen/conifer forests tended to be preferred by Flammulated Owls.

Using vegetation data we collected at the site, most survey locations were predominantly aspen (*Populus tremuloides*) stands, followed by an aspen/conifer mix, and fir/spruce (Table 1). While conducting surveys, we also classified average stand age into three classifications of diameter at

breast height (DBH): <10", 10-20", and >20" (i.e., young, mid, old). Eight percent of the surveyed locations were classified as young, 84% as mid, and 8% as old.

We recorded 35 detections of Flammulated Owls (Figure 1). Several studies of Flammulated Owl home ranges sizes have indicated mean areas (minimum convex polygons) of 10 and 12 ha. To determine the number of potential territories located we combined owl locations within 300m to account for imperfect estimates of distance to owl when heard. The radius of a 12ha circle is 110m, so owl territories could be up to 220m in diameter. But considering territories are rarely circular, using a 300m threshold to separate potential neighbors was a conservative estimate for this pilot effort. Using this criterion, we located the 23 potential nesting territories.

Discussion

Flammulated Owls were detected at 10% of our survey points in Teton County during the 2017 searching effort. Although we had a large effort searching for nests, we were unable to confirm any nest cavities or find any fledglings in presumed territories. We did locate one cavity that had Flammulated Owl feathers below it, but the nest may have failed or fledged prior to discovery.

Our general impression of habitats near detection sites were that Flammulated Owls occurred in older-aged aspen stands with nearby older conifers. Theoretically, owls need aspen for nesting (cavities) and coniferous trees for preferred prey (moths). This supposition is supported by the higher proportion of mixed forest habitat type near owl locations than proportion of that habitat type sampled (Table 1).

We did not randomly select locations for the survey points due to the goal of finding territories, not necessarily surveying the entire study area evenly. The SoundScout audio recorders were generally placed in the more hard to reach locations for crew safety since they can be deployed during the daytime and provide two weeks' worth of data, meaning the points do not have to be surveyed a second time. This could explain the lower owl detection percentage for the recorders verse traditional callback surveys, since they were not generally in what we would consider ideal Flammulated owl habitat.

Surveys will continue in the same manor for the 2018 and 2019 seasons, but will expand to a more statewide approach for a better understanding of statewide population and habitat usage. Further, more usage of automated recorders may expand our understanding of calling patterns and timing while simultaneously allowing for a larger area to be surveyed without having to have a large crew.

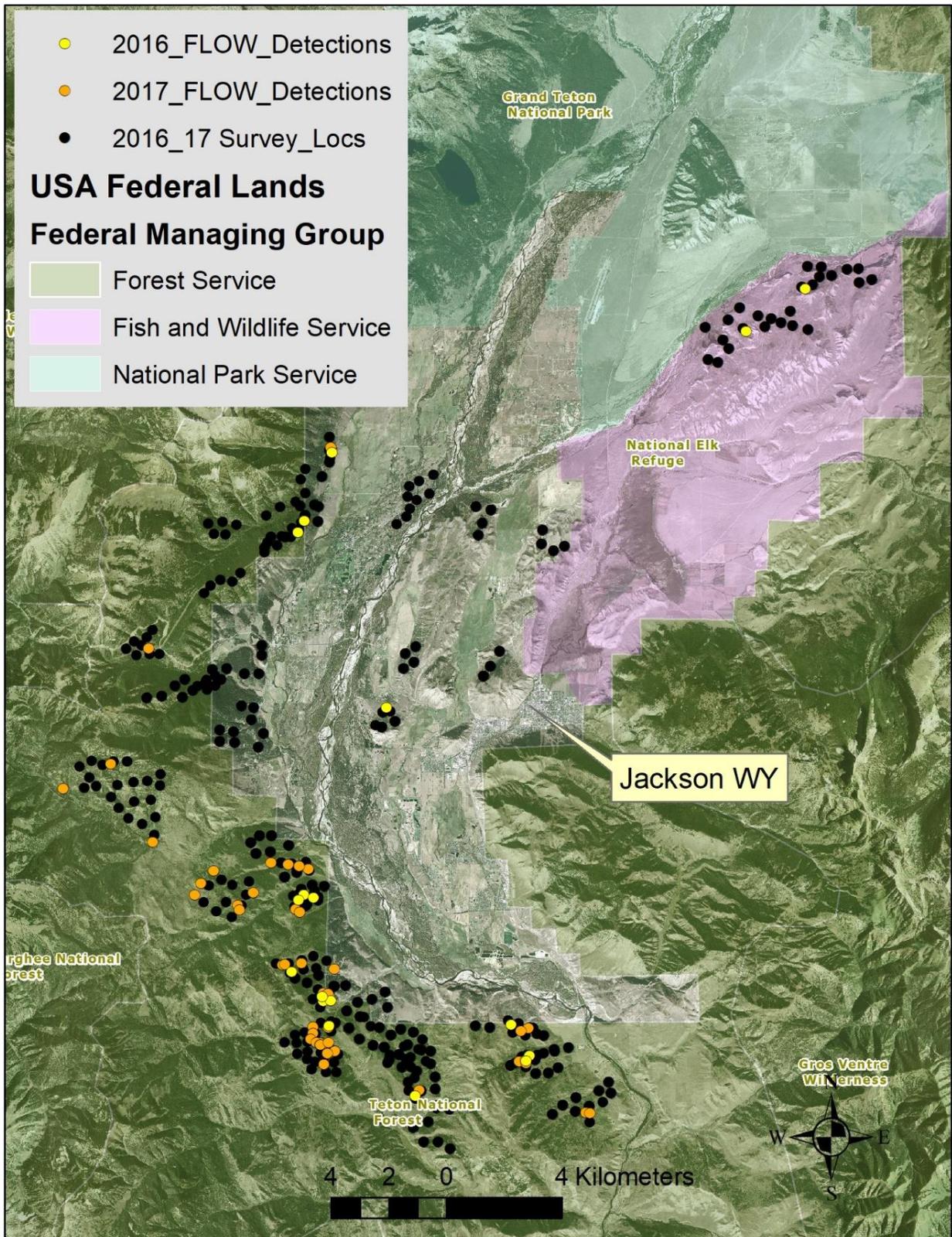


Figure 1: All survey points for Flammulated owls including detections for the 2016 and 2017 field seasons

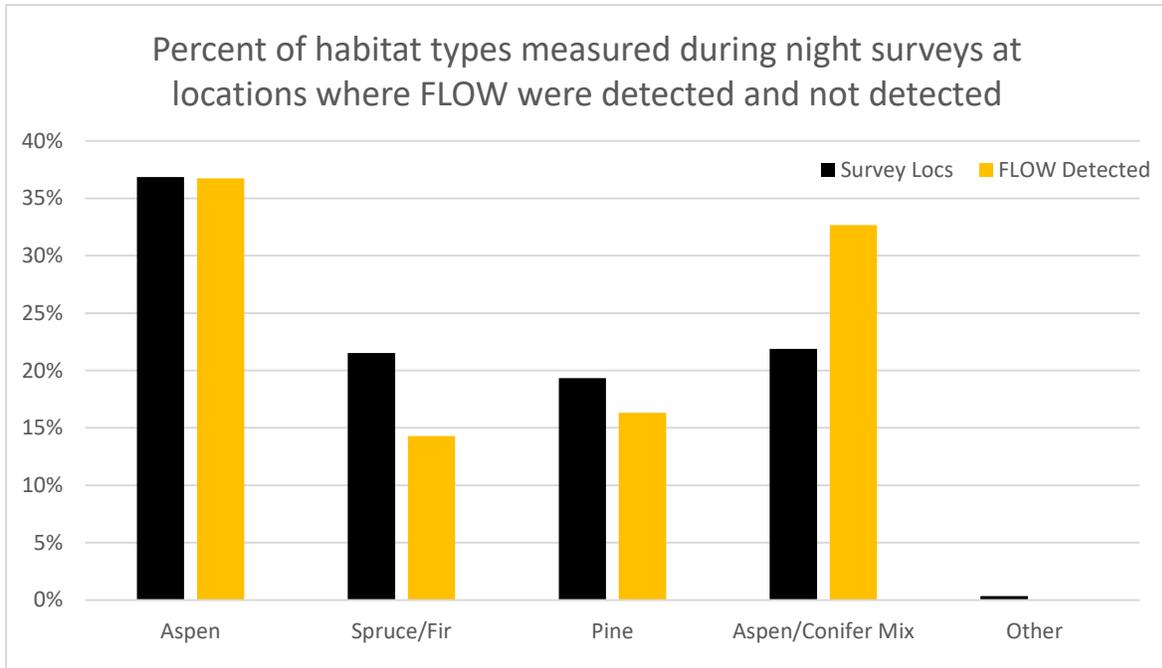


Table 1: Habitat that was measured during the nighttime callback surveys where Flammulated owls were detected and not detected.

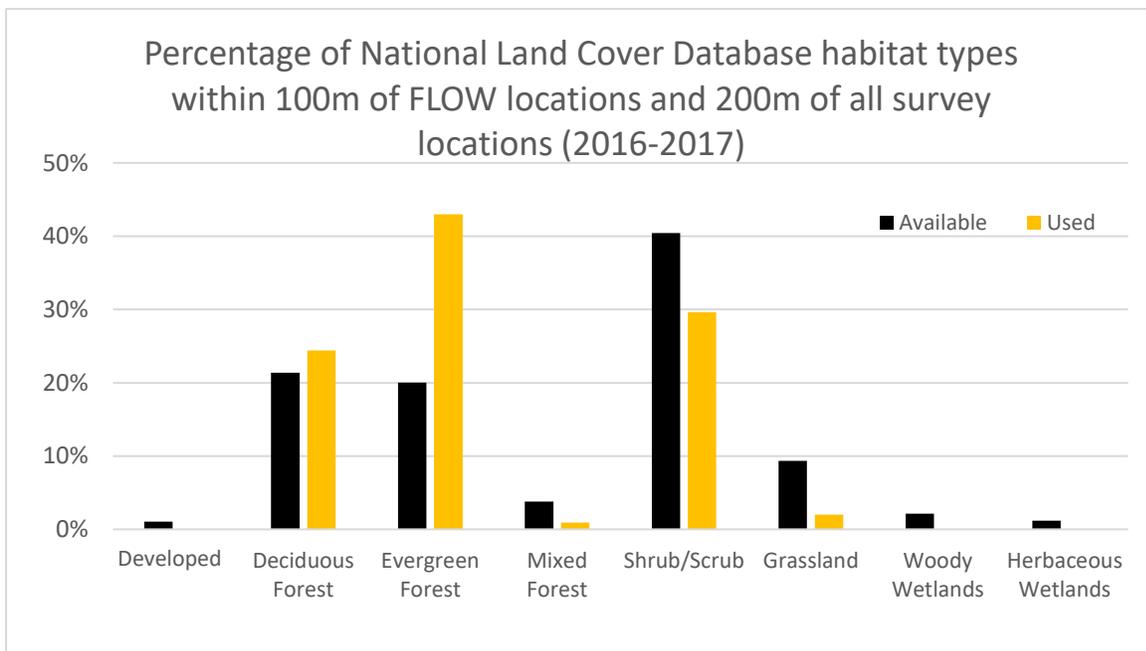


Table 2: Habitat classified using National Land Cover Database (2011) in areas where Flammulated owls were detected.