

Characteristics of Merriam's Turkey Loafing Habitat Reused Following Silvicultural Treatment

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Abstract. We monitored known turkey loafing sites following silvicultural treatment to determine which factors seem to influence habitat reuse. Five loafing sites used by Merriam's turkey (*Meleagris gallopavo merriami*) during the summer of 1989 on the Chevelon study area were protected from subsequent silvicultural treatment. Portions of the forest stands containing the loafing sites were logged in 1990. We inspected these loafing sites annually after logging to detect reuse by turkeys. Habitat surrounding two loafing sites was reused during summer 1992. Habitat characteristics of all five loafing sites were remeasured to determine characteristics that influenced reuse. Dense canopy, dense horizontal cover, and contiguous similar habitat were characteristics of loafing sites that received reuse following logging. Loafing habitat isolated from other similar habitat was not reused. Mosaic timber treatments that leave areas of >25 m²/ha basal area (BA) and avoid isolation of habitats seem to favor turkey reuse.

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Key words: Forest, habitat use, loafing, logging, *Meleagris gallopavo merriami*, Merriam's turkey, timber harvest.

Loafing is a behavior in which many gallinaceous birds engage. In Merriam's turkeys, this includes resting, preening, and dusting in habitats with dense canopy (Rumble 1990, Mollohan et al. 1995). In addition to resting, because turkeys loaf more frequently during summer than winter, loafing habitat may be used to reduce thermal loading during the warmer summer months (Wakeling and Rogers 1996).

Loafing habitat is one component identified in some Merriam's turkey habitat evaluations (Hoffman et al. 1993, Mollohan et al. 1995). Validation and evaluation of research recommendations are essential because management activities are often necessarily based on observational descriptions rather than rigorously designed experiments.

Loafing sites are generally located in characteristic forest stands. Loafing sites are typified as small (0.05–0.25 ha) stands of dense pole (12–38 cm) timber immediately adjacent to drainages, >25 m²/ha BA, containing large diameter (>30 cm) downed logs (Mollohan et al. 1995) or rock outcrops (Rumble 1990). These sites are typically interspersed within adjacent small openings used for feeding that have sharp edge contrast and escape cover (Rumble 1990, Shaw and Mollohan 1992, Mollohan et al. 1995). Loafing sites appear as dense clumps of pole timber containing large downed logs and little understory vegetation surrounded by small herbaceous openings.

We are unaware of any published information on how silvicultural treatment affected reuse of previously used loafing habitat. Our objective was to defer known loafing sites from silvicultural treatment and determine through monitoring if turkeys would reuse the loafing sites and surrounding habitats. In our monitoring efforts, the loafing sites identified within active timber sales were few in number. Consequently, we sought to identify variables potentially influencing reuse. We intend that results from our study should foster further investigations and monitoring efforts following land management activities.

Study Area and Methods

Merriam's turkey hens were captured, radio-marked (Model LB400, Telonics, Mesa, Arizona), and released at sites baited with whole oats on the Chevelon study area (CSA), Arizona (Wakeling 1991). The CSA was located approximately 65 km south of Winslow, Arizona, along the Mogollon Rim. Vegetation communities on the CSA were (1) mixed-conifer (20.1%); (2) ponderosa pine (*Pinus ponderosa*)-Gambel oak (*Quercus gambelii*) (34.9%); (3) pinyon (*Pinus edulis*)-juniper (*Juniperus* spp.) (44.4%); (4) aspen (*Populus tremuloides*) (0.4%); and (5) meadow (0.2%). A detailed description of the study area may be found in Wakeling (1997).

Visual observations were obtained from radio-marked hens to identify the exact location of loafing sites. Five loafing sites, located during summer 1989, were selected for study (Fig. 1) because they were located within the boundaries of two scheduled timber sales. The five loafing sites were located within the boundaries of the Double Cabin Timber Sale (DCTS) ($n = 2$) and the Ridge Timber Sale (RTS) ($n = 3$). Both areas were logged during 1990. The stands surrounding the two study sites in the DCTS were logged in an even-aged manner, removing all ponderosa pine trees ≥ 38 cm diameter at breast height (dbh). The stands surrounding the three study sites within the RTS were logged as a seed cut, removing ponderosa pine trees ≥ 23 cm dbh leave 4.6 m²/ha basal area.

Prior to logging, habitat characteristics were measured at each study site in summer 1989. Site center was defined as the central point of the undisturbed flock when first observed. Site BA was determined by measuring the dbh of all conifers on a 0.04-ha circular plot and computing area dimensions per hectare. We examined horizontal sight distance by placing a turkey silhouette at site center and pacing away until the silhouette was completely obscured. At each site, horizontal sight distance was estimated in four directions, at right angles to each other, with the first bearing randomly determined. We calculated a mean value for each site from the four measurements. We estimated canopy density (Strickler 1959) 11.4 m from site center on each of the four bearings and averaged.

Following mensuration, each site (approximately 0.04–0.08 ha) was protected from subsequent logging in summer 1990. Following logging, loafing sites and surrounding habitat within 300 m were surveyed annually during August to detect physical sign that would indicate turkey reuse. We monitored each site during August because these sites were first used during summer, and late-summer monitoring allowed for an accumulation of physical sign that would indicate reuse. During September 1993, the center of each loafing site was relocated, bearings were identified, and loafing sites were resampled as described during initial mensuration. Because sample size was limited, we simply compared means and standard deviations for each attribute among four categories of loafing sites: between sites that were abandoned and those that were reused both pre- and post-harvest.

Results

Reuse of habitat surrounding two loafing sites within DCTS was detected during August of 1992. No reuse was detected on the remaining three sites. Because each loafing site was protected from logging, BA averaged 52 m²/ha both before and after treatment at all sites.

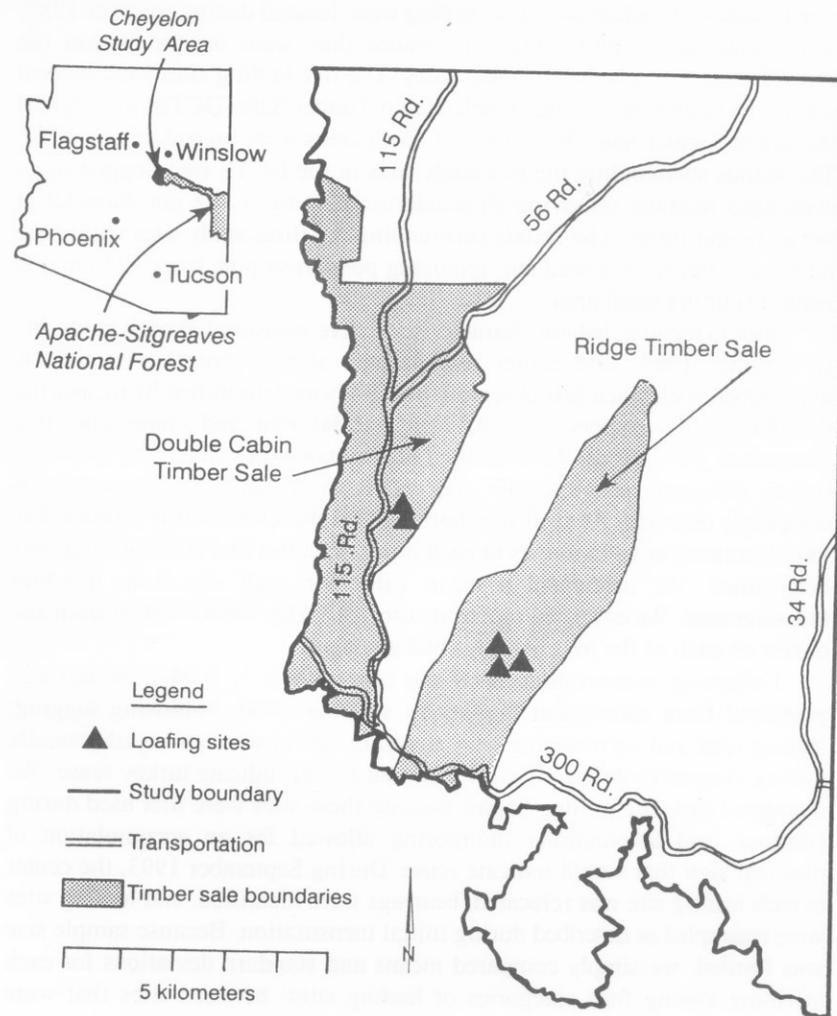


Fig. 1. Location of loafing sites within Double Cabin and Ridge Timber Sales on the Chevelon study area, Arizona.

Characteristics of all loafing sites before logging were within the range of attributes described by Mollohan et al. (1995) (Tables 1 and 2). Although all mean values following logging remained within ranges observed by Mollohan et al. (1995), those that were abandoned had mean TSD values almost two times greater than the mean identified by Mollohan et al. (1995).

Table 1. Mean, standard deviation, and range of select habitat attributes described for loafing habitat used by Merriam's turkeys (Mollohan et al. 1995).

Habitat attribute	Mean	SD	Range
Canopy density (%)	57.9	17.9	21.5–90.0
TSD (m)	22.6	7.5	9.8–40.8

Table 2. Mean and standard deviation of reused and abandoned loafing sites both before and after harvest, Chevelon study area, 1989 and 1993.

Habitat attribute	Reused (<i>n</i> = 2)				Abandoned (<i>n</i> = 3)			
	Before		After		Before		After	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Canopy density	84.5	5.2	79.5	12.7	65.1	16.3	65.5	11.0
TSD (m)	16.3	9.1	18.2	3.9	24.3	5.1	30.3	8.6

The abandoned sites were also greater than Mollohan et al.'s (1995) mean before logging, whereas the sites that were reused had shorter-than-average TSD values to begin with. Likewise, canopy densities were substantially lower on sites that were abandoned than those that were reused both before and after logging (Table 2). Finally, the sites in reused habitat had not been isolated from contiguous high-BA stands; those that were abandoned had been isolated by distances >12 m.

Discussion

The differences we observed between loafing sites that were abandoned following silvicultural treatment and those that continued to receive reuse are certainly not definitive. In fact, loafing behavior is not well understood. The

difference in loafing frequency between seasons remains unexplained and may deal with nutritional demands or thermal loading (Wakeling and Rogers 1996). But observed differences in our study provide a starting point for future research.

Horizontal cover and canopy density seems to have influenced loafing habitat reuse. TSD was almost two times greater at abandoned loafing sites than at reused loafing sites. Mollohan et al. (1995) found mean TSD approximately equal to the reused loafing sites in our study. Although logging increased TSD at all sites in our study, those sites with substantially shorter TSDs were reused. Sites that were not reused may have been predisposed to abandonment because they had longer TSDs to start with. Dense horizontal cover may be influential in the selection of loafing habitat.

A similar relationship was apparent with canopy density, with canopy density greater on reused than on abandoned sites. However, the mean canopy density for post-harvest abandoned sites was about equal to loafing sites documented by Mollohan et al. (1995). Neither TSD or canopy density values at any loafing site in our study were outside of ranges specified as acceptable to turkeys by Mollohan et al. (1995). However, in each case where TSD was greater than and canopy density was less than the mean described by Mollohan et al. (1995), the site did not receive reuse.

Isolation (i.e., no continuous forested corridor to adjacent high-BA stands) from contiguous habitat also seemed to influence reuse of loafing habitats. Those sites that had been isolated by logging were not reused, indicating that habitat fragmentation and isolation might affect habitat reuse by turkeys. Reuse was documented in stands that retained a corridor to habitat similar in structure to that contained in the loafing site.

We believe that dense canopy, dense horizontal cover, and contiguous high-basal-area habitat are major factors influencing loafing habitat reuse by turkeys. Although our results support previous research findings (Rumble 1990, Mollohan et al. 1995), we were unable to exclude the possibility of random errors because of our small sample.

Based on our findings, we recommend further research into the ecological importance of loafing habitat. Although turkeys seem to loaf frequently during summer, the value of loafing habitat to turkeys is basically speculative and not well understood. If turkeys require loafing habitats regardless of the reasons, management of these habitats may be critical in southwestern habitats. If so, management of our forested habitats should emphasize retention of loafing habitat characteristics in silvicultural treatments. Finally, we recommend that habitat models and guidelines (e.g., Hoffman et al. 1993, Mollohan et al. 1995) be tested to determine the suitability and scope of each model. Further testing ultimately determines the quality of research recommendations in a management setting.

Acknowledgments

We are grateful for the assistance of R. Stedt and S. Woods in the analysis of the loafing sites. Funding for this research was provided by the Federal Aid in Wildlife Restoration Project W-78-R of the Arizona Game and Fish Department and by the U.S. Forest Service, Chevelon Ranger District. We would also like to thank the anonymous reviewers for the improvements they suggested in this manuscript.

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