Survey of Imported Fire Ant Mound Densities in Managed Native Prairies - the Attwater Prairie-Chicken National Wildlife Refuge

Bastiaan M. Drees, Extension Specialist and Associate Professor of Entomology
Jenni Hoskins, Biological Aide and Mike Morrow, Biologist,
Attwater Prairie-Chicken National Wildlife Refuge

The Attwater's prairie chicken, Tympanuchus cupido attwateri, is a subspecies, lik the Greater prairie-chicken, of the Heath hen. The Attwater Prairie-Chicken National Wildlife Refuge was established in 1972 to preserve and restore critical habitat for this endangered subspecies. Approximately 8,000 acres are currently managed by the U.S. Fish and Wildlife Service. Native grasses and forbes of the prairie make up the only habitat suitable to the prairie-chicken's needs.

The five-month mating season of the Attwater's prairie-chicken begins in late December when males congregate on courtship or "booming" grounds. Booming grounds vary in shape and size (usually 0.1 to 10 acres or less) and have short plant cover. Females are attracted to the booming grounds by the spirited fighting and booming of the males. Mating usually occurs there, and nest are normally located within one-half mile. Hens prefer to nest in medium to heavy grass cover and lay an average of 11 eggs which incubate for 28 days. Chicks are escorted from dense cover soon after hatching and can fly when they are two weeks old. The nesting occurs in April and is completed by mid-May.

The refuge is intensively managed for the preservation of the Attwater's prairie-chicken, one of the few National Wildlife Refuges designated specifically for an endangered species. Management techniques to improve habitat include: controlled grazing, prescribed burning, strip row cropping, mowing, pest plant control, and predator control. Snakes, opossums, racoons, coyotes, armadillos and especially skunks prey upon the eggs and young birds.

The red imported fire ant, Solenopsis invicta Buren, has been documented to prey upon hatching eggs of several ground-nesting birds including waterfowl and quail. However, no ant-related mortality of the Attwater's prairie-chicken has been documented. This survey was initiated to monitor fire ant mound nesting density in the managed native prairie to determine if management practices produced any changes in mound density over time.

Materials and Methods

The Reichardt prairie, a section of managed native prairie approximately 4,000 by 10,000 ft. (918 acres) and containing no internal fencing, was subdivided into plots under a three to four-year rotational management regime of prescribed burning and controlled grazing. On 6 March 1991, four plots were established: 1) 106 acres not burned since 1979 (this area contains a booming area); 2) 137 acres not burned since 1983/84; 3) 234 acres burned in 1990 (this area serves as good nesting habitat; and 4) 175 acres burned in February 1991 (this area serves as brood habitat). Within each plot, four permanent subplot sites were established using metal fence posts and were arranged in transect lines initiating from road intersections that separate plot areas

within the prairie. The number of active red imported fire ant mounds within an 80 ft. radius (0.46 acre or 0.19 hectare) of these fence posts were counted.

This process was repeated on 12 March 1992 and will be repeated each spring (and perhaps fall) at roughly the same period of the year for the next 2 years. Average density of fire ant mounds and the effect of prescribed burning will be documented.

Results and Discussion

On 9 March 1991, the ambient temperature was roughly 85EF. Rain had occurred the previous week and ant mounds were highly visible and ants were active. Densities of fire ant mounds were remarkably consistent between plots except in the plot recently burned, where mound density averaged 89 mounds per acre – 45 percent greater than in plots with forage cover (averaging 49 mounds per acre). Apparently, the lack of cover allowed more mounds to be detected in these subplots. This difference was not interpreted to indicate that the controlled burn in February resulted in increased mound density. Surveying mound densities in the fall (November) after forage has regrown would reduce this sampling error. All of these density values are within the range normally associated with areas inhabited by the single queen or monogynous form of the red imported fire ant.

The evaluation made 12 March 1992, revealed that fire ant mound numbers had remained constant from the previous year in plots 1 and 2 which were burned in February 1991, and plots 3 and 4 which were burned on 24 January 1992. However, mound numbers in plots burned in 1990 and 1991 were found to have roughly half as many mounds as in the previous year. Whether this decline resulted from the burn or from weather conditions can not be determined from these data. Of interest are the relative differences in observed mounds in burned plot mound numbers appears to be consistent between the two years.

Table 1. Number of red imported fire ants per 80 ft. radius circular subplots within managed areas of the Reichardt Prairie, Attwater Prairie Chicken National Wildlife Refuge, Colorado County, Texas, 6 March 1991.

Number of fire ant mounds per 80 ft. radius circular

Plot/management	Subplot 1	Subplot 2	Subplot 3	Subplot 4	Average
6 March 1991:					
not burned since 1979	19	24	22	23	22(48)*
not burned since 1983/84	24	23	21	21	22(48)
burned in 1990	24	24	30	18	24(52)
burned in February 1991	34	50	40	40	41(89)
12 March 1992:					
not burned since 1979**	23	20	22	19	21(46)*
not burned since 1983/84**	32	23	16	29	25(54)
burned in 1990***	14	9	13	11	12(26)
burned in February 1991***	9	17	14	15	14(30)

* Number of mounds per acre
** Burned 24 Jan. 1992
*** Shredded early August 1991