

Territorial display as a population-regulating mechanism in the Yellow Warbler.—Although territorial behavior limits population size (e.g., F. S. Tompa, *Auk*, 79: 687–697, 1962), it is unusual to have the opportunity to see evidence of this directly in the field. We made some observations on a population of about 30 male Yellow Warblers (*Dendroica petechia*) on 5 May 1962 at Howland's Island, New York, in an area of second growth along the Genesee River, bordered by some large trees. This was very favorable habitat for the species; territories were small, many less than half an acre. Many males were mated and territorial encounters were frequent and intense. We discovered three males having encounters and watched them for about two hours. At the beginning of observation, resident male A had a territory of about 0.2 acres at the river's edge (Figure 1). His territory had only shrubbery less than 10 feet tall. He was "boxed" in by two other males (B and C) and the river. B and C defended larger adjacent areas each of which included a large tree which provided singing perches during the encounter period. Male A seemed to be unmated; one of the others (C) had a mate. B and C, first singly and later simultaneously, invaded A's territory. B and C never had encounters with each other, direct-

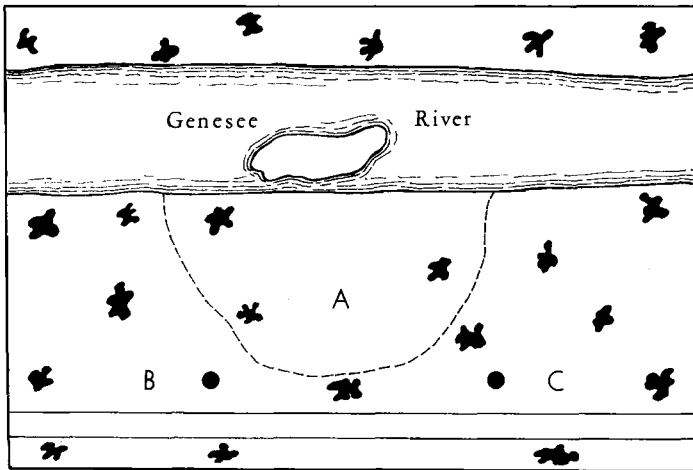


Figure 1. Territory of Bird A at beginning of observation, showing the island he retired to before leaving permanently, and the main singing perch of each opponent.

ing all their aggression toward A. Initially A responded to the intruders by chasing and displaying at them. The displays consisted primarily of Circling, Gliding, and Song (M. S. Ficken and R. W. Ficken, *Living Bird*, 1: 103–122, 1962). The intruders initially returned to their respective territories following each encounter, but later spent more time in A's territory. After about an hour A's aggressive responses became weaker. He sang less frequently, often muting his songs. His chases and displays became less frequent and vigorous while those of the intruders increased. Finally, he flew to and remained on the small island shown in Figure 1. B and C continued chasing and Circling at him for almost an hour. A responded with occasional Circlings, but

did not chase his opponents in return and sang only muted songs. Then after B chased him he again landed briefly on the island. Suddenly he left the island, flying rapidly in a straight line at least 500 yards until out of our sight. We returned several hours later and A had not returned. B and C had occupied almost all of A's old territory. We concluded that A abandoned this area permanently.

It is unusual for a male bird to abandon his territory because of aggression from neighboring males. We watched scores of territorial encounters between Yellow Warblers, all involving a small boundary zone and ending in "draws," each male finally retreating to his original area. It is very possible that A was at a disadvantage because of the absence of a suitable singing perch, an important requirement for Yellow Warblers (S. C. Kendeigh, *Condor*, 43: 165-174, 1941). The inadequacy of the territory seems to have reduced the vigor of his territorial defense.

There was no fighting, showing that displays alone have sufficient threat value to induce escape in another bird. These observations support the concept that territorial behavior, particularly visual and vocal displays, serves as a regulator of population density. This work was partially supported by the National Science Foundation (GB-891).—MILLICENT S. FICKEN and ROBERT W. FICKEN, *Department of Zoology, University of Maryland, College Park, Maryland.*

Townsend's Solitaire and Pine Grosbeak in Missouri.—On 1 December 1963 I took a Townsend's Solitaire (*Myadestes townsendi*) at Mt. Washington Cemetery, Kansas City, Jackson County, Missouri. The specimen (Univ. of Kansas Mus. Nat. Hist. no. 43407) has the characters of the race *M. t. townsendi*. It was an adult male, weighed 31.5 g, had little fat, and the stomach contained many juniper berries (*Juniperus* sp.).

This specimen, so far as I have been able to ascertain, is the first for Missouri, although there are sight records by E. Cole and B. King from Jackson County, 26 January 1954, by me from Platte County, 27 December 1959, and by F. Lawhon from Buchanan County, 9 February 1964.

The solitaire was seen in an open artificial parkland of native and exotic trees including Austrian pine (*Pinus austriaca*), an exotic spruce (*Picea excelsa*), red cedar (*Juniperus virginiana*), tree-of-heaven (*Ailanthus glandulosa*), sugar maple (*Acer saccharum*), and red ash (*Fraxinus pennsylvanica*). It was easily approached and was not seen with other species of birds.

On 29 November 1962 Dean R. Rising saw one male and two female Pine Grosbeaks (*Pinicola enucleator*) at Mt. Washington Cemetery in the same area described above. On 2 December 1962 I took a moderately fat female (UKMNH no. 41460) there. The other birds were recorded until mid-January, 1963. The specimen, to my knowledge, is the first for Missouri. Susan Johnson saw a female Pine Grosbeak at close range at LaGrange, Lewis County, on 3 December 1903 (*Auk*, 25: 324, 1908). This seems to be the only previously published sight record for Missouri (see Bennitt, "Check-list of the birds of Missouri," *Univ. Missouri Studies*, 7: 60, 1932). The bird I shot morphologically resembles *P. e. leucura* (wing, 113.7 mm; tail, 96.0 mm; culmen width at base, 11.2 mm), yet the low weight (56.5 g) indicates that it might be *P. e. eschatosus*. Hence, I think it unsound at present to assign it to either subspecies.

The grosbeaks apparently ate buds from spruce and sugar maple and berries from red cedar. They stayed together and were not seen with other birds. The weather in the autumns of 1962 and 1963 was mild.—JAMES D. RISING, *Museum of Natural History, The University of Kansas, Lawrence, Kansas.*