Friedmann separated *levis* from *plumbeus* on the basis of a slightly larger bill. Additional material shows extensive overlap between the two populations. Friedmann's measurements for 14 Florida skins are, wing 340–373 mm, culmen 22–25 mm, and for five from Cuba and the Isle of Pines, wing 350–371 mm, culmen 25–26 mm. Four birds from Cuba and the Isle of Pines in The American Museum of Natural History (all females) measure: wing 351–383 mm, culmen 25–26.5 mm. I find for 14 Florida birds in The American Museum a range of 24–26 mm in culmen length, somewhat higher than Friedmann's figures. Six measure 25 mm, three 25.5 mm, and two 26 mm.

Thus Everglade Kites from Cuba and the Isle of Pines probably average a little larger than Florida birds in all dimensions but at most only a few individuals can be identified on this basis. Taxonomic separation does not seem advisable. But even if *Rostrhamus sociabilis plumbeus* is no longer considered to be an "endangered subspecies" wholly endemic to the United States, it may, nevertheless, be endangered throughout its range. In any event, every effort should be made to save the threatened Florida population of this remarkably specialized raptor.

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DEAN AMADON, *American Museum of Natural History, New York, New York 10024.* Accepted 1 Apr. 74.

Food storage and winter territory in Red-headed Woodpeckers in northwestern Louisiana.—Kilham (1958a, 1958b) described winter territory and food storing behavior of Red-headed Woodpeckers (*Melanerpes erythrocephalus*) in Maryland. Aside from Kilham's observations, little is known about these two aspects of this species' behavior in other parts of its range. This note provides additional information on these behaviors.

In late December 1973 and early January 1974, I studied Red-headed Woodpeckers south of Shreveport, Louisiana in a small oak-pine woodland where the understory had been cleared for grazing, which gave it an open parklike appearance. Four oak species were dominant (*Quercus stellata, Q. phellos, Q. falcata, and Q. shumardii*) but a few pines (*Pinus echinata* and *P. taeda*) and hickory (*Carya* sp.) were scattered among the oaks. The woods was surrounded by grassland on three sides. It extended for about 400 m north–south and was divided by a road. To the

east of the road the woods was about 150 m deep. To the west the woodland was continuous.

Five Red-headed Woodpeckers occupied that part of the woods that abutted the road; three were first-year birds and two were adults. Each defended an individual territory. No territorial boundaries were precisely known, as the woodpeckers did not frequently trespass onto other individuals' lands and therefore defense was rare. Nevertheless by following individuals, all of which were distinguishable by variations in plumage patterns, it was possible to determine both the range of individual movement and the localities where the woodpeckers interacted with conspecifics and with individuals of other species. Territory and home range appeared to be coterminous. All food, including insects caught on the wing, was taken from within the territory. Each Red-headed Woodpecker spent most of its time in a "core" sector in its territory centered on its acorn storage sites that, although scattered, were concentrated in a few closely adjacent trees and fence posts.

Red-headed Woodpeckers migrate in the late summer or early autumn from their breeding grounds to wintering areas where mast is abundant. Kilham (1958b) in his Maryland studies found that each individual defended from conspecifics an average winter territory of about 0.1 to 0.2 ha. My observations indicate that each individual was defending about 0.8 to 1.2 ha on average. Presumably winter territory size in this species is highly compressible and is correlated with mast production.

Kilham (1958b) also found that Red-headed Woodpeckers defend their winter territories interspecifically. My observations do not entirely agree with these findings. The Red-headed Woodpeckers in Shreveport frequently chased Blue Jays (*Cyanocitta cristata*), Tufted Titmice (*Parus bicolor*), Common Flickers (*Colaptes auratus*), Yellow-bellied Sapsuckers (*Sphyrapicus varius*), White-breasted Nuthatches (*Sitta carolinensis*), Common Grackles (*Quiscalus quiscula*), and fox squirrels (*Sciurus niger*), but only from certain sites within their territories— specifically their roosts and acorn stores. When any of these intruders approached a Red-headed Woodpecker's stores or its roost, the owner flew at the intruder, who usually quickly retreated. This type of interaction was often accompanied by "quirr" calling by the Red-headed Woodpecker (see Kilham 1958b for a description of the context of this call). This type of territorial defense; that is, an all-purpose territory defended from conspecifics with interspecific defense of specific localities within the territory, is very similar to that of the Acorn Woodpecker (*Melanerpes formicivorus*) (MacRoberts 1970, MacRoberts and MacRoberts 1972). The differences in interspecific territoriality between Kilham's birds and those reported here undoubtedly relate to size of territory. Presumably interspecific defense of the entire territory is energetically feasible only if the area defended is very small. Very likely the Red-headed Woodpecker territories Kilham described were so small that they included little more than the storage sites and the roosts themselves.

Red-headed Woodpeckers store food, mainly acorns and beechnuts but also insects (Agersborg *in* Beal 1911, Dorsey 1926, Eckstrom *in* Bent 1939, Hay 1887, Kilham 1958a, Roberts 1936, Skutch 1969, pers. comm.). All reports of storage have been from the north and eastern portions of the species' range. The birds store either whole or fragmented nuts in desiccation cracks, crevices, knot holes, and under loose bark in standing trees, fence posts, and utility poles. Kilham (1963) has reported that they sometimes enlarge natural cavities or dig pits for separate acorns. In some cases, they were reported to seal in these stores with

slivers of damp rotten wood taken from dead limbs or with bark. I watched the Red-headed Woodpeckers in Shreveport store acorns and seal them in just as Kilham (1958a) described, but saw none enlarge cavities or dig pits for the acorns. All acorns stored were either ones that the woodpeckers retrieved from the ground (all acorns had fallen from the oaks before I arrived) or ones that they had previously stored. They frequently retrieved stored acorns and moved them to other locations or they retrieved the nut, carried it to an "anvil," broke it up, and stored what they did not consume. Many of the acorns that they cached were later sealed in. Not all stored acorns were sealed in; many were clearly exposed to view.

Food storage, mainly in the form of mast but also insects, has been described for several species of North American woodpeckers (Ritter 1938, Bent 1939, Bock 1970).

For none of these species are accurate data available on the distribution or variation in food storage techniques over their ranges. However, for example, the information on variations in storing behavior for the Acorn Woodpecker in different parts of the species' range strongly suggests different dispersion and dispersal patterns (Dickey and van Rossem 1938; Miller, 1963, MS; Skutch 1969; Kjell von Sneidern, pers. comm.).

Certainly further information on the distribution of food storing, dispersion, and dispersal, and the relationship between productivity of habitat and territory size in these and other woodpeckers will be of value.

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MICHAEL H. MACROBERTS, *Hastings Natural History Reservation, University of California, Star Route, Box 80, Carmel Valley, California 93924.* Accepted 27 Mar. 74.

Bill size, food size, and jaw forces of insectivorous birds.—In a recent paper Willson (1972) demonstrated that the relative forces applied by seed-eating birds' bills may be correlated with bill depth and width more than length, and that small birds are limited in diet by their inability to handle large seeds. I would like to add some data on insectivorous birds (Tyrannidae) to her information, and clarify the methods used.

The bird being measured was held stationary in a plastic tube with an opening diameter slightly smaller than the bird's widest diameter. The upper and lower mandibles were inserted into metal plates with curled edges forming a tapering trough. The upper plate had upturned edges and the lower plate downturned ones. The plates were fastened to the upper and lower portions of a force pressure transducer and the jaws of the bird adjusted so that the head was severely restricted. The angle formed by the jaws was the maximum angle to which the bird opened its jaws just prior to prey capture. This angle (30–35°) was determined by analyses of high speed motion pictures of aerial captures of flies (*Sarcophaga bullata*).

The force pressure transducer was connected to a Gilson physiograph. The movement of the lower plate (the upper plate being fixed), caused by the movement of the bird's mandible, was converted into electrical impulses recorded on the physiograph. The height of the mark made on the physiograph paper was proportional to the distance the lower plate moved upward. The transducer was calibrated, by interchangeable springs, to move a certain distance under a certain force. Thus the height of the physiograph line could be easily converted into the force exerted by the bird's lower bill. The area of the bill contacting the plate was measured and the force per area (pressure) calculated. The lower jaw force only was measured as most of the muscles that function to close the bill work on the lower jaw. The upper jaw closes from the resiliency of the stretched nasofrontal hinge. I did not take into account the differences in force between the jaws, the effect of jaw kinesis, nor the strength of the nasofrontal hinge. Thus the force measured was a very general one (see Bock 1964, 1966 for detailed discussion), but was probably adequate for comparison between species.

To induce the birds to exert maximum force on the plates, both mechanical and electrical stimulation of the skin of the neck were tried. No discernable difference in results were detected. Whenever the bird tried to close its jaws, the force applied was at least fairly consistent, if not maximum.

Six species of flycatchers (Tyrannidae) were measured. Table 1 shows the average pressure exerted (g-wt per cm^2), bill measurements (mm), sample size, and standard deviation.

The correlation ($P < 0.05$) between all bill measurements is positive, and the force increases at about the same rate as bill width, somewhat slower than bill