

WINTER HABITATS OF SAPSUCKERS IN SOUTHEASTERN ARIZONA¹

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INTRODUCTION

Sexes of the Williamson's Sapsucker (*Sphyrapicus thyroideus*) are so unlike that for more than 20 years they were thought to be different species (Bent 1939). Males are largely black dorsally and laterally, while females have brown heads and are barred with brown and white on the back, wings, and flanks. This species breeds in mixed montane forests of western North America, and it winters at lower elevations and southward into northwestern Mexico. Crockett (1975) and Crockett and Hansley (1977) studied Williamson's Sapsuckers nesting in the central Rocky Mountains, but they could find no explanation for the species' extraordinary plumage dimorphism in terms of summer foraging behavior or reproductive activities. Crockett speculated that plumage differences might be related to habitat selection and feeding behavior in winter.

We recorded elevations, habitats, and feeding trees of Williamson's and Yellow-bellied sapsuckers (*Sphyrapicus varius*) as part of a general survey of winter birds in and near the Huachuca Mountains of southeastern Arizona in 1984 to 1985. All Yellow-bellied Sapsuckers were identified as belonging to the western subspecies, *Sphyrapicus varius nuchalis*. In marked contrast to *S. thyroideus*, *S. v. nuchalis* is nearly monomorphic (Howell 1952, 1953), although the white chin of the female makes it distinguishable from the male in the field. Our study had two objectives. One was to describe and compare winter habits of these two species in the southwestern United States, where they have been little studied. A second objective was to test the hypothesis that the highly dimorphic sexes of the Williamson's Sapsucker occupy different winter habitats and/or feeding trees, while the similar sexes of the Yellow-bellied Sapsucker use similar habitats and trees.

STUDY AREA AND METHODS

The Huachuca Mountains are in Cochise and Santa Cruz counties, just north of the Arizona-Sonora border. Study sites ranged from surrounding plains at about 1,350-m elevation, up to montane slopes as high as 2,100 m. Sapsuckers were discovered in the following habitats: 1) riparian woodlands associated with semidesert grasslands, where major trees were cottonwood (*Populus fremontii*), sycamore (*Platanus wrightii*), walnut (*Juglans major*), and ash (*Fraxinus velutinus*); 2) oak savannah and oak woodland (mostly *Quercus emoryi* and *Q. arizonica*); 3) oak-juniper woodland (*Quercus* spp. and *Juniperus deppeana*); and 4) pine-oak woodland, where dominant species were *Pinus chihuahuana* and *P. ponderosa*. Riparian trees of the first habitat also occurred along water courses of the

other habitats. Arizona madroño (*Arbutus arizonica*) was a minor but (it proved) important tree in the two higher elevation habitats.

We searched systematically through slopes, canyons, foothills, and water courses in the study area, recording the species, sex, habitat, and foraging tree of each sapsucker observed. Usually we tallied only the foraging tree where a bird was first discovered, but occasionally a bird was followed for up to two additional tree selections. We made an effort to avoid repeated sampling of the same areas and birds, although the scarcity and apparent mobility of female *S. thyroideus* makes it possible that not all sightings were of different birds. We recorded information on 116 sapsuckers during about 160 hr of field work, on 60 days between 8 November 1984 and 18 February 1985. Habitat data were compared between species and sexes using Chi-square contingency tables, while *t*-tests were used to compare the means of elevations. Habitat and tree selection data are shown in detail for their intrinsic interest, but adjacent categories were combined as needed to achieve expected cell frequencies ≥ 5 for contingency tests.

RESULTS AND DISCUSSION

Williamson's Sapsuckers were less abundant and less widespread than their congeners and occurred at a significantly higher mean elevation (Table 1). *Sphyrapicus thyroideus* were confined largely to pine-oak and oak-juniper habitats, where they drilled for sap mostly in pines and junipers. *Sphyrapicus varius* drilled sap holes in nearly all types of trees available. Both sexes of each species fed on madroño berries. While the two species differed significantly in terms of habitats and feeding trees (Table 1), these results do not indicate a complementary ecological relationship. Rather, the Williamson's Sapsucker occupied a subset of habitats and trees used by its more abundant and widespread congener.

Female Williamson's Sapsuckers occurred at a significantly lower mean elevation and in different habitats and trees than males, while no such sexual segregation was apparent in Yellow-bellied Sapsuckers (Table 1). While these results strongly support our initial hypothesis, the ecological segregation of male and female *S. thyroideus* was far from complete. It is not clear how this statistical difference in habitat might be related to such dramatic plumage differences, nor is it clear why the sexes should choose different habitats in the first place.

To our eyes, male and female Williamson's Sapsuckers appeared more cryptically colored on their preferred foraging substrates. Males more closely matched the bark of pines, particularly the nearly black bark of mature *Pinus chihuahuana*. Females appeared more cryptically colored on the gray-brown bark of junipers, oaks, and madroño, where they occurred more often than males (Table 1). The constant tapping associated with digging sap holes makes sapsuckers easy to locate, so that cryptic coloration may be an important adaptation against predators. But why should the sexes differ in foraging substrates?

Female *S. thyroideus* appear to be particularly attracted to sporadically available fruit crops, a fact that offers a

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TABLE 1. Elevations, habitats, and feeding trees of sapsuckers observed in or near the Huachuca Mountains in winter, 1984-1985.

	Williamson's Sapsucker			Yellow-bellied Sapsucker		
	Male	Female	Total	Total	Male	Female
Elevation (m) \bar{x}	1,883	1,710	1,824	1,685	1,690	1,670
SD	78	131	128	156	156	155
<i>n</i>	27	14	41	75	56	19
<i>t</i>	4.55*		5.17*		0.49	
Habitats (number of sightings)						
Grassland riparian	0	0	0	4	2	2
Oak woodland	0	1	1	19	14	5
Oak-juniper	2	9	11	35	27	8
Pine-oak	25	4	29	17	13	4
Chi-square	18.2*		28.3*		0.45	
Feeding trees (number of sightings)						
Deciduous	0	0	0	16	11	5
Oak	0	3	3	37	28	9
Madroño	2	9	11	15	11	4
Juniper	4	6	10	4	2	2
Pine	27	6	33	9	8	1
Chi-square	18.4*		59.4*		0.02	

* $P < 0.001$.

somewhat different possible explanation for their plumage characteristics. Russell (1925) saw a female eating juniper berries in Yosemite Valley, California. In our study area, female Williamson's Sapsuckers fed extensively on the red berries of madroño trees. Twelve of 14 sightings were of birds in or near madroño with berries. These sightings all occurred before 20 December, by which time the berry crops were exhausted and the birds apparently had moved on to other unknown habitats. The single Williamson's Sapsucker we found in oak woodland (Table 1; a female) appeared at a residence on 14 November, where she fed periodically for four weeks on the red berries of an exotic shrub. This bird disappeared on 12 December, but returned for a few days in early January and again in early February to work sap holes dug during her initial visit. Our impression of male behavior was that they remained in the same sites throughout the winter, mostly working sap holes in the same few pines.

There is other evidence that female *S. thyroideus* may be more nomadic and opportunistic than males in winter. Swarth (1904) saw a flock of about 12 birds moving through high elevation conifer forests in the Huachuca Mountains in April 1902, all but one or two of which were females. Williamson's Sapsuckers occasionally appear in winter in the low deserts of southern Arizona, far out of their usual habitats (Phillips et al. 1964). From the records of William B. Davis (pers. comm.), five of six birds seen in winter at such low elevations were females ($P = 0.094$ if sexes are equally abundant).

The plumage of female *S. thyroideus* appears essentially neotenic, resembling that of juvenile *S. varius*. It could be that female Williamson's Sapsuckers are members of a "fugitive sex" (sensu Hutchinson 1951): one that moves opportunistically in search of sporadically abundant fruit crops, and one that has lost plumage signals that might make it conspicuous to competitors or might elicit an aggressive response from them (especially from conspecific males and *S. varius*). This scenario is opposite that proposed for Red-headed Woodpeckers (*Melanerpes erythrocephalus*) by Kilham (1978), wherein females presum-

ably came to resemble the brightly colored males in order to successfully defend their winter territories against them.

Results of this study suggest that male and female Williamson's Sapsuckers choose winter habitats and foraging trees in ways that are consistent with their extraordinary plumage dimorphism. However, our data are restricted to one year and one mountain range. We encourage other observers, including compilers of Christmas Bird Counts and other winter censuses, to record the distributions of sexes of this unusual species in the future.

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