

IDENTIFICATION AND DISTRIBUTION IN CALIFORNIA OF THE *SPHYRAPICUS VARIUS* GROUP OF SAPSUCKERS

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INTRODUCTION

In his recent paper on avian hybridization, Short (1969) recommended that the three sapsuckers, Yellow-bellied *Sphyrapicus varius*, Red-naped *S. nuchalis*, and Red-breasted *S. ruber* be treated as distinct species, thus opening a new chapter in a long controversy. *S. ruber* was described as a new species in 1788 by Gmelin. Ridgway was the first to suggest its subordination to *S. varius* in 1872 and again in 1873 and 1874. In his "Birds of North and Middle America" (1914) he returned to treating it as a distinct species. Meanwhile the A.O.U. Check-list had retained the full species status in its three first editions (1886, 1895 and 1910), changing to a racial treatment in the fourth edition, in contrast with Ridgway's own change of mind. *S. nuchalis*, described by Baird in 1858, was subsequently treated as a race of *varius* by most authorities, starting with Coues in 1872 and Ridgway in 1873, but Ridgway included a note of warning in "Birds of North and Middle America", writing, ". . . I believe that it would be better to consider [*nuchalis*] as specifically distinct from *S. varius*." The main issue was already the interpretation of the "intermediates" or "hybrids". Grinnell (1901), for instance, claimed to see "continuous intergradation" between *S. varius* and *S. ruber* through *S. nuchalis*, a view opposed by Ridgway but one which presumably weighed heavily in the later decision of the A.O.U. Clearly, arguments over specimens could not lead anywhere, and careful study of the contacts between the forms was required, a need which was partially filled by Howell (1952). After studying in detail the contacts between the Red-breasted and the Red-naped Sapsuckers and summarizing the very scanty information available on the contacts between the Yellow-bellied Sapsucker and the other forms, Howell supported the then current treatment of the A.O.U., considering the three forms as conspecific. Dickinson (1953),

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on the contrary, found convincing evidence for retaining *ruber* as a distinct species in his analysis of British Columbia material. Apparently little further progress was made in the field, but in 1969, Short, in the course of a general reassessment of the taxonomic implications of hybridization, applied his criteria to Howell's information and thus reversed the latter's decision.

A result of the long treatment of the three forms as races of one species, is the complete lack of information on identification in field guides and a consequent confusion as to the status of the various forms in several areas. In California, for instance, there is a widespread belief that most birds are "intermediates", resulting in reluctance of field observers to make positive identification of these forms, finally leading to ignorance of their comparative distribution and abundance, and failure to recognize real hybrids or ascertain their frequency. Even specimens are misidentified, sometimes in a manner that approaches the unbelievable. It seems warranted, therefore, to summarize the problems related to the identification of the three sapsuckers, their distribution, and the frequency of hybrids.

Throughout the paper *S. varius*, *S. nuchalis*, and *S. ruber* are considered as distinct species, as suggested by Short (op. cit.). This treatment is also followed by McCaskie, Devillers, Craig, Lyons, Coughran, and Craig in the California Checklist (1970). This choice will be further explained in the paragraph devoted to the contacts between the species.

GENERAL DISTRIBUTION

As a background to the discussion, an outline of the general distribution is presented here, condensed from Howell (1952), the A.O.U. Check-list (1957), Godfrey (1966), Griscom in Miller et al (1957), and various other sources which are quoted where relevant. Designations of the biomes are those of Shelford (1963), and are capitalized.

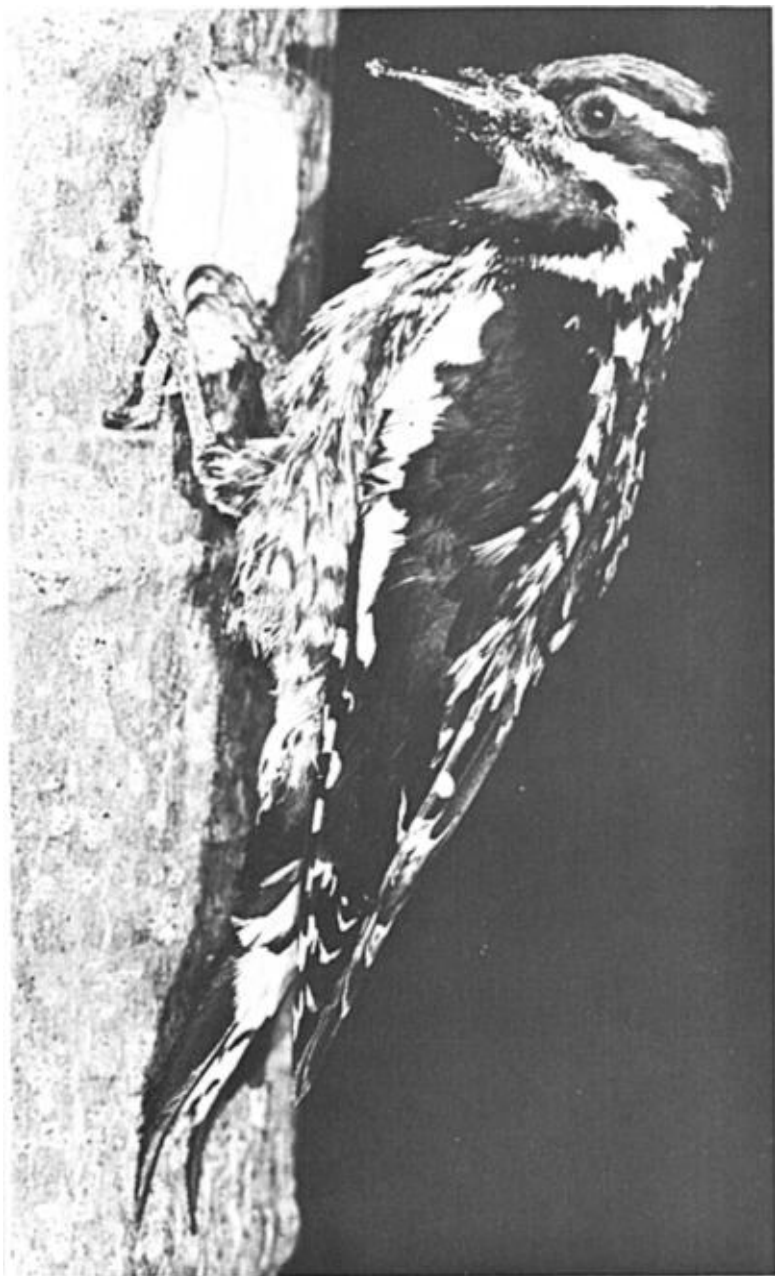
The Yellow-bellied Sapsucker breeds in the southern half of the trans-continental Boreal Coniferous Forest belt and in the Northern Temperate Deciduous Forest of the eastern United States and Canada.

In the West its range extends to southern Yukon and includes north-eastern British Columbia (Peace River Valley) and western Alberta (east of the Rockies). Within this region it occurs in deciduous or deciduous-coniferous stands, particularly where poplars and birches are important constituents. It winters throughout the southeastern United States and Central America, north to about 40 degrees latitude, west to central Oklahoma (Sutton, 1967), eastern Texas, eastern Coahuila, southern Durango, and southern Sinaloa. It is of irregular occurrence in southern Arizona (Phillips, Marshall, and Monson, 1964).

The Red-naped Sapsucker is characteristic of the Montane Coniferous Forest region of western North America (excluding the Sierra Nevada). It breeds north to southeastern British Columbia and southwestern Alberta, west to the east slope of the Cascades and a few points on the east slope of the Sierra Nevada, south to central Arizona (Phillips et al, 1964) and the Mogollon Mountains of southern New Mexico (Hubbard, 1965). Outside the range mapped by Howell, it has been found nesting in the Black Hills of South Dakota by W. and K. Eastman (Gammell and Huenecke, 1954; Gammell, 1956; no supporting details). It breeds in forests containing aspen or aspen mixed with conifers, more rarely in predominantly coniferous forests. It winters in southern California, most of Arizona (except the northwest), southern New Mexico, the whole of Baja California, and the northwestern part of the Mexican mainland.

The Red-breasted Sapsucker has two well differentiated races. The northern race, *S. ruber ruber*, is practically limited to the Rainy Western Hemlock Forest of the northern Pacific coast, occurring from southeastern Alaska to southern Oregon, and extending east of the Cascades at a few points in Oregon and Washington, as well as inland in British Columbia to the Peace River Parklands. It winters in the coastal part of its range. The southern race, *S. ruber daggetti*, breeds in a small region of the southern part of the same biome in northwestern California as well as in the Cascades of southern Oregon, the Sierra Nevada, and the higher mountains of southern California. It is a bird of aspen-ponderosa pine association, except in its restricted coastal range. It winters at lower elevations throughout California and in northwestern Baja California.

It is evident from this that the three species have different migratory habits, *varius* being a long distance migrant, *nuchalis* intermediate, and *ruber* a short distance migrant, the northern race almost resident.



Red-naped Sapsucker *S. nuchalis*, presumed female, at nest hole in an aspen, western Wyoming, July 1969.

Photo by Herbert Clarke.



Red-breasted Sapsucker *S. r. daggetti* bathing in a small stream, Mt. Pinos, June, 1968.

Photo by Herbert Clarke.

NATURE OF THE CONTACTS

This section is a summary of the information gathered by Howell; its purpose is to further explain why the three forms are treated as distinct species; in addition it will clarify views about prevalence and significance of hybrids.

THE RACES OF *RUBER*

The two forms, *ruber* and *daggetti*, meet in southern Oregon between Klamath Lake and the coast. Inland the replacement is rather abrupt, but in the coastal region there is apparently progressive intergradation which justifies the treatment of the two forms as conspecific. All intermediates can thus be expected, both in the contact area and in the winter range of *daggetti*.

CONTACTS OF *VARIUS* WITH THE OTHER TWO FORMS

Next to nothing was known about the possible contacts of the Yellow-bellied Sapsucker with the other two species at the time of Howell's studies; he did not investigate them himself, and, as far as I know, they have not yet been studied. This remains the main gap in our knowledge of the complex and one which will have to be filled before any reasonably certain conclusions can be drawn. The Yellow-bellied and Red-naped Sapsuckers are presumed to come in contact in western Alberta but the region has not been critically explored; it is further assumed, because of the scarcity of possible hybrids in series of birds taken on migration or in winter, that interbreeding is very limited (Howell lists six possible hybrids). *S. varius* definitely comes in contact with *S. ruber ruber* in northern British Columbia, in the Peace River Parklands. Prior to Howell's study there had been two observations in that region, one (Swarth, 1922) including an apparent mixed pair observed (*varius* + *varius* x *ruber*) and a lone hybrid collected, the other (Cowan, 1939) a pair of typical *ruber* breeding within eight feet and fifty feet, respectively, of two pairs of *varius*. I have been able to trace only two recent observations, both merely indicating the presence of lone Yellow-bellied Sapsuckers in the known range of the Red-breasted, north of Prince George (Rogers, 1968 and 1969). No hybrids are known from the migration routes, but they could be confusingly similar to *nuchalis* x *ruber* or *nuchalis* x *daggetti* hybrids, or even typical

nuchalis, as indicated by the specimen taken by Swarth, described by Howell.

CONTACTS OF *NUCHALIS* AND *RUBER*

The ranges of *S. nuchalis* and *S. ruber daggetti* come in contact along the eastern slope of the Cascade-Sierra ranges from southern Oregon to central California. The overlap region is always very narrow. The contact was studied in detail by Howell in Modoc County, extreme northeastern California. He found the overlap region to be about forty miles wide; at a point in the middle of this area, he found the following repartition for a sample of forty-two individuals: eight typical *nuchalis*, fourteen typical *daggetti* and twenty birds showing some degree of intermediacy. (Of these, eleven are in the categories labeled as close to one species but with traces of the other, which could include some extreme variants of the pure forms in addition to true hybrids.) Thus, even with the most severe criterion, more than fifty per cent are typical birds. In central California, the contact seems to take place almost without overlap and with very little interbreeding. In the Sierra Nevada *daggetti* occurs virtually alone; collecting nine miles west of Benton produced ten *daggetti* and one hybrid, in the Sweetwater Mountains nine typical *daggetti*, one typical *nuchalis* (Howell, op. cit.). Just to the east, in the White Mountains, *nuchalis* is the only form present and is common (Miller and Russel, 1956; McCaskie, pers. comm.). The same situation prevails farther to the southeast in the Spring and Sheep Ranges of Nevada where, however, Johnson (1965) recorded two hybrids, very close to pure *daggetti*, one in each range; the Sheep Range bird was paired with a *nuchalis* female. An individual *daggetti* with traces of *nuchalis* characteristics was collected on 16 September 1964 in the Charleston Mountains (Austin and Bradley, 1965). Still farther southeast, a lone *S. r. daggetti*, apparently unpaired, was taken in the Hualapai Mountains (Arizona) in July 1959 (Coppa, 1960); *nuchalis* was breeding in the vicinity.

The northern race of *S. ruber*, *S. r. ruber*, meets *S. nuchalis* along the Cascades from southern Oregon to central British Columbia (with *ruber* to the west of *nuchalis*) and in the Cariboo Region of central interior British Columbia (with *ruber* to the north of *nuchalis*); Howell studied their contact at two points and in both cases found almost no overlap, but instead an abrupt replacement of one form by the other. At the Cascade location (where the replacement occurred on either

side of a burn 2.7 miles long), he noted 10 pairs in the contact area, only one of which was mixed (female *nuchalis* with male *ruber* showing slight traces of hybridization). At the Cariboo region location, between Quesnel and Williams Lake, he noted complete replacement of one form by the other over 1.5 miles (except for one *ruber* and one intermediate found paired with *nuchalis* in the range of the latter, among five pairs of pure *nuchalis*). In the replacement zone he found two pairs of *ruber*, two pairs of *nuchalis*, one pair of intermediates, and one pair involving an intermediate and a *nuchalis*.

Recently a pair of apparently pure *nuchalis* was found nesting thirty miles north of Quesnel, well to the north of the contact studied by Howell and within the range of *ruber* (Rogers, 1967). Together with the recent observations of *varius* in the Prince George region, this brings the three species within a fairly limited area.

CONCLUSIONS

Short (op. cit.) has proposed that contact areas be classified either as "hybrid zones" if only hybrids occur in the area of hybridization, or as "zones of overlap and hybridization" if both parental forms are present in the zone, as well as numerous hybrids. In the latter case, the parental forms are actually sympatric, and Short recommends treating them taxonomically as species. The number of parental phenotypes that must be present to preclude the possibility of their being the result of recombination is arbitrarily fixed by him at not less than five per cent of the population.

It is clear from the previous discussion that the contacts between *S. ruber* and *S. nuchalis* both qualify as "zones of overlap and hybridization", justifying their treatment as distinct species. Indeed, the contact between *ruber* and *nuchalis* involves very few hybrids, while that between *daggetti* and *nuchalis* involves about fifty per cent hybrids at most, well below the threshold proposed by Short. The same applies to the overlap between *varius* and *ruber*, as far as we know. On the other hand, the criterion cannot be applied to the *varius-nuchalis* relationship. The specimens from the wintering area constitute only indirect and very poor evidence for limited interbreeding. A far more convincing argument for holding them as distinct species is found in the juvenile plumage and the timing of the moult. In these characters the two forms certainly do not seem more closely related than *nuchalis*

and *ruber* are. Let us still emphasize, however, the need for a study of the presumed overlap area.

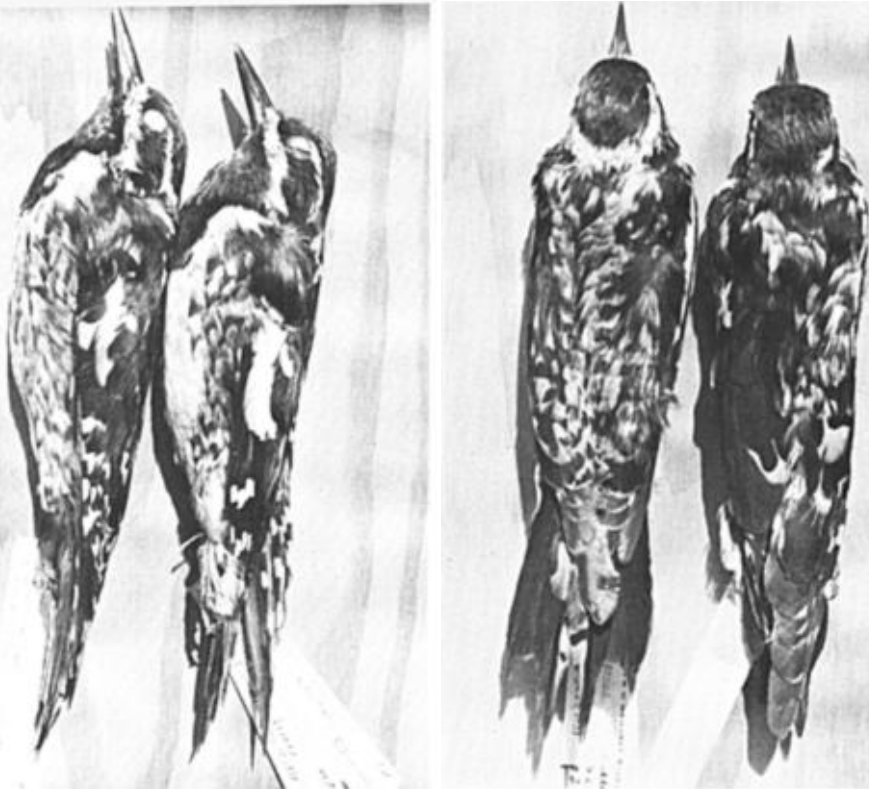
IDENTIFICATION

From the foregoing it is clear that one should not expect a high proportion of hybrids on the wintergrounds, and therefore the idea that most sapsuckers are intermediate should certainly be discarded. It remains true that the possibility of hybrids considerably complicates certain aspects of the identification problem. Conversely, recording possible hybrids away from their breeding grounds can be very interesting in connection with the study of the migrations of the species, and careful notes should be made of any bird presumed to be intermediate.

Descriptions of all the forms can be found in Ridgway (1914) and Howell (1952); Bent (1939) discusses the juvenile plumages and the progress to maturity. The discussion of identification in this section is based on their accounts, on personal field notes, and particularly on examination of the collection of the San Diego Natural History Museum (hereafter referred to as SDNHM), consisting of 21 *varius*, 102 *nuchalis*, and 62 *ruber*.

ADULTS

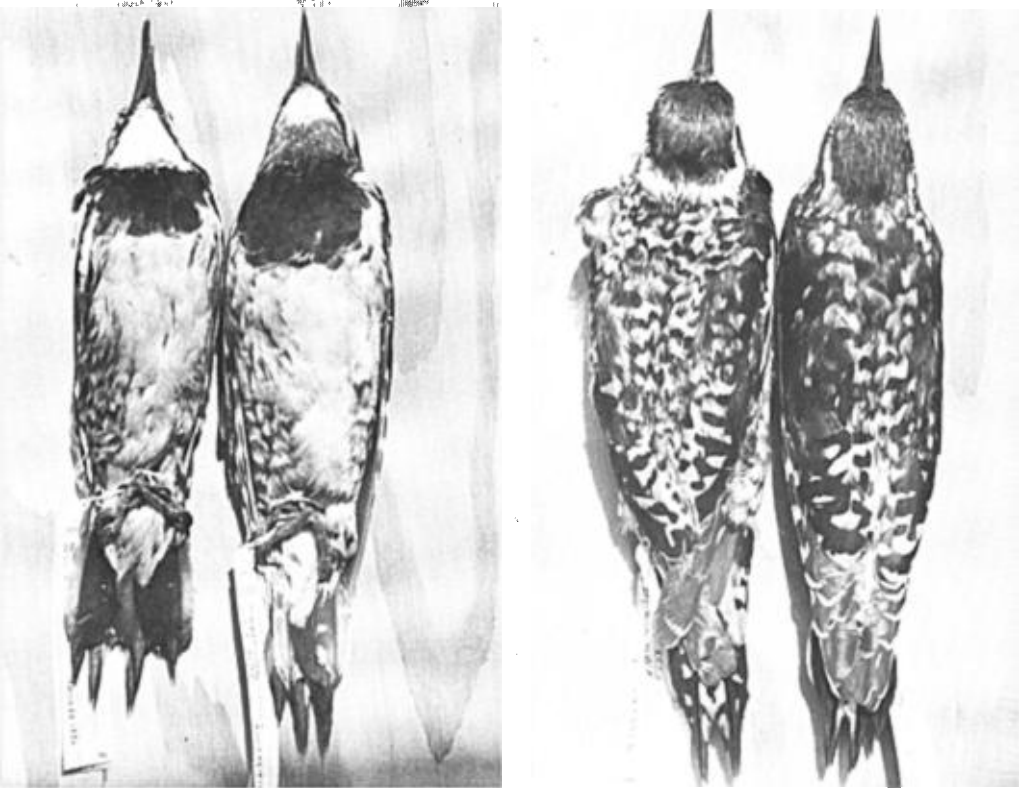
Adult Red-breasted Sapsuckers (males and females alike) are separated at first glance (except from hybrids!) by their complete red hood, including head, nape, and breast (fig. 11 & 12). It should be noted, however, that the dark and pale head markings of the other forms remain visible as an underlying pattern in *S. r. daggetti* and, to a much lesser extent, in *S. r. ruber*. Most field guides depict *S. r. ruber*, which accounts for the false impression that the *daggetti* seen are "intermediates". In fact, a long white or whitish moustache, black lores, and a white postocular spot are normal features of *S. r. daggetti*; this race has as much white on the back as *S. nuchalis*, or slightly less. *S. r. ruber* differs from *S. r. daggetti* (see fig. 11) by its deeper red and usually more extensive hood with the head pattern very obscure, a blacker back with the white reduced to two very narrow stripes, broken and often tinged with yellow, and deeper yellow underparts. However, the two races do not normally occur together, and they are too similar to allow reliable field identification of possible strays, unless the bird is handled.



FIGURES 1 and 2. Male Yellow-bellied Sapsuckers (left in each photograph) and Red-naped Sapsuckers (right in each photograph). Note the extent of red on the throat; in *nuchalis*, the black bordering line is interrupted, in *varius* it is not. Also compare the color of the nape: white in *varius*, red in *nuchalis*. The greater amount of white on the back of *varius* is also visible.

Specimen photographs by Alan M. Craig

The separation of *varius* and *nuchalis* is far more delicate, and in some cases feasible only under extremely favorable conditions. Whenever possible, any critical bird should be trapped and examined in the hand. Both species have the same basic pattern: a red crown bordered by black; black auriculars continuing in a black band on the sides of the neck; a black nape interrupted by a white or red area; a red or white throat bordered by black, which also forms a broad breast patch; white underparts tinged with yellow; barred flanks; a black back and black scapulars with a greater or lesser admixture of white or whitish, either forming two distinct stripes or covering the entire back; black wings barred with white on the flight feathers, and with a large longitudinal white patch along the anterior part; a white rump; and a black tail with white bars and spots.



FIGURES 3 and 4. Female Yellow-bellied Sapsuckers (left in each photograph) and Red-naped Sapsuckers (right in each photograph). Note the white throat and chin of the former, while the latter has a red throat and a white chin. Again, the white nape of *varius* and the red nape of *nuchalis* can be seen; although the female *varius* has more white on the back than the female *nuchalis*, both specimens show more white than the male *nuchalis* in fig. 2.

The most important character in separating the two species, irrespective of the sex of the bird, is the color of the nape (fig. 2 & 4). Yellow-bellied Sapsuckers have the black nape line (the line that joins the posterior crown to the upper back) interrupted by a white or brownish-white area connected with the postocular stripe. In Red-naped Sapsuckers the corresponding area is red. Unfortunately, it is possible that this single character is not always reliable. I have not found any individual in the SDNHM that did not show it, but Howell, who has examined a larger number of specimens, claims that the nape of *varius* is "rarely tinged lightly with red" and, worse, that for *nuchalis* "in very rare instances the red of the nape is lacking". Besides, the red coloration is confined to the feather tips and could conceivably disappear through wear (complete moult in late summer and fall, partial moult about the head and throat early in spring – Bent, 1939).

Furthermore, even a small degree of hybridism could lead to the modification of such a single character. For all these reasons, it is not possible to rely entirely on the color of the nape for positive identification, and further supporting characters will have to be sought.

Male *nuchalis* can be fairly easily separated by the following additional characters: The throat is entirely red; the red covers the posterior part of the black malar strip, thus *interrupting* it and actually coming in contact with the white of the cheek; the red also extends over the upper part of the breast patch (fig. 1); often the auricular region is tinged with red. The white on the back is restricted to two definite stripes converging posteriorly; these stripes are narrower than those of *varius* (the stripes are chain-like, the white line being interrupted by black bars; however, in male *nuchalis* the individual white elements tend to be long and narrow, looking like "drops" while on those *varius* that show a "two striped" effect, the individual elements are short and broad, producing a ladder-like appearance); the white is usually pure or tinged with yellowish (fig. 2).

At the other extreme, female *varius* (fig. 3) are easily determined by their entirely white throat, without any red, bordered by a black frame. Some individuals lack red on the crown also.

Male *varius* have a solid red throat, and differ from male *nuchalis* primarily by the uninterrupted black frame that borders the throat, so that the red does not come in contact with the white (fig. 1). Additionally, they have more white on the back; either the white spotting covers the back almost uniformly, or, if stripes are formed, they are broad and have the ladder appearance explained above (fig. 2); the white, at least in winter, is usually tinged with golden or bronzy buff; it is slightly different from the color of *nuchalis* when the two are compared directly.

Most female *nuchalis* have a white chin and a red throat (fig. 3), or sometimes a white chin and upper throat with only the lower throat red; this alone is sufficient to identify them. Unfortunately, a certain number of birds show an almost entirely red chin and throat, and they may be impossible to separate in the field from male Yellow-bellied Sapsuckers except by the color of the nape. Such a bird is shown in fig. 5 together with a male *varius*. Among 16 adult and 14 subadult (i.e. brown breasted) *nuchalis* individuals labeled as female in the SDNHM collection, 8 (3 adult and 5 subadult) have enough red in the throat and chin for those parts to be called entirely red in the field; 3 of those (1 adult, 2 subadult) have interrupted black frames and would simply pass for male *nuchalis* (which they might well be!),

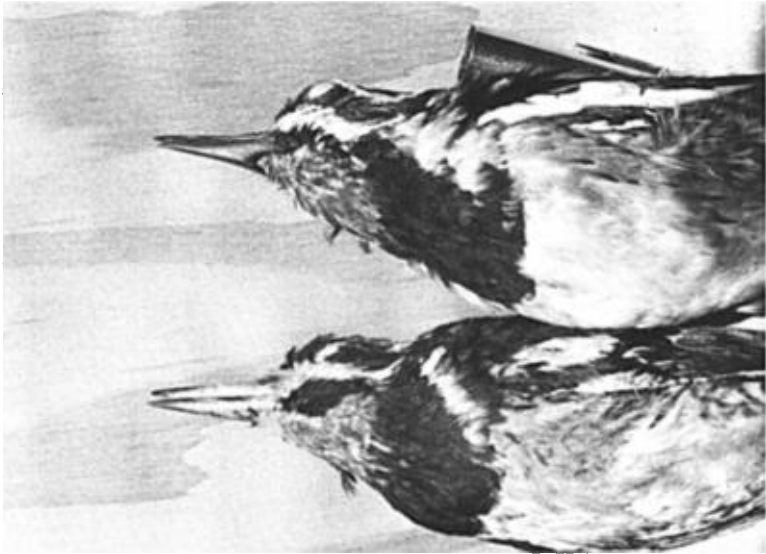


FIGURE 5. This photograph illustrates the difficulty of separating some female Red-naped from male Yellow-bellied Sapsuckers. This particular female *nuchalis* (below) has almost as red a throat as the male *varius* (above), and also has an uninterrupted black malar strip; note, however, that the former shows a little whitish near the base of the bill.

but 5 (2 adult, 3 subadult) have complete frames and could be called male *varius* in the field except for their red napes. Here lies, as already pointed out by Phillips and Marshall (1964), the main pitfall in field identification of *S. nuchalis* and *S. varius*. For those birds with a complete black frame around a solid red throat, the following guidelines are suggested. Male *varius* will have a truly uniform red throat, while, for female *nuchalis*, an admixture of white feathers will usually be noted, particularly toward the chin, if the bird can be examined in the hand or at very close range. *Varius* will in general have more white on the back, the pattern being indicated above; most female *nuchalis* have the same type of pattern as male *nuchalis* (narrow chain-like stripes), but some show the ladder-like stripes of *varius* and a very few do not even show any band pattern (fig. 4). Finally, it seems to me somewhat unlikely (?) that the red nape would be lacking in such a heavily pigmented female *nuchalis*, and it is not at all certain that the combination of fully red throat and white nape does exist in pure *nuchalis* females.

Any bird presenting what seems to be a combination of characters between the two species should be very carefully described and, if possible, photographed since very few possible hybrids are known.

As an illustration to this discussion, color drawings can be found in various field guides. The Red-breasted Sapsucker is very satisfactorily shown by Crosby in Godfrey (1966), by Eckelberry in Pough (1957), and by Peterson (1961), but all have chosen the race *ruber* for a model (as apparently did Singer in Robbins et al, 1966). Both sexes of the Yellow-bellied Sapsucker are well represented by Crosby in Godfrey, although the black frame around the throat is perhaps normally broader than shown, and by L. Agassiz Fuertes in Forbush and May (1953); a good picture of a male is given by Singer in Robbins et al. Satisfactory drawings of Red-naped Sapsuckers are not frequent, but Eckelberry shows a male in Pough; however, the red of the throat is more extensive than shown.

IMMATURES

The juvenile plumage of all species is strikingly different from the adult plumage, appearing mostly brown, with the red areas lacking, the white areas much obscured, the black head and breast pattern replaced by brown. The tail and wings are similar to those of adults. This plumage is replaced by a slow progressive moult. The three species are very similar to each other at that stage and their identification requires great care. Since *nuchalis* is somewhat intermediate in appearance between *varius* and *ruber*, we will discuss successively the *nuchalis-varius* and *ruber-nuchalis* identification problems.

The timing, sequence, and manner of the moult is of decisive importance in the identification of the first two species. Howell hints that the progress might be faster in *nuchalis* when he writes, "Moult is apparently as in *S. v. varius*, but adult plumage is sometimes attained by late fall and always by early spring at the latest." The *varius* material in the SDNHM is insufficient to draw definitive conclusions, but immature plumaged birds have been collected in September (1), October (5), December (1), February (1), and on 15 March (1); none has a uniformly red crown, and the March bird, a male, still has very little red in the throat. The *nuchalis* material is much more extensive. Twelve birds are in almost complete juvenile plumage; they were taken between 26 July and 2 September; four of them have partially red

crowns and some red on the throat (2 females: 26 August, 2 September; 2 males: 18 and 20 August); two (males, 6 August) have some red on the throat but none on the crown. Two birds collected on 3 and 30 August are intermediate, already showing a lot of the adult pattern, including a red nape, as well as some red on the crown and the throat. The other immatures (22 birds) show a completely adult-like plumage except for a brown, scalloped breast, and sometimes some brown in the malar stripe; they were collected in August (1), September (6), October (10), and early November (5). Only four specimens showing signs of immaturity were collected at a later date; two of them have a lot of black in the brown breast (male, 16 January and female, 28 December); a 5 February female might be hybrid, as is almost certainly the fourth bird, collected on the same date at the same place.

Thus, except on the breeding grounds, immature *nuchalis* can be expected to show much of the adult plumage, particularly the red areas, so that their identification is not different from that of adults; indeed, all the birds we have examined, except the twelve in nearly full juvenile plumage, show the red nape. Confusing females have already been included in the previous section under the label subadult. On the contrary, immature *varius* are much slower in developing, and individuals can be seen during most of the fall and winter with little or no red in the crown and throat; it is useful to discuss their characters in detail.

At any stage, the pattern of the crown is the most diagnostic feature of *varius*. At first the entire crown is dark brown, dotted with fine, sharp, very conspicuous, pale brown to golden or whitish spots, sometimes slightly elongated (fig. 6 & 8); often there is also a scattering of black spots. Later, scattered red feathers appear randomly throughout the crown, adding to the variegated effect; the red feathers cover more and more of the crown, but the light dotting remains apparent until the crown is solidly red. Conversely, juvenile *nuchalis* has a uniform dark brown crown, slightly darker than *varius*, sometimes with faint, paler brown spots, but rather diffuse and inconspicuous (fig. 8); often there is a uniform red suffusion, particularly near the bill and on the forehead. Soon, it seems that a solid red patch develops from the same area and includes progressively the whole crown; some of our birds show a partially red crown: the red region covers only the anterior crown, but there are no isolated red feathers appearing elsewhere.

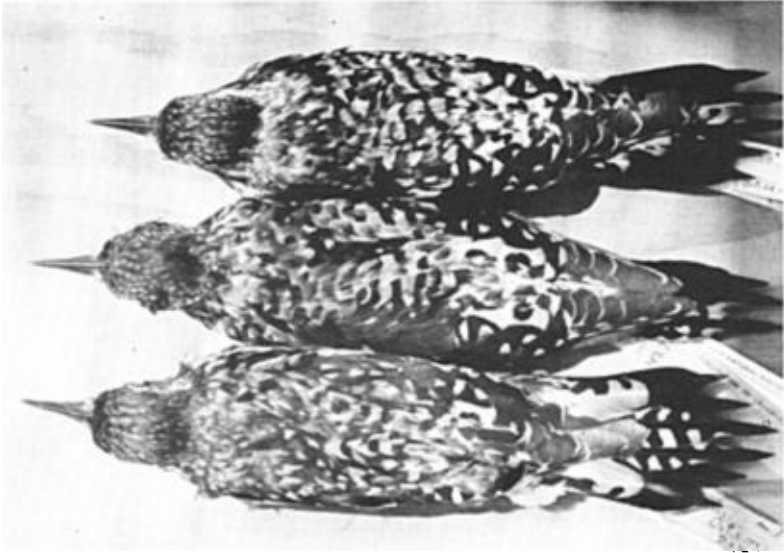
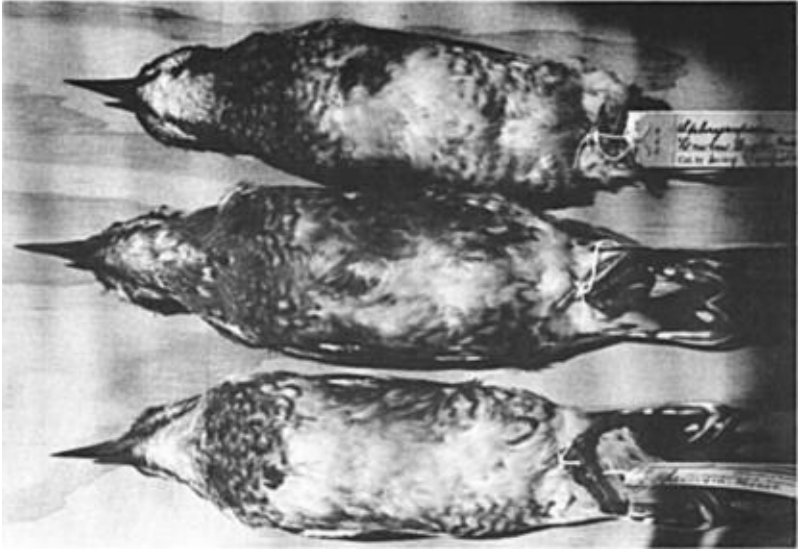


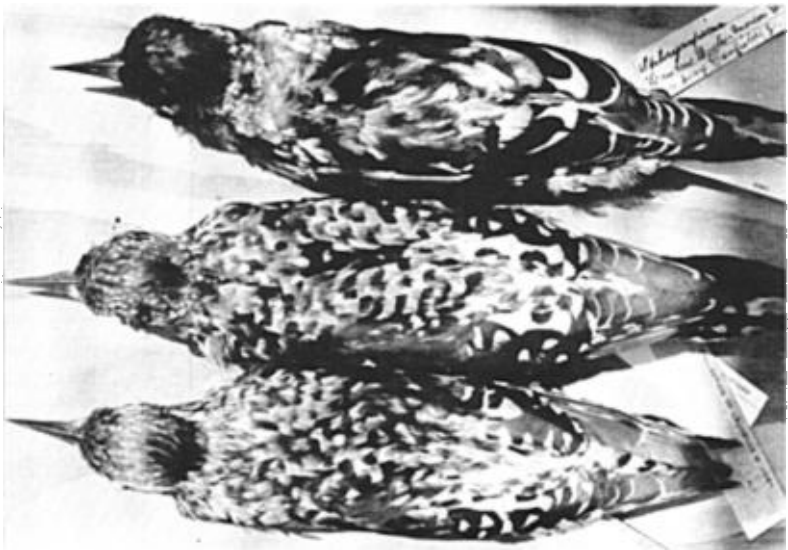
FIGURE 6. Three immature Yellow-bellied Sapsuckers. Note the spotted crown and spangled back. The bird in the center is the California specimen (lower Colorado, 18 December 1938).

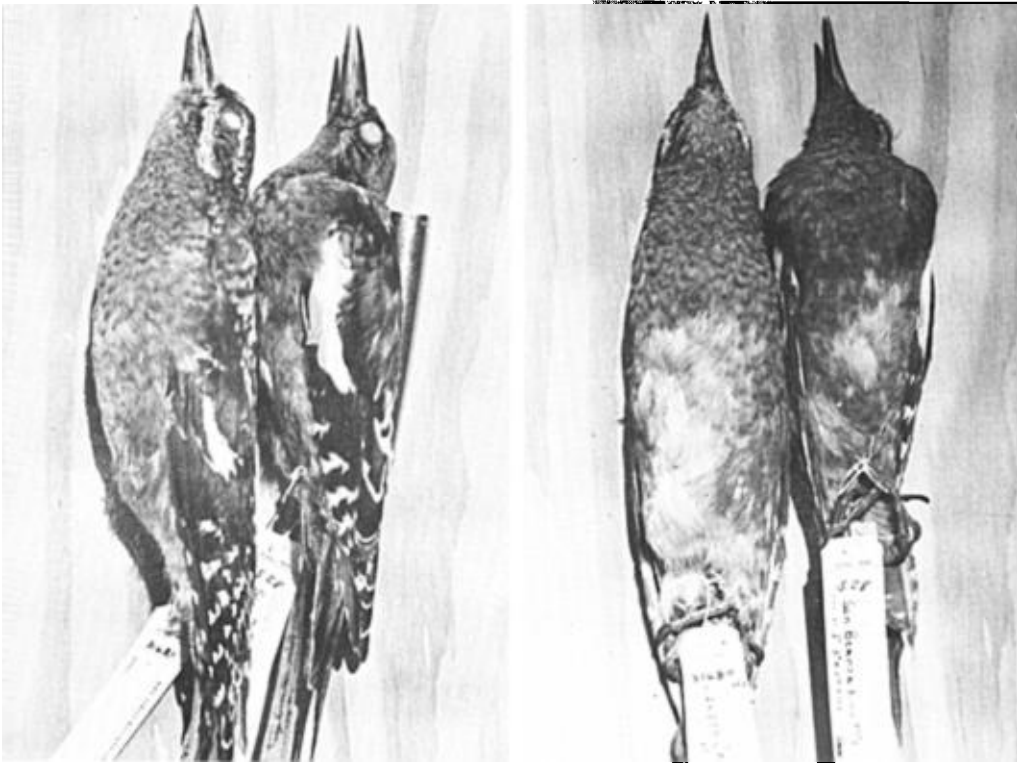
The light stripes of the head pattern are usually broader in *varius* than in *nuchalis*, and less sharply defined, giving a more frosty appearance; this is very difficult to evaluate and somewhat subjective. The supposed darker chin and throat of *nuchalis* (Howell) does not hold. (fig. 7).

Almost all our *varius* have a very yellow belly and the breast is yellowish buff-brown with heavy, sharp, dark brown scalloping. Juvenile *nuchalis* have a more uniform breast, brown with fine, indistinct scalloping; the belly is much less yellow. This corresponds to the descriptions of Ridgway and Howell, but it probably represents different stages of plumage. One *varius* in the collection, #22691 collected in Georgia in October, has hardly any yellow on the belly and an indistinctly scalloped breast; it is indistinguishable in that respect from juvenile *nuchalis* and may be representative of juvenile *varius*. Also, many *nuchalis* that have progressed beyond the complete juvenile plumage have the belly as yellow and the breast as distinctly scalloped as *varius*; note, however, that in that case they have fully developed red areas.



FIGURES 7 and 8. Two December immature Yellow-bellied Sapsuckers (two lower birds in each photograph) are compared with an August juvenile Red-naped Sapsucker (upper bird in each photograph). The California *varius* is in the center. Note the uniform brown cap of *nuchalis*, and its relatively unpatterned back. The heavy scalloping of the breast of *varius* can be seen. It is evident in these figures as well as in fig. 6 that the California bird has the characters of *varius*. In addition, the new white feathers of the throat of this bird can be seen in fig. 7.





FIGURES 9 and 10. August juvenile Red-naped Sapsucker (left in each photograph) and Red-breasted Sapsucker (right in each photograph). The latter has obscure face striping and a darker, more uniform breast. The specimen shown represents *S. ruber daggetti*.

The backs of all our immature *varius* are extremely striking, being entirely spangled with deep golden or very deep buff offset by black (fig. 6 & 8). The material available does not permit judging whether the juvenile bird is similar, but Bent describes a young bird, not fully grown, taken 25 July as boldly spotted with grayish or yellowish white on black. The back of juvenile *nuchalis* is a dull dark brown to black with white spotting, obscured on the upper back, and not tinged with buff or yellow, except sometimes on the lower part of the stripes (fig. 8); in first winter plumage, when the adult type back is acquired, it is not as extensively spangled nor as deeply colored as in *varius*; again in that case, the red areas are present.

According to Howell an occasional *S. nuchalis* is pale enough to be indistinguishable from a dark *S. varius*. However, we think that the pattern of the crown, at least, should make identification possible at any stage of plumage.

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Juvenile Red-naped and Red-breasted Sapsuckers (fig. 9 & 10) are also fairly similar. *Ruber* has a darker head and breast, more sooty, and its breast is even more uniform, almost lacking any scalloping; better, the striping of the head of *ruber* is much obscured, reduced to a whitish moustache and frequently a dull white postocular spot (in *daggetti*). Usually the pileum, throat, and breast are washed with reddish, in which case identification is very easy. At any rate, the timing of the moult of *ruber* is very similar to that of *nuchalis*, or even faster, so that the adult plumage can usually be recognized at a very early age, simplifying the identification considerably. Birds away from the breeding grounds should pose no problems.

Very few color drawings of immature sapsuckers can be found in field guides; the bird shown by Peterson corresponds somewhat to *nuchalis*, while Singer's (in Robbins et al) is a combination of *varius* and *nuchalis*.

DISTRIBUTION IN CALIFORNIA AND BAJA CALIFORNIA

The distribution of the different forms within the two states is still imperfectly known, because of the lack of specific data from field observers, and the resulting necessity to rely on collected material which is by nature a very small and incomplete sample of the populations involved. This section is based mainly on the distributional checklists of Grinnell (1928) and Grinnell and Miller (1944), the studies of Howell (1952), and an examination of the SDNHM collection. The latter involved the reassessment of several specimens. All the specimens of the collection were discussed with Jean T. Craig, and she concurred with the identification of the critical individuals, namely *S. varius* (#31656), *S. nuchalis* x *S. varius* (#14286) and *S. r. ruber* x *S. nuchalis* (#31652) from Bard, along the lower Colorado, *S. r. ruber* from San Diego County (#30061) and the various hybrids *S. ruber* x *S. nuchalis* mentioned later. Our determinations were made by comparison with the local material only. The most important specimens (#31656, #30061, #31652) were examined by Alan M. Craig who agreed with their interpretation. Finally, #31656 and #30061 were sent to Dr. Allan R. Phillips who very kindly accepted to examine them.

The Red-breasted Sapsucker breeds in the coastal district south to Mendocino County, in the entire Sierra Nevada and in the connecting mountainous area in the extreme northern part of the state (extending east to the Warner Mountains). Isolated populations are found on the highest mountains of southern California, Mt. Pinos,

San Gabriel, San Bernardino and San Jacinto Mountains, and also on Mt. Palomar. As far as we know, the fact that the bird breeds on Palomar has not been published before. Arthur G. Morley (pers. comm.) has records of the species in Palomar State Park throughout the summer, from May (March in 1970) to September. His records date back to 1957. He obtained positive evidence of nesting twice; he observed a bird feeding young in an alder on 26 June 1966 (altitude 4600 feet) and he examined a fledgling found in a campground on 13 July 1970. All this information was generously supplied by Mr. Morley from his personal notes, together with ample details supporting the identification. I have seen the species, myself, on Palomar, but at a slightly different location from that of A. G. Morley's observations, on 14 April 1968. In winter, it occurs throughout the state but only very rarely in the southeast. Grinnell and Miller (op. cit.) mention only one record for the Mojave and Colorado Deserts. In Baja California it is recorded only from the western slope, south to Rosario. San Diego County and Baja California specimens in the SDNHM are from September 20 to February 17. Local sight records extend to early March (PD).

The only race included in the avifaunas of the states by Grinnell (1928) and Grinnell and Miller (1944) is *daggetti*. As Howell indicated, Grinnell somewhat arbitrarily assigned all northern California breeders to this race; actually, a line cannot be drawn to separate precisely the ranges of the two races, and the northern part of the state belongs to the region of intergradation. Birds referable to *S. r. ruber* can, however, occur in winter. A specimen taken five miles northeast of Lakeside, near San Diego, on 9 November 1957 (SDNHM #30061) is exactly similar to the *ruber* material in the collection, which is entirely from Oregon. The red color is of the same depth and intensity, the red hood as extensive, and the back is identical, very black with greatly reduced and very yellow stripes. There are no white edgings to the outer tail feathers. The specimen shows a little more white than average on the extreme upper back. We feel that it belongs to the southern population of *ruber*, showing intergradation with *daggetti*. Dr. Phillips (in litt.) also assigns it to *ruber* but remarks that he, as well, could compare it only with Oregon material, and that the bird may represent the middle part of a cline. He adds that he has two probable migrants, taken in Humboldt County in October and February, which are still darker red and may represent birds from British Columbia. The San Diego bird is shown in fig. 11, between specimens of *ruber* and *daggetti*.

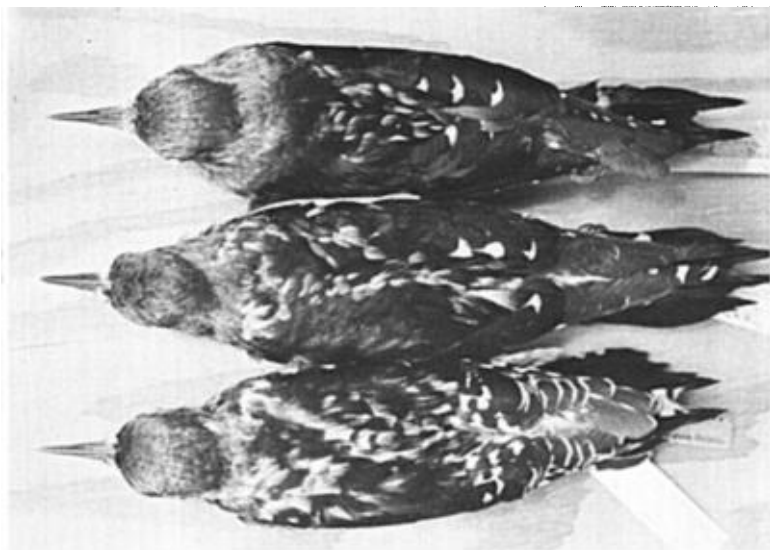


FIGURE 11. Red-breasted Sapsuckers. The lower specimen is typical of *daggetti* and the upper one of *ruber* (Oregon population). Note on the latter the lack of white on the back and on the remiges. The bird in the center is from San Diego County and approaches *ruber*.

The Red-naped Sapsucker breeds in the Warner Mountains where it is, by far, the dominant species. It also occurs, mixed with the Red-breasted and hybridizing with it, in neighboring areas to the west (Howell, 1952). Farther south it is a common breeder in the White Mountains (Miller and Russel, 1956; McCaskie, pers. comm.). A few pure birds might breed in the Sweetwater Mountains and adjacent areas of the east slope of the Sierra Nevada (Howell, 1952). It winters along the lower Colorado, in the Mojave and Colorado deserts, the coastal region south of about 35° of latitude, and sparingly over the entire peninsula of Baja California. It is everywhere the only or the dominant form, except on the Pacific slope of southwestern California, where it is rarer than *daggetti*. SDNHM specimens from southern California or Baja California have been taken between early October and early February; local sight records extend to early March (PD). There is a scattering of winter records from the area west of the Sierran divide and north of the 35th parallel. Those listed by Grinnell and Miller include one from Shasta County, five from the west slope of the Sierra Nevada and four from the coastal district between Marin and Santa Cruz Counties (some of those may pertain to migrants). More

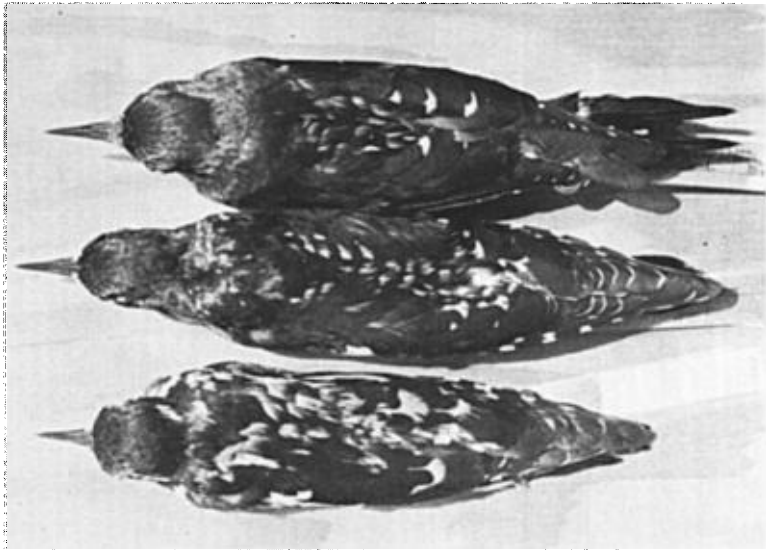


FIGURE 12. A hybrid sapsucker, taken along the lower Colorado (center) is compared to a Red-naped Sapsucker (below) and a Red-breasted Sapsucker of the *ruber* race (above), the presumed parental forms. Note the great reduction of white on the back of the hybrid, which points to the black-backed *ruber* rather than to *daggetti*.

recently, winter records have been published (without supporting details) from the San Francisco Bay area (South San Jose, 20 January 1966, reported by D. D. McLean; Chase and Chandik 1966) and, more remarkably, from Mendocino County (Westport, 6 and 20 December 1954, seen by R. Coy; Cogswell and Pray, 1955).

Hybrids between the two species have been taken in summer in the overlap region, as mentioned earlier. The record of a hybrid, feeding young in the San Gabriel Mountains, far outside the contact area (McCaskie, 1964) should be disregarded (G. S. Suffel, pers. comm.). Wintering intermediates between *nuchalis* and *daggetti* are mentioned by Howell from "southern California" and Santa Cruz Island; he refers a specimen from Crescent City (northern coast), 29 November 1915, to *nuchalis* x *ruber ruber*. In the SDNHM collection, we recognize as *daggetti* x *nuchalis* hybrids, a bird from Dehesa, San Diego County (#31644, male, 15 February 1919), and one from the Pinta Mountains, Kern County (#11719, male, 4 November 1907). An individual taken near Lakeside, San Diego (#30058, 10 October 1957) is a hybrid of

nuchalis with either *ruber* or *daggetti*. An intermediate from the lower Colorado is, in our opinion, a *ruber ruber* x *nuchalis* hybrid; the white spotting of the back is reduced to very little (#31652, female, vicinity of Bard, 31 December 1916). It is shown in figure 12 between typical examples of *nuchalis* and *r. ruber*. A second hybrid is more difficult to assess, but may have the same origin (#31661, female, 23 October 1924, one mile north of Potholes). A few other individuals of either *nuchalis* or *daggetti* show "traces" of the other form but are very difficult to judge since they may be extreme variants.

The Yellow-bellied Sapsucker is not known to occur regularly in California or Baja California. One occurrence has been reported in the state: Pasadena, 19 July 1950 (Davis & Howell, 1951). The record was not accepted by McCaskie and coworkers (1970), because it pertained to a mummified specimen the origin of which clearly remains in doubt. The bird is an adult female, with a few red feathers in the throat indicating a probable degree of hybridism.

The species can, however, be expected in the two states, at least occasionally, since it has been recorded irregularly in the Tucson area of Arizona (Phillips et al, 1964, mention its occurrence in seven different winters, beginning in 1940, with several in 1952-53), and, at least casually, to the Arizona bank of the lower Colorado (Phillips et al, op. cit.).

In the SDNHM collection, specimen #31656, an immature female collected two miles north of Bard on the west side of the Colorado near Yuma, on 18 December 1938, by Laurence M. Huey, shows the characters of typical *varius*. The bird is illustrated in figure 6 with two Yellow-bellied Sapsuckers in similar plumage and in figures 7 and 8 with a Yellow-bellied and a juvenile Red-naped Sapsucker. In addition, the following description was made of the specimen:

Chin and upper throat white. Dark brown moustaches. Lower throat and upper breast gray-brown. Middle breast heavily scalloped with dark brown on light brown. Belly and undertail-coverts pale yellow. Flanks brown, scalloped with blackish. Cheek brown and black. Whitish stripe behind eye. Crown dark brown, with fine, sharp, pale brown spotting, four red feathers and some black spots towards the rear. Upper back mostly golden buffy with black spotting. Lower back showing two broad golden buffy "ladders" with a narrow black line separating them. White band on closed wing (coverts). Primaries black, barred with white. Tertiaries broadly edged with white. Tail black; the inner webs of the middle pair of rectrices are barred black and white; the lateralmost rectrices have white dots on both webs.

The spotted crown with a few scattered red feathers is characteristic of *varius*; the coloration and pattern of the back and of the

underparts fall well within the limits of variation of that form. The lack of adult characters around the head is very unlikely for *nuchalis* at the late date this bird was collected (Dec. 18). Dr. Phillips compared this individual with his material and concurs with the identification. He writes (in litt.) that "this bird is a perfectly typical [*Sphyrapicus varius*] *varius*, and a good basis for its inclusion in the California list" (Dr. Phillips does not subscribe to recognizing three species of *varius* without further field evidence). He also points out that the bird has several new *white* feathers in the lower throat, including one with a black terminal spot; this region is always red in *nuchalis*. Those feathers, particularly the black tipped one, are visible on the photograph (fig. 7).

A female in the SDNHM collection, #14286, taken three miles north of Bard, on 5 February 1931, by L. M. Huey, has a white throat except for red patches in each lower corner, widely separated. The nape has a fair admixture of white (to what extent is difficult to judge on a specimen), the white stripes of the head are very broad, and, as mentioned before, the bird has a complete brown breast at the late date of 5 February. We consider this bird almost certainly a hybrid *nuchalis* x *varius*.

A second female, #14285, taken on the same day at the same place, cannot be positively assigned but could also be of mixed ancestry. The red of the throat is more limited than usual, being restricted to a narrow band on the lower quarter of the throat. The breast is brown with little black.

Finally, for the sake of completeness, the following observation from the San Diego area is related. The main reason to present it, is that only an accumulation of material, pertaining to probable or certain typical birds, and particularly to birds that exhibit possible hybrid characters, will permit drawing useful conclusions. A very few records will not throw much light on the status of the form within our boundaries, because of the complexity of a situation that may involve unrecognizable hybrids. In addition, this record will illustrate some of the difficulties involved in field identification.

On 20 December 1969 at Imperial Beach, just south of San Diego, Xenia Devillers located a sapsucker and drew my attention to it. The woodpecker was working low on the trunk of a eucalyptus tree with its back to the observers. It resembled a Red-naped Sapsucker, but, at first inspection, the complete lack of red on the nape was very striking; suspecting that the bird could be a Yellow-bellied Sapsucker, I took the following description of it:

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Forehead and crown bright red bordered with black; black stripe running down the middle of the nape interrupted by a very narrow white gap just below the crown. Black stripe through eye to the sides of the neck. Chin and throat bright red bordered by a broad black band. Rest of head and neck whitish. Upper breast brownish; rest of underparts yellowish; flanks marked with dark gray "V"s on a yellowish ground color. Center of the back, black. On either side, a broad band, buff or pale brown, barred with black. Coverts black with a broad white band near the edge of the wing. Secondaries black with large white dots. Primaries black with fine terminal white edges. Rump white. Tail black.

The bird was kept under observation for about half an hour as it worked in a small group of eucalyptus trees located in an old overgrown garden. The general area is residential with eucalyptus-bordered lanes, the trees bearing numerous marks of sapsucker presence. Several attempts at relocating the bird later both by the writer and by other observers failed. Long, careful scrutiny at less than thirty feet, with 7x50 binoculars, and in good light (bird at eye-level), showed beyond any doubt that there was not a trace of red on the nape and that the narrow interruption in the black stripe was white. Considerable attention was also given to the chin in order to eliminate the possibility of a female *nuchalis*, and no white feather could be found.

We are unfortunately confronted with a bird with a full red throat and a complete black frame, which is the most difficult type. However, in addition to the very significant white nape, the complete lack of white in the throat and the wideness of the black frame are characters of male *varius*. The pattern of the back with very broad and ladder-like pale stripes is also indicative, although it is not extreme and could easily be matched by a female *nuchalis*. In addition, the buff coloration is of *varius* type. A completely brown breast at this late date is unlikely in *nuchalis*; on the other hand, it is early for *varius* to have complete red areas on crown and throat. The evidence seems to point towards a male Yellow-bellied Sapsucker in transitional plumage, but the possibility of a hybrid or of an extreme variant *nuchalis* (female) cannot be entirely eliminated.

I hope these notes will encourage observers to study sapsuckers critically, particularly along the lower Colorado and in the San Diego area; I feel confident the near future will produce more records of *varius*.

"VAGRANCY" IN THE *SPHYRAPICUS VARIUS* COMPLEX

The consideration of "extralimital" records in this group is particularly interesting, because of their connection with the hybrid-

zation phenomenon. Four forms with very different migratory habits come in contact and hybridize. Since the migration mechanisms are in all probability under genetic control, it is to be expected that they will be strongly affected by hybridization. Hybrid individuals will inherit the migratory behavior of either of the parent species, or perhaps some combination of both, if such a thing is possible. We can thus expect to find hybrids in the winter range of either of the parent species, and this could, of course, include birds which are phenotypically (at least as far as external appearance is concerned) identical to the other parent species, although genetically of mixed ancestry. Such birds would appear as "pure" individuals having straggled from their normal range. Many of the extralimital occurrences of sapsuckers can probably be explained by such a mechanism. One can argue that innumerable "vagrant" records also exist in species that do not hybridize in this manner. However, those involve mostly birds on migration which can be assumed to have defective orientation mechanisms. They are not usually found wintering much closer to or much farther from the breeding range of the species than normal individuals. The "vagrant" sapsuckers, on the contrary, are mostly seen in winter, in areas which are well outside the winter range of the species they resemble, but inside that of another form. The journey involved may be much longer, or much shorter, than that normally performed by the species. It is notable, furthermore, that among those "extralimital" individuals there appears a number of clear hybrids.

S. r. ruber, an almost sedentary form, is recorded from Arizona (three records, October to February, Phillips, et al, 1964); in addition, an "occasional intermediate towards *nuchalis* has been taken" (Phillips, et al, op. cit.). From southern California there are the San Diego bird (#30061), approaching *ruber*, and the lower Colorado *ruber* x *nuchalis* (#31652 and possibly #31661) mentioned before.

S. r. daggetti, a short distance migrant, has straggled to Arizona, (two records, Sacaton, 9 February 1910, and lower Colorado, 23 January 1953 — Phillips et al, 1964); a bird identified as a hybrid *daggetti* x *nuchalis* was collected in Albuquerque, New Mexico, on 13 March 1962 (Niles, 1966).

S. nuchalis has been found in Guatemala, according to Griscom (1932), hundreds of miles south of its normal range, but in the range of *varius*; I have not seen the original Salvin and Godman record, also quoted by the A.O.U. and have no idea of its validity. Records from San Luis Potosi and Yucatan are mentioned in passing by Howell (1953), but I do not know the basis of his statement, and the records

have not been included in the A.O.U. checklist (1957), or in the Mexican Checklist of Miller et al. (1957). A scattering of records from California, west of the Sierran divide and north of the 35th parallel, are north of the normal wintering range, but in the range of *S. ruber*. Particularly significant is the Westport record (Cogswell and Pray, 1955).

S. varius is irregularly found in Arizona and probably to southern California. It is difficult to decide whether this constitutes the northwestern limit of the normal winter range (the bird having been overlooked in northwestern Mexico), or whether the range as outlined by Howell is correct, in which case all the Arizona-California records could pertain to a genetically mixed stock. It should be noted that such birds would not have to be scattered throughout the wintering range of the other parent species, since they could parallel the habits of a local population, which might occupy a limited portion of the wintering range. The large number of birds involved in the Arizona records (in the winter of 1952-53, in the Tucson area, *varius* outnumbered *nuchalis*, G. Monson, 1953) however, supports the idea that the region is within the normal wintering range of the Yellow-bellied Sapsucker.

Certainly, a very interesting pattern could be revealed by careful observation of "extralimital" sapsuckers and particularly of probable hybrids on their wintering grounds. As pointed out by Howell, those may be particularly difficult to identify, since many could be matched by extreme types of individual variation within the typical population.

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I am greatly indebted to Suzanne I. Bond for permission to study the collection of the SDNHM, and for assistance in that study, including the sending of specimens. I am obliged to Dr. Allan R. Phillips for his kindness in examining those specimens and his extremely useful comments. Alan M. Craig generously accepted to illustrate the paper and examined the critical specimens. I am particularly grateful to Jean T. Craig for her collaboration in analyzing the entire specimen collection, fruitful discussions on identification and invaluable help in bringing the manuscript to its final form.

SUMMARY

The general distribution of the Yellow-bellied Sapsucker *Sphyrapicus varius*, Red-naped Sapsucker *S. nuchalis* and Red-breasted Sapsucker *S. ruber* is briefly outlined. The information gathered by Howell about their contact and hybridization is summarized and the more recent scattered observations concerning these matters are added. The reasons to treat the three forms as distinct species are discussed.

The identification problem is considered in detail, using the San Diego Natural History Museum (SDNHM) collection as a reference. Adult Red-breasted Sapsuckers can be easily identified by their red hood, with or without white and black head markings. Red-naped Sapsuckers are very similar to Yellow-bellied Sapsuckers but have a red patch in the middle of the nape. In addition, male *nuchalis* have an extensive red throat patch, overlapping the malar stripe, while female *varius* have a completely white throat. Usually, female *nuchalis* have a white chin and a red throat but some have the throat entirely red, and are very similar to male *varius*. In juvenile plumage, *varius* can best be told from *nuchalis* by its spotted crown (*nuchalis* has a uniform crown); *ruber* is characterized by indistinct head striping and often a reddish suffusion over the hood. At later stages Red-naped and Red-breasted Sapsuckers show very rapidly the red areas of the adult plumage; Yellow-bellied Sapsuckers, on the contrary, are very slow in acquiring those marks; a scattering of red feathers on the crown is typical of them. Additional characters are discussed in the text, both for adults and for immatures, and this summary should by no means be used as a "key".

The distribution in California and Baja California is summarized from standard sources, recent literature, and with the help of the SDNHM collection. The Red-breasted Sapsucker is fairly widespread as a breeder in the mountainous and northern areas, wintering everywhere, except in the desert. The Red-naped Sapsucker is a very local breeder in extreme eastern California, wintering in southern California and in Baja California. The Yellow-bellied Sapsucker, not previously recorded from either state, is represented by a specimen in the SDNHM collection, an immature female taken in December along the lower Colorado. An individual of the northern race of *ruber*, from San Diego County, is described; the race had not been recorded from the two states. Several hybrid *ruber* x *nuchalis*, *nuchalis* x *daggetti* and particularly one *varius* x *nuchalis* found in the SDNHM collection are mentioned.

Finally, extralimital records in the group are discussed and it is argued that many result from the interbreeding between the forms.

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APPENDIX

Date and locality of collection of the specimens illustrated:

Fig. 1, left, male *varius*, 21 February 1930, Texas; right, male *nuchalis*, 19 February 1938, Nevada. Fig. 2, left, male *varius*, 5 March 1933, Georgia; right, male *nuchalis*, 19 February 1938, Nevada. Fig. 3, left, female *varius*, 28 March 1930, Georgia; right, female *nuchalis*, 27 April 1878, Colorado. Fig. 4, left, female *varius*, 20 April 1916, Wisconsin; right, female *nuchalis*, 27 April 1878, Colorado. Fig. 5, below, female *nuchalis*, 25 July 1903, Colorado; above, male *varius*, 1 October 1891, New York. Fig. 6, immature *varius*; above, female, 26 October 1928, Georgia; center, female, 18 December 1938, California; below, male, 5 October 1927, Georgia. Fig. 7, and 8, above, juvenile male *nuchalis*, 1 August 1917, Modoc County, California; center, immature female *varius*, 18 December 1938, California; below immature female *varius*, 18 December 1924, Georgia. Fig. 9 and 10, left, juvenile female *nuchalis*, 19 August 1917, Modoc County, California; right, juvenile *daggetti*, 14 August 1885, San Bernardino Mountains, California. Fig. 11, above, *ruber*, 2 November 1913, Oregon; center, *ruber*, 9 November 1957, San Diego County, California; below, *daggetti*, 5 December 1926, Baja California. Fig. 12, above, *ruber*, 2 November 1913, Oregon; center, female *nuchalis* x *ruber*, 31 December 1916, California; below, male *nuchalis*, 19 February 1938, Nevada.

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