TAXONOMIC STATUS OF THE CALIFORNIA GNATCATCHERS OF NORTHWESTERN BAJA CALIFORNIA, MEXICO

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The California Gnatcatcher (*Polioptila californica*) was first described as a new species by Brewster (1881) from specimens collected at Riverside, California. Later, Grinnell (1926) merged it with *Polioptila melanura*, as a subspecies. Phillips (1980) and Rea (1983) considered it a different species, and Atwood (1988), in a taxonomic revision of the black-tailed gnatcatcher complex, demonstrated that the two forms are sympatric in Baja California on the east side of the central peninsula (29°–31° N), have distinctly different vocalizations, and mate non-randomly. Therefore, he concluded that they were different species. The California Gnatcatcher ranges from the southern tip of the peninsula north to about 31° N. From there northward it is restricted to the Pacific coastal area as far as Los Angeles and Riverside, California.

The California Gnatcatcher is a polytypic species, that is, geographic variation in it has been expressed by the naming of subspecies. The northernmost subspecies, nominate *californica* as traditionally understood (American Ornithologists' Union 1957, Wilbur 1987), ranges from 30° N in Baja California to southern California (San Diego, Orange, Los Angeles, and Riverside counties). In examining the few fresh-plumaged (fall–winter) specimens from northwestern Baja California, however, we found that they did not seem to be nominate *californica*, although they also differed from those of the central peninsula. We did not know whether these differences, through a north–south distance of 360 km, were part of a gradual transition or a stepped cline. Many other sedentary birds vary geographically within this area. Therefore we undertook a more intensive study of the California Gnatcatcher's variation in northern Baja California with newly collected specimens.

TAXONOMIC HISTORY

The first additional subspecies of the California Gnatcatcher to be named was *P. c. margaritae* Ridgway, 1888, described from Isla Margarita, Baja California Sur (24°25' N). It was considered by Grinnell (1926, 1928) to range north to 29° 30' N. In 1926, Grinnell segregated the population from the Cape region, Baja California Sur, as *P. c. abbreviata*. Van Rossem (1931) considered *abbreviata* indistinguishable from *margaritae*, but described *P. c. nelsoni* from Bahía de San Francisquito, on the coast of the Sea of Cortez, 28° 26' N. This subspecies was said to be intermediate in color and size as well as range between *californica* and *margaritae*. The subspecific name *nelsoni* was preoccupied by *P. nelsoni* (= *P. caerulea*

nelsoni) Ridgway, 1903, and van Rossem himself renamed the subspecies as *P. c. pontilis*.

This was the taxonomy accepted in the fifth edition of the American Ornithologists' Union's checklist (1957), which gave the distribution of this intermediate form as from Bahía de San Bartolomé, 27°40' N, on the west coast, San Ignacio, 27°17' N, in the interior, and Bahía de San Francisquito, 28°26' N, on the Gulf of California, south at least to San Bruno, lat 27°9' N.

Atwood (1988), in his analysis of the distributional limits of the members of the black-tailed gnatcatcher complex, commented briefly on the variability found in the peninsula. He concluded that only two forms should be admitted, *P. c. californica* and *P. c. margaritae*. He reported an abrupt transition in many characteristics at about 25° N but only a slight clinal variation to the north. However, in spite of its broad title, Atwood's (1988) monograph primarily addresses the issue of species limits (see summary, p. 67), which it does admirably. The problem of geographic variation within the range of the segregated species *P. californica* is only incidentally, and not meaningfully, addressed. In a later work, Atwood (1991) recognized three subspecies: nominate *californica*, occurring from the northern limit of the species to about 30° N, *margaritae* between approximately 24° and 30° N, and *abbreviata* south of 24° N.

Phillips (1991:25-26) also addressed the taxonomy of *Polioptila californica*. He too considered the nominate subspecies *P. c. californica* to range south to 30° N. He tentatively recognized *P. c. pontilis* in the central peninsula, and *P. c. margaritae* from about 27° N southward, synonymizing *P. c. abbreviata* with a query. He could not agree with Atwood's (1988) abrupt transition at 25° N. Under "remarks" on the nominate (northernmost) race, Phillips stated, "Geographic variation within these dark [northern] populations is indicated; need I repeat endlessly, 'There are few clean, fresh-plumaged specimens'? Sorry." At least two subspecific taxa are represented south of 30° N. Therefore we will use the name *pontilis* as traditionally understood (A.O.U. 1957, Phillips 1991).

METHODS

The field work for this study was conducted in the northwestern part of the state of Baja California, Mexico, between the international border and El Rosario. The vegetation is composed of Mediterranean communities: coastal sage and maritime succulent scrub, near the coast, and chaparral, farther inland.

We collected 40 specimens from 19 localities between 16 January and 27 February and again in December 1991. Some spring visits were made to determine if there was a replacement of the individuals that had been removed. The gnatcatchers were collected with mist nets. At first we attempted to attract the birds with a tape recording. Later we used the recording to find the birds, then herded them into the net. Captured birds were sacrificed or released. We removed for measurement one outer rectrix from most males that were released. This also enabled us to recognize them subsequently in the field. The collected birds were prepared as study skins

by Philip Unitt (San Diego Natural History Museum), without chemical preservatives.

These specimens were compared with specimens of the two neighboring subspecies, *P. c. californica* and *P. c. pontilis*, from the following collections: American Museum of Natural History, New York (AMNH), California Academy of Sciences, San Francisco (CAS), Carnegie Museum of Natural History, Pittsburgh, Denver Museum of Natural History, Los Angeles County Museum of Natural History (LACM), Museum of Vetebrate Zoology, University of California, Berkeley (MVZ), San Diego Natural History Museum (SDNHM), University of California, Los Angeles (UCLA), and Western Foundation for Vertebrate Zoology, Camarillo. We compared a total of 72 females and 81 males from the ranges of these two forms as traditionally defined. Additionally, we compared 17 males and 13 females of *P. c. margaritae*.

In analyses of gnatcatchers, many variables have been measured (see Atwood 1988:5–8). Of these, only the following have been found taxonomically relevant (Atwood 1991, Phillips 1991, this study): darkness of both upperparts and underparts, brown wash (back, flanks, crissum) of females, amount of white in the tail, and tail length. Bill size might be a significant variable in the southern quarter of the species' range, but it was not significant within the area of our study.

The majority of museum specimens of the California Gnatcatcher are males, since they are more responsive on territories and easier to collect than females. However, geographic variation in this species is greater in females, as in many other passerines, for example, thraupines, icterines, emberizines, and carduelines (Rea 1983:122).

We attempted to quantify plumage color by means of a spectrophotometer but found that this instrument failed to give consistent readings, even of a single specimen. The spectrophotometer, designed to measure the colors of flat and uniform surfaces, seems ill suited for the variable texture of feathers. Therefore we made our comparisons visually, using only natural light from a north-facing window or from an east-facing window when the sky was overcast. For color comparisons we used Ridgway's (1912) and Smithe's (1975) standards.

Unfortunately, many skins from the northern end of the species' range (Los Angeles, Riverside, San Bernardino counties) are severely soiled (see also Rea and Weaver 1990:92–94). Most of these were taken early in the twentieth century and have soot-stained plumage. To be sure that we were comparing genetic differences, not artifacts of industrialization, we had to exclude over half of the fall/winter specimens from southern California from analysis. A list of these excluded specimens is available from the Birds and Mammals Department, San Diego Natural History Museum. The ultimate norm for evaluation was seven clean early fall specimens collected in the early 1980s by Atwood and Rea (LACM, UCLA, SDNHM). We also excluded worn specimens taken from April, occasionally March, through August. Insofar as possible we segregated recently taken specimens (12 years or less museum age) from more ancient skins. However, in this species, foxing (color change associated with time after preparation) is slight and seems restricted largely to the gray underparts, with little or no

apparent change in brown areas (Figure 1). In evaluating the amount of white in the tail, we used only those specimens with evidently adult rectrices (crisp patterns and unfrayed tips).

The specimens collected for this study were deposited in the vertebrate collection of the Escuela de Biología, Universidad Autónoma de Baja California. Later, 24 of them were exchanged with the San Diego Natural History Museum.

RESULTS AND DISCUSION

Within the area studied (the state of Baja California beginning at 28° N northward through coastal southern California) there is a stepped cline in the geographic variation of California gnatcatchers, with three increments, representing three subspecies or races (Figure 2). All populations have reduced white on the tips of the outer pair of rectrices (maximum 4.5 mm) and all are largely gray below, unlike populations south of, at least, 25° 30' N, which have extensive white in the outer rectrices (4.5 mm or more) and are largely white below.

Polioptila c. californica

The northermost step in the cline represents the nominate race, *P. c. californica* Brewster. It is characterized by females with the darkest and

Figure 1. Females of *Polioptila c. californica*, showing lack of evident foxing. Left, three old specimens (MVZ, SDNHM, LACM); right three recent specimens (UCLA, SDNHM).

warmest (more pinkish) brown backs and the most strongly brown-washed flanks and crissum. Their back color is nearest Sepia of Ridgway (1912) and similar to color 23, Raw Umber, of Smithe (1975) but diluted. The ventral browns are near Snuff Brown of Ridgway and similar to color 33, Cinnamon-Brown, of Smithe. In both sexes there is less white on the abdomen than in the race to the south. There is a greater tendency in males to have

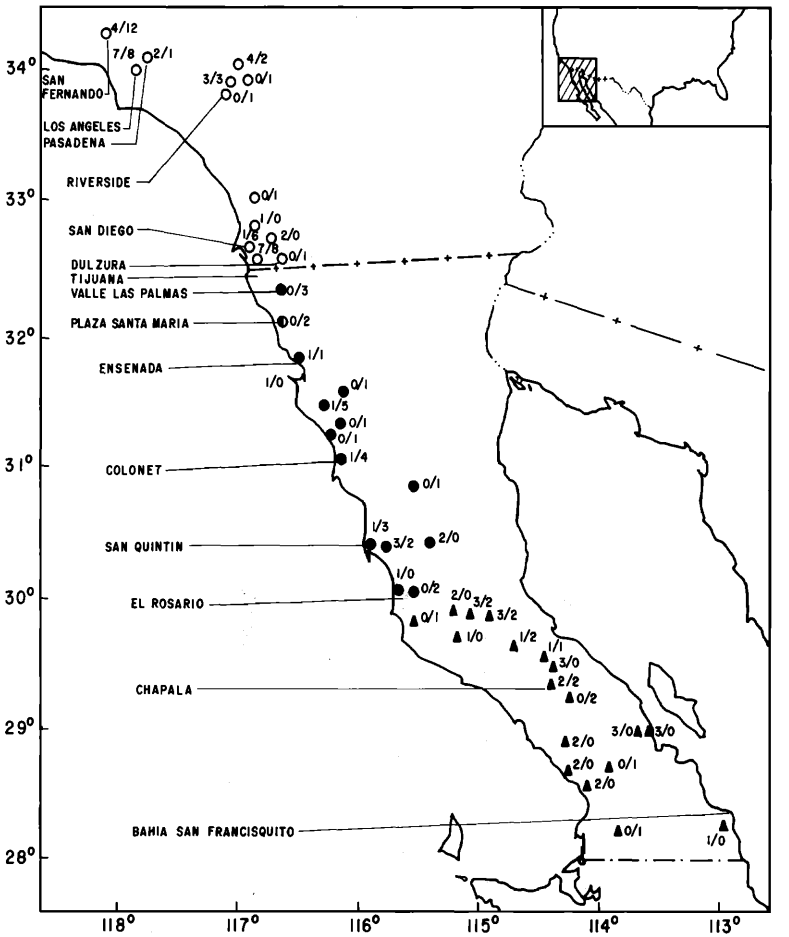

Figure 2. The distribution of California Gnatcatchers in Baja California, Mexico, and California, U.S.A. Open circles, *P. c. californica*; solid circles, *P. c. atwoodi* subsp. nov.; half-filled circles, intermediates between the above two; triangles, *P. c. pontilis*. Numbers indicate numbers of males, then females, examined from each locality. Some localities in close proximity have been lumped.

a dilute brown wash on the back (22 of 25 clean specimens) than in the next race.

The following specimens document the known southern limits of the nominate race: along the coast, a female taken in Baja California 5 miles (8 km) south of monument 258, the westermost international boundary marker (MVZ 52719, 1 January 1928). Three females and two males taken in the Tijuana River valley just north of the border in October 1917 are also good *P. c. californica* (UCLA 25370, 25371, 25379, 25378, AMNH 758890). Both males have a brown wash on the back. Farther inland, *californica* is represented by a female from Dulzura, San Diego Co. (AMNH 377606, 26 October 1891). This specimen is shown in Figure 3.

The next step in the cline is undescribed. The population of northwestern Baja California may be known as

Polioptila californica atwoodi subsp. nov.

Types. Adult female, adult or possibly immature female, and adult male, SDNHM 48443, 48444, and 48442, respectively. Collected 6.5 to 7 km west of Colonet on the road to San Antonio del Mar, Baja California (31° 06' N) by Eric Mellink, prepared by Philip Unitt. Tail lengths 48.4, 50.15, and 52.6 mm, respectively. Weights 5.25, 5.65, and 5.7 grams, respectively.

Description. Similar to *P. c. californica* in size and tail markings, but in females back paler and grayer, less brown, between Brownish Olive and Olive-Brown of Ridgway, similar to color 33, Cinnamon-Brown, of Smithe (Figure 3); flanks and crissum grayer, less brownish, the color tending more toward dilute Tawny-Olive of Ridgway, similar to color 29, Brownish Olive, of Smithe (Figure 4). In fresh plumaged males, backs usually clear gray (2 of 11 with a faint brownish wash) (Figure 5). There is a strong tendency for the secondary edgings to be whiter in *atwoodi*, duller and buffier in *californica*. In both sexes, darker gray, both above and below, than in *P. c. pontilis* (Figures 6, 7).

Range. From Río de las Palmas and Valle de las Palmas (30 km SE of Tijuana) in the interior and at least Punta Banda along the coast south to Arroyo El Rosario, 32° to 30° N. The extension of this race farther north in the interior may be associated with the dryer climate of the area (170 mm rainfall in Valle de las Palmas vs. 270 in Tijuana, García 1973).

Habitat. Nominate *P. c. californica* inhabits soft chaparral or coastal sage scrub (*sensu* Westman 1983) with little vertical stratification except for scattered Lemonadeberry bushes (*Rhus integrifolia*) and Laurel Sumacs (*Malosma laurina*). Oberbauer (1992) estimated that southern California has lost between 80 and 90% of its total coastal sage scrub to agriculture and urbanization. *P. c. pontilis* occurs in Sonoran Desert vegetation with microphyllous legumes, cacti, the Creosote Bush (*Larrea tridentata*), and other highly xerophilous plants.

Between these extremes, *atwoodi* is restricted to the coastal sage scrub and maritime succulent scrub communities, nearly matching the distribution of Westman's (1983) "coastal succulent scrub." Approximately 107 plant species are endemic to this area (Oberbauer 1992), and at least 12

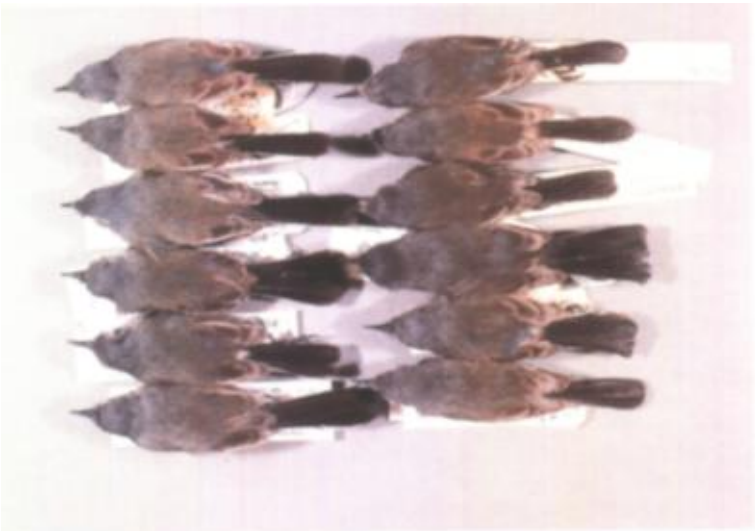

Figure 3. Female California Gnatcatchers, dorsal view. Left, *P. c. atwoodi*; right, *P. c. californica*. Note the darker and more extensive brown of *P. c. californica*.

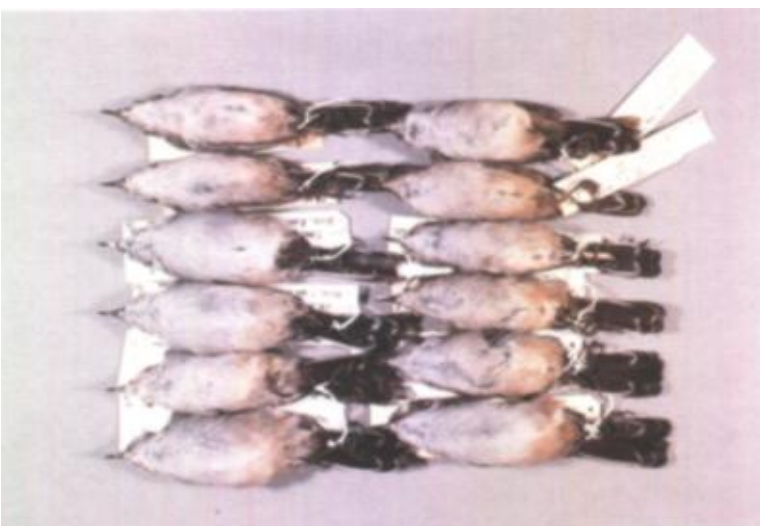

Figure 4. Female California Gnatcatchers, ventral view. Left, *P. c. atwoodi*; right, *P. c. californica*. Note darker and more extensive brown wash of flanks, belly, and crissum of nominate *californica*.

polytypic bird species reputedly have differentiated subspecific forms here (A.O.U. 1957).

In northwestern Baja California the coastal sage scrub communities are more vertically stratified than in the U.S.. Two species in particular contribute to this: the Parry Buckeye (*Aesculus parryi*) and the Chaparral Ash (*Fraxinus trifoliata*). The Coastal Agave (*Agave shawii*), also gives the habitat a characteristic appearance. Frequently the two southern California dominants of gnatcatcher habitat, the Coast Sagebrush (*Artemisia californica*) and Flat-top Buckwheat (*Eriogonum fasciculatum*), are only the fourth or fifth most abundant woody species, and sometimes, in the south, they are an insignificant component of the community or absent. The abundance of arboreal lichens (especially on the Cliff Spurge, *Euphorbia misera*) in the southern half of this area indicates air moister than in the northern half or in California. Exceptions to this general habitat characterization are at two marginal localities, Valle de las Palmas and San José de Meling, where the habitat had some elements of hard chaparral.

Although in some areas of northwestern Baja California gnatcatchers are common and the territories seem to be tightly packed, in other areas of what appeared to us excellent habitat we were unable to to locate the species, even by playing taped recordings on repeated visits. Thus it is not possible to estimate the numbers of *atwoodi* on the basis of available habitat.

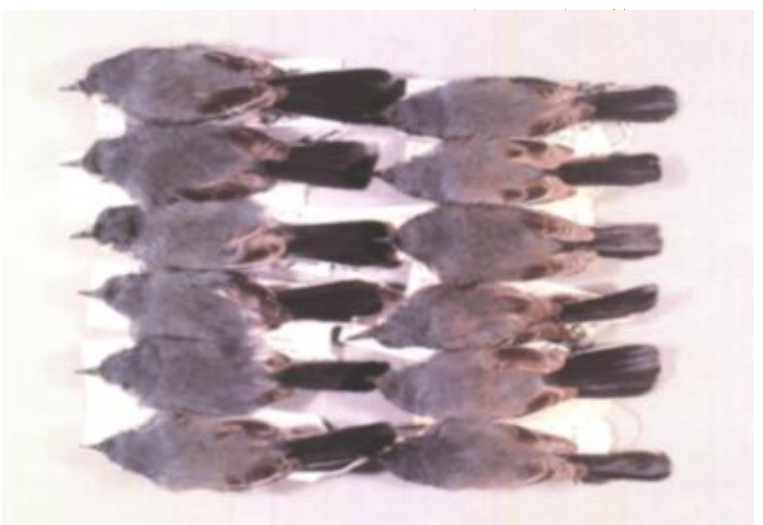

Figure 5. Male California Gnatcatchers, dorsal view. Left, *P. c. atwoodi*; right, *P. c. californica*. Note only slightly olive-brown wash on back of *atwoodi* in contrast to more extensive, browner wash of *californica*. Recently collected specimens of *californica* on top and bottom, showing lack of evident foxing.

The distinctive habitat occupied by *atwoodi* "is rapidly being developed with condominiums, campgrounds, and resort housing, mostly for a U.S. tourist [trade]. Lands that are not being converted to these uses are being converted to agricultural uses" (Oberbauer 1992). Grazing, burning, and off-road recreational vehicles are additional factors in habitat degradation in this area.

Etymology. We name this subspecies in honor of Jonathan L. Atwood, who resolved the relationships between the gnatcatcher species *Polioptila melanura* and *P. californica* and has contributed so much to the conservation of California Gnatcatchers in the U.S.

Polioptila c. pontilis

South of the range of *P. c. atwoodi*, there is a second abrupt step in characters, matching an equally abrupt habitat transition to Sonoran Desert vegetation. This population is *P. c. pontilis* van Rossem. It is paler gray above (Figure 6) and whiter below than the two northern races. The whiteness of the entire underparts (throat, chest, belly) is especially noticeable. The flanks and crissum of *pontilis* are less strongly washed with brown than in either *atwoodi* or nominate *californica* (Figure 7). This brown wash is near Saccardo's Brown of Ridgway (1912).

All specimens we have seen southward to the state line (28° N) are *pontilis*. Unlike Phillips (1991:26) and Atwood (1991) we find *pontilis* readily separable from *P. c. margaritae* Ridgway. The latter is paler, even whiter below, and has extensive white in the outer rectrices. However, too few useful specimens exist in collections to resolve the racial taxonomy of California Gnatcatchers south of 26° N. Adequate samples are needed from the mainland as well as from islas Margarita, San José, and Espíritu Santo to determine if more than one race occurs in the Cape region.

Intergrades

Within the race *atwoodi* we find no indication of clinal variation: females from the northern part of the range in Valle de las Palmas are just as pale and olive brown as those from the river bed southeast of El Rosario.

The only place where extant specimens demonstrate intergradation between nominate *californica* and *atwoodi* is along the coast in extreme northwestern Baja California. A female (E. Mellink 91-40, 8 December 1991) taken along the coast near Plaza de Santa María, 43 km south of the border, has the brown of the back and flanks intermediate between the warm brown tone of recently taken *californica* and the olive tone of *atwoodi*. It is darker above and below than *atwoodi*. Another female taken from this locality (SDNHM 48453, 29 February 1991) appears to have rich browns on the lower flanks and lower back but was undergoing extensive molt, so the remainder of the specimen could not be evaluated.

Thirty-five kilometers farther south, a female (SDNHM 48439, 16 January 1991) taken on Cerro El Vigía in Ensenada is dark in the grays, above and below, like the nominate race, but it is nearer the darkest examples of *atwoodi* in olive-brown tones (for example, syntype SDNHM 48443, near Colonet, and SDNHM 48450, near San Quintín). It may represent the

southern extent of some nominate *californica* influence along the coast. As noted, the three females we took in the interior at Valle de las Palmas are typical *atwoodi*, although the locality is only 32 km south of the Dulzura specimen noted above.

Atypical Specimens

Among the 153 specimens we examined, excluding the 3 intergrades, we encountered an occasional specimen that was not typical of the local race (4% of 75 in *californica*, 7.7% of 34 in *atwoodi*, and 2.3% of 44 in *pontilis*).

Range of californica. Two females from Los Angeles Co. (AMNH 94797, 14 November 1897, Claremont; LACM 12776, 1 December 1895, San Fernando) are both pale, with the brown tones of back and underparts similar to those of *atwoodi*.

Another female, from Riverside (CAS 56647, 29 December 1887) is exceptionally pale. It is in lax, fresh plumage. The browns, both above and below, are paler than in some *pontilis*, which it most closely resembles. The head, nape, upper back, and chest are far too pale for *atwoodi*. In 1980 Phillips annotated this as "(*lucida* × *californica*)" (see also Phillips 1991:25); *lucida* is the race of *Polioptila melanura* occupying the Sonoran Desert east of *P. californica*. This odd specimen may be an interspecific hybrid. However, the tail shows only minimal white (2.1 mm). *P. m. lucida* usually has 7.5 mm or more of white on the inner web of the outer rectrix and has the entire outer web white, reaching the rachis.

Range of atwoodi. One female from San José [de Meling], 31° N, 2500 feet (750 m) (MVZ 46531, 7 October 1925) has the brown of the back and flanks as dark and pinkish as in nominate *californica*. We collected a female here (SDNHM 48454, 21 February 1991), although somewhat worn and molting, with the colors of *atwoodi*.

Another female, from El Valle de la Trinidad, 2500 feet (750 m) (MVZ 50418, 7 December 1926), has rich and dark browns. Even the rectrices are brown rather than blackish, perhaps owing to chemical change. Atwood (1988:18) found both species of gnatcatcher at this locality, where the Crissal (*Toxostoma crissale*) and California (*T. redivivum*) thrashers also overlap.

Range of pontilis. All the browns of one female from Chapala, 29°21' N (SDNHM 13749, 16 October 1930) are dark, as in *P. c. californica*. The grays and whites of the underparts can be matched by paler, clean specimens of the nominate race, such as UCLA 37981 (Banning, Riverside Co.) and MVZ 9981 (San Fernando, Los Angeles Co.).

The aberrant specimens from Chapala and El Valle de la Trinidad could be vagrants from the north. Although the California Gnatcatcher is considered sedentary, limited vagrancy might take place. It seems more likely to us that these represent variants of the local populations. Alternatively, their unusual colors could be an artifact of chemicals used in preparation: the atypical skins in the north are a century old.

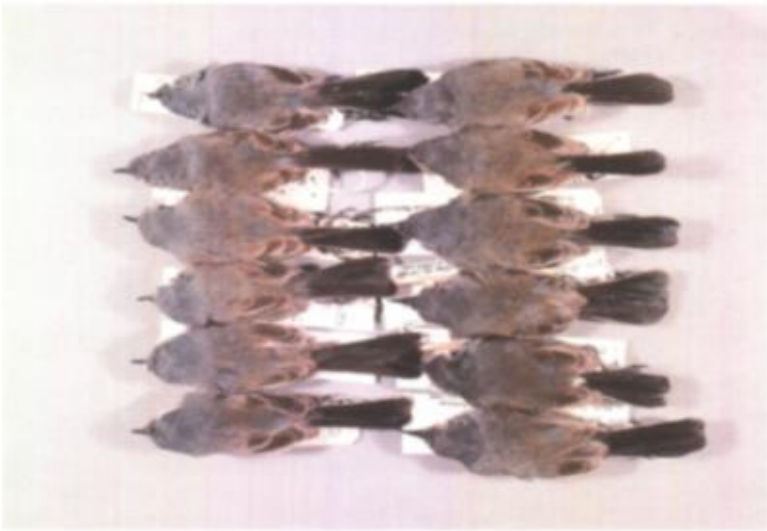

Figure 6. Female California Gnatcatchers, dorsal view. Left, *P. c. pontilis*; right, *P. c. atwoodi*. Note that *atwoodi* is darker gray, especially on crown, with more brown wash on back.

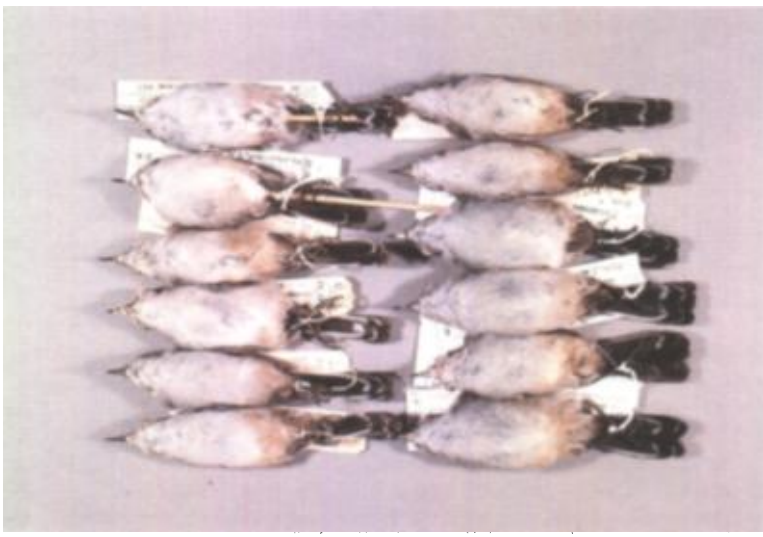

Figure 7. Female California Gnatcatchers, ventral view. Left, *P. c. pontilis*; right, *P. c. atwoodi*. Note whiter chest of *pontilis* and grayer underparts of *atwoodi*.

SUMMARY

The California Gnatcatchers of northwestern Baja California represent a previously undescribed subspecies, hitherto included under *Polioptila c. californica*, for which we propose the name *P. c. atwoodi*. Ranging from about Ensenada and Valle de las Palmas south to El Rosario, it differs from nominate *californica* in the paler, grayer (less brownish) back, flanks, and crissum of females. Males differ in only rarely having the faint brown tinge to the back frequent in nominate *californica*. From *P. c. pontilis*, the subspecies of central Baja California, both sexes of *atwoodi* differ in their darker upperparts and gray, not whitish, underparts.

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California Gnatcatcher
Sketch by Tim Manolis