

A taxonomic revision of the genus *Chondrohierax*

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Abstract

The North American Classification Committee (NACC, hereafter “the committee”) solicits proposals to change the taxonomy of bird species in North America. These proposals are summaries of the background information on a given taxonomic problem, summary of new information, and recommendations on best taxonomic treatments, under the Biological Species Concept (<https://americanornithology.org/nacc/>). What follows is a summary of the information pertinent to the taxonomic status of taxa in the genus *Chondrohierax*. The genus is currently considered monotypic, with the sole representative containing three allopatric subspecies. One of these, *wilsonii* of the island of Cuba, is distinct in plumage and genetics. Here, I provide a summary of the taxonomic history of the complex, genetic information, and novel morphological (plumage) data. These data support the treatment of *wilsonii* as a species distinct from other *Chondrohierax*.

Description of the problem:

Chondrohierax uncinatus is a widespread polytypic raptor found from central Mexico to Argentina, with 3 subspecies currently recognized (Clements 2021). The nominate subspecies is widespread throughout the continental parts of its range. The two other widely recognized subspecies are *mirus* from the island of Grenada, and *wilsonii* from Cuba. Friedmann (1934) described, as subspecies, the populations from northern and central Mexico (somewhat darker; “*aquilonis*”) and the western Amazon (larger bill and broader rectrices; “*immanis*”), but neither are generally recognized. There is a confusing array of plumage variation within all taxa, including strong sexual dimorphism, distinct juvenile plumages, and a dark/melanistic morph in both adults and juveniles. There is also a white-bellied morph, at least in juveniles, that bears a strong resemblance to comparable plumages of some Forest-Falcons (*Micrastur*). Additionally, there is lots of individual variation, especially in bill size, with especially large-billed individuals originally described as a separate species (“*megarhynchus*”), now a synonym of *uncinatus* (Friedmann 1934, Hellmayr and Conover 1949).

Morphological differences among the three taxa were well described by Friedmann (1934, 1950), which are summarized here. In his key to *Chondrohierax*, Friedmann (1950) gives the main difference between *wilsonii* and the rest of the taxa as: “upper mandible pale yellowish white, inclining to bluish horn at base; feathers of upperparts with concealed white bars on their bases”. Friedmann (1950) also mentions the solidly tawny nuchal collar of female *uncinatus* in contrast to the “white or pale buff [nuchal collar], barred with russet or chestnut” of female *wilsonii* (males have no nuchal collar), plus narrower barring below on *wilsonii*. Friedmann’s other mainland subspecies (“*aquilonis*” and “*immanis*”) are largely separated based on the shade/darkness of the overall coloration (i.e. minor differences), so although there is considerable individual variation, there are few geographic differences among continental populations. The mostly solid-yellow bill and barred vs. solid nuchal collar seem to be the most consistent characters separating *wilsonii*. The BirdLife rationale described above mentioned the smaller size

and larger bill, so below I have here included the measurements (of adult males) from Friedmann (1950) for *uncinatus*, *mirus*, and *wilsonii*:

uncinatus (n=26): wing 265-301 (285.8); tail 173-210 (191.1); culmen from the cere, 27.0-35.5 (31.3), one 42.0; tarsus 32.0-37.0 (35.1); middle toe, without claw, 28.0-35.0 (31.1 mm.).

mirus (n=3): wing 250-265 (257); tail 165-182 (172.7); culmen from base of cere, 28-32 (30); tarsus 30-38 (34.5); middle toe, without claw, 25 mm.

wilsonii (n=2): wing 240-244; tail 177-178; culmen from cere, 35.5-37.5; tarsus, 29-30; middle toe without claw, 26-27 mm.

These size differences seem minor to me, and given that bill size especially is known to vary drastically among individuals within *uncinatus*, I don't think these are reliable species-level characters. The wing length does appear to be significantly shorter in *wilsonii*, however.

Wilsonii was described as a species by Cassin (1847), and considered as such by most authors (e.g. Peters 1931, Friedmann 1934, 1950, Bond 1940) until it was lumped with *uncinatus* by Amadon (1960). In his decision to lump *wilsonii* with *uncinatus*, Amadon (1960) cited the realization that *uncinatus* showed considerable individual variation in bill size (Hellmayr and Conover's justification for lumping *megarhynchus* with *uncinatus*) to suggest that the difference in bill size between *wilsonii* and the *uncinatus* was insufficient for species status. Friedmann (1934) also gave the concealed white barring on the back as a character for separating *wilsonii*, but Amadon (1960) noted that this can be shown by immature plumages of *uncinatus*. Amadon (1960) also suggested that the mostly pale maxilla of *wilsonii* may not be a species-level character, as *uncinatus* shows a pale mandible and that this pale coloration can extend onto the maxilla. However, this pale coloration on the "maxilla" of *uncinatus* is largely restricted to the lower part of the cere. Therefore, Amadon's primary justification for lumping *wilsonii* was that differences in bill size and in the hidden white bases to the dorsal feathers were shown by other taxa of *Chondrohierax*, and that bill coloration alone was insufficient to split *wilsonii*. Many thanks to Frederik Brammer for tracking down the Amadon (1960) paper. Later authors (e.g. AOU 1983, Howard and Moore 1991, Clements 2007, Clements et al. 2021) consistently treated *wilsonii* as a subspecies of *uncinatus* (following Amadon 1960), until BirdLife International, using the Tobias yardstick criteria, elevated *wilsonii* to species status with the following rationale: "Until recently was considered conspecific with *C. uncinatus*, but trend now widespread to accept species status: differs on account of all-yellow bill (3); larger bill (at least 1); barred collar (2); smaller overall size (at least 1). Molecular evidence has been interpreted as supporting this split (Johnson et al. 2007)." Note, however, that the bill lengths of *wilsonii* and *uncinatus* overlap (see measurements above).

Methods:

Here, I consolidate published information relevant to the taxonomy of *Chondrohierax* kites, with special attention to data from the peripheral isolate taxa *mirus* and *wilsonii*. I obtained photographs (courtesy of two museum collections) of specimens of all relevant taxa for both males and females. I assess the differences in plumage patterns and coloration between taxa in relation to plumage variation within taxa, and compare these patterns to those from published

genetic data. I use these comparisons to make a recommendation on the best taxonomic treatment for the genus based on available data.

New information:

Very little. Results from a genetic study (Johnson et al. 2007) were the basis for NACC proposal 2007-B-4 to split *wilsonii* from *uncinatus*, which did not pass (5-4 votes): (<https://americanornithology.org/wp-content/uploads/2020/02/2007-B.pdf> and comments <https://americanornithology.org/nacc/current-prior-proposals/2007-proposals/comments-2007-b/>) . As far as I can tell there has been no additional work on the genus that is relevant to taxonomy. No recordings of the taxon are known, nor is the voice described in any texts that I can find. A single in-life photo of the bird has been published but is of too poor quality to be relevant for this proposal (page 23), and is perhaps not identifiable as a *Chondrohierax*: https://www.aba.org/themencode-pdf-viewer/?file=https://www.aba.org/birding_archive_files/v42n1p22.pdf#zoom=page-fit

The taxon is critically endangered, or possibly extinct, with very few sightings in recent years, despite focused surveys (Gallardo and Thorstrom 2019, BirdLife International 2021). It may now be restricted to a remnant population in the mountains of the far east of the island (Gallardo and Thorstrom 2019). Its declines are attributed to loss of habitat, loss of its main prey item (snails), and persecution due to the mistaken belief that it hunts game birds. This doesn't have any bearing on the taxonomy, but the lack of data makes a decision on the species status difficult. Thankfully, there is a small series of specimens, which combined with the detailed descriptions of Friedmann (1934, 1950; see above), which can help with the decision. I do suggest that the committee read the (short) 2007 proposal and comments linked to above.

Jacob Saucier has been gracious enough to photograph some of the series of specimens housed at the Smithsonian National Museum of Natural History (USNM), and Marco Rego photographed a single specimen housed at the Louisiana State University Museum of Natural Science (LSUMZ), which are pasted below. These include photos of *wilsonii*, *uncinatus*, and *mirus*, although the USNM specimen of female *wilsonii* is unfortunately rather faded. In all photos, note the pale bill and narrower but more extensive barring below of *wilsonii* in comparison to *uncinatus/mirus*. The LSUMZ *wilsonii* specimen is labeled as a male, but the brown dorsum, narrow tail bars, and barred nuchal collar all suggest it is a female (or perhaps a subadult male). The USNM male *wilsonii* has an unbarred nuchal collar and is grayer above. In looking at these photos, it appears that both sexes of *mirus* show an unbarred tawny nuchal collar, while this character is only found in females of *uncinatus*. The specimens of *wilsonii* that show a nuchal collar do have this area barred rather than unbarred tawny, although the coloration of this region in the female USNM specimen is too faded to assess the original color.

USNM males: *wilsonii* left, *uncinatus* right.



LSUMZ specimens: *wilsonii* on left (labeled as male, possibly a female or subadult male), female *uncinatus* on right.



USNM females: *wilsonii* on left, *uncinatus* on right.



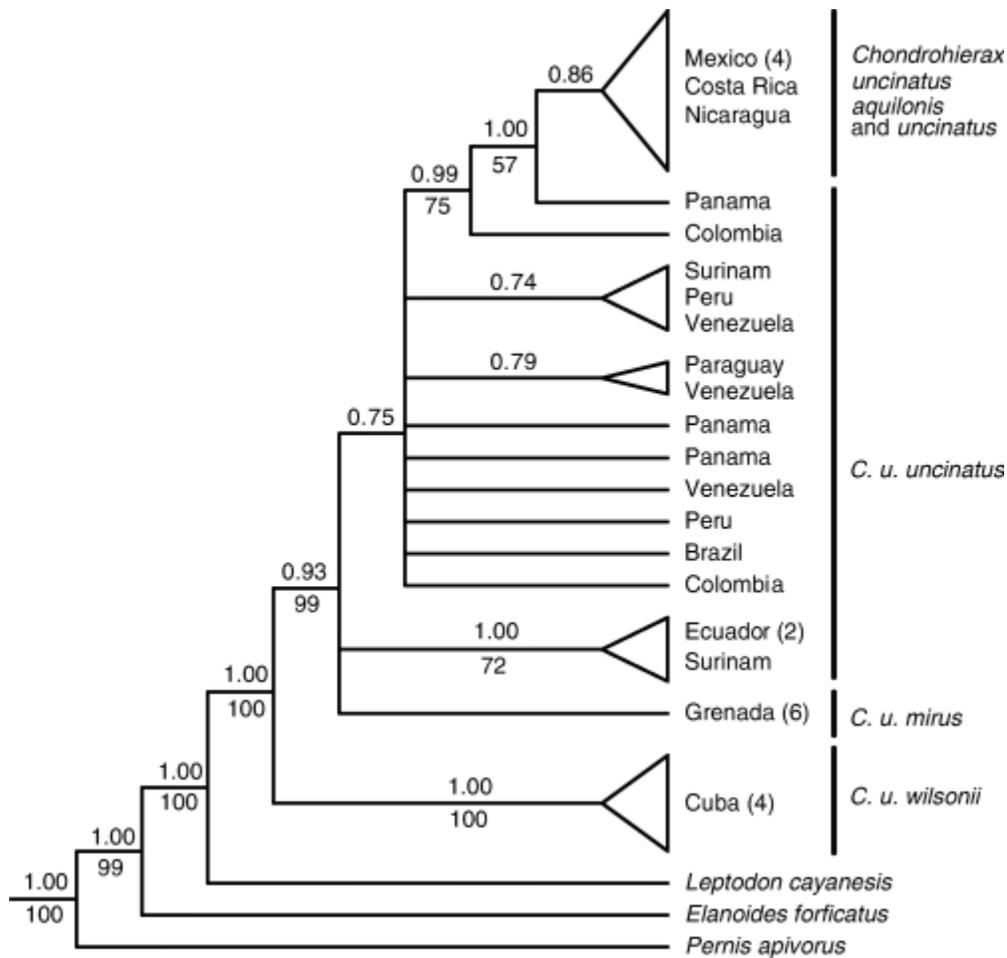
USNM specimens: two male *uncinatus* (darker bird from Mexico, typical male from Colombia) on left, typical female *uncinatus* on right.

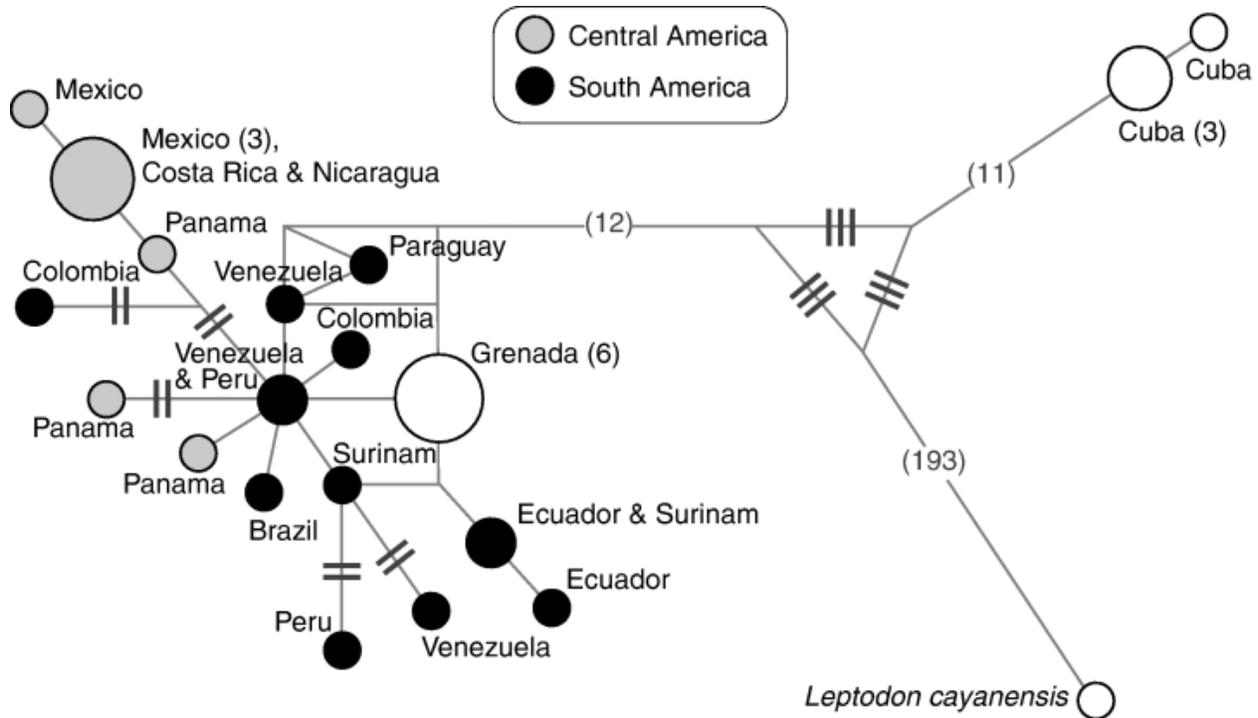


USNM specimens: male *mirus* on left, female *mirus* on right.



Although the results from Johnson et al. (2007) have been voted on by the committee previously, I have pasted the main results below for reference. That study used two mitochondrial genes, Cyt-b and ND2 (so all the standard gene tree / species tree caveats apply), but did find that *wilsonii* was sister to the remainder of *Chondrohierax* and 1.8-2.0% divergent, with a divergence time estimate of 400,000-1.25 million years. The Grenada taxon *mirus* was largely undifferentiated from continental populations (nominate *uncinatus*). The phylogeny and the haplotype network are included below. Node support values in the phylogeny are from maximum parsimony (above branches) and Bayesian (below branches) analyses. Unfortunately, Johnson et al. (2007) estimated migration rates between North and South American populations of *uncinatus*, but not between *uncinatus* and either of the insular taxa. However, those migration rates within *uncinatus* were close to zero (albeit with broad confidence intervals), perhaps suggesting that there is low connectivity even within continental populations.





Results and taxonomic implications

The genetic differences between *wilsonii* and *uncinatus/mirus* are rather borderline regarding species status, especially given that its only two mitochondrial genes, so in my opinion are not very informative either way. The morphological differences do seem quite different for a raptor, however. The combination of the solid yellow bill of *wilsonii* and differences in the pattern of the nuchal collar and width and extent of the barring below, all give *wilsonii* quite a different appearance. Plus, there is rather little geographic variation within the remainder of *Chondrohierax*, making *wilsonii* the morphological outlier within the genus. On the whole, I believe the data suggest that *wilsonii* and *uncinatus* are best treated as separate species. If considered as separate species, the English name of Hook-billed Kite could stay with *uncinatus*, given that *wilsonii* is a peripheral isolate. The name Cuban Kite is appropriate for *wilsonii*.

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