Salvadori, T. 1915. Notizie storiche intorno alla collezione ornitologica del Museo di Torino. *Mem. R. Acad. Sci. Torino,* ser. II, 65(5): 1–49.
Savi, P. 1825. Osservazioni per servire alla storia di alcune Silvie toscane. *Nuovo Giornale de'Letterati, Pisa* 11: 16–30.
Savi, P. 1827–31. *Ornitologia Toscana*, vols. 1–3. Nistri, Pisa.
Seebohm, H. 1881. *Catalogue of the Passeriformes or perching birds in the collection of the British Museum—Cichlomorphae: Part II containing the family Turdidae (warblers and thrushes)*, vol. 5. Trustees of the Brit. Mus., London.
Sherborn, C. 1905. The new species of birds in Vroeg's catalogue, 1764. *Smithsonian Misc. Coll.* 47: 332–341.
Shirihai, H., Gargallo, G. & Helbig, A. J. 2001. *Sylvia warblers: identification, taxonomy and phylogeny of the genus Sylvia.* Christopher Helm, London.
Svensson, L. 1992. *Identification guide to European passerines.* Fourth edn. Privately published, Stockholm.
Temminck, C. J. 1820. *Manuel d'Ornithologie.* Second edn., pt. 1. H. Cousin, Paris.
Trischitta, A. 1922. Note ornitologiche. *Atti Soc. It. Sci. Nat., Milano* 61: 121–131.
Vaurie, C. 1959. *The birds of the Palearctic fauna. Passeriformes.* H. F. & G. Witherby, London.
Vosmaer, A. 1764. *Beredeneerde Catalogus, Van eene, by uitstekfraaye en weergaalooze Verzameling* etc. Pieter van Os, Gravenhage.
Williamson, K. 1968. *Identification for ringers. The genus Sylvia.* British Trust for Ornithology, Tring.
Whitaker, J. 1905. *The birds of Tunisia.* R. H. Porter, London.

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Taxonomic status and distribution of Mangrove Black Hawk *Buteogallus* (*anthracinus*) *subtilis*

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Mangrove Black Hawk was described, by Thayer & Bangs (1905), as *Urubitinga subtilis*, from two specimens taken on Gorgona Island, off south-west Colombia. The adult appeared very similar to adult Common Black Hawk *Buteogallus anthracinus* but was smaller, had a larger white patch at the base of the outer primaries, and the ground colour of the secondaries was bright cinnamon-rufous (the secondaries of adult Common Black Hawk are greyish, often tinged rufous). Swann (1920) erroneously listed *subtilis* as a race of Great Black Hawk *B. urubitinga*; subsequently, he corrected this by listing it as a race of Common Black Hawk (Swann 1922, 1930). Chapman (1926) likewise treated *subtilis* as a race of Common Black Hawk and gave its range as 'southern Ecuador to eastern Panama.' Peters (1931), however, considered it a separate species and gave the range as

Ecuador to El Salvador in mangroves along the Pacific coast, without explanation or citation for the extension in range or change in taxonomy. Aldrich & Bole (1937), in contrast, concluded that only Common Black Hawk occurs in Panama. Most subsequent authors have considered *subtilis* a race of *B. anthracinus* (e.g., Hellmayr & Conover 1949, Friedmann 1950, Amadon 1961), but Monroe (1963) treated it specifically and even described a new subspecies, *B. s. rhizophorae*, though others were doubtful of this (e.g., Wetmore 1965, Brown & Amadon 1968, Land 1970, Mayr & Short 1970, Meyer de Schauensee 1970, Blake 1977) and continued to treat *subtilis* subspecifically. Amadon (*in* Stresemann & Amadon 1979) reversed his earlier opinion (Amadon 1961, Brown & Amadon 1968) that *subtilis* was a race and treated Mangrove Black Hawk as a polytypic species with three subspecies, without presenting any justification for his change of opinion, but later wrote (Amadon 1982) that it was based on differences in morphology and habits. The American Ornithologists' Union Check-list Committee (1983) (which included Monroe) followed Stresemann & Amadon (1979) and gave its range as mangroves on the Pacific coast from southern Mexico to northern Peru, and the range of Common Black Hawk as the adjacent Middle American mainland and mangroves on the Caribbean coast. Still there was disagreement and many authors expressed doubts over this arrangement (e.g., Hilty & Brown 1986, Palmer 1988, Ridgely & Gwynne 1989, Stiles & Skutch 1989, Schnell 1994, Howell & Webb 1995, Ridgely & Greenfield 2001). Thiollay (1994) and Ferguson-Lees & Christie (2001) also treated *subtilis* specifically, though the former regarded such status as uncertain.

Based on field work in many countries and research in several museums, I have found that birds with the characters of *subtilis* described by Thayer and Bangs (1905) occur only on the Pacific coast of South America, and that they differ from *B. anthracinus* in just a few characters. Mangrove Black Hawk is best considered a race of that species.

Methods

I examined all adult specimens of Common and Mangrove Black Hawks in the collections of the American Museum of Natural History (AMNH), New York (n=75), the Natural History Museum (NHM), Tring (n=37), and the National Museum of Natural History (NMNH), Washington DC (n=30). I recorded the following plumage characters for those in AMNH and NHM: size of the white patch at the base of the three outermost primaries, amount of rufous on the upper secondaries, amount of rufous on the undersides of the secondaries and inner primaries, and amount of rufous and buff feather fringes on the nape, breast and tarsal feathers. I scored the secondaries, above and below, for the amount of rufous on 19 adults from Panama in the NMNH, and measured the wing-chord of all specimens in the other two institutions.

I have observed both taxa in mangroves on opposite coasts of Panama, in mangroves in Belize, Ecuador, Guatemala, Mexico and Venezuela, and in other

Figure 1. Two adult *subtilis* specimens from Ecuador showing the strong rufous wash on the uppersides of the secondaries on one specimen and the strong rufous wash on the undersides of the secondaries and large white patch on the undersides of the outer primaries on the spread-wing specimen (William S. Clark, American Museum of Natural History, New York)

Figure 2. Three adult specimens of *subtilis* from the Pacific coast of South America (Peru, Colombia and one mislabeled 'Mexico') and a fourth from Coiba Island, Panama (). Note the strong rufous wash on the uppersides of the secondaries. All also have large white patches at the bases of the undersides of the outer primaries (William S. Clark, Natural History Museum, Tring)

Figure 3. Comparison of the rufous patch on the upperwings of Common Black Hawks. Only the *subtilis* specimen from Ecuador (extreme left) shows the rufous patch on the uppersides of the secondaries. None of the other adults from outside of the range of *subtilis* shows this strong rufous patch (William S. Clark, American Museum of Natural History, New York)

TABLE 1
Rufous wash on the undersides of the secondaries of specimens of adult Common Black Hawks *Buteogallus anthracinus* in the American Museum of Natural History, New York (*n*=75) and the Natural History Museum, Tring (*n*=37).

Country	**Strong**	**Medium**	**Noticeable**	**Faint**	**None**
Pacific coast of South America (*subtilis*)	7				
Panama	2	2	5	6	1
Colombia/Venezuela	1	7	4		
St Vincent, West Indies	3	2	1		
Costa Rica	3	5	2		
Guatemala/El Salvador	2	16	2		
Mexico	3	19	16		
Arizona	2	1			

TABLE 2
Wing-chords of specimens (mm) of adult Common Black Hawks *Buteogallus anthracinus* in the American Museum of Natural History, New York (*n*=75) and the Natural History Museum, Tring (*n*=37).

Country	**Males (*n*)**	**Females (*n*)**
Pacific coast of South America (*subtilis*)	320–336 (4)	346–359 (3)
Panama	331–359 (6)	347–365 (10)
Colombia/Venezuela	350–355 (5)	363–374 (7)
St Vincent, West Indies	353–363 (4)	377–380 (2)
Costa Rica	366–373 (5)	372–395 (5)
Guatemala/El Salvador	350–367 (10)	372–393 (9)
Mexico	342–372 (13)	375–420 (26)
Arizona	370 (1)	396, 397 (2)

habitats in Central America, Mexico, Texas and Arizona and noted their plumages and vocalisations.

Results

All adults from the Pacific coast of South America, between northern Colombia and northern Peru, have bright rufous on their secondaries and inner primaries and larger white patches at the base of the outer primaries (Figs. 1–2, Table 1), and are slightly smaller than adults from elsewhere (Table 2). These are the characters of *subtilis* described by Thayer & Bangs (1905). They differ from adults from the entire range of Common Black Hawk by these characters. All adult *anthracinus* examined, from Arizona south through Middle America to the north coast and mountains of Colombia and Venezuela, and the Caribbean, are essentially alike, with some individual variation but no consistent geographic variation (Fig. 3, Table 1). No

plumage differences were found between mangrove-inhabiting hawks from the Pacific and Caribbean coasts of Central America. Two adults from Panama (AMNH 136410, NHM 1925.12.22.443) are identical to specimens of *subtilis* from South America, with bright rufous secondaries and large white primary patches, and were taken on the Pacific coast of Darién, near the border with Colombia, and on Coiba Island (though this locality is perhaps doubtful, as the original label is missing). Specimens of adult *anthracinus* from Panama show intergrade characters; of 19 adults in NMNH, nine had noticeable rufous on the upper secondaries and ten had no rufous, but most showed rufous on the underside of the secondaries.

Vocalisations of adults, *anthracinus* from Arizona and both coasts of Panama, and *subtilis* from Ecuador, sound identical to my ear. A sonogram of the latter, the only known recorded vocalisation of this taxon, had too much background noise to be readily analysed.

Discussion

Before considering its taxonomic status, I address two important questions concerning *subtilis*. What are its distinguishing characters and what is its range? In response to the first query, as stated above, *subtilis* is distinguishable by the characters presented by Thayer & Bangs (1905). Concerning this taxon's range, specimens exhibiting the characteristics described by Thayer & Bangs (1905) occur only on the Pacific coast of South America from northern Colombia to northern Peru (except for two from adjacent Panama).

Monroe (1963, 1968) used only size (wing-chord) and no biological or behavioural information to describe the Mangrove Black Hawk and its three subspecies (*subtilis*, *bangsi* and *rhizophorae*). In justifying the race *rhizophorae*, Monroe (1963) stated that it differed from all adults of *anthracinus* by its lack of rufous wash on the undersides of the secondaries and from southern races of *subtilis* by its grey rather than rufous mottling to the inner webs of the secondaries. However, he was mistaken, because some adults from various parts of the entire range lack any rufous on the secondaries (Table 1). He wrote that both Mangrove and Common Black Hawks occur in mangroves on the Pacific coast of Central America but failed to explain how two 'species' that have identical plumages, voices and feeding habits, and differ only in size, do not interbreed. Size variation in these taxa is best explained by selection according to Bergmann's Rule and for smaller size by inhabiting mangroves. Those occurring in mangroves consume mainly crabs and are thought to be more successful in pursuing them amongst the mangrove roots by being smaller and more agile (Amadon 1961). It is possible for two species of *Buteogallus* to be syntopic in coastal mangroves, because Rufous Crab Hawk *B. aequinoctialis* and Common Black Hawk are syntopic in coastal eastern Venezuela to northern Guyana (Hilty 2003, Ferguson-Lees & Christie 2001). However, these species differ greatly in plumage and size.

Amadon (1961, *in* Brown & Amadon 1968) discussed the reasons why he doubted that *subtilis* was a species and why he considered it a race of *B.*

anthracinus. It is difficult to understand what made him reverse his opinion and elevate *subtilis* to specific status (Stresemann & Amadon 1975), because he presented neither explanations nor rebuttals to his and other authors' arguments as to the rationale for considering it a subspecies. He, like Monroe (1963, 1968), presented no information on differences in behaviour and biology sufficient to treat these sympatric taxa as species. He made his taxonomic decision despite the contrary opinions of many authors (e.g., Aldrich & Bole 1937, Dickey & van Rossem 1938, Hellmayr & Conover 1949, Friedmann 1950, Slud 1964, Wetmore 1965), all of whom advocated treatment of *subtilis* as a race of Common Black Hawk.

Peters (1931) extended the known range of *subtilis* (previously only the Pacific coasts of Colombia and Ecuador) to El Salvador for reasons not given. His basis is unclear, because I have found no specimens of *subtilis* from the Pacific coast of Central America except for the two from Panama mentioned earlier. An adult *subtilis* in NHM is labeled only 'Mexico' (NHM 1850.1.31.138). Because no other Mexican adult specimens have the characters of this race it is most likely that this is a mistake in labeling. It was collected during the 1840s Kellett & Wood expedition, which also visited other locations along the Pacific coast of the Americas, including Gorgona Island, where the first specimen of *subtilis* was collected. As the original label on this specimen is missing (R. Prŷs-Jones pers. comm.), the collecting locality is in doubt. This apparently mislabeled specimen could offer one reason for the confusion as to the taxonomic status and distribution of *subtilis*.

The extremes of variation in wing-chord measurement amongst adult Common Black Hawks of all subspecies by sex is less than 15% for the smallest (*subtilis*) (320 mm) to the largest mountain-dwelling males (373 mm) and less than 18% for the smallest (*subtilis*) (346 mm) and largest mountain-dwelling females (420 mm) (Table 2). This variation is comparable to that in other species, e.g., Eastern Red-tailed Hawk *Buteo jamaicensis borealis*, in which adult male wing-chords (n=25) varied 15% (337–396 mm), and adult females (n=27) varied 13% (370–427 mm) (Friedmann 1950).

Hellmayr & Conover (1949) wrote with regards to Panama 'with thirty specimens in adult plumage before us we cannot make out a case for recognizing either *cancrivorus* or *subtilis*.' Wetmore (1965) thought that all black hawks in Panama were *anthracinus*, questioning the validity of the forms *bangsi* (sometimes ascribed to the *subtilis* group) and *utilensis*. Blake (1977) presented a clear discussion of the taxa involved and properly described the range of *subtilis* as the Pacific coast of South America, and concluded that the two taxa constitute one species, *B. anthracinus*. More recently, Ridgely & Gwynne (1988) wrote concerning the situation in Panama, 'as the two [*subtilis* and *anthracinus*] are so similar morphological and behaviorally, we remain less than convinced that two species are indeed involved.' Stiles & Skutch (1989) stated 'at least in Costa Rica, mangroves are inhabited by long-, medium-, and short-winged birds (no evidence of

discontinuity in wing-length), and to date we can discern no diagnostic differences in color, pattern, voice, behavior, or other characters between Caribbean and Pacific coast or inland birds… we prefer to consider *subtilis* as conspecific with *anthracinus*,' whilst for Mexico Howell & Webb (1985) remarked 'We see no reason to consider *subtilis* as other than a mangrove-inhabiting ssp of Common Black Hawk. Voice and behavior are very similar and many *anthracinus* on the Atlantic Slope live in mangroves, where, in the manner of *subtilis*, they run after crabs on the beaches and mud-flats.' Some years later, Ridgely & Greenfield (2001), commenting with respect to Ecuador, stated 'We do not find evidence for considering *B subtilis* as a separate species persuasive and thus opt to consider it with *B. anthracinus*.'

An egg taken from a black hawk nest in mangroves on the Pacific coast of Costa Rica is indistinguishable from *B. anthracinus* eggs from throughout the range (L. Kiff *in litt.* 2005). The egg and adult are deposited in the collection of the Western Foundation of Vertebrate Zoology in Camarillo, California, USA.

Some adult specimens of *anthracinus* from Panama show a stronger rufous wash on the secondaries than do those from the rest of the range, suggesting gene flow from *subtilis* from South America.

The black hawks from Cuba are considered by Wiley & Garrido (2005) to represent a species-level taxon, Cuban Black Hawk *Buteogallus gundlachi*, based on differences in size, plumage and vocalisations from *anthracinus*. They are small, approximately the size of mangrove-inhabiting nominate birds. Adults differ in being overall more brownish black, lacking the grey cast of nominate adults, and having narrow rufous tips to many body-feathers and upperwing-coverts. They also have a much larger white patch on the underside of the primaries that extends onto the inner primaries. The tail in some adults has a second, narrower white band basal to the broad one. Juveniles appear more like nominate juveniles but have more and narrower tail bands and bars on the tarsal feathers (Wiley & Garrido 2005).

The taxon *subtilis* is restricted to the Pacific coast of South America and differs from all other *anthracinus* only in its slightly smaller size, strong rufous wash on the secondaries and larger white panel at the base of the outer primaries of adults. Because behaviourial and vocal differences from Common Black Hawk have not been documented, and because they intergrade where their ranges meet on the Pacific coast of eastern Panama, I recommend that *subtilis* be considered a subspecies of *B. anthracinus*.

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References:

Aldrich, J. W. & Bole, B. P. 1937. The birds and mammals of the western slope of the Azuero Peninsula (Republic of Panama). *Sci. Publ. Cleveland Mus. Nat. Hist.* 7: 1–196.

Amadon, D. 1961. Remarks on the genus *Buteogallus*. *Novedades Colombianas* 1: 358–361.

Amadon, D. 1982. A revision of the sub-Buteonine hawks. *Amer. Mus. Novit.* 2741.
American Ornithologists' Union. 1983. *Check-list of North American birds.* Sixth edn. American Ornithologists' Union, Washington DC.
Blake, E. R. 1977. *Manual of Neotropical birds*, vol. 1. Univ. of Chicago Press.
Brown L. H. & Amadon, D. 1968. *Eagles, hawks, and falcons of the world*, vol. 1. McGraw-Hill, New York.
Chapman, F. M. 1926. Distribution of bird-life in Ecuador. *Bull. Amer. Mus. Nat. Hist.* 55: 1–784.
Dickey, D. R. & van Rossem, A. J. 1938. Birds of El Salvador. *Field Mus Nat. Hist. Zool.* 23: 1–609.
Ferguson-Lees, J. & Christie, D. A. 2001. *Raptors of the world.* Christopher Helm, London.
Friedmann, H. 1950. Birds of North and Middle America, pt. 11. *Bull. US Natl. Mus.* 50: 1–793.
Hellmayr, C. E. & Conover, B. 1949. Catalog of the birds of the Americas and the adjacent islands. *Field Mus. Nat. Hist. Zool. Ser.* 13 (pt. 1, no. 4): 1–358.
Hilty, S. L. 2003. *Birds of Venezuela.* Princeton Univ. Press.
Hilty, S. L. & Brown, W. L. 1986. *A guide to the birds of Colombia.* Princeton Univ. Press.
Howell, S. N. G. & Webb, S. 1995. *A guide to the birds of Mexico and northern Central America.* Oxford Univ. Press.
Land, H. C. 1970. *Birds of Guatemala.* Livingston Publishing Co., Wynnewood, PA.
Mayr, E. & Short, L. L. 1970. *Species taxa of North American birds.* Publ. Nuttall Orn. Cl. 9. Nuttall Orn. Cl., Cambridge, MA.
Meyer de Schauensee, R. 1970. *A guide to the birds of South America.* Livingston Publishing Co, Wynnewood, PA.
Monroe, B. L. 1963. Three new subspecies of birds from Honduras. *Occ. Pap. Mus. Zool., Louisiana State Univ.* 26: 1–7.
Monroe, B. L. . 1968. *The birds of Honduras.* Orn. Monogr. 7. American Ornithologists' Union, Washington DC.
Palmer, R. 1988. *Handbook of North American birds*, vol. 4., Yale Univ. Press, New Haven, CT.
Peters, J. L. 1931. *Check-list of birds of the world*, vol. 1. Harvard Univ. Press, Cambridge, MA.
Ridgely, R. S. & Gwynne, J. A. 1989. *A guide to the birds of Panama, with Costa Rica, El Salvador and Honduras.* Second edn. Princeton Univ. Press.
Ridgely, R. S. & Greenfield, P. J. 2001. *The birds of Ecuador.* Cornell Univ. Press, Ithaca, NY.
Schnell, J. H. 1994. Common Black Hawk (*Buteogallus anthracinus*). *In* Poole, A. & Gill, F. (eds.) *The birds of North America*, no. 122. Acad. Nat. Sci., Philadelphia, PA.
Stiles, F. G. & Skutch, A. F. 1989. *A guide to the birds of Costa Rica.* Cornell Univ. Press, Ithaca, NY.
Slud, P. 1964. The birds of Costa Rica. *Bull. Amer. Mus. Nat. Hist.* 128: 1–430.
Stresemann, E. & Amadon, D. 1979. Falconiformes. Pp 270–425 *in* Mayr, E. & Cottrell, G. W. (eds.) *Check-list of the birds of the world*, vol. 1. Revised edn. Mus. Comp. Zool., Harvard Univ. Press, Cambridge, MA.
Swann, H. K. 1920. *A synoptical list of the Accipitres.* John Wheldon & Co., London.
Swann, H. K. 1922. *A synopsis of the Accipiters.* Second edn. John Wheldon & Co., London.
Swann, H. K. 1930. *Monographs of the birds of prey*, vol. 1. Wheldon & Wesley, London.
Thayer, J. E. & Bangs, O. 1905. The vertebrates of Gorgona Island, Colombia. *Bull. Mus. Comp. Zool.* 46: 94.
Thiollay. J. M. 1994. Family Accipitridae (hawks and eagles). Pp. 52–205 *in* del Hoyo, J., Elliott, A. & Sargatal, J. (eds.) *Handbook of the birds of the world*, vol. 2. Lynx Edicions, Barcelona.
Wetmore, A. 1965. *The birds of the Republic of Panamá*, vol. 1. Smithsonian Misc. Coll. 150.
Wiley, J. W. & Garrido, O. H. 2005. Taxonomic status and biology of the Cuban Black-Hawk, *Buteogallus anthracinus gundlachii* (Aves: Accipitridae). *J. Raptor Res.* 39: 351–364.

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