First Northern Hemisphere record and first juvenile plumage description of the Cox's Sandpiper (*Calidris paramelanotos*)

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A JUVENILE COX'S SANDPIPER (*Calidris paramelanotos)* was observed and photographed in Massachusetts September 15–21, 1987. This species was first formally described to science in 1982 (Parker 1982). Approximately 40 individuals have been seen in the field with only two specimens known to exist, both of which are adults. All previous records have been from Australia. Because of the infrequency with which Cox's Sandpiper has been reported and the fact that its breeding grounds are unknown, it is possible that this form may be a hybrid (Marchant *et al.* 1986) rather than a valid species.

While mist-netting shorebirds the night of September 15, 1987, staff of the Manomet Bird Observatory caught what initially appeared to be a Pectoral Sandpiper (*Calidris melanotos*) at Duxbury Beach, Plymouth County, Massachusetts. During banding, we noticed that some of the morphological features of the sandpiper were strange: the bill was very long and the breast streaking was not as prominent or sharply demarcated as in a Pectoral Sandpiper, especially where the streaking faded out along the lower median edge of the breast. The bird was aged as a juvenile on the basis of its fresh plumage, particularly its unworn tertials. The individual was banded, measured, photographed, and released during the early morning of September 16.

In later reference to literature concerning Pectoral Sandpiper plumages,

The especially long black bill with slightly drooping tip was the most obvious field characteristic of the Cox's Sandpiper. Duxbury Beach, Massachusetts, September 16, 1987. Photo/Mark K Kaspryzk.

Note the fine breast streaking against the buffy background. Streaking is bolder on the sides of the upper breast and absent from the medial portion of the lower breast. Buffy background coloration of the breast is not sharply delimited from the white of the belly. Note the split supercilium, with the upper branches less prominent than the lower. Duxbury Beach, Massachusetts, September 16, 1987. Photo/Mark Kaspryzk.

we found many important contrasts to the characters we had seen. Adult Pectorals are boldly patterned on the chest, and juveniles, although less prominently marked than adults, still possess a complete, well demarcated pectoral band. Therefore, we considered Sharp-tailed Sandpiper (*C. acuminata*) to be the most likely alternative identification, although the bird possessed extensive streaking on the upper breast and lacked the orangish color on the upper breast and crown characteristic of juvenile *C. acuminata.*

Remaining unconvinced, Kasprzyk returned to Duxbury Beach on the evening of September 17 and recorded a complete field description of the bird. On September 18 it was studied by many observers, including the authors, as it foraged in the wrack with Short-billed Dowitchers (*Limnodromus griseus*), White-rumped Sandpipers (*C. fuscicollis*) and Semipalmated Sandpipers (*C. pusilla*). The bill was long, rather fine, and decurved; the upper chest and breast were finely streaked; and the legs were olive, darker than the typical yellowish of a Pectoral Sandpiper. All observers commented on how the fine streaks faded near the lower central edge of the breast, unlike the strongly patterned, sharply demarcated streaking of a Pectoral Sandpiper. By default, the bird was then identified as an adult Sharp-tailed Sandpiper that possessed a plumage unfamiliar to us. We were confident that it was not a juvenile of this species. The Massachusetts Audubon Society rare bird alert was notified of the bird with its new identification that afternoon.

Later that night, we discussed our misgivings about the bird's identification as an adult Sharp-tailed Sandpiper and considered the possibility of a Cox's Sandpiper (*Calidris paramelanotos*). Comparison of the in-hand measurements were made against measurements for Sharp-tailed, Pectoral and Cox's sandpipers given by Marchant *et al.* (1986). The bill length was well within the appropriate range for Cox's Sandpiper; further, it was 3 millimeters longer than the maximum bill length listed for Pectoral Sandpipers, and 7 millimeters longer than that given for Sharp-tailed Sandpipers (Marchant *et al.* 1986). As we compared the field marks, we discovered that characters such as the long black bill and leg color better fit the description for Cox's Sandpiper.

On September 19, after further study of the bird at Duxbury Beach, and based on the field characters and measurements we had discussed, Forster became convinced that the bird was a Cox's Sandpiper. On September 19 and 20, several more observers experienced in shorebird identification studied the bird with us. The extensive white sides of the rump, uncharacteristic of Sharp-tailed Sandpiper, were well-seen while the bird preened; the extensive white uppertail coverts contained a few streaks that ran parallel along the dark central tail band, unlike the unmarked uppertail coverts of Pectoral Sandpiper The uniform age of the body feathering and the light edgings of most dorsal body feathering characterized the bird as a juvenile. We ultimately agreed that the long, entirely black bill, the proportionately long olive legs and the extensively white uppertail coverts with light streaking most closely matched those characters describing a Cox's Sandpiper.

On Monday, September 21, staff at Manomet Bird Observatory met to discuss how to proceed with the Cox's Sandpiper. Scientifically, a strong case existed for collecting the bird. Not only did this individual represent what was apparently the first known example of a juvenile Cox's Sandpiper and a first record for the northern hemisphere, but a preserved specimen would provide various characters that could be used to study the bird's taxonomic status However, another option was to use the technique of mitochondrial DNA analysis based on blood samples to determine the relationship of Cox's Sandpiper to other species. Such a blood sample is best obtained from a live bird This procedure also alleviated our concern about collecting what might be an exceptionally rare species whose distribution and total population size are unknown. We therefore decided to attempt to recapture the bird.

Rocket-nets were set up at the high tide line of Duxbury Beach September 21—23 in an effort to recapture the bird. However, we did not see the bird after the morning of September 21. After September 21, a noticeable reduction in shorebird numbers and diversity, following a break in the persistent storm pattern, indicated that many birds had resumed migration.

Description of a juvenile Cox's Sandpiper

Measurements taken of the bird in hand are followed by measurements in parentheses from Marchant *et al.* (1986) based on two specimens and one live bird, and from Lane *et al.* (1981) for weight based on one bird. Note that the wing measurements listed in Marchant *et al.* are based on a flattened wing.

wing (unflattened) **chord:** 129 mm (134–144 mm)
culmen (exposed): 35.1 mm (33–37 mm)
weight: 67.9 g (67 g)

Bill: In the field, appears entirely black; in hand, the base of the lower mandible and the upper mandible immediately anterior to nares is slightly paler with a grayish-olive tone. Long and thin, slightly decurved at the tip, slightly longer than the length of the head. Longer and proportionately finer than on either Sharp-tailed or Pectoral sandpipers; slightly shorter and not as "thick," especially basally, as in Dunlin (*C. alpina*). Most similar to Curlew Sandpiper (*C. ferruginea*), but less strongly decurved, and with a less pointed tip.

Legs: Olive or olive-brown. Proportionately longer-legged appearance in comparison with Pectoral Sandpiper. Leg color darker than the yellowish leg coloration of Pectoral Sandpiper, most closely resembling that of Stilt Sandpiper (*C. himantopus*).

Breast: Incomplete band of fine blackish-brown streaks running vertically across a rich buff background, the streaks being lighter, finer and less clearly demarcated than in Pectoral Sandpiper. Streaks becoming less pronounced toward the lower central region of the breast, which appears unstreaked in the field; in the hand, small blackish-brown flecks were present in this region. Breast patterning lacks the sharp cutoff characteristic of Pectoral Sandpiper. Streaking extends farther along the upper flanks than in Pectoral Sandpiper. Breast coloration and pattern somewhat reminiscent of juvenile Baird's Sandpiper (*C. bairdii*), except for the greater amount of streaking in the Cox's Sandpiper.

Undertail coverts and belly: Immaculate white, no markings.

Head: Chin white; throat mostly white with faint streaking along lower edge. Lores blackish; crown warm brown, finely streaked with blackish, paling at the nape where streaks were grayish-brown with a lighter brown background. Auricular region rufous brown, accentuated by pale nape. No noticeable eye ring. Whitish supercilium obvious but not prominent, with indistict gray-brown streaks. Facing the bird, the supercilium appeared to split immediately anterior to the eye, similar to that of a Broad-billed Sandpiper (*Limicola falcinellus*). The upper less conspicuous branch extended up to the sides of the crown and then ran parallel to the blackish crown streaks; the more prominent lower branch continued above the eye and along the side of the head. The split supercilium was less evident when viewed from the side. Toward the back of the head the upper fork of the split supercilium faded out, and the conspicuous lower branch extended slightly upwards, contributing to a slightly capped appearance.

Here the breast coloration and streaking are evident, as is the bird's elongated bill. Duxbury Beach, Massachusetts, September 16, 1987. Photo/Mark K. Kaspryzk.

Wing: Upper wing coverts were light gray–brown edged pale buff, lower wing coverts edged rufons. Primaries dark blackish-brown. In flight, narrow white wing bar formed by pale tips of greater secondary coverts. At rest, primaries extended just beyond the tail. Tertials were dark blackish-brown broadly edged with bright rufous.

Scapulars: Lower scapulars with blackish-brown centers; feathers fading to light brown at the base. Dark feather shaft streaks extending through white feather tips; shaft streaks especially obvious on basal, light brown portions of lower scapulars. Upper scapulars with more uniformly dark feather centers and more complete, brighter rufous edgings, without the contrasting white feather tips as in the lower scapulars. The richly-colored upper scapulars contrasted with the back and lower scapulars, somewhat like those on a juvenile White-rumped Sandpiper.

Mantle: Blackish-brown feather centers; feather edgings pale buff, giving spangled appearance. Contrast between brighter, more strongly rufous-edged scapulars and paler mantle feathers. Pale "V" along the mantle edges and across scapulars less distinct than in Pectoral Sandpiper due to duller feather tips.

Rump: Solid blackish-brown band extending through the tail and bordered by a few dark streaks along upper tail coverts. Extensive white sides to rump and upper tail coverts similar to Pectoral Sandpiper.

Tail: A detailed description of the rectrices was not obtained. Photographs of the bird in-hand indicates that the tail was uniformly dark. Central rectrices were longer and more pointed than outer feathers, similar to a Pectoral Sandpiper

Behavior

The bird foraged in the wrack by pecking and probing. While the Cox's Sandpiper was always seen in the company of other shorebirds, it never associated with any particular species, including a group of three Pectoral Sandpipers that was sporadically present at Duxbury Beach. During its visit, the Cox's Sandpiper was seen regularly along 70 meters of beach, usually from two hours before until two hours after high tide. However, from September 18–20 it remained longer, still foraging in the upper tidal zone. Only once did we see the bird feeding away from the tidal wrack on sand flats; we could not find the bird during low tides. We never heard the bird call.

In Australia, Cox's Sandpipers have been described as rapid probers in soft mud, often feeding in belly-deep water while completely submerging their head (Smith 1982). Cox (1987) described foraging as pecking from the mud sur-

Note the white feather tips to lower scapulars. The mantle feather edgings are entirely rufous. The nape is slightly paler than the crown. Note the dark feather shaft streaks, especially on the upper wing coverts. Duxbury Beach, Massachusetts, September 16, 1987. Photo/Mark Kaspryzk

face or deep probing when in belly-deep water, repeatedly "dunking its bill below the surface with forward and downward head movements, seemingly identical to the method of Curlew Sandpiper when feeding in similar circumstances." Cox's Sandpipers that Smith (1982) described were "often in the company with Sharp-tailed and Curlew sandpipers and Rufous-necked Stints [*Calidris ruficollis*]." Cox (1987) observed that birds were mostly solitary, although they tended to join large groups of other calidrids when flushed.

Habitat

Dry, rocky upper tidal zone interspersed with Saltmarsh cordgrass (*Spartina alterniflora*) and covered extensively with rotted and fresh wrack of algae and Eelgrass (*Zostera marina*). Foraged primarily in the rotted wrack and tidal pools along the rocky section of the beach. Only once was the bird observed feeding in sand pools along the tide line.

In Australia, Cox's Sandpiper has been reported from a variety of wetland habitats, including muddy shoreline shallows, brackish and freshwater lakes, marshes and sewage ponds (Smith 1982; F.T.H. Smith *pers. comm.*). An individual present at Werribee, Victoria, September 24, 1987, to early November 1987, fed on mudflats at low tide (R.J. Swindley *pers. comm.*).

No information is available to indicate whether sexual dimorphism exists in Cox's Sandpipers as in Pectoral and Sharp-tailed sandpipers. However, Smith (1982; *pers. comm.*) has observed size variation of Cox's Sandpiper in Australia similar to that of Pectoral Sandpiper. Smith (*pers. comm.*) mentions how "larger birds can look fairly squat at times, almost Red Knot (*Calidris canutus*) like." The Massachusetts bird appeared stocky both in the hand and in the field.

DISCUSSION

To date, all records (but see below) of Cox's Sandpiper have been in southeastern Australia during the austral summer (September–March), where it occurs primarily in the company of Rufous-necked Stints and Sharp-tailed and Curlew sandpipers, which breed primarily in Siberia during the temperate summer. The lack of reports in Australia during their winter suggests that it might breed in Siberia (as hypothesized by Marchant *et al.* 1986). The appearance of a Cox's Sandpiper on the east coast of North America, where vagrants from Siberia occasionally appear, further strengthens that supposition.

Hybridization in shorebirds

The question is still unresolved as to whether Cox's Sandpiper is a true species or a hybrid, possibly between *C. acuminata* and *C. ferruginea* or *C. melanotos* and *C. ferruginea* (Lane *et al* 1981; Cox 1987). Cox (1987) recently compared many morphological features of Cox's Sandpiper with those of Pectoral and Curlew sandpipers and provided evidence suggesting a close relationship to the two species. However, this question may not be settled until either the breeding grounds of *paramelanotos* are found or additional specimen evidence clearly indicates hybrid origin.

Compared with most groups of birds, hybridization among shorebirds has been rarely reported. Hybridization has been documented more often among the oystercatcher complex (Bancroft 1927; Jehl *et al.* 1973; Jehl 1978, 1985), a poorly differentiated superspecies group that collectively has a continuous breeding range from Alaska to Tierra del Fuego. In New Zealand, hybridization between pied and black forms of the Variable Oystercatcher (*Haematopus unicolor*) has also been described (Baker 1975).

Hybridization has also been reported in avocets and stilts, which are in the same suborder (Charadrii) as oyster-

Note bill length relative to head length and the slight droop of the black bill tip. The bill is black and the base of the lower mandible and upper mandible immediately anterior to nares are slightly pale. Duxbury Beach, Massachusetts, September 16, 1987. Photo/Mark Kaspryzk.

catchers. Principe (1977) described an "avostilt" (*Recurvirostra americana* x *Himantopus mexicanus*) from California, and Pierce (1984) discusses hybridization in New Zealand stilts, *Himantopus spp.* However, the "avostilt" resulted from birds held captive for at least five years and cannot be considered a natural occurrence. Other apparent shorebird hybrids include a Greater Golden-Plover (*Pluvialis apricaria*) x Lesser Golden-Plover (*Pluvialis dominica*), based on measurements (Borg 1976), and a Black-winged Pratincole (*Glareola nordmanni*) x Common Pratincole (*G. pratincola*) (Walmsley 1970). Gray (1958) lists earlier apparent shorebird hybrids, however, only a few scolopacids and no calidrids were cited.

Cox's and Cooper's sandpipers

The Cooper's Sandpiper (*Calidris cooperi*) is known only from the type specimen collected at Long Island, New York, on May 24, 1833, by William Cooper (Ridgway 1919). Could this specimen represent an early record of what is now called Cox's Sandpiper? Many of the plumage characters of Cooper's Sandpiper (Ridgway 1919) resemble those of Cox's Sandpiper, although some features do not agree such as ". . . upper tail-coverts white, with irregular sagittate and V-shaped marks of dusky." However, Ridgway's measurements were close to those given for Cox's Sandpiper in Marchant *et al.* (1986). Ridgway gave no description of the bird's soft parts.

Roger B. Clapp at the United States National Museum kindly reexamined the Cooper's Sandpiper specimen and provided more details. The measurements and description he obtained were nearly identical to those presented by Ridgway (1919). The legs and bill appeared as if they were originally darkish throughout; most importantly, the bill was not decurved as in Cox's Sandpiper. Based on this information, the possibility of the specimen being a Cox's Sandpiper was ruled out. The confusing question then remains: what hybrid or aberrant plumage does this individual represent?

Recent sight records

Sightings of Cox's Sandpiper have been increasing recently from southeastern Australia, where at least nine birds were sighted during the 1986–1987 season. Smith reported single birds at Werribee (November 10, 1986), Lake Murdeduke (December 20, 1986) and, for the first multiple report, he saw a "flock" of three in New South Wales (March 8, 1987) (F.T.H. Smith *pers comm.*). Cox (1987) observed a minimum of four individuals north-northwest of Adelaide, one of which apparently remained almost four months (December 6, 1986–April 4, 1987).

The 1987–1988 field season has already yielded three reports from Australia. Single adult birds were found during late August in South Australia and at Werribee (September 24, 1987) (*fide* Robert J. Swindley); Australia's first documented sighting of a juvenile Cox's Sandpiper occurred October 3, 1987, with photographs obtained (*fide* Robert J. Swindley).

Further records of Cox's Sandpiper outside Australia will likely increase now that more observers are on the alert. Eventual knowledge of *paramelanotos'* true distribution and abundance in Australia, along with additional life history information, should provide further clues as to this bird's taxonomic status. Based on the increasing number of field sightings, the limited plumage variability between individuals and the apparent scarcity of hybrid cal-

idrids, Cox's Sandpiper may, in fact, represent a valid species.

ACKNOWLEDGMENTS

We especially wish to thank Manomet Bird Observatory, along with the numerous students and volunteers who participated in the shorebird banding program. Special thanks to Jonathan L. Atwood for his help and contributions in manuscript preparation, and additional thanks to Linda E. Leddy, Trevor Lloyd-Evans, Simon A. Perkins and Bruce A. Sorrie for their helpful comments. David C. Morimoto kindly alerted us to contacts in Australia. We wish to acknowledge our Australian correspondents, Fred T.H. Smith, Robert J. Swindley, Shane A. Parker, and John B. Cox for supplying information on field characters and on current sightings of the Cox's Sandpiper. Roger B. Clapp at the National Museum clarified our questions on Cooper's Sandpiper. Martha U. Rustigian typed the manuscript. Camille M. Romano patiently listened to and commented on more than one hundred stories concerning the Cox's Sandpiper.

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