

Status of the Semipalmated Sandpiper

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The Semipalmated Sandpiper (*Calidris pusilla*) is one of the most widely distributed and numerous shorebirds breeding in North America, occurring throughout the low and middle Arctic and sub-Arctic regions of Canada and Alaska. The preceding six papers were motivated by previous analyses indicating that this abundant shorebird was undergoing a substantial decline, particularly along the Atlantic coast (summarized in Morrison *et al.* 2001). These papers were the result of a workshop held at the Waterbird Society meeting in November 2009 and were produced to help evaluate population trends and conservation status of the Semipalmated Sandpiper. Authors synthesized information from past studies and added new data and/or analyses. This report summarizes their findings and provides recommendations for additional conservation assessments and management actions.

Although it is not known if populations are differentiated genetically across the broad breeding range of the Semipalmated Sandpiper, Gratto-Trevor *et al.* (2012a), using additional data, verified the previously reported cline in bill length, with the smallest-billed birds breeding in the west and the largest-billed birds breeding in the east. These differences in bill lengths tended to segregate Semipalmated Sandpipers

into three breeding populations: western (Alaska), central (western Canadian Arctic), and eastern (eastern Canadian Arctic). The different morphological populations also segregate, to some degree, on the wintering grounds, although there is considerable mixing of populations along the northern coast of South America (Gratto-Trevor *et al.* 2012a). Birds wintering in northern South America, where the species is found in greatest abundance in the non-breeding season, appear to be primarily a combination of central- and eastern-breeding individuals.

The distinctive morphometrics of the breeding populations have also been used to monitor Semipalmated Sandpipers at migratory stopovers. In the Bay of Fundy during fall migration, average wing and bill lengths in catches of sandpipers declined between 1981 and 2006, while mean body mass remained stable or increased (Hicklin and Chardine 2012). There was a noticeable step in the decrease of average bill length between the periods of 1981-1989 and 1997-2006, indicating a loss of individuals from the easternmost portion of the Semipalmated Sandpipers' range. The trend towards later staging in the Bay of Fundy between the 1980s and 2000s (Hicklin, personal observation *in* Hicklin and Chardine 2012) corresponds with the later arrival of more

western breeding individuals, further supporting the disproportionate loss of eastern-breeding birds. Their ability to continue to gain mass at the Bay of Fundy stopover suggests that factors responsible for declines in Semipalmated Sandpipers were occur elsewhere (Hicklin and Chardine 2012).

Contrary to observations in the Bay of Fundy, Semipalmated Sandpipers in Delaware Bay during their spring stopover had lower size-adjusted body masses in the 2000s than in mid-1990s (Mizrahi *et al.* 2012). The shape of average mass curves through the season also changed from a quadratic in the early period to a linear function in the later period, indicating that birds still needed to continue to accumulate mass late in the season. In contrast, Least Sandpipers did not show reductions in mass gain; the difference in mass reductions between species was attributed to the greater importance of horseshoe crab eggs in the diet of Semipalmated than in the diet of Least Sandpipers (Mizrahi *et al.* 2012). Excessive harvest of horseshoe crabs in the late 1990s reduced egg availability to migrant shorebirds for years afterward.

Following Gratto-Trevor *et al.*'s (2012a) partitioning of the breeding population, Smith *et al.* (2012) found that changes in counts at local sites and reporting frequencies (in regional checklist submissions) of Semipalmated Sandpipers were consistently stable to increasing in western and central regions and variable among sites and datasets in eastern Canada. Few long-term sites were available for analyses in the central and eastern region, and checklist information was available from 1987 to 2007. Comparisons across wider time periods tended to show decreases, whereas analyses over more recent decades demonstrated stability to possible increases. No information on trends exists from the Ungava Peninsula, a large region where the species is not uncommon. Data were similarly sparse or lacking from elsewhere at the southern edge of the species' range, where expansion of woody vegetation into graminoid tundra and changes in wetland hydrology, both associated with climate change, could also

be reducing the amount of nesting habitat available to Semipalmated Sandpipers.

Information collected at migration stopovers in the northern Atlantic provinces and states indicates that there were relatively high abundances of Semipalmated Sandpipers in the late 1970s and 1980s, declines through the 1990s, and some increases or no change during the 2000s (Gratto-Trevor *et al.* 2012b). Checklist submissions from Quebec hinted at a similar pattern, where large flocks of Semipalmated Sandpipers were less common in the 1990s. The pattern in Ontario count data, however, suggested a steady decline since the early 1980s. Counts in the mid-continent appeared to decline during the study period, but high variability among years prevented finding a statistically meaningful result. Avian predators, particularly Peregrine Falcons (*Falco peregrinus*), have increased in abundance since the 1970s. Their role in influencing length of stay at migratory stopover locations (and perhaps biasing the survey results) or the effect of their predation on slowing the recovery of Semipalmated Sandpipers to 1980s population levels, remains unknown.

Morrison *et al.* (2012) reported large declines in shorebirds wintering along the northern coast of South America. Small calidridine sandpipers, primarily Semipalmated Sandpipers, recorded on aerial surveys in Suriname, French Guiana, and Guyana decreased by 79% between 1982 and 2008-2012. Preliminary information indicates that wintering birds did not shift their distribution along the northern South America coastline between time periods, although distribution of mudflats and inter tidal exposure patterns along coastlines of Suriname and French Guiana varied between the two time periods (Morrison *et al.* 2012). Declines measured in northern South America between the early 1980s and 2000s were reflected in eastern North America migration counts over the same period. Harvest of Semipalmated Sandpipers occurs throughout northern South American countries, and on some islands in the eastern Caribbean, and may play a larger role in their population dynamics than previously realized.

In conclusion, Semipalmated Sandpipers: 1) have been stable to increasing in Alaska over the last 40 years, 2) may now be stable to increasing in the central portion of their range, and 3) had pronounced decreases in the eastern Canadian Arctic, where declines may or may not be reversing. Sandpipers wintering along the coast of northern South America are likely a mix of central- and eastern-breeding populations, where large changes in abundance have been observed between recent surveys and those made in the 1980s. Too few long-term studies are available from breeding sites in the central Canadian Arctic to determine if large changes found on the wintering grounds were reflected in this population. The Bay of Fundy appears to provide adequate stopover habitat for Semipalmated Sandpipers, whereas habitat quality at Delaware Bay has deteriorated.

Until they have demonstrated sustained recovery, eastern populations of Semipalmated Sandpipers should be considered a shorebird of high conservation concern. The studies described in the preceding papers offer a variety of insights into the threats faced by Semipalmated Sandpipers throughout their range. To address what we perceive as the most significant of these threats, we propose the following conservation assessment and mitigation actions for eastern Semipalmated Sandpipers: 1) determine and, if necessary, mitigate the effects of hunting in the eastern Caribbean Basin and northern South America, 2) determine the effects of avian predation on sandpipers at migration stopovers and wintering sites, 3) assess the effects of climate and goose-influenced habitat change on their breeding grounds, 4) as-

sess the effects of climate (e.g. storms) during migration and winter, 5) restore habitat quality at the Delaware Bay stopover, and 6) assess the effects of contaminant exposure on their wintering grounds.

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