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Revisiting Western Hudson Bay: Using aerial surveys to update polar bear abundance in a sentinel population

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SUMMARY

Capture-based studies of the Western Hudson Bay polar bear population in Canada have reported declines in abundance, survival, and body condition, but these findings are inconsistent with the perceptions of local people. To address this uncertainty about current status, we conducted a comprehensive aerial survey of this population during August, 2011, when the region was ice-free and bears were on shore. We flew a combination of overland transects oriented perpendicular to the coastline, coastal transects parallel to shore, and transects across small islands. We used distance sampling and sight-resight protocols to estimate abundance. Bears were concentrated along the coast in central and southern Manitoba and Ontario portions of the population, although sightings >10 km inland were not uncommon in central Manitoba. We analyzed 2 combinations of data and derived an abundance estimate of 1030 bears (95% CI: ~754–1406). This figure is similar to a 2004 mark-recapture estimate but higher than projections indicating declining abundance since then. Our results suggest that mark-recapture estimates may have been negatively biased due to limited spatial sampling. We observed large numbers of bears summering in southeastern Western Hudson Bay, an area not regularly sampled by mark-recapture. Consequently, previous mark-recapture estimates are not directly comparable to our aerial survey of the entire population. Whereas our results do not necessarily contradict the reported declines in this population, we believe that improvements are needed in monitoring, and Methodological limitations and inconsistencies must be resolved to accurately assess status and the impacts of climate change.