

Diet and foraging routes of Common, Arctic, and Roseate Terns in Lobster Bay, Nova Scotia

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Seabirds serve as important bio-indicators for assessing marine ecosystem health. Specialist species that are restricted in their dietary and foraging range are particularly vulnerable to changing conditions and can provide a sensitive measure of environmental disruptions. Within their northern breeding range, up to 75% of the Canadian population of the endangered Roseate Tern (*Sterna dougallii*) nests sympatrically with Common (*S. hirundo*) and Arctic Terns (*S. paradisaea*) on North Brother Island in southwest Nova Scotia. To compare the diet and foraging behaviour of all three tern species, we used photography of bill-load holding terns, environmental DNA (eDNA) via chick fecal matter, and observations of foraging routes. Photographic data of 2022 and 2023 revealed that Roseate Tern chicks consumed 4 and 5 different prey species, where combined proportions of herring and sand lance accounted for 83% and 95% of their diet. During the same period, Common Tern chicks consumed 15 and 11 prey species with 44% and 51% of herring and sand lance. Results of eDNA in 2021 revealed 6 prey fish species for Roseate Terns, 8 for Arctic Terns, and 9 for Common Terns. Observations from a stationary blind indicated that Common and Arctic Terns arrived from foraging from all four cardinal directions, while Roseate Terns used almost exclusively the east and south. Our results show that Roseate Terns are foraging specialists relative to Common and Arctic Terns and thus confirm that Roseates may serve as more sensitive indicators of marine environmental change than sympatric Common and Arctic Terns.

Keywords: conservation, ornithology, eDNA metabarcoding, diet monitoring