



Songbird Monitoring Along the St. Croix Riverway

Of the nine parks in the Great Lakes Network, the St. Croix National Scenic Riverway has the most area to cover. How do you conduct songbird surveys along 200 miles of river that spans two different ecoregions (see map)?

There are six survey routes, with anywhere from 47 to 53 points along a given route, from the headwaters to where the St. Croix meets the Mississippi River: upper Namekagon River (UNAM), lower Namekagon River (LNAME), upper St. Croix River (USAC), St. Croix River North (SACN), middle St. Croix River (MSAC), and lower St. Croix River (LOSA). Upper and lower river sites are sampled in alternate years.

St. Croix also has the longest running songbird survey program, having started with two routes in 1982. The program has gone through a number of changes since that time, so not all the data were useable in this analysis. Some of the best data for assessing bird populations along the riverway are from 2005 to 2014 when surveys were conducted from an anchored point in the river rather than while drifting by a survey site.

Data for 100 songbird species were analyzed to identify population trends by species and among guilds (functional groups) organized by *migration strategy* (permanent resident, short-distance migrant, and long-distance/Neotropical migrant); *habitat preference* (grassland/open, wetland, successional/scrub, woodland, urban); *diet* (frugivore, granivore, insectivore, omnivore); and *forage substrate* (air, bark, ground, shrub/low canopy, high canopy).

Overall Trends—Species and Guilds

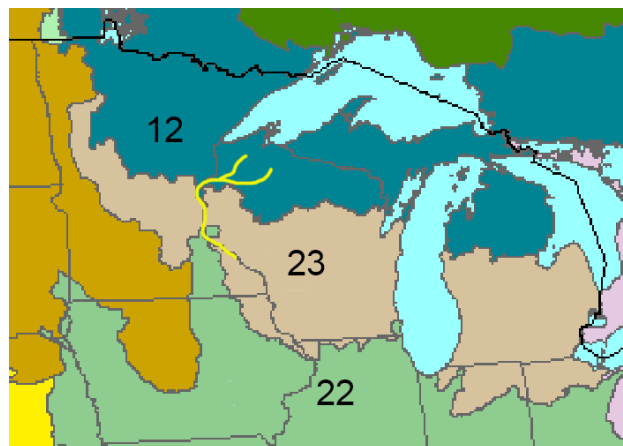
These results apply to habitats immediately adjacent to the rivers and should not be extrapolated to inland or upland locations.

Four species had significantly increasing trends and **six species showed significant declines** between 2005 and 2014 (Table 1). There were unprecedented declines in 16 of the 17 guilds, 13 of which were statistically significant (ranging from 0.9% to 3.9% decline per year). Only the wetland guild showed a slightly increasing (but not statistically significant) trend.

The Take-Away

It is tricky to interpret the trends among the St. Croix Riverway's breeding songbirds in this first-ever statistical analysis, in part because of the changes in how data were collected over the years, but also because annual surveys alternate between upper and lower river routes. Nevertheless, for individual species, data collected since 2005 (when canoes and boats were held at anchor rather than floating past a survey point) probably reflect true bird population trends in the park.

While the cycle of alternating between upper and lower river sites introduces a few challenges to precise analyses, it does allow more habitat types and a much larger number of points to be surveyed. There are ways to account for these challenging survey conditions and to come to reasonable conclusions about bird population trends. Future analyses should be very enlightening.



The St. Croix Riverway (shown in yellow) traverses two ecoregions and part of a third: the boreal hardwood transition (12), the hardwood prairie transition (23), and the eastern tallgrass prairie (22). A diversity of bird species can be expected from such an extensive geography. Base map from Bird Studies Canada, www.bsc-eoc.org/research/gislab/images/bcr_terrestrial.png.

Table 1. Statistically significant population trends for songbird species at St. Croix National Scenic Riverway. Trends were only significant on the routes shown.

Species	Population Trend (% change/year)	Routes
Common Grackle	(+13	UNAM-SACN
Yellow Warbler	(+5	UNAM-SACN
Gray Catbird	(+4	UNAM-SACN
Yellow-throated Vireo	(+4	UNAM-SACN
White-breasted Nuthatch	-4	LOSA-LNAME
Ovenbird	-4	UNAM-SACN
Swamp Sparrow	-4	UNAM-SACN
Golden-winged Warbler	-5	LOSA-LNAME
Black-capped Chickadee	-6	UNAM-SACN
Indigo Bunting	-8	UNAM-SACN