



Coastal Wetland Bird Communities

Indicator #4507

Overall Assessment

Status: **Mixed**

Trend: **Deteriorating**

Rationale: **Species across the Great Lakes basin exhibited both positive and negative population trend tendencies. Significantly negative population trends occurred for 18 species, while only six species exhibited significantly positive population trends.**

Lake-by-Lake Assessment

Lake Superior

Status: Not Assessed

Trend: Undetermined

Lake Michigan

Status: Mixed

Trend: Deteriorating

Rationale: Species in this lake basin exhibited both positive and negative population trend tendencies. Of the seven significant population trends observed, three were positive, while four were negative.

Lake Huron

Status: Poor

Trend: Deteriorating

Rationale: Most species in this lake basin exhibited negative population trend tendencies. Twelve significantly negative species population trends occurred, while there were no significantly positive species population trends.

Lake Erie

Status: Mixed

Trend: Deteriorating

Rationale: Species in this lake basin exhibited both positive and negative population trend tendencies. Significantly negative population trends occurred for twelve species, while only three species exhibited significantly positive population trends.

Lake Ontario

Status: Mixed

Trend: Deteriorating

Rationale: Species in this lake basin exhibited both positive and negative population trend tendencies. Significantly negative population trends occurred for thirteen species, while only four species exhibited significantly positive population trends.

Purpose

- To assess wetland bird species composition and relative abundance
- To infer condition of coastal wetland habitat as it relates to factors that influence the biological condition of this ecologically and culturally important component of wetland biotic communities

Ecosystem Objective

To restore and maintain diverse and self-sustaining populations of Great Lakes coastal wetland bird communities. Breeding populations of bird species across their historical range should be sufficient to maintain populations of each species and overall species diversity. This indicator supports the restoration and maintenance of the chemical, physical and biological integrity of the Great Lakes basin and beneficial uses dependent on healthy wetlands (Annex 2 GLWQA).

State of the EcosystemBackground

Assessments of wetland-dependent bird diversity and abundance in the Great Lakes are used to evaluate health and function of coastal and inland wetlands. Breeding birds are valuable components of Great Lakes wetlands and rely on the physical, chemical and biological condition of their habitats, particularly during breeding. Presence and abundance of breeding individuals therefore provide a valuable source of information about wetland status and population trends. Because several wetland-dependent birds are listed as species-at-risk due to the loss and degradation of their habitats, the combination of long-term monitoring data and analysis of habitat characteristics can help to assess how well Great Lakes coastal wetlands are able to provide habitat for these sensitive species as well as other birds and wetland-dependent wildlife.

Status of Wetland-Dependent Birds

Since 1995, Marsh Monitoring Program (MMP) volunteers have collected bird data at 610 discrete routes across the Great Lakes basin. An annual summary of bird routes monitored is provided in Table 1.

From 1995 through 2007, MMP volunteers recorded 56 bird species that use marshes (wetlands dominated by non-woody emergent plants) for feeding, nesting or both throughout the Great Lakes basin. In 2007, Red-winged Blackbird was the most commonly recorded non-aerial foraging bird species observed by MMP participants, followed by Swamp Sparrow, Yellow Warbler, and Marsh Wren. Among birds that nest exclusively in marsh habitats, the most commonly recorded species was Marsh Wren, followed by undifferentiated Common Moorhen/American Coot (calls of these two species are difficult to distinguish from one another), Virginia Rail, Black Tern, Common Moorhen, Pied-billed Grebe, American Bittern, American Coot, Sora and Least Bittern. Among bird species that typically forage in the air above marshes, Tree Swallow and Bank Swallow were the two most commonly recorded bird species.

Another study, focusing on wetlands in Lake Michigan and Lake Superior, found a similar pattern in relative bird abundance, with Red-winged Blackbird being the most commonly observed non-aerial foraging bird, followed by Swamp Sparrow, Common Yellowthroat, Song Sparrow, and Yellow Warbler (Hanowski *et al.* 2007). Obligate marsh-breeders, such as Sora and Virginia Rail, showed moderate-to-low abundance (mean abundance of 0.25 and 0.19 individuals per site, respectively) when compared with generalist species like Red-winged Blackbird (5.38), Song Sparrow (1.25) and Common Grackle (1.89). Tree Swallow and Cliff Swallow were the two most commonly observed aerial foragers.

With thirteen years of data collected across the Great Lakes basin, the MMP is becoming an established and

recognized long-term marsh bird population monitoring program. Bird species occurrence, abundance, activity and detectability vary naturally among years and within seasons. Population indices and trends (i.e., average annual percent change in population index) are presented for several bird species recorded at Great Lakes MMP routes, from 1995 through 2007 (Figure 1). Species with significant basin-wide declines were American Coot (not shown), Barn Swallow (not shown), Black Tern, Blue-winged Teal (not shown), Canada Goose (not shown), Common Grackle (not shown), Common Moorhen (not shown), Common Nighthawk (not shown), Forster's Tern (not shown), Least Bittern, undifferentiated Common Moorhen/American Coot, Mute Swan (not shown), Northern Harrier (not shown), Pied-billed Grebe, Red-winged Blackbird, Sora, Tree Swallow and Virginia Rail (Figure 1). Statistically significant basin-wide population increases were observed for Common Yellowthroat, Great Blue Heron (not shown), Northern Rough-winged Swallow (not shown), Trumpeter Swan (not shown), Wood Duck (not shown) and Yellow Warbler (not shown). American Bittern, Mallard and Marsh Wren populations did not show a significant trend in abundance indices from 1995 through 2007 (Figure 1). Declines in population indices of species that use wetlands almost exclusively for breeding such as Least Bittern, Black Tern, Common Moorhen, American Coot, Sora, Pied-billed Grebe and Virginia Rail, combined with an increase in some wetland edge and generalist species (e.g., Common Yellowthroat, Great Blue Heron and Yellow Warbler) suggest changes in wetland habitat conditions may be occurring. Difference in habitats, regional population densities, timing of survey visits, annual weather variability and other factors likely interplay with water levels to explain variation in wetland-dependent bird populations. American bittern, for example, showed a significant declining population index from 1995 to 2004 (Crewe *et al.* 2006) but recently its population index has rebounded. As such, further years of data will hopefully help explain natural population variation from significant population trends.

A study testing the use of bird community-based coastal wetland indices of biotic integrity (IBIs) was conducted using MMP data collected between 1995 and 2003 in the Great Lakes basin. The geographic range included all of Lake Erie, Lake Ontario, and Lake St. Clair, parts of Lake Michigan and Lake Huron, and the Detroit River. The highest mean IBI (where higher scores indicate bird communities in better biotic condition) was from Black Creek Area Wetland with a value of 93.2 (out of 100) (Timmermans *et al.* 2008). The next highest values belonged to Lake St. Clair Marshes (82.4), Point Pelee Marsh 2 (81.6), Wye Marsh (78.6), Hucyks Bay 1 (77.0), and Suamico River Area Wetland (75.9). The remaining study marshes yielded mean IBI scores ranging from 74.0 down to 17.8. It is important to note that some marshes only had a single year of data available for analysis, while others had IBI scores for all nine years.

Pressures

Future pressures on wetland-dependent birds will likely include continuing loss and degradation of important breeding habitats through wetland loss, water level stabilization, sedimentation, contaminant and nutrient inputs and invasion of non-native plants and animals.

Management Implications

Wherever possible, efforts should be made to maintain high quality wetland habitat and adjacent upland areas. There is also a need to address other impacts that are detrimental to wetland health such as water level stabilization, invasive species, and inputs of toxic chemicals, nutrients and sediments. Restoration programs are underway for many degraded wetland areas through the work of local citizens, organizations and governments. Although significant progress has been made, considerably more conservation and restoration work is needed to ensure maintenance of healthy and functional wetland habitats throughout the Great Lakes basin.

Comments from the author(s)

MMP wetland monitoring activities will continue across the Great Lakes basin. Continued monitoring of at least 100

routes through 2008 is projected to provide good resolution for most of the wetland-dependent birds recorded by MMP volunteers. Recruitment and retention of program participants will therefore continue to be a high priority. Priority should also be placed on establishing regional goals and acceptable thresholds for species-specific abundance indices and species community compositions. Assessments to determine relationships among survey indices, bird population parameters and critical environmental parameters are also needed.

MMP staff has engaged in efforts with other marsh bird experts to develop and implement continentally standardized marsh bird monitoring protocols. Recently, the MMP marsh bird monitoring protocol was revised to align with this accepted standardized protocol. These revisions will facilitate improved data sharing and compatibility among most major marsh bird monitoring programs, and will thus improve our knowledge of marsh bird population status and trends across various spatial scales. MMP staff will continue to seek opportunities to work cooperatively with existing monitoring programs in various regions of the Great Lakes basin.

Previous studies have ascertained marsh bird habitat associations using MMP bird and habitat data. As more data are accumulated, these studies should be periodically updated in order to provide a better understanding of the relationships between wetland bird species and habitat. Most MMP bird survey routes have been georeferenced to the level of individual survey stations. Volunteer recruitment has also improved significantly since the last status reporting period, and with the recent development of an MMP regional coordinator network throughout the Great Lakes basin, improved local and regional delivery of the program is anticipated. Future work will focus to enhance the utility of the SOLEC wetland bird indicator by applying the bird community-based IBI to evaluate coastal wetland health. Two additional important tasks are in progress: 1) improve the program's capacity to monitor and report on status of wetland specific Beneficial Use Impairments (BUI) among Great Lakes Areas of Concern (AOCs), and; 2) develop and improve the program's capacity to train volunteer participants to identify and survey marsh birds following standard MMP protocols.

Although more frequent updates are possible, reporting trends in marsh bird population indices every five or six years is most appropriate for this indicator. A variety of efforts are underway to enhance reporting breadth and efficiency.

Geographically extensive and long-term monitoring of wetland-dependent birds is possible through the enthusiasm, skill and coordination of volunteer participants trained in the application of standardized monitoring protocols. Information about abundance, distribution and diversity of marsh birds provides data for calculating trends in population indices as well as investigating habitat associations which can contribute to effective, long-term conservation strategies.

Assessing Data Quality

Insert "x" under the statement that best corresponds with each data characteristic

Data Characteristics	Strongly Agree	Agree	Neutral or Unknown	Disagree	Strongly Disagree	Not Applicable
1. Data are documented, validated, or quality-assured by a recognized agency or organization	X					
2. Data are traceable to original sources	X					
3. The source of the data is a known, reliable and respected generator of data	X					

4. Geographic coverage and scale of data are appropriate to the Great Lakes basin	X					
5. Data obtained from sources within the U.S. are comparable to those from Canada	X					
6. Uncertainty and variability in the data are documented and within acceptable limits for this indicator report	X					
Clarifying Notes:						

Acknowledgments

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Table 1. Number of routes surveyed for marsh birds within the Great Lakes basin, from 1995 to 2007.

Source: Marsh Monitoring Program

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Figure 1. Trends (percent annual change) in relative abundance (population index) of marsh nesting and aerial foraging bird species detected at Marsh Monitoring Program routes, from 1995 to 2007.

Values in parentheses are upper and lower 95% confidence limits, respectively, for trend values given.

Source: Marsh Monitoring Program

Last Updated

State of the Lakes Ecosystem Conference (SOLEC) 2008

Year	Number of Routes
1995	150
1996	181
1997	181
1998	150
1999	156
2000	152
2001	147
2002	172
2003	132
2004	121
2005	185
2006	227
2007	224

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Source: Marsh Monitoring Program

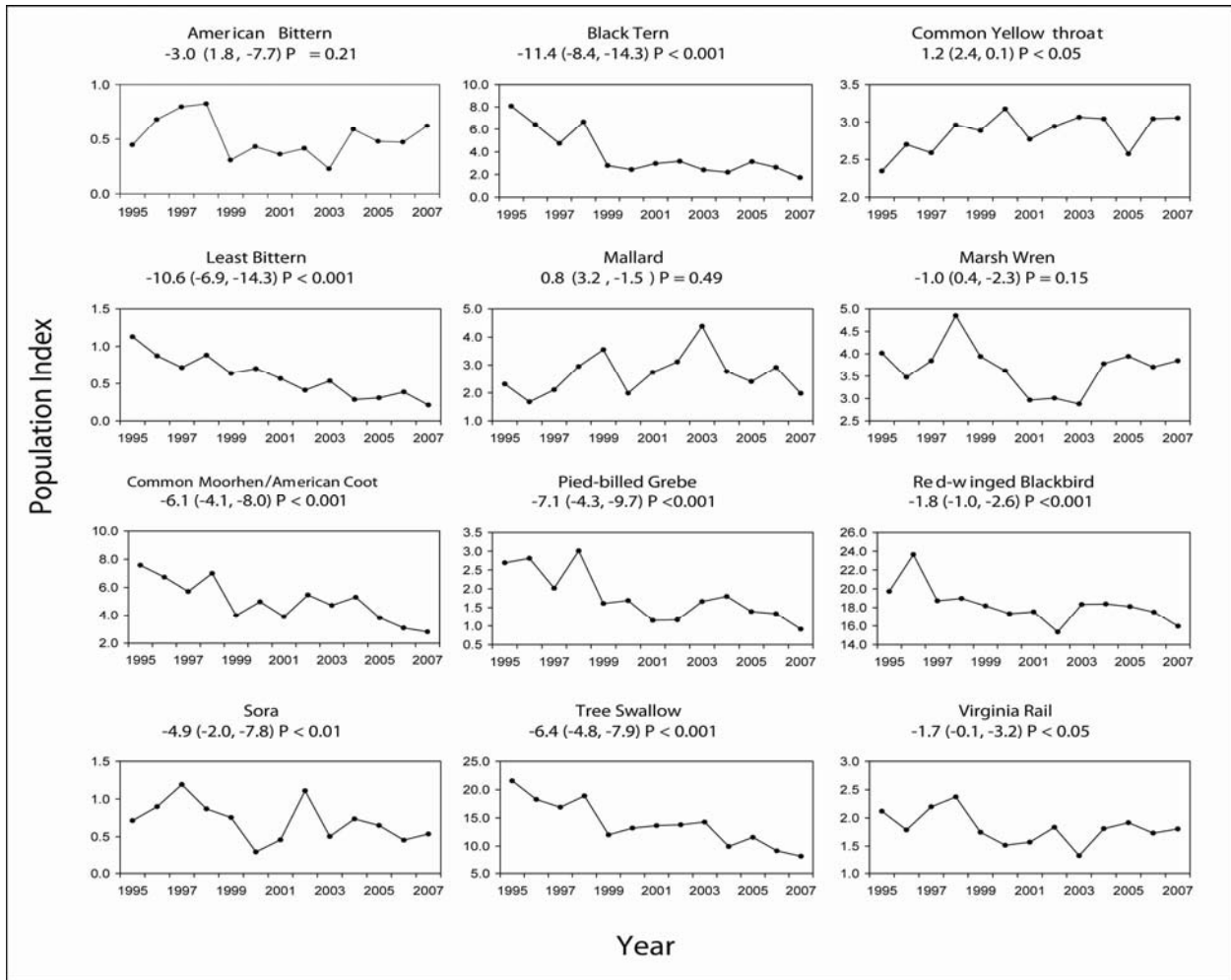


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