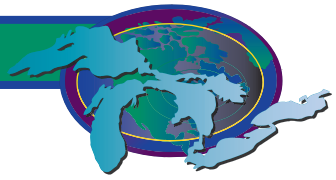

## Wetland-Dependent Bird Diversity and Abundance

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 14 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. Despite an equal number of significantly positive and negative trends among species, certain focal species did not occur at a level sufficient for trend analysis, or were absent from monitoring stations.

**Lake Huron**

Status: Poor
Trend: Deteriorating
Rationale: Most species in this lake basin exhibited a negative population trend. Eight 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 seven 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 six species, while only two 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 communities

### Ecosystem Objective

The overall objective is 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 Great Lakes Water Quality Agreement, specifically

regarding maintenance of fish and wildlife populations, elimination of bird or animal deformities or reproductive problems, and preservation of fish and wildlife habitat (United States and Canada 1987).

**State of the Ecosystem**

Background

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.

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.

Status of Wetland-Dependent Birds

Since 1995, Marsh Monitoring Program (MMP) volunteers have collected bird data at 508 discrete routes across the Great Lakes basin. An annual summary of bird routes monitored is provided in Table 1.

| Year | Number of Routes |
|---|---|
| 1995 | 145 |
| 1996 | 177 |
| 1997 | 175 |
| 1998 | 151 |
| 1999 | 154 |
| 2000 | 153 |
| 2001 | 146 |
| 2002 | 170 |
| 2003 | 131 |
| 2004 | 118 |
| 2005 | 183 |

**Table 1**. Number of routes surveyed for marsh birds within the Great Lakes basin, from 1995 to 2005.
Source: Marsh Monitoring Program

From 1995 through 2005, 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. Red-winged blackbird was the most commonly recorded non-aerial foraging bird species observed by MMP participants, followed by swamp sparrow, marsh wren and yellow warbler. Among birds that nest exclusively in marsh habitats, the most commonly recorded species was marsh wren, followed by Virginia rail, common moorhen, pied-billed grebe, American coot and sora. Among bird species that typically forage in the air above marshes, tree swallow and barn swallow were the two most commonly recorded bird species.

With eleven 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 2005 (Figure 1). Species with significant basin-wide declines were American coot (not shown), black tern, blue-winged teal (not shown), common grackle (not shown), common moorhen (not shown), least bittern, undifferentiated common moorhen/American coot (calls of these two species are difficult to distinguish from one another), 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, mallard, northern rough-winged swallow (not shown), purple martin (not shown), trumpeter swan (not shown), willow flycatcher (not shown) and yellow warbler (not shown). American bittern and marsh wren populations did not show a significant trend in abundance indices from 1995 through 2005 (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, willow flycatcher and mallard) 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; Archer *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.

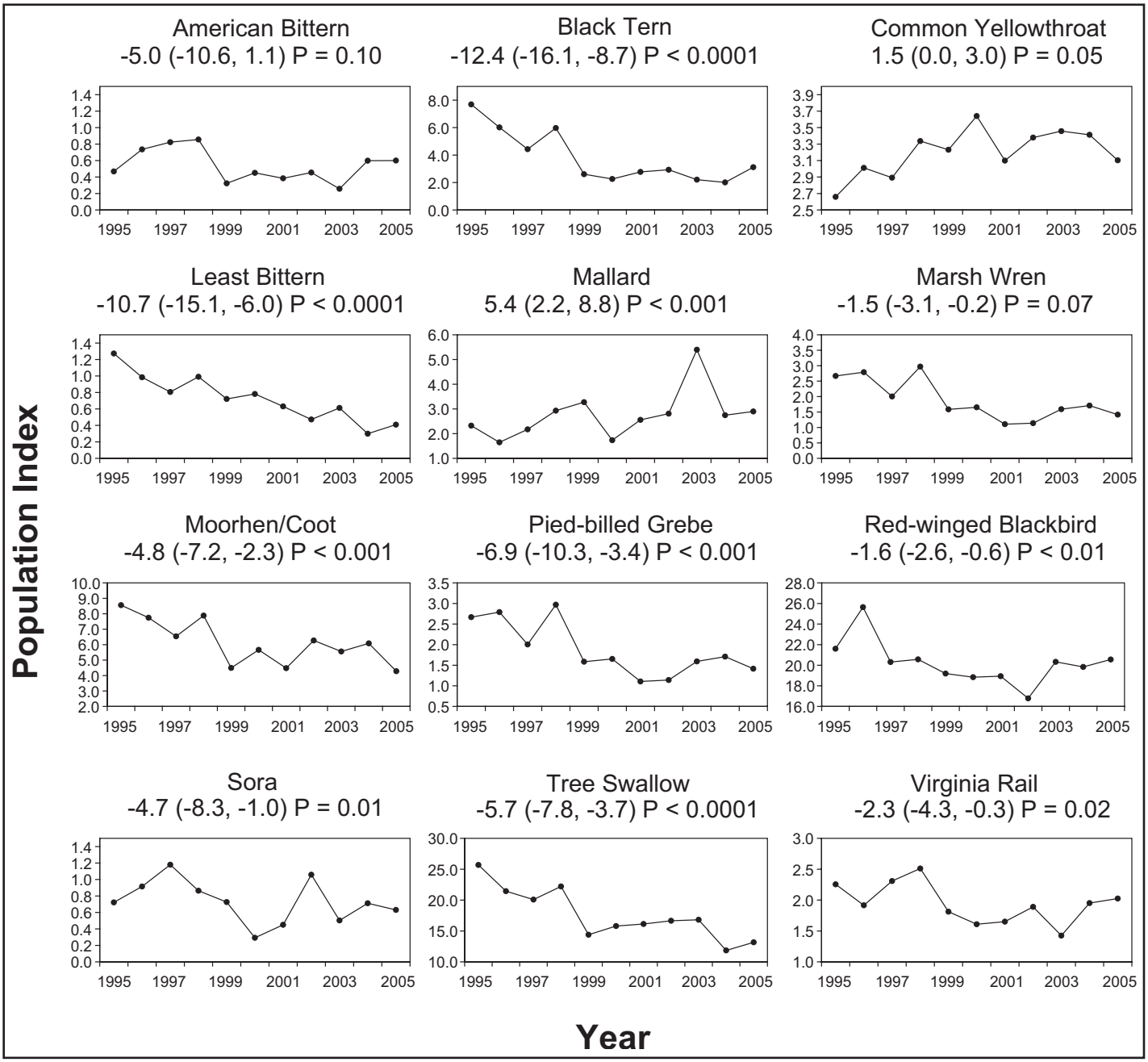


**Figure 1**. Trends (percent annual change) in relative abundance (population index) of marsh nesting and aerial foraging bird species detected at Marsh Monitoring Program routes, from 1995 to 2005.

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

Source: Marsh Monitoring Program

**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 2006 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.

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. Five additional important tasks are in progress: 1) develop the SOLEC wetland bird indicator as an index for evaluating coastal wetland health; 2) 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); 3) improve and revise MMP bird survey protocols to coincide with continentally-accepted marsh bird monitoring survey standards; 4) develop and improve the program's capacity to train volunteer participants to identify and survey marsh birds following standard MMP protocols, and; 5) develop the capacity to incorporate a regional MMP coordinator network component into the MMP to improve regional and local delivery of the program throughout the Great Lakes basin.

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.

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