



**PROCEEDINGS OF THE  
2006 MARSH BIRD MONITORING WORKSHOP  
PATUXENT WILDLIFE RESEARCH CENTER  
MARCH 6-8, 2006**

**EXECUTIVE SUMMARY**

A Marsh Bird Monitoring Workshop was held at the Patuxent Wildlife Research Center in March 2006 to continue progress towards the development of an operational monitoring program for marsh birds in North America. The goal of this program is to estimate temporal and spatial changes in abundance of selected breeding marsh bird species at continental, national, regional, and possibly local scales. Moreover, population data will be tied to ancillary data on habitat, in order to inform population and habitat management strategies. The program will have as focal species: Pied-billed Grebe, Least Bittern, American Bittern, Sora, Clapper Rail, King Rail, Virginia Rail, Black Rail, Yellow Rail, American Coot, Common Moorhen, Purple Gallinule, and Limpkin, as well as Seaside Sparrow and Salt-marsh Sharp-tailed Sparrow, although additional species can be accommodated to meet local or regional objectives.

Participants at the workshop reviewed the status of development of marsh bird survey protocols, survey sampling designs, and a data management system for marsh bird survey data. They concluded that the survey protocol developed from the multi-year study recently completed by Courtney Conway can essentially serve as the standard protocol for a marsh bird monitoring program. However, participants could not agree on an overall approach to sampling design that would be feasible for the diverse regions of the continent and still produce adequate continental-scale information. Until issues of overall approach are resolved, the recommendation to survey practitioners is to coordinate sampling plans at the largest spatial units practical and statistically-defensible, such as for major portions of the continent, i.e., North American Waterbird Conservation Plan waterbird conservation planning regions. Recommendations for a data management system were also broad, including that it be centralized and continental in scope.

The highest priority action item identified at the workshop is the formation of a small, very-statistically oriented group, focused on continental-scale objectives, but with representation across the continent, to create specific written guidance on sampling design for use by survey practitioners across the continent.

**NEED FOR A WORKSHOP**

**Introduction**

“Marsh bird” is a term meant to encompass non-colonial, non-waterfowl (“webless”) aquatic species including loons, bitterns, non-colonial grebes, rails, gallinules, coots, limpkin, and cranes. With the exception of cranes and loons, these species tend to be secretive and difficult to survey accurately. Issues of wetland accessibility have also limited surveys of other marsh-dependent species (e.g., swamp sparrows). Population sizes and trends for many marsh-dependent species are largely unknown, yet they face a host of conservation concerns including

continued habitat loss and fragmentation, sea level rise eliminating coastal wetlands, and the influence of various marsh management practices. Some species are hunted, and better information is needed to set harvest regulations.

In the last several years, considerable progress has been made towards developing approaches to better understand population status of marsh birds, including the development of a proposed standardized survey protocol, a recommendation for a sampling framework, and work towards a data management system. These efforts, in addition to an increase in interest in marsh bird conservation in recent years prompted the formation of a steering committee comprised of representatives of Bird Studies Canada (BSC), Canadian Wildlife Service (CWS), U.S. Fish and Wildlife Service (USFWS), and U.S. Geological Survey (USGS) to address the following issues:

- 1) Determine the current status of the development of marsh bird survey protocols, survey sampling designs, and a data management system for marsh bird survey data;**
- 2) Assess whether these efforts are technically adequate to commence implementation of a large-scale marsh bird monitoring program;**
- 3) Establish whether additional research and development are needed to enhance the program, and, if so, prioritize these research/development needs; and**
- 4) Identify steps needed to move towards implementation of a large-scale marsh bird monitoring program, and the roles for agencies and organizations involved in it, if the framework is determined to be technically adequate.**

The steering committee convened a group of 30 scientists, biometricians, and biologists from management agencies on March 6-8, 2006 at a workshop held at Patuxent Wildlife Research Center, Laurel, Maryland. More information on this workshop, including a list of participants, presentations made by Steering Committee members, and preparatory readings is available at <http://www.fws.gov/birds/waterbirds/monitoring/marshmonitoring.html>

### **Goal of the Workshop**

Bruce Peterjohn (USGS) presented the purpose and premises for the workshop. He referred to the recommendations and information needs identified at the 1998 international Marsh Bird Monitoring Workshop, and reviewed the major projects undertaken since that time. Species of concern were proposed and discussed, as well as information on coverage of these species by existing surveys. Participants were invited to provide comments, criticisms, feedback, insights, expertise, guidance, and personal perspectives on issues related to marsh bird monitoring in order to meet the goal of the workshop:

**Continue progress towards the development of an operational monitoring program for marsh birds in North America that provides timely data for the purposes of determining distribution, relative abundance and population trends, and informing population and habitat management strategies, at multiple geographic scales.**

## **WORKSHOP RESULTS**

### **Session I: Objectives for a Continental Marsh Bird Monitoring Program**

Jon Bart (USGS) presented various ways that marsh bird monitoring data are or are likely to be used and described some alternatives to how a monitoring infrastructure might be built around

these uses. These uses included identifying species at risk, setting harvest limits, designing and evaluating management programs, documenting progress towards population goals, investigating basic biology, and helping managers address local issues. He introduced an approach or framework for a monitoring program, drawing from his work in the Intermountain West, which would address these uses.

The presentation was followed by extensive discussion on objectives for marsh bird monitoring from the perspective of the many programs and organizations represented by participants. This discussion touched on issues of scale, of geographic and taxonomic scope, and the importance of flexibility in making recommendations about a marsh bird monitoring program.

### **Consensus Reached:**

- **The participants agreed to support the development of a program that would provide estimates of temporal and spatial changes in abundance of breeding marsh bird populations at continental, national, regional and possibly local scales.**
- **Under this program, population information should be linked to auxiliary habitat data.**
- **The program should address the following species: Pied-billed Grebe, Common Moorhen, Least Bittern, American Bittern, Sora, Clapper Rail, King Rail, Virginia Rail, Black Rail, Yellow Rail, American Coot, Purple Gallinule, Limpkin, as well as Seaside Sparrow, and Salt-Marsh Sharp-tailed Sparrow, because of habitat overlap.<sup>1</sup>**
- **Program should be flexible such that surveys will allow for the addition of other species of regional or local interest.**
- **This program should aim to be truly continental, addressing marsh birds south of the U.S. border to the extent possible. Specifically, subsequent planning should include representatives from Mexico.**

### **Session II: Survey Protocol**

Courtney Conway (USGS) presented on work to develop, refine, test and recommend survey methods and a protocol to monitor marsh birds in North America. He reported on analyses regarding the use of call-broadcast to increase detection probability while maximizing pooling of data and their analytical capabilities; reviewed findings regarding causes of variation in detection probability and approaches to reduce variation and bias; and discussed issues associated with survey point placement. Steve Timmermans (BSC) followed with a presentation addressing

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<sup>1</sup> Horned Grebe and Red-necked Grebe might also be included following consultations with grebe experts to ascertain the degree of habitat use overlap with the above species and how well these species are monitored by other survey efforts. Common Snipe was excluded from this list as a focus on this species requires a significantly different sampling frame (e.g., surveys on non-marsh habitat).

additional issues regarding use of volunteers, collection of auxiliary habitat information, and some specific details on the protocol used in the BSC's Marsh Monitoring Program..

Subsequent discussion was facilitated around a desired outcome of recommending a standardized survey protocol for use in marsh bird surveys at all geographic scales, or identifying and prioritizing information gaps and research needs that must be addressed before a standardized survey protocol could be recommended.

### **Consensus Reached:**

- **Participants agreed that the fundamental structure of the Conway protocol is recommended for marsh bird monitoring, that is:**
  - **a five minute passive listening period followed by one-minute call broadcast intervals for each target species**
  - **individual data records created for each target bird vocalization detected, including type of call and if bird was heard at a previous point**
  - **standard lists of species that must be included in the survey**
  - **a standardized sequence (order) of calls**
  - **a centralized, standardized source of call recordings**
  - **an additional passive listening period is acceptable following the call broadcast intervals**
  - **an unlimited-radius point count, with distance estimates for all detections**
- **Additional guidance on the standardization of the order and identity of a small number of minimum species lists for call broadcast, as well as the maximum number of one minute broadcast intervals allowed (i.e., the extent of broadcast species list) is forthcoming. This guidance will be generated by additional analyses of existing data (in association with the National Wildlife Refuge System – see Data Management section below).**
- **The principle of obtaining associated local habitat variables should be emphasized and there should be additional investigation into sources and approaches for this.**
- **Additional analyses should be conducted to develop specific guidance for number of surveys over space and time. In general, this guidance should encourage multiple surveys at given locations, both to develop information on detectability and to sample peak breeding periods of multiple species; however, in situations of limited time and/or resources (especially personnel), guidance should favor surveying the maximum number of locations once.**

In addition to those described above, a number of other investigations were suggested. These were to address issues including: response of birds to conspecific species' calls vs. a lag/delay in response, the effects of tidal phase on response rates of marsh birds, and the extent to which non-focal or "secondary" species might be included in surveys (due to the significant data management ramifications), effects of sound level and equipment quality on responses, and effects of use of volunteers in surveys. It was recommended that input from workshop participants (and other groups, such as the Refuge User Acceptance Team) be solicited to prioritize these issues, and then to pursue the appropriate analyses to generate draft additional guidance for consideration.

### **Session III: Sampling Framework/Design**

Jon Bart presented his recommendation for a marsh bird monitoring framework, which would be built up from sampling plans developed individually for Bird Conservation Sub-Regions (BCSs - units developed by combining BCR and State/Provincial boundaries). These sampling plans would be tailored to the needs and practical realities of the sub-regions, recognizing that for given locations sampling intensity will vary, accessibility will be a challenge, and habitats will change over time. The BCS sample plans would be habitat-based, with “designated areas” in each region (comprising the target population for the region) grouped into strata for developing survey locations and schedules. His approach was illustrated by examples developed for the Intermountain West.

Participants had a number of questions and comments about the presented approach, and discussion of how it would have to be modified to apply to other geographic units of the continent (Colorado River Basin, Prairie Potholes, Ohio, New York, coastal areas). The complexity of associated database design and analysis was acknowledged, yet despite this, Jon Bart maintained that practical considerations (lack of resources and interest) precluded the development of range-wide, top-down sampling plans. Because a number of participants continued to hold serious reservations that the presented approach would not produce data comparable enough to provide estimates of continental-scale trends, recommendations of the group focused on continued research and dialogue.

#### **Consensus Reached:**

- **The participants stressed that the continental marsh bird monitoring program requires standard, or at least compatible, approaches be developed across all, even quite diverse, portions of the continent.**
- **A small, very-statistically oriented group, focused on the continental-scale objectives, but with representation across the continent, should be formed to resolve issues of overall approach. This group would then provide specific written guidance for developing sampling plans for use by survey practitioners across the continent.**
- **Continuing or new marsh monitoring work should be viewed and encouraged as pilot studies to support development of this guidance.**
- **Coordination of sampling plans should be pursued at the largest spatial units practical and statistically-defensible, such as for major portions of the continent, i.e., North American Waterbird Conservation Plan waterbird conservation planning regions.**

### **Session IV: Data Management**

Bruce Peterjohn presented on the marsh bird monitoring data management system under development at Patuxent Wildlife Research Center for use by the USFWS National Wildlife Refuge System. This system will manage data collected on refuges using the marsh bird survey protocol developed by Courtney Conway. Even though the emphasis of this system will be data collected on refuges, USFWS Refuges will allow its use to manage data collected at off-refuge

locations. Work on developing this data management system will continue with the goal of creating an operational system for Refuges use by autumn 2006.

The participants discussed a number of issues related to a data management system for marsh bird surveys. For example, whether to have a single data management system or dual systems in the U.S. and Canada was discussed but not resolved. At this time, the participants believed it was premature to make specific detailed recommendations concerning the desired functionality of a continental data management system. If the continental marsh bird monitoring program adopts the Conway survey protocol, then the Refuges data management system has the potential to support the continental program. Modifications to the Refuges system will likely be necessary to support the sampling design and other aspects of the continental survey program. Patuxent Wildlife Research Center has expressed a willingness to devote some computer programming resources towards making the necessary modifications required by a continental program. If extensive modifications are required to the Refuges system, however, then funding beyond the Patuxent programming resources will be necessary to develop the continental data management system.

#### **Consensus Reached:**

- **A centralized data management system, preferably continental in scope, is desirable. When the appropriate time for more specific recommendations is reached, the broad range of potential stakeholders should be involved.**

#### **Session V: Information Needs and Topics for Further Discussion**

The highest priority topic for additional investigation identified at the workshop is development of sampling design guidance. Participants listed considerations or questions that should be taken into account in developing such guidance, including:

- Pilot projects to test new guidance on protocols and sampling plans
- Investigation of detection probability estimation from capture-recapture approaches
- Understanding of the value of various auxiliary data that can be collected on or in conjunction with surveys
- Emerging/existing land cover or wetland information technology
- Characterization of distance sampling's ability to produce density estimations
- Collaborations with existing programs, e.g., waterfowl surveys
- Training and qualifications of surveyors

#### **Wrap-Up Session: Next Steps and Continued Communication**

The Steering Committee agreed to re-convene to identify individuals to serve on working groups to address major tasks identified during the workshop. Foremost is the working group to address issues of the continental sampling framework. This working group will be made up of survey design and population monitoring experts, will have representation from all waterbird planning regions, and will have enough management experience to understand practical issues (e.g., accessibility) associated with marsh bird monitoring. This working group will be charged with producing specific guidance within one year (March 2007). All workshop participants were

invited to make suggestions to the Steering Committee with regards to the formation of this working group.

The Steering Committee also agreed to ensure that the workshop proceedings and future updates of marshbird monitoring activities will be regularly reported to interested groups of stakeholders (e.g., Flyways, regional planning groups, etc.). Information will be reported at <http://www.fws.gov/birds/waterbirds/monitoring/marshmonitoring.html>

*April 10, 2006*