



# Priority Information Needs for Rails and Snipe

A FUNDING STRATEGY

Developed by the Association  
of Fish and Wildlife Agencies'  
Migratory Shore and Upland  
Game Bird Support Task Force

May 11, 2009





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May 11, 2009

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## Executive Summary

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This Strategy contains recommendations for obtaining priority information needed to reduce the uncertainties underlying management decisions for rails and snipe. This Strategy is intended to increase the financial support for management over the next five to ten years with thoughtful and deliberate planning built on scientific principles.

The Task Force determined that convening a workshop of national experts to develop the Strategy would be the most efficient and effective process. By invitation of the Working Group Chairman, experts from flyways, universities, and from state and federal agencies in the United States, Canada and Mexico were invited to the workshop. The workshop was held November 18–20, 2008.

Population sizes, and trends in abundance, are essentially unknown for snipe and rails at the flyway and national levels, and habitat types that are important for rails, such as salt marsh and freshwater emergent marsh, have likely declined (Dahl 2006). Existing habitat quality is likely negatively affected by development and changes in hydrologic regimes, and existing surveys, such as the Breeding Bird Survey (Sauer, et al. 2007), do not adequately index rail abundance. The king rail is classified as a “bird of management concern” and a “game bird below desired condition” by the U.S. Fish and Wildlife Service, and is a federally endangered species in Canada.

Four priority information needs for rails and snipe (in priority order) have been determined:

1. Implement a national monitoring program
2. Continue to improve the Harvest Information Program sampling frame
3. Improve the rails and snipe parts collection survey
4. Estimate vital rates to support population modeling

Workshop participants identified three overarching guidelines that should be considered in further development of each of the priority information needs.

1. Consider the involvement of Canada and Mexico. It is important to evaluate the potential importance of breeding, migration, wintering habitats, and harvest levels that occur in Canada and Mexico to management decisions. New or expanded information-gathering activities should be range wide in scope.
2. Recognize regional differences that likely exist in vital rates, and other characteristics of rail and snipe populations.
3. Consider the effects of climate or system change and its impacts on rail and snipe population priority vital rates (survival, reproduction and recruitment). Assessing the impact of projected sea-level change on coastal breeding, wintering, and migratory habitats is especially important.

Ultimately, these priorities help build on the foundation of current efforts in a way that ensures the long-term conservation and informed harvest management of these critically important birds in the face of a changing environment.



## Introduction

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The Migratory Shore and Upland Game Bird Working Group (Working Group) met during the March 2006 meeting of the Association of Fish and Wildlife Agencies. The Working Group established a Migratory Shore and Upland Game Bird Support Task Force (Task Force) to assist it. The Task Force is composed of nine representatives of state, federal and non-governmental organizations. The Task Force was directed to update the research and management needs of the sixteen species of migratory shore and upland game birds (MSUGB), and to develop a strategy for funding priority research and management needs for these species.

With the approval of the Working Group, the Task Force completed the update of the list of research and management needs, but did not establish priorities for the needed work. The Task Force also placed the 16 species into five groups because it was determined that separate strategies for each species were not possible. A Funding Strategy for Mourning and White-Winged Doves was completed in June 2008, which established priorities for needed work. The second strategy identified by the Task Force was for the five species of rails and snipe: Wilson's snipe, sora, clapper rail, king rail, and Virginia rail.

### STRATEGY PURPOSE

This Strategy contains recommendations for obtaining priority information needed to reduce the uncertainties underlying harvest management decisions for rails and snipe. The Strategy focuses on identifying priority information needs as they influence population vital rates (survival, reproduction, and recruitment) during the annual cycle of these birds.

The Strategy is intended to increase the financial support for management, research and monitoring activities over the next five to ten years with thoughtful and deliberate planning built on basic scientific principles. It can be used to guide the acquisition and expenditure of funds, as well as to provide the means to attract additional funds from partners interested in migratory shore and upland game birds.

Separate from the Strategy, an action plan will be developed to encourage partners to collaborate and support these information needs, to use or redirect current funding, and/or to secure new funding. It will describe a budget process or other means of securing funds. Finally, this action plan will ensure that everyone presents a consistent message when pursuing funding.

### STRATEGY DEVELOPMENT PROCESS

The Task Force determined that convening a workshop of national experts to develop the Strategy would be the most efficient and effective process. By invitation of the Working Group Chairman, experts from flyways, universities, and from state and federal agencies in the United States, Canada and Mexico were invited to the workshop. The workshop was held November 18–20, 2008. A list of workshop participants is included in Appendix A. The Task Force retained D.J. Case & Associates (DJ Case) to facilitate the workshop.

A draft of the Strategy was compiled and edited by DJ Case and distributed to workshop participants on January 21, 2009. This draft was also sent to the four flyway councils for review. Comments from participants and the flyway councils were incorporated into this final document.

Status of Rails and Snipe

POPULATION STATUS AND TRENDS

The best information on the status of rails and snipe comes from the North American Breeding Bird Survey (BBS). However, it should be noted that the BBS is poorly designed for monitoring population trends of these birds (Ribic, et al. 1999) and portions of some species' breeding ranges might not be covered by the survey (i.e., Wilson's snipe). Short-term (1996–2006) and long-term (1966–2006) trends for the hunted rails and snipe are listed in Table 1. Trends for Virginia, clapper, and king rail are based on a limited number of routes.

Table 1. Population Status and Trends

Species	Region	Period	Trend	P <sup>b</sup>	N <sup>c</sup>
Wilson's snipe	United States	1966–2006	-0.25	0.60	711
		1996–2006	-0.36	0.58	499
Sora	United States	1966–2006	-0.16	0.83	269
		1996–2006	-7.60	<0.01	150
Virginia rail	United States	1966–2006	0.52	0.65	85
		1996–2006	-2.86	0.01	43
Clapper rail	United States	1966–2006	1.20	0.28	48
		1996–2006	1.40	0.43	24
King rail	United States	1966–2006	-7.20	<0.01	39
		1996–2006	-9.48	0.17	18

<sup>a</sup> Trends (% change/year) obtained from: Sauer, J. R., J. E. Hines, and J. Fallon. 2007. The North American Breeding Bird Survey, Results and Analysis 1966–2006. Version 10.13.2007. USGS Patuxent Wildlife Research Center, Laurel, MD. Do not cite without permission from authors.

<sup>b</sup> P-values less than or equal to 0.05 indicate trend is significantly different from zero.

<sup>c</sup> Number of BBS routes used in analysis for trend estimates.

HUNTING AND HARVEST

At least one species of rail is hunted in 36 states, and approximately 25,000 rails were harvested by 8,000 hunters who spent 22,900 days afield in 2007. Snipe are hunted in 49 states, plus Puerto Rico. In 2007, approximately 120,000 snipe were harvested by 30,000 hunters. Species-specific estimates from 2007 were 13,200 sora, 700 Virginia, 10,000 clapper, and 600 king rails (Richkus, et al. 2008).

Population sizes, and trends in abundance, are essentially unknown for snipe and rails at the flyway and national levels, and habitat types that are important for rails, such as salt marsh and freshwater emergent marsh, have likely declined (Dahl 2006). Existing habitat quality is likely negatively affected by development and changes in hydrologic regimes, and existing surveys, such as the Breeding Bird Survey (Sauer, et al. 2007), do not adequately index rail abundance. The king rail is classified as a “game bird below desired condition” by the U.S. Fish and Wildlife Service, a species of high concern in the North American Waterbird Conservation Plan, and is a federally endangered species in Canada. In the past, the king rail was also listed as a “bird of conservation concern” by the U.S. Fish and Wildlife Service; however, the decision was made to not include hunted species in the updated list released in December 2008 (U.S. Fish and Wildlife Service 2008).

A DIFFICULT CHALLENGE

Compared to waterfowl and doves, there are relatively few rail and snipe hunters, and these hunters harvest a relatively small number of birds. Even though the best estimates indicate a minimal harvest, there is still uncertainty about how harvest relates to population size for each species. This uncertainty stems from the inherent difficulty in monitoring these species due to their inconspicuous nature. Methods to better survey this group of birds have been developed over the past decade. However, steps are just now being taken to implement this methodology on a landscape scale to better monitor population status. Are funding priorities for rails and snipe more or less important than other migratory game birds, given the differences noted above? Although workshop participants discussed this question, it was beyond the scope of the workshop. Instead, the workshop focused solely on identifying priority information needs for rails and snipe. Moving forward, difficult decisions still need to be made on what level of harvest management is necessary for this group, and how much funding will be required to improve management.

Priority Information Needs

Four priority information needs (in priority order) have been determined:

1. Implement a national monitoring program
2. Continue to improve the Harvest Information Program sampling frame
3. Improve the rails and snipe parts collection survey
4. Estimate vital rates to support population modeling

Following for each of the priorities are the rationale, description, timetable and cost.

Priority 1. Implement a National Monitoring Program

RATIONALE

An operational monitoring program conducted on a national scale is critical to inform harvest management of Wilson’s snipe, sora, clapper rail, king rail, and Virginia rail. These five species are difficult to monitor because of their secretive habits, cryptic coloration, infrequent vocalizations, and use of difficult-to-access dense wetland habitats. Although harvest estimates for these hunted species are available through the Migratory Game Bird Harvest Information Program (HIP), annual harvest management decisions are made with considerable uncertainty due to lack of abundance information or

GUIDELINES

Workshop participants identified three overarching guidelines that should be considered in further development of each of the priority information needs.

- Consider the involvement of Canada and Mexico. It is important to evaluate the potential importance of breeding, migration, wintering habitats, and harvest levels that occur in Canada and Mexico to management decisions. New or expanded information-gathering activities should be range wide in scope.
- Recognize regional differences that likely exist in vital rates, and other characteristics of rail and snipe populations.
- Consider the effects of climate or system change and its impacts on rail and snipe population vital rates (survival, reproduction and recruitment). Assessing the impact of projected sea-level change on coastal breeding, wintering, and migratory habitats is especially important.

knowledge of relative population trends. Uncertainty also exists concerning population response to habitat management due to lack of basic trend information. Recognizing this uncertainty, a series of workshops conducted since 1998 has resulted in a set of field protocols that have the potential to provide a national monitoring framework for rails, snipe, and similar non-game species (Conway 2008, Johnson, et al. 2008).

#### DESCRIPTION

A monitoring protocol has been successfully tested and piloted in several locations around the United States (Conway 2008). The field survey protocol consists of a passive listening period followed by playback of target species' calls from April through June (depending upon latitude). The two-part protocol allows the use of all available data (e.g., North American Breeding Bird Survey information), and increases the opportunity to detect all species and individuals present. Strata for the national monitoring program will be hierarchical in nature; i.e., local wetland, state, bird conservation region, flyway, and continental species range. Although numerous details have been worked out during the development and pilot phase of the monitoring protocol, considerable uncertainty exists about full survey implementation at a national and/or continental scale.

#### TIMETABLE AND COST

The following items must occur during the next five years to ensure complete implementation of the monitoring program and full collaboration with all affected stakeholder groups:

1. Inform all flyway councils and respective technical committees of the current progress of the national monitoring program and tentative implementation schedule. This communication need is critical because individual states, under the leadership of the flyway councils and technical committees, will ultimately conduct the survey on an operational basis.
2. Convene a regional meeting targeted at the Atlantic and Mississippi Flyways webless game bird technical committees and monitoring program experts to further refine implementation details in states with the largest harvest of Wilson's snipe, sora, clapper rail, king rail, and Virginia rail; specifically Louisiana, Florida, and South Carolina. Objectives of the meeting will be to finalize issues related to the ultimate use of the monitoring data in the harvest management decision-making process at the flyway level, implementation details about stakeholder responsibilities (e.g., responsible flyway technical committee member to coordinate activities within each flyway), and identification of funding needs to successfully implement monitoring at a flyway level. Estimated meeting and travel costs: \$35,000.
3. One-time purchase of field equipment is required each time a new state is brought into the monitoring program. Estimated cost is \$50,000 annually during years two through five.
4. As outlined above, short-term implementation of the national monitoring program will occur incrementally with initial emphasis on the Atlantic and Mississippi Flyways. Next, implementation steps will occur in the Central and Pacific Flyways (years six through ten), with long-term work on range-wide monitoring (e.g., Canada and Central America).

## Priority 2. Continue to Improve the Harvest Information Program Sampling Frame

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### RATIONALE

Screening questions asked during the HIP certification process are used to identify hunters by type (e.g., duck, goose, woodcock) in order to increase the efficiency of the sampling procedure. When registering for HIP, hunters are asked a series of six or seven questions, including: “Did you hunt for snipe or coot last year?” and “Did you hunt for rails or gallinules last year?” Snipe/coot and rail/gallinule were combined to reduce the number of screening questions at the request of license vendors. Hunters who reported hunting for these species the previous year are sampled at higher rates than those who did not. This allows the sampling effort to be concentrated on the hunters who hunt these species. However, estimates of hunter numbers suggest that screening data are not accurately identifying these snipe, coot, rail, or gallinule hunters. For example, according to 2007 HIP screening data received from the states, 270,000 hunters said they hunted snipe/coots the previous year, and 184,000 said they hunted rails/gallinules. However, the HIP survey estimated there were 20,000 active snipe hunters and 8,600 active rail hunters in 2006.

### DESCRIPTION

There is concern that screening questions are not the most appropriate groupings (e.g., snipe with coot and rail with gallinule) and vendors are not consistently asking the hunters the screening questions. Improper HIP certification practices seem to be reducing the efficiency of the stratification. This reduces the ability to identify actual snipe and rail hunters and might even lower response rates. Better screening information will allow biologists to achieve improved precision with the same or reduced sample effort. Additionally, HIP certification is only required of legally-licensed hunters. In some states, a small population of hunters (e.g., junior hunters, landowners) may not be required to become HIP certified and thus are not included in the sampling frame. A complete sampling frame of all migratory bird hunters will allow biologists to reduce bias in harvest estimates. Most importantly, improvements in the quality of the HIP sampling frame will improve harvest estimates for all migratory birds in the HIP program: ducks, geese, doves and pigeons, cranes, woodcock, snipe, coot, rails, and gallinules.

### TIMETABLE AND COST

The estimated cost associated with this issue over three years is \$250,000. This includes staff time, both federal and states, and also money associated with changing the programming or printing of a new HIP certification.

### Priority 3. Improve the Rails and Snipe Parts Collection Survey

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#### RATIONALE

Currently, the Parts Collection Survey (PCS) for rails and snipe enables estimation of the species composition of the rail harvest and the age ratio of the snipe harvest. Rail wings received from hunters are identified to species. Species-specific harvest estimates for rails are then derived by adjusting HIP harvest estimates by the five-year running average of species composition from the wings collected. For snipe, wings are aged based on feather characteristics, which results in a harvest-age ratio of hatch-year to after-hatch-year birds. The age ratio at time of harvest provides an index of recruitment from the breeding season prior to the current year's hunting season. Wings collected as part of the PCS could be used for additional purposes to better inform management of these species.

#### DESCRIPTION

Fully utilizing wings collected through the PCS is desirable in order to better manage rails and snipe. Other uses for the wings include: (1) developing methods to age rail wings in order to provide an index to recruitment, (2) determining the spatial origin of harvested rails and snipe, and (3) further assessing the species composition in the harvest. In addition, a wing-bee for these species should be developed to assist the Branch of Harvest Surveys of the U.S. Fish and Wildlife Service in processing rail and snipe wings.

For rails, efforts should be focused on developing methods to accurately classify age (i.e., hatch-year and after-hatch-year) from rail wings, which would provide an index of annual recruitment. Recently, methods to age rails based on feather characteristics have been developed. The methods should be evaluated and refined through a graduate-level research project.

The feathers from wings collected through the PCS could potentially be used to determine the breeding origin of harvested rails and snipe using stable isotope analysis. Both species molt their wing feathers on the breeding ground prior to fall migration. Therefore, the feathers retain the stable isotope signatures of where they breed. Information obtained from stable isotope analysis may help focus rail and snipe monitoring efforts toward breeding locations important to harvest. A graduate-level project should evaluate the use of stable isotopes to identify breeding location of rails and snipe. Efforts should focus on determining breeding location for rails and snipe harvested in high-harvest states.

Feather characteristics of king rail and clapper rail are very similar, especially for those harvested on the Gulf Coast. Therefore, wings might be misclassified using feather characteristics alone. Genetic analysis techniques should be developed to assess the proportion of king rail and clapper rail in the harvest. This information will help inform harvest management decisions, especially for populations of concern such as the migratory population of king rail.

There is an indication that the PCS for snipe may be discontinued because the age ratio information is not currently used to make management decisions. In addition, eliminating the survey would free up time to devote to other harvest surveys. Participants at the workshop believed that the snipe PCS should continue. Likewise, the additional work identified will increase the workload of the Branch of Harvest Surveys of the U.S. Fish and Wildlife Service. Currently, wings for these species are processed solely by staff with the Branch of Harvest

Surveys. A wing-bee, such as those for other species (i.e., waterfowl, doves, and woodcock), does not exist for rail and snipe. It is recommended that a wing-bee be developed for these species in order to assist with the processing of the wings. One suggestion was to hold a rail and snipe wing-bee in conjunction with the annual American woodcock wing-bee.

#### TIMETABLE AND COST

The estimated costs associated with this priority include four steps, each over three years (except for the wing-bee):

1. Develop methods for aging rails—graduate-level research project: \$250,000
2. Conduct stable isotope analysis to determine breeding locations of derivation of harvest (isotope analysis)—graduate research project: \$300,000
3. Develop methods to genetically identify and separate clapper and king rail—graduate-level research project: \$300,000
4. Hold an annual snipe/rail/gallinule wing-bee: \$10,000/year

### Priority 4. Estimate Vital Rates to Support Population Modeling

#### RATIONALE

By predicting future population size or trends under alternative harvest management, habitat management, or climate change scenarios, population models support science-based adaptive management decisions. Very few studies have estimated vital rates for rails and snipe, thus there are significant knowledge gaps. Research is needed to establish where the limits to population growth occur during the annual cycle for a given species or regional population. For rails and snipe, small-scale, regionally-replicated studies offer the best opportunity to provide initial estimates of vital rates. The large-scale banding programs that typically supply vital rate information for other hunted species may not be practical for rails and snipes. In a recent study of sora and Virginia rail (Haramis and Kearns 2007), of the thousands banded, extremely few individuals were recovered or recaptured. Fortunately, telemetry studies also support estimation of period vital rates, especially during breeding and fall migration staging periods when birds are more easily captured and tracked. For rails, which generally have high nest success, these periods when telemetry is possible also represent our greatest knowledge gap and the most likely bottlenecks due to habitat change. In particular, limited water availability in the landscape, due to climate and management decisions, likely has a strong negative influence on vital rates, as appropriate water levels are thought to reduce predation and ensure high quality forage during these same life stages.

#### DESCRIPTION

Two research projects are proposed to provide the initial period and annual vital rate estimates necessary to develop preliminary population models in support of harvest and habitat management decisions for sora, Virginia rail, and king rail. Both projects would use telemetry methods to estimate vital rates. Furthermore, in conjunction with results from population abundance estimates (Priority 1) and improved harvest data (Priority 2), the resulting data will allow simulation of population trends under alternative harvest management scenarios.

## Measuring Success

1. Identify the effects of water management on migratory king rail brood survival rate by tracking individuals from hatching to dispersal. As a rare and declining population, migratory king rail are not easily captured or tracked in numbers adequate to estimate annual vital rates. However, information on juvenile period survival (from hatch to initial dispersal) can be obtained, and these period rates offer the best opportunity to identify beneficial habitat management actions to prevent the further decline of this game species. It is recommended this study occur in the upper Midwest and possibly the Atlantic Flyway.
2. Identify the effects of water management on sora migratory survival rate by monitoring staging areas. Ideally, this study would track first-year juveniles from August to August to obtain an annual juvenile survival rate. However, this would increase the cost estimate given that two doctoral students would be required. Sora can initially serve as a surrogate for most other migratory rail populations, given that (1) capture methods for this species are well established, (2) population size and availability increase the likelihood of obtaining an adequate sample size to provide accurate estimates within three to five years, and (3) sora dominate the annual rail harvest. The sora offers the best opportunity to model how harvest effort affects rail populations. Population models that include harvest should be developed as part of these studies both before (i.e. *a priori* models) and after (i.e. assessment of models) data collection and vital rate estimation. If it can be determined, it is recommended that these studies use sora populations that are subject to the most harvest.

### TIMETABLE AND COST

The research projects could be initiated immediately and the formal modeling for harvest regulation done once vital rates have been estimated. Fieldwork must continue for at least three years to ensure adequate sample size and each study must also be replicated, to capture some geographic variation in vital rates. The differences in total cost estimates reflect differences in each species' relative abundance and/or ease of capture. The estimate includes cost for three years of fieldwork and compilation of data into population models during a fourth year.

1. Sora migratory survival: \$300,000
2. Migratory king rail brood survival: \$250,000

## Measuring Success

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Ultimately, these priorities help build on the foundation of current efforts in a way that ensures the long-term conservation and informed harvest management of these critically important birds in the face of a changing environment.

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Appendix A

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