

*Conservation Assessment
for
Yellow Rail (Coturnicops noveboracensis)*



Photo by: M. Robert

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December 18, 2002

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This document is undergoing peer review, comments welcome

This Conservation Assessment was prepared to compile the published and unpublished information on the subject taxon or community; or this document was prepared by another organization and provides information to serve as a Conservation Assessment for the Eastern Region of the Forest Service. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject taxon, please contact the Eastern Region of the Forest Service - Threatened and Endangered Species Program at 310 Wisconsin Avenue, Suite 580 Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

The following is a draft conservation assessment providing a summary of readily available information on the distribution, ecology, habitat and population biology of the yellow rail (*Coturnicops noveboracensis*) in the Great Lakes region.

The yellow rail is a ground-dwelling marsh bird that is very shy and secretive in nature. There is uncertainty as to whether the apparent rarity of this species is due to lack of observation or if the bird is simply not present (Bookhout 1995b). As a result, the true status and abundance of this species is uncertain. It appears to be stable in some areas, while in others it may be declining (NatureServe 2001).

The greatest threat facing the yellow rail is that of habitat loss or alteration. Their preference for large tracts of land and their specificity as to which marshes are suitable, appropriate habitat is scattered and discreet. Therefore, loss of habitat poses a very dangerous threat (Margaret A. Burkman pers. comm. 2001). Other threats include habitat fragmentation, overgrazing by livestock, and habitat quality decline by the encroachment of woody vegetation and/or invasion by exotic vegetative species (USFS Species Data 1999).

Research priorities for this species encompass gathering information on the following: 1) various aspects of life history, such as breeding biology and demographics; 2) the effects of livestock grazing; 3) migratory routes; 4) behavior; 5) accurate status and abundance estimates; 6) the effects of natural water level fluctuations; and 7) threats on the winter grounds.

ACKNOWLEDGEMENTS

Information was provided by the following individuals: Margaret A. Burkman, Forest Ecologist, Hiawatha National Forest; Chris Clampitt, Stewardship Ecologist, The Nature Conservancy; Edward L. Lindquist, Biological Scientist, Superior National Forest; Jim McCormac, Botanist, Ohio Bird Records Committee Secretary, Ohio Department of Natural Resources; Wayne P. Russ, Assistant Ranger (Wildlife), Superior National Forest; Al Williamson, Wildlife Biologist, Chippewa National Forest; Robert Johnson, Wildlife Biologist, Ottawa National Forest; Kenneth (Rex) Ennis, Wildlife Biologist, Huron-Manistee National Forest; Teresa Mackey, Information Services, New York Natural Heritage Program; Ronald P. Hellmich, Indiana Natural Heritage Data Center; Mike Tansy, Refuge Manager, Seney National Wildlife Refuge; Sharron Nelson, Minnesota Natural Heritage and Nongame Research Program; Mike Fashoway, Michigan Natural Features Inventory; Kevin Doran, Wildlife Biologist, Hiawatha National Forest; Betty Les, Wisconsin Natural Heritage Program; Steve Sjogren, Wildlife Biologist, Hiawatha National Forest.

NOMENCLATURE AND TAXONOMY

- Order:** Gruiformes
- Family:** Rallidae
- Scientific name:** *Coturnicops noveboracensis* (Gmelin, 1789)
- Subspecies:** Two subspecies are recognized in North America: *C.n. noveboracensis* of Canada and the United States, and *C.n. goldmani* from the state of México, Mexico. One additional subspecies is recognized in eastern Asia: *C.n. exquisita*
- Common name:** Yellow rail
- Synonym(s):** yellow crane, clicker, white-winged crane

DESCRIPTION OF SPECIES

The yellow rail is a small, very shy and secretive ground-dwelling marsh bird. As typical of all rails, it has a laterally compressed body with long toes for maneuvering through aquatic vegetation (Species at Risk 2001). Measuring 5-7 1/2 inches long with a wingspan of 10-13 inches and weighing 46-60 grams, this is the smallest rail in the world (INHS 2001). The plumage on its back is yellowish-brown with dark stripes crossed by white bars, the breast is buffy-yellow, the flanks gray, and the legs and feet greenish-yellow. The distinguishing characteristics of the yellow rail are the white patches on the trailing edge of each wing that are visible only in flight, and the short, black bill that is yellow in males until after the breeding season when it fades to black (NatureServe 2001).

This bird rarely flies but instead will hide or run when disturbed, and therefore is rarely seen. The best form of identification is its distinctive voice consisting a series of five “kiks” resembling two stones being struck together (Bookhout 1995b). Before incubation begins, the male will call for numerous hours during the night with only short, infrequent breaks. During and after incubation, the calling will continue, though at a subdued level, and will typically stop completely by mid-August (NatureServe 2001). The female also uses a variety of calls with her chicks, including a “rowr” when the nest is disturbed, whining to attract the chicks, and moans when brooding (NatureServe 2001). During the fall, the yellow rail is silent and therefore becomes difficult to detect (NatureServe 2001).

The chicks are black in color with a pink bill that will fade to black as it becomes a juvenile. The juveniles are darker than the adults with white-barred areas on the breast and spots on the head. Vocalizations of both the chicks and juveniles consist of “wees” and “peeps” (NatureServe 2001).

LIFE HISTORY

The yellow rail is classified as an omnivore that eats small snails, insects, seeds of marsh vegetation, and clover leaves. Wisconsin Department of Natural Resources (WDNR) (1999) listed the diet as including snails, beetles, grasshoppers, aquatic bugs, dragonfly nymphs, damselfly nymphs, spiders, crayfish, slugs, leeches, tadpoles, small fishes, arrowhead, smartweed, pondweed, bur reed, bristle grass, wheat, oats, bulrush, wigeon grass, and spike rush. Of these diet components, snails have been classified as the critical component, especially for the juveniles (NatureServe 2001). The yellow rail carries out most of its feeding activities during the day by gleaning prey from vegetation, the ground, and sometimes from the water (Bookhout 1995b). It has been observed sticking its head as far as 1.5 inches below the water while foraging (NatureServe 2001).

Migration occurs at night and in large groups with the daytime resting points often in odd locations such as residential areas (NatureServe 2001). Arrival on spring breeding grounds typically ranges from March to April. In Wisconsin, arrival is late-April to late-May (WDNR 1999), in Minnesota arrival is in the last week of April, and in Michigan the last week of April to the first week of May (USDA Statement of Purpose 1999). In mid- to late-August, the yellow rail undergoes a period of molting during which time it is flightless (NatureServe 2001). Fall migration typically begins in September to October.

In spite of the fact that the yellow rail will often be heard calling in the night during the summer, this bird is sedentary during the night. All breeding, feeding, and nest-building activities occur diurnally (NatureServe 2001).

Males of this species are territorial, establishing territories within one week of their arrival on the spring breeding grounds. The territories average 7.8ha, often overlap with other males', and oftentimes will encompass more than one female's activity area. The activity areas of the females averages 1.2ha before incubation and 0.3ha during incubation (NatureServe 2001). According to the Wisconsin DNR (1999), males appear to exhibit only weak fidelity to breeding sites.

The yellow rail is presumed to be monogamous, though polygynous activities have been recorded in captivity and multiple nests have been found in a single male's territory (USFS Species Data 1999). Mating is presumed to begin when the birds are one year old, with breeding activity typically occurring in the late morning hours (NatureServe 2001). These birds are semi-colonial nesters that may nest in shallow depressions in drier portions of the marsh, damp ground without standing water, or moist soil with 1-1.6 inches of standing water. Occasionally they will nest up to 6 inches above the ground on hummocks, and have been observed building up the nest and moving the eggs higher with encroaching water levels (WDNR 1999). The nests is a tightly woven cup of dead grass, 7 cm in diameter and 3-4 cm thick, and typically covered with a dense canopy of dead vegetation making the nest difficult to spot (Statement of purpose 1999). In captivity, it has been observed that the yellow rail will build multiple nests, later opting to lay the eggs in one of those nests (INHS 2001). It is unclear as to whether this behavior is also utilized in nature.

Usually in May or early-June, this species will lay 6-10 yellow-buff eggs with red-brown speckles at the larger end, measuring 28.3 x 20.7 mm (INHS 2001). The eggs will be laid one

day apart with incubation beginning after the last egg is laid. The female incubates the nest 13-20 days during which time she does not leave the nest at night. The semi-precocial chicks hatch synchronously and can leave the nest within 1-2 days. Though the young are able to feed on their own within 11 days, they will continue to receive parental care for approximately 17 days. Though it is known that the male does not participate with incubation, it is speculated that he may participate with the brooding after the chicks have hatched (INHS 2001). The young fledge at approximately 5 weeks of age (NatureServe 2001).

HABITAT

The yellow rail is very specific about which types of marshes it will utilize, needing a certain vegetation type and structure, a certain water depth, and a certain thickness and density of the dead layer of vegetation (Margaret A. Burkman pers. comm. 2001). During the breeding season, the yellow rail inhabits large (usually >100 acres), dense sedge- or grass-dominated freshwater marshes or wet meadows typically associated with nearby running water. Each pair prefers approximately a 40-acre tract of land, hence the need for so much habitat (Margaret A. Burkman pers. comm. 2001). Good habitat is identified as 100-200 acres (USFS Population Viability Assessment 2000) of wet meadows or marshes (DeGraaf 1991). Substrate preference ranges from moist to shallow standing water, with a preference for a dense build-up of litter that is critical for cover and nesting. Standing water less than 12 inches deep is typically present during nest-building, but dried to a shallower level by mid-summer (WDNR 1999). Vegetation preference is for dense narrow-leaved sedges, and sometimes grasses and broad-leaved sedges, ranging 5-60+ cm in height (NatureServe 2001). Cattails, forbs, shrubs and woody vegetation, and deep marsh zones are avoided (USFS Species Data 1999). According to NatureServe (2001), yellow rails in the Great Lakes Region are nearly exclusively associated with *Carex* species. In Michigan, they were almost always found in areas dominated by *Carex lasiocarpa*, while in Minnesota they showed a preference for large marshes of mixed sedge and bulrush with cattails in deeper areas, and in North Dakota they preferred fens with thick, soft mats of vegetation (NatureServe 2001).

During the migration, they may rest in grain fields or marshes. Winter habitat includes fresh- and saltwater marshes, damp meadows, agricultural fields, and sometimes rice paddies (NatureServe 2001).

DISTRIBUTION AND ABUNDANCE

The yellow rail has a wide distribution east of the Rocky Mountains, but due to its specificity in habitat preference, suitable habitat is patchily distributed resulting in numerous discrete populations across its range. Historically, the yellow rail was found from Alberta and Saskatchewan south to 40°N. The breeding range currently ranges from northwestern Alberta to central Saskatchewan, northern New York, Maine, and New Brunswick, south to southern Alberta, northeastern Montana, North Dakota, Michigan, southern Wisconsin, southern Ontario, and New England. It has also been rediscovered in southern Oregon and may also be found in eastern California (USFS Species Data 1999). The wintering range is found in the southeastern United States coastal regions, from Texas to North Carolina.

Figure 1. *Range map of the Yellow rail*



Status

Table 1. State or Provincial and Heritage Status Rankings for the yellow rail

State or Province	State or Provincial Ranking	Heritage Status Ranking*
Illinois	Endangered	SXB,S2N
Indiana	Not Listed	SZN
Michigan	Threatened	S1S2
Minnesota	Special Concern	S3
New York	Not Listed	S?N
Ohio	Not Listed	SX
Ontario	Special Concern	S4B,SZN
Pennsylvania	Not Listed	
Wisconsin	Threatened	S1B,SZN

*Heritage Status Rankings: S: Subnational

N: National

1: Critically imperiled

2: Imperiled

3: Vulnerable to extirpation or extinction

4: apparently secure

X: presumed extirpated

Z: Zero occurrences

B: Breeding range

N: Non-breeding range

?: unranked

Other Statuses:

National Heritage Status Rank: United States N3B,N4N

Canada: N4B

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Special concern

The yellow rail is a rare bird, though this may be more attributed to its secretive nature and tendency to spend most of its time under dense vegetation than to its overall abundance (Bookhout 1995b). Rangelwide, the habitat is decreasing due to coastal development, natural succession, and wetland loss. In the Great Lakes Region, the habitat is classified as stable as a result of extensive wetland restoration and preservation programs (USFS Species Data 1999). Because of the secretive nature of the yellow rail, the status and abundance are difficult to determine. For this reason, the status of the population both rangelwide and specifically in the Great Lakes Region is unknown. There is evidence that in some areas the populations are increasing while in other areas they are stable or decreasing and becoming quite rare (NatureServe 2001). One known habitat for the yellow rail in Michigan is at the Seney National Wildlife Refuge in Seney, Michigan, where according to Mike Tansy (pers. comm. 2001), the refuge manager, some years have resulted in upwards of 50 yellow rails observed, while other years very few have been observed. The survey in 1995 resulted in the detection of 84 male yellow rails, the highest number of rails heard in any survey at Seney (Bookhout 1995a). The survey in May, 2001, revealed a total of only one bird on the Refuge (Margaret A. Burkman pers. comm. 2001). The Seney Wildlife Refuge in the central Upper Peninsula of Michigan and the Houghton Lake area in central Lower Michigan are the only known and probable breeding locations in Michigan (Brewer et. al 1991).

POPULATION BIOLOGY AND VIABILITY

Yellow rails are able to reproduce at one year of age (USFS Species Data 1999) with a mean clutch size of 8.03 eggs (Bookhout 1995b). No information is available on maximum reproductive age, annual and lifetime reproductive success, the proportion of progeny that survive to reproductive age, or lifespan of the yellow rail. One brood per year is typical of this species, though they will re-nest if the original nest fails or is destroyed (WDNR 1999). A high hatching success is speculated for this species (Species at Risk 2001).

There may be a viable population or the potential for a viable population on the Chippewa National forest. The potential on the Superior National Forest and Chequamegon-Nicolet National Forest is unknown, as there is a lack of information (USFS Population Viability Assessment 2000).

POTENTIAL THREATS AND MONITORING

Present or Threatened Risks to Habitat or Range

The greatest present threat to the yellow rail is that of habitat loss caused by such things as coastal development, natural succession, and wetland destruction. Their preference for large tracts of land and their specificity as to which marshes are suitable, appropriate habitat is scattered and discreet. Therefore, loss of habitat poses a very dangerous threat (Margaret A. Burkman pers. comm. 2001). Habitat quality decline could result in further habitat loss. Quality decline may occur by the encroachment of woody vegetation (a possible result of fire suppression), or by invasion by unsuitable vegetation, such as purple loosestrife, choking out the natural, critical vegetation (*Carex* spp.) (USFS Species Data 1999). A combination of uncontrolled succession and fire suppression could result in large-scale loss of habitat.

Other threatened risks include habitat fragmentation, heavy agricultural use resulting in loss of cover, and conflicts with game-bird management. In Minnesota, the timing of flooding for game-bird management does not coincide with the natural flooding cycle, and as such could threaten the yellow rail (USFS Species Data 1999). The USFS Population Viability Assessment (2000) also recognizes any practice that changes water conditions (e.g. ditching of habitat, excessive water release from dams) as a major risk to yellow rail habitat.

Table 2. Threats or Risks to the Yellow Rail and its Habitat by Forest

Forest	Risk or Threat
Chequamegon-Nicolet	Not a RFSS on this Forest
Chippewa	Greatest threat on the forest a result of fire frequency in sedge meadows
Hiawatha	Fire suppression and wetland succession; altered hydrology
Huron-Manistee	None identified
Ottawa	Habitat alteration, specifically succession of sedge meadows to shrub and flooding of wetlands due to beaver activity
Superior	Possible threat from loss of herbaceous-dominated lowlands due to fire exclusion

Commercial, Recreational, Scientific or Educational Overutilization

The yellow rail has been classified as fairly resistant, not being easily flushed from the nest though it is not tolerant of large groups of people in the habitat during nesting (NatureServe 2001). It is also a curious animal that will leave its nest to investigate novel sounds, which could attract or open the nest up to predators. In Wisconsin, studies found that productivity of yellow rail nests located near nature trails had a dramatic decline (USFS Species Data 1999). In spite of this, human disturbance is not classified as a high threat for this species since its habitat is of the type not frequented by humans.

Disease or Predation

The common predators of the yellow rail are red fox, mink, raccoon, snakes, turtles, crows, gulls, hawks, owls, eagles, rats, opossum, striped skunk, river otter, coyote, and bobcat (NatureServe 2001). No information exists on diseases or parasites of this species (Bookhout 1995b).

Other Natural or Human Factors Affecting Continued Existence of Species

Long-term droughts or flooding could result in loss of the critical wetland habitat necessary for yellow rails (USFS Population Viability Assessment 2000). Yellow rails may also be lost to collision with man-made objects, such as radio towers during night migrations, and to machinery during cutting or baling on the winter grounds (Bookhout 1995b).

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

Table 3. Number of Occurrences of the yellow rail and Land Ownership by National Forest

Forest	Number of Occurrences	County	Land Ownership	Comments
Chequamegon-Nicolet	Not a RFSS on this Forest			Refer to the county occurrence listing in Table 4
Chippewa	Multiple occurrences	Cass	FS	
Hiawatha	Not documented on the forest			(Kevin Doran pers. comm. 2001)
Huron-Manistee	No known occurrence			
Ottawa	Not a RFSS on this Forest			No documented occurrences within Forest boundary (Robert Johnson pers. comm. 2001)
Superior	1 occurrence	Cook	Forest Service	Possibly breeds on the western edge of the forest, but very little is known about its breeding range

Table 4. Yellow rail Occurrence in the Great Lake States by State, County, and Year

State	County	Number of Occurrences and Year
Illinois		
Indiana*		Is a migrant species through the state and is not tracked
Michigan*	Chippewa Luce Roscommon Schoolcraft	1 occurrence: 1996 2 occurrences**: 1995, 1999 1 occurrence: 1978 (MNFI) 1 occurrence: 1980 1 occurrence: 1979 90 occurrences***: 1995(84), 1999(5), 2001
Minnesota*	Cass Clay Itasca Kittson Marshall Mille Lacs Morrison Norman Pennington Polk Roseau St. Louis Sherburne Wilkin	25 occurrences: 1994(24), 1995 1 occurrence: 1995 1 occurrence: 1994 12 occurrences: 1991 8 occurrences: 1992 1 occurrence: 2000 7 occurrences: 1991(3), 1992(4) 4 occurrences: 1995 8 occurrences: 1980, 1992(7) 11 occurrences: 1995 19 occurrences: 1991(14), 1992(5) 4 occurrences: 1993 1 occurrence: 1952 1 occurrence: 1980
New York*		Yellow rail is not tracked in this state
Ontario		
Pennsylvania		
Wisconsin*	Barron Bayfield Burnett Calumet Chippewa Door Douglas Forest Marinette Oconto Vilas	1 occurrence: 1988 1 occurrence: 1996 4 occurrences: 1989(2), 1992, 1993 1 occurrence: 1991 1 occurrence: unknown 1 occurrence: 1989 1 occurrence: 1996 2 occurrences: 1994, 1995 1 occurrence: 1985 1 occurrence: 1990 3 occurrences: 1980(2), 1988

*Information provided by: MNFI Natural Heritage Biological and Conservation Datasystem, 2001; Indiana Natural Heritage Data Center, 2001; New York Natural Heritage Program Information Services, 2001; Minnesota Natural Heritage and Nongame Research Program, 2001; Wisconsin Natural Heritage Datasystem, 2001

** (Spieles 1999)

***Seney National Wildlife Refuge (Bookhout 1995a; Urbanek 1999; Margaret Burkman pers. comm. 2001) Rail surveys occur every year, results for every year were not made available for this report.

SUMMARY OF EXISTING MANAGEMENT ACTIVITIES

It is presumed that if existing populations and their habitats are protected and other potential yellow rail habitat is protected, that the population as it is will be able to maintain current levels. Restoration potential is classified as high since this bird will inhabit suitable man-made areas and burned-over areas (NatureServe 2001).

Management requirements entail providing or protecting the proper habitat, which would be wetlands, wet meadows, or grass/sedge marshes with vegetation 5-60 cm in height and substrate ranging from damp to 38 cm of standing water. There should be at least 8ha of area for the males' territories with dead vegetation present for nest-building activities (NatureServe 2001). Proper prey items, such as snails, insects, seeds, and grasses need to be made available as well (NatureServe 2001).

In Michigan, it is vital that *Carex* species be present. Controlled burns have been found to be a successful tool in controlling the encroachment of woody vegetation and ensuring the presence of vital vegetative species. Margaret A. Burkman (1993) studied the effects of prescribed fire on yellow rails and found a positive relationship. It was observed that three birds were present before a burn, none in the summer immediately following a burn, and eight birds were present in the following year. This was in comparison to control plots, which had no birds in the years before and after a burn and two birds in the summer immediately following a burn. As a result of the findings of this study, prescribed fires have been successfully used to control the encroachment of woody vegetation and to encourage the continued existence of *Carex* spp on the Seney National Wildlife Refuge (Bookhout 1995b).

The USFS Species data (1999), listed several management recommendations that were made by The Nature Conservancy:

1. Reduce or eliminate livestock grazing in breeding areas
2. Prevent woody vegetation and maintain suitable breeding habitats through periodic burning
3. Protect remaining breeding habitat such as coastal marshes and prairie pothole marshes
4. Prevent stream projects that lower the water table in rail breeding habitats
5. Enforce the 1985 Farm Act; accelerate USFWS acquisition of wetlands; resume funding of the Accelerated Research Program for Migratory and Upland Game Birds; institute hunting stamp for hunting rails.

In addition, human disturbance should be minimized (NatureServe 2001).

Following is a management protocol for the authorized incidental take of yellow rails used by Bureau of Endangered Resources, Wisconsin Department of Natural Resources:

If the management activity is for the purpose of recovering, maintaining or improving the grassland, prairie or savanna ecosystem that includes habitat for yellow rails, then incidental take is allowed if these conditions are followed:

A. Burning, Mowing, Grazing, Selective Brush/Tree-cutting, and Herbicide Use:

1. If any of the above management activities are to occur at a site (see definition below) between 26 July and 19 May, then there are no restrictions on the management activities, as take is avoided under these circumstances.
2. If any of the above management activities are to occur at a site between 20 May and 25 July, then incidental take is allowed as described under the following conditions:
 - a. Burning, Mowing, and Grazing:
These activities may be employed under consultation with the DNR Bureaus of endangered Resources and Integrated Science Services
 - b. Selective Brush/Tree-cutting:
As long as precautions are taken to avoid unnecessary trampling or crushing of herbaceous vegetation, there are no restrictions on this activity.
 - c. Herbicide Use:
 - i. If herbicide is being used to control woody vegetation:
Then there are no restrictions on this activity as long as precautions are taken to avoid drift of chemicals onto adjacent herbaceous vegetation.
 - ii. If the herbicide is being used to control herbaceous plants:
then the activity may be employed under consultation with the DNR Bureaus of Endangered Resources and Integrated Science Services.

B. Definitions

1. "Site" for Yellow rail: Any patch of habitat suitable for yellow rails and designated as a management unit, as well as any directly adjacent suitable habitat within a given property ownership, or across ownerships where survey and management agreements for the species are in place.

PAST AND CURRENT CONSERVATION ACTIVITIES

The state of Minnesota currently employs a no-net-loss policy for wetlands and has programs to restore and protect existing wetlands. Wisconsin has approximately 20,000 acres of wetland that has been or is being restored. In Michigan, previously most historical yellow rail populations in such places as Munuscong Bay and southeastern Michigan have been lost due to habitat loss or degradation. Currently existing populations, such as in the Seney National Wildlife Refuge, are protected by private, state, or federal agencies.

RESEARCH AND MONITORING

Existing Surveys, Monitoring, and Research

The Nature Conservancy of Michigan conducts yellow rail surveys on the McMahon Lake Preserve in Luce County, Michigan (protocol listed below) (Spieles 1999). The Wisconsin DNR Bureau of Endangered Resources has also completed yellow rail surveys in the past (protocol listed below) (WDNR 1999). At one time, formal surveys were conducted at the Seney National Wildlife Refuge in Seney, Michigan. Currently, informal tours are given in May for casual observers wishing to see the yellow rail. During these tours, yellow rails are banded and pertinent information is recorded about the bird. However, these tours are not considered formal surveys and therefore do not have a set protocol (Tansy 2001). The Ottawa National Forest began the first known survey (protocol description listed below) for yellow rails on the forest in May, 2001. Wildlife Biologist Robert Johnson (pers. comm. 2001) stated that after one week of surveying, none had been found.

Survey Protocols

Protocol for: The Nature Conservancy's yellow rail survey, McMahon Lake Preserve in Luce County, Michigan, May 27-30 and June 6-7, 1999 (Spieles 1999)

Observations were made on three separate nights beginning at dusk, approximately 10:00pm, and continuing for two to four hours. Each night of the survey the peatland complex was entered during daylight hours and a start point was chosen. The start point was occupied until after dusk, until after the time when objects observed within five to ten feet lose sharp definition. Once night had set, a recorded yellow rail call was played approximately one minute, and three listening pauses of approximately three minutes, the tape was moved between 200 and 400 meters and the call series was repeated. At most, but not all stations, the clicking of two rocks together was substituted for one of the taped calls.

Protocol for: Wisconsin DNR Bureau of Endangered Resources Presence/Absence survey for the Yellow rail (WDNR 1999)

1. Personnel must be able to identify yellow rails in the field by call and sight
2. Survey period: 20 May – 10 July
3. Weather conditions: No rain (drizzle OK), no or light wind <Beaufort 2, or < 4-7 mph
4. Time of day: Conduct surveys between 11 p.m. and 4 a.m.
5. Number of visits: At least two visits on different days, preferably at least 4 days apart (3 days apart if management is to begin before 23 May), including at least one visit \leq 1 week prior to proposed management activity.
6. Size of area surveyed: Entire area to be subjected to management that contains suitable nesting habitat for yellow rail.
7. Method: Traverse area slowly on foot, stopping regularly to listen or moving to confirm calls of yellow rails where detected. Cover the site in such a way as to ensure that the observer comes within 0.3 mile of any part of the site (up to 0.6 mile if conditions are good: no wind, no other obscuring vocalizations or noises from anurans, birds, traffic, etc., or less than 0.3 mile if listening conditions are poor). This could be

accomplished at large sites by walking parallel line transects a maximum of 0.6 miles apart. If rails are not heard, tap two small stones together at the rate of 3-5 taps per second (listen to a bird song recording for proper rhythm) for several minutes at points along the route followed that are approximately 0.6 miles apart. Record estimated location and number of yellow rails on a map of the area.

Protocol for: Ottawa National Forest Yellow Rail Survey (Robert Johnson pers. comm. 2001):

Surveys are conducted from ½ hour before sunrise and run no longer than five hours after sunrise. The type of survey is a point count method with each wetland having from 1 to 4 points or stations depending on the size of the wetland. The points are spaced 250 meters apart on a transect. At the start of each point, a 5-minute passive listening period is conducted, followed by a 1-minute audio tape call, followed by an additional 30 seconds of passive listening. This 1-minute call, 30-second passive listening series is repeated in each of three directions to cover a total of 360 degrees. Before leaving each point count station, there is a final 1-minute post-playback passive listening period (for a total of 10.5 minutes at each point). No surveys are conducted in rain, stormy, or extremely windy weather.

Research Priorities

NatureServe (2001) identified numerous areas that need further research: life history information such as breeding biology and demographics, the effects of livestock graze on winter habitat, information on migratory routes, behavior, accurate status and abundance estimates, and the effects of natural water level fluctuations.

Information is also needed on maximum reproductive age, annual and lifetime reproductive success, the proportion of progeny that survive to reproductive age, lifespan of the yellow rail, size of breeding pair territory, patch size requirements, and population and distribution numbers for viable levels. Margaret A. Burkman (pers. comm. 2001) identified the need to determine what threats face the yellow rail on its wintering grounds.

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APPENDICES

Appendix 1: List of Contacts and Information Requests

Margaret A. Burkman, Forest Ecologist, Hiawatha National Forest, Michigan
Chris Clampitt, Stewardship Ecologist, The Nature Conservancy, Michigan
Kevin Doran, Wildlife Biologist, Hiawatha National Forest, Michigan
Mike Fashoway, Michigan Natural Features Inventory
Ronald P. Hellmich, Indiana Natural Heritage Data Center
Robert Johnson, Wildlife Biologist, Ottawa National Forest, Michigan
Betty Les, Natural Heritage Program, Wisconsin
Edward L. Lindquist, Biological Scientist, Superior National Forest, Minnesota
Sharron Nelson, Assistant Database Manager, Natural Heritage and Nongame Research Program, Minnesota
Teresa Mackey, Information Services, Natural Heritage Program, New York
Jim McCormac, Botanist, Ohio Bird Records Committee Secretary, Department of Natural Resources, Ohio
Wayne P. Russ, Assistant Ranger (wildlife), Superior National Forest, Minnesota
Mike Tansy, Refuge Manager, Seney National Wildlife Refuge, Michigan
Al Williamson, Wildlife Biologist, Chippewa National Forest, Minnesota
Kenneth (Rex) Ennis, Wildlife Biologist, Huron-Manistee National Forest, Michigan

Appendix 2: Review Requests

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