

**STATE OF ILLINOIS
DEPARTMENT OF NATURAL RESOURCES**

PROJECT PERFORMANCE REPORT

I. Project Information:

Project Title: Restoration of King Rail Habitat

Project Number: T-102-R-1

Federal Program: PR, DJ, **SWG, Section 6, CVA, BIG-P, NCWC, _____**
(circle or write in the name of the federal assistance funding source)

Reporting Entity: Forest Preserve District of Cook County

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Person Preparing Report: Michelle Uting

Date Report Prepared: 10/31/2018
(month/day/year)

II. Performance Report Information:

Type of Performance Report: Quarterly, Interim or **Final (circle type of report)**

Reporting Period: 10/1/2015 to 11/30/2018
(month/day/year) (month/day/year)

Actual Accomplishments vs Project Objectives:

(In accordance with 2 CFR 200.328 (b)(2)(i), the level of detail required for this section of the performance report is a comparison of actual accomplishments to the objectives of the Federal award established for the period. Where the accomplishments of the Federal award can be quantified, a computation of the cost (for example, related to units of accomplishment) may be required if that information will be useful. Where performance trend data and analysis would be informative to the Federal awarding agency program, the Federal awarding agency should include this as a performance reporting requirement.)

Objectives.

The project objectives as described in the original proposal were to restore 35 acres of habitat suitable for king rail and other marsh bird use, band any king rails located, document any breeding success, and collect data to correlate habitat and king rail use. These objectives were set based on the desire to increase habitat for this rare bird and the broader suite of Midwestern marsh birds and to learn more about the king rail's habits and ecology.

Actual Accomplishments

Preferred habitat goals were established using literature on the king rail and other marsh birds. Using those goals, 79 acres of habitat for king rail was restored. This work included removal of invasive brush and cattails along the

margins and interior of wetlands. King rails were captured within the restored areas in 2017; biometrics were collected and each was banded. Three other species of marsh bird were also captured, measured, and banded. Although the number of birds captures and measured was not large, initial observations on habitat use and preferences by these birds were supportive of literature-based information – closed wetlands have little to no use, and open areas with interspersed vegetation was used much more frequently. Detection and capture was almost exclusive to restored areas.

A wrap up of prior reported deliverables follows.

- 1) **Fall 2015** Gather and organize available king rail data
This activity has been completed: Forest Preserve staff has completed assembling literature and field information.
- 2) **Fall 2015** Identify and hire restoration contractor
This activity has been completed: The Forest Preserve has put out a bid to hire a restoration contractor and anticipates hiring the contractor during this next quarter. Forest Preserves staff has completed the field design and put together project specifications for the habitat work.
- 3) **Winter 2015/Fall and Winter 2016-17** Conduct restoration activities: brush removal
This activity has been completed: In late January 2016 Forest Preserve staff began removing brush from the site. Contractors were hired in the summer of 2016 and they begin mowing brush in December of 2016, finishing in January of 2017.
- 4) **Spring & Summer 2016 and Spring & Summer 2017** Monitoring and banding of king rail
This activity has been completed.
2016: Monitoring of marsh birds conducted May through July 2016; no king rails were captured or observed at the site in 2016.
2017: Monitoring began the first week of May and Forest Preserve staff has already conducted preliminary monitoring on April 23 (recording Virginia rail and sora). In June, staff noted two king rails and successfully banded one of them. (Photos attached)
- 5) **Summer 2017** Conduct restoration activities: resprout control
This activity has been completed. Resprout control for 2017 has been completed and there will be a second round of treatment next summer. The Forest Preserves also herbicided cattails in order to increase desirable nesting areas in 2018.
- 6) **Fall 2017/Winter 2018** Conduct restoration activities
This activity has been completed. The Forest Preserves conducted prescribed burns in part of the work zones as part of our management plan for this site. Grant related restoration activities such as treatment of re-sprouts were completed in summer 2018. The Forest Preserves purchased new monitoring equipment to help with this study; the equipment was purchased with FPCC monies and is not part of the grant or match dollars.
- 7) **Winter 2018** January through March 2018: Forest Preserve wildlife biologists prepared for the spring/May monitoring season.
- 8) **Spring/Summer 2018:** Monitoring
This activity has been completed. Monitoring began the first week of May and 3 surveys were conducted, with 2 additional surveys planned. Although, no king rails have been spotted thus far in 2018, staff banded and monitored other marsh birds with similar habitat needs such as least bittern and Virginia rails. Staff completed surveys through August 2018, and compiled all data for the final report.

Complete project/submit final report – YES.

Reasons Estimated Goals were not Met:

(In accordance with 2 CFR 200.328 (b)(2)(ii), the level of detail required for this section of the performance report is, if applicable, is the reasons why the applicable goals were not met within the given performance reporting period. Otherwise, indicate this was not an issue during the given reporting period by stating, "Not Applicable".)

Weather delayed some of the initial habitat restoration work due to warm winters and soft ground near wetlands. However, with an extended timeline, suitable winter conditions allowed for completion of the restoration work. Due to excellent pricing and opportune weather conditions in 2017, we were able to double the acres of habitat restored. All of the planned monitoring work was completed.

Additional Pertinent Information:

(In accordance with 2 CFR 200.328 (b)(2)(iii), the level of detail required for this section of the performance report is, depending on the type of project (i.e. Research, Implementation, etc.) and whether it is an Interim or Final Performance Report, is to include additional information relevant to the project, such as: analysis and explanation of cost overruns or high unit costs; included Photographs, Maps, Data, Publications, Management Implications, Recommendations, etc. Otherwise, indicate this was not an issue during the given reporting period by stating, "Not Applicable".)

Photos and aerials of the king rail habitat restoration work (see attachments)

Significant Developments:

(In accordance with 2 CFR 200.328(d) the level of detail required for this section of the performance report is to address when events occur between the scheduled performance reporting dates that have significant impact upon the supported activity. In such cases, the non-Federal entity must inform the Federal awarding agency or pass-through entity as soon as the following types of conditions become known: (1) Problems, delays, or adverse conditions which will materially impair the ability to meet the objective of the Federal award. This disclosure must include a statement of the action taken, or contemplated, and any assistance needed to resolve the situation. (2) Favorable developments which enable meeting time schedules and objectives sooner or at less cost than anticipated or producing more or different beneficial results than originally planned. Otherwise, indicate this was not an issue during the given reporting period by stating, "Not Applicable".)

- Initial restoration work was delayed in 2016 due to a warm winter; the restoration work was completed instead in 2017 when frozen conditions were more conducive for tracked equipment.
- An additional 44 acres of habitat work was conducted due to lower than expected pricing and equipment efficiencies which allowed for more acres to be restored.

Executive Summary:

(Regardless of the date when the federal agreement for the funding of this project was executed, ALL interim and final Performance Reports must contain this section. The executive summary should be less than four pages in length and contain relevant literature citations, when applicable. Executive summary for planning or research projects shall include a summary of the study objectives, research methods, major accomplishments and findings. Executive summary for implementation projects shall include a summary of activities, work location(s), and major accomplishments.)

As described in the above sections, 79 acres of wetland restoration for the benefit of the king rail was conducted in 2016-2018. Background research on this bird and other marsh birds was used to help design the restoration work and the monitoring techniques used. Brush removal and cattail thinning work led to greatly improved habitat by opening sight lines and feeding areas close to the edges of five wetlands. Marsh bird use of these restored wetlands was monitored through frequent visitation, use of playback tapes, passive recording devices, and mist netting. Although the project had a short timeframe, much was learned about habitat use and visitation after restoration. Key findings are verification that good vegetational interspersion (25-50% cattail / river bulrush/ hardstem bulrush) in deeper water and along shorelines was preferred (based on capture sites and observations of bird foraging); along shorelines, lower height vegetation such as sedge hummocks were also used heavily. Interestingly, much feeding was observed in the transition zones between these two habitats. The main species of interest, the king rail, was located in 2017 in the restored wetlands. Continued monitoring will help to expand our knowledge of the king rail and other marsh birds as well as their habitat preferences and responses to habitat change.

Habitat Work.

Literature and other data collection was conducted in 2015 to assist with restoration design and monitoring design. The literature indicated king rails prefer wetlands with vegetative interspersion, meaning a mix of open water and vegetated zones. They are tolerant of cattails, but not monolithic stands. Nesting and feeding locations differ to some degree, with nesting happening in more vegetated areas helping to secrete nests, and feeding happening in both low vegetated areas and open water. King rails are deterred by complete stands of tall vegetation such as cattails or common reed. Shoreline habitat is avoided if obstructed by woody vegetation (see Bolenbaugh, Cooper, Darrah and others below). Based on that information and our own observations on marsh bird's habitat preferences, the restoration design focused on creating preferred habitat structure both within the marshes and along their margins and immediate surrounding uplands. Within wetlands, the design was to create a mix of open and closed habitat ("hemi-marsh") where marsh birds can use open areas to forage and more closed areas to hide and place nests. Along margins, there was a similar design, breaking up closed rings of vegetation to provide better habitat use options, and to provide better sight lines for predator detection. In the immediate upland areas, the design was to open areas for sight lines and easier movement between wetland areas, by removing dense brush that completely surrounded wetlands and the intervening spaces between wetland lobes and between nearby wetlands. Knowing that the preserve had a long agricultural history, we did not expect the return of prairie or other natural communities, and instead focused on improving vegetation structure, and native ground cover to meet the needs of marsh birds as our goals.

Habitat work was conducted in the fall and winter of 2016-17. Skid-steers with brush-mowing heads (see 2nd photo below) cleared **79 acres** of invasive brush from the margins of five wetlands. Overabundant cattails and other invasive wetland species were controlled in the summer of 2017 to reduce dense cover and create more suitable hemi-marsh habitat. Prescribed burns were conducted in fall 2017 to reduce the cattail duff layer and wood chips from the mowing operations. Re-sprouted brush and cattails were treated in late summer/early fall of 2018 to ensure the wetlands remained open with contract specifications requiring a minimum of 90% resprout control.

King rail and marsh bird work.

A monitoring design was established to increase the likelihood of encounter for this secretive and notoriously difficult to detect species and the full suite of secretive marsh birds. The design involved active surveys of the wetlands to determine occupancy including the use of playback calls, passive recording of vocalizations, and mist-netting. These three techniques have proven somewhat successful for other researchers (see Conway, Cooper, Perkins below), although none has worked perfectly. Our design used a high-effort combined strategy in order to increase our chances of detection and our likelihood of capture.

Biologists visited the project wetlands in the evenings/early morning hours during the breeding seasons of 2016-18 to attempt to record vocalizations, document presence and use, and capture individuals for banding. Biologists started their searches one-half hour before sunrise using playback tapes of secretive marsh birds. Once birds were detected and their general calling area located, a mist net would be deployed in an appropriate area. If a bird was captured, it was identified, physical measures were taken, and a tag was placed on the bird's leg. In 2018, FPCC purchased wildlife acoustic detectors and placed them in one of the marshes to increase coverage / detection potential.

Birds captured in the restoration study area were king rails, least bitterns, Virginia rails, and soras. Standard metrics were collected from all birds, including age, sex, size, feather condition as well as a swab for avian influenza, and blood sample for dry blood spot testing for heavy metals (see attached data sheets). This data helped set a baseline for our understanding of the basic biology of these species and potential disease issues and transmission, and create a dataset for long-term trends of marsh bird populations in Cook County.

Habitat Status and Marsh Bird Response

The wetlands currently have had marginal brush removed, and ground-level vegetation in the uplands and wetland margins is recovering (see map of work zone and photos of post-work/recovery above). The wetlands have more of a hemi-marsh structure within, in large part due to cattail control, and more open sight lines. Wetland bird response has been positive with four species detected and captured. Numerous species were found in pairs, in

particular least bitterns. Captures were in areas that very closely matched the habitat preferences found in the literature. Two types of habitat appeared suitable for all species; patches of cattails/rushes interspersed in open water and lower height sedge-dominated areas near the shoreline. Although this project area has been in an old-field state for decades, the graminoid and herbaceous response has been quite good, with a reasonably low level of invasives and limited bare ground. Structurally, the project area has been vastly improved with new connections between wetlands, improved shoreline habitat for feeding, and improved vegetational interspersions in deeper water areas.

Future Plans

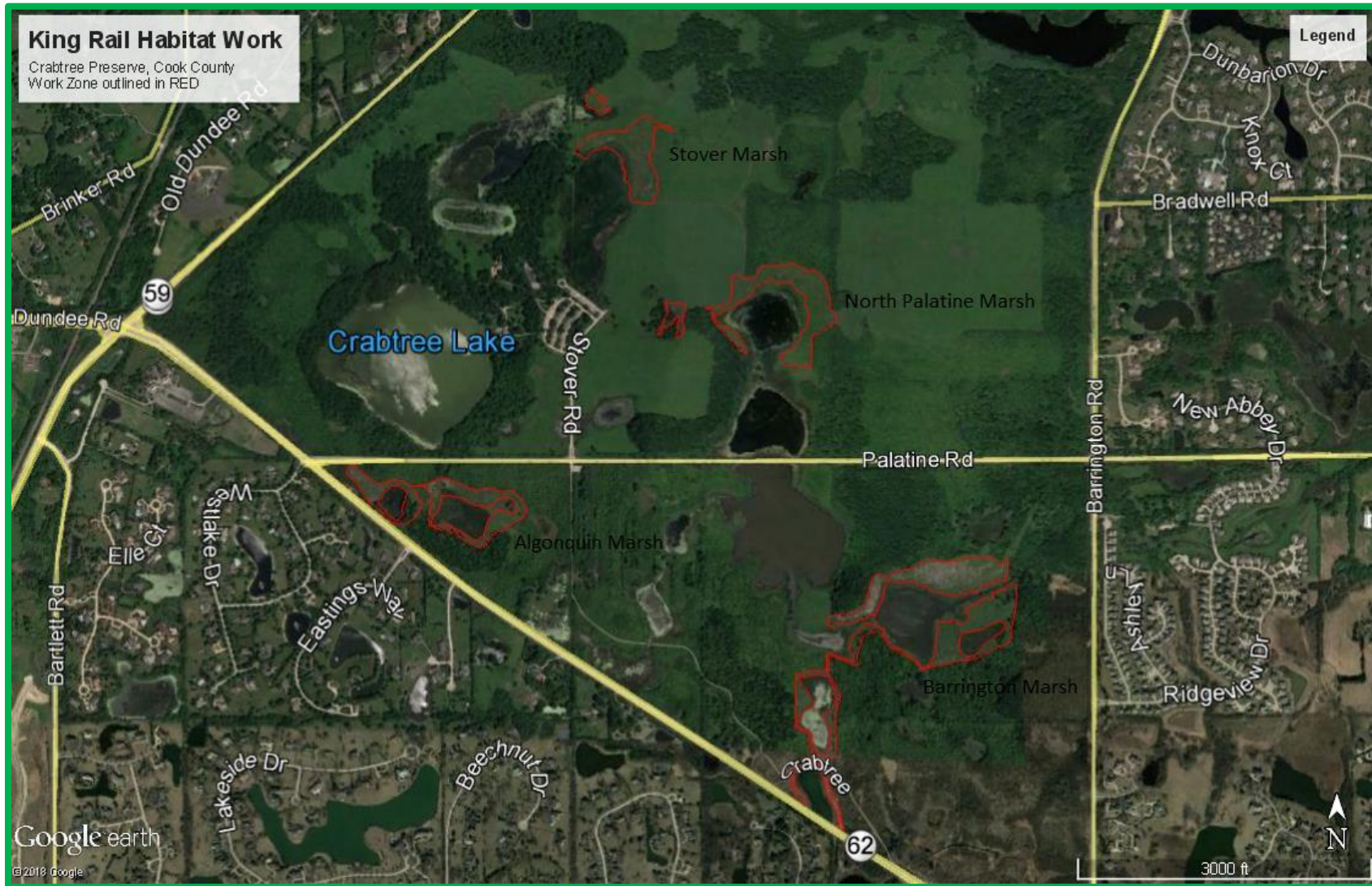
FPCC will manage these sites with prescribed fire to keep brush at bay, and monitor coverage of cattails. FPCC plans to continue marsh bird data collection at these restored wetlands in 2019 and potentially beyond to learn more about king rail biology, habitat preferences, and nesting success. Because the captured birds were banded, we may be able to learn more about their migration travels through the national bird-banding network, and will be able to identify individuals should they be re-captured at this location. This work was presented to the Illinois Department of Natural Resources Heritage Biologists at their annual meeting in October 2018.

In summary, through this grant, FPCC was able to restore significant wetland habitat for marsh birds, document use by king rail and three other marsh species, collect basic biological information on them, and band them for future study.

Literature (primary):

- Bolenbaugh, J. R. et al 2012. Population Status and Habitat Associations of the King Rail in the Midwestern United States. *Waterbirds* 35(4):535-545.
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- Perkins, M., King S.L, and Linscombe, J. 2010. Effectiveness of Capture Techniques for Rails in Emergent Marsh and Agricultural Wetlands. *Waterbirds* 33 (3): 376-380.
- Pickens, B. A. & King, S. L. Multiscale habitat selection of wetland birds in the Northern Gulf Coast. *Estuaries and Coasts* **37**, 1301–1311 (2014).
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- Pickens, B. A. & King, S. L. 2013. Microhabitat selection, demography and correlates of home range size for the King Rail (*Rallus elegans*). *Waterbirds* **36**, 319–329.
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- https://www.fws.gov/refuge/currituck/wildlife_and_habitat/king_rail.html
- <http://www.arkive.org/king-rail/rallus-elegans/>
- <https://birdsna.org/Species-Account/bna/species/kinrai4/introduction>
- <https://www.audubon.org/field-guide/bird/king-rail>
- https://www.allaboutbirds.org/guide/King_Rail/id#

Attachment 1 – map of habitat improvement zones



Crabtree Preserve in Barrington, Illinois. This former orchard and farm owned and managed by the Forest Preserves of Cook County has excellent wildlife habitat. This project was designed to improve habitat along five marsh areas with king rail and other marsh birds in mind. Invasive brush and cattails were removed from the areas outlined in red to improve habitat at the marsh and where possible connect pockets.

Attachment 2 – photographs of habitat work

Mowing of Brush between and around margins of wetlands



Burning post mowing and herbiciding to reduce wood chips and dead stems:



Unassisted regrowth of ground layer vegetation:



In-marsh habitat improvements (“preferred” marsh bird habitat):



Attachment 3 – photographs of marsh bird monitoring



King Rail (*Rallus elegans*)



Least Bittern (*Ixobrychus exilis*)



Sora (*Porzana carolina*)

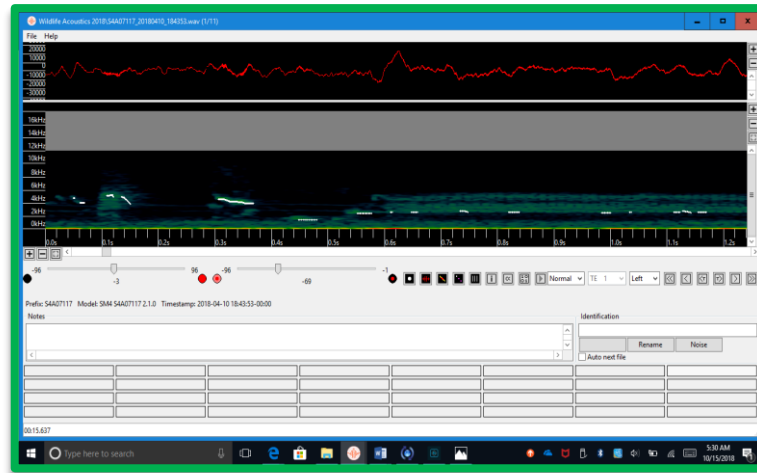


Solitary Sandpiper (*Tringa solitaria*)

Passive Monitoring Device:



Passive call recorder



Sonogram from passive call recorder

Attachment 4 – bird data

Biometrics

Species	Age	Banding Date	How Aged	How Captured	How Sexed	Sex	Tail Length	Tarsus Length	Tests Performed	Wing Chord	Ectoparasites	Bird Weight
SORA	AHY	10/16/2013	1	Mist net	1	M	55	33.5	AI	108	NS	91.4
VIRA	SY	05/28/2015	P	Mist net		U	47		AI	109	NS	86
VIRA	AHY	05/23/2018	CC	Mist net		U	42	36.54	AI	98	NS	91
LEBI	ASY	05/23/2018	CC	Mist net	PL	F	40	37.28	AI	110	NS	74
LEBI	SY	05/23/2018	CC	Mist net	PL	M	39	39.41	AI	115	NS	82
KIRA	HY	07/30/2014	2	Mist net		U	27	6.55	AI	62	NS	243
KIRA	HY	08/25/2014	PL	Mist net		U	64	6.76	AI	158	NS	303
KIRA	HY	08/25/2014	PL	Mist net		U	60	5.83	AI	159	NS	328
SORA	SY	08/11/2015	1	Mist net	1	M	45	38.5	AI	105	NS	92.9
KIRA	SY	06/13/2017	CC	Mist net	NA	U	65	65.26	AI, DBS	173	NS	