Final Report for T-85-D-1

Recovery of Greater Prairie Chickens in Illinois

Project Information

a) Project Title: Recovery of Greater Prairie Chickens in Illinois
b) Project Number: T-85-D-1
c) Legal Name of Entity Doing the Project: The Illinois Department of Natural Resources
    - Grant agreement: RC13T85D01 was developed between the IDNR and the Illinois Audubon Society
    - Work order to contract: #RC09-13FWUIUC was implemented between the IDNR and the Board of Trustees of University of Illinois
d) Period of Time covered by this report is November 1, 2013 through March 31, 2018

The greater prairie chicken is state endangered and a conservation reliant species in Illinois, requiring specific conservation actions to maintain the declining populations that persist in the State of Illinois. The preservation of Illinois' greater prairie chickens is dependent upon the augmentation of Illinois populations with birds from other states for genetic and demographic purposes. Based on the "*A Plan for the Recovery of the Greater Prairie Chicken in Illinois* (Walk 2004)", existing geographically separate populations should be considered candidates for augmentation through translocation when population size falls below 50 birds or genetic and/or demographic constraints are demonstrated to be preventing population recovery. Prairie chicken numbers fell below the 50 bird threshold in the spring of 2012. The 2012 spring booming ground census indicated 21 attending males on the Jasper County unit of Prairie Ridge State Natural Area (PRSNA), down 50% from the 2011 male count of 42 individuals and down 47% from the 10 year average. The 2012 male count on the Marion County unit of PRSNA indicated 32 males – down 20% from 2011 (40 males) and 30% below the 10 year average. Considering a 50:50 sex ratio, in 2012 the Jasper County unit dipped below the 50 bird threshold at 42 total animals present; Marion County provided a population of 64 birds in 2012. The 2012 spring booming ground census therefore indicated that a translocation was necessary in order to bolster population numbers and offset the observed declines.

Genetic and demographic rescue of Illinois prairie chickens was first initiated in 1992 and was a well-documented success by the Illinois Natural History Survey (INHS) (Westemeier etal 1998). Illinois prairie chicken egg viability and genetic health was successfully restored through translocation efforts at that time. Westemeier (1998) stated sufficient genetic resources appear to be critical for maintaining populations of greater prairie chickens and predicted that periodic translocations would be necessary to maintain the genetic fitness of Illinois' prairie chickens. Insular small populations of greater prairie chickens cannot be conserved indefinitely without providing for gene flow. Small populations are notably subject to stochastic events, in this specific case poor nesting conditions due to above average spring rainfall during nesting and early brooding from 2008-2011; record rainfall in 2011; a localized hail storm across the Jasper county unit of PRSNA on April 22, 2011; and the historic drought of 2012. The preservation of this species in Illinois appears to be dependent on augmentation of the populations with

birds from other states for genetic and demographic recovery purposes. Population augmentation is necessary to bolster population size in order to offset individual losses, losses resulting from the stochasticity of modern environmental conditions – weather and climatic conditions, declining available habitat, and more intensive landuses.

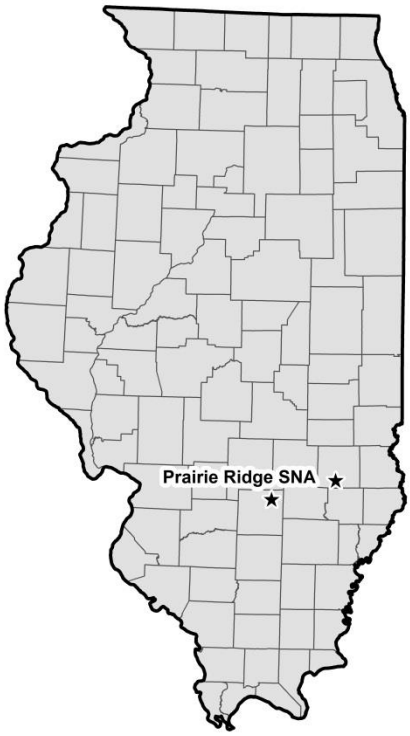

Figure 1: Prairie Ridge State Natural Area is located in down-state Illinois and is composed of two management units, the Jasper county unit and the Marion county unit. The units of Prairie Ridge SNA are situated approximately 37 miles apart. The Jasper county unit (the area headquarters unit) is approximately 2,850 acres in size, the Marion county unit is approximately 1,400 – excluding non-grassland satellite areas under Prairie Ridge SNA's jurisdiction.

A State Wildlife Grant proposal was developed titled the *Recovery of Greater Prairie Chicken in Illinois*. This initiative was funded and became project number T-85-D-1, *Recovery of Greater Prairie Chicken in Illinois.* This document proposed the following:

1. The translocation of 300 greater prairie chickens from Kansas over a period of three years to augment the population at PRSNA.
2. The restoration and stewardship of critical grassland habitat on PRSNA and on private lands associated with the core grasslands at PRSNA.

3. The funding for a three year project coordinator position to oversee the complex translocation initiative. In this case, the Illinois Natural History Survey (INHS) would serve as the sub grantee for this position.

The types of activities to be accomplished included the development of a prairie chicken translocation plan, the implementation of the plan to effectively translocate prairie chickens, and annual booming ground monitoring to assess the results of translocation and habitat management.

Project T-85-D-1 would constitute a multi-year project with three individual translocation endeavors within a three year period. The Kansas Department of Wildlife, Parks, and Tourism provided a 100 bird quota (specifically, 50 males and 50 females) per year, allowing for a total take by the Illinois Department of Natural Resources of 300 birds. Under T-85-D-1, the actual translocations would occur in 2014, 2016, and 2017.

2014 Translocation

The project coordinator, a Natural Resources Coordinator with the INHS, was hired in early 2014 to oversee the 2014 spring prairie chicken translocation. Trapping in Kansas would focus on the Smoky Hills region in north-central Kansas. Ninety-one (91) greater prairie chickens would be translocated during this trapping perid (50 males and 41 females); 87 were effectively released on the Jasper county unit of PRSNA. Trapping occurred from March 25, 2014 through April 12, 2014. The Illinois Department of Transportation, Division of Aeronautics would provide the flight services necessary for this year's translocation. Sixteen (16) flights were conducted from Springfield, Illinois, Abraham Lincoln Capital Airport (SPI) (the IDOT Aeronautics headquarters) to Salina, Kansas, Salina Regional Airport (SLN) to Effingham, Illinois (Effingham County Memorial Airport (1H2) – from Effingham the birds were transported to the Jasper county unit of Prairie Ridge SNA for release.

2016 Translocation:

Ninety seven (97) greater prairie chickens (50 males and 47 females) were translocated from the Smoky Hills of Kansas, of those 93 were released on the Marion county unit of PRSNA. Trapping occurred from March 22, 2016 through April 9, 2016. In 2016, Southern Illinois University, Department of Aviation Management and Flight conducted flight operations from the Southern Illinois Airport (MDH) to the Salina Regional Airport (SLN), birds were flown from SLN to the Salem-Leckrone Airport (SLO) – from there birds were transported to the Marion county unit of Prairie Ridge SNA for release.

2017 Translocation:

One hundred greater prairie chickens (50 males and 50 females) were translocated from the western extent of the Smoky Hills of Kansas, of those 96 were effectively translocated. Birds were released in both Jasper and Marion counties in 2017. Trapping occurred from March 22, 2017 through April 8, 2017. In 2017, Southern Illinois University, Department of Aviation Management and Flight conducted flight operations from the Southern Illinois Airport (MDH) to the Salina Regional Airport (SLN), birds were flown from SLN to the Salem-Leckrone Airport (SLO) or to the Olney-Noble Airport (OLY). Birds

destined for the Marion county geography were delivered to SLO and birds destined for Jasper county were delivered to OLY.

	Total Captured	Males	Females	Survived to Release
2014 Translocation	91	50	41	87
2016 Translocation	97	50	47	93
2017 Translocation	100	50	50	96

Table 1: Overview of translocation results from the three trapping years.

Figure 2: Trapping methodologies changed during the multi-year project. At the outset the project utilized wire arrays but shifted towards drop nets in the latter translocation years.

Trapping and Translocation Methodologies

Translocating greater prairie chickens involves considerable prior planning and effective operations in the field. In Kansas it was necessary to identify suitable booming grounds of sufficient size for trapping, booming grounds less than 10 birds were not trapped. Upon identifying those suitable sites it was then requisite to obtain landowner permission to access the property to translocate prairie chickens. When conducting trapping we utilized both wire arrays (essentially barrel sized funnel traps with chicken wire drift fences) and drop nets. These two trapping systems were utilized to harvest both males and

females, with drop nets being much preferred for their selectivity when trapping females. From all booming grounds trapped, less than or equal to 20% of the original census number of a scouted lek could be harvested. For example, a 20 male lek would allow for 4 males and 4 females to be translocated – a 25 male lek would allow for 5 males and 5 females to be taken, and so forth. This quota system allowed us to harvest animals without dramatically depopulating any lek site.

Once trapped the birds were quickly transported to the Rolling Hills Zoo, near Salina, for requisite health checks, banding, radio transmitter placement, and the collection of genetic samples. After processing at the Rolling Hills Zoo, the birds were transported to the Salina Regional Airport and then quickly loaded onto an aircraft for departure to Illinois. Upon arriving in Illinois the birds would be picked up by IDNR personnel and transported to PRSNA. The birds would typically arrive at PRSNA late in the day (having been trapped in the early morning in Kansas) there they would overnight in their transport boxes until the following morning.

Well before dawn the birds would be transported to a booming ground at PRSNA for release. Release personnel would allow the booming ground to become active and let the dawn arrive before the Kansan birds would be released from their transport boxes. This soft release technique was utilized to encourage translocated birds to stay at PRSNA – the auditory and visual cues of prairie chickens near a release site is considered an important factor for retaining birds at release due to the gregarious nature of the birds.

Partners and Budgeting

The greater prairie chicken trapping initiative was a complex logistical endeavor that required the involvement of governmental, non-governmental agencies, contractors, and volunteers. Involved extensively in this recovery effort were the Illinois Natural History Survey; the Illinois Audubon Society (IAS); the Illinois Department of Transportation Aeronautics division; the Southern Illinois University, Department of Aviation Management and Flight; and the Southern Illinois University Cooperative Wildlife Research Laboratory. To accomplish the proposed conservation actions of T-85-D-1 the Illinois Department of Natural Resources developed agreements with conservation partners. Grant agreement RC13T85D01 was developed between the IDNR and the Illinois Audubon Society (IAS) this agreement allowed the IDNR to reimburse IAS for expenditures related to the execution of T-85-D-1. Specifically for IAS employee salaries and per diem; IAS supported lodging expenses; and flight operations expenses. A work order to contract #RC09-13FWUIUC was implemented between the IDNR and the Board of Trustees of University of Illinois. This work order authorized the Board of Trustees of the University of Illinois, *to employee trained scientists and professionals in the fields of ecology/conservation of birds research since the Division of Resources Conservation , Department of Natural Resources, desires to engage the services of said scientists and professionals to undertake, under the State Wildlife Grant Program, and described as*:

Recovery of Greater Prairie Chickens in Illinois, T-85-D-1

This project will restore and provide stewardship of non-IDNR lands (623 acres) that are associated with grassland conservation at Prairie Ridge State Natural Area. Provide suitable habitats for threatenend

and endangered species, and the translocation of greater prairie chickens for genetic and demographic rescue of Illinois Prairie Chickens.

The contract developed allowed the IDNR to engage the support of the INHS. The INHS hired the Natural Resources Coordinator, field biologists, and telemetry technicians to monitor and support the prairie chicken translocation project.

FEDERAL GRANT SUBMISSION (Modification #1 to T-85-D-1 Grant Award)							**8/17/16 version**	
		Federal Funds			Nonfederal Funds			Total
		INHS**	IAS	IDNR	INHS**	IAS	IDNR	
a.	Personnel	$107,249	$0	$0	$14,045	$0	$52,062	$173,356
b.	Fringe	$20,688	$0	$0	$6,253	$18,750	$0	$45,691
c.	Travel	$41,800	$0	$28,628	$0	$0	$0	$70,428
d.	Equipment *	$0	$0	$0	$0	$0	$0	$0
e.	Supplies	$1,000	$0	$6,742	$0	$0	$0	$7,742
f.	Contractual	$132,000	$55,750	$0	$0	$10,000	$8,000	$205,750
g.	Other (fuel for vehicles)	$0	$17,120	$0	$0	$10,000	$0	$27,120
h.	Total Direct Charges **(Sum of a. thru g.)**	$302,737	$72,870	$35,370	$20,298	$38,750	$60,062	$530,087
i.	Modified Total Direct Costs (MTDC)	$302,737	$72,870	$35,370	$20,298	$38,750	$60,062	$530,087
j.	Indiect Rate of 20% (INHS) or 15% (IAS)	$60,547	$10,931	$0	$0	$0		$71,478
k.	F & A (58.6% of Direct Costs on U of I, 22.90% on salaries for IDNR)	$0	$0	$0	$11,895	$0	$11,922	$23,817
l.	Unrecovered F & A (20% vs 58.6% of on campus MTDC)	$0	$0	$0	$116,856	$0		$116,856
m	TOTAL Estimated Costs **(Sum of i. - m.)**	$363,284	$83,801	$35,370	$149,049	$38,750	$71,984	**$742,238**
	Subtotals	**$482,455**			**$259,783**			
	Ratio	**65%**			**35%**			

Table 2: The project budget with the three primary project partners: INHS, IAS, and IDNR. This budget reflects the final changes to the federal grant following the 2016 spring translocation.

As defined by Table 2, the INHS oversaw the hiring of a number of INHS temporary personnel to complete the translocation initiative (INHS Federal Funds, a. Personnel), supported their lodging and travel expenses (c. Travel), and provided vehicles for field use in Kansas and for conducting monitoring in Illinois. The INHS utilized contractual funds (f. Contractual) to contractually employee an experienced Missouri-based prairie chicken trapping crew for the 2016 and 2017 trapping periods. The IAS and INHS utilized federal funds (c. Contractual) to cover expenses relate to air operations necessary to effectively transport the prairie chickens from Kansas to Illinois (Prairie Ridge SNA). Illinois Audubon Society also assisted with fuel expenses, vehicle rental, and lodging costs while deployed to Kansas. Travel expenses (c. Travel) indicate the costs associated with extensive out-of-state travel for INHS personnel and IDNR staff members.

The initial grant was based on the assumption that Illinois Department of Natural Resources employees would conduct the majority of the greater prairie chicken trapping. During the 2014 trapping season this was indeed the case, however in 2015 Out-of-State travel restrictions prevented state employees from participating. Therefore the 2015 trapping effort was postponed until the spring of 2016. The 2014 trapping scenario involved IDNR staff members conducting the trapping and Illinois Department of Transportation Division of Aeronautics employees conducting the air transport of the birds from Kansas

to Illinois. Out-of-State travel was not available for 2015 or 2016 and the participation of IDOT Aeronautics was curtailed. The 2016 trapping effort would necessitate the hiring of contractual personnel by the INHS to take the place of IDNR biologists. In 2016, the INHS would hire an eight man crew from Missouri, 6 INHS hourly employees, and provide vehicles to complete the 2016 trapping program. The IAS would develop agreements in 2016 that allowed the Southern Illinois University Carbondale (SIUC), Department of Aviation Management and Flight to conduct the prairie chicken transport flights. The 2017 trapping effort would be similar to 2016 but Out-of-State travel would be available for a limited number of IDNR personnel available to support the trapping effort. The INHS would again hire a contractual trapping crew and coordinate the necessary vehicles to complete the operation.

Budgetary Changes

As a result of the described changing operational conditions for this project the INHS original budget request (defined in contract #RC09-13FWUIUC), totaling $247,080, required a (INHS-IDNR) budget revision, and required a supplemental request of $116,204 in Federal Funds, generally to support the requisite hiring of the contractual Missouri trapping crew for the 2017 trapping period, provide for vehicles and associated travel costs, and to cover a portion of the 2017 flight services.

Original Grant Cost: $333, 558 ($247,080 Federal Funds; $86,478 cost share)

Supplemental Request: $178,775 ($116,204 Supplemental Federal Funds; $62,571 Supplemental cost share

Total to Be Expended: $512,333 ($363,284 Federal Funds; $149,049 cost share

The Federal Funds requested by IAS ($83,801 Federal Funds) changed during the budget modification as well with an addition of $25,000 in contractual services to cover flight expenses and additive contractual obligations; IDNR ($35,370 Federal Funds) did not change through the budgetary modifications.

An AFA (SF-424) modification was also approved for a six-moth time extension to allow for post-translocation monitoring of greater prairie chickens from the 2017 trap year cohort. This would extend the project to an end date of December 31, 2017.

Flight Services

Prairie Ridge SNA is approximately 540 miles from Salina, Kansas – the first base of operations for the 2014 and 2016 translocations (in 2017 trapping was based out of Russell, Kansas). Transporting greater prairie chickens by auto-vehicle that distance would not have successfully delivered viable individuals for release in Illinois. Therefore flight operations were utilized to minimize the time the animals were in transit. Throughout the project flight operations would transport trapped prairie chickens from the

Salina Regional Airport (SLN) back to specific destinations in Illinois. Once delivered to the designated airport in Illinois the animals were transported to Prairie Ridge SNA for subsequent releasal.

The collaboration of the IAS and INHS with SIUC greatly facilitated the transportation of greater prairie chickens in 2016 and 2017. The Southern Illinois University Carbondale (SIUC), Department of Aviation Management and Flight conducted 16 flights in 2016 and 12 total flights in 2017 for a total cost of $42,000. The coordination between the SIUC Department of Aviation Management and the SIUC Cooperative Wildlife Research Laboratory allowed students interested in wildlife sciences to take part in an important endangered species recovery initiative as well as provide aviation students with the opportunity to accrue flight hours and experience (particularly when it came to flight planning related to adverse spring weather patterns).

Figure 3: Southern Illinois University Carbondale (SIUC) Aviation supported T-85-D-1 with flight services. SIUC Aviation conducted flight operations during the 2016 and 2017 translocations. Students and Flight instructors from SIUC Aviation were instrumental in completing this project.

Translocation Results

A total of 276 greater prairie chickens were effectively released at PRSNA from March of 2014 to mid-April of 2017. As a result of this translocation program bird numbers at Prairie Ridge responded with higher census values.

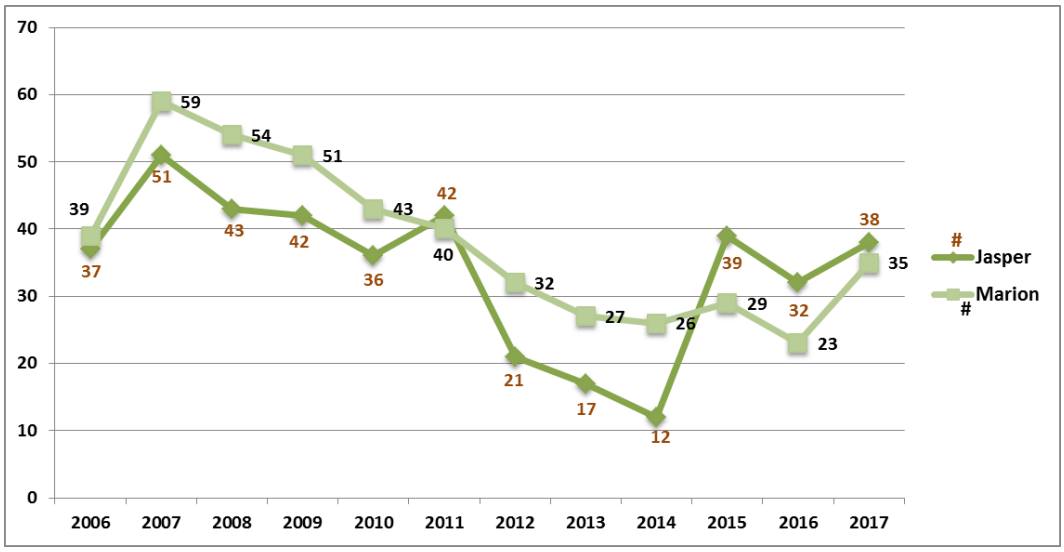

Figure 4. Lek census values of greater prairie chicken males from 2006 through 2017 for the Jasper and Marion county units of Prairie Ridge SNA.

The Jasper County unit dipped precipitously to 12 observed males in 2014, just shortly before the Year 1 trapping session in Kansas began. Following the 2014 release in Jasper County, the following year's census (2015) indicated a significant increase to 39 males observed on lek on the area. The 2016 translocated birds were released in Marion county. The 2017 Marion county census numbers reflect a subtle increase as a result of that population augmentation. Lek census assessments in April of 2018 will indicate the immediate effects to bird numbers in both Jasper and Marion counties. The 2017 translocation was a split release; translocated individuals were dispersed evenly between the two Prairie Ridge SNA county units.

Post Release Monitoring

Post release monitoring and spring booming ground census activities were performed by temporary personnel with the INHS, IDNR staff, and IAS staff. Project W-175-R-3, Monitoring Success of Greater Prairie Chicken Translocation in Illinois was coordinated by Wendy Schelsky of the INHS. This project was undertaken to better understand and evaluate the translocation of greater prairie chickens from

Kansas to Illinois. This project focused on the use of VHF telemetry and booming ground censuses to determine the success of the 2014 and 2016 translocations. During both translocations approximately 25 males and 25 females of both cohorts were radio transmittered. This study also determined the assimilation of translocated birds into the existing population by monitoring the nesting success and lek visitation of the radioed and color banded translocated birds. The study also assessed habitat use and home ranges of nesting and brooding hens to identify high-quality breeding habitats. W-175-R-3 identified micro-site selection for nest site and brood rearing areas which included areas that were planted or developed by IDNR staff to act as "brood strips", typically composed of legumes and successional weedy strips. These areas were known to be important for brooding hens; W-175-R-3 further documented the use of these important habitats and their import for prairie chicken recruitment in Illinois. This study collected over 3,213 for 69 individuals, documented 40 mortality events, conducted 125 separate lek surveys (across all years), and confirmed the attendance of 38 individuals that attended a lek in a breeding season (Schelsky 2017).

Figure 5: A translocated, Kansan male greater prairie chicken pauses momentarily on a booming ground in Marion county, Illinois. Notice the band color combinations and radio transmitter in this photograph. Band combinations allowed for the post-monitoring of birds on booming grounds after release – from these observations complete histories of a birds' translocation and activity at PRSNA can be developed.

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