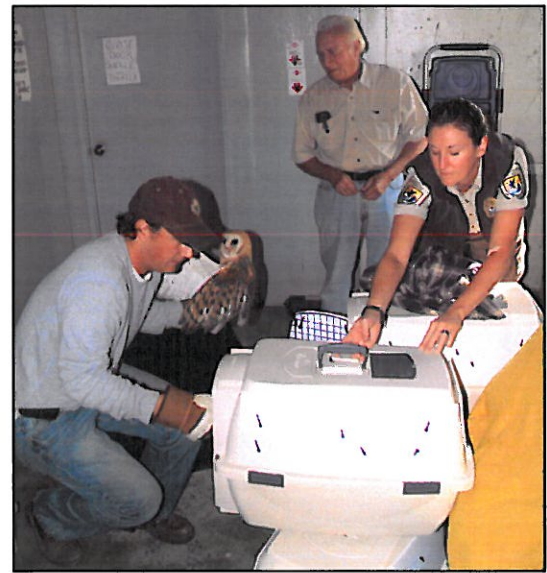
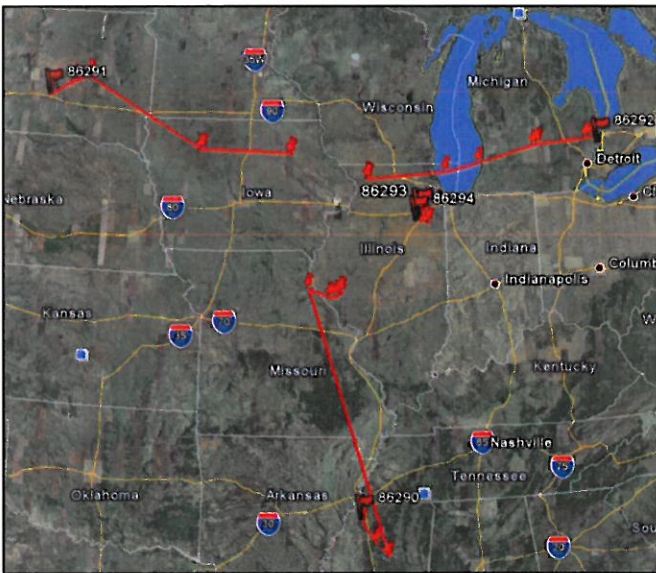


A Post Release Study of Barn Owl Survival and Dispersal in Northeastern Illinois

Forest Preserve District of DuPage County



Introduction

The barn owl (*Tyto alba*) is a species with a worldwide distribution whose historic range in North America encompassed all of Illinois. For various reasons, barn owl populations declined in the 20th century and their current status in Illinois is endangered. In recent decades, the species' distribution in Illinois has been limited to the southern half of the state and breeding in northeastern Illinois has not been confirmed. Although young barn owls may disperse up to 1900 km (McCracken 1998), it is uncertain if any individuals will naturally repopulate suitable reserves in northeastern Illinois. Since this species is endangered in surrounding states (such as Indiana, Iowa, Missouri and Wisconsin), source populations may not be available to provide natural repopulation opportunities, even in areas with suitable feeding and nesting habitats.

The barn owl's preferred habitat is open grassland. Throughout its range, the barn owl specializes on voles and vole-sized small mammals (Colvin 1984). This implies that the barn owl fills a specific ecological niche in various grassland communities. The decline of the barn owl in the Midwest has been attributed mainly to a decrease in prey densities (particularly vole species) and a lack of suitable nest sites (McCracken 1998). Both of these factors are a result of changing land use practices. The historic conversion of pastures, hayfields, wetlands and native grasslands to large-scale, row crop agriculture have resulted in decreased small mammal prey densities and fewer hollow trees, wooden barns and open silos for nesting (Bunn *et al.* 1982; Colvin 1984; Colvin 1985). Additionally, continuing development of natural areas into urbanized development has also contributed heavily to the decline of the barn owl. Moreover, it is estimated that only 0.01% of the original native prairie remains in the State of Illinois (Iverson 1988).

However, efforts by public and private conservation agencies in northeastern Illinois to protect and restore natural habitat continue to increase. It is estimated that over 200,000 acres of natural land has been protected in northeastern Illinois. The combination of open space protection and active management to improve ecosystem quality that characterizes much of northeastern Illinois today may present suitable opportunities to support a breeding population of barn owls.

Methods

Release Sites

Pratt's Wayne Woods – Located in Wayne, Illinois, the preserve's 1383 hectares (3,417 acres) combine with James Pate Philip State Park to form over 1618 continuous hectares (4,000 acres) of open space including 40% wetland, 36% grassland, and 14% woodland. Pratt's Wayne Woods contains one of the highest quality wetland communities in the county which is home to numerous State E&T species. At least half of the prairie areas are reconstructed short and tall grass communities previously occupied by agriculture. The amount of land designated as agricultural has decreased from 933 hectares (2307 acres) in 1974 to 64 hectares (159 acres) in 2005 due to conversion from farmland to restored native habitat types or cool season grass meadows.

Springbrook Prairie – Located in Naperville, Illinois, and totaling 728 hectares (1,800 acres), Springbrook Prairie is the District's largest grassland in the county at approx 607 hectares (1,500 acres) of reconstructed short and tall grass communities previously occupied by agriculture. Springbrook Prairie's large contiguous blocks of grassland are currently home to many conservative species of Illinois. Henslow's sparrows (*Ammodramus henslowii*), northern harrier (*Circus cyaneus*), bobolinks (*Dolichonyx oryzivorus*), and dickcissels (*Spiza americana*) are found throughout the preserve.

Fermilab National Accelerator—Located in Batavia, Illinois, and contains a significant portion habitat in the region with over 890 hectares (2,100 acres) in grassland. This habitat is mostly contiguous and large tracts such as this are extremely rare in the Chicago region. Larger tracts of habitat have proven to be more significant for wildlife, especially birds. It contains one of Illinois’s largest reconstructed native, tall grass prairies and has earned a designation as one of only six national environmental research parks to conduct ecological research projects.

Des Plaines Conservation Area – Located near Wilmington, Illinois, it contains over 2,023 hectares (5,000 acres). A dedicated nature preserve makes up over 32 hectares (80 acres) which contains many remnants of natural prairie from years past. The preserve is managed so it can protect and perpetuate this prairie heritage for future generations. Adjacent to Midewin National Tallgrass Prairie, which contains over 7,689 hectares (19,000 acres) of prairie and grassland.

Pre-release

Seven fledgling owls were released in 2009. One came from a breeding pair at Willowbrook Wildlife Center in Glen Ellyn, Illinois. Two were acquired from Scovill Zoo in Decatur, Illinois, and four were provided by African Lion Safari in Cambridge, Ontario, Canada. Birds were raised by their respective parents until nearly fledged. The birds were housed in a flight chamber for two weeks prior to release to develop their flight and hunting skills. There they were fed dead mice daily which were supplemented by live mice when possible. Prior to release five birds were fitted with a 20 gram satellite PTT transmitter purchased from Northstar Science and Technology in King George, Virginia. These PTT’s are battery powered and have approximately 500 hours of life. Predetermined duty cycles can alter the PTT to turn on and off at desired increments to monitor activity and potential dispersal patterns.

After transmitter attachment, the birds were returned to the flight chamber and observed for any flight impediment caused by the transmitters. Additionally, great-horned owl conditioning was performed in the flight chamber by playing a recorded great-horned owl call and disturbing the barn owls with a live, resident education bird. It is anticipated that this technique will condition the barn owls to visual and audio cues of a potential predator.

Release

Barn owls were released using a “soft” release method (Ehresman 1984 and Ehresman et al. 1988). Juvenile birds were placed in barn lofts at each site within constructed Ohio style “hack boxes” to simulate nest cavities (Figures 1 and 2).



Figure 1. Barn opening to allow owls to escape.



Figure 2. Hack box mounted on inside of barn wall.

Owls were kept in the hack box overnight before being allowed free flight within the interior of the barn. Hardware cloth was placed over the exit hole to maintain presence in the barn for a short period (approximately 5 days depending on weather) for acclimation to sites, sounds, smells, etc. Following this acclimation period the hardware cloth was removed, allowing utilization of the barn. Owls were provided dead mice while inside the barn and for one additional day after all birds have left. Owls were tracked via internet download and data emailed from Argos and CLS America. Following a duty cycle, data Argos obtained from their satellite was emailed to the Forest Preserve District of DuPage County. Additional information such as Google Earth map locations and data in Excel format were downloaded from the Argos website.

Results

The process for acquiring importation permits for the birds from African Lion Safari was delayed. This delay prevented us from receiving the birds until mid-September when seasonal temperature were beginning to drop Upon release the cooler temperatures may cause the birds to disperse without first imprinting to the area, and thus less likely to return. Therefore two of the birds were released without transmitters.

The following is the summary of each of the five birds with satellite transmitters:

USFWS Band	Transmitter type	PTT ID	Sex	Release Location	Release Date
1687-17269	Satellite	86291	female	Fermilab	6/29/2009
1687-17270	Satellite	86292	female	Pratt's Wayne Woods	6/29/2009
1687-17271	Satellite	86290	female	Pratt's Wayne Woods	6/29/2009
1687-17273	none	N/A	female	Springbrook Prairie	9/22/2009
1687-17274	none	N/A	female	Springbrook Prairie	9/22/2009
1687-17275	Satellite	86293	male	Des Plaines Conservation Area	9/25/2009
1687-17276	Satellite	86294	female	Des Plaines Conservation Area	9/25/2009

Bird 86290 was raised from the captive pair at Willowbrook Wildlife Center. This bird is a female hatchling of the year and was released at Pratt's Wayne Woods Forest Preserve on June 25, 2009. As of December 31, 2009, this bird is 448 miles from its release location and is currently residing near Covington, Tennessee. This bird has logged over 1,083 miles of movement from her release location. Most interestingly this bird settled into the Covington area on October 24 and was there until November 13. She moved west across the Mississippi River into Arkansas and then headed north possibly into the very southeast tip of Missouri that evening. By November 17 this bird was back near Covington, TN and has remained there since (Figure 3).

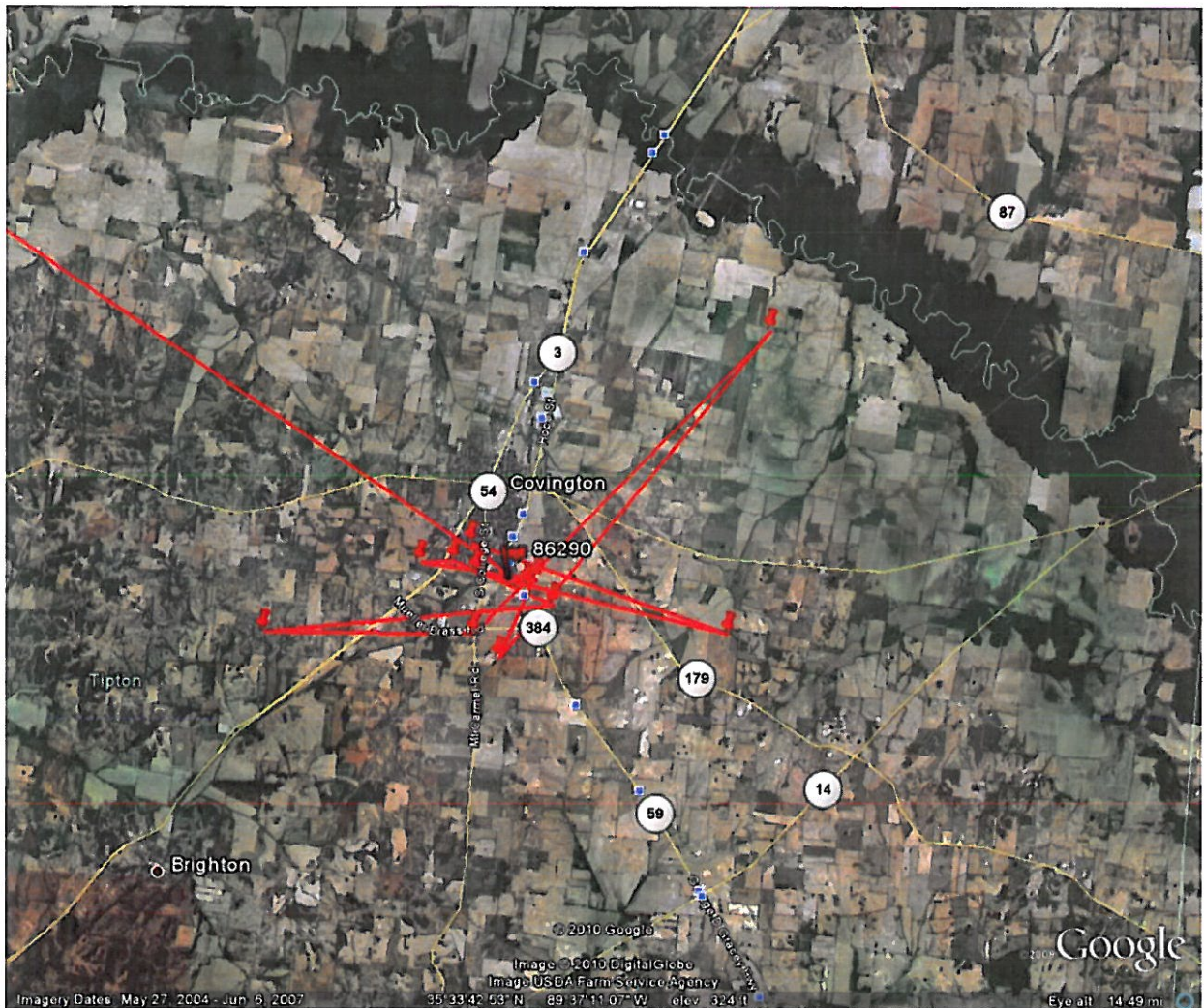


Figure 3. Approximate location of female barn owl 86290 on December 31, 2009 near Covington, TN.

Bird 86291 was raised from a captive pair at Scovill Zoo in Decatur, Illinois. This bird is a female hatchling of the year and was released at Fermilab on June 25, 2009. From the release site, this bird eventually moved north into Wisconsin and then west across Iowa into South Dakota. The bird remained in South Dakota until November 25, 2009 when she returned to Iowa, settling down in central Iowa near Blairsburg (Figure 4). Her furthest point was 582 miles away near Dallas, South Dakota. Overall this bird has logged 1,177 miles of movement since her release. As of December 31, 2009, this bird was currently 282 miles from its release location. Unfortunately high snow fall (11.5 inches) on December 8 followed

by extreme cold with temperatures hitting -11°F on December 10 appear to have possibly caused the mortality of this bird. Temperature data from the transmitter decreased to ambient temperature and movement stopped. This bird may have been able to remove her transmitter, but severe weather and the open landscape are not the most favorable conditions for barn owls. More may be known following retrieval efforts to recover the transmitter.

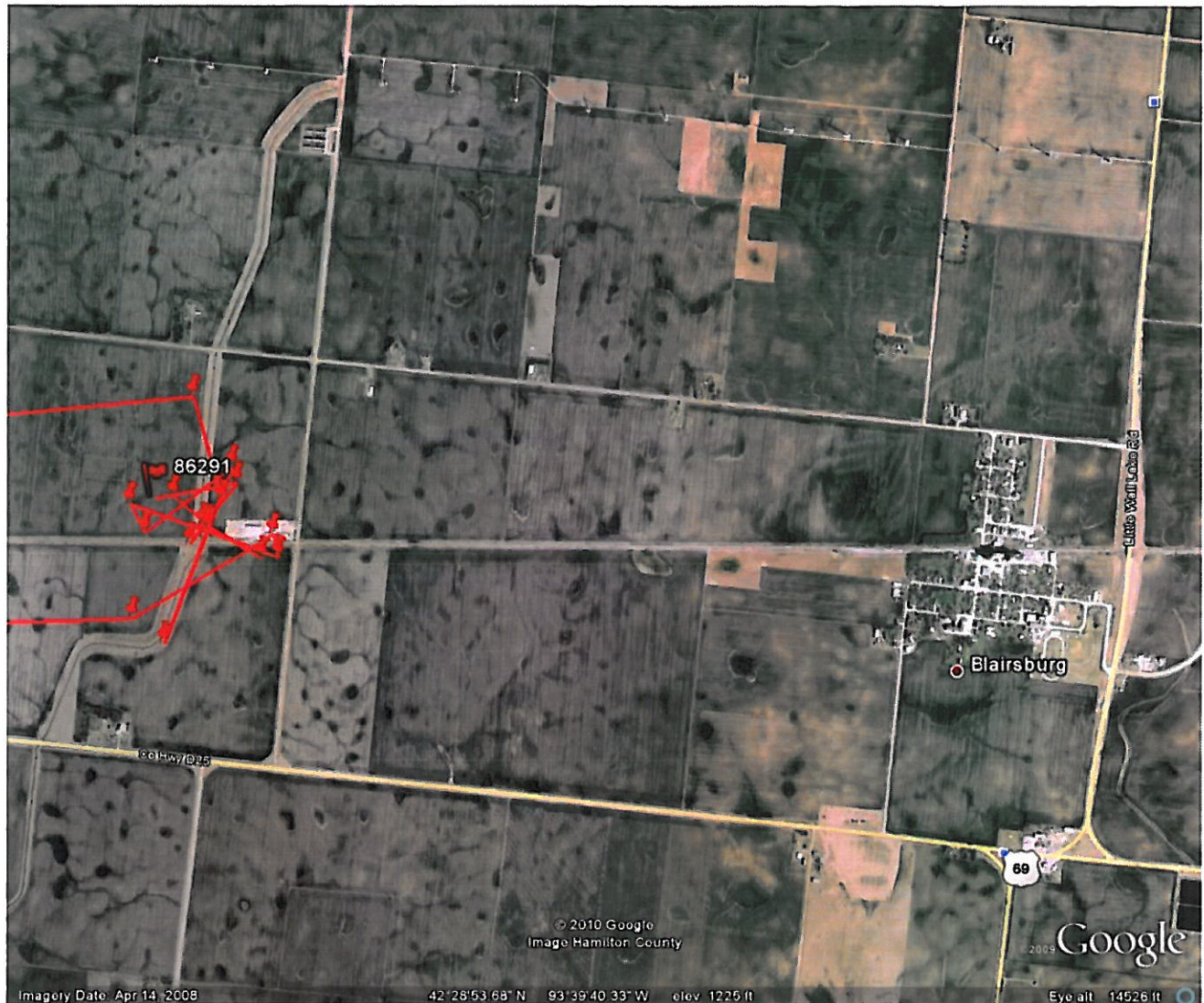


Figure 4. Last known location of female bird 86291 west of Blairsburg, IA.

Bird 86292 was raised from a captive pair at Scovill Zoo in Decatur, Illinois. This bird is a female hatchling of the year and was released at Pratt's Wayne Woods Forest Preserve on June 25, 2009. This bird is currently 720 miles from its release site and is located near Port Norris, New Jersey. This bird has logged 1,267 miles of movement from its release location. This bird has taken a very interesting dispersal pattern, departing Illinois October 20, 2009. Her route took across Lake Michigan and the state of Michigan ending in Port Huron. She later crossed southern Ontario and settled into northern New York. This bird left New York and was found in Cape May, New Jersey on November 25. This bird has moved a bit west along the coast and is now near Port Norris, New Jersey (Figure 5). This area received 18.2

inches of snow on December 19, 2009. Transmissions from the satellite PTT indicate the bird is still alive.

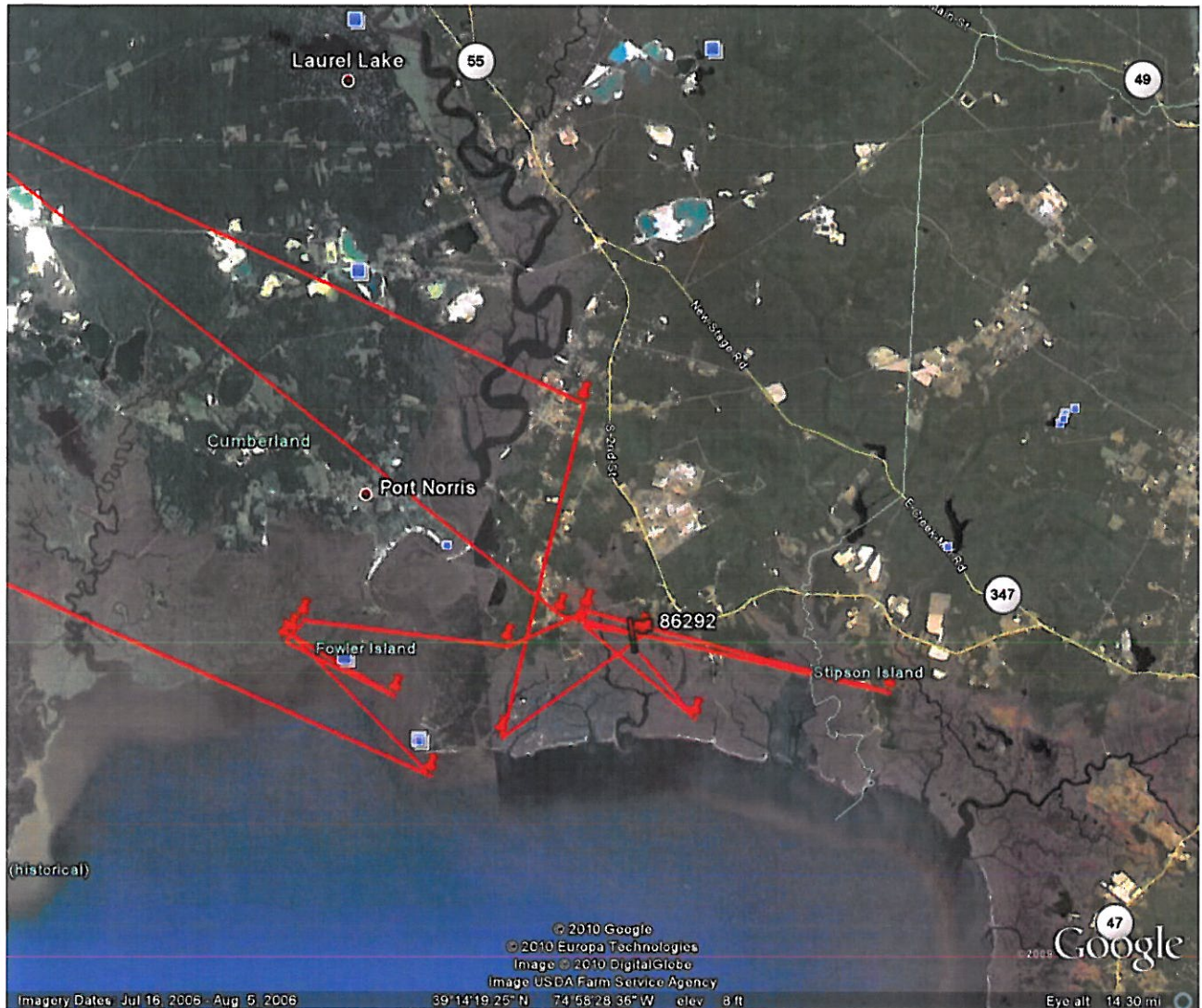


Figure 5. Approximate location of female barn owl 86292 on December 31, 2009 near Port Norris, NJ.

Bird 86293 was raised from a captive pair at African Lion Safari. This bird is a male hatchling of the year and was released at Des Plaines Conservation Area on September 23, 2009. This bird is now 161 miles from its release site and is currently located near Filmore, IL (Figure 6). There has been relatively little movement except for the actual dispersal or migratory move.



Figure 6. Approximate location of male barn owl 86293 on December 31, 2009 near Fillmore, IL.

Bird 86294 was raised from a captive pair at African Lion Safari. This bird is a female hatchling of the year and was released at Des Plaines Conservation Area on September 23, 2009. This transmitter was found 5.6 miles from its release location in Sand Ridge Savanna Nature Preserve, near Braidwood, IL. The transmitter was recovered November 11, 2009. Data from the transmitter on October 16 indicated that movement had ceased when activity counts on remained static and temperatures dropped to levels similar to ambient. It is speculated that this bird likely fell victim to great-horned owl predation. The transmitter was found below a snag being used by a great horned owl. Casted pellets and mute were found near the transmitter, blood was observed on the backside of the transmitter and the antenna was bent similar to having been chewed upon.

Discussion

The five birds tracked in 2009 showed a wide array of dispersal and/or migratory movement. The two birds which covered the most ground came from Scovill Zoo in Decatur. They moved quite a bit more than the other three. Interestingly enough their patterns could not have been more different. Bird 86291 headed west, while bird 86292 moved east. Birds 86290 and 86293 dispersals were more direct, mainly

heading south. This year showed little similarity in dispersal/migratory trends. Additional data from more birds will be required to determine if any dispersal/migratory patterns exist. Data should be logged from our current birds until August 2010. Results obtained up to August 2010 should help determine whether movements seen during 2009 were dispersal or migratory.

Homing abilities of barn owls is not clearly understood. Any attempts by these birds to return to release locations would be very interesting. A possible account of homing back to a location may have occurred on a rather small scale. When bird 86290 left the Covington, TN, area on November 1, 2009, she traveled over 50 miles west of the area, only to be found back in the Covington area on November 17, 2009. On a possibly larger scale bird 86291 went 582 miles west of her release site and was moving back east when she appeared to succumb to extreme environmental conditions. She had returned 300 miles east the possibility of this bird trying to return to northern Illinois is speculative.

Tracking these birds with satellite transmitters has greatly supplemented our previous data and some information collected this year has not been documented in the past. Continued tracking will provide valuable insight into their dispersal and migratory patterns. Hopefully knowledge will be gained to better direct recovery efforts of this species throughout the Midwest.

Due to the fact that the majority of birds being released are juveniles, dispersal may be a more likely occurrence. Efforts to try to create a stronger bond to the local landscape should be explored. One possible method may be to place unrelated birds into a captive structure such as a barn over winter, providing supplemental food and access to live prey using bait stations. A nest box could be provided within that structure, encouraging a pair bond to be formed. Breeding may likely occur and, once young are pipped, the parents could be allowed access out of the barn to forage. Successfully raising young in a more natural setting should provide even stronger ties to the area.

This program is also being used as an educational tool to better help students and the general public understand endangered and threatened species recovery efforts. Educational programs are being developed, and people can currently monitor progress of these owls on the Forest Preserve District of DuPage County's website at <http://www.dupageforest.com/Conservation/NaturalResources/Birds.html>.

Collaborators to this project include: Forest Preserve District of DuPage County, Willowbrook Wildlife Center, Cosley Zoo, McHenry County Conservation District, Illinois Department of Natural Resources, Fermilab National Accelerator, and Max McGraw Wildlife Foundation

References Cited

Bunn, D.S., Warburton, A.B. and Wilson, R.D.S. 1982. *The Barn Owl*. Buteo Books, Vermillion, SD.

Colvin, B. 1984. Barn owl foraging behavior and secondary poisoning hazard from rodenticide use on farms. PhD. Thesis, Bowling Green University, Bowling, Ohio.

Colvin, B. 1985. Common Barn-owl population decline in Ohio and the relationship to agricultural trends. *J. Field Ornithol.* 56(3): 224-235.

Ehresman, B. 1984. Common Barn owl restoration in Iowa. *Annu. Symp. Natl. Wildlife Rehabilitation* 3: 10-19.

Ehresman, B., Reeves, D. and Schlarbaum, K. 1988. Post release survival and movements of captive reared Common barn owls in Iowa. *Annu. Symp. Natl. Wildlife Rehabilitation* 7: 133-150.

Iverson, L.R. 1988. Land-use changes in Illinois, U.S.A.: the influence of landscape attributes on current and historic land use. *Landscape Ecology* 2: 45-61.

Krebs, C. J. 2001. *Ecology: The experimental analysis of distribution and abundance*. Fifth ed., Benjamin Cummings, San Francisco, CA.

McCracken, J. D. 1998. A recovery plan for the barn owl in Ontario. Ontario Ministry of Natural Resources, Ontario Hydro, and the Ontario Barn Owl Recovery Committee.

Rudolph, S.G. 1978. Predation Ecology of Coexisting Great Horned and Barn Owls. *The Wilson Bulletin*, v. 90, 1: 134-137

Sullivan, J. 1998. *Chicago Wilderness, An Atlas of Biodiversity*. Chicago Region Biodiversity Council, printed in Mexico.

Budget

2009 COSTS				
		WPF Funds	Cost Share Funds	Detail Total
PERSONNEL				
Ecologist		\$0	NA	\$5,159.70
Volunteers used to feed and assist with some care of owls, in addition to raising mice to feed out	Estimated hourly value \$10	NA	\$5,000	\$5,000
Intern position provided by grant from Willowbrook Wildlife Foundation	\$10	\$0	\$5,000	\$5,000
TRAVEL				
		\$0	\$0	\$0
EQUIPMENT				
Satellite PTT (4 total) North Star Science & Technology (invoice attached)		\$10,000	\$1,889	\$11,889
MATERIALS/SUPPLIES				
Mice American Rodent Supply, LLC (invoice attached)		\$0	\$777.28	\$777.28
CONTRACTUAL SERVICES				
Information transfer – July CLS America		\$0	\$131.36	\$131.36
Information transfer – August CLS America (invoice attached)		\$0	\$158.23	\$158.23
Information transfer – September CLS America (invoice attached)		\$0	\$208.57	\$208.57
Information transfer – October CLS America		\$0	\$230.57	\$230.57
Information transfer – November CLS America		\$0	\$305.17	\$305.17
Information transfer – December CLS America		\$0	\$274.77	\$274.77
		\$10,000 WPF TOTAL	\$13,974.95 MATCH TOTAL	Total
TOTAL COST OF PROJECT				\$29,134.65

North Star Science and Technology, LLC

Post Office Box 438

King George, Virginia 22485

Invoice

Date

11/18/2009

Invoice #

1651

Bill To

Dan Thompson Forest Preserve District of DuPage County 3 S. 580 Naperville Road Wheaton, IL 60187-8761

Terms

Net 30

Quantity	Description	Price Each	Amount
4	20 gram battery PTT	2,950.00	11,800.00
	Shipping & Handling	89.00	89.00

Balance Due	\$11,889.00
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Visit our web page at www.northstarst.com.

Thank you for your order; we appreciate your business.

Please pay from this invoice; no other statement will be issued.

Payment due in US dollars.

American Rodent Supply, LLC

American Rodent Supply, LLC
 8620 E 30th Street
 Indianapolis, IN 46219
 (317)899-1599
 briangocolts@yahoo.com

Invoice

DATE	INVOICE #
11/23/2009	2021
TERMS	DUE DATE
Net 30	12/23/2009

BILL TO
Forest Preserve District of Dupage County P.O. Box 5000 Wheaton, IL 60189-5000

AMOUNT DUE	ENCLOSED
\$777.28	

✂ Please detach top portion and return with your payment. ✂

SHIP DATE	SHIP VIA
11/23/2009	UPS Ground

DATE	ACCOUNT SUMMARY	AMOUNT
08/19/2009	Balance Forward	\$1,620.79
09/21/2009	Payment received	-1,620.79
	New charges (see details below)	777.28
	TOTAL AMOUNT DUE	\$777.28

Activity	Quantity	Rate	Amount
• Large Mice	1500	0.47	705.00
• Box Charge & Dry Ice	3	10.00	30.00

Please disregard the sales receipt I send previously, this is your invoice for this order.

SUBTOTAL	\$735.00
SHIPPING	\$42.28
TOTAL OF NEW CHARGES	\$777.28
TOTAL AMOUNT DUE	\$777.28

Largo, 09/30/09

Federal I.D. Number 52-1469996



*Susan NAT resource
10/14*

RECEIVED
2009 OCT 14 AM 7:36
F P D

Dan Thompson
Forest Preserve District
of Dupage County
P.O. Box 5000
3 S. 580 Naperville Rd.
Wheaton, IL, 60187-8761
USA

Customer ID: 160889

Invoice NB: 037922 /Page: 1

DESCRIPTION	UNIT PRICE	QUANTITY	AMOUNT
O/REF: 1945 -Y/REF:			
ARGOS PROGRAM ELECTRONIC EMAIL OR FILE TRANSFER SERVICE 09/09	0.13	149.00 KBYT	19.37
Prog: 03453 / ANIMALS & FLOATS LOCATION AND COLLECTION 09/09	8.40	14.25 UNIT	119.70
Prog: 03453 / MONTHLY ACTIVE PLATFORM FEE 09/09	13.90	5.00 PTT	69.50
		TOTAL w/o Tax	208.57
		Tax 0.00% :	0.00
	(USD)	NET TOTAL	208.57
RECD OCT 14 2009			

TERMS: NET DUE IN 30 DAYS: 1.5% PER MONTH (18% ANNUAL RATE) SERVICE CHARGE ON PAST DUE ACCOUNTS.
PAYMENT IN US DOLLARS TO THE ORDER OF CLS AMERICA, INC.
PLEASE INCLUDE YOUR INVOICE NUMBER WITH PAYMENT.
CREDIT CARD PAYMENTS CAN BE MADE ONLINE FROM OUR WEBSITE: WWW.CLSAMERICA.COM