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## Bringing the Endangered Barn Owl Back to McLean County, Illinois: Implementing a Local Nest Box Program

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**BRINGING THE ENDANGERED BARN OWL BACK TO MCLEAN COUNTY, ILLINOIS:  
IMPLEMENTING A LOCAL NEST BOX PROGRAM**



Shaw Creek Bird Supply 2003.

**ANNA GROVES  
RESEARCH REPORT**

**ABSTRACT**

Barn owls are an endangered species in Illinois, but populations have been known to increase where nest box programs have been implemented. In conjunction with the John Wesley Powell Audubon Society, a barn owl nest box program was established in McLean County and the surrounding area. Seventeen boxes are now scheduled for construction and installation this winter in the McLean County area in order to enhance existing barn owl populations, and the nest box program will continue in the future through the JWP Audubon.

**INTRODUCTION**

The barn owl (*Tyto alba*) was once a common resident of McLean County, Illinois, but no breeding pairs have been recorded in the county since it was listed as a state endangered species in 1972 (IDNR 2009). The agricultural landscape was once dotted with wooden barns, one of its favorite nesting spots, along with plenty of other old buildings and hollow trees in which it could raise young or roost at night. Farmers had more than just corn or soybeans that reached to the edges of their properties; there were still acres upon acres of pastures, hay fields, and even some native prairie remnants among the sea of crops, where the owls could hunt for their favorite food, voles. Since the middle of the 20<sup>th</sup> century, however, the number of farms has dwindled and the landscape has shifted to nearly a complete monoculture of corn and soybeans. Old wooden barns have been either demolished or left in disrepair as more modern, efficient, and inexpensive structures have replaced them (Schumm-Burgess 2010). Even old

hollow trees have disappeared as more and more land has been cleared. Without anywhere left to nest or hunt, barn owl populations have declined drastically along with the changing landscape (Marti et al. 2005). Today, barn owls are an endangered species in Illinois and are at risk for being lost from the state forever (Nýboer et al. 2006).

Luckily, the barn owl still has a chance to bounce back, but that can only happen with the help of humans. Barn owls are known to readily nest in nest boxes installed on or inside barns and other structures, as long as there are a few acres of grassland habitat nearby in which they can hunt (Marti et al. 1979). Therefore, in order to support and increase remaining local barn owl populations, I initiated a barn owl nest box program in McLean County in conjunction with the John Wesley Powell Audubon Society. In this paper, I present an examination of the literature on the importance of conservation, the history and decline of the barn owl, efforts to increase barn owl populations (such as the introduction of nest boxes), and the state of the barn owl in central Illinois today. I then explain my methodology for setting up a nest box program for McLean County and the surrounding area. My goals of this project have involved both raising awareness about barn owls and helping to conserve remaining populations through a local nest box program.

## REVIEW OF THE LITERATURE

There are many reasons why the conservation of species, and the barn owl specifically, is important. The conservation of natural systems is vital to our survival as these systems provide many goods and services that we depend on—even barn owls play a vital role because of the natural rodent control they provide (CDEPWD 2010). Though once a global species, populations of the barn owl have greatly declined in areas like the Midwest where their hunting habitat and nesting sites have been drastically lost (Marti et al. 2005). Barn owl reintroduction programs have been attempted in order to boost populations, with little to no success (Ehresman et al. 1988). Nest box programs, on the contrary, have been very successful in increasing populations when implemented in areas with suitable grassland habitat (Marti et al. 1979; Walk et al. 1999). In this section, I discuss the scholarly literature on each of these issues.

## IMPORTANCE OF CONSERVATION

The field of conservation biology has developed relatively recently—officially in 1978—in response to the world-wide destruction of habitats, ecosystems, and species (Primack 2006). The main goals of conservation biology are to document the full range of biological diversity on earth; to investigate human impacts on species, communities, and ecosystems; and to protect and restore biological communities and their associated ecosystem functions (Primack 2006). A functioning ecosystem—a community of interacting organisms plus the physical environment in which they live—is vital not only to the plant and animal species living in “nature” but also to humans in our everyday lives (Cain et al. 2008). Goods like timber, fresh water, mined minerals, fish, many pharmaceuticals, fertile soil, wild-grown foods, and more all depend on the natural ecosystem to survive. Taking out just one piece of the puzzle can cause the entire picture to collapse, so every species is important. Many would also argue that we have a moral obligation to protect our world’s species from extinction (e.g., Elliot 1995). Whichever way you look at it, it is clear that species—even on a local level—deserve protecting.

## NATURAL RODENT CONTROL

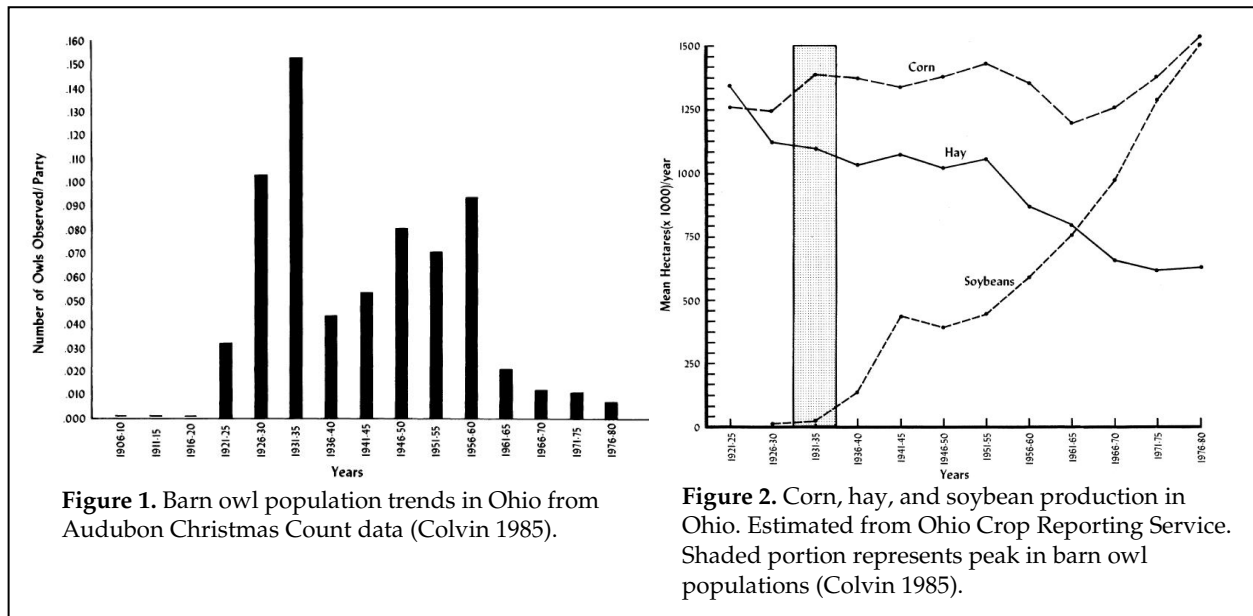
Barn owls serve a particularly important function in the natural ecosystem: rodent control. This is extremely valuable both to the ecosystem as a whole and to farmers experiencing crop damage from rodents. Natural rodent control from barn owls can eliminate the need for expensive rodenticides which, like the use of any pesticide, can have lasting negative effects on the environment. Young barn owls have a particularly high metabolism, and can eat one-and-a-half to two times their body weight each day (Brendle 2002). The Connecticut Department of Environmental Protection's Wildlife Division has reported that a single barn owl family of two adults and six young can consume more than 1,000 rodents over a typical three month nesting period (2010). It can be imagined that as barn owl populations disappear, rodent pest populations will expand, inflicting great costs on agricultural production. Other instances of the removal of the top predator in an ecosystem have resulted in destructive increases in prey populations, the most famous example being the increases in elk browsing in the western United States after the extirpation (local extinction) of gray wolves (Ripple et al. 2001). Barn owls are not only worth saving for their own sake, but for our sake as well.

## HISTORY & DECLINE OF THE BARN OWL

Early fossils of the barn owl, *Tyto alba*, from two to two-and-a-half million years ago have been found worldwide in Arizona, California, Florida, New Mexico, and Texas, as well as the West Indies, Mexico, Brazil, Europe, and Israel (Brodkorb 1971). Before barns existed, the owls nested in cavities in hollow trees or cliffs. North American barn owl populations, once restricted to natural grasslands near these suitable nesting sites, actually expanded with settlement and westward expansion, as forests were cleared for pasture and as buildings like barns—their new favorite nesting sites—became more and more commonplace. Barn owl populations in states like Ohio were virtually nonexistent when the landscape was mostly forested; they increased in number as the forests were cleared for pasture, and finally peaked around the 1930s when pastures and hayfields started being lost to corn and soybean production (Colvin 1985). But in places like Illinois where the native landscape is prairie, the barn owl is a historical resident who has called the area home since before human settlement (Ridgway 1889).

By the 1950s, changing agricultural practices had begun to drastically reduce the grasslands that the owls depend on. Farmers that once kept hay fields and pastures began replacing them with fields of corn and soybeans, which greatly reduced the amount of grasslands available for wildlife. For example, a study by Bruce Colvin (1985) found a direct correlation between barn owl population declines and the increase in soybean field acreage in Ohio (see **Figures 1 & 2**). This year, the USDA (2010) has reported that U.S. farmers will plant a record-high 78.1 million acres of soybeans, an increase of over 100,000 acres in Illinois alone. This suggests that the barn owls need our help now more than ever to keep from being lost in Illinois forever.

As noted above, the barn owl's favorite meal is the meadow vole, a small mouse-like mammal that is abundant in grassland habitats. In Great Britain, Love et al. (2000) found that even following the loss of vole habitat (grasslands) and thus a reduction in number of voles, the importance of voles in the barn owl's diet did not change. Colvin and McLean (1986) also found



very little variation in the diets of barn owls (a vast majority of what any individual sampled had eaten was meadow voles), suggesting that the owls do not adapt to differences in prey availability and that the decline of suitable grassland habitat—and thus the decline of meadow vole prey populations—has been an important factor in the decline of barn owl populations.

Changing agricultural practices have also caused declines in barns. A majority of buildings that the owls use for nesting and roosting are agricultural; yet, traditional farm buildings that would be suitable are now lost at a significant rate as they are replaced or demolished (Ramsden 1998). Barns were once vital to any farm operation, housing and storing livestock, machinery, hay, and grain for feed. Today, farmers often specialize in a single crop, livestock are raised in big confinement facilities, and old barns can no longer house the huge machinery used. In 1955, there were 4,850 barns in McLean County, and a farm of 150 acres was considered large. By 2002, there were only 1,229 barns remaining, with a farm of 1600 acres considered small. Most single properties today encompass many old farmsteads and may thus have old barns scattered throughout, hundreds of which across the county are in poor condition. Old barns are expensive to restore and are often no longer useful, so many are burned or simply abandoned. Some are salvaged for lumber. Those that are restored are often converted to houses or other facilities to which a barn owl would not have access. Based on their 2002 barn survey data and the state of disrepair of many of the barns, the McLean County Barn Keepers estimate that today there are only 1,000 to 1,100 barns remaining in the county (R. Ropp, personal communication, 10 Nov 2010). The decline of suitable nesting sites, particularly barns, has been correlated with the decline of barn owls (Marti et al. 1979). Even trees with suitable hollows (the barn owl's original nesting and roosting ground) are disappearing as fields enlarge and hollow trees are lost from disease, age, and removal.

A study by Ramsden (1998) investigated the effects of barn conversions on local populations of barn owls. Ramsden looked at buildings already occupied by barn owls which were known to have plans for conversion or demolition. Within a one-and-a-half kilometer radius, he documented *all* suitable nesting sites (natural sites included), as well as the amount of

suitable grassland habitat and the use of rodenticides. Owl activity did not change based on the amount of grassland or rodenticides; however, owl activity significantly declined in areas where the central nesting site was demolished or converted. In most of the sites, not only did the original building become unoccupied, but the other sites in the study area were also abandoned. This suggests the importance of the presence of suitable nesting sites and the vast impact that their loss can have on owl populations.

#### EFFORTS TO INCREASE BARN OWL POPULATIONS

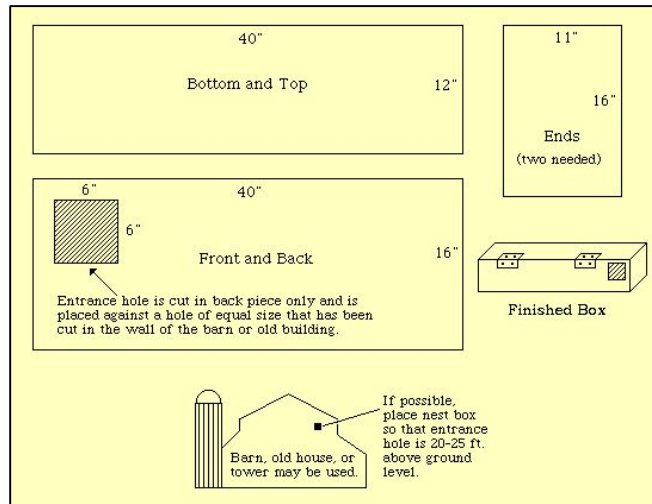
One popular technique often used to help boost the numbers of an endangered species' population is captive rearing and release programs, also known as reintroduction programs. One such program was attempted with barn owls in Iowa in the 1980s, with surprisingly little success (Ehresmen et al. 1988). Of the 36 owls released in 1985 and 1986 with radio transmitters to track their survival and movements, 24 perished while still in contact, two escaped their transmitters, and only ten were verified as still alive just 30 days after their release (the transmitters only lasted about 45 days). It did not appear that wild owl populations increased due to the program, and the program was discontinued. Over 1,000 barn owls have been released through this and other reintroduction programs in Missouri and Nebraska, but there is still no evidence that the releases have had any effect on the wild barn owl populations in the Midwest. The fact that barn owls do not respond well to reintroduction programs—a common fallback method for endangered species conservation—emphasizes the need for the protection and enhancement of existing populations.

One of the best ways to conserve and help promote sustained populations of barn owls is through the implementation of nest box programs in areas where suitable habitat is available. Regarding the discontinuation of the Iowa reintroduction program, Ehresmen et al. commented, "Our emphasis now is on placing nest boxes in quality habitat areas where barn owls are sighted, and increasing awareness of the barn owl's value through public education." In a landmark study, Marti et al. (1979) successfully installed nest boxes in an agricultural region of northern Utah. The nest boxes were purposefully placed in locations where prey populations and hunting habitat were suitable, but there were no available nesting sites. In Marti's study, four out of eight boxes were utilized for nesting in 1977, and 24 out of 30 were utilized in 1978. This study suggests that nest boxes can indeed maintain or increase existing barn owl populations when used appropriately. In the Ramsden study (1998) mentioned earlier, in converted buildings in which provisions were made for the owls, such as the inclusion of nest boxes in barn conversion plans, owl activity levels in the area were sustained.

The flexibility of barn owls' reproduction also makes them perfect candidates for nest boxes. Barn owls are known to adjust the number and timing of broods raised based on the abundance of food, to quickly utilize new nest sites, and to breed before they are one year old (Marti et al. 1979). In Illinois, barn owls have been documented laying eggs, incubating eggs, or rearing a brood during every month of the year (Walk et al. 1999). And although it can take years for owls to discover a nest box, once discovered it is common for the same pair to use it regularly for years (World Owl Trust 2010).

## NEST BOX SPECIFICS

The literature demonstrates that nest boxes must be constructed in certain ways. A poor box is worse than no box at all (World Owl Trust 2010). It is essential that the box is rainproof or placed in a dry location, that it avoids draughts, and that there be permanent access to the box. Actual dimensions can vary, but whatever the design, small drainage holes must be drilled in the bottom of the box. The entrance hole cut in the barn wall must be noticeable to a passing bird outside and must not be blocked from view by a tree or other obstruction. The two nest box designs used in the project are: the “Ohio-style” design and the Simmons design.



**Figure 3.** “Ohio-style” nest box design (Hilton Pond Center 2010).

The “Ohio-style” design is a relatively simple 40 by 12 by 16 inch box, with a six by six square entrance hole fitted directly adjacent to an equally sized hole cut in the barn wall (Hilton Pond Center 2010; See **Figure 3**). The plan recommends a box made of half -inch plywood, with two hinges on the lid of the box to allow for cleaning of the box. If possible, the box should be placed with the entrance hole 20 to 25 feet above ground level.



**Figure 4.** A Simmons nest box (Simmons 2010).

The Simmons design involves a more complicated structure for better protection from the predators of barn owls, particularly great horned owls and raccoons (Simmons 2010; See **Figure 4**). The box itself is 16 by 12  $\frac{3}{8}$  by 22  $\frac{3}{4}$  inches and is constructed from three-fourths inch exterior-grade plywood. An interior divider breaks the box into two main compartments, which provide a safe living area away from the entrance so that predators reaching in cannot reach the occupants. The placement of the ellipse-shaped, 4  $\frac{1}{2}$  by 3  $\frac{3}{4}$  inch hole is high enough on the box that nestlings congregating near the entrance while begging for food cannot push each other out or fall from the entrance hole. The design warns against the use of perches or platforms outside the entrance, which can both increase predators’ access to the entrance and increase nestlings’ vulnerability as they may congregate outside the box. Two

hinged doors allow for easy cleaning: one on top and a second “end clean out door” through which one can sweep out the contents. The box is placed somewhere inside the barn or other structure, and a separate entrance hole must also be cut into the wall of the building (See **Figure 5**). The box is not situated directly interior to the hole in the barn wall, rather it is situated inside the building somewhere in view of a bird flying inside.



Barn owls will nest in a box with a dirty interior, but there needs to remain an adequate internal depth of the box so that nestlings cannot fall from the entrance hole, a predicament that would most certainly lead to death by neglect or predation (Barn Owl Trust 2006). The Barn Owl Trust also recommends situating the box at least three meters (about nine feet ten inches, as opposed to the Ohio design's suggested 20 to 25 feet) above ground level, further then one kilometer from any major roads (2006). This last recommendation is regarding the fact that fully 50 percent of recorded barn owl mortality in Britain in the 1990s was due to vehicle collisions (Marti et al. 2005).

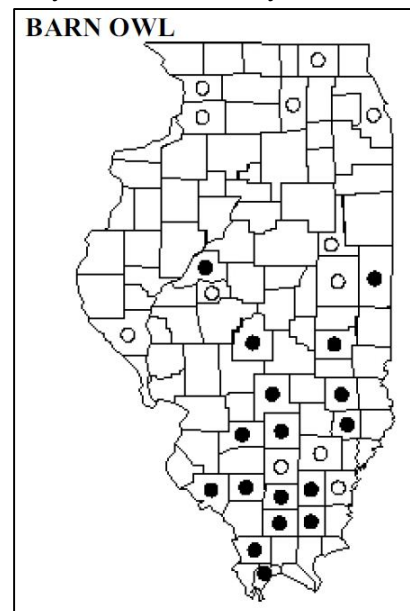


**Figure 5.** An example of nest box placement in a barn. (The Barn Owl Trust 2006).

A study by Radley and Bednarz on nest boxes in Arkansas suggests that barn owls prefer nest boxes placed on man-made structures compared to those in trees (2005). Of the 48 nest boxes erected, 24 were placed on man-made structures and 24 were placed in trees standing alone or in small aggregations next to agricultural fields. Unfortunately, only four boxes were utilized by the end of the 19-month study period, which significantly reduces the strength of the conclusions drawn from the study. Regardless, is it noteworthy that all four of the boxes utilized were on man-made structures, and none were in trees. Overall, the low rate of occupation of the boxes by the owls in this study may have been due to the lack of natural grassland in the area (the presence of grassland habitat was not analyzed in this study). Even with a low sample size, this study suggests that barn owls show a preference for nest boxes on man-made structures, such as barns.

#### THE BARN OWL IN ILLINOIS TODAY

Today, less than 0.1% of Illinois' original prairie remains (IDNR 2010). Farmers are leaving less land unplowed, are sealing their barns tighter or replacing them completely, and are killing rodent populations with rodenticides. Because of this, barn owl hunting habitat and nesting sites are now few and far between. The barn owl was first added to the National Audubon Society's Blue List of apparently declining species as a "species of special concern" in 1982 (Johnsgard 1988). From 1998 to 2008, fewer than twenty barn owl sightings were documented by the Illinois Department of Natural Resources (Grim 2008), and it has been suggested that barn owl populations may now be limited to the southern half of the state (Forest Preserve District of DuPage County 2010). By 2004, seven states nationwide, including the State of Illinois, had the barn owl on their endangered species list, and seven



**Figure 6.** Barn owl distribution in Illinois (Nyboer et al. 2006). Solid circle denotes counties in which species is known to occur; open circle denotes records which may no longer be extant.



others listed it as a species of special concern (Marti et al. 2005).

The majority of the surveys of our state's birds are through programs like the Christmas Bird Count (National Audubon Society), the Breeding Bird Survey (U.S. Geographical Survey), and Spring Bird Count (Illinois Natural History Survey); however, these surveys only monitor diurnal (active during the day) bird species. Records of many nocturnal or otherwise uncommon bird species are mostly based on personal communications and sightings reported to the Department of Natural Resources (IDNR). In 2006, IDNR published an update on the status and distribution of Illinois' endangered species (See **Figure 6**). Unfortunately, no barn owls have been reported in McLean County since its listing as a state endangered species (Nyboer et al. 2006). There were no state-sponsored owl population surveys until 2008, when the Illinois Natural History Survey established the Monitoring of Owls and Nightjars (MOON) program. This program now runs nocturnal bird surveys throughout the state in order to more effectively monitor owl populations, many of which are known to be declining. Though MOON has so far been successful in monitoring population levels of many nocturnal birds (for example, nightjars, great horned owls, and eastern screech owls) no barn owls have been seen in Illinois over the past two years of surveys (Beveroth 2009). However, it is speculated that undocumented barn owls remain, and that they simply have not been sighted due to their elusive nature and the difficulty in locating nests in natural sites (R. G. Harper, personal communication, 04 Nov 2010; Colvin 1985).

Over the past few years, the State of Illinois has been working on implementing a Plan for the Recovery of the Endangered Barn Owl, which was recently revised in 2009. This recovery plan is run by the Illinois Department of Natural Resources, the Illinois Natural History Survey, and the Illinois Endangered Species Protection Board. The plan's objectives are to (1.) prepare an official documented recovery plan, to be distributed and posted on the Illinois Endangered Species Protection Board's webpage; (2.) identify and document all known barn owl reports and nesting attempts in the last ten years; (3.) identify large grassland complexes and other potential habitats across Illinois; and (4.) implement a barn owl nest box program, concentrating on areas with documented observations of barn owls and large grassland habitats (IDNR 2009). This plan is scheduled to be completed (or in the nest box phase) by June 2011. However, as of November 2010, no update of efforts since the 2009 revision was publicly available.

In summary, the barn owl is a valuable part of our ecosystem, both ecologically and economically. Its populations have suffered drastic reductions since the 1950s and without human intervention are at great risk for being lost completely in Illinois (Colvin 1985). The loss of suitable nesting sites in barns, coupled with the loss of nearly all grassland habitat, have made conservation difficult. The loss of a barn that an owl is nesting in can lead to not only the abandonment of an area by the owl, but also of the surrounding area by other owls (Ramsden 1998). Owls are flexible in their breeding habits (Walk et al. 1999), but not in their nesting location (Marti et al. 1979) or diet (Colvin and McLean 1986; Love et al. 2000). A barn owl's diet consists of mostly voles, no matter the concentration in which voles are present. The owls do not respond to captive-release reintroduction programs (Ehresman 1988), but studies have shown that barn owls react positively to nest box programs and that such programs have real potential for increasing populations (Marti et al. 1979). A real need exists to develop nest box programs in appropriate habitats to increase the number of barn owls.

## RESEARCH DESIGN & METHODOLOGY

### INITIATING A NEST BOX PROGRAM

With this information in hand, I embarked on a project to introduce a nest box program in McLean County in order to conserve remaining barn owl populations. To begin, I attended the September 7, 2010 meeting of the McLean County Barn Keepers, an organization formed “to promote the documentation, restoration, and preservation of these vanishing landmarks [barns] of our rural countryside” (McLean County Barn Keepers 2001). That evening, Dr. Given Harper, an active member of the John Wesley Powell Audubon Society (JWP Audubon), presented a talk on barn owls in order to increase barn owl awareness and to establish a basic interest in the owls among barn owners. I introduced myself and the early ideas for the nest box project to the Barn Keepers. Even without much more than basic barn owl information, some barn owners expressed interest in volunteering to have a box installed in their barn, and other Barn Keeper members were excited to help with the project. For instance, the secretary of the Barn Keepers encouraged me to contact her about putting information on the Barn Keepers website, and another Barn Keeper recommended I make up a flyer for distribution at The Barn Keeper’s Annual Tour the following Saturday (September 11), in order to get the word out to more than just those attending the meeting. The flyers went out (See **Appendix A**), and one barn tour attendee responded with a report of a barn owl sighting. Though the sighting was in neighboring Tazewell County and not McLean, the report was still good news and the flyers were a good way to spark some interest in the owls on short notice. It would later be decided to include nest box sites outside of but nearby McLean County, in order to accommodate for demand for boxes at sites such as this one.

Over the month following, I completed an in-depth review of the literature on barn owls, their conservation, nest box programs, and box designs. I also investigated the prices of materials needed to build nest boxes. I used this information to write a formal project proposal to be presented to the John Wesley Powell Audubon Society at their October 12<sup>th</sup> meeting (See **Appendix B**). Through discussions with Dr. Harper, I was already aware of the interest among the JWP Audubon members to start a barn owl nest box program, but the logistics of an actual project had not yet been worked out. I consulted with Dr. Harper and Dr. Angelo Capparella (professor of biology at Illinois State University and member of the JWP Audubon) about a few already-known potential nest box sites in the McLean County area, such as ParkLands Foundation properties (Dr. Capparella is the president of ParkLands) and the properties of other JWP Audubon members. Dr. Capparella had already spoken with a volunteer at the Sugar Grove Nature Center who had offered to construct the barn owl boxes. One of the biggest concerns of the JWP Audubon was the potential for problems with raccoons, because a nest box installed in a barn at the Letcher Basin Nature Preserve prior to this project had been destroyed by raccoons. I included the Simmons box, designed for maximum predator protection, in the proposal for this reason. After the meeting, Dr. Harper reported that JWP Audubon had approved my project funding request for \$500 to make 17 nest boxes: ten Simmons and seven “Ohio-style” boxes.

For the remainder of October, I began to work on gathering potential nest box sites and continued to search for information on barn owl populations and barns in Illinois and McLean County. I contacted Laurie Vial, secretary of the Barn Keepers, about posting barn owl nest box

information on the Barn Keeper's website (See **Appendix C**). I was pleasantly surprised when a few weeks later, Dr. Harper received an email from Ruth Cobb at the McLean County Extension office. She had seen one of my flyers at the office and wanted to include the information and image in the McLean County Extension Newsletter in their Agriculture and Natural Resource pages. Word was getting around. Shortly thereafter, we began to receive reports of past barn owl sightings and suggestions for nest box sites.

The next step towards constructing the boxes was to coordinate with Angela Funk, director of the Sugar Grove Nature Center. Angela, the volunteer who would construct the boxes, and I met in order to discuss the purchasing and transport of the materials for the construction of the boxes. Since the volunteer lives a significant distance from Bloomington, Angela arranged to meet him in Decatur so that she could pay for the materials and he could then take them home to be worked on in his shop. Due to the bulk of 17 completed boxes, it was agreed that he would prepare all the materials at home (for example, cutting the plywood into pieces) and then assemble the boxes at the Nature Center's pavilion with the assistance of other Nature Center volunteers. From there, the boxes would be picked up and distributed to the sites by members of JWP Audubon, myself, or the landowners at the sites. Most, if not all, landowners will install the boxes themselves, and will be provided instructions in writing on how to do so.

There are a few known concerns that can be associated with nest boxes, of which owners of nest box sites will be notified prior to box installation, along with the installation information mentioned above. Barn owls can be messy; the Hungry Owl Project recommends not placing boxes over equipment or vehicles because of the excrement and other mess that can be generated by a family of owls (2010). The Project also warns of the noisiness of barn owls; nest boxes should not be placed too near the homes of any light sleepers. Once the young fledge from the nest, they loiter in nearby trees and beg for food all night for approximately two months (per clutch). Also, once the owls have moved in and have begun nesting, they are protected by the Illinois Endangered Species Protection Act, so a barn owner cannot legally displace the owls or eggs from inside the box. I greatly hope that none of these disadvantages will deter any barn owner who is otherwise interested in participating in the project.

A small amount of upkeep is required to keep barn owl boxes functional, and I imagine that some barn owners will play a more active role in this upkeep than others, depending on their interest and capabilities. As much as three inches of debris can build up in a barn owl box after a breeding season, and too much buildup can decrease the interior depth of the box such that nestlings gain access to the entrance hole and the space may become too crowded in general (Simmons 2010; World Owl Trust 2010). In the case of occupation of the box by another species, such as a squirrel, nesting materials should be removed in order to attract barn owls. Cleaning is recommended in August or September and should not disturb the owls. Most if not all of our nest box sites are places where the barn owners are genuinely interested in the project and are obliging about maintenance issues. The JWP Audubon will monitor the boxes in the future as they see fit, as information about the use of the boxes will prove interesting to both their own concerns about local bird populations and to the Illinois Department of Natural Resource's efforts to increase endangered species populations.

## NEST BOX SITES IN MCLEAN COUNTY

One of the goals of my project was to document many potential sites in McLean County that had both a suitable location for a nest box (a barn or other structure) as well as a suitable hunting habitat. The literature suggests that the owls require two to three acres of grassland habitat—pasture, prairie, or other habitat replete with meadow voles—within about two kilometers from their nesting site (Colvin 1985; Walk et al. 1999). Some birds may regularly hunt over three kilometers from their nest (Colvin 1985). The McLean County Barn Keepers were the perfect group to collaborate with to investigate the current number and condition of old structures in McLean County and to get in touch with barn owners interested in having a nest box installed on their property.

We currently have 12 potential sites for nest boxes. Three boxes are set for local natural areas: the corn crib at Funk's Grove, a barn at ParkLands' Merwin Nature Preserve, and a barn at ParkLands' Letcher Basin Nature Preserve (to replace the box destroyed by raccoons). Five more sites are on the properties of JWP Audubon members or their personal contacts, discovered simply by word of mouth about the project. Two sites are properties in which there have been recent barn owl sightings reported, and two more sites are on the properties of the Barn Keepers that expressed initial interest at the September Barn Keepers meeting.

As mentioned above, the McLean County Barn Keepers estimate 1,000 to 1,100 barns remain in the county (R. Ropp, personal communication, 10 Nov 2010). Using the 2001 National Land Cover Data (NLCD 2001) and Geographic Information Systems (GIS), I calculated that there are a total of about 22,500 acres (35 square miles) of grassland, pasture, and hay remaining in McLean County, or about three percent of the county's total area (See **Appendix D** for a map containing grassland locations in the county). The total number of barns across the county that are located close enough to these grasslands to support a barn owl is difficult to estimate without knowing the locations of each of the barns. However, based on the visible patches of grassland habitat on the McLean County map, and the amount of areas with no grassland habitat nearby, I would estimate the total number of potential nest box sites to be only a fraction of the total number of barns available.

Nevertheless, I am confident that the JWP Audubon Society will not struggle in the future to find sites for the currently unclaimed nest boxes. The JWP Audubon Society has a wide web of connections throughout the county, particularly among those interested in conservation efforts. Continued contact with the McLean County Barn Keepers may also continue to provide good locations for nest boxes, because their barns are considerably safer from demolition and destruction than other barns throughout the county because of their dedication to preserving them. In addition, through the steps taken to initiate this project, a wider net has been cast. The two announcements posted on the Barn Keepers website and the McLean County Extension newsletter will continue to keep the goals of this project alive. Throughout this entire project, I have been utterly overwhelmed by the amount of support and interest I received from nearly everyone I encountered; therefore I am incredibly optimistic about the future of this project under the guidance of the JWP Audubon.

## CONCLUSIONS

The first nest boxes are scheduled to be installed this winter. The JWP Audubon will coordinate with the site volunteers for the distribution of the boxes, and most landowners will install the boxes themselves. The owls may not find the boxes for years, but by installing them properly and in areas with suitable habitat for barn owls, the chances of some being occupied in the future are good. I hope that this project will supplement the Illinois Barn Owl Recovery Plan in McLean County, both in terms of collecting grassland data and installing nest boxes. The barn owl is a fascinating and beneficial bird, and it will be a great tragedy if it is lost from McLean County forever. By starting a local nest box program, there is a substantial chance that a population, be it a small one, can remain.

## LITERATURE CITED

- Barn Owl Trust. 2006. Nestboxes for use in barns and other buildings. Leaflet No. 3. Retrieved from: <<http://www.barnowltrust.org.uk/infopage.html?Id=86>>. Accessed: 06 Oct 2010.
- Beveroth, T. 2009. Monitoring of Owls and Nightjars, MOON, in Illinois—2009 report. Retrieved from: <[http://www.inhs.illinois.edu/research/MOON/includes/MOON\\_Report\\_2009.pdf](http://www.inhs.illinois.edu/research/MOON/includes/MOON_Report_2009.pdf)>. Accessed 02 Oct 2010.
- Brendle, A. 30 Oct 2002. Farmers, conservationists seek return of barn owls. *National Geographic News*. Retrieved from: <[http://news.nationalgeographic.com/news/2002/10/1030\\_021030\\_BarnOwls.html](http://news.nationalgeographic.com/news/2002/10/1030_021030_BarnOwls.html)>. Accessed 28 Aug 2010.
- Brodkorb, P. 1971. Catalogue of fossil birds, Pt. 4. *Bulletin of the Florida State Museum, Biological Science*. 15.
- Cain, M. L., W. D. Bowman, and S. D. Hacker. 2008. Ecology. Sinauer Associates.
- Colvin, B. A. 1985. Common Barn Owl population decline in Ohio and the relationship to agricultural trends. *Journal of Field Ornithology*. 56:224-235.
- Colvin, B. A. and B. McLean. 1986. Food habits and prey specificity of the common barn owl in Ohio. *Ohio Journal of Science*. 86(1):76-80.
- Connecticut Department of Environmental Protection's Wildlife Division (CDEPWD). Wildlife in Connecticut Endangered and Threatened Species Series: Barn Owl. Retrieved from: <[http://www.ct.gov/dep/lib/dep/wildlife/pdf\\_files/outreach/fact\\_sheets/barnowl.pdf](http://www.ct.gov/dep/lib/dep/wildlife/pdf_files/outreach/fact_sheets/barnowl.pdf)>. Accessed: 28 Aug 2010.
- Ehresman, B. L., D. A. Reeves, and K. P. Schlarbaum. 1988. Post release survival and movements of captively reared Common Barn-Owls in Iowa. *Annual Symposium of the National Wildlife Rehab Association*. 7:133-150.
- Elliot, R. 1995. Environmental Ethics. Oxford University Press. Oxford.

- Forest Preserve District of DuPage County. 10 Sept 2010. Barn Owl Dispersal and Survival Project. Retrieved from: <<http://www.dupageforest.com/page.aspx?id=4294967687>>. Accessed 01 Oct 2010.
- Grim, Kathryn. 18 Sep 2008. Fermilab gives home to endangered owls. *Fermilab Today*. Retrieved from: <<http://www.fnal.gov/pub/today/>>. Accessed 02 Oct 2010.
- Hilton Pond Center. 2010. "Ohio style" nestbox for barn owls, *Tyto alba*. Retrieved from: <<http://www.hiltonpond.org/NestboxOwlBarnPlans.html>> Accessed 10 Nov 2010.
- Home Depot. 2010. Retrieved from: <<http://www.homedepot.com>>. Accessed 02 Oct 2010.
- Hungry Owl Project. 2010. Should I install an owl box? Retrieved from: <<http://www.hungryowl.org/info.html>>. Accessed 06 Oct 2010.
- Illinois Department of Natural Resources (IDNR). Jun 2009. A plan for the recovery of the endangered barn owl (*Tyto alba*) in Illinois. Retrieved from: <<http://dnr.state.il.us/ORC/WildlifeResources/theplan/swgGrant/pdfs/swg/2006/PDFs/T-35%20%20BARN%20OWL%20GS%206-09%20Final.pdf>> Accessed: 04 Oct 2010.
- Illinois Department of Natural Resources (IDNR). Oct 2009. Site assessment document for proposed wind farm. Handout at hearing.
- Illinois Department of Natural Resources (IDNR). 30 Jun 2010. Illinois Nature Preserves Commission. Retrieved from: <<http://dnr.state.il.us/inpc/>>. Accessed: 06 Oct 2010.
- Johnsgard, P. A. 1988. North American Owls. Smithsonian Institution Press. Washington and London.
- Love, R. A., C. Webbon, D. E. Glue, and S. Harris. 2000. Changes in the food of British Barn Owls (*Tyto alba*) between 1974 and 1997. *Mammal Review*. 30:107–129.
- Marti, C. D., P. W. Wagner, and K. W. Denne. 1979. Nest boxes for the management of Barn Owls. *Wildlife Society Bulletin*. 7:145-148.
- Marti, C. D., A. F. Poole and L. R. Bevier. 2005. Barn Owl (*Tyto alba*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Retrieved from the Birds of North America Online: <<http://bna.birds.cornell.edu/bna/species/001>>.
- McLean County Barn Keepers. 2001. History of Barn Keepers. Retrieved from: <[www.barnkeepers.org](http://www.barnkeepers.org)>. Accessed 04 Sep 2010.
- Nyboer, R. W., J. R. Heckert, J.E. Ebinger. 2006. Endangered and threatened species of Illinois: Status and distribution. Volume 2: Animals. *Illinois Endangered Species Protection Board*.
- Primack, R. B. 2006. Essentials of Conservation Biology. Sinauer Associates, 4<sup>th</sup> Edition.

- Radley, P. M. and J. C. Bednarz. 2005. Artificial nest structure use and reproductive success of barn owls in northeastern Arkansas. *Journal of Raptor Research*. 39(1):74-79.
- Ramsden, D. J. 1998. Effect of barn conversions on local populations of Barn Owl *Tyto alba*. *Bird Study*. 45:68-76.
- Ridgway, R. 1889. The ornithology of Illinois: Part I. Natural History Survey of Illinois. Viii: 520.
- Ripple, W. J., E. J. Larsen, R. A. Renkin, and D. W. Smith. 2001. Trophic cascades among wolves, elk, and aspen on Yellowstone National Park's northern range. *Biological Conservation*. 102:227-234.
- Schumm-Burgess, N. Save a Barn. Retrieved from: <[www.saveabarn.com/home.html](http://www.saveabarn.com/home.html)>. Accessed 04 Sep 2010.
- Shaw Creek Bird Supply. 2003. Retrieved from: <[http://www.shawcreekbirdsupply.com/barn\\_owl\\_info.htm](http://www.shawcreekbirdsupply.com/barn_owl_info.htm)>. Accessed 11 Nov 2010.
- Tyler, H. A. and D. Phillips. 1978. Owls by Day and Night. Naturegraph Publishers, Inc. Happy Camp, California.
- USDA. 31 Mar 2010. U.S. farmers to plant record soybean acres in 2010, USDA reports. *USDA National Agricultural Statistics Service: Newsroom*. Retrieved from: <<http://www.nass.usda.gov/Newsroom/index.asp>>. Accessed 02 Oct 2010.
- Walk, J. W., T. L. Esker, and S. A. Simpson. 1999. Continuous Nesting of Barn Owls in Illinois. *The Wilson Bulletin*. 111(4):572-573.
- World Owl Trust. Nest Boxes for barn owls. Retrieved from: <<http://www.owls.org/Information/newnestbox.htm>>. Accessed 02 Oct 2010.



# HAVE YOU SEEN ME?

Wanted:  
Barn Owls in  
McLean County!



We are surveying local barn keepers to see if barn owls are present and how much barn owl habitat remains in McLean and surrounding counties. Have you seen any?

Did you know:

- Barn owls were once common but have severely declined in population since the 1970s due to the loss of wooden barns and grassland habitat.
- Today, barn owls are an Endangered Species in Illinois.
- Barn owls need wooden barns or other similar structures to nest—not the new steel buildings that are replacing them.
- The owls need at least 2-3 acres of grassland habitat within about 1.25 miles of their nest.

We need your help! Please tell us if you have ever seen barn owls in your area, or if you have a wooden barn (or other structure) with at least 2-3 acres of pasture/grassland that might be suitable for the owls.

Author contact information has been removed.

## APPENDIX B.

Proposal presented to the John Wesley Powell Audubon Society at 10/12/2010 meeting.

John Wesley Powell Audubon Society

October 12, 2010

### Proposal for a Barn Owl Nest Box Program in McLean County

#### Goals of the project:

- I. Document potential sites in McLean County that have a suitable nest box location (barn or other structure within 2 km of 2-3 acres of grassland habitat)
- II. Construct and install 17 nest boxes in McLean County.

#### Potential sites for nest boxes:

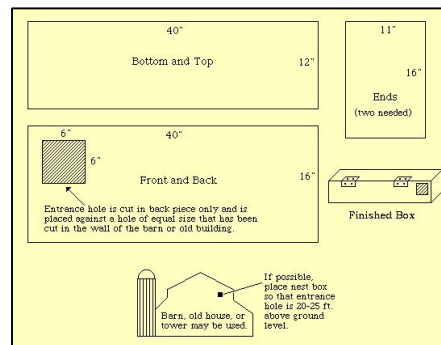
- |   |  |
|---|--|
| - Funk's Grove                            | - Matt Fraker's property                       |
| - Jim Mohr's property                     | - Letcher Basin Nature Preserve                |
| - Merwin Nature Preserve                  | - Dee Sober's Property                         |
| - Barbara Stoops' property                | - Phelan Property (McLean County Barn Keepers) |
| - Barn near Mackinaw Fish & Wildlife Area | - Sears Property (McLean County Barn Keepers)  |

#### Nest box design basics:

- A volunteer at the Sugar Grove Nature Center will build the boxes, and owners at the sites listed above will install the boxes.
- Holes must be drilled in the bottom of the box for drainage purposes
- A hinged lid will allow for cleaning of the box—too much interior debris buildup will eventually lessen the internal depth of the box, allowing nestlings to fall from the entrance hole
- A 4 ½" wide, 3 ½" tall entrance hole (especially an ellipsis by those axis dimensions) is ideal for barn owls—it is just large enough for the owls but too small for any large predators to gain access to the box

#### “Ohio-Style” Box Design (7 boxes):

- 40" x 12" x 16" box (using ½" plywood, can cut 1 2/3 boxes per 4' x 8' sheet, approx. \$15/sheet)
- 1" x 2" x 8' seam boards (3per box) may be necessary to connect the plywood sides (\$1.12 each)
- Entrance hole opens through barn's outer wall, which prevents mammals from taking over the box (e.g. squirrels) and minimizes predation
- Additional materials: 2 top hinges on lid (\$2.50 each)
- From: <http://www.hiltonpond.org/NestboxOwlBarnPlans.html>
- Estimated cost per box = **\$20**



#### Simmons Box Design (10 boxes):

- Claims optimal protection from predation from great horned owls and raccoons
- Interior divider separates the box into two compartments so “living area” is away from entrance hole
- Grip grooves below entrance hole assist owls entering the box (better than a platform that might serve predators as well as the owls)
- 16" x 22 ¾" x 12 3/8" box (2 boxes cut per 4' x 8' sheet plywood)
- Suggested materials: ¾" exterior grade plywood (\$30/sheet), 68 deck screws (#8, 1 5/8in. long; \$6.48/lb screws), exterior glue (\$6), 8 L screws (1 ¾ in.), 4 pair pin hinges (1.5 x 1.5in.; \$2.00 each)
- Detailed assembly instructions at: <http://www.scvas.org/pdf/cbrp/BuildingBarnOwlBoxes.pdf>
- Estimated cost per box = **\$35**




Prices estimated from HomeDepot.com and Lowes.com.

## APPENDIX C.

McLean County Barn Keepers website, as of November 2010.

UNIVERSITY OF ILLINOIS EXTENSION



McLean County  
Barn Keepers

About the Program

Barn Owl Nest Boxes

BOARD OF DIRECTORS

CALENDAR OF  
Quarterly Meetings,  
Speakers and Topics

History of Barn  
Keepers

MEMBERSHIP  
APPLICATION

NEWSLETTERS

UPCOMING EVENTS

Program Links

Contact Us

Community &  
Economic  
Development

McLean County  
Extension

### Barn Owl Nest Boxes

Help us bring barn owls back to McLean County!

The John Wesley Powell Audubon Society, in conjunction with Anna Groves, a senior environmental studies student at Illinois Wesleyan University, has just started a nest box program for barn owls in the county.


If your barn (or other structure) is within 2 km of 2-3 acres of grassland or more (pastures, prairies, old fields), then your barn would be suitable for a nest box. Barn owls provide excellent rodent control-- a family of barn owls can consume thousands of voles and mice over a three-month nesting period. These owls are an Endangered Species in Illinois, and are known to readily nest in boxes.


Boxes are funded and constructed by the Audubon Society.


Seen a barn owl? We would also like to know about any barn owl sightings in the area, recently or in the past.

Author contact information has been removed.

Laurie Benjamin, Barn Keepers, Secretary

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Urbana-Champaign

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College of Agricultural, Consumer  
& Environmental Sciences

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APPENDIX D.

Map of McLean County, Illinois available habitat. Created with ESRI ArcMap.  
Note the orange "pasture, hay, grassland" category.

