

Attracting Wildlife for Pest Control on Farmland

An Introduction to Barn Owl Boxes, Kestrel Boxes, Raptor Perches, Wintering Raptors, and More



Native predators will rarely completely eliminate a pest problem, but can be part of a multifaceted solution to pest control. Using wildlife to help control pests can improve crop production, cut down on pesticide use, improve water quality, save time, supply important habitat, and provide viewing enjoyment. The structures outlined in this document are ideal for farmland, but can also be used in parks, golf courses, large gardens and yards, and other open areas.

Barn Owl and American Kestrel Nest Boxes

The barn owl and the American kestrel are easy to attract to farmland by installing nest boxes. Although many raptor species will hunt on agricultural land, nesting pairs will focus hunting near the nests and will capture increased amounts of rodent prey for their growing chicks. These species are easy to attract with nest boxes because natural nesting cavities may be difficult to find.

Barn owls primarily prey on nocturnal rodents, especially voles and gophers. Barn owls are known to kill and stockpile more prey than needed. Kestrels, formerly known as sparrow hawks, will hunt large insects, such as grasshoppers, crickets, beetles, and moths, as well as small mammals and birds. Attracting raptors may also help with avian pests, such as magpies and starlings, by changing their behavior. The presence of predators nearby may make the pests more cautious and less likely to come into the area to feed.

Barn owl adult



American kestrel adult

There are many small details that will make a nest box more suitable to attract and fledge birds. Important factors include the number and location of boxes, timing of box set up, predation and competition, management of the area around the box, and box design.

NUMBER OF BOXES - Rarely will all the installed nest boxes be occupied on a given year. It is recommended that you put up at least twice as many boxes as the number of nests desired. Territoriality, availability of resources, and numerous other factors determine which boxes and how many boxes will be occupied. The idea of putting up more boxes is based upon giving the birds options to determine which sites best suit their needs. If a box is not used the first year, wait a few more years to see if it becomes occupied. If a box is consistently not used for a number of years, the location should be changed. For barn owls, the recommended density is up to 1 box per 5 to 10ac, and for kestrels, the recommended density is up to 1 box per 10ac. This density is recommended for areas with ideal habitat and a serious pest problem.

LOCATION AND HEIGHT OF BOXES - Boxes should be put up in areas with clear flight access, preferably away from stands of large trees. Barn owl boxes should face north or east to avoid the heat of the afternoon sun and be 15-30ft high, and kestrel boxes should face east or south and be 12-20ft high. Boxes should be set up as far away from busy roads as possible, since raptors may get hit by cars while hunting.

TIMING - Barn owls in Utah begin selecting nesting territories as early as Feb. 1 and may take until Sept. 15 to fledge their chicks. Kestrels may begin selecting nesting territories as early as Apr. 1 and may not fledge until Aug. 15. Set nest boxes up in the selected areas by the beginning of the nesting season.



Barn owl chicks

PREDATION AND COMPETITION - Barn owls and kestrels are predators, but can also be preyed upon by other animals. Their eggs and chicks may also be eaten. It is important to minimize predation to the extent possible. Great horned owls will prey on barn owls if the opening to the box is too large. Other predators can also have beneficial roles in pest control, so it is important to not try to eliminate them, only to minimize their effect on the nesting barn owls and kestrels. Effects from terrestrial predators (raccoons, snakes, cats) can be significantly reduced by putting conical predator guards on the wooden post below the nest box, using metal poles, and locating the box away from branches where predators can enter the boxes. Competition for nest boxes from other species can also reduce the value of the boxes. Nest boxes mimic natural cavities, which are valuable nesting and cover sites for many species, so they may attract non-target wildlife.

MANAGEMENT OF BOXES - Boxes should be cleaned and repaired annually to maintain the attractiveness to birds. If occupied, the boxes should not be disturbed during nesting season, since disturbance could result in nest abandonment. Normal farming operations are usually compatible with nesting barn owls and kestrels.

DESIGN AND INSTALLATION - Beware, there are many inappropriate designs for these nest boxes on the internet. Be sure to contact NRCS, HawkWatch, or USU (see contact info below) to get the best designs. There are boxes for purchase on the internet and at some home stores, or you can build your own. Ideally boxes are located on wooden or metal poles, but can be installed on other existing structures if safe from predation (see above). Wood shavings are often added to the boxes to increase their attractiveness to potential nesting birds.

Installation of a kestrel box



Perches, Snags, and Wintering Raptors



Raptor perch

Snags, which are standing dead trees, are important for many types of wildlife. Snags provide cavities for nesting birds and other wildlife, important foraging sites for woodpeckers, and perching sites for many species of birds. It is important to maintain natural snags whenever possible.

Plentiful perching sites are important for attracting wintering raptor species, such as red-tail hawks, bald and golden eagles, kestrels, northern harriers, and rough-legged hawks. Wintering raptors can provide valuable rodent and rabbit control throughout the winter months, and will help maintain populations of these birds to provide pest control in other seasons.

Artificial snags and perches can also be installed to benefit wildlife. Materials can be dead trees or branches, or wooden or metal posts. Artificial perches should be 10-30ft high, and benefit from a small crossbar (1-3ft) (see photo to left). Different heights and structures will attract different species, so a variety is ideal. Kestrels show a preference for perching on fence lines and wires. Installing wire perches, where perching wires are not already present, may attract hunting kestrels.

Many hawks wintering in the Intermountain region, especially rough-legged hawks and ferruginous hawks, use irrigation pivots and lines for perching. Outdated irrigation structures placed near areas with high pest populations may improve raptor habitat. It is important to locate artificial perches and snags in appropriate areas where pests are a concern, and are ideally installed near nest boxes. Note that artificial perches are generally not recommended in rangelands or natural areas.

Other Structures for Wildlife

There are numerous other structures you can build to attract beneficial wildlife to your property. Consider bat boxes to attract insect-eating bats, bluebird boxes to house these attractive insect-eating birds, tree swallow boxes to attract these colonial nesting mosquito-eating birds, and bee blocks to provide nesting sites for these valuable pollinators. Also consider brush piles, downed wood, and rock piles as habitat for terrestrial wildlife.



Bat box

More Information, Box Designs, Potential Funding, Advice, Monitoring, and Volunteering

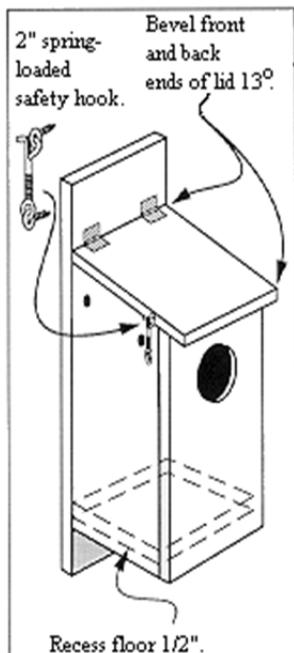
USDA Natural Resources Conservation Service * ut.nrcs.usda.gov * Casey Burns * (801) 524-4566 * casey.burns@ut.usda.gov

HawkWatch International * hawkwatch.org * (801) 484-6808

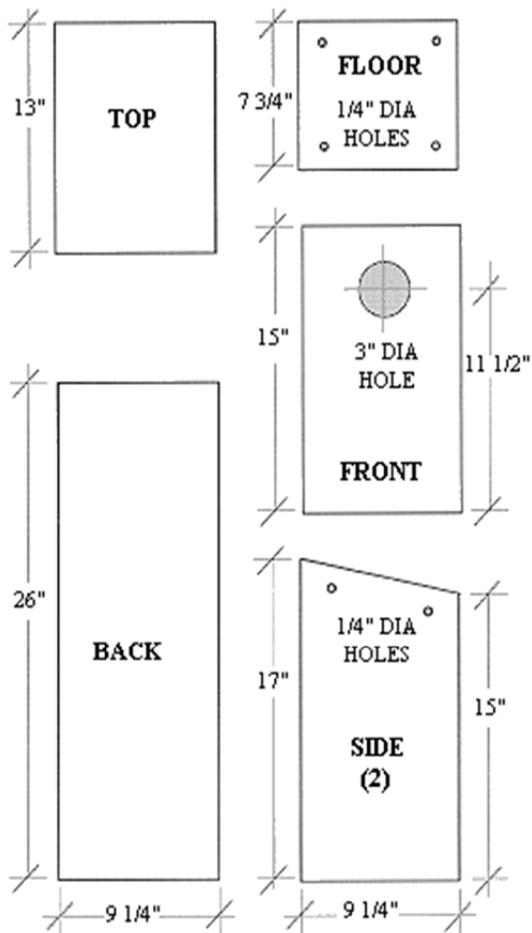
Utah State University Extension * extension.usu.edu * Dr. Terry Messmer * (435) 797-3975 * terry.messmer@usu.edu

Dec. 2012

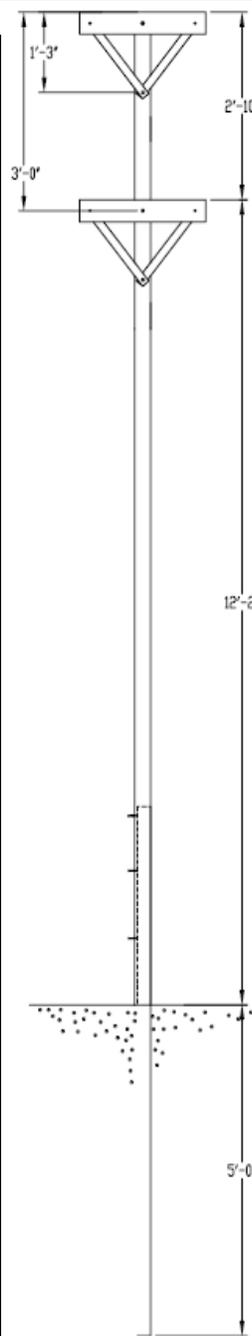
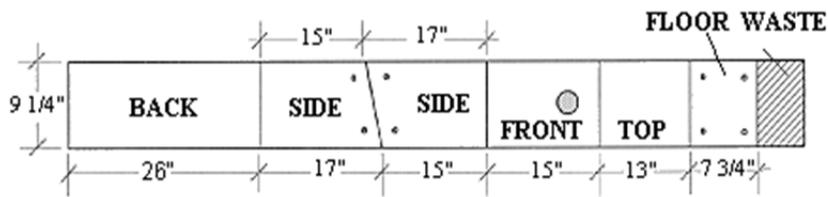
Kestrel Box



To hold the roof secure and allow for easy cleaning access, hinge the roof and use a spring-loaded safety hook.
Place 3" of wood chips, wood shavings, or straw in bottom of box.



LUMBER: One 1" x 10" x 8', (#2 white pine recommended). Painting the box will increase its useful life.
HARDWARE: Twenty-two 1 1/2" wood screws (#6), two 2" hinges and one 2" spring-loaded safety hook.



RAPTOR PERCH

MATERIALS

One 15' hollow metal pole 3" diameter (ex: electrical conduit or galvanized steel pipe)
Important: Use like metals for both pipe and support flats to prevent corrosion.

- One 8' Fence post
- 2 - 2"x4" cross pieces 24' treated boards
- 4 - 1/2"x1 1/2"x16" metal support flats
- 3 - 2 1/2" x 3/8" bolts and nuts
- 4 - 2" x 3/8" bolts and nuts
- 2 - 3/4" bolts and nuts
- 2 - 5" bolts and nuts*

*A 6" inch bolt should be used on top cross piece at center if intending to attach a kestrel box to back of pipe.

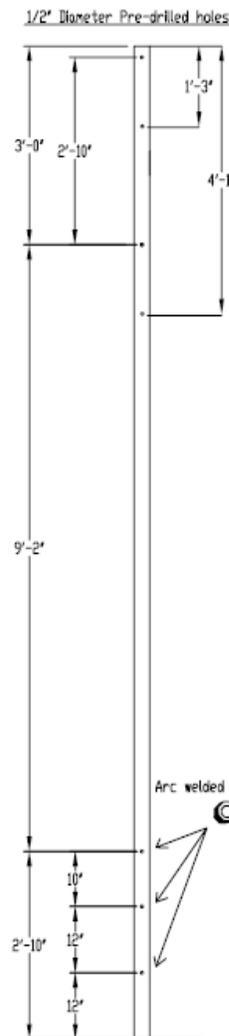
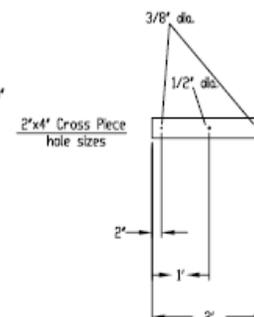
PREPARATION

Drill 1/2" holes in hollow metal pole, vertically aligned at 2', and 36' from top of pole through both front and back of pole. Pre-drill holes through front and back of pole at approximately 15' and 49' from top for securing metal support flats. See diagram at right.

Pre-drill 1/2" diameter holes at 12', 24', and 34' from base of pole. Arc weld nuts matching 2 1/2"x3/8" bolts to outside of 3 base holes.

Pre-drill 1/2" holes in both 2"x4" cross pieces, at center. Pre-drill 3/8" holes at 2" from end on both pieces.

Tan/Brown rust prevention point shall be applied to exposed metal surfaces.



COOPERATOR _____ COUNTY SWCD, INDIANA
LOCATION _____

RAPTOR PERCH
Indiana Biology Technical Note 2
(Sheet 1 of 3)

U. S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed _____ Date _____ Approved By _____ Date _____
Drawn _____ Title _____

BUILDING A BARN OWL NESTING BOX

Points to consider

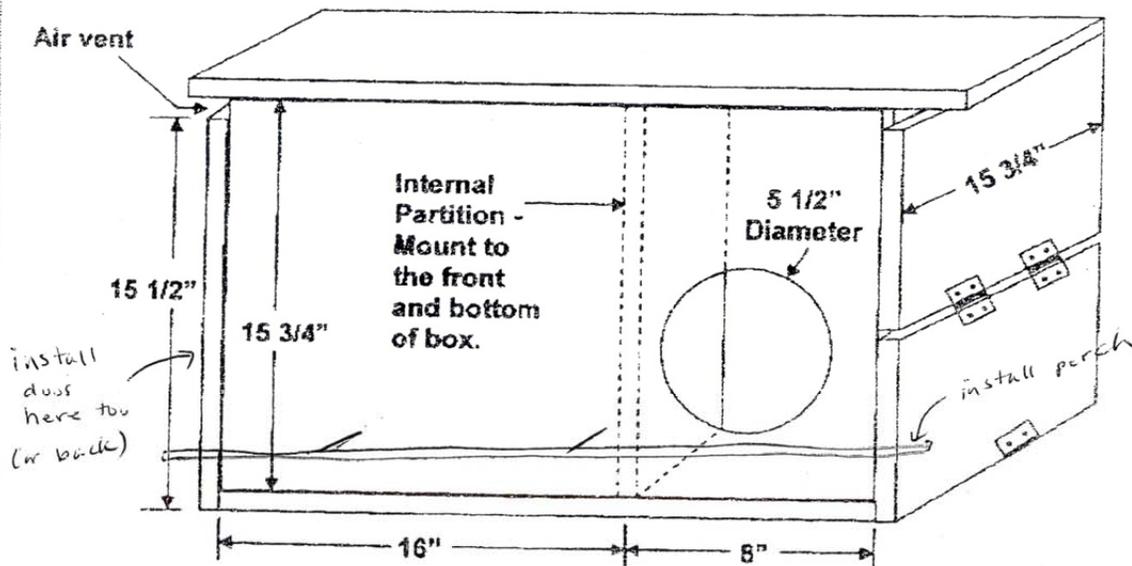
- Use 1/2" CDX grade or better plywood
- Glue and nail all joints
- Entrance hole should not exceed 6" in diameter. 5" to 5 1/2" is sufficient.
- Drill a 5/8" hole in each corner of the floor for drainage.
- Mount box on a 16' pressure treated 4"X4" post. Set 3 1/2' in the ground.
- Always point entrance to the east.
- Add shade to sides exposed to the sun.
- Treat finished box with a preservative made from 1 part boiled linseed oil and 3 parts thinner. Soak wood multiple times until wood will not take any more of the mixture. Allow to dry a week and apply an optional final coat using an oil based stain.

LIST OF MATERIALS

- Box front, back, and bottom - 24" X 15 3/4"
- Box top - 26" X 15 3/4"
- Left side - 15 3/4" wide X 15 1/2" high
- Right side - From 15 3/4" X 15 1/2" piece
Cut into two pieces.
- Cut top piece 8" X 15 3/4"
- Cut bottom piece (clean-out door)
 7 1/2" X 15 3/4"
- Interior partition - 6" X 15 3/4"
- One pair of box hinges
- Box hasp or hook and eye for clean out door
- One quart of boiled linseed oil
- Three quarts of paint thinner
- One 16' 4"X4" pressure treated post
- Two 3/8" X 6" carriage bolts
- Two 3/8" flat washers

ORDER OF ASSEMBLY

- Start** by gluing and nailing the front and back pieces to the bottom piece. The front and back pieces should sit on top of the bottom piece.
- Attach** the left side to the outside of the bottom piece.
- This** will leave a 1/2" gap at the top for ventilation.
- Next** lay the two pieces for the right side in place so bottom piece is flush with the bottom of the floor piece like the left side. **Attach** the hinges. Again there should be a 1/2" gap at the top for ventilation. **Attach** box hasp to bottom of cleanout door.
- Cut** entrance hole in the front of the box with a jig saw.
- Mount** interior partition to the front and bottom of the box.
- Drill** a 5/8" drain hole in each corner of the floor.
- Final** step is to mount roof allowing for 1" overhang on both the right and left sides.
- When** glue is dry, sand wood. Finish using the boiled linseed oil and thinner preservative.
- Mount** 4" X 4" pressure treated post, with 3/8" carriage bolts, to the back of the box.



The Imperial County Farm Bureau's TMDL Voluntary Compliance Program would like to thank the Department of Water Resources, The Water Education Foundation, Audubon California's Landowner Stewardship Program, Region 7 Water Quality Control Board, and Department of Fish & Game for their continued help and support of this barn owl project.