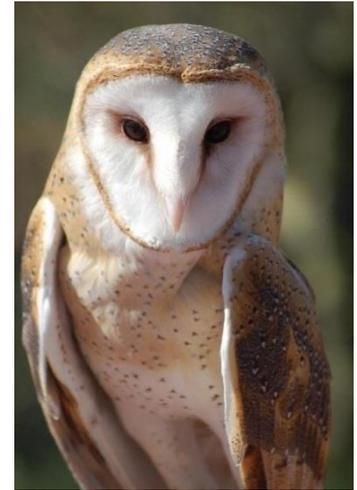


## Barn Owls in Agriculture

Barn owls (*Tyto alba*) are one of the most common owls in California and are often found in agricultural fields where they hunt rodents, primarily gophers, mice and voles. They do not build their own nests, but instead use natural cavities, buildings or nest boxes to raise their young. Many landowners install nest boxes to attract beneficial barn owls to their farms and ranches as part of an integrated pest management plan.

A recent nest box camera study found that over a 5 month breeding period an adult barn owl will eat approximately 165 rodents and each chick will eat 152 rodents (Browning et al. 2017). If a pair of nesting owls has 3 chicks (they often have more) they can consume up to 786 rodents in 5 months. Barn owls can often raise two or more broods of chicks a year in a mild California climate if there is an ample supply of rodents.

Although barn owls eat a lot of rodents, they rarely completely eliminate rodents from a field. However, having sufficient occupied nest boxes may reduce the impacts of rodents to a manageable level, or to a point where minimal trapping is needed. **Never install barn owl nest boxes in, or near, fields where anticoagulant rodenticide is used, as secondary poisoning kills barn owls** (Elliott et al. 2014). **Always use rodenticide according to the label.**

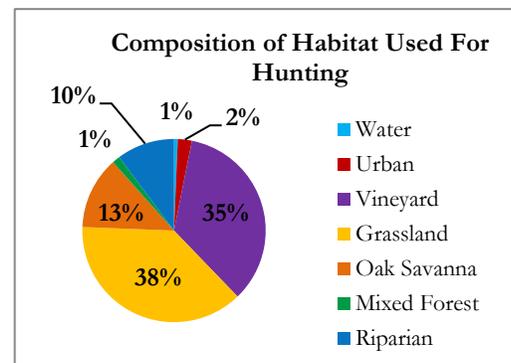


Adult Barn Owl

### Recent Barn Owl Research Results

Simply installing nest boxes will not guarantee occupancy. Here are some suggestions to increase the chances of a pair of barn owls breeding in a nest box. These results were compiled from studies conducted at Humboldt State University of 298 nest boxes installed in Napa Valley vineyards (Wendt and Johnson, 2017; Castenada and Johnson, unpublished data). Although these studies were focused in vineyards, it is assumed that barn owls act similarly in other agricultural systems.

- Place nest boxes in open fields, surrounded by grassland and riparian habitat within a half mile of the box.
- Barn owls fitted with GPS tags spent about 70% of their time hunting in vineyards and grasslands surrounding vineyards. They use riparian habitat for roosting.
- Face the nest box opening to the north or east.
- In Napa wooden nest boxes were preferred more than plastic boxes but in other studies plastic boxes were also occupied.
- Boxes should be mounted 8- 12 feet off the ground on metal poles to prevent mammal predators from entering the box.
- Clear branches from in front of the nest box opening if mounted on or near trees.
- Stain or paint boxes white to keep them cool. In hot climates it may be necessary to install sunshields on the top or side of the box.
- Clean nest boxes every fall (October- December).
- Nest boxes can be spaced as close as 100 feet apart as barn owls are not territorial while breeding.
- It can take 2 or 3 years for owls to find and use new boxes. If nest boxes are not occupied after 3 years, try moving the nest box to a new location.



## Nest Box Design and Placement

This nest box design provides protection from predators, enough room for large broods, a separate chamber for the adults, and access for easy maintenance and cleaning. The divider separates the living chambers, and also acts as a deterrent to most predators attempting access the owls, nestlings or eggs.

This design is from *Build A Barn Owl Box* by Charles Wade, Lee Pauser and David Altknecht, 2012  
<http://www.sevas.org/pdf/cbrp/BuildingBarnOwlBoxes.pdf>



### **Nest Box Design (see *Build a Barn Owl Box* for detailed instructions):**

- Whether you build or buy a nest box, make sure the dimensions meet the criteria below and in Appendix A of “Build A Barn Owl Box”
  - ENTRANCE HOLE is 4 1/2” wide and 3 3/4” in height
  - FRONT and BACK are 16” wide and 22 3/4 ” in length
  - BOTTOM is 10 7/8 wide and 22 3/4 “ in length
  - LEFT SIDE is 12 3/8 ” wide and 16” in length
  - RIGHT SIDE is 12 3/8 wide and 16 1/8” in length, then cut into a 11” high UPPER RIGHT SIDE and a 5” high CLEAN OUT DOOR
  - TOP is 12 3/8” wide and 24 5/8” in length, then cut into a 7 1/2“ long TOP and a 16 3/4” long TOP DOOR
  - DIVIDER is 5 1/2” and 15 1/4” in length
- *Placement*
  - Place boxes where installation and maintenance activities can be accomplished with little risk to those doing these activities.
  - Although nest boxes can be mounted to the side of barns or other buildings consider the level of disturbance in the vicinity of where the box is mounted.
  - Avoid placing nest boxes on telephone poles or near roads, where young owls learning to fly or hunt may get killed by vehicles as collisions are a leading cause of barn owl deaths.
- *Mounting*
  - Most nest boxes are mounted on metal poles, but they can be mounted on trees and buildings as well.
  - Mount nest box on 2” diameter steel pipe that is 10-15’ in length and set in concrete buried about 2’. Mounting on metal pipes will reduce predation of eggs or young.
  - Mounting to the steel pipe can be accomplished by welding a piece of angle iron horizontally to the post at a spot where the nest box can rest or using pipe clamps (pipe grip ties).
  - Use 5/16” lag bolts or threaded bolts if mounting nest boxes on sides of buildings or trees.



*Mounting by welding piece of angle iron*



*Mount back of nest box with Pipe clamps*

- *Maintenance*
  - Nest boxes should be maintained and cleaned once a year during fall or winter (Oct-Dec).
  - Barn owls regurgitate undigested prey items like bones and fur twice a day. Regurgitated pellets can quickly fill up a nest box.
  - Lubricate hinges and check mounting structures during annual inspections.
  - Avoid disturbing nest boxes during the breeding season (Feb- Aug). **Barn owls will often abandon nests if disturbed while breeding.**

### **Resources and Literature (email specific authors for scientific papers)**

- Nest box plans for download- <http://www.scvas.org/pdf/cbrp/BuildingBarnOwlBoxes.pdf>
- A few companies that sell nest boxes (not endorsed by NRCS or Point Blue Conservation Science)- Hungry Owl Project, JCS wildlife, Wild Wing Company, Amador Barn Owl Box Company
- Information on the Humboldt State University barn owl research lab, Dr. Matt Johnson- <https://www.facebook.com/barnowlHSU/>, [https://www2.humboldt.edu/wildlife/faculty/johnson/research\\_studentprojects.html](https://www2.humboldt.edu/wildlife/faculty/johnson/research_studentprojects.html)

Browning, M., J. Cleckler, K. Knott, M. Johnson. 2017. Prey Consumption by a large aggregation of barn owls in an agricultural setting. Proc. 27<sup>th</sup> Vertebrate Pest Conference. Univ. of Calif., Davis. 337-344.

Elliott, J. E., Hindmarch, S., Albert, C. A., Emery, J., Mineau, P., & Maisonneuve, F. 2014. Exposure pathways of anticoagulant rodenticides to nontarget wildlife. Environmental monitoring and Assessment, 186, 895-906. <https://link.springer.com/article/10.1007/s10661-013-3422-x>

USDA, Natural Resource Conservation Service, 2015. Structures for Wildlife- Barn Owl Nest Structures. Conservation Practice 649B.

Wendt, C., M. D. Johnson. 2017. Multi-scale analysis of barn owl nest box selection on Napa Valley vineyards. Agriculture, Ecosystems and Environment 247:75-83. <http://www.sciencedirect.com/science/article/pii/S0167880917302669>