

## A SIMPLE ONE-WAY DOOR DESIGN FOR PASSIVE RELOCATION OF WESTERN BURROWING OWLS

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California supports a declining population of resident and migratory Western Burrowing Owls, *Athene cunicularia hypugaea*, which occur in grasslands throughout the State. Primary causes of population declines in California are conversion of grassland habitats to agriculture or urban land uses and eradication of fossorial mammals, such as the California ground squirrel (*Spermophilus beecheyi*; Haug et al. 1993). The Burrowing Owl, identified as a species of special concern by the California Department of Fish and Game, appropriates burrows made by other animals. Burrowing Owls usually do not excavate their own burrows. Burrowing Owls also require open grassland fields with a sufficient food supply for foraging habitat, low vegetative cover to allow owls to watch for predators, and adequate roosting sites (Zarn 1974). The owl is protected under the Migratory Bird treaty Act of 1918 (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755, as amended), which prohibits the destruction of owls or their nests. California Fish and Game Code (sections 3503, 3503.5, 3513, 3800-3806) also protects these owls, their nests, eggs, and young (LawTech Publishing 2004). When economic development or other land conversion is planned where these owls occur, the California Department of Fish and Game often suggests mitigation for the destruction of burrows during development projects, or similar activities.

The California Burrowing Owl Consortium (CBOC 1993)<sup>2</sup> developed a Survey Protocol and Mitigation Guideline to meet the need for standardized measures when surveying Burrowing Owl populations, and for evaluating impacts to owl habitat from development projects. The guidelines were “intended to provide a decision-making process that should be implemented wherever there is potential for an action or project to adversely affect burrowing owls or the resources that support them” (CBOC 1993)<sup>2</sup>, and were submitted for consideration by the California Department of Fish and Game. The California Department of Fish and Game adapted these suggested guidelines in its

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<sup>2</sup> California Burrowing Owl Consortium (CBOC). 1993. Burrowing owl survey protocol and mitigation guidelines. Technical Report, Burrowing Owl Consortium, Alviso, California.

own report (CDFG 1995)<sup>3</sup>. Trulio (1995) described one approach to mitigating Burrowing Owl habitat loss due to development: passive relocation. On-site passive relocation should be implemented if other avoidance requirements cannot be met (see CBOC 1993)<sup>2</sup>. Passive relocation was defined as “encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond 50 m from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls” (CBOC 1993)<sup>2</sup>. Relocation of owls should be implemented during the non-breeding season, however occupied burrows can be disturbed during the nesting season (February 1 through August 31) if a qualified biologist approved by the California Department of Fish and Game verifies through non-invasive methods either: the owls have not begun egg-laying and incubation, or that juveniles from the occupied burrows are foraging independently and are capable of independent survival (CDFG 1995)<sup>3</sup>.

Trulio (1995) described passive relocation of owls in terms of using artificial burrows. Following the guidelines established by the California Burrowing Owl Consortium (1993)<sup>2</sup>, the passive relocation process is composed of four phases: impact assessment, artificial burrow creation, owl eviction, and monitoring. Trulio (1995) described the process in significant detail, and therefore is not expanded upon here. However, both the California Burrowing Owl Consortium (1993)<sup>2</sup> and Trulio (1995) call for one-way doors to be used as a method to exclude owls from an occupied burrow and not allow them to re-enter the burrow. No guidance is provided for an effective one-way door design that is simple to manufacture, inexpensive, and can be employed in large numbers depending on the size of the development. Here we describe a field-tested design that fits the criteria recommended by the California Burrowing Owl Consortium (1993)<sup>2</sup> and Trulio (1995). The design was field-tested in several economic development / land conversion projects where passive relocation of owls was necessary. Several hundred owls were successfully passively relocated from over 20 projects from 1997-2004 throughout California, including the San Joaquin Valley, San Francisco Bay area, and the Dublin area in Alameda County (H. T. Harvey & Associates, unpublished data). The owls showed no apprehension in exiting the one-way doors (S. Terrill, H. T. Harvey & Associates, personal communication).

The one-way door is a variation of the Burrowing Owl trap theme described in Martin (1971), Plumpton and Lutz (1992), and Botelho and Arrowood (1995), among many others. These traps are humane, safe, and will not cause injury to the bird. The main difference is the one-way door does not trap the owl – it excluded the owl from a burrow once the owl has exited the one-way door device. The one-way door design described herein is modified from a readily available dryer vent (Figure 1 — Deflecto® 4 inch Supurr-Vent® louvered vent hood with aluminum pipe, model number SVHAW4, Deflecto Corporation, Indianapolis, Indiana).

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<sup>3</sup> California Department of Fish and Game (CDFG). 1995. Staff Report on Burrowing Owl Mitigation. Unpublished report. 8 pp. Report dated 25 Sep 1995. California Department of Fish and Game, Sacramento, California.

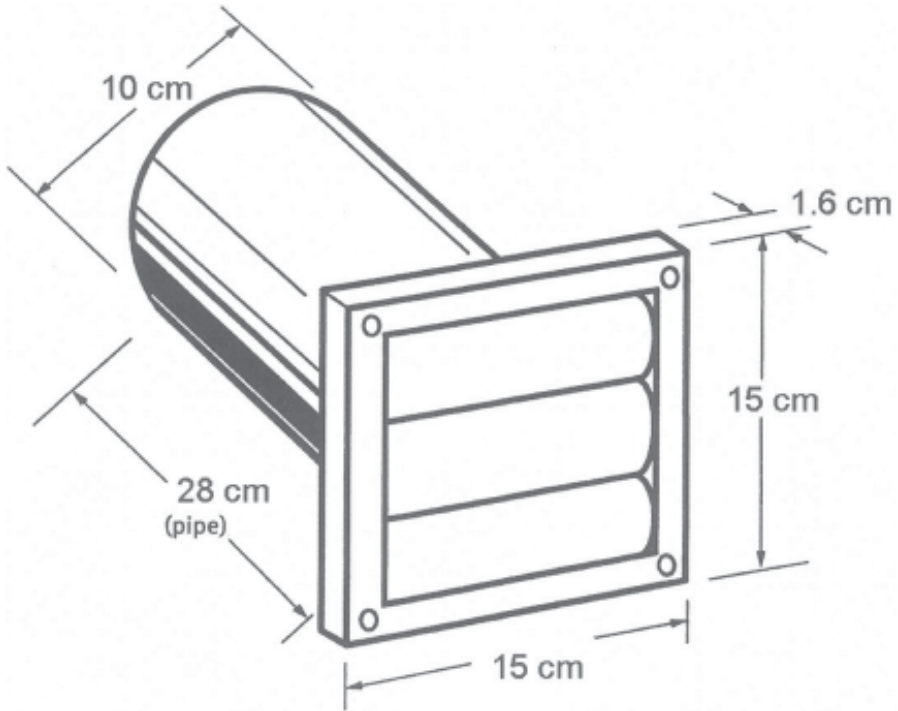


Figure 1. Deflecto® 4 in dryer vent, Supurr-Vent® louvered vent hood with aluminum pipe, model number SVHAW4.

The vent hood has three louvers (Figure 2). The two lower louvers are removed, while the upper louver remains in place. Rivet to the upper louver a 7 x 10 cm piece of Plexiglas (or some other thin, rigid, transparent plastic material). The Plexiglas allows the owl to see through the door and exit the tube. The owls may further be encouraged to use the one-way door by spraying the inside of the tube with spray adhesive and sprinkling a coat of sand on the inside of the tube while the spray adhesive is still wet. The sand provides a footing for the owl upon exiting the one-way door device. The one-way doors should be left over the burrow entrance 3-4 days (Trulio 1995). The previously occupied burrow should be carefully excavated and collapsed as described in Trulio (1995).

Once the one-way doors are removed they can be reused and employed elsewhere. The design is effective in projects with similarly sized small mammal burrows as well as in areas with a substantial small mammal population with a variety of non-uniformed burrow opening configurations (H. T. Harvey & Associates, unpublished data). The design is simple, inexpensive, and can be manufactured in large quantities in a short period of time with minimal materials and tools.

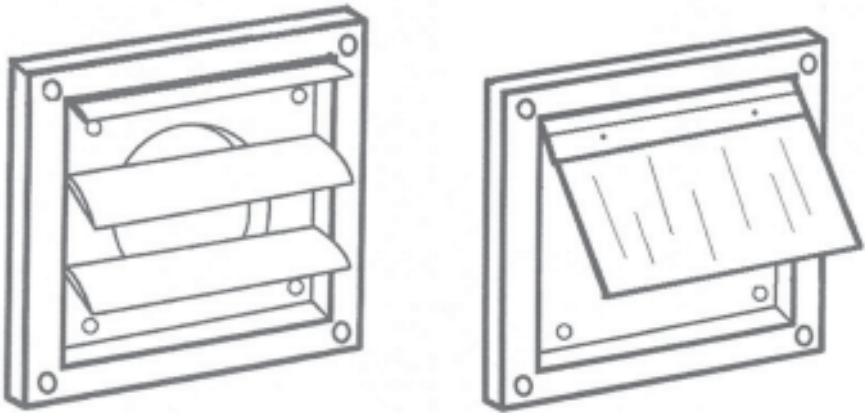


Figure 2. The vent hood has three louvers. The two lower louvers are removed, while the upper louver remains in place. Rivet to the upper louver a 7 x 10 cm piece of Plexiglas. Plexiglas riveted to the upper louver becomes the one-way door.

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