



COLORADO

Parks and Wildlife

Department of Natural Resources

RECOMMENDED SURVEY PROTOCOL AND ACTIONS TO PROTECT NESTING BURROWING OWLS

Western Burrowing Owls (*Athene cunicularia hypugaea*) are commonly found in prairie dog towns throughout Colorado. Burrowing owls require prairie dog or other suitable burrows (e.g. badger, Wyoming ground squirrel) for nesting and roosting. Western burrowing owls breed throughout the western United States, southern Canada, and northern Mexico and winter in the southern United States and throughout Mexico. Colorado's burrowing owls are mostly migratory but overwintering owls have been documented.

Federal and state laws prohibit the harming or killing of burrowing owls and the destruction of active nests. It is quite possible to inadvertently kill burrowing owls during prairie dog poisoning projects, removal of prairie dogs, destruction of burrows and prairie dogs using a concussive device, or during earth moving for construction. Because burrowing owls often hide in burrows when alarmed, it is not practical to haze the birds away from prairie dog towns prior to prairie dog poisoning/removal, burrow destruction, or construction activity. Because of this, Colorado Parks and Wildlife (CPW) recommends surveying prairie dog towns for burrowing owl presence before potentially harmful activities are initiated.

The following guidelines are intended as advice on how to determine if burrowing owls are present in a prairie dog town, and what to do if burrowing owls are detected. These guidelines do not guarantee that burrowing owls will be detected if they are present. However, adherence to these guidelines will greatly increase the likelihood of detection.

Seasonal Timing

Burrowing owls typically arrive on breeding grounds in Colorado in late March or early April, with nesting beginning a few weeks later. Active nesting has been recorded and may be expected from late March through early August. Adults and young may remain at prairie dog towns until migrating to wintering grounds in late summer or early autumn.

Surveys should be conducted during times when burrowing owls may be present on prairie dog towns. Although nesting most commonly occurs March 15th through August 31st, burrowing owls may be present at burrows several months after young have fledged. Therefore, CPW recommends that targeted surveys should be conducted for any activities resulting in ground disturbing destruction or poisoning of burrows between March 15th and October 31st. Note, there is a small chance to encounter burrowing owls in Colorado during the winter. Although CPW does not necessarily recommend surveys between November 1 and March 14, if burrowing owls are known to be present in an area in the winter, CPW's recommendations apply.

Daily Timing

Burrowing owls may be active throughout the day and night; however, peaks in activity in the morning and evening make these the best times for conducting surveys (Conway and Simon 2003). Surveys should be

conducted in the early morning (1/2 hour before sunrise until 10:00 am or until the temperature reaches 80 degrees F, whichever is earlier) and early evening (2 hours before sunset until 1/2 hour after sunset).

Number and locations of survey points

Burrowing owls are most frequently located visually; thus, obtaining a clear view of the entire prairie dog town is necessary. For small prairie dog towns that can be adequately viewed in their entirety from a single location, only one survey point is necessary. The survey point should be selected to provide unobstructed views (with binoculars if necessary) of the entire prairie dog town (burrow mounds and open areas between) and all nearby structures that may provide perches (e.g., fences, utility poles, etc.). For prairie dog towns that cannot be entirely viewed from a single location because of terrain or size, enough survey points should be established to provide unobstructed views of the entire prairie dog town and nearby structures that may provide perches. Survey locations should be separated by approximately 800 meters (1/2 mile), or as necessary to provide adequate visual coverage of the entire prairie dog town.

Number of surveys to conduct

Detection of burrowing owls can be highly variable and multiple visits to each site should be conducted to maximize the likelihood of detecting owls if they are present. At least three surveys should be conducted at each survey point. Surveys should be separated by approximately one week.

Conducting the survey

- **Avoid flushing owls prior to initiating survey:** Burrowing owls are very likely to either flush or hide in a burrow if approached at distances closer than 200 m, especially if observers are on foot or ATVs (versus within a vehicle). Therefore, the first survey point should be located outside the prairie dog colony, with observers surveying ahead of their route if it is necessary to enter the colony. If observers must exit their vehicle, they should keep a low profile and recognize that flush distance may increase for observers on foot.
- **Weather Considerations:** Because poor weather conditions may impact the ability to detect burrowing owls, surveys should only be conducted on days with little or no wind (less than 12 mph) and no precipitation or fog.
- **Passive surveys:** Most burrowing owls are detected visually. At each survey location, the observer should *visually* scan the area with binoculars and then spotting scope, if possible, to detect any owls that are present. Some burrowing owls may be detected by their call, so observers should also *listen* for burrowing owls while conducting the survey.

Burrowing owls are frequently detected soon after initiating a survey (Conway and Simon 2003). However, some burrowing owls may not be detected immediately because they are inconspicuous, are inside of burrows, or are not present on the site when the survey is initiated. We recommend that surveys be conducted for at least 10 minutes at each survey location.

- **Call-broadcast surveys:** To increase the likelihood of detecting burrowing owls, if present, we recommend incorporating call-broadcast methods into burrowing owl surveys. Conway and Simon (2003) detected 22% more burrowing owls at point-count locations by broadcasting the primary male (*coo-coo*) and alarm (*quick-quick-quick*) calls during surveys. Although call-broadcast may increase the probability of detecting burrowing owls, most owls will still be detected visually.

We recommend the following 10-minute timeline for incorporating call-broadcast methods (Conway and Simon 2003, C. Conway pers. comm.). The observer should scan the area for burrowing owls during the entire survey period. If the intent is to document which burrows are used for nesting, the initial silent period may need to be lengthened so that observers have the opportunity to note as many owl spatial locations as possible before playing calls (owls may move in response to calls).

- 3 minutes of silence
- 30 seconds call-broadcast of primary call (*coo-coo*)
- 30 seconds silence
- 30 seconds call-broadcast of primary call (*coo-coo*)
- 30 seconds silence
- 30 seconds call-broadcast of alarm call (*quick-quick-quick*)
- 30 seconds silence
- 4 minutes of silence

Calls can be broadcast from cell phone or mp3 player attached to amplified speakers. Calls should be broadcast loudly, but without distortion. Recordings of this survey sequence (mp3) are available for download at: <https://cpw.state.co.us/conservation/Pages/CON-Energy-Land.aspx>

Note: The mp3 download includes a 6-minute survey sequence (3 passive (silent) minutes followed by 3 minutes of calls) and should then be followed by 4 additional minutes of passive survey.

- **Burrow Searches:** If owls are detected in the area, surveyors should search areas that the owls are using to document the nest burrows as well as other actively used burrows. Nest burrows generally have dung lining the entrance of the burrow, with prey remains and collected materials outside the entrance. Nest burrows may have whitewash and regurgitated pellets visible, or they may be visible at a more prominent perch location nearby. Also, note that if owls flush from the nest burrow, they may return to the general area, but often will not return to the specific nest burrow when an observer is present. Example photos of nest burrows are available at: <https://cpw.state.co.us/conservation/Pages/CON-Energy-Land.aspx>

Identification

Adult burrowing owls are small, approximately 9-11 inches. They are brown with white spotting and white barring on the chest. They have long legs in comparison to other owls and are frequently seen perching on prairie dog mounds or other suitable perches (e.g., fence posts, utility poles) near prairie dog towns. Juvenile burrowing owls are similar to adults but have a white/buff colored chest that lacks barring.

General information about burrowing owls is available from the Colorado Parks and Wildlife website:

<https://cpw.state.co.us/learn/Pages/SpeciesProfiles.aspx>

Additional identification tips and information are available from the Cornell Lab of Ornithology and the U.S. Geological Survey Patuxent Wildlife Research Center websites below:

https://www.allaboutbirds.org/guide/Burrowing_Owl/overview

<http://www.mbr-pwrc.usgs.gov/id/framlst/i3780id.html>

What To Do If Burrowing Owls Are Present

If burrowing owls are confirmed to be nesting in a prairie dog town (or other suitable burrow), there are two options before proceeding with planned activities:

1. Wait to initiate activities until after October 31st or until it can be confirmed that the owls have left the prairie dog town. Although burrowing owls may not be actively nesting during this entire period, they may be present at burrows several months after young have fledged.
2. If burrowing owls are nesting at the site and waiting to initiate activities is not possible, carefully monitor the activities of the owls, noting and marking which burrows they are using in order to document the nesting burrow. This is not easy to accomplish and will require considerable time, as the owls may use several burrows in a prairie dog town, and their activity footprint spreads as juvenile owls age and begin to use areas farther from the nest. When all active burrowing owl burrows have been located and marked, surface activity can proceed in areas greater than 660 feet (200 meters) from the nest burrow. Activity closer than 660 feet may endanger the owls. If possible, avoid the satellite use burrows as well. If the actual nest burrow cannot be determined, then buffer the entire group of burrows in use. **NOTE: For large industrial disturbances (e.g. drilling rigs, residential construction, etc.), CPW recommends a larger buffer of ¼ mile (1320 feet, 400 meters) from the nest burrow.** CPW recommends no surface disturbance within nesting buffers from March 15th through August 31st.
3. If the planned activity includes active poisoning or killing of prairie dogs (or ground squirrels) or ground-disturbing destruction of burrows, CPW recommends delaying activities until after it can be confirmed that the owls have left the prairie dog colony. CPW recommends surveys of prairie dog towns March 15th through October 31st to confirm absence of burrowing owls.

Reference

Conway, C. J. and J. C. Simon. 2003. Comparison of detection probability associated with Burrowing Owl survey methods. *Journal of Wildlife Management* 67:501-511.

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