Eastern Screech-Owl
Survey Protocol

Photo by Bill Schmoker

Bird Conservancy of the Rockies
Citizen Science

Contact info:
Rob Sparks: rob.sparks@birdconservancy.org
# Table of Contents

Introduction ........................................................................................................................................... 3
   Eastern Screech-Owl Background & Objectives ................................................................................. 3

General Protocol .................................................................................................................................... 3

Survey Areas and Survey Points ........................................................................................................... 3

Conducting Surveys ............................................................................................................................... 4

Data Collection ...................................................................................................................................... 4
   CODES ................................................................................................................................................. 5

BIBLIOGRAPHY .................................................................................................................................... 7

APPENDIX I. Field Equipment and Mapping Materials ................................................................. 8

APPENDIX II. Site Location Form. ...................................................................................................... 9

APPENDIX III. Data sheet for Eastern Screech-Owl surveys............................................................. 10
Introduction

Eastern Screech-Owl Background & Objectives
The Eastern Screech-Owl, *Megascops asio* is considered one of the most common owls in North America. All owls are protected under state and federal regulations. Eastern Screech-Owls are small, nocturnal, sedentary permanent residents. Population trends reported by the Breeding Bird Survey (BBS) are not available for eastern screech-owls in Colorado due to inadequate sample sizes (Sauer et al. 2011). Eastern Screech-Owls start breeding in early March to mid-May but may vary depending on location.

Our objectives are to:

- Estimate occupancy and occupancy dynamics along the Fort Collins Poudre River urban corridor
- Estimate number of breeding pairs along the Fort Collins Poudre River urban corridor
- Understand mechanisms governing occupancy/occupancy dynamics to inform management

General Protocol

The probability of detecting an Eastern Screech-Owl varies considerably depending on the nesting phase and other factors i.e., weather: detection probability estimates in New York from April to September ranged from 40% to 60% (Barnes and Belthoff 2008). In Colorado clutch initiation probably occurs between mid-April and mid-May (Kingery 1998). In addition, fledging dates in Colorado range between 15 May and 22 July (Jones 1998). Total home range size in Idaho was estimated as being roughly a 1260 x 480 meter rectangle along a riparian corridor (Hayward and Garton 1988).

Both our understanding of how owl detectability decreases during the brooding stage and our concern of detecting owls during their breeding season factor into our recommendations for when to initiate and conclude surveys for Eastern Screech-Owl.

- March 1st – June 1st

  - Repeat each survey four times according to protocol.
  - Begin no earlier than 30 minutes after sunset.
  - Use broadcast equipment and 10 minute survey periods.

Survey Areas and Survey Points

Develop a tentative schedule such that surveys are spread out geographically and no areas are surveyed for the first time too late in the season (when detection rates diminish).

Each survey area should have a site number and name. Write these on all survey forms, maps, the Site Location Form (Appendix II) and datasheet (Appendix III). For each survey area, you will need to review maps (and potentially get advice) on the best approach. Plan ahead and explore how to access the survey area.
Conducting Surveys

Start and Finish: Broadcasting for Eastern Screech-owl can begin no earlier than 30 min after sunset. Thus, counts begin just after dark.

Calling at Stations: For the broadcast equipment, we will use a pre-recorded, standardized call and a Foxpro or similar caller. See more information about callers in Appendix I.

You will spend a total of 10 minutes listening and calling for owls at each survey point. The 10-minute protocol will be split into five 2-minute intervals: two minutes of silent listening, and for each of the remaining 2-minute intervals, you will spend the first 30 seconds broadcasting, followed by 90 seconds listening. For the 30 seconds of broadcasting, play approximately 7.5 seconds with the caller pointed in each of 4 cardinal directions. Hold the broadcast caller approximately at shoulder height or above your head. Continue with the broadcast protocol, even if owls are heard in the first 2 minutes (to identify other Eastern Screech-Owls in the vicinity and to keep the protocol consistent). One row in the data form is used for each individual bird detected. Although we are not targeting other species with the playback, you will also record all detections of other owl species.

Safety: Your personal safety comes first. Be aware of your surroundings and bring a good headlamp/flashlight, a backup light, and extra batteries; bring proper clothing and other equipment (see Appendix I).

Unacceptable field conditions: Do not conduct surveys when the weather is inclement enough to modify owl behavior or influence your ability to hear singing owls – that includes continuous rain (anything more than a light drizzle) and wind that is constant and of enough strength to cause constant motion to leaves and small twigs (4 or 5 on the Beaufort scale).

The weather can be so variable that we recommend you travel to the site start area before assessing weather conditions. Often times, winds will let up in the early evening just as night settles in. Under all circumstances safety comes first. If weather (e.g., lightening, cold, rain, snow) or road conditions are placing you at risk, please find safety.

If conditions are questionable, go ahead and survey but make a note detailing the weather conditions. If you have flexibility with time, try to schedule the survey with the best possible conditions.

Data Collection

Details for how and what data to collect are explained here. Recommended site location forms and survey datasheet are also included (Appendix II and III).

Top section: The top section of the data form is where technicians will record transect, date, number of snags (# Snags), # of Cavities and observer information.

For the # Snags field please count the number of snags within a 50 meter radius of your survey station. This should be done when scouting out the survey location during day light hours. We define a snag as any dead trees standing or trees with a dead branch greater than 12 inches. For the # of Cavities field please count the number of cavities seen within the 50 meter radius greater than 6 inches.
**Survey Information:** In the second section of the data form, you will record the point information. For each point number, you will record UTM’s, visit #, weather info, noise levels (stream, wind, or other noise), moon visibility (Y or N), and survey times. Always fill in every field on the datasheet. **Blanks are interpreted as missing data, NOT as zeros.** Likewise, a zero **is NOT to be used to represent missing data.** When no owls are detected please write in NOBI or No Owls detected. Datasheets with missing information compromise the reliability of your data. To avoid mistakes, it is absolutely essential to double-check your entries on data forms and maps on the same day that each site is visited.

If you fail to finish a point (some form of disturbance or weather forces you to quit), make it clear that the count was not completed, and draw a line through the line on the data sheet. Whenever a point does not receive a complete survey, record the reason using the codes at the bottom of the form.

If you cannot obtain GPS locations, i.e. insufficient satellites or dead batteries (you should always carry plenty of extras), please try to describe the point locations (using obvious point markers: bridge, road or trail intersection, some distinct geographic feature) and place them on the field map provided. This will aid in relocating points in future visits and years if necessary.

**CODES**

**WIND CODES** (Beaufort Wind Scale):
- 0 -- < 1 mph; smoke rises vertically
- 1 -- 1-3 mph; wind direction shown by smoke drift
- 2 -- 4-7 mph; wind felt on face; leaves rustle at times
- 3 -- 8-12 mph; leaves and small twigs in constant motion; light flag extended
- 4 -- 13-17 mph; raises dust and loose paper; small branches in motion
- 5 -- 18-24 mph; small trees sway; crested wavelets on inland waters

**SKY CODES** (Sky Condition): you shouldn’t be surveying with a 5 or 6!
- 0 – clear or a few clouds (<30% cloud cover)
- 1 – partly cloudy (30-70% cloud cover)
- 2 – cloudy (>70% cloud cover)
- 3 – fog or smoke (visibility impaired beyond 30 m.)
- 4 – light drizzle
- 5 – constant snow (DON’T SURVEY)
- 6 – constant rain (DON’T SURVEY)

**NOISE CODES** (for constant noise, not intermittent; can include stream, wind or other noise):
- 0 – no noise
- 1 – some noise, but can hear very well
- 2 – moderate noise; can still hear within 200 meters, but distant birds are tough to hear
- 3 – loud noise; noise affecting ability to detect most birds
- 4 – very loud stream or other noise; difficult to hear anything at all (DON’T SURVEY)

**Detection information:** Each line will represent a single bird you have detected at a specific survey station. If more than one individual is detected from a survey station, record each individual on a separate line.

For each bird, record the point, species, sex if known, method of detection (see codes on datasheet), detection time (military time), number of minutes from start of survey that you first detected the owl, and the time period in which the owl was detected (1-5). See Appendix III to view the data sheet and a complete list of codes.
**VOCALIZATIONS:** The owl species that sounds and is very similar in plumage if not identical to the gray morph Eastern Screech-Owl is the Western Screech-Owl. Where their ranges overlap it is best to identify them by sound. Listen to the difference in their calls by browsing xeno canto; Eastern Screech-Owl [http://www.xeno-canto.org/species/Megascops-asio](http://www.xeno-canto.org/species/Megascops-asio); Western Screech-Owl [http://www.xeno-canto.org/species/Megascops-kennicottii](http://www.xeno-canto.org/species/Megascops-kennicottii). Their habitats have potential to overlap in Colorado, Kansas and Texas.

**DATA ENTRY:** Ideally data would be transposed from field forms to the computer soon after the survey and by the person who collected the data. However, depending on computer access, this may not be done until the end of the season. Thus, it is essential that data forms are complete and legible. Ideally, an online data entry system will be in place before technicians begin their surveys. Contact the coordinator for specific information on how to enter your data.
BIBLIOGRAPHY


APPENDIX I. Field Equipment and Mapping Materials

FIELD EQUIPMENT:

Headlamp
GPS unit and extra batteries
Digital watch with timer
Broadcast calling unit with extra batteries
Binoculars
Methods protocol
Data forms
Clipboard and plastic page cover
Pencils with erasers or pens
Daypack or cruiser vest
Raingear, extra layers

MATERIALS FOR MAPPING POINT AND SITE LOCATIONS:

Field map
GPS location
USGS 7.5-minute topographic quads (optional)
Site Location Forms (see Appendix III)
Pencil, carry a backup pencil

BROADCAST CALLERS:

A Foxpro (http://www.gofoxpro.com/) or similar caller should be used to broadcast standardized vocalizations. These devices are very reliable, lightweight in the field, and the volume can be carefully adjusted (ideally the call can be heard by us for ~200m under calm conditions). If you’d like to use a FoxPro we recommend the NX3 ($199.95), but be aware that model numbers change frequently. In some instances you can use your ipod with a good quality speaker.
APPENDIX II. Site Location Form.

EASTERN SCREECH-OWL - SITE LOCATION FORM

General Area: ____________________________________________

SITE NUMBER: _____________ SITE NAME: ________________

GPS info for access point: Point: ______________________________
(Please collect point location data in NAD83 Zone 13)
Lat/Longs or UTM: ______________________________
DATUM: _____________________________________________

DIRECTIONS TO START POINT (from nearest main road) and ACCESS INFORMATION:

ACCESS CONSIDERATIONS (circle those that apply):

BIKE TO START
HIKE TO START
ON TRAIL
OPEN ROAD
OFF TRAIL
CLOSED ROAD (key needed)
APPENDIX III. Data sheet for Eastern Screech-Owl surveys.

EASTERN SCREECH-OWL BROADCAST SURVEY FORM
Bird Conservancy Citizen Science Program

Transect: ______________ Date: ___________ # Snags: __________ # Cavities: __________ Page __ of __

Observer 1: _______________ Observer 2: _______________ Visit Number: __________

Survey Information:

<table>
<thead>
<tr>
<th>Wind (Beaufort)</th>
<th>Sky (see codes)</th>
<th>Noise (see codes)</th>
<th>Moon Visible?</th>
<th>Start Time</th>
<th>End Time</th>
<th>Survey Minuted</th>
<th>Why Not Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Describe if Moved Pt. ____________ Call point location: ____________ UTME: ____________ UTMN: ____________

Detection Information:

<table>
<thead>
<tr>
<th>Point</th>
<th>Species</th>
<th>Sex</th>
<th>Detected</th>
<th>Time Detected (1-5)</th>
<th>Field Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Why point not surveyed: P-Private property, denied access; U-Unsafe terrain; W-Weather (precip. or wind); O-Other (explain on back of form)

Beaufort: km/h  mph | Sky codes | Noise Codes
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>u</td>
<td>u</td>
</tr>
<tr>
<td>2</td>
<td>1-6</td>
<td>1-3</td>
</tr>
<tr>
<td>3</td>
<td>7-11</td>
<td>4-7</td>
</tr>
<tr>
<td>4</td>
<td>12-19</td>
<td>8-12</td>
</tr>
<tr>
<td>5*</td>
<td>20-29</td>
<td>13-18</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>19-24</td>
</tr>
</tbody>
</table>

* (DON'T SURVEY) 6 - constant rain (DON'T SURVEY)

How detected: HO = heard only; HS = heard, then seen; SO = seen, then heard

Owl Codes: Eastern Screech Owl=EASO; Great Horned Owl=GHOW; Northern Saw-whet Owl=NSWO; Barn Owl=BNOW; Long-eared Owl=LEOW

Comments on Back of Form? Y / N