Updated
2017

Species Survey Protocol

1. Rare Plants – Suggested Guidelines for Conducting Surveys for Environmental Review
2. American Burying Beetle – Conservation Measures, Nebraska Trapping Protocol
3. Bald Eagle – Survey Protocol
4. Golden Eagle – Survey Protocol
5. Interior Least Tern and Piping Plover – Fact Sheet, Survey Protocol
6. Massasauga – Impact Avoidance Protocol
7. Mountain Plover – Survey Protocol
8. Northern Long-Eared Bat – Survey Protocol
9. River Otter – Survey Protocol
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11. Swift Fox – Information and Recommended Survey Protocol
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NDOR Survey Methodology for Small White Lady's Slipper

5-1-2013

Preparation

1. Identify known locations of populations (Nebraska Natural Heritage Database records), and become familiar with as much information about those sites as possible (soil type, hydrology, etc.)

2. Have ledger-size (11 X 17 inch) aerial photos made for the project. Plans should show new alignments, where applicable.

3. Obtain a current location map for the project.

4. Identify on the aerials: portions of the project that look like SWLS habitats, marking them for the site visit.

5. Discern from project description and the project's designer: types of construction work proposed.

6. Determine the bloom period for the species, and plan to be on-site during that time.

7. Obtain a hand-held GPS unit and digital camera (each complete with charged batteries).

Execution

1. Write the ***date of the survey,*** the participants, and the species being surveyed on the first page of the aerials . . . and on any data sheets you use.

2. Drive the length of the project, noting areas of potential habitat (first one side of the highway, then the other). Refer to the location map and/or aerials to guarantee that you've covered the ENTIRE length of the project. You don't want to make a return trip because you missed a spot.

    a. Photograph actual conditions of areas marked on the plans during "Preparation" because they looked like potential habitat (if it looked like a possibility to you ...). Mark the photo location and direction on the aerials and/or GPS unit.

    b. Photograph actual conditions of areas noted during the "Execution" drive-through because they looked like potential habitat. Mark the photo location and direction on the aerials or GPS unit.

3. Walk through all potential habitat areas, searching for blooming and vegetative SWLS plants.

4. **If SWLS plants are found,**
    - Note the location with the GPS unit, and mark the location on the plans, too.
    - Photograph individual plants (close-up), groupings of plants, and the larger setting in relation to the highway, Reference Post, or other landmarks.
    - Count the number of blooming and vegetative plants separately – if population is too large to count, use a 1' x 1' PVC square to estimate stems per square foot.
    - Take GPS points at the limits of the population's expanse (walk a boundary line, if possible).
    - Make note of other plant species growing in association with the SWLS.

NDOR Survey Methodology for Small White Lady's Slipper

5-1-2013

Reporting

1. Prepare the photographs for inclusion in a report (mount onto Excel or Word templates, using descriptive captions and references to location indicators on a map).

2. Prepare a survey report form, describing when, who, how (including preparations made for the actual survey).

3. Put these features on the computer files of the aerial photos: photo number, location, and direction, any GPS points taken during the survey (if reporting a population or individual plants, include the number of plants found). Include enough detail so that the right photo can be referenced to its location on the aerial photo page.

4. See Melissa Marinovich or Zach Cunningham for the current format and composition of plant survey reports.

Small White Lady's Slipper – Pierce County

NDOR Survey Methodology for Small White Lady's Slipper

5-1-2013

Small White Lady's Slipper – Pierce County

Above: Approximately 7 plants (both vegetative and flowering)

Below: Growing with Canada anemone and bluegrass. Commonly occurs with big bluestem, sedges, *Galium*, *Juncus*, and *Spartina*.

SURVEY DATA SHEET FOR SMALL WHITE LADY'S SLIPPER

Observer(s): _____ Date: _____

Surveyor Affiliation: _____

Survey Start Time: _____

Site Identification Number: _____ (the first three letters of the county name, and a three-digit number, assigned consecutively, to indicate the survey area; for instance, the third site in Blue Earth County would be BLU003).

Project Name:

County/State:

Number of Small White Lady's Slipper Flowers Counted (Denote Blooming vs. Veg):

Estimated Population Size (Stems per Square Foot):

Identified Associated Species:

Habitat Type/Description:

Description of Adjacent Land use (Note any land alteration or disturbance):

Additional Notes:

Photo Numbers & Orientation (Ex: P1 - North):

NDOR Survey Methodology for Western Prairie Fringed Orchid

7-1-2013

Preparation

1. Identify known locations of populations (Nebraska Natural Heritage Database records), and become familiar with as much information about those sites as possible (soil type, hydrology, etc.)

2. Have ledger-size (11 X 17 inch) aerial photos made for the project. Plans should show new alignments, where applicable.

3. Obtain a current location map for the project.

4. Identify on the aerials: portions of the project that look like WPFO habitats, marking them for the site visit.

5. Discern from project description and the project's designer: types of construction work proposed.

6. Determine the bloom period for the species, and plan to be on-site during that time.

7. Obtain a hand-held GPS unit and digital camera (each complete with charged batteries).

Execution

1. Write the ***date of the survey,*** the participants, and the species being surveyed on the first page of the aerials . . . and on any data sheets you use.

2. Drive the length of the project, noting areas of potential habitat (first one side of the highway, then the other). Refer to the location map and/or aerials to guarantee that you've covered the ENTIRE length of the project. *You don't want to make a return trip because you missed a spot.*

    a. Photograph actual conditions of areas marked on the plans during "Preparation" because they looked like potential habitat (if it looked like a possibility to you ...). Mark the photo location and direction on the aerials and/or GPS unit.

    b. Photograph actual conditions of areas noted during the "Execution" drive-through because they looked like potential habitat. Mark the photo location and direction on the aerials or GPS unit.

3. Walk through all potential habitat areas, searching for blooming and vegetative WPFO plants (*HINT – they sometimes grow under Willow shrubs!*).

4. **If Western Prairie Fringed Orchid plants are found,**
    - Note the location with the GPS unit, and mark the location on the plans, too.
    - Photograph individual plants (close-up), groupings of plants, and the larger setting in relation to the highway, Reference Post, or other landmarks.
    - Count the number of blooming and vegetative plants separately – if population is too large to count, use a 1' x 1' PVC square to estimate stems per square foot.
    - Take GPS points at the limits of the population's expanse (walk a boundary line, if possible).
    - Make note of other plant species growing in association with the WPFO.

Reporting

1. Prepare the photographs for inclusion in a report (mount onto Excel or Word templates, using descriptive captions and references to location indicators on a map).

2. Prepare a survey report form, describing when, who, how (including preparations made for the actual survey).

3. Put these features on the computer files of the aerial photos: photo number, location, and direction, any GPS points taken during the survey (if reporting a population or individual plants, include the number of plants found). Include enough detail so that the right photo can be referenced to its location on the aerial photo page.

4. See Melissa Marinovich or Zach Cunningham for the current format and composition of plant survey reports.

Western Prairie Fringed Orchid – Cherry County

NDOR Survey Methodology for Western Prairie Fringed Orchid

7-1-2013

Western Prairie Fringed Orchid – Cherry County

Above: Approximately 3 plants (flowering)

Below: Three stems - Growing with *Carex* spp., *Eleocharis* spp, and goldenrod. Commonly occurs with Big Bluestem, Sedges, *Eleocharis*, *Juncus*, and *Spartina*. Seen here under willow shrubs.

NDOR Survey Methodology for Western Prairie Fringed Orchid

7-1-2013

Western Prairie Fringed Orchid – Cherry County

Above: Vegetative – Valentine Wildlife Refuge

Below: Near the end of blooming - Growing with *Juncus balticus*, big bluestem, sedges, and *Spartina*

SURVEY DATA SHEET FOR WESTERN PRAIRIE FRINGED ORCHID (WPFO)

Observer: _____ Date: _____

Surveyor Affiliation: _____ Survey Start Time: _____

Site Identification Number: _____ (the first three letters of the county name, and a three-digit number, assigned consecutively, to indicate the survey area; for instance, the third site in Blue County would be BLU003).

Project Name:

County/State:

Number of Western Prairie Fringed Orchid Flowers Counted (Denote Blooming vs. Veg):

Estimated Population Size (Stems per Square Foot):

Identified Associated Species:

Habitat Type/Description:

Description of Adjacent Land use (Note any land alteration or disturbance):

Additional Notes:

Photo Numbers & Orientation (Ex: P1 - North):

Conservation Measures for the American Burying Beetle (ABB)
Provided by the U.S. Fish and Wildlife Service, Nebraska Ecological Services Field Office
Nebraska Game and Parks Commission

Background

The federally and state endangered American burying beetle (ABB) is the largest member of the carrion beetle family and has a lifespan of about one year. It ranges from 1 to 1.5 inches in length, has four red-orange spots on its wing covers, and is distinguished by its larger size and its orange-red pronotum. The ABB was common over the eastern half of North America as recently as the 1920's, but has disappeared over 90 percent of their historic range (Sikes and Raithel 2002). The ABB's current range now includes Rhode Island, Oklahoma, Arkansas, and Nebraska. Reasons for the decline are not well understood but human activity, light pollution, pesticides, and habitat loss are all considered contributing factors (Sikes and Raithel 2002). In Nebraska, historical records of ABB have been observed in Antelope, Custer, and Lancaster counties. Other counties that have suitable habitat include: Antelope, Blaine, Boone, Boyd, Brown, Cherry, Custer, Dawson, Frontier, Garfield, Gosper, Grant, Holt, Hooker, Keya Paha, Lincoln, Logan, Loup, Rock, Thomas, and Wheeler. See enclosed map for current distribution and potential habitat areas.

The ABB has been captured in a variety of habitats including grasslands, grazed pasture, bottomland forest, riparian zones, and oak-hickory forests (Creighton et al. 1993; Lomolino and Creighton 1996; NatureServe Explorer 2007; and U.S. Fish and Wildlife Service 1991) and have been labeled a vegetation generalist (Lomolino et al. 1995). In Nebraska, ABB have been found in mesic areas such as wet meadows, and wetlands in association with relatively undisturbed semi-arid, sandhill and loam grasslands. Such areas have been observed to have a thick stand of grassland vegetation with some woody vegetation. ABB are also found in the Loess Canyons, primarily located in Lincoln County. These steep loess hills and canyons support mixedgrass prairie, but much of the area is heavily invaded by eastern red cedars (Schneider et al. 2005).

It is suspected that carrion availability in a given area is more indicative of ABB presence than vegetation structure since carrion is the sole food source for ABB and is an essential component in a complex reproductive cycle for the species (U.S. Fish and Wildlife Service 1991). The ABB is able to efficiently locate carrion (Bedick et al. 1999) and have been moving over two miles to a carrion source (Creighton and Schnell 1998). Because of their habit of feeding on carrion, their sole food source, the species may be found in marginal habitat like roadsides where they likely forage on roadkill.

For the ABB to use the carrion for reproductive purposes, the carrion must also be the approximate size of a squirrel and also be located in an area where soil conditions are conducive to excavation by ABBs (Anderson 1982, Lomolino and Creighton 1996). When the ABB locates a suitable carcass, a mated pair will bury the carcass for egg deposition and brood rearing. The larvae feed on the carcass and remain underground through the pupal stage and the parents care for the developing young underground. The development process from egg to adult takes approximately 48 – 65 days (Ratcliffe and Spomer 2002). Adults and newly hatched adults (teneral) will emerge from the ground to feed in preparation for winter hibernation. Current

research suggests that the adults return to the ground to overwinter. In Nebraska, ABB have been found in association with soils composed of some clay with a prominent duff (litter) layer have also been observed.

Adult ABB are fully nocturnal and are typically active when night time temperatures reach 60° F. Thus, the ABB active period in Nebraska can be as long as April 1 to October 29, with peak periods of activity in June and August. The first peak active period in early summer (approximately June 7th to July 1st) is after beetles have emerged from hibernation and prior to beetles going underground during the larvae rearing cycle. The second peak active period is in late summer (approximately August 7th to September 1st), after the larval cycle when both senescent and teneral beetles are present. ABB enter an inactive period spent underground throughout the winter when the nighttime low temperatures are consistently 60° F or below. In Nebraska, this typically occurs from October 29 to April 1.

Purpose

American burying beetle surveys are designed to ensure awareness and resolution to any potential conflicts between ABB and potentially disruptive human activities. To prevent conflict, two types of actions are recommended depending on location: **Presence/Absence Surveys and Capture/Relocation Conservation Measures**. In addition, **Maintaining Clear Activities** may be necessary depending on the situation. One factor when deciding which actions are necessary is the is the American Burying Beetle Distribution Map (Attached). In areas of counties with ABB, first a Presence/Absence Survey should be conducted to determine if relocation is necessary. ABB Habitat should assume presence and implement Capture and Relocation conservation measures, followed by Maintaining Clear Activities.

These measures/surveys and activities are to occur in areas of suitable habitat in construction areas. Construction areas include areas that will be impacted by construction, where heavy equipment and materials will be staged and/or stored, all areas within the Limits of Construction, potential haul or temporary roads and borrow site areas. Areas of basic unsuitable habitat are defined below. Since this species is found in a variety of habitats, the Commission and Service encourage the project proponent to discuss additional unsuitable habitat or potential habitat if the project proponent desires further guidance in determining where conservation activities are necessary.

If the project proponent chooses to conduct a survey, the Nebraska ABB Survey Protocol is recommended (See Attached). A valid section 10 permit from the U.S. Fish and Wildlife Service (Service) and Scientific and Education Permit from the NGPC is required for anyone conducting such surveys. All survey results, positive or negative, must be submitted in writing to these Agency offices for review prior to initiating any ground disturbing activities.

Presence Absence Survey (PA)

An initial screening of the project may reduce the area where the PA survey is necessary. Urban areas dominated by pavement, areas dominated by row crop agriculture and areas consistently inundated with water need not be surveyed for presence or absence. Wet meadows, often

associated with wetlands and riparian areas are ideal habitat and cannot be eliminated. Open grassland areas surrounded by trees also represent potential habitat. If the project proponent chooses to reduce the PA survey area based on these habitat criteria, a revised area where the PA survey will be conducted should be submitted to the US Fish and Wildlife Service (Service) and the NE Game and Parks Commission (Commission) to ensure areas of potential habitat are not inadvertently omitted.

The PA Survey needs to be conducted when the ABB is active. Research suggests that when the average temperature at midnight is 60 degrees Fahrenheit or greater, detection results are the most consistent. PA Survey of ABB may be conducted during this period when the average temperature at midnight is 55 degrees Fahrenheit or greater, however, false negative presence data may be obtained under these conditions. Each situation is unique and the project proponent will need to determine, based on local conditions if surveys are valid or if a repeat is necessary. The Commission would welcome questions as they arise during a survey. A photograph should be taken of each trap site and sent to the Commission.

The Presence Absence Survey needs to be conducted for a minimum of 5 consecutive trap nights[*]. If no beetles are captured during those 5 nights, the ABB is considered to be absent and the area is considered "clear." This information needs to be sent to the Service and the Commission. If the project has concurrence from these agencies, then n*o further conservation measures are necessary and construction may begin.* If a beetle is caught anytime during those 5 days, this is considered a positive survey and the P/A may cease. Depending on the project, if capture and relocation measures are recommended they may begin immediately if conditions are adequate. If capture and relocation measures will not follow the P/A survey, any ABB captured during the PA Survey should be released on site. Notify the Service and Commission of any change of trapping type. Survey results must be submitted to both the Commission and the Service. A photo should be taken of the first ABB captured to serve as a voucher specimen.

Capture and Relocation (CR) Conservation Measure

An initial screening of the project may reduce the area where the CR Conservation measure is necessary. Urban areas dominated by pavement, areas dominated by row crop agriculture and areas consistently inundated with water need not have an attempt to remove ABB. Wet meadows, often associated with wetlands and riparian areas are ideal habitat and cannot be eliminated. Open grassland areas surrounded by trees also represent potential habitat. If the project proponent decides to reduce the CR area based on these habitat criteria, a revised area where the CR Conservation measures will be conducted should be submitted to the Service and the Commission to ensure areas of potential habitat is not inadvertently omitted.

The CR Conservation Measures need to be conducted when the ABB is active. Research suggests that when the average temperature at midnight is 60 degrees Fahrenheit or greater, detection and capture results are the most consistent. CR Conservation Measures of ABB may be conducted during this period when the average temperature at midnight is 55 degrees

[*] When trapping for ABB, if weather conditions are unsuitable for trapping during the 5 consecutive days, it is not necessary begin the session again, but rather add one night to the end of the session. For each unsuitable trap night Unsuitable weather conditions include nights when the temperature drops below 55°F or it is raining.

Fahrenheit or greater, however, false negative presence data may be obtained under these conditions. Each situation is unique and the project proponent will need to determine, based on local conditions if surveys are valid or if a repeat is necessary. The Commission would welcome questions as they arise during a survey or trapping series. A photograph should be taken of each trap site and sent to the Commission.

Trapping for relocation must be conducted for a minimum of 5 consecutive nights[†]. For an area to be "cleared" the last three consecutive nights must have no ABB. Any captured ABB must be moved to suitable habitat areas located at least 2 miles from the area of construction. Photo documentation of the release sites should be taken and submitted to the Service and Commission. Upon completion of the capture and relocation measures, if the project is within the known ABB distribution, *Maintaining Clear Activities must be implemented within 3 days of establishing "clear," regardless of the presence or absence of ABB.* If the project is not in the current distribution area of the map and no ABB were detected, no further conservation actions are necessary for that calendar year. Results of the survey must be submitted to both the Commission and the Service. A photo should be taken of the first ABB captured to serve as a voucher specimen.

If a site cannot be cleared by the capture and relocation procedure after 10 days of trapping, contact the Service and the Commission for additional guidance. This situation is considered unlikely, and will need to be dealt with on a case by case basis. Additionally, no more than 50 ABB should be moved to each re-location site.

If the project will impact suitable ABB habitat or impact areas of known ABB occurrences for multiple years, a new survey, the capture relocation procedure and the standard conservation measures may be necessary for each year of construction. Surveys results are typically only valid for one season. The sequence of construction will determine what measures are necessary. In this situation, it is recommended that the details and necessary measures be determined through the information consultation process between the Commission and Service.

Maintaining Clear Activities

The purpose of Maintaining Clear (MC) Activities are to ensure that once an area is "cleared" that ABB are not attracted to the site during construction. MC Activities are necessary when the ABB is active, so depending on the disturbance timeframe, the maximum time they maybe necessary is from April 1 through September 15. Upon completion of Capture and Relocation Conservation Measures, Maintaining Clear Activities must be implemented within 3 days. However, these activities may be implemented prior to survey or capture/relocation completion. These activities are designed to deter ABB from utilizing the site, so it may be in the project proponent's best interest to begin these activities as early as April 1. If only these activities are being implemented (if the clearing activities occurred the previous fall), then these activities

[†] When trapping for ABB, if weather conditions are unsuitable for trapping during the 5 consecutive days, it is not necessary begin the session again, but rather add one night to the end of the session. For each unsuitable trap night Unsuitable weather conditions include nights when the temperature drops below 55°F or it is raining.

should begin by April 15th if the construction will occur after that time. If construction will occur on or before April 15th, then these MC Activities should begin 2 weeks prior to April 15th.

The project proponent will prepare the area by removing any and all carcasses prior to construction. Carcasses as small as songbirds are ideal food for the ABB, so this removal activity must be thorough. Carcass removal must continue until September 15 or until construction is completed, whichever is earlier. Carcass removal can be done at any time throughout the day, but the preferred timing is late afternoon. This will ensure that the nocturnal ABB is not drawn to the area by road kill caused by daytime traffic. Disposal of carcasses should be at least 0.5 miles from the project site.

In addition, the area of construction should be mowed such that the vegetation is as low as possible without causing erosion. This short vegetation height shall be maintained by the project proponent for the duration of the project. Along with mowing, the residual vegetation from mowing needs to be removed from the area. Possible methods are raking, windrowing or bailing. Alternatively, mowing can be done approximately every 2 weeks and the vegetation kept less than 8 inches tall. No vegetation removal is necessary if this height is maintained. All construction, work vehicles and personal vehicles should be staged in mowed areas.

Photo documentation of these MC activities is in the best interest of the project proponent. The Service and Commission request that photographs of mowing and carrion that is removed be included in weekly reports to the Environmental Analyst (Commission) and Wildlife Biologist (Service).

Unusual Circumstances

This protocol was developed as a standard for most projects that may disturb ABB habitat, but unique situations may require an individualized approach. If the project proponent has an alternative to the suggested conservation actions described in this protocol, the Service and Commission will discuss potential alternative methods for avoiding take of American burying beetle.

Night Work and Light Pollution Concerns

In areas of known ABB populations or where ABB have been positively identified night work may need to be restricted during the ABB active seasons due to potential impacts to the species. The appropriate action would need to be determined on a case by case situation. However, artificial light sources have been implicated in causing insect population losses (Pyle *et al* 1981). The ABB's attraction to artificial lighting could cause it to fly from suitable habitat resulting in excessive energy expenditure and reduced reproductive success as well as make it vulnerable to nocturnal predators such as other insects and bats. The Service and Commission are aware that the ABB is attracted to ultraviolet light since several individuals have been trapped on other project areas using black light traps. In addition, forms of insect control used at residential areas, which involve the use of black lights as an attractant and a lethal electric grid have been known to kill ABBs.

To avoid attracting the ABB from nearby habitats to the proposed project site, it is recommended that the following conservation measures be implemented for permanent structures:

a. All exterior lighting sources should be low pressure sodium vapor lights;

b. All exterior lighting should have downward shields installed to direct light to the ground and not illuminate the project area;

c. All exterior lighting should be low mast to minimize light dispersion thereby reducing the attraction to the ABB;

d. Where possible, a vegetative screen consisting of native trees and shrubs should be established between the proposed permanent facilities and nearby habitats that may harbor the ABB; and

e. No light traps should be used as a means of insect control.

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Updated 12/9/2014

Bald Eagle Fact Sheet

Bald Eagles (*Haliaeetus leucocephalus*) are very large, brown raptors that utilize the mature, forested areas along the major river systems in Nebraska. Nets are typically built near rivers, lakes and reservoirs and are most often in large cottonwood trees. Nests are constructed with large sticks and can become 8 feet across and 12 feet deep. A breeding pair will often return to the same nest and add new material each year.

Adult Bald Eagle

Bald Eagle in Flight

Bald Eagle Nest

The bald eagle gained protection under the Bald and Golden Eagle Protection Act in the Federal Register on June 8, 1940. This Act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

Golden Eagle (*Haliaeetus leucocephalus*)
Order: *Accipitriformes*
Family: *Accipitridae*
Status: Protected by the Bald and Golden Eagle Protection Act

Description: L 35" W 80”. Sexes similar, but females are about 25% larger than males. Adults readily identified by white head and tail, large yellow bill. Feet are also yellow. Juveniles are mostly dark, with blotchy white patches. Require four or five years to reach full adult plumage.

Habitat: Wooded river corridors and larger lakes/sandpits with the presence of large cottonwoods for nesting/roosting. Solitary trees have been used for nesting, but are associated with prime fishing locations. Eagles may establish winter roosts miles from foraging areas. In Nebraska, some communal roost sites can have as many as 100 eagles.

Status/Range: Bald eagles can be found statewide in Nebraska, and are present throughout the year as they both breed and winter here. Wintering eagle numbers fluctuate, as there are often few locations that provide adequate resources for eagles during winter.

Call: Weak staccato of chirping whistles, “*kleek kik ik ik ik*”.

Similar Species: Immature bald eagles can be mistaken for golden eagles or turkey vultures.

Bald Eagle Survey Protocol
Nebraska Game and Parks Commission

Background

Bald eagles **(***Haliaeetus leucocephalus*) utilize the mature, forested areas along the major river systems in Nebraska. Eagles are present throughout the year in Nebraska as they both breed and winter in Nebraska. Nest building activity may begin as early as December. Nests are typically built near rivers, lakes and reservoirs and in Nebraska are most often in large cottonwood trees, although bald eagles use other types of trees nationwide. The nests are constructed with large sticks and lined with leaves and grasses. A breeding pair will often return to the same nest and add new material each year. Nests can become 8 feet across and 12 feet deep. Nesting activities begin with egg laying which occurs as early as February. Fledging takes place when the young are approximately 10 – 11 weeks old, however the young remain near the nest and are dependent on the adults for food for at least another 6 weeks. In Nebraska, the nesting season continues through August.

The bald eagle southward migration begins as early as October and the wintering period extends from December through March. Breeding pairs may stay at their nest site year round if food is available. Eagles are often most numerous from late February through early March, when wintering numbers are supplemented by migrants that wintered further south. All migrants that breed elsewhere typically leave by late March. Wintering eagle numbers fluctuate from year to year, but birds typically concentrate in areas with large open water where food is available and form winter roosts. In Nebraska, there are often few locations that provide adequate resources for eagles during the winter. Protection of these areas is important, as relocation during the winter may impact survival. Roosts may be in deciduous or coniferous trees, but in Nebraska, most are in cottonwood trees. Eagles may establish winter roosts miles from the foraging areas (Keister et al. 1985). Winter roosting may assist with finding resources (Knight and Knight 1983) and pair bond formation. In Nebraska, some communal roost sites can have as many as 100 eagles (Nebraska Game and Parks Commission 1993).

Purpose

Eagle surveys are designed to ensure awareness and resolution to any potential conflicts between bald eagle and potentially disruptive human activities. To document the presence or absence of bald eagles and their activities, two types of surveys are recommended: nest surveys and winter roost surveys. These should be considered when a disturbance will occur within 0.5 miles of areas of suitable habitat for bald eagles.

Nest Surveys

Bald eagle nests are usually conspicuous and distinctive, but it must be stressed that nests can be well concealed and very difficult to see, particularly when trees have foliage. Nest surveys should complete a full inspection of potential trees for bald eagle nests within 0.5 miles of the project in areas considered suitable habitat. Transects should be recorded using GPS. In addition to nests, any bald eagles observed during the survey and their behavior should be noted. Potential nests should be observed from a distant location that does not disturb the eagles to confirm the presence or absence of eagles. Nest surveys are to be conducted by a qualified

biologist. Results of surveys and transect locations should be sent to the Nebraska Game and Parks Commission and US Fish and Wildlife Service.

If construction will begin between February 1 and April 15, a nest survey must be completed at least 1 but not more that 14 days prior to construction. If construction will begin between April 15 and October 1, a nest survey completed in March is sufficient, as nests will likely already be constructed if nesting will occur that year. However a nest survey may be completed anytime during this timeframe, as long as it is completed prior to construction. If bald eagles are nesting in the area, consultation with NGPC and USFWS will be required, so it is in the project proponent's best interest to complete the survey and notify the agencies as early as possible.

(See timing diagram page 3)

Winter Roost Surveys:
For the purposes of avoiding adverse impacts to wintering bald eagles, two types of roosts are defined. *Transitory roosts* are defined as 3 or more eagles, within 100 meters of each other, for at least 2 nights in an area with no previous knowledge of winter communal roosting. *Communal roosts* are defined as 6 or more eagles in a small area for extended periods of time or used for multiple years. Communal roosts in Nebraska are monitored, so typically their existence will be known and conservation measures established prior to construction.

If construction will be occurring in an area near suitable habitat (near open water with large trees present) where there is no prior knowledge of a communal roost site and construction will be occurring between October 1 and January 31 winter roost surveys are necessary. Winter roost surveys should begin at least 1 day prior to the first date of construction. Winter roost surveys should be conducted daily at dawn as the eagles are likely to leave the roost to forage within the first hour of daylight (depending on weather conditions). These surveys need only be conducted in the area of active construction, not the entire project area. Surveys may be completed by a trained individual using appropriate binoculars or spotting scope. Survey reports should be submitted weekly to the Nebraska Game and Parks Commission and US Fish and Wildlife Service. Evidence of a roost should be reported immediately.

Please note, eagles seen soaring over a construction site should be watched to observe potential nesting or roosting, but construction does not need to terminate due to soaring behavior.

(See timing diagram page 3)

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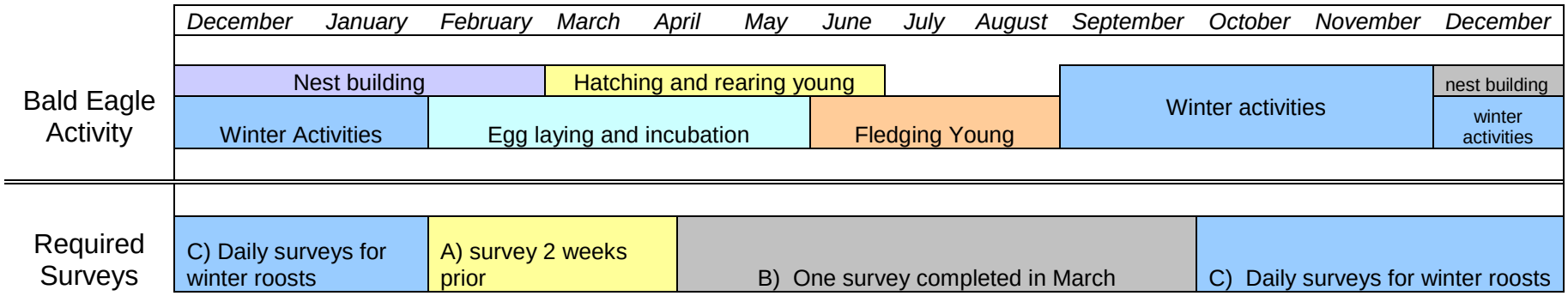
Bald Eagle Survey Recommendations
Timing Diagram
Standard Protocol prepared by NE Game and Parks Commission
January-07



A) Projects starting between February 1 to April 15 must have a nest survey completed 1-14 days prior to the start of construction
B) Projects starting between April 15 to October 1 need a nest survey completed as early as March, or before project begins
C) Projects starting between October 1 and December need daily winter roost surveys completed

NOTE: Surveys are only necessary in areas where the disturbance is near suitable eagle habitat

Timing of eagle activity references:

Draft National Bald Eagle Management Guidelines, US Fish and Wildlife Service, 2006,

Buehler, D.A. 2000. Bald Eagle (*Haliaeetus leucocephalus*), In The Birds of North America, No. 506 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Nebraska Game and Parks Commission. 1993. Nebraska's threatened and endangered species: Bald eagle. Nebraska Game and Parks Commission, Lincoln, Nebraska.

Nebraska Transportation Habitat Assessment Protocol for Golden Eagle

Background

Golden eagles (*Aquila chrysaetos*) can be found in the tundra, throughout grasslands, woodland-brushlands, and forested habitat, south to arid deserts, including Death Valley, California (Kochert et al., 2002). They are aerial predators and eat small to mid-sized reptiles, birds, and mammals up to the size of mule deer fawns and coyote pups. They also are known to scavenge and utilize carrion. In Nebraska's Panhandle, golden eagles are found in arid open country with grassland for foraging, which covers approximately the western quarter of the state. These habitats are typically near buttes or canyons which serve as nesting sites. Golden eagle food sources often consist of prairie dogs and jackrabbits; however, eagles are opportunistic scavengers and will occasionally feed on any available animal carcass. Golden eagles are a regular spring and fall migrant and winter visitor in central Nebraska, but they are not commonly observed in the eastern third of the state.

Golden eagles build nests on cliffs, in the largest trees of forested stands, or on rock escarpments, allowing for an unobstructed view of the surrounding habitat (Beecham and Kochert 1975, Menkens and Anderson 1987, Bates and Moretti, 1994). Usually, sticks and soft material are added to existing nests, or new nests are constructed to create a strong, flat or bowl shaped platform for nesting (Palmer 1988, Watson 1997, Kochert et al., 2002). Golden eagles have been known to decorate multiple nests in a single year; continuing to do so until they lay eggs in a selected nest. The completed nest structure(s) can vary from large and multi-layered; or a small augmentation of sticks in caves with little material other than extant detritus (Ellis et al., 2009).

Golden eagles avoid nesting near urban areas and do not generally nest in densely forested habitat. Individuals will occasionally nest near semi-urban areas where housing density is low or in farmland habitat; however golden eagles have been noted to be sensitive to some forms of human presence (Pagel et al., 2010). Golden Eagles lay one to four eggs, with two eggs being common and four eggs being rare. The laying interval between eggs ranges between three to five days. Severe weather may delay the onset of egg-laying (Driscoll, 2010).

Phenology is not well understood in Nebraska; however nesting birds have been observed on eggs in April and young birds reported by the third week of May (Molhoff, 2001). The golden eagle breeding season generally occurs from mid-January to mid-September, but varies according to geographic area (Phillips et al., 1990, Verner et al., 1980).

Driscoll (2010) describes that breeding chronology begins with an increase in courtship flights and nest refurbishment in December and January. Some eagle pairs lay eggs as early as January; however, mid-February is more typical. Incubation is 45 days. Young hatch from mid-March through April and remain in the nest for 10 weeks, fledging in June. Fledglings remain in the breeding area for up to two months, during which the adults continue to feed them. Juveniles disperse from the breeding area during July and August.

Purpose

Golden eagles are legally protected by the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act and are considered a Tier II at-risk species (i.e., a species that is at-risk in Nebraska but doing well in other parts of its range) by the Nebraska Game and Parks Commission (NGPC) (Schneider et. al., 2011). The Nebraska Department of Roads (NDOR) and Federal Highway Administration (FHWA) has a need to demonstrate due diligence efforts that the transportation program is trying to avoid potential conflicts between eagles and potentially disruptive construction activities, as is already assessed and completed for bald eagles and migratory birds (Bald eagle survey protocol, 2007, NDOR APP, 2012). To document this effort for golden eagles, a habitat assessment process will be followed and coordinated with the NGPC and the U.S. Fish and Wildlife Service (USFWS).

Habitat Assessment Process

1) Similar to our Species Evaluation Process for listed species, NDOR will determine if a proposed project occurs in a county within the most current available breeding range map (2012 example attached) and if there are known nest observations identified by NGPC's Heritage Program or the Breeding Bird Atlas within a 0.5-mile radius of the project.

2) In addition to range & nest location data, other types of desktop (GIS) information could be analyzed to determine whether the Limits of Construction are within 0.5-mile of the following golden eagle habitat indicators:

- Undeveloped
- Native grassland
- Trees
- Steep terrain
- Biologically Unique Landscapes (Pine Ridge, Wildcat Hills, Panhandle Prairies, Kimball Grasslands, Oglala Grasslands)
- Rocky escarpments
- Cliffs
- Rock outcrop
- Shortgrass prairie
- Sandhills dune prairie with 400 foot high rolling dunes
- Prairie dog towns

(3) If a **known** nest does occur within 0.5-mile of the project, or the habitat within 0.5-mile of the project appears to suggest a strong likelihood for golden eagle occupancy, a planned site visit prior to construction should take place:

It is recommended that the dates of the site visit should be sensitive to the local nesting (i.e. laying, incubating, and brooding) and conducted during weather conditions favorable for observing from medium to long range distances (+300—700 meters) (Pagel et al, 2010). There is some unknown proportion of golden eagles that nest in trees in the panhandle (<10%) but these nests are not always detected as cliff-dwelling nests are but usually they are found in

fairly remote locations (Joel Jorgensen, pers comm). It seems likely that these tree nests should be detected by following the bald eagle nest survey protocol.

(4) If nests are identified, follow up coordination with the Service and Commission should take place.

Nest Surveys

Golden eagle nests are typically large and distinctive, but may be well concealed and difficult to see against cliff faces and within rocky areas, or if in a tree, when trees have foliage. Nest surveys should complete a full inspection of rock escarpments, buttes, cliff faces, and large trees within 0.5-mile of the project in areas considered suitable habitat. Identified nests should be recorded using GPS. In addition to nests, any golden eagles observed during the survey and their behavior should be noted on the survey report. Potential nests should be observed from a distant location that does not disturb the eagles to confirm presence or absence of eagle activity. Nest surveys are to be conducted by a qualified biologist. Surveys resulting in a positive nest location will be sent to the NGPC and USFWS.

If construction will begin between February 1 and April 15, a nest survey must be completed at least 1, but not more than 14 days prior to construction. If construction will begin between April 15 and November 1, a nest survey completed in March is sufficient, as nests will likely already be constructed if nesting will occur that year. However, a nest survey may be completed at any time during this timeframe, as long as it is completed prior to construction. If golden eagles are nesting in the area, consultation with USFWS will be required, so it is in the project proponent's best interest to complete the survey and notify the agencies as early as possible.

Identification resources

The field identification of North American eagles:
http://www.globalraptors.org/grin/researchers/uploads/155/eagle_i.d._1983.pdf

Good examples of differences between species (i.e. feet, bills, feathers and pictures):
http://www.hancockwildlife.org/forum/viewtopic.php?showtopic=132018

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Verner, Jared, Boss, Allan S., tech. coords. 1980. California wildlife and their habitats: western Sierra Nevada. Gen. Tech. Rep. PSW-37. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station. 439 p.

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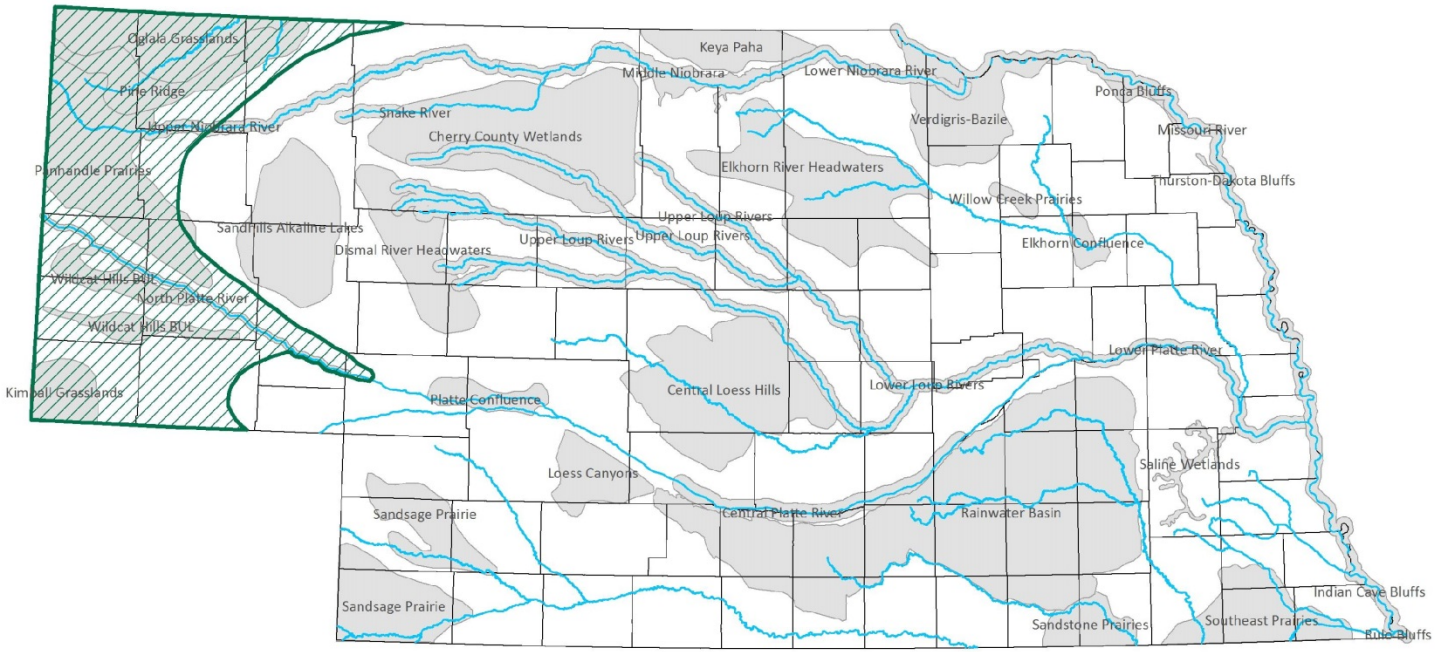
Current breeding range of Golden Eagle
(Aquila chrysaetos)



Nebraska Natural Heritage Program,
Nebraska Game and Parks Commission
September 2012

Adult Golden Eagle (USFWS)

Immature Bald Eagle (USFWS)

Golden Eagle (USFWS)

Turkey Vulture (USFWS)

Interior Least Tern & Piping Plover Fact Sheet

Piping plovers (*Charadrius melodus*) and Interior Least Terns (*Sterna antillarum*) are small water birds that nest on a sandy-gravelly substrate. Their natural nesting habitat in Nebraska is high, dry, barren mid-stream sandbars within rivers. Terns and plovers also nest on artificial substrate, mainly sand spoils produced as a byproduct of sand and gravel mining.

Piping Plover (*Charadrius melodus*)

Order: *Charadriiformes*
Family: *Charadriiae*
Status: State and Federally Threatened

Foraging Piping Plover

Piping Plover on Nest

Piping Plover Chick

The Piping Plover was listed in the Federal Register on December 11, 1985, as Endangered. It has since been de-listed to Threatened in Nebraska (Information from U.S. Fish and Wildlife Service)

Description: L 7 1/4"(18 cm). Sexes similar. Very pale above, white below. In breeding plumage has single complete black breast band. Sometimes the breast band can be incomplete, especially in females and juveniles. White forehead and small black cap. Legs are orange. Bill is yellow with black tip.

Habitat: Sparsely vegetated shorelines of shallow water bodies. Prefer shorelines with bare sand, and sandy or pebbly mud. Plovers generally nest on unvegetated or sparsely vegetated sandbars in river channels.

Status/Range: Occasional to rare spring and fall migrant and rare local summer resident. Have recent breeding records for Platte, Niobrara, Loup, and Middle Loup Rivers and at Lake McConaughy and recently at Lake Minatare. **Call:** Clear piping "*peep-lo*." **Comments:** Surveys in 1996 indicate that nearly 300 pairs of Piping Plovers bred in the state. (Information provided from Nebraska Game and Parks Commission website)

Courtship Behaviors: Males perform courtship flights over breeding territory, with slow wing beats and piping call note. On the ground, male approaches female, stands upright with neck stretched, and rapidly stamps feet with odd high-stepping gait.

Nest/Nesting Behavior: Nest site is on open ground some distances from the water, often with large rock or clump of grass nearby, but no direct shelter or shade. May nest very close to tern breeding colonies. Nest is a shallow scrape in the sand, sometimes lined with shells and pebbles. May make several scrapes before actual nesting. Piping plovers lay 4 eggs that take about 25-30 days to hatch. Soon after hatching the chicks leave the nest and are able to feed themselves (worms, flies, and other invertebrates along the shoreline). **Chicks are very mobile within about 3-5 days**. In approximately another 20-25 days, they are able to fly and may feed at the site for another week or two. *(Information from Renae Held, UNL Tern & Plover Conservation Partnership Program Coordinator and Troy Peterson Field Guides).*

Similar Species: Killdeer, Semipalmated plover

Killdeer is 9 - 11"

Semipalmated plover

Interior Least Tern (*Sterna antillarum*)

Order: *Charadriiformes*
Family: *Laridae*
Status: State and Federally Endangered

Foraging Least Tern

Least Tern with nestling

Least Tern on Nest

The Interior Least Tern was listed in the Federal Register as Endangered on May 28, 1985 (Information from U.S. Fish and Wildlife Service)

Description: L 9" (23 cm) W 20" (51 cm). Sexes similar. Breeding adults show distinctive white forehead against black cap and nape; gray above and white below; orange-yellow bill with dark tip; orange-yellow legs. Conspicuous black wedge on outer primaries is visible in flight. Short deeply forked tail. Non-breeding birds lack black cap, instead having a dark eye stripe. Juvenile birds are mottled gray-brown above and white below. **The Interior Least Tern is the smallest of all the terns**.

Habitat: Migrants can be found on lakes, rivers, and reservoirs. Nesting is done mainly on river sand bars or islands, but sometimes also on barren shorelines, gravel beaches, or newly cleared land.

Status/Range: Uncommon spring and fall migrant in eastern part of the state. Highly local summer resident in Platte and Niobrara River valleys. Local breeder. **Call:** Sharp "*kit, kit*", and repetitive "*dee-dee*". (Information from Nebraska Game and Parks Commission website)

Courtship Behaviors: In courtship, male (carrying fish in bill) flies upward, followed by female, then both glide down. On the ground, displays include courtship feeding by male.

Nest/Nesting Behavior: Nest site is on open ground. Nest is shallow scrape, sometimes lined with pebbles, grass, and debris. Least terns lay 3 eggs that hatch in about 22-28 days. The chicks are fed small, whole fish by the adults even after they learn to fly. **In the first few weeks the chicks move very little and tend to stay near the nest. Their defense at this age is to lie down and hide, making them vulnerable to machinery and human traffic or disturbance.**

(Information from Renae Held, UNL Tern & Plover Conservation Partnership Program Coordinator and Troy Peterson Field Guides)

Similar Species: Common Tern or Forster's Tern

Forster's Tern is 14-15"

Common Tern is 13-16"

Interior Least Tern and Piping Plover Survey Protocol

Terns and plovers can be disturbed by sight (human figures, visible equipment) and sound (loud equipment, banging, etc.) that are abnormal in their environment (typical roadway traffic is considered "normal"), chicks can be harassed or crushed by construction equipment; therefore surveyors need to ensure disturbance is minimized.

Dates of Survey:

- April 15 – August 15
- If no nesting activity is observed within the June 1 – July 15 time period, then no further surveys are needed.

Frequency and Timing of Survey:

- Survey in the morning, prior to the start of project/construction activities for the day and record a start and stop time.
- Surveys must be conducted when there is adequate light to detect and identify birds. If cloudy or foggy – take additional time to ensure a good quality survey.
- Survey at least 3 times a week during nesting: Monday, Wednesday, Friday.

Method of Survey:

- From a good vantage point, survey areas within 0.25 miles of where project/construction activities will occur.
- Use binoculars or spotting scope to survey for a minimum of 20 minutes.
- Look specifically for bird movements along sandbars in the middle of the channel and/or along the shoreline

Indicators of Nesting Activity:

- Nesting behavior: copulations, birds returning to the same place, sitting on the sand for a long period of time, or nest exchange (males and females will generally take 20 minute shifts to incubate)
- Foraging behavior: looking for food along sandbar, probing the sand, hovering over river channel and diving into water for fish, and bringing back fish to sandbar.

If nesting activity is not observed, project/construction activities may commence. If a possible sighting occurs, then further investigation may be needed from a different vantage point or using higher-powered optics to verify if a nest or chicks are present. Landowner permission must be obtained if entering private land.

If at any time, a nest and nesting behavior is observed within 0.25 miles of the project:

- Do not start or continue to work
- Contact NDOR Environmental Section, Melissa Marinovich at 402-479-3546 or Zach Cunningham at 402-479-4464.
    - NDOR Environmental will contact USFWS and NGPC for further instructions.
- Do not resume work within 0.25 mile of location until NDOR Environmental Section relays the "all clear" message to the Project Manager.

Massasauga Impact Avoidance Protocol

1. All work activities, whether in suitable habitat or not, must avoid harming snakes anywhere within the project area, including, but not limited to, roadways, shoulders, culverts, the ROW from the existing hingepoint to ROW boundary fence, and areas where Contractor activities outside the limits of construction may take place.

2. Areas of suitable habitat shall be marked. All Contractor activities including, but not limited to, borrow, haul roads, stockpiling, staging, parking, and material storage will be located outside suitable habitat. Additionally, vehicles and machinery shall not be driven within areas of suitable habitat, except as allowed by #3 below. Vehicles and machinery should be driven on the existing roadway to the extent possible, since massasauga may move through vegetation and areas that are not suitable habitat.

3. If it is necessary for any construction or Contractor activities to occur within suitable habitat, the following measures should be taken:

   a. Mow the area designated as suitable habitat to a height of 6 inches, starting March 1 and continuing through October 31. Vegetation should be re-mowed at appropriate intervals to maintain a height of 6 inches or less. If construction or Contractor activities within areas of suitable habitat are complete before October 31, the area no longer needs to be mowed. Keeping the vegetation as short as possible will aid in detection of snakes.

   b. If construction will not begin near the March 1 start-date for mowing, then a survey for massasauga shall be conducted by a qualified biologist the day mowing commences. The area should be mowed prior to initiation of construction activities.

4. Before construction begins each day, the Contractor should survey the road and shoulders along areas that will be under construction or utilized for any construction activities that day. Several species of snakes (including massasauga) can often be found basking on warm surfaces (such as asphalt, cement, gravel roads, shoulders and rocks), especially in the morning. If construction activities will occur between the existing hingepoint and the ROW boundary fence within suitable habitat, that area should also be surveyed in addition to the roadway and shoulders.

5. If massasauga are encountered, the following actions shall be taken:

   a. Cease activity until the massasauga has moved at least 50 m (approximately 160 ft.) away from the work site where construction activities will be taking place.

   b. As soon as the snake is identified as a massasauga (see page 3 for Massasauga Identification), contact Mike Fritz, NGPC Heritage Zoologist, at 402-471-5419, or Daniel Fogell, Herpetologist, at 402-578-4651 for further direction on how to proceed.

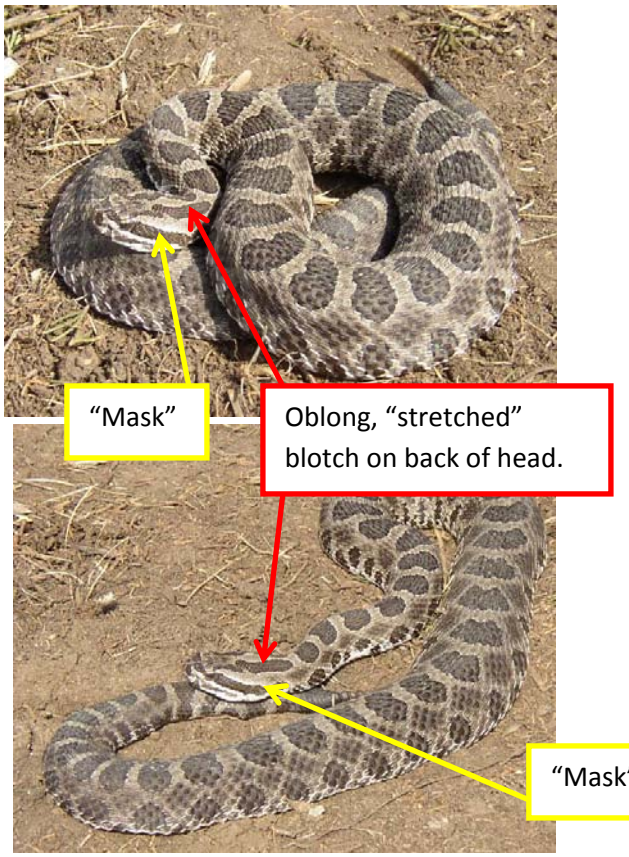
c. Contact Melissa Marinovich or Zach Cunningham, NDOR Highway Environmental Biologists, at 402-479-3546 or 402-479-4464 and inform them that a massasauga has been encountered.

d. If a massasauga arrives on the scene but does not/will not leave the activity area, either Dan Fogell or Mike Fritz will collect and relocate the snake.

e. **Under no circumstances should the snake be harmed or destroyed, nor should it be handled by inexperienced persons.** This is for the safety of the workers as well as the snake. **Massasaugas are venomous.**

6. Survey reports should be submitted weekly when construction activities are occurring within areas of suitable habitat. Reports should indicate if any massasaugas were found (dead or alive), and what actions were taken if they were found. Mowing dates should also be included in the report. Submit reports electronically to NDOR Environmental (either for State Projects - Melissa.marinovich@nebraska.gov or for LPA - zach.cunningham@nebraska.gov) and NGPC Environmental Analyst, Michelle Koch (michelle.koch@nebraska.gov).

Massasauga Identification



Massasauga is a species of rattlesnake. Massasaugas are venomous. Do not get too close to the snake while trying to identify it, and do not attempt to pick it up or handle it.

Size: Small to medium sized snake. Adults can be 18 – 40 inches long and are gray to tan in color. Young are 6 – 10 inches long when born.

Description: There is an oblong, "stretched" blotch on the back of the head. There are also markings across the face extending back behind the eye giving the appearance of a "mask." They have a row of 21-50 dark brown to black blotches on their back. These blotches have a slight silver edge. There are also three rows of small brown to black blotches on each side of the body. The tail is stocky and has alternating dark and light bands. Most have a moderately developed rattle on the end of their tail. **<u>However, massasaugas can lose their rattles completely. Therefore, do not base identification solely on whether or not the snake has a rattle.</u>** If the rattle is still attached, they will rattle their tail to attract prey.

Habitat: Areas where snakes hibernate are called hibernacula. Massasauga hibernate in crayfish burrows in wet, mesic areas, which can be found around culverts, drainages, seeps, ponds, lakes, streams, and rivers. These areas are typically characterized by reed canary grass or other wetland grasses or sedges and the presence of crayfish burrows. Massasaugas hibernate from October to mid-March, but may return to the hibernacula earlier to give birth. In summer, they also utilize warm season grasslands and migrate between different areas for mating and foraging.

MOUNTAIN PLOVER SURVEY GUIDELINES-MONTANA
U.S. Fish and Wildlife Service
March 2002

The mountain plover (*Charadrius montanus*) is a small bird (17.5 cm, 7 in.) about the size of a killdeer (*C. vociferus*). It is light brown above with a lighter colored breast, but lacks the contrasting dark breast-belt common to many other plovers. During the breeding season it has a white forehead and a dark line between the beak and eye, which contrasts with the dark crown.

Mountain plover breeding habitat includes short-grass prairie and shrub-steppe landscapes; dryland, cultivated farms; and prairie dog towns. Plovers usually nest on sites where vegetation is sparse or absent, conditions that can be created by herbivores, including domestic livestock and prairie dogs. Vegetation in shortgrass prairie sites is typically less than 4 inches tall. Nest sites within the shrub-steppe landscape are also confined to areas of little to no vegetation, although surrounded by areas visually dominated by shrubs. Commonly, nest sites within shrub-steppe areas are on active prairie dog towns. Nests are commonly located near a manure pile or rock. In addition to disturbance by prairie dogs or livestock, nests have also been found on bare ground created by oil and gas development activities, and on dryland, cultivated agriculture in the southern part of their breeding range. Mountain plovers are rarely found near water. Positive indicators for mountain plovers therefore include level terrain, prairie dogs, bare ground, Opuntia pads, cattle, widely spaced plants, and horned larks. It would be unusual to find mountain plovers on sites characterized by irregular or rolling terrain, dense, matted vegetation, grass taller than 4 inches, wet soils, or the presence of killdeer.

In Montana, the mountain plover historically ranged over the eastern two thirds of the state, as far west as Jefferson, Madison and Teton Counties and as far north as Toole County. Mountain plovers in Montana are strongly associated with active black-tailed prairie dog towns that have flat and unbroken terrain (Blaine and Phillips Counties). They do not nest on cultivated fields in Montana. Other habitats that support nesting mountain plovers in Montana that currently are not associated with prairie dogs are flat barren areas that are underlain with bentonite (Valley and Carbon Counties), gravel benches, ridges, and alluvial fans that are heavily grazed (Golden Valley, Musselshell, Meaghan, Judith Basin, Fergus, Wheatland, Yellowstone, Rosebud, Big Horn, Carter, and Treasure Counties).

Service biologists and Dr. Fritz Knopf, USGS-BRD developed these guidelines. Keep in mind these are guidelines - please call the, U.S. Fish and Wildlife Service, Ecological Services, Billings Sub Office, 406-247-7366, if you have any suggestions.

GENERAL GUIDELINES FOR SURVEYS

On February 16, 1999, the Service proposed the mountain plover for federal listing as threatened. Because listing of this species is proposed, the Service may recommend surveys for mountain plovers to better define nesting areas, and minimize potential negative impacts. The Service may recommend surveys for mountain plovers in all suitable habitat, as well as avoidance of nesting areas, to minimize impact to plovers in a site planned for development. While the Service believes that plover surveys, avoidance of nesting and brood rearing areas, and timing restrictions (avoidance of important areas during nesting) will lessen the chance of direct impacts to and mortality of individual mountain plovers in the area, these restrictions do nothing to mitigate indirect effects, including changes in habitat suitability and habitat loss. Surveys are, however, a necessary starting point. The Service has developed the following 3 survey guidelines, depending on whether the intent is to determine the presence or absence of plovers at a site during the nesting season for permanent and short-term projects, or to determine the density of nesting plovers at known nesting sites.

Survey Protocol

Surveys for mountain plovers are conducted during the period where the highest numbers of plovers are likely to be tending nests and territories, and therefore are most likely to be detected. Throughout their range, these dates are generally from May 01 through June 15. However, seasonal restrictions for ground disturbing activities in suitable mountain plover nesting habitats are usually longer than the survey dates. The longer seasonal restrictions allow for protection of early nesting birds, and very young chicks which tend to sit still to avoid detection during the first week post-hatch. Since specific nesting dates across the breeding range of the plover vary according to latitude and local weather, the project proponent or the land management agency should contact the local U.S. Fish and Wildlife Service Office to determine what seasonal restrictions apply for specific projects.

Two types of surveys may be conducted: 1) surveys to determine the presence/absence of breeding plovers (i.e., displaying males and foraging adults), or 2) surveys to determine nest density. The survey type chosen for a project and the extent of the survey area (i.e., beyond the edge of the construction or operational ROW) will depend on the type of project activity being analyzed (e.g., construction, operation) and the users intent. One methodology outlines a breeding survey that was used in northeastern Colorado to establish the density of occupied territories, based on displaying male plovers or foraging adults. The other was developed to only determine whether plovers occupy an area.

Techniques Common to Each Survey Method

Conduct surveys during early courtship and territorial establishment. Throughout the breeding range, this period extends from approximately mid-April through early July.

However, the specific breeding period, and therefore peak survey days, depends on latitude, elevation, and weather.

Conduct surveys between local sunrise and 1000 and from 1730 to sunset (periods of horizontal light to facilitate spotting the white breast of the adult plovers).

Drive transects within the project area to minimize early flushing. Flushing distances for mountain plovers may be within 3 meters for vehicles, but plovers often flush at 50 to 100 meters when approached by humans on foot.

Use of a 4-wheel drive vehicle is preferable where allowed. Use of ATVs has proven highly successful in observing and recording displaying males. Always seek guidance from land management agencies regarding use of vehicles on public lands, and always obtain permission of private landowners before entering their lands.

Stay in or close to the vehicle when scanning. Use binoculars to scan and spotting scopes to confirm sightings. Do not use scopes to scan.

Do not conduct surveys in poor weather (i.e., high wind, precipitation, etc.).

Surveys conducted during the courtship period should focus on identifying displaying or calling males, which would signify breeding territories.

For all breeding birds observed, conduct additional surveys immediately prior to construction activities to search for active nest sites.

If an active nest is located, an appropriate buffer area should be established to prevent direct loss of the nest or indirect impacts from human-related disturbance. The appropriate buffer distance will vary, depending on topography, type of activity proposed, and duration of disturbance. For disturbances including pedestrian foot traffic and continual equipment operations, a ¼-mile buffer is recommended.

SURVEY TO DETERMINE PRESENCE/ABSENCE

Large scale/long term projects

Conduct the survey between May 1 and June 15, throughout the breeding range.

Visual observation of the area should be made within 1/4 mile of the proposed action to detect the presence of plovers. All plovers located should be observed long enough to determine if a nest is present. These observations should be made from within a stationary vehicle, as plovers do not appear to be wary of vehicles. Because this survey is to determine presence/absence only, and not calculate statistical confidence, there is no recommended distance interval for stopping the vehicle to scan for birds. Obviously numerous stops will be required to conduct a thorough survey, but number of stops should be determined on a project and site-specific basis.

If no visual observations are made from vehicles, the area should be surveyed on ATVs. Extreme care should be exercised in locating plovers due to their highly secretive and quiet nature. Surveys by foot are not recommended because plovers tend to flush at greater distances when approached using this method. Finding nests during foot surveys is more difficult because of the greater flushing distance.

A site must be surveyed 3 times during the survey window, with each survey separated by at least 14 days. The need for 3 surveys is to capture the entire nesting period, with the intent of reducing the risk of concluding the site is not nesting habitat by an absence of nesting birds during a single survey.

Initiation of the project should occur as near to completion of the survey as possible. For example, seismic exploration should begin within 2 days of survey completion. A 14-day period may be appropriate for other projects.

If an active nest is found in the survey area, the planned activity should be delayed 37 days, or seven days post-hatching. If a brood of flightless chicks is observed, activities should be delayed at least seven days.

Short-term, linear projects

The Service recognizes that many projects have minimal, if any impact on mountain plover nesting habitat, and that these projects may only be present in suitable habitat for a day or less. In order to address concerns from project proponents about delays associated with mountain plover surveys for these projects, the Service has developed the following guidelines. However, the Service encourages the project proponent to plan these projects so that all work occurs outside the plover-nesting season.

Short-term linear projects are defined as projects, which move through an area within the course of a day and result in no permanent habitat alteration (e.g., vegetative/topographic changes), and no permanent project-related above ground features. Short-term, linear projects may include activities such as pipelines, fiber optic cables, and seismic exploration. For these projects, all ROW surveying/staking activities should be completed before April 1 to avoid discouraging plovers from nesting in suitable habitat. If ROW surveying cannot be completed before April 1, surveyors will need to coordinate with the lead Federal agency before entering these areas, and a plover survey may be required prior to ROW demarcation. For these projects, the presence/absence guidelines above should adhere to the dates below.

1. April 10 through July 10 - a plover survey will need to be completed 1- 3 days prior to any construction activity, including initial brush clearing, to avoid direct take of mountain plovers. The survey should include the route and a ¼-mile buffer on either of the project corridor. If there is a break in construction activity in these areas of more than 3 days (e.g., between pipe stringing, trenching, or welding), an additional plover survey is necessary before construction activity can resume after that break in activity.

Generally, mountain plovers are either establishing territories and nests in April, and from late June to early July young chicks commonly freeze in place to avoid detection, increasing their vulnerability to direct take. After July 10, most mountain plover chicks are sufficiently mobile to reduce the risk of direct take.

2. If an active nest is found in the survey area, the planned activity should be delayed 37 days, or seven days post-hatching. If a brood of flightless chicks is observed, activities should be delayed at least seven days.

SURVEY TO DETERMINE DENSITY OF NESTING MOUNTAIN PLOVERS

We are assuming people will have received training on point counts in general before using this specialized point count technique adapted to mountain plovers.

Establishing Transects

Identify appropriate habitat and habitat of interest within geographic areas of interest.

Upon arriving in appropriate habitat, drive to a previously determined random starting point.

For subsequent points, drive a previously determined random distance of 0.3, 0.4 or 0.5 miles.

Each transect of point counts should contain a minimum of 20 points.

Conducting The Point Counts

1. Conduct counts between last week in June to July 4th at elevations equivalent to the eastern plains of Colorado (i.e., about 5,000 feet). Timing of counts at other elevations should be coordinated with the local FWS office.

2. Only 1 counter is used. Do not use a counter and recorder or other combinations of field help. Drivers are okay as long as they don't help spot plovers.

3. If an adult mountain plover is observed, plot occupied territories on a minimum of 1:24,000 scale map and on a ROW diagram or site grid (see attached). The ROW diagram will be at a greater level of detail, depicting the location of breeding birds (and possible nest sites) relative to ROW centerline, construction boundary, and applicable access roads.

4. Estimate or measure distances (in meters) to all mountain plovers. Method used should be noted, e.g., estimates w/distance training, estimates w/o distance training, rangefinder or measured with tape measure, etc.

5. Record "fly-overs" as "FO" in the distance column of the data sheet.

6. If you disturb a mountain plover while approaching the point, estimate the distance from point-center to the spot from which the bird was flushed.

7. Conduct counts for 5 minutes with a 3-minute sub sample to standardize with BBS.

8. Stay close to your vehicle while scanning.

Recording Data

Record the following information AT EVERY POINT, EVERY DAY.

Start time
Unique point code (don't duplicate within a field crew or across dates)
Number of mountain plovers and distance to each
Land use and/or habitat type (e.g., fallow wheat, plowed, shortgrass)
Temperature, Beaufort wind, and sky conditions (clear, partly cloudy, overcast)
information on the data sheet somewhere.
Your name and address
Date
Record for each point at some point during the census.
Detailed location description of each point count including road number, distance to important intersections.
Record transects and point locations on USGS county maps.
Universal Transverse Mercator from maps or GPS are useful.

GENERAL HABITAT INDICATORS

Positive habitat images

Stock tank (non-leaking, leaking tanks often attract killdeer)
Flat (level or Atilted@) terrain
Burned field/prairie/pasture
Bare ground (minimum of 30 percent) usually a gravely Apavement@
ASpaced@ grass plants
Prairie dog colonies
Horned larks
Cattle
Heavily grazed pastures
Opuntia pads visible

Negative habitat images

Killdeer present (indicating less than optimal habitat)
Hillsides or steep slope
Prominent, obvious low ridge

Leaky stock tanks
Vegetation greater than 4 inches in height in short-grass prairie habitat
Increasing presence of tall shrubs
Matted grass (i.e., minimal bare ground)
Lark buntings

Northern Long-Eared Bat Fact Sheet

Northern long-eared bats (*Myotis septentrionalis*) (NLEB) are medium sized bats distinguished by the long, rounded ears for which it is named. When the ears are pushed forward, they are long enough to reach past the bat's nose. Northern long-eared bats face danger of extinction due to the growing cases of White-Nose Syndrome (WNS), a fungus that attacks the bat's respiratory system.

Northern long-eared bat (*Myotis septentrionalis*)

Order: *Chiroptera*
Family: *Vespertilionidae*
Status: Federally Threatened

NLEB Close-Up

NLEB Hanging on Rock

NLEB in Flight

Appearance: 3 - 3.7 inch body length. 9 -10 inch wingspan. The coat of a northern long-eared bat can vary in color from mid to dark brown on top, and a yellowish-grey or light brown on the belly. The bats ears and face commonly have a black tint. Male northern long-eared bats are usually smaller and lighter compared to their female counterparts.

Range: The northern long-eared bat has been found in 39 states, including Nebraska. This species may be found throughout the north central and eastern United States. Northern long-eared bats have also been recorded in all Canadian provinces from the East Coast to the southern Yukon Territory and British Columbia.

Roosting Behavior and Habitat: Though little information exists regarding northern long-eared bat habitat in Nebraska, literature has documented that the northern long-eared bat is opportunistic in summer roost site selection. Roosting locations during the summer months may include: underneath tree bark, under bridges, inside caves, mines, houses, and barns. The northern long-eared bat prefers to roost in tight cracks and crevices, rather than open spaces. Winter hibernation for this species necessitates a roosting selection with high humidity, no air currents, a large area, and relatively constant in temperature. For this reason, winter roosts are primarily in caves, mines, and human created structures. Roosting occurs in groups or individually.

Roosting Timeline: The northern long-eared bat will travel 35-55 miles every year to hibernate in a new or previously used hibernacula. Nearing winter, gatherings will take place near the hibernacula (over-wintering site) starting in August or September until the northern long-eared bat begins hibernation in October and November, which lasts until April.

Diet: Arachnids (i.e. spiders), beetles, and flying insects (i.e. moths and mosquitos).

Similar Species: Other bats within the *Myotis* genus

Little Brown Myotis

Long-Legged Myotis

Northern Long-Eared Bat Survey Protocol

Northern long-eared bats can be disturbed by sound (loud equipment, banging, etc.) that is abnormal (roadway traffic is considered normal) and activity that manipulates or disturbs occupied habitat (jack-hammering, joint replacement where sealing compound seeps through cracks, removal of bridge substructure, or removal of trees).

Dates of Survey:

- June 1 – July 31 (maternal roosting period)
- Surveys are to be conducted in areas where bridge construction or tree removal is occurring during the maternal roosting and pup-rearing season.

Time of Survey:

- Up to 10 days prior to the start of construction activity on bridge structures or removal of trees
- During daylight hours

Method of Survey:

- Arrive at the survey location and take a photo of the structure/trees and if applicable; the bridge structure name, areas underneath the bridge including the structure itself and the surrounding habitat (upstream/downstream).
- Scan beneath the structure for bat sign (urine staining or guano).
- For bridges, check crevices, cracks, expansion joints, and wall faces for roosting bats (use high power flashlight and, if available, pole-mounted camera).
- For trees, check live/dead tree species or snags that exhibit peeling bark, crevices or hollows. Typically trees greater than 6 inches dbh.
- Include weather, date and time in the survey report form.
- In comments on the survey form – include brief description of work to be done on the structure/trees.

If no roosting bats are observed, work may begin accordingly. If suitable habitat cannot be surveyed or a bat sighting occurs, DO NOT START WORK, further investigation may be needed. Contact NDOR Environmental: Melissa Marinovich (402) 479-3546 or Zach Cunningham (402) 479-4464 to discuss.

If at any time, a bat is observed roosting within the area of a construction site:

- Stop work and contact NDOR Environmental Section
    - NDOR Environmental will contact USFWS and NGPC for further instructions on how to proceed.
- Do not resume work in the area with bats until the NDOR Environmental Section relays the "all clear" message to the Project Manager.
- Work may begin or resume if the bats move off on their own; record the sighting, bat departure time, and work start time in the notes on a survey form.

River Otter Survey Protocol
Nebraska Game and Parks Commission

Background

River otters were historically found in all major waterways of Nebraska. Unregulated trapping was the likely factor leading to the complete disappearance of otters from Nebraska in the early 1900's. From 1986 to 1991, river otters were reintroduced at seven locations: South Loup River, Calamus River, North Platte River, Platte River, Cedar River, Elkhorn River and Niobrara River (Andelt 1992). Their populations have become established and have expanded from these locations.

River otters are very adaptable. They typically live along wooded rivers and streams with sloughs and backwater areas and ponds. Ideal habitat has year-round open water with a plentiful food supply. Otters have been referred to as a "flagship species" for wetlands and aquatic habitats and are an indicator of wetlands with ample and high quality water (Foster-Turley 1996 and Polechla 2000) and often select sites with the least amount of human disturbance (Wilson 1959, Tabor and Wight 1977, Polechla 1990, Testa et al. 1994). Suitable habitat must also have a sufficient food source available. River otters are generalists. The primary component of their diet is fish but crustaceans are a major component of their diet in Nebraska. Fallen trees, logjams, rock piles, and other structures in the water make good habitat for the otter's prey species and thus good habitat for the otter. Beaver dams create deep pools and slow currents that otters frequently utilize for hunting.

River otters are a highly mobile species and require large amount of space to meet their annual requirements. They are active throughout the year and may occupy 50 or more miles of stream course annually (Andelt 1992) and will often move from one area to another. A single day movement was documented of 42 km (Melquist and Hornocker 1983) but daily movements are more likely less than 10km/day (Melquest et al. 2003). The social structure of river otters is not well defined and appears to vary across its geographic range (Gorman et al. 2006a), so local densities are highly variable as otters may be solitary or in small groups.

While on land, otters will utilize "slides" on steep muddy or snowy banks where they slide down into the water on their bellies. When traveling any distance on a slippery surface otters are known to take a running start and then slide up to six meters (twenty feet).

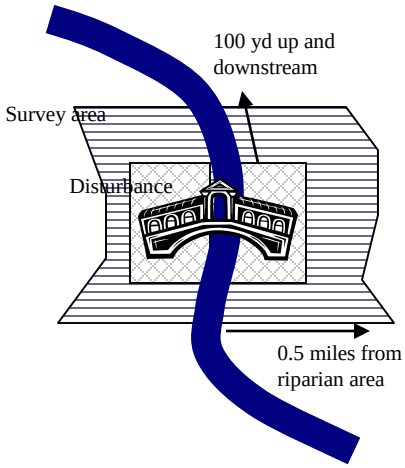
River otters use dens that were dug by other species such as beaver and will also utilize upland dens such as rock, brush and log piles, hollow logs, or tree root structures. They will use a variety of temporary dens and resting sites and appear to prefer sheltered sites that provide protection and seclusion (Melquist et al. 2003). A female with young pups will typically only use one natal den until the pups are sufficiently mobile and self-sufficient which may take 10 weeks. Gorman et al. 2006b found that natal dens were located in areas protected from rapid changes in water levels. Many of the dens in this study were not in the bank, but rather a distance overland and were most often located below the ground. In Nebraska, female otters enter the natal den beginning in late February through April.

Purpose

River otter surveys are designed to ensure awareness and resolution to any potential conflicts between the river otters and potentially disruptive human activities. This is a highly mobile species, and if present, is likely to leave during disturbance. However, otters are especially susceptible to disturbance when they have young pups in the natal den. Den surveys, which include presence/absence surveys, are recommended and, upon consultation with the Nebraska Game and Parks Commission, may be modified from this protocol depending on the situation. These should be considered when a disturbance will be within 0.5 miles of a river, pond, sandpit, or wetland area where river otters are known to exist or are likely to be present.

Den Surveys

River otter dens are notoriously difficult to find and identify, as they will use dens excavated by other animals as well as brush piles, log piles and uprooted tree structures. For this reason, a den survey should begin by establishing presence/absence for the designated area. If river otters are present, a more thorough search for dens is necessary. Otters are highly mobile, and therefore, presence/absence and den surveys should be done within 10 days of the initiation of the construction activities or disturbance. It may be desirable to conduct two sets of surveys, one month or a season in advance and one within 10 days of the project beginning.



Generally the survey area must include:

1. The entire area of disturbance which includes construction areas, equipment staging areas, temporary roads, etc.
2. An additional 100 yards up and down stream from the edge of the area of disturbance
3. At least 0.5 miles from the edge of the riparian/wetland area upland across the entire area of disturbance. Additional survey area may be necessary depending on the landscape context of the site. Tributaries, wetland complexes, sloughs or ponds may increase the necessary survey area.

Presence/absence can be established by identifying sign (scat, tracks, runs, rolls etc.), by finding slides or latrine sites. Otter scat will vary in size, but can generally be distinguished by fish scales. They often disintegrate into a pile of fish scales and reek of fish (Elbroch 2003). In Nebraska, scat is likely to have crayfish shells and may have bones of mammals, birds, or amphibians. Ideal latrine sites for otters in Nebraska tend to be higher areas near the edge of the water and may include sandbars, bank protrusions, rocks or logs which stick out into waterways or sites where tributaries meet a main stream or body of water. They can often be found right near the water's edge but can also be located higher up on a bank, especially if water levels change throughout the year. Often a latrine will be located near a potential den site. Since otters repeatedly use the same latrine sites, scats will usually be abundant in one site, making them easier to find. Otter tracks are 5 to 7.5 cm (2 to 3 inches) across (Elbroch 2003)

Otter slide marks can be an easy way to identify the presence or absence of river otters. They will slip down the steep banks of a body of water and also when they travel overland across snow, ice, or mud. Bridge surveys or aerial surveys after a fresh snow are especially good times to find evidence of otter activity because the snow provides a slippery surface for an otter to slide and slides imprints can be seen in fresh snow. Otters can take a few running steps and then slide up to six meters (20 feet) on the right surfaces and slopes. Winter otter slides can be an easy way to find if otters are in the area, however, presence or absence in the winter will not preclude additional surveys immediately prior to construction (within 10 days) for these highly mobile animals. In some cases, if otters are present there may be preventative measures that can be used to prevent them from using the area prior to construction.

If otters are established in the area, a thorough survey for potential den sites should be conducted. Any potential dens should be monitored to determine which species inhabits the den. Since they are highly mobile, potential dens should be re-checked 24 hours prior to initiating groundbreaking construction. If a river otter den is found in the area of the den survey, disturbance activities should not proceed or should cease and the Nebraska Game and Parks Commission should be contacted immediately.

Sam Wilson, Furbearer and Carnivore Program Manager, 402-471-5174
Michelle Koch, Fish and Wildlife Specialist, 402-471-5438

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Southern Flying Squirrel (Glaucomys volans)

The Nebraska Game and Parks Commission
Prepared by Mike Fritz and Sam Wilson, 4/4/14

Description

The Southern flying squirrel is the smallest squirrel found in Nebraska. It is 8-10 inches in length with a 3-4 inch long tail. It has a relatively short, rounded nose and large dark eyes, which produce a distinctive reddish orange eye shine. The soft, silky fur blends from gray to reddish brown on the head, sides and back. This is contrasted with the creamy white chin, throat and stomach. The most distinguishing feature of the SFS are its folds of skin connecting its front and rear legs. When the legs are out- stretched, these folds enable the SFS to glide or "fly" from one tree to another.

Distribution

The southern flying squirrel (SFS) is found only in remnant tracts of eastern deciduous forest in the southeastern corner of the Nebraska. It is known to occur in the forested bluffs along the Missouri River from the far southeastern corner of the state north to about Nebraska City. Historically, it probably occurred over a wider area when the deciduous forest in the state was more extensive than it is today. Although the southern flying squirrel is listed as threatened in Nebraska and is fully protected, it is quite common in many eastern states.

Life History

Southern flying squirrels are nocturnal in their activity patterns and are rarely observed during the day. The period of peak activity is from dusk to midnight and again before dawn. SFS do not hibernate, although they may remain in their nests for several days during severe winter weather. SFS are frequently found nesting in communal groups. The largest groupings are during winter when they form groups to conserve warmth. The number of animals in the winter congregations varies by latitude, with larger congregations found in northern climates. One tree cavity in Illinois was reported to contain 50 squirrels. In Nebraska, eight squirrels have been found in one nest box.

Southern flying squirrels show two periods of breeding activity. The first is in February and March, and the other is from late May through July. Females can produce two litters per year but only under favorable conditions. Litters, usually of three or four, but up to seven young, are born following a gestation period of 40 days. The young are weaned at six to eight weeks and are capable of gliding soon thereafter. Young typically remain with the female until the birth of the next litter.

Southern flying squirrels are primarily vegetarian, but will occasionally eat animal foods. Nuts, primarily acorns and hickory nuts, are preferred foods and make up the bulk of the diet. Flying squirrels will also consume various seeds, fruits, berries, mushrooms, buds, flower blossoms and tree bark. Animal items that occasionally may be eaten include insects, bird eggs and nestlings, small nestling mammals, carrion, and adult shrews and mice. Nuts are gathered and stored as winter approaches. The shortening of

day length rather than temperature triggers the urge to store food. Nuts are buried individually or are cached in nest cavities or other cracks and crevices in trees. Several hundred nuts can be stored in a night. In good nut-production years, the stored nuts carry the squirrels through the winter and even into spring and summer. Nuts are eaten in a characteristic pattern. Flying squirrels usually cut a fairly smooth circular or oval opening on the side or end of a nut. On larger, heavy-shelled nuts they will make a second opening or remove an entire end in a single cut. Other tree squirrels usually crush nuts without leaving the shells intact.

Habitat Use

Southern flying squirrels require mixed deciduous forests as habitat. Specifically, they require forests with mature stands of mast-producing trees such as oaks, hickories and walnuts for food, cavities in dead or live trees for shelter, and some form of water. Preferred stand size is 250 acres or larger but they are found in smaller stands. The home range for adult males ranges from 6-40 acres, for females home range is 5-18 acres. Home ranges of individuals may overlap. SFS nest in woodpecker holes and natural cavities which they use year round. They will use leaf nests during the summer but only tree cavities are used during the winter. While SFS will utilize cavities in dead snags as small as 10" diameter at breast height (dbh), they prefer nest cavities in larger, living trees averaging 20" dbh. The average height of nest cavities used by SFS is 20 ft. above ground, with an average hole diameter of 1.75 inches. SFS will use larger diameter holes but prefer smaller holes to preclude competition from grey and fox squirrels. They will use holes as small as 1.25 inches in diameter.

Survey Protocol

- Survey area should encompass an area of 1500 ft. from the area of disturbance.
- Conduct a walking survey of trees for presence of potential nest cavities and record number and location of potential cavities.
- Bait stations monitored by trail cams should be placed in areas with potential nest cavities at a distribution of one per 10 acres of habitat. Bait station should be placed on tree with potential nest cavity if present.
- Use bait mixture of peanut butter and rolled oats formed into ball ~size of golf ball. Place in bait container on bait station and secure station to tree trunk ~ 5 ft. above ground.
- Position trail cam at height and distance from bait station to provide coverage area of ~15 ft. around bait container. Motion trigger setting should be adjusted for high sensitivity to allow for trigger by small movement.
- Monitor bait stations for a minimum of 7 days.
- For large survey areas, bait stations can be moved to cover blocks of potential habitat.

Swift Fox (*Vulpes velox)* Information and Small Area Den Survey Protocol

Nebraska Game and Parks Commission

Description/habitat: Small fox, buff colored with black-tipped tail. It is about half the size of a red fox. It is distinguished from other canids by its small size. They are nocturnal. They are found in topographically flat, arid regions of North America. In Nebraska, suitable habitat is in the shortgrass prairie ecoregion where vegetation is less than 40 cm tall and slopes are less than 20%. They are found in higher density in large expanses of prairie, but will use prairie intermixed with agriculture, but at lower density and with smaller dens. The home range can be as small as a few hundred to as large as a few thousand hectares (Harrison 2003), but in Nebraska they have been documented to be 6 miles^2 (Hines 1980).

Reproduction: Mainly monogamous. They breed in late winter. In Nebraska, pups are born between April – June. Weaning begins at approximately 6-7 weeks of age. Pups can be seen above ground as early as June, but are more frequently seen around the den in August and September. Dispersal may begin as early as August, but depending on local conditions may not be until November or December. In one study, pups begin moving between dens in August and begin dispersing in September (Hines 1980). Other studies found that radio collared fox pups did not disperse until November or December (Rongstad 1989). The swift fox's family remains at the natal den longer than other canids.

Dens: Swift foxes use dens throughout the year and rely on them for protection (Tannerfeldt et al 2003). Swift fox dens are generally found in elevated areas with well-drained soils. Extensive natal dens will have numerous entrances whereas dens for escape from predators may only have one opening (Tannerfeldt et al 2003). In Nebraska, den entrances primarily had east or western exposures (Hines and Case 1991). Swift fox dens are usually clustered. The fox family, more than most canids, tend to remain at the natal den site until pup dispersal in the fall. Den entrances have a diameter of approximately 20 cm (Cutter 1958, Pruss 1999). Dens are normally near the tops of gently sloping hills. Dens are often located near anthropogenic areas such as near roads and trails or in culverts, pipes, buildings and fallow fields (Tannerfeldt et al. 2003). Speculation suggests that proximity to human activity provides refuge from coyotes, a primary predator.

Distribution: Current distribution estimates are that swift fox represents only 38-41% of its historical range (Sovada and Scheick 2000).

Threats: This species is susceptible to intensive poisoning programs primarily aimed at coyotes. Pups can be killed by raptors and other mammalian predators. Coyotes are a main predator of both adult swift fox as well as pups. Swift foxes are also inadvertently caught in traps and hit on roads.

Disturbance response: Foxes will move in response to some disturbances, but in Canada immediately returned to the area after a pipe construction (Moehrenschlager 2000).

Management Implications: Den ecology is an important aspect of the management of this fox. Habitat protection should focus on the entire home range of the fox as they readily use multiple den sites (Tannerfeldt et al. 2003).

Surveys

Small Area Den Survey: If a relatively small area will be impacted by a type of disturbance/construction, a den survey may be utilized to ensure that no swift fox would be impacted by the construction. The area that must be surveyed includes the limits of construction and an additional 250 yards beyond the area of construction during the natal denning period (April 1 – August 31) or an additional100 yards beyond the area of construction during the non-natal denning season (September 1 – March 31). The survey consists of initially walking (or driving if applicable < 10 mph) the area using transects no more than 50 meters apart to cover the area. Swift fox den entrances have a diameter of approximately 20 cm. They may have multiple entrances, or just one. An active den may have fresh digging at the entrance, although this is not always the case (Jackson et al 2000). Sign such as scat or tracks can also indicate an active den. Swift fox tracks are approximately 1 inch wide and 1.5 inches long. Although this is the smallest canid species, tracks can be confused with other species, especially young coyotes. Surveyors must be familiar with furbearers in the area and be able to identify tracks. Inactive dens may be overgrown with vegetation, have spider webs over the entrance or be caving in. If a den is identified and has potential to be active, we recommend setting up a motion sensitive camera (i.e. a trail camera) at least 10 ft from the den entrance to determine what animal, if any, is using the den. Do not use scent or bait stations within 300 meters of a known or suspected active den as these methods may attract predators.

If it is determined the den is being used by swift fox, contact Michelle Koch (402-471-5438) or Mike Fritz (402-471-5419), both with the Nebraska Game and Parks Commission, to determine how to proceed. Work should not proceed until after further consultation with the Nebraska Game and Parks Commission occurs and conservation conditions to avoid impacts to swift fox have been developed. A buffer zone or “no construction” zone may need to be established in order to avoid impacting swift fox denning in the area.

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Whooping Crane Fact Sheet

Whooping Cranes in Flight

Foraging Whooping Cranes

Adult with juvenile

The Whooping Crane (*Grus americana*) is a federal and state listed endangered migratory species. The Whooping Crane was federally listed as endangered in 1967. Major river systems used by whooping cranes in Nebraska include the Platte, Loup, Republican, and Niobrara rivers. Additionally, a 3-mile-wide, 56-mile-long reach of the Platte River between Lexington and Denman, Nebraska, has been federally designated as critical habitat for whooping cranes. (Information from U.S. Fish and Wildlife Service)

Whooping Crane (*Grus americana*)
Order: *Gruiformes*
Family: *Gruidae*
Status: State and Federally Endangered. **Description:** L 52"(132 cm) W 87"(221 cm). Sexes similar but males are larger. White body with red and black facial markings. Yellow bill and long dark legs. Immature is white with tawny head and neck, and reddish-brown mottling on rest of body. **Habitat:** In Nebraska is found along the Platte Valley, with its wide slow moving river and associated sandbars and islands. Nearby wet meadows, croplands, and marshlands are important for foraging. **Status/Range:** Occasional spring and fall migrant along Platte Valley. 90% of sightings within 30 miles of Platte River, and 80% occurred between Lexington and Grand Island. **Call:** Shrill "*ker-loo-ker-lee-loo"* trumpet. **Comments:** Endangered. Management and protection programs slowly succeeding.

Similar: Sandhill Crane, Snow Geese, and especially American White Pelicans in flight: (Information from Nebraska Game and Parks Commission website)

American White Pelican

The Whooping Crane is one of the rarest birds in North America and also one of the largest. Whooping cranes are vulnerable to accidents during migration. Each spring they travel north from their wintering grounds around Aransas National Wildlife Refuge in Texas to their breeding grounds in Wood Buffalo National Park in central Canada (2,400 miles). Each fall this route is reversed. Their journey traverses eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas. In Nebraska, they stop to rest and feed on the Platte, North and Middle Loup and Niobrara Rivers. (Information taken from the International Recovery Plan, Whooping Crane *Grus americana*; Third revision, 2007).

Whooping Crane Survey Protocol

Whooping Cranes can be disturbed by sight (human figures, equipment within sight) and sound (loud equipment, banging, etc.) that are abnormal (roadway traffic is normal), therefore surveys are needed to ensure disturbance is minimized.

Dates of Survey:

- Spring Migration – March 6 – April 29
- Fall Migration – October 9 – November 15

NDOR will receive migration updates from USFWS. Surveys are to be conducted 3 times a week until whooping cranes are reported in South Dakota (Fall) or Kansas (Spring), then they will be required daily. If all Whooping Cranes have moved out of the area, NDOR and USFWS will consult and no further surveys may be necessary.

<u>Bridge Projects (Roosting Survey)</u>

Time of Survey:

- Prior to sunrise (published clock time) to make use of the beginning daylight hours, record start and stop time
- *Optional* evening survey (after 4:00 pm) to check for birds potentially coming into roost
- Do east side of bridge first to reduce glare from sun.

Method of Survey:

- Stand at the four corners of the bridge – look at all up and down stream channels as far as you can see
- Use binoculars or spotting scope
- Watch for at least 15 minutes overall
  - Look for bird movements – possibly moving within channel among vegetation
  - Look for Whooping Cranes among Sandhill Crane groups
- If cloudy, overcast or foggy and visibility is reduced to below 0.5 miles, allow time for clearing– take additional time to ensure the best survey possible

<u>Linear Projects (Foraging Survey)-not crossing a major river</u>

Time of Survey:

- Survey project within one hour of start of workday, with at least one survey done no later than 10 am. Record start and stop time.
- Survey by driving the area of project to be worked on that day and searching fields for birds within 0.5 miles of project.

For projects which are a combination of bridge and linear work use both methods.

If Whooping Cranes are not seen during the morning survey, work may begin after completion of the survey.

If Whooping Cranes are spotted within 0.5 miles of the active construction:

- Do not start work.
- Stop work if seen at times other than the morning survey.
- Contact NDOR Environmental Section: Melissa Marinovich 402-479-3546 or Zach Cunningham, 402-479-4464
- Melissa Marinovich or Zach Cunningham will contact USFWS and NGPC for further instructions.
- Do not resume work at the bridge or within 0.5 mile of the abutments until NDOR Environmental Section relays the "all clear" message to the Project Manager.
- Work can begin or resume if birds move off; record sighting, bird departure time, and work start time on survey form.