

**WILDLIFE SURVEY PROTOCOL
FOR COAL BED NATURAL GAS DEVELOPMENT
POWDER RIVER BASIN WILDLIFE TASKFORCE**



February 2005

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INTRODUCTION

The Federal Land Policy and Management Act (FLPMA, Sec. 1701 (a) (8)) and National Forest Management Act direct BLM and the USDA Forest Service respectively to manage land in a manner that will provide food and habitat for fish and wildlife while providing for multiple uses. Federal agencies also have wildlife management responsibilities in accordance with the Endangered Species Act, National Environmental Policy Act and other legislation. Surveys to document presence or absence of special status species are one step in the wildlife and habitat management process.

The primary objective of wildlife surveys is to identify occupied habitats. With this information operators can plan their CBNG projects to benefit both wildlife and natural gas production.

A second objective of the surveys is to better define suitable habitat within the Powder River Basin. Much of the research used to define suitable habitat for special status species was not conducted within the Powder River Basin, and therefore local habitat requirements may differ slightly than published reports. Therefore if BLM or the USDAFS request a survey, it is recommended the survey be conducted. If a knowledgeable biologist believes the survey area does not contain even marginally suitable habitat, then contact the appropriate federal biologist to discuss before the appropriate survey season expires.

Survey areas must correspond to the maximum protection area afforded to the species (Table 1). The two-mile requirement for sage grouse must be accommodated to the maximum extent possible. For example a low level aerial survey may be conducted where permission for ground surveys has not been acquired. If there are questions or concerns regarding survey areas, then contact the appropriate federal biologist to discuss before the appropriate survey season expires.

Survey protocols within this document are protocols established by the U.S. Fish and Wildlife Service (FWS), Western Association of Fish and Wildlife Agencies (WAFWA), or peer reviewed publications.

Table 1. Wildlife Survey Criteria. (See “Special Status Species Habitat Screens” for additional information on habitat characteristics.)

SPECIES	PROTECTED ACTIVITY	HABITAT	SURVEY DISTANCE FROM ACTIVITY	SURVEY DATES
Bald Eagle	Nesting (Productivity)	Mature trees	1.0 MI.	April 15 – June 15
Bald Eagle	Winter Roosting	Stands of mature trees	1.0 MI.	Dec. 1 – Feb. 28
Black-tailed prairie dog	Prairie dog colonies	Prairie habitats with deep, firm soils.	Colonies within project area	Year-round
Greater Sage Grouse	Breeding Sites	Openings within sagebrush	2.0 MI.	April 1 – May 7
Mountain Plover	Nesting	Flat, shortgrass prairie	0.25 MI.	May 1 – June 15
Plains Sharp-tailed Grouse	Breeding Sites	High points within grasslands	1.0 MI.	April 1 – May 7
Raptors	Nesting	Nesting Substrates: outcrops, cliffs, stream banks, ridges, knolls, trees, etc.	0.5 MI.	April 15 – June 15
Ute Ladies’-tresses Orchid	Occurrence	Moist soils bordering perennial water	Disturbance area and downstream of discharge points	July 15 – Sept. 15

Greater Sage Grouse Lek Survey & Count Methodology

Developed by Western Association of Fish and Wildlife Agencies and locally adapted by
the Wyoming Game and Fish Department
2004

Definitions:

Lek Survey: A monitoring technique to identify new sage grouse leks and to determine whether known leks are active.

Lek Count: A census technique that documents the actual number of male sage grouse observed on a particular lek.

- Lek count data are primarily used to develop indices to relative population levels and provide short and long term trend information for both populations and changes in occupied range.

Lek Survey Methodology:

1. Searches should be conducted from early April to early May (April 1 – May 7). (Survey season corresponds to peak male attendance as established by the WGFD for documenting population trends.)
2. Surveys for new leks should be conducted a minimum of three (3) times (with subsequent surveys 7-10 days apart).
3. Surveys for new leks should be conducted throughout suitable habitat. New leks can be located by the discovery of concentrated tracks/droppings/feathers at all times of the day when conducting other field activities. Return visits to such sites during the morning strutting hours must be made to confirm the location as a lek.
4. Surveys to confirm the activity of a lek may require only one visit if grouse are identified on the lek.
 - **NOTE** To designate a known lek as inactive requires either an absence of birds on the lek during multiple ground visits under ideal conditions throughout the strutting season or a ground check of the exact lek site late in the strutting season that fails to find any sign (droppings/feathers) of strutting activity.
5. Surveys can be conducted from the ground or from an aircraft.
 - Lek surveys can be conducted from the **ground** by driving along roads in suspected or known breeding habitat and stopping every ½ mile to listen for sounds of breeding grouse. Ground searches can be conducted from an hour before to an hour after sunrise. In less accessible areas, searches can be made from a mountain bike, trail motorcycle, 4-wheel all terrain vehicle, horseback, or on foot. On a calm morning, breeding sage grouse may be heard at a distance of 1.5 km (about 1 mi). All openings or areas of less dense sagebrush should be searched for breeding birds with binoculars or a spotting scope.

- Helicopters or fixed-wing airplanes can be used for **aerial** surveys. Suspected breeding habitat should be flown on north - south transects with lines about one km (.6 mi) apart. Aerial searches are biased toward finding larger leks; small leks (<15 birds) are more difficult to detect. Calm, clear mornings are a prerequisite to aerial searches. Winds over 15 mph and more than scattered cloud cover should be sufficient to cancel search flights. Cocks can be observed from the air at distances greater than one km (0.6 mi) in early morning sun, but cloud cover greatly reduces observability. Under conditions of marginal light, transect width should be narrowed. High winds not only make traveling a straight transect difficult, but also affect strutting behavior. Fewer cocks will strut continuously, and flushing distance appears to be greater under windy conditions.

Transects should be flown at about 100-150 meters (300-450 ft) above ground level. Whenever possible, two observers should be used in addition to the pilot so that one observer is always looking away from the sun regardless of the direction the aircraft is flying. Surveys should begin at the east edge of the survey area and work west to minimize the possibility of the plane flying over leks prior to them being observed. Special attention should be paid to old lakebeds, stock-watering areas, and other relatively open sites largely surrounded by sagebrush with 15 to 25% canopy cover. Lek searches from an aircraft should be conducted from ½ hour before to one hour after sunrise.

6. If a new lek is identified, the location should be accurately determined and recorded in UTM's using NAD83 datum. It is advisable to record/map the perimeters of new leks. Surveyor(s) should **not** disturb grouse to GPS lek locations. If a lek is active, the surveyor(s) should make the best estimate of the lek location and return later to confirm.

Lek Count Methodology:

1. Counts should be conducted during the month following the peak of mating activity, which is usually in early April in Wyoming (April 1 – May 7). Research has shown that the highest numbers of male sage grouse are observed during this period. The increased number of males is due to young males showing up later in the strutting season even though most of the breeding has already occurred.
2. Counts should be conducted from the ground. Counts from fixed-winged aircraft are not accurate enough to be used for monitoring population trends.
3. Counts should be made as close to sunrise as possible and may extend for one-half hour after sunrise. The phase of the moon may affect use patterns of leks. During a full moon, grouse may display at night and consequently terminate activities earlier in the morning.
4. Counts should be conducted a minimum of three (3) times each year for each lek (at least one count every 7-10 days.)
5. Optimum weather conditions for counts are clear, calm days. Wind speeds should be less than 20 mph due to the fact that high winds reduce lek activity. Temperature seems to have little effect on lek activity. Weather conditions should be recorded each time lek observations are made.

6. The location of each lek should be accurately determined and recorded in UTM's using NAD83 datum. Observer(s) should not disturb grouse to obtain lek locations. If a lek is active, the observer(s) should make the best estimate of the lek location and return later to confirm.
7. Data should be recorded on the standardized statewide reporting form with the following format:

						LOCATION				GPS UTM				
<u>Date</u>	<u>Time</u>	<u>Observer</u>	<u>Males</u>	<u>Females</u>	<u>Unk</u>	<u>QQ</u>	<u>Sec</u>	<u>Twn</u>	<u>Rng</u>	<u>northing</u>	<u>easting</u>	<u>Grouse</u>	<u>Sign</u>	<u>Comments</u>

Annual status - Each year a lek will be determined to be in one of the following status categories:

Active. Any lek that has been attended by male sage grouse during the strutting season. Presence can be documented by observation of birds using the site or by signs of strutting activity.

Inactive. Leks where it is known that there was no strutting activity through the course of a strutting season. A single visit, or even several visits, without strutting grouse being seen is not adequate documentation to designate a lek as inactive. This designation requires either an absence of birds on the lek during multiple ground visits under ideal conditions throughout the strutting season or a ground check of the exact lek site late in the strutting season that fails to find any sign (droppings/feathers) of strutting activity.

Unknown. Leks that have not been documented either active or inactive during the course of a strutting season.

Based on annual status a lek may be put into one of the following categories for management purposes:

Occupied Lek. A lek that has been active during at least one strutting season within the last ten years. Management protection will be afforded to occupied leks.

Unoccupied Lek. (Formerly termed “historical lek”) There are two types of unoccupied leks, “destroyed” or “abandoned”. Management protection will not be afforded to unoccupied leks.

Destroyed lek: A formerly active lek site and surrounding sagebrush habitat that has been destroyed and no longer capable of supporting sage-grouse breeding activity. A lek site that has been strip mined, paved, converted to cropland or undergone other long-term habitat type conversion is considered destroyed. Destroyed leks do not require monitoring unless site is reclaimed to suitable sage-grouse habitat.

Abandoned lek: A lek in otherwise suitable habitat that has not been active during a consecutive ten-year period. Before a lek is designated “abandoned” it must be confirmed as “inactive” (see above criteria) in at least four non-consecutive strutting seasons spanning the ten years. Once designated “abandoned”, the site should be surveyed at least once every ten years to determine whether or not the lek has been reoccupied.

Undetermined Lek. Any lek that has not been documented as being active in the last ten years but does not have sufficient documentation to be designated unoccupied. Management protection will be afforded to undetermined leks until their status has been documented as unoccupied.

Other Important Surveys:

The recommended surveys to document sage grouse use in sagebrush habitat where no breeding complexes are known, are 0.5 mile spaced transect surveys conducted by foot or vehicle (ATV). Sage grouse signs, such as droppings or feathers, should be noted.

Sage grouse brood rearing

- Document location of hens with chicks (number) during June 1 to July 30 using GPS equipment

Locating Sage-Grouse Winter Concentration Areas

Introduction

The following section is an excerpt from a draft (02/04/04) chapter of the WGFD's Wyoming Handbook of Biological Techniques concerning monitoring of sage-grouse.

Unlike breeding populations and production, there are no widely accepted methods for assessing winter populations. In part, this is because birds may be spread out over large areas during mild winters but concentrated in a relatively small proportion of the area in severe winters.

Methodology

Probable winter use areas can be searched, during periods of deep snow and cold temperatures from December 1 to February 30, by 4-wheel drive vehicle, snowmobile, or on foot to document sage-grouse winter habitat. Aerial surveys using either a fixed-wing aircraft or helicopter may also be effective in identifying sage-grouse winter habitats and can often be done in conjunction with surveys for other wildlife (e.g. elk trend counts/classifications). North-South transects flown about one minute of longitude apart are recommended. This transect width is not designed to allow complete coverage of an area for "census" purposes. Rather, it is designed to be able to cover significant acreage and determine relative distribution/habitat use patterns. Not every group of grouse will be seen.

Tracks/sign should be recorded along with observations of live birds. Under good conditions (sunlight and fresh, uncrusted snow cover) grouse tracks are quite easy to see at 300 feet or lower level. Tracks are usually seen in groups, the individual tracks tend to wander in a "snakelike" pattern rather than a straight line, and the bird's abdomens plow the snow.

Data collected should include at least approximate flock size and location. In addition, cover type (including sagebrush species present), topography, and snow depth data are also valuable but may not be possible to obtain from the aerial observations. The WGFD's Sage-Grouse Observation Form may be used in this effort. Data should be acquired over a series of years with different snow conditions to give a more complete picture of winter grouse distribution.

SHARPTAILED GROUSE LEK SURVEY & COUNT METHODOLOGY

Same methodology as used for sage grouse.

RAPTOR NESTING / HABITAT

Recommended protocol based on peer reviewed publications.

1. Surveys should be conducted within 0.5 miles of proposed surface disturbance or activity to document nest activity during April 15 to June 15. Surveys outside this period may not accurately depict nesting activity. It is recommended for early nesting species such as eagles and great-horned owls that this survey be conducted early as possible, while late nesting species could be conducted later in the survey window. Surveys for nest sites between Feb. 1 and April 15 shall be avoided to protect this sensitive breeding and nesting period. Surveys conducted at other times of the year, are allowed however a nest occupancy check and/or additional surveys may be required.
2. Surveys should be done in important raptor habitat including: rock outcrops, cliffs, ridges, knolls, stream banks, conifer, and cottonwood trees. Nests should be recorded in UTM coordinates using NAD83 datum.
3. Optimum weather conditions for surveys are clear, calm days. Nests should be approached cautiously to avoid flushing the female, and their status (ie, number of nestling) will be determined from a distance with binoculars or a spotting scope.
4. Nests will not be visited during adverse weather conditions (e.g. extreme cold, precipitation events, windy periods or during the hottest part of the day). Visits will be as brief as possible.
5. Photograph the nest to help illustrate nest shape, condition, and substrate. See attached nest photographs in appendix 2 for assistance in determining nest condition.
6. Data should be recorded on the standardized form, and summarized for project reports in a table format; data should be provided to the land management agency in a digital format. Field names and codes to use are as follows:

Raptor Nest ID

Previously documented nests should be identified in all documentation (reports, tables, etc.) with the identification number supplied by the land management agency, in order to avoid confusion and duplication.

New nests should be identified in a unique 12 digit, alpha/numeric format. The number in its entirety indicates species and location. The first two characters are alpha and refer to the raptor species (first letter). Next is a three digit alpha/numeric character which indicates the township number and whether the township is north or south of the base line (N or S). This is followed by another three more alpha/numeric characters which indicate the range number and whether the range is east or west of the base line (E or W). The next two characters refer to the section and the final two numeric characters represent a sequential number for all known and inventoried nests for that particular species within that section. Therefore, nest number FH11N54E2102 is a Ferruginous Hawk nest in T.11N., R.54E., Section 21, and this is the 2nd ferruginous hawk nest identified within section 21.

Species

BUOW = Burrowing Owl	OSPR = Osprey
COHA = Cooper's Hawk	PEFA = Peregrine Falcon
FEHA = Ferruginous Hawk	PRFA = Prairie Falcon
GOEA = Golden Eagle	RETA = Red-tailed Hawk

GRHO = Great Horned Owl	SWHA = Swainson's Hawk
NOGO = Northern Goshawk	SHHA = Sharp-shinned hawk
BAEA = Bald Eagle	UNAC = Unknown Accipiter
AMKE = American Kestrel	UNBU = Unknown Buteo
LOOW = Long-eared Owl	UNOW = Unknown Owl
MERL = Merlin	UNRA = Unknown Raptor
NOHA = Northern Harrier	

LOCATION

Enter Township Number; for example, **12**; Select/Circle either **N** for North or **S** for South;
 Enter Range Number; for example, **57**; Select/Circle either **E** for East or **W** for West;
 Enter the **Quarter**, and **Quarter/Quarter** Section.

UTM ZONE

Enter the UTM Zone for the nest location:

GEO. DATUM: Circle NAD 27 or NAD 83 or whatever datum is used.
 NAD83 preferred.

NORTHING: Enter the northing UTM coordinate (7 characters);

EASTING: Enter the easting UTM coordinate (6 characters);

NEST SITE ELEVATION

Enter the elevation at the nest in feet. (**NOT** nest height, but the elevation of the terrain)

USGS QUAD NAME

Enter the name of the appropriate USGS 7½" Quad.

BLM MAP NAME

Enter the name of the appropriate BLM 1:100,000 Map.

COUNTY

Enter the name of the appropriate County (if desired).

NEST STATUS

Status of the nest when observed (4 Characters)

ACTI: ACTIve nest; A nest in which a breeding attempt was made as indicated by:

- 1) Eggs in nest, or
- 2) Young in nest, or
- 3) Fledged young near nest, or
- 4) Incubating/brooding adult.

ACTF: ACTIve Failed; An active nest that did not fledge young, indicated by:

- 1) Egg shells in or around nest with no young when, young should be in the nest, or
- 2) Young present but known not to have fledged, or
- 3) Eggs in nest but obviously abandoned (past the time when eggs should have normally hatched).

DNLO: Did Not Locate; Surveyor searched but was unable to locate the nest (does not mean nest is gone or destroyed, merely that the observer was unable to find the nest).

OCCU: OCCUped; A nest with one or more of the following:

- 1) Fresh lining material
- 2) Adult presence at or near the nest
- 3) Recent and well-used perch site near the nest

OCAL: OCcupied ALternate; A tended nest within the boundaries of a territory housing an **ACTI**ve nest.

INAC: **INACTI**ve; A nest with no apparent recent use or adult presence at the time of observation, but in good condition.

INAL: INactive ALternate; An inactive nest within a territory that contains an active nest.

INDI: INactive DIlapidated; An inactive nest in a state of ruin due to weather, natural aging and/or neglect.

INDE: INactive DEstroyed; A nest showing no sign of raptor activity that is destroyed to the point that it is no longer usable without major reconstruction. These nests, for all practical purposes, have disappeared, but there is often still lingering evidence of an historic presence.

GONE: nest was GONE; A nest that was located during a previous survey but has subsequently been found to have been destroyed and no longer exists. No evidence remains.

PRED: PREDated; The nest was active, but there is evidence that it was predated (remains of adults or young, feathers or egg shells scattered, or other physical evidence is present).

NEST CONDITION

GONE: There may or may not be evidence of where the nest was, but it is no longer there.

REMNANTS: Scant material remaining and not usable unless fully rebuilt.

POOR: Nest is dilapidated, in need of major repair to be used.

FAIR: Nest is not dilapidated, but needs significant repair in order to be used.

GOOD: Nest is in need of only minor attention in order for it to be used.

EXCELLENT: Nest is able to be used with little or no attention or maintenance.

UNKNOWN: The nest is obviously present (i.e. a tree cavity, rock cavity), but because of its location, a determination can't be made.

NUMBER OF EGGS

Record the number of eggs in the nest.

NUMBER OF YOUNG

Record the number of young in the nest.

DATE OBSERVED

Date of observation in Month/Day/Year format (MM/DD/YYYY). This format applies to the date of the first observation and the dates of all future observations.

OBSERVED BY

Record the name of the person making the first observation of this nest.

OWNERSHIP

P: Private Land

S: State Land

FS: Forest Service

BLM: BLM (Public) Land

LU: Bankhead-Jones LU Lands

OTHER: Other - Specify

NEST SUBSTRATE

Substrate upon which nest is built (3 Characters)

ABB = Abandoned Burrow

ACB = Active Burrow

ANS = Artificial Nesting Structure

ASP = Aspen Tree

BLS = Blue Spruce Tree

BLT = Broadleaf Tree

BOX = Boxelder Tree

BTT = Butte

CLF = Cliff

CKB = Creek Bank

CTL = Cottonwood Tree (Live)

CTD = Cottonwood Tree (Dead)

DOF = Douglas Fir

ERC = Erosion Cone

ERR = Erosion Remnant (Badland)

GRE = Green Ash

GHS = Ground/Hillside

JUN = Juniper Tree

LIM = Limber Pine Tree

LOW = Low Ridge/Knoll

LPP = Lodgepole Pine Tree

MMS = Manmade Structures

OSS = Other Shrub Species

PON = Ponderosa Pine Tree

RIM = Rimrock

RIP = Riparian Area

ROC = Rock Cavity

ROK = Rock Outcrop

ROL = Rocky Ledge

ROP = Rock Pillar/Pinnacle

RUS = Russian Olive

SAG = Sagebrush

SER = Serviceberry

UNK = Unknown

WIL = Willow (Live)

HEIGHT OF SUBSTRATE

Record (in feet) the height of the substrate upon/in which the nest is located. Height of the cliff/butte/tree/etc. above the surrounding terrain.

HEIGHT OF NEST ON SUBSTRATE

Record (in feet) the height of the nest on/in the substrate (i.e. height of tree nest above the ground; height of cliff nest on cliff height of pillar nest above the surrounding terrain).

NEST EXPOSURE

Record the general direction of nest exposure (i.e. N, NE, S, SW, WNW, etc.)

VEGETATION TYPE

Indicates the type of habitat/vegetation found around the nest site; select habitat type from pull down menu of options.

Badland

Bitterbrush Shrubland

Cottonwood/Riparian

Cultivated Cropland

Cultivated/Reseeded

Grassland

Juniper Woodland

Mixed Mountain Shrub

Ponderosa Pine Woodland

Ponderosa Pine/Grassland

Ponderosa/Juniper Woodland

Ponderosa Pine/Skunkbrush

Riparian

Sagebrush/Grassland

Short Grass Prairie

REMARKS

Any unique features, physical relationships to other nests, proximity to human disturbances, or other pertinent observations are to be placed in the remarks section.

RAPTOR NEST LOCATION

**Powder River Basin Wildlife Taskforce
Raptor Inventory Data Sheet**

Raptor Nest ID*: _____ **Date First Observed*:** _____

Species: _____ **Observed By:** _____

Location: Township _____ N S, Range _____ E W **Ownership:** P S FS BLM LU Other _____

Section _____, _____ ¼ _____ ¼ Nest Substrate*: _____

UTM Zone: _____ Height of Substrate (ft.): _____

Geo. Datum (circle one): NAD 27 NAD 83 Nest Height On/In Substrate (ft.): _____

Northing: _____, Easting: _____ Nest Exposure: _____

Nest Site Elevation: _____ Vegetation Type*: _____

USGS Quad Name: _____ Remarks/Comments: Physical Relationship to Other
Nests, Proximity to Potential Disturbances, Etc.:

BLM Map Name: _____

County: _____

Nest Status*: _____

Nest Condition*: _____

Number of Eggs: _____ Young: _____

* Use existing data codes † Historic Nest Record Monitoring of Nest Activity on Reverse Side

Map/Photo

BLACK-TAILED PRAIRIE DOG

Recommended Protocol

1. Delineate colonies using a GPS receiver in UTM coordinates and NAD83 datum. First, Identify the prairie dog colony with one GPS fix at the approximate center of the town. Then map the colony perimeter by taking points approximately every 10 meters at the outermost burrows around the colony edge. Document segments of the colony by activity level (high, low, or inactive).
2. Use this table to submit data on prairie dog colony locations. If you have GPS files, guidelines and a data dictionary are available at <http://nris.state.mt.us/mtnhp> (navigate to “animals” and “submit data”).

Location: provide as specific location information as possible in UTM coordinates, NAD83 datum.

Township-Range/UTM: Include township, range, section and $\frac{1}{4}$ section and UTM's for the approximate center of the colony. **Activity:** defines if the colony is occupied: YES = animals or fresh sign seen, NO = mounds present but neither fresh sign nor animals seen and mounds show various stages of abandonment. UNKNOWN = mounds present but neither fresh sign or animals seen, mounds may or may not show various stages of abandonment OR the survey was not at the time of day and/or season when animals or fresh sign would be expected to be seen. **Size:** If a colony is active, record the acreage of active mounds. Include the acreage of any inactive mounds, if possible. If a colony is inactive or activity is unknown, indicate the acreage of all mounds. If acreage cannot be accurately estimated, place size in one of the following acreage categories; A: 0-5, B: 6-40, C: 41 – 160, D: 161 – 640, E: > 640, or U: unfamiliar with or unable to give acreage estimation. **How size determined:** Indicate how the size was determined, e.g., visual, 7.5-minute map, GPS. **Density:** estimate the number of burrows per acre: Low = less than 5 burrows per acre, Medium = 5 – 10 burrows per acre, High = more than 10 burrows per acre. (An acre is a circle with a diameter of 235 feet, or a square 209 feet to the side.) **Land Ownership:** Indicate ownership, if known. **Comments:** provide any notable information such as shape of colony, landscape features, or adjacent land use. Indicate if any of these associated species are present: Burrowing Owl, Mountain Plover, Ferruginous Hawk, Swift Fox, or Black-footed Ferret.

Prairie Dog Colony Observation Form

Observer _____
Address _____

Tel. _____
Email _____



<u>Location or Identifier</u>	<u>Township, Range, Section, 1/4 and UTM zone, east, north</u>	<u>Date (mo/day/yr)</u>	<u>Activity Y, N, U</u>	<u>Size (acres) all mounds</u>	<u>Size (acres) active mounds</u>	<u>How size determined</u>	<u>Density L, M, H</u>	<u>Land Ownership</u>
Example: 2.5 mi SSE of Miles City	T7N,R47E,12,NW	7/1/00	Y	20	15	Mapped	M	Private
Comments: Example: Colony is semi-circular in shape. Colony is bordered by grain fields on the north. Five acres of inactive burrows adjacent to the west.								
Example: town ref #. muss99012	13T 271988E, 5171617N	7/12/00	Y	D		Visual	M	BLM
Comments: Example: Colony is elongate, approximately 3/4 mile long and 1/2 mile wide. Two burrowing owls near center of colony and one Ferruginous Hawk.								
1.								
Comments:								
2.								
Comments:								
3.								
Comments:								
4.								
Comments:								
5.								
Comments:								

BLACK-FOOTED FERRET

Introduction

In response to requests from numerous entities and an internal review of the situation regarding ferret surveys, the U.S. Fish and Wildlife Service (Service) and others have been evaluating the potential for a previously unidentified black-footed ferret population to occur in Wyoming and the need for conducting black-footed ferret surveys across the entire state. Through this process, the Service has developed an initial list of habitat blocks that are not likely to be inhabited by black-footed ferrets. In these areas, take of individual ferrets and effects to a wild population are not an issue and surveys for ferrets are no longer recommended. Black-footed ferret surveys are no longer necessary in black-tailed prairie dog colonies statewide (Wyoming).

Please note that “block clearance” must not be interpreted to mean that the area is free of all value to black-footed ferrets. These areas, or blocks, are merely being cleared from the need for ferret surveys. Therefore, this clearance from the survey recommendations reflects only the negligible likelihood of a wild population of ferrets occurring in an area. It does not provide insight into an area’s value for survival and recovery of the species through future reintroduction efforts. For example, while an action proposed in a cleared area needs no survey and is not likely to result in take of individuals, the action could have an adverse effect upon the value of a prairie dog town as a future reintroduction site and should be evaluated to determine the significance of that effect.

A similar block clearance action has not occurred in Montana, therefore black-footed ferret surveys may be required where suitable habitat is present. Black-tailed prairie dog complexes less than 80 acres do not require surveys (USFWS 1989). For any complex greater than 80 acres, the need for black-footed ferret surveys will be determined for each Plan of Development. Conditions for survey waivers may be possible for grouped projects where past history of black-footed ferret surveys are established.

GUIDELINES FOR BLACK-FOOTED FERRET SURVEYS

U.S. Fish and Wildlife Service

Denver, Colorado and

Albuquerque, New Mexico

April 1989

INTRODUCTION

The Endangered Species Act (Act), as amended, requires Federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of a threatened or endangered species. Regulations implementing Section 7 of the Act require that Federal agencies determine if any action they propose "may affect" any threatened or endangered species. If it is determined that a proposed action "may affect" an endangered or threatened species, then the agency is required to request formal Section 7 consultation with the Fish and Wildlife Service (Service).

The black-footed ferret is a federally listed endangered species that depends upon the prairie dog (*Cynomys spp.*) as a source of food and uses its burrows for shelter. Ferrets are rare, nocturnal animals whose brief above-ground nighttime activities make them difficult to find and observe. Any actions that kill prairie dogs or alter their habitat could prove detrimental to ferrets occupying the affected prairie dog town(s). This requires that we determine whether ferrets are present in a proposed project area and whether the proposed project activity "may affect" the survival and recovery of this endangered species. To help detect the presence of ferrets on a prairie dog town, the Service has prepared this set of guidelines. These guidelines should assist agencies or their authorized representatives in designing surveys to "clear" prairie dog towns prior to initiation of construction projects, prairie dog control projects, or other actions that affect prairie dogs. They are intended for use by Service personnel and other State, Federal, or private agencies or organizations interested in conducting surveys for the black-footed ferret. In addition these guidelines should assist individuals in designing surveys to be used in areas suspected of maintaining a ferret population, but without confirmed or recent sightings. If these guidelines are followed by persons conducting black-footed ferret surveys, agency personnel can be reasonably confident in results that show black-footed ferrets are not occupying a proposed project area. A survey for ferrets will supplement the consultation process, but does not relieve any agency of their obligation to consult with the Service as required by Section 7 of the Act.

To determine whether the limits and exclusions apply to an area being proposed for a planned action, the lead agency should consult with the appropriate Service office (see Appendix I). In situations where the limits or exclusions do not apply, each State Supervisor or Associate Regional Director is authorized to determine what precautions must be taken to ensure that ferrets are not adversely affected before a prairie dog town is impacted or destroyed.

SURVEY CRITERIA

Delineation of Survey Areas

Until the time that the Service, States, and other Federal agencies are able to identify reintroduction areas and to classify other areas as being free of ferrets, surveys for black-footed ferrets will usually be recommended. During this interim period the following approach is recommended to determine where surveys are needed.

A black-tailed prairie dog (*Cynomys ludovicianus*) town or complex of less than 80 acres having no neighboring prairie dog towns may be developed or treated without a ferret survey. A neighboring prairie dog town is defined as one less than 7 kilometers (4.34 miles) distance from the nearest edge of the town being affected by a project.

Black-tailed prairie dog towns or complexes greater than 80 acres but less than 1,000 acres, may be cleared after a survey for black-footed ferrets has been completed, provided that no ferrets or ferret sign have been found.

A white-tailed prairie dog (*Cynomys leucurus*) town or complex of less than 200 acres having no neighboring prairie dog towns may be cleared without a ferret survey. White-tailed prairie dog towns or complexes greater than 200 acres but less than 1,000 acres, may be cleared after completion of a survey for black-footed ferrets provided that no ferrets or their sign were found during the survey.

A complex consists of two or more neighboring prairie dog towns each less than 7 kilometers (4.34) from the other. Instructions for determining a complex of black-tailed or white-tailed prairie dogs are found in Appendix II.

Before any federally funded or permitted activities are conducted on black-tailed or white-tailed prairie dog towns or complexes greater than 1,000 acres, the appropriate Service office should be contacted to determine the status of the area for future black-footed ferret reintroductions (see Appendix I). That office also will determine whether a survey for black-footed ferrets should be completed.

Defining a Prairie Dog Town

For the purpose of this document a prairie dog town is defined as a group of prairie dog holes whose density meets or exceeds 20 burrows per hectare (8 burrows/acre). Prairie dog holes need not be active to be counted but they should be recognizable and intact; i.e., not caved in or filled with debris

Timing of Surveys

The Service recommends that surveys for black-footed ferrets be conducted as close to the initiation of a project construction date as possible but not more than 1 year before the start of a proposed action. This is recommended to minimize the chance that a ferret might move into an area during the period between completion of a survey and the start of a project. If the town being affected is part of a complex in which the combined acreage of prairie dog towns total less than 1,000 acres, a survey of all the prairie dog towns within the complex will serve to clear the entire area provided no black-footed ferrets or their sign are found. If this is done, no future surveys for ferrets will be required within the borders of the complex regardless of future project activities unless a ferret is observed and confirmed on the complex at a later date.

An alternative to clearing all of the complex would be to search only the prairie dog town(s) being affected. Assuming that no ferrets or ferret sign is found, this would allow an activity to take place on the prairie dog town. If an activity is proposed in the same area in the future, a survey for ferrets may again be required if the Service cannot justify an exemption based upon the ferret history in the area, survey records, or current status of prairie dog habitat.

In a prairie dog town or complex where the acres of prairie dog towns meet or exceed 1,000 acres, any prairie dog town being affected should be surveyed as close to the initiation of project activity as possible, but not more than 1 year prior to the proposed action. When other projects are planned that will affect different prairie dog towns within the complex, they too will need to be surveyed before the project starts. Towns or complexes of 1,000 or more acres should be given special consideration for their importance to the overall recovery and survival of the black-footed ferret as potential reintroduction areas. The Service would like to minimize disturbances of these areas until black-footed ferret reintroduction sites have been selected. Once reintroduction sites are selected, these large areas of prairie dogs can be cleared from the need for future surveys if the area is surveyed, no ferrets or ferret sign are found, and it is determined that the area is not needed or suitable for ferret recovery.

PROJECT TYPE

Construction projects - both linear and spatial developments that permanently alter prairie dog towns (buildings, facilities, surface coal mines, transmission lines, major roadways, large pipelines, impoundments, etc.) should be surveyed. The area to be surveyed should include all black-tailed prairie dog towns or complexes greater than 80 acres and white-tailed prairie dog towns or complexes greater than 200 acres occurring on a project right-of-way and the portion of those towns found within one-half mile of the construction site or right-of-way border. Projects of a temporary nature and those that involve only minor disturbance (e.g., fences, some power lines, underground cables, etc.) may be exempted from surveys when project activities are proposed on small prairie dog towns or complexes of less than 1,000 acres, do not impact those areas where ferret sightings have been frequently reported, or occur on areas where no confirmed sightings have been made in the last 10 years. To determine whether a project qualifies for exemption, the lead agency must contact the appropriate Service Office (see Appendix I)

Pesticide or toxicant use - The Service recommends that before any action involving the use of a toxicant in or near a prairie dog town begins, a survey for ferrets should be conducted. This includes all black-tailed prairie dog towns or complexes greater than 80 acres or white-tailed prairie dog towns or complexes greater than 200 acres proposed for control. If phosphide-treated grain, gas cartridges, or tablets are the proposed toxicants and the town proposed for treatment is in a complex of less than 1,000 acres, the town should be surveyed 30 days or less before treatment using the nocturnal survey technique (see Selection of Survey Method, Method 2). In this situation it is recommended that the entire complex be surveyed and cleared before treatment begins. This would avoid the need for an additional survey if the town needs to be treated again at a later date. Otherwise the town to be treated should be surveyed as described above and surveyed again if a second treatment is needed.

Prairie dog towns or complexes greater than 1,000 acres should not be poisoned without first contacting the appropriate Service office (see Appendix I). Procedures to be followed on large towns or complexes will be the same as for those recommended for construction projects.

If the proposed control agent involves the use of any other compound under registration with the Environmental Protection Agency, then the area to be surveyed for ferrets should include the prairie dog town to be treated and any other town or portion of a town within 1 mile of the town being treated with the toxicant. The survey should be conducted within 30 days or less of the treatment using the nocturnal survey technique. This difference is justified on the basis of potential hazards to ferrets from secondary poisoning. As above, if the town(s) are part of a complex of less than 1,000 acres and the entire complex is surveyed for ferrets, then no future surveys will be required in the affected area if ferrets or their sign are not found.

SELECTION OF SURVEY METHOD

Two methods to survey for black-footed ferrets or their sign are recommended. Either can be used. These methods are based upon the most recent survey research data, and both involve specific time periods. Research has shown a marked decrease in ferret activity and/or sign in November, April, May, and June. For this reason surveys for ferrets during these months are not recommended, since no acceptable confidence can be placed on the results of surveys conducted during this period.

METHOD 1

Diurnal (daylight) surveys for ferrets are recommended if surveys are conducted between December 1 and March 31. This type of survey is used to locate signs left by ferrets. During winter months, ferret scats, prairie dog skulls, and diggings are more abundant because prairie dogs are less active and less likely to disturb or destroy ferret sign. When there is snow cover, both ferret tracks and fresh diggings are more obvious and detectable. Daylight searches for ferret sign, should meet the following criteria to fulfill the minimum standards of these guidelines.

1. Three searches must be made on each town. Each search should be done when fresh snow has been present for at least 24 hours and after 10 or more days have passed between each search period.
2. Vehicles driven at less than 5 miles per hour may be used to search for tracks or ferret diggings, but complete visual inspections of each part of the town being surveyed is required (i.e., visually overlapping transects).
3. If ferret sign is observed, photograph the sign and make drawings and measurements of diggings before contacting the appropriate Service office (see Appendix I) and State Wildlife Agency.

Aerial surveys for ferrets are considered experimental, but may be allowed in winter using skilled aerial observers when suitable snow conditions exist. Determination of when to use this technique should be made with the appropriate Service office (see Appendix I).

METHOD 2

Nocturnal (nighttime) surveys involve the use of spotlighting techniques for locating ferrets. This survey method is designed to locate ferrets when the maximum population and the longest periods of ferret activity are expected to occur.

Minimum standards have been established by the Service for nocturnal surveys, these should be followed as recommended and include:

1. Surveys should be conducted between, July 1 and October 31.
2. The prairie dog town should be continuously surveyed using spotlights. Surveys should begin at dusk and continue until dawn on each of at least three consecutive nights. Large prairie dog colonies should be divided into tracts of 320 acres and each tract systematically

searched throughout three consecutive nights. Rough uneven terrain and tall dense vegetation may require smaller tracts to result in effective coverage of a town.

3. Observations on each prairie dog town or tract searched should begin a different starting point on each successive night to maximize the chance of overlapping the black-footed ferrets' nighttime activity period(s).
4. A survey crew consists of one vehicle and two observers equipped with two 200,000 to 300,000 candle power spotlights. In terrain not suitable for vehicles, a crew will consist of two individuals working on foot with battery-powered 200,000 to 300,000 candle power spotlights. To estimate the number of crew nights for a survey, divide the total area (acres) of prairie dog town to be surveyed by 320/acres and multiply by 3. One or both of the observers in each survey crew should be a biologist trained in ferret search techniques.

Survey Reports

The following outline provides a general summary of the types of information useful to the Service in reviewing the results of ferret surveys for concurrence with an agency's decision of "may affect" or "no affect." This information will be used to assist in Section 7 compliance decisions. Headings listed can be used in field data forms to ensure that all pertinent data are collected and surveys are not unnecessarily repeated. It is recommended that a report summarizing survey data be prepared for each project and submitted to the lead agency and to the appropriate Service office (see Appendix I). Data requirements for daylight searches (December 1 to March 31) or night searches (July 1 to October 31) are as follows:

1. Date
2. Hours spent searching (record time started - time stopped)
3. Acres searched
4. Number of colonies searched
5. Number of burrows inspected
6. Ferrets or ferret sign observed and locations
7. Photos taken
8. Names, address(es), telephone numbers and qualifications of searchers
9. Weather conditions (ground condition bare or snow covered)
10. Method used to search (backpack spotlight, vehicle, walking)
11. Mapped survey route and location of prairie dog town

Survey Summary

1. Starting and completion dates for the survey
2. Total hours of spotlight search
3. Total acres searched by spotlight
4. Total colonies searched using spotlight
5. Total ferrets observed and locations by night search
6. Total hours searched in daylight
7. Total acres searched in daylight
8. Total colonies searched in daylight
9. Total ferret sign observed and location of sign observed
10. Narrative describing search technique used

11. Mapped location of central project (include acres and description)
12. Copies of field data sheets

Surveyor Qualifications

The Service has established a process to provide specific training for conducting ferret surveys. This formal training (a 1-day workshop for biologists) is currently available through the Wyoming Cooperative Fishery and Wildlife Research Unit, Box 3166, University Station, Laramie, Wyoming 82071, telephone (307) 766-5415. A trained biologist should accompany each survey crew; i.e., one trained biologist in each two person crew, when surveys are being conducted.

A field guide "Handbook of Methods for Locating Black-footed Ferrets" provides detailed methods for locating black-footed ferrets and interpreting sign made by this animal under field conditions. This handbook should be useful when designing surveys for black-footed ferrets, whether for Section 7 compliance or for locating ferrets for conservation and recovery. A copy of this document may be obtained from:

Bureau of Land Management
Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82001

Bureau of Land Management
Montana State Office
P.O. Box 36800
Billings, Montana 59107

COORDINATION OF SURVEYS

This section discusses coordination measures that the Service believes are vital to completing a proper survey.

State Wildlife Agency

The appropriate State wildlife agency should be contacted prior to initiating ferret surveys. State agency personnel may provide historical information or literature pertinent to the survey or offer suggestions regarding access or landowner contacts needed for the survey. In addition, some States may require special permits for spotlighting wildlife or have minimum requirements for protecting ferrets under State laws which are different or more detailed than those described in these guidelines.

Other Local Authorities

We recommend that persons planning surveys contact local authorities before initiating surveys. Many sheriff departments cooperate with State conservation officers in investigating possible game violations. Spotlighting crews are often reported to the game warden and sheriff by local citizens and ranchers. Proper coordination of survey activities should prevent unnecessary conflict with these groups and agencies.

PROCEDURES TO FOLLOW IF FERRET SIGN OR A FERRET IS LOCATED

Wildlife agencies of some States located within the potential range of the black-footed ferret have developed a procedure to follow when ferrets are seen and reported. We recommend that agencies or their representatives request these procedures from the States in which they are working and review them before conducting surveys. If no procedures are available, contact the appropriate Service office (see Appendix I) for guidance. If you observe a ferret while conducting surveys, you should notify the closest Service or State wildlife agency office within 24 hours.

Experience has shown that premature release of a ferret sighting to the news media or others can have lasting negative effects upon recovery actions in the area. We request that contacts with the public be avoided until the presence of a ferret is confirmed by the Service or State wildlife agency and necessary landowner contacts and discussions are completed.

Appendix I

A set of rules for circumscribing a prairie dog complex has been developed by "Biggins, D., B. Houston, B. Miller, B. Oakleaf, T. Clark and A. Dood. 1988. A system for evaluating black-footed ferret habitat. U.S. Fish and Wildlife Service Draft Report, 40 p. plus appendix." This method provides a practical and reasonably straightforward procedure for circumscribing a complex of prairie dogs.

To determine the acreage that a prairie dog town or complex of towns occupy, several steps are required. A diagrammatic example of a simulated complex is presented here. Before starting this exercise, those prairie dog towns that will be affected by the action and those in the surrounding area should be identified on a map having a scale of 1:24,000. Once this has been done, the following procedures should be followed:

1. Determine the northernmost prairie dog town on the map. Start at the northernmost point of the northernmost town of the complex being considered.
2. Pivot a 7-km (4.34 mile) line segment clockwise from due north until it touches a point on a town (see example). The line between the initial point and the second point forms the first segment of the polygon.
3. From the second point, pivot the 7-km line clockwise from alignment with the first segment until it touches a third point on a town. This forms the second segment of the polygon.
4. If a convex town perimeter prevents "pivoting" the 7-km line to another point, move clockwise around that perimeter until Step 3 can be accomplished. The convex perimeter of a town can thus become a segment of the boundary of the complex.
5. Continue pivoting the line from town to town until the polygon becomes closed.
6. In rare circumstances, a complex may contain one or more large prairie dog-free spaces (diameter = 7 km). Delete this space from the area of the complex, circumscribing it as follows.
 - a. Start at the southernmost point of the northernmost town in the prairie dog-free space.
 - b. Pivot a 7-km long line counter-clockwise from due south until it touches a point on a town.
 - c. If a concave town perimeter prevents the "pivoting" 7-km line from contacting another point, move counter-clockwise around that perimeter until (b) can be accomplished.
 - d. Repeat step (b) until the polygon becomes closed.

BALD EAGLE WINTER ROOST SITES

Recommended protocol based on peer reviewed publications.

1. Survey stands of coniferous and cottonwood trees during the period of Dec. 1 to March 1 from 1 hour before sunrise or sunset to 1 hour after sunrise or sunset. Surveys after this period are not reliable. Late afternoon surveys may be preferable as eagles often leave roost sites at or before dawn and may return to roost throughout the afternoon.
2. Helicopters or fixed-wing airplanes can be used for surveys. If not following a drainage, suspected roost habitat should be flown on north - south transects with lines about one km (.6 mi) apart. Under conditions of marginal light, transect width should be narrowed. Transects should be flown at about 100-150 meters (300-450 ft) above ground level. Whenever possible, two observers should be used in addition to the pilot so that one observer is always looking away from the sun regardless of the direction the aircraft is flying. Surveys should begin at the east edge of the survey area and work west to minimize the possibility of the plane flying over roost sites prior to them being observed.
3. Document all bald eagle observations using GPS equipment (UTMs - NAD83).
Record: date, location, number seen, age class (adult, juvenile, unknown eagle) and habitat
4. Survey will consist of at least 3 visits, with at least 1 week between visits. Visits should extend throughout the winter roosting season (recommended minimum of 1 visit per month), as eagle use is largely dependent on regional weather patterns, and eagle use often increases as the roosting season progresses. APD analysis shall proceed with the completion of 3 visits so as not to delay APD analysis for the entire three month survey period.

Introduction

The U.S. Fish and Wildlife Service has withdrawn the proposal to list the mountain plover and will no longer be reviewing project impacts to this species under the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 *et seq.* However, the land management agencies continue to provide protection for this species in accordance with the Powder River Basin Oil and Gas Project Final EIS and Montana Oil and Gas Final EIS and their respective Records of Decision. In addition the mountain plover remains protected under the Migratory Bird Treaty Act (16 U.S.C. 703) and as a sensitive species under Bureau and USDAFS policy.

MOUNTAIN PLOVER SURVEY GUIDELINES **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.

These guidelines were developed by Service biologists and Dr. Fritz Knopf, USGS-BRD. Keep in mind these are guidelines - please call the local Fish and Wildlife Service, Ecological Services office, 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 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 1/4 mile buffer is recommended.

SURVEY TO DETERMINE PRESENCE/ABSENCE

Large scale/long term projects

1. Conduct the survey between May 1 and June 15, throughout the breeding range.
2. Visual observation of the area should be made within 1/4 mile of the proposed action to detect the
 - i. 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.
3. If no visual observations are made from vehicles, the area should be surveyed on ATV's. 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.
4. 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.
5. 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.
6. 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 (4 inch diameter or less), 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 1/4 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

1. Identify appropriate habitat and habitat of interest within geographic areas of interest.
2. Upon arriving in appropriate habitat, drive to a previously determined random starting point.
3. For subsequent points, drive a previously determined random distance of 0.3, 0.4 or 0.5 miles.
4. 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 subsample 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 transect and point locations on USGS county maps.
 Universal Transverse Mercator from maps or GPS are useful.

Additional Data Requested by CBNG Wildlife Taskforce Where Mountain Plovers are Observed Quantitative data should be measured and not estimated ocularly.

Vegetation species present
Vegetation cover by grass, prickly pear, all forb, rock, bare ground, shrub
Vegetation height by grass, forb, shrub
Vegetation density by grass, forb, shrub?
Area of similar vegetation (habitat)
Prairie dog colony present (area)
Distance to topographic feature (and type)
Grazing evidence, season of use
Percent slope
Photograph

GENERAL HABITAT INDICATORS

Positive habitat images

Stock tank (non-leaking, leaking tanks often attract killdeer)
 Flat (level or "tilted") terrain
 Burned field/prairie/pasture
 Bare ground (minimum of 30 percent)
 "Spaced" 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

RECOMMENDATIONS AND GUIDELINES FOR UTE LADIES'-TRESSES ORCHID (*Spiranthes diluvialis*) RECOVERY AND FULFILLING SECTION 7 CONSULTATION RESPONSIBILITIES

June 1995

As a follow-up to a recent Ute ladies'-tresses orchid recovery team meeting the U.S. Fish and Wildlife Service (Service) has prepared these recommendations and guidelines for Service staff and partners to further orchid recovery and aid in conducting Section 7 consultations.

BACKGROUND

Ute ladies'-tresses orchid (*Spiranthes diluvialis*) is endemic to moist soils near springs, lakes, or perennial streams. The elevational range of known orchid occurrences is 4,200 to 7,000 feet. Most of the occurrences are in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows in the floodplains of perennial streams, but some locations in the eastern Great Basin are in similar situations near freshwater lakes or springs. The orchid appears to require moisture in the rooting zone, typically provided by a high ground water table, through the growing season and into late summer or early autumn. The orchid is well adapted to disturbances caused by stream movement through floodplains over time, and is tolerant of other disturbances, such as grazing, that may mimic natural disturbances in their effects on riparian habitat. Suitable potential habitat is typically found along streams that experience heavy spring runoff of sufficient magnitude to create movement and reshaping of the stream channel. Plants usually occur as small scattered groups and occupy relatively small areas within the riparian system. It is not known how, under what conditions, and in what time frame, the orchid is dispersed and new viable colonies established. The orchid is generally intolerant of deep shade and strongly alkaline or clay soils and cannot compete with aggressive rhizomatous species such as reed canarygrass (*Phalaris arundinacea*) and cattails (*Typha* spp.) or exotic species such as Canada thistle (*Cirsium arvense*). Attachment 1 provides a more complete description of orchid biology, life history, and ecology.

"Typical" orchid habitat, as described above, can be found throughout the Intermountain and Rocky Mountain west and the western plains. However, the orchid only occurs in significant numbers in two locations, in and near Boulder, Colorado along the east slope of the Front Range, and in the Uinta Basin along the south slope of the Uinta Mountains. Otherwise, it is found infrequently in widely scattered locations. Recent discoveries of colonies in Wyoming and Montana indicate that surveys for and inventories of orchid occurrences continue to be an important part of orchid recovery planning and implementation. The recovery team has identified and prioritized areas where survey and inventory of the orchid are important.

SECTION 7 CONSULTATION AND UTE LADIES'-TRESSES ORCHID SURVEYS

Potential habitat is fairly common, yet orchid occurrences are infrequent and unpredictable. Because the probability of actually finding an orchid colony at any one location is small, the Service wishes to avoid the regulatory burden of requiring surveys under Section 7 of the Endangered Species Act for all projects throughout the potential range of the species. However, in order to recover the orchid, it is important that surveys be conducted in appropriate locations and in response to impending impacts to colonies or potential habitat. The Service has therefore developed the following recommendations and guidelines to help ensure that surveys are conducted where and when appropriate

General Guidelines for Surveys

Field Offices are encouraged to take the following actions regarding surveys for Ute ladies'-tresses orchid:

1. Solicit funds and organize partnership and volunteer efforts to conduct surveys in identified high priority areas, especially those in which future impacts are likely to occur. Survey efforts should be coordinated with state Natural Heritage Programs and with the orchid recovery team.
2. Acquaint all Service staff with the orchid, high priority areas for surveys, habitat preferences, and species identification. Staff should have the orchid in mind when visiting wetlands or streams for any purpose, and also when reviewing projects of any type, for example, fishery, wetland, or stream enhancement or

alteration projects, FERC and 404 licenses, and surveys for other species of interest that may be in or near potential orchid habitat.

3. Develop relationships with state and other Federal partnership agencies to acquaint them with orchid habitat, appearance, and priority areas for survey. Encourage them to look for the orchid when in suitable areas and notify Service staff about projects that are planned for potential orchid habitat. Especially important partners include state wildlife agencies, state stream management or water quality agencies, Corps of Engineers, Natural Resources Conservation Service, Bureau of Reclamation, Forest Service and Bureau of Land Management.
4. Require surveys as part of Section 7 consultation under appropriate conditions in areas identified as high priority for surveys. Appropriate conditions include:
 - a. large areas of potential habitat will be impacted. Examples of projects that can result in impacts to large areas of potential habitat include stream channelization and stabilization, stream habitat improvement, projects that impact downstream hydrology and hydrograph such as dams, diversions, and hydropower, gravel mining operations And streamside recreation trails.
 - b. b. planning time frame allows a survey to be conducted, i.e., project will not be initiated until after the next orchid flowering period. If possible, surveys should be conducted for several years. Developers in priority survey areas should be educated about the orchid and the need for surveys. They should be encouraged to plan projects sufficiently ahead that surveys will be possible so that they will not be put in a bind should the Service determine that a proposed project will have an impact on potential orchid habitat of sufficient magnitude that a survey will be required before permits can be issued.

Recommendations and Guidelines for Section 7 Consultation

The Service has placed potential habitat within the known distribution of Ute ladies'-tresses orchid into 3 categories for purposes of Section 7 consultation as follows:

Category 1: Surveys Required

Ute ladies'-tresses orchid is currently documented as occurring within the watershed or is documented as having occurred within the watershed within the past 50 years. Surveys for the orchid should be required as part of Section 7 consultation for projects that will have an impact on potential habitat. Agencies, developers, and others who may propose projects in areas with potential habitat should be alerted that such surveys will be required and urged to schedule project planning so as to allow time for orchid surveys during the flowering period in late summer.

Category 2: Surveys Recommended

Ute ladies'-tresses orchid may have occurred within the watershed or in nearby similar watersheds, however historical records are incomplete and the orchid is not now known to occur in the area. The watersheds are adjacent to or essentially similar in character to those where the orchid is currently known to occur. Surveys are recommended, particularly in circumstances when large areas of potential habitat will be impacted and/or when planning schedules permit surveys prior to project commencement. Project proponents should be alerted and encouraged to schedule project planning to as to allow time for orchid surveys.

Category 3: Surveys Encouraged

Ute ladies'-tresses orchid is not known to occur in or near these watersheds. However, given the known distribution of the orchid and character of the watersheds, it is possible that the orchid could be discovered. Surveys are not required or recommended as part of Section 7 consultation. However, Service field offices and partners are strongly encouraged to organize and support survey efforts in these watersheds.

Attachment 2 is a list of Category 1, 2, and 3 areas in Idaho, Colorado, Montana, Nevada, Utah and Wyoming. The areas are referenced as watershed units or subunits from USGS Hydrologic Unit maps of each state. Within these watershed units, wetlands, springs and seeps, and riparian areas within the 100 year floodplain of perennial streams below 6,500 feet elevation should be considered potential habitat. Recommended survey areas in each category will be revised as new information becomes available.

Survey Procedures

Ute ladies'-tresses orchid can only be reliably found and identified when it is flowering, which typically occurs sometime during the period from mid-July through mid-September. Surveys are conducted by walking or otherwise closely scrutinizing areas of potential habitat looking for flowering stalks. Surveys conducted at other times of the year are not reliable and are therefore not acceptable to the Service for purposes of clearance under Section 7.

Surveys should be conducted by knowledgeable botanists trained in conducting rare plant surveys. The Service does not maintain a list of "qualified" surveyors. However, the Service can refer those wishing to become familiar with the orchid to experts within their area who can help provide training.

Potential Habitat

Within the recommended search areas, surveys should focus only on good potential habitat as described in the Background section and in Attachment 1.

Disqualified Habitat

Considerable experience in conducting surveys in Colorado and Utah has led to identification of a number of habitat and landscape features that indicate that a site does not qualify as suitable potential habitat for Ute ladies'-tresses orchid. Most of these features can be identified at any time of year, often by as simple an activity as driving by in a vehicle. Surveyors are urged to visit sites where projects are proposed and surveys may be recommended to determine whether, and how much, of the site actually qualifies as good potential habitat. Typically, the amount of good potential habitat in a project area is limited. Therefore, if it is a hardship for a project to be postponed until the following summer in order for a survey to be completed, it is often possible to make minor design changes to avoid potential habitat. Caution must be taken to avoid alterations in hydrology, however.

The following features serve to disqualify potential orchid habitat:

1. Appropriate hydrology not present, typically indicated by:
 - area is composed of mostly upland vegetation
 - area dries up by mid-July, with water table lower than 12 inches below the soil surface
2. Heavy clay soils present
3. Soils strongly alkaline
4. Site heavily disturbed, such as, for example:
 - stream banks channelized and stabilized by heavy rip-rap
 - highway rights-of-way built on filled or compacted soil or rock material
 - construction sites where construction has either stripped the topsoil or where construction has been completed within the last 5 years but the area has not been revegetated

(note that Ute ladies'-tresses orchid has been found in some heavily disturbed sites where hydrology is appropriate, such as revegetated gravel pits, heavily grazed riparian edges and pastures, and along well-traveled trails developed on old berms)

5. Stream banks steep, transition from stream margin to upland areas abrupt
6. Site characterized by standing water with cattails, bullrushes, and other aquatic vegetation (note that margins of such areas may be suitable habitat)
7. Riparian areas or stream banks vegetated with dense rhizomatous species such as reed canarygrass (*Phalaris arundinacea*), tamarisk or salt cedar (*Tamarix ramosissima*), teasel (*Dipsacus sylvestris*), common reed (*Phragmites australis*), or saltgrass; (*Distichlis spicata spicata*)
8. Riparian areas overgrazed or otherwise managed such that the vegetation community is composed of upland native or weedy species or is unvegetated. Note that the orchid can tolerate rather extreme overgrazing as long as it has not resulted in a drop in the water table as indicated by conversion of the riparian vegetation community to mostly upland species.
9. Potential habitat is no longer in a natural condition, for example, has been converted to agricultural uses and is now plowed and cropped, or has been converted to lawns or golf courses
10. Wetland is a brackish playa or pothole not fed by springs or not in the floodplain of or connected hydrologically with a riparian system or other source of fresh water

PERMITS AND VOUCHER SPECIMENS

Ute ladies'-tresses orchid (*Spiranthes diluvialis*) can be mistaken with a closely related species, *Spiranthes romanzoffiana*, which generally grows at higher elevations. It is important that potential new discoveries be appropriately identified and verified. However, since Ute ladies'-tresses orchid often occurs in very small numbers, destructive sampling may be undesirable. Proper verification of new locations of Ute ladies'-tresses orchid should include (1) identification of the species by experts, (2) depositing a voucher specimen in an authorized institution, and (3) completion of a data form, such as an Element Occurrence Record form provided by the state Natural Heritage Program, and submission of the form to the state Natural Heritage Program and the Service.

Field Offices should have at least one staff person with a permit for collecting *Spiranthes diluvialis* and should be sure that other authorized surveyors, such as the state Natural Heritage Programs, have the necessary permit also. It is not necessary for everyone conducting surveys to have a permit, however. Service staff should make sure that all potential surveyors understand the permit requirements and persons without a permit do not take specimens. Service staff should also encourage all surveyors and partners to notify the Service immediately if it is suspected that a new location of Ute ladies'-tresses orchid has been discovered. There have been problems in the recent past with surveyors waiting several months before notifying the Service or the state Natural Heritage Program. Immediate notification will allow the Service an opportunity to arrange for a person with the proper permit to take a voucher specimen and contact experts to help with identification when the orchid is still fresh and flowering. The Service may need to provide assurances to surveyors that information will be treated as confidential until surveyors have had an opportunity to notify their clients of a discovery. For your information, attachment 3 lists specifications placed on permits issued in 1995.

TRAINING

The Service and the Ute ladies'-tresses orchid recovery team will be working to develop training materials and conduct training workshops for Service staff, partners, and other interested persons. To facilitate that effort, Service staff and partners are encouraged to take photographs or make video tapes of potential habitat and orchid colonies in their areas and also to share their experience and expertise in conducting surveys. Training will include education about:

Habitat

- preferred or good potential habitat characteristics
- features that disqualify habitat
- habitat management

Identification

- characteristics that distinguish *Spiranthes diluvialis* from other orchids that may be encountered

Survey Methods

- when to survey
- what to look for
- how to look
- data documentation and recording
 - what should be noted
 - how it should be recorded
 - to whom it should be submitted

Regulations

- Section 7 consultation and conservation recommendations
- permits and collecting

Recovery

- recovery approach and goals
- status of recovery planning and implementation
- potential partners and their role

CONCLUSION

This guidance was prepared to encourage actions that will further orchid recovery and avoid placing an extreme regulatory burden on those planning projects within potential habitat areas. The Service hopes that good communication, coordination, and education among staff, partners, and the public can promote orchid recovery without conflict and acrimony.

SENSITIVE SPECIES

BLM and USDAFS sensitive species and other incidental wildlife observations should be recorded. Appendix 1 lists the sensitive species and other special status species by land manager. Any observations of these species should be reported to the land management agency regardless of whether that land manager designates the species as a special status species or not. Additional surveys for these species may also be required by the land management agency. If no surveys are required the following minimum data should be collected:

- Species
- Sex
- Number
- Date
- Time
- UTM Coordinates, datum
- Photographs
- Activity
- Habitat Description
- Nest or other breeding activity

APPENDIX 1. Special Status Species designated by the BLM Buffalo, Casper, and Miles City Field Offices and the USDAFS Thunder Basin National Grasslands.

Common Name (scientific name)	BFO	CFO	MCFO	TBNG
Amphibians & Reptiles				
Northern leopard frog (<i>Rana pipiens</i>)	S	S		S
Snapping turtle (<i>Chelydra serpentina</i>)			S	
Spiny softshell turtle (<i>Trionyx spiniferus</i>)			S	
Spotted frog (<i>Rana pretiosa</i>)	S			
Wood frog (<i>Rana sylvatica</i>)			S	
Birds				
Baird's sparrow (<i>Ammodramus bairdii</i>)	S	S	S	S
Bald eagle (<i>Haliaeetus leucocephalus</i>)	T	T	T	T
Black-backed woodpecker (<i>Picoides arcticus</i>)			S	
Black tern (<i>Chlidonias niger</i>)			S	
Brewer's sparrow (<i>Spizella breweri</i>)	S	S		S
Burrowing owl (<i>Athene cunicularia</i>)	S	S	S	S
Canvasback duck (<i>Aythya valisineria</i>)			S	
Chestnut-collared longspur (<i>Calcarius ornatus</i>)				S
Common loon (<i>Gavia immer</i>)			S	
Dickcissel (<i>Spiza Americana</i>)			S	
Ferruginous hawk (<i>Buteo regalis</i>)	S	S	S	S
Greater sage-grouse (<i>Centrocercus urophasianus</i>)	S	S	S	S
Hairy woodpecker (<i>Picoides villosus</i>)			S	
Interior least tern (<i>Sterna antillarum</i>)			E	
LeConte's sparrow (<i>Ammodramus leconteii</i>)			S	
Loggerhead shrike (<i>Lanius ludovicianus</i>)	S	S	S	S
Long-billed curlew (<i>Numenius americanus</i>)	S	S	S	
McCown's longspur (<i>Calcarius mccownii</i>)				S
Mountain plover (<i>Charadrius montanus</i>)	S	S	S	S
Northern goshawk (<i>Accipiter gentilis</i>)	S	S	S	
Northern harrier (<i>Circus cyaneus</i>)				S
Peregrine falcon (<i>Falco peregrinus</i>)	S	S	S	
Piping plover (<i>Charadrius melodus</i>)			T	
Purple martin (<i>Progne subis</i>)				S
Sage sparrow (<i>Amphispiza billneata</i>)	S	S	S	S
Sage thrasher (<i>Oreoscoptes montanus</i>)	S	S		
Swainson's hawk (<i>Buteo swainsoni</i>)			S	
Trumpeter swan (<i>Cygnus buccinator</i>)	S	S	S	
White-faced ibis (<i>Plegadis chihi</i>)	S	S	S	
Whooping crane (<i>Grus americana</i>)			E	
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	S	S		
Fish				
Blue sucker (<i>Cycleptus elongates</i>)			S	
Finescale dace (<i>Phoxinus neogaeus</i>)				S

Appendix 1 Continued.

Common Name (scientific name)	BFO	CFO	MCFO	TBNG
Northern redbelly X Finescale dace (<i>Phoxinus eos</i> X <i>Phoxinus neogaeus</i>)			S	
Paddlefish (<i>Polyodon spathula</i>)			S	
Pearl dace (<i>Margariscus margarita nachtriebi</i>)			S	
Shortnose gar (<i>Lepisosteus platostomus</i>)			S	
Sturgeon chub (<i>Macrhybopsis gelida</i>)			S	
Yellowstone cutthroat trout (<i>Oncorhynchus clarki bouvieri</i>)	S		S	
Mammals				
Black-footed ferret (<i>Mustela nigripes</i>)	E	E	E	E
Black-tailed prairie dog (<i>Cynomys ludovicianus</i>)	S	S	S	S
Canada lynx (<i>Lynx canadensis</i>)	T			
Fringed myotis (<i>Myotis thysanodes</i>)	S	S		
Long-eared myotis (<i>Myotis evotis</i>)	S	S		
Meadow jumping mouse (<i>Zapus hudsonius</i>)			S	
Merriam's shrew (<i>Sorex merriami</i>)			S	
Preble's shrew (<i>Sorex preblei</i>)			S	
Spotted bat (<i>Euderma maculatum</i>)	S	S	S	
Swift fox (<i>Vulpes velox</i>)	S	S	S	S
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	S	S	S	S
Western spotted skunk (<i>Spilogale putorius</i>)			S	
Plants				
Barr's milkvetch (<i>Astragalus barrii</i>)				S
Laramie fals sagebrush (<i>Spaeromeria simplex</i>)		S		
Many-stemmed spider-flower (<i>Cleome multicaulis</i>)		S		
Nelson's milkvetch (<i>Astragalus nelsonianus</i>)		S		
Porter's sagebrush (<i>Artemisia porteri</i>)	S	S		
Utes ladies'-tresses orchid (<i>Spiranthes diluvialis</i>)	T	T		T
William's wafer parship (<i>Cymopterus williamsii</i>)	S	S		

E: Endangered

S: Sensitive

T: Threatened

APPENDIX 2. Photographs Illustrating Raptor Nest Condition.