



Draft Northern Goshawk Nest Survey Memorandum

Uinta Basin Railway

Seven County Infrastructure Coalition

July 14, 2020

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1.0 Introduction

The Seven County Infrastructure Coalition (Coalition or applicant), a governmental entity comprising Carbon, Daggett, Duchesne, Emery, San Juan, Sevier, and Uintah Counties, is proposing a new railway that would connect the Uinta Basin's various industries to the national rail network. Currently, the Uinta Basin does not have rail service, and freight needs are met primarily through trucking over a limited highway network. The railway (proposed action) would be constructed and operated under the authority of the U.S. Surface Transportation Board (STB). STB, in conjunction with other regulatory bodies, is preparing an Environmental Impact Statement (EIS) for this railway, which has the potential to cause environmental impacts. STB has identified three railway alternative routes for analysis in the EIS. The Coalition, through its consultant team, is conducting engineering and environmental activities in support of the EIS.

This memorandum, which has been prepared by HDR on behalf of the Coalition, describes the methodology for northern goshawk (*Accipiter gentiles*) nest surveys in the study areas of the three alternative railway routes:

- Indian Canyon, as defined by a conceptually engineered route dated November 22, 2019
- Wells Draw, as defined by a conceptually engineered route dated November 22, 2019
- Whitmore Park, as defined by a conceptually engineered route dated February 12, 2020

The study areas are predominantly 1,000 feet wide and encompass about 500 feet on either side of the proposed centerline. They cross Uintah, Duchesne, Carbon, and Utah Counties. However, in some areas, the study areas are wider where the design team anticipates that a wider earthwork footprint might be needed to accommodate design features.

2.0 Regulatory Setting

Resource and land management agencies, including the U.S. Department of Agriculture (USDA) Forest Service, the Utah Division of Wildlife Resources (UDWR), and the Bureau of Land Management (BLM), designate sensitive species, identify wildlife habitat areas (such as those for big-game species), and establish conservation agreements. These agencies and the U.S. Fish and Wildlife Service (USFWS) also manage designated lands as wildlife refuges or lands otherwise protected for wildlife. Sensitive species and conservation agreement species typically include species listed under the Endangered Species Act (ESA) and additional species identified as those that warrant management considerations and actions in order to avoid becoming threatened or endangered.

The northern goshawk is known or suspected to occur in Uintah, Duchesne, Carbon, and Utah Counties and has been designated as a sensitive species by UDWR, BLM, and the USDA Forest Service [species lists were obtained from UDWR (no date), BLM (Fletcher 2019), and USDA Forest Service (Christensen 2019)]. It has also been designated as a USDA Forest Service management indicator species. The northern goshawk is known to have habitat in the Ashley National Forest, part of which overlaps the Indian Canyon and Whitmore Park study areas.

As a cooperating agency in the EIS process, the Ashley Forest Service has requested that the Coalition conduct nest surveys where suitable northern goshawk habitat overlaps the alternative study areas.

3.0 Northern Goshawk Biology

Northern goshawks are similar in size to red-tailed hawks (*Buteo jamaicensis*) and resemble Cooper's hawks (*Accipiter cooperii*) and sharp-shinned hawks (*Accipiter striatus*). Adult northern goshawks are dark gray above, with alternating light and dark gray bars on the tail. The breast is white to light gray with fine streaks of dark gray. Adult northern goshawks have a red eye with a horizontal white stripe directly above the eye. Juvenile northern goshawks have a brown head, back, and wings. The tail is brown with dark-brown bars. The breast is buff-colored with brown streaks (Cornell Lab of Ornithology, no date).

Northern goshawks nest in mature, old-growth forests with more than 60% closed canopy, sparse ground cover, and open understory (Cornell Lab of Ornithology, no date; Graham et al. 1999; NatureServe, no date; UDW, no date). They nest in a wide variety of forest types including deciduous, coniferous, and mixed forests. In the western United States, northern goshawks typically nest in coniferous forests dominated by ponderosa pine (*Pinus ponderosa*) or lodgepole pine (*Pinus contorta*) or in mixed coniferous forests. Western birds might also nest in deciduous forests dominated by aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), or willow (*Salix* species). Nests are often built near breaks in the canopy at sites with a creek, pond, or lake nearby.

Adult goshawks typically return to nesting territories during March and early April and often use nests that were previously used by northern goshawks or other bird species. Females lay and then incubate a single clutch of two to four eggs in mid-April to early May. Incubation lasts about 30 days, resulting in hatching dates from mid-May through early June. Nestlings remain in the nest for 36 to 42 days, typically fledging from late June through late July. Newly fledged goshawks remain close to the nest tree for another 2 to 3 weeks and then begin making longer movements until dispersal in mid- to late August (USDA Forest Service 2006).

Stands with large trees and relatively open understories are preferred for foraging. Northern goshawks prey on a wide variety of vertebrates including squirrels, lagomorphs, birds, and occasionally insects.

Potentially suitable habitat exists in the study areas. Although no observations have been documented in the study areas, observations have been recorded within a 2-mile radius of all three alternative study areas.

4.0 Methodology

The Ashley National Forest provided geographic information systems (GIS) shapefile polygons for northern goshawk suitable habitat in the forest. These polygons intersect the study areas for the Indian Canyon and Whitmore Park alternative routes (see Appendix A, Northern Goshawk Suitable Habitat Overview, for an overview map of the three alternative routes in relation to the northern goshawk suitable habitat polygons). HDR performed ground-based broadcast acoustic surveys in areas where the forest polygons overlap the Indian Canyon and Whitmore Park study areas.

HDR consulted with personnel at the Ashley National Forest to develop the following survey methodology (Christensen 2020). This methodology is based on the *Ashley National Forest Goshawk Inventory and Survey Protocol* document provided by Ashley National Forest (this document is provided in Appendix B, Ashley National Forest Goshawk Inventory and Survey Protocol).

Direct visual and auditory detectability of northern goshawks varies during the reproductive cycle (USDA Forest Service 2006). Detectability tends to be high before egg laying begins due to courtship vocalizations

and over-canopy flights. Detectability is low during incubation and the early nestling stage. The detectability of defensive behavior by adult goshawks increases later in the nestling stage and throughout the fledgling stage due to the defensive behavior of adult birds. As fledglings reach 2 to 3 weeks of age, they begin to respond to food-begging calls, and their highly vocal responses account for most detections late in the season (July to August). Based on this information, the Ashley National Forest advised HDR to perform broadcast acoustical surveys beginning on or shortly after June 15, 2020.

Broadcast acoustical surveys are based on broadcasting taped goshawk calls at set points or stations along transects in an effort to elicit defensive responses from adult goshawks and their young. Two transects, running parallel with the proposed railway, were established on the east side of the route centerline in areas where the goshawk suitable habitat polygons overlapped the Indian Canyon and Whitmore Park study areas (the Indian Canyon and Whitmore Park study areas overlap in this part of the canyon). Tunnel portal areas were included in the survey, but the lengths of the tunnels were not included. The lower transect was 3.8 miles long and located 300 meters from the route centerline. The adjacent, upper transect was 3.9 miles long and located 250 meters upslope from the first transect.

Calling stations were initially located every 300 meters along the transects, with calling stations on the adjacent transects offset by 150 meters. However, calling stations were adjusted once in the field to ensure they were located in potentially suitable goshawk habitat (i.e., conifer and aspens stands) and excluded from open meadows or other non-suitable goshawk habitat. Additionally, once surveying began, HDR determined that the Church Camp fire that occurred in 2012 (BLM 2015) (see Figure 1) burned areas that the model identified as potential habitat. Burned areas were therefore not included in the surveys due to a lack of suitable habitat. Based on this criterion, there were 9 calling stations on the lower survey transect located 300 meters from the centerline and 7 calling stations on the upper survey transect located 550 meters from the centerline, for a total of 16 calling stations. See Appendix C, Northern Goshawk Calling Station Overview, for a figure showing the transects, calling station locations, and the extent of burned areas.

Figure 1. Burned Area along Goshawk Calling Transects



The goshawk alarm call was used at each calling station. A small megaphone and call recording were used for calling. Upon arriving at a calling station, the biologists looked and listened for 1 to 2 minutes before calling. After this arrival procedure, the call recording was broadcasted for 10 seconds, after which the biologists listened for goshawk callback and watched for movement for 30 seconds and then rotated 120 degrees for the next vocalization while continuing to look and listen in all directions for an approaching goshawk. The tape then began the second 10-second broadcast alarm call. When the second 30-second pause began, the biologists rotated another 120 degrees. After the third 10-second alarm call, the biologists remained at the station for 30 seconds to look and listen for a response. This procedure was repeated twice for a total of 6 calls per station. If there was no visual or audible response after the last sequence, the biologist moved to the next station.

If a callback or movement was detected, the biologists stopped the broadcast, immediately recorded the direction and compass bearing of the approach or vocalization, and attempted to follow the sound or movement to see where a nest was located. Once these steps were complete, in order to avoid excess disturbance, the biologists left the area and concentrated their survey efforts on transects away from the goshawk vocalization or sighting.

Surveys were performed throughout the day, but were not performed under conditions such as high winds (greater than 15 miles per hour) or rain that could have reduced the ability to detect goshawk responses. Surveys were performed twice. The initial survey took place on June 16, 2020, and was followed by an additional survey on June 22, 2020.

5.0 Results

No goshawks were observed during the surveys conducted on June 16, 2020, and June 22, 2020. Representative photographs from each calling station can be found in Appendix D, Calling Station Representative Photographs. Additionally, survey data forms can be found in Appendix E, Goshawk Survey Data Forms.

6.0 References

[BLM] Bureau of Land Management

- 2015 BLM Utah Fire Perimeters [statewide wildland fire history polygon data of mapped fires]. Metadata obtained from https://gis.blm.gov/utarcgis/rest/services/Fire/BLM_UT_FPER_MapService/MapServer on June 21, 2020.

Christensen, Robert

- 2019 Email from Christensen, Ashley National Forest, to Amy Croft, HDR, regarding USDA Forest Service sensitive species associated with Ashley National Forest. November 26.
- 2020 Phone conversation between Christensen, Ashley National Forest, and Amy Croft, HDR, regarding survey methodology. April 7.

Cornell Lab of Ornithology

- No date eBird.org. <https://ebird.org>. Accessed May 11, 2020.

Fletcher, Christine

- 2019 Email from Fletcher, BLM, to Karen Nichols, HDR, regarding 2018 Utah sensitive plant and wildlife lists. October 31.

Graham, Russell T., Ronald L. Rodriguez, Kathleen M. Paulin, Rodney L. Player, Arlene P. Heap, and Richard Williams

- 1999 The Northern Goshawk in Utah: Habitat Assessment and Management Recommendations. General Technical Report RMRS-GTR-22. Prepared by USDA Forest Service, Rocky Mountain Research Station. February.

NatureServe

- No date NatureServe Explorer. <http://explorer.natureserve.org>. Accessed May 11, 2020.

[UDWR] Utah Division of Wildlife Resources

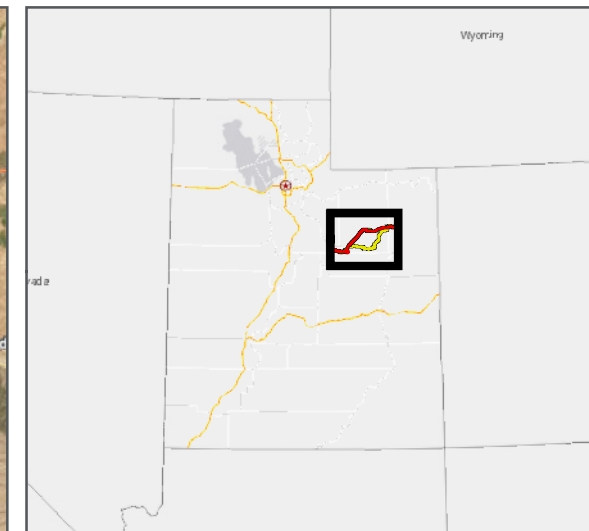
- No date Utah Conservation Data Center [online database]. <https://dwrcdc.nr.utah.gov/ucdc/default.asp>. Accessed November 27, 2019.

[USDA Forest Service] United States Department of Agriculture Forest Service

- 2006 Northern Goshawk Inventory and Monitoring Technical Guide. General Technical Report WO-71. July.

APPENDIX A

Northern Goshawk Suitable Habitat Overview



LEGEND

 Indian Canyon Centerline
Alternative 11/22/19



Wells Draw Centerline
Alternative 11/22/19

Whitmore Park Centerline
Alternative 2/12/20

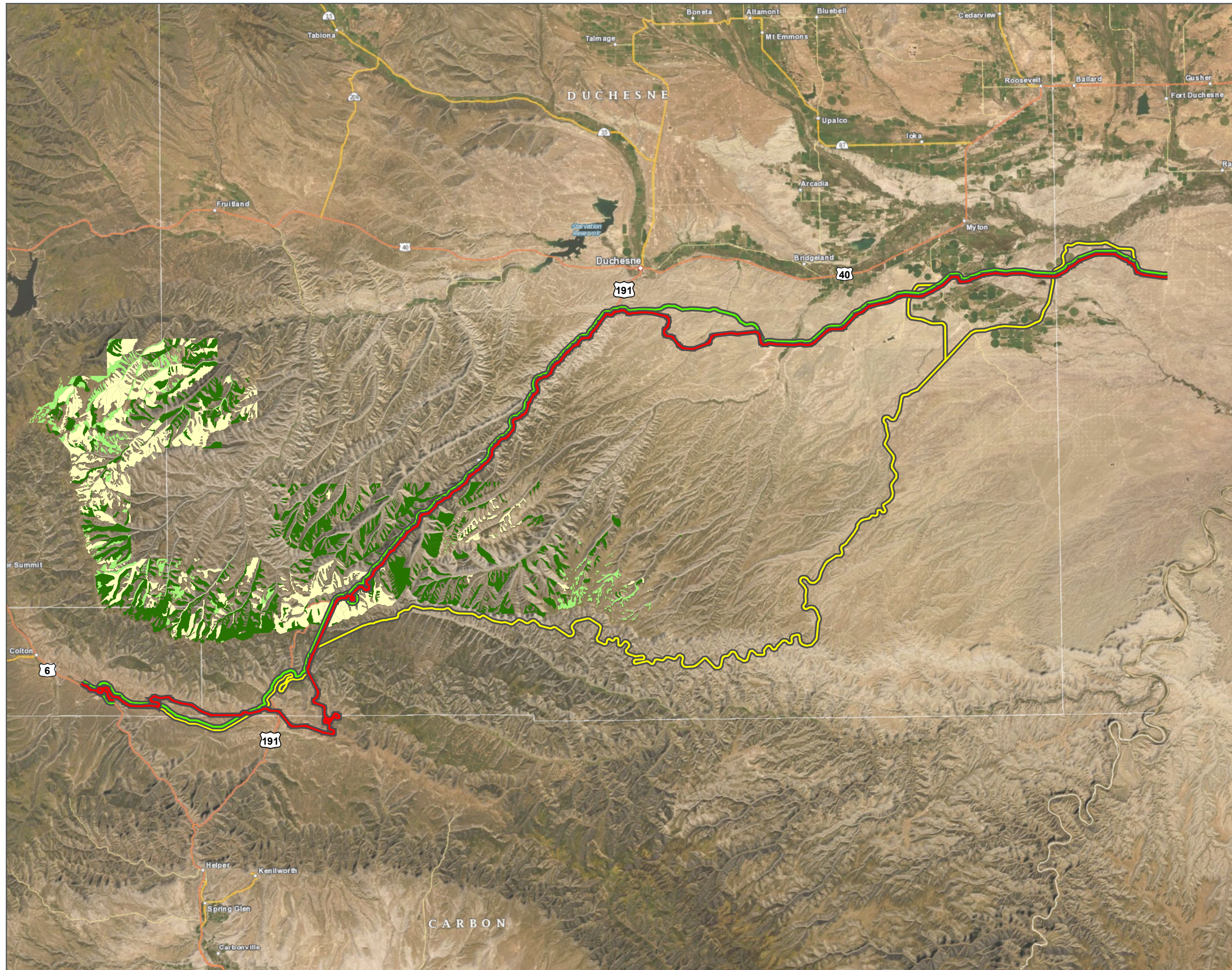
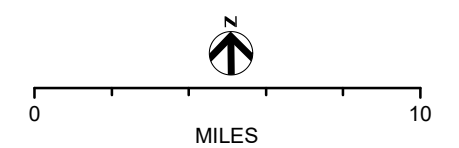
Northern Goshawk (<i>Accipiter gentilis</i>) Habitat
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Coniferous Forest

Deciduous Forest

 Seral Deciduous Forest

USFS NORTHERN GOSHAWK HABITAT



APPENDIX B

Ashley National Forest Goshawk Inventory and Survey Protocol

Protocol name: ANF Goshawk Inventory and Survey

Target species: Northern Goshawk

Non-target species recorded: Other Raptors

Years used: 1993 to present (also 1992 – see modifications section)

This protocol is: ☒ X ☐ current ☐ obsolete

Source: USDA Forest Service interdisciplinary working group Region 4

Name/location of field data dictionary (if any): None

Purpose (survey objectives and intended uses for the data):

The purpose of goshawk inventories is to identify suitable habitat as well as locate nest sites.

The goshawk is a species of concern, so locating suitable habitat and nesting pairs is important for proper management of the species. The data gained from inventories will be used in monitoring efforts and forest and wildlife management.

Survey design (transect placement and spacing, etc.):

Once suitable habitat has been delineated, transects should be placed 260 meters (850 feet) apart and the calling stations should be 300 meters (985 feet) apart along each transect. Depending on topography, you may want/need to make some alterations. The main point is to design the survey both for efficiency and complete coverage.

Field methods (directions for conducting survey, including equipment specifications):

Goshawks generally respond more frequently to broadcast vocalization during the nestling period. The nestling period is usually late May through mid-July. Responses can be solicited throughout the day. For calling, a small megaphone/CD player unit should be used. Be sure that the [call](#) you are using is appropriate to the current nesting phase. Upon arriving at a calling station, look and listen for 1-2 minutes before calling. When calling, be sure to only play it at the volume you would expect from an adult goshawk. Hold the megaphone about head height. The alarm call should play for 10 seconds then a 30 second pause, rotate 120 degrees for the next vocalization but continue to look and listen in all directions for an approaching goshawk. Males tend to approach silently and females tend to approach while vocalizing. The tape will then begin the second 10 second broadcast alarm call. When the 30 second pause begins, rotate another 120 degrees. After the third and final 10 second alarm call, remain at the station for 30 seconds to look and listen for a response. If none is heard, continue to next calling station.

If a response is heard/seen, stop the broadcast immediately and record the direction and compass bearing of the approach or vocalization. To avoid excess disturbance, leave the area and concentrate survey efforts on transects away from goshawk vocalization or sighting. Using Kennedy and Stahlecker 1993, we determined that the effective distance for broadcast calling is 150 meters (pgs 256-7).

Modifications (describe any changes/variations from the original protocol and when/where the modified protocol was used): Surveys done in 1992 used basically the same protocol with the following differences:

- Transects were spaced farther apart (400-800m vs 260m)
- In some cases calling stations were also further apart (400m vs 300m)

- Time spent at each calling station was greater. The tape was played for 20-30 seconds rather than 10 seconds, was broadcast in 4 directions rather than 3, and was played a total of 4 times per station rather than 3. Also, the observer spent 2 minutes listening after the 4th tape playback interval before moving on to the next station.

Data sheets: [Inventory Form](#) (currently used – contains all the same data as the original forms from 1993); [Original Definitions](#)

DRAFT: 6/21/93
Reply to: 2670

Date: *

Subject: Northern Goshawk Survey Protocol and Data Collection Forms

To: Forest Supervisors

In January, we established a center of excellence (COE) program for the northern goshawk, a Regional sensitive species. As part of the COE effort, an interdisciplinary working group was established to review literature, share information and work on a conservation assessment and draft potential management strategies for the northern goshawk in the Intermountain Region. The interdisciplinary group consists of a cross section of wildlife biologists and silvaculturists from across the region.

The first task the working group felt needed immediate attention was providing guidance to the Region in goshawk survey protocol and data collection. In October 1992, the Region directed Forests to undertake adequate goshawk surveys and enclosed a copy of R-3's goshawk inventory protocol as information. The working group felt that further clarification of inventory protocol is necessary to help ensure consistency and uniformity in northern goshawk data collection in the Region. The working group reviewed survey protocols and data collection methodologies being used by biologists in the Region as well as other FS Regions.

The enclosed protocol represents a combination of the best techniques available for inventorying and monitoring northern goshawks and their habitat. These techniques are consistent with the Region's current direction to conduct goshawk surveys. This document describes suitable goshawk nesting habitat, suggested equipment to conduct surveys, a specific protocol for conducting goshawk surveys, likely indicators of goshawk nesting activity and field forms for goshawk inventory, monitoring, and nest search forms. This protocol and data collection package is to be used by all Intermountain Region National Forests. Forest that have unique situations which they feel justify deviation from these protocols, must document the situation and rationale for deviation in the project files.

The northern goshawk working group will continue to provide Forests with specific information regarding inventory efforts and interregional coordination. Ron Rodriguez, Dixie National Forest Biologist, is the team leader of the working group. The working group will also continue work on the development of the conservation assessment. Once the conservation assessment has been completed, draft potential management strategies will then be developed to assist in managing the diverse habitat condition present in our Region. The working group plans to have the draft conservation assessment document ready for Forest review this winter and draft management strategies for review by next spring. In the interim, Forests dealing with the need to manage for goshawk habitat should continue to draw from the intent of the Forest Service's Management Recommendations for the Northern Goshawk in the Southwestern United States. This document provides excellent information regarding the northern goshawk and its prey.

Any questions regarding application of the enclosed protocols or the development of the conservation assessment and potential management strategies, should be directed to COE working group leader Ron Rodriguez, Dixie NF, Ph. 801-865-3732 (R.Rodriguez:R04F07A) or Mike Rath, R4 TES Program Manager, Ph. 801-625-5664 (M.Rath:R04A).

Gray F. Reynolds
Regional Forester

cc: WO (WLF)
R3 (WLF)
TM
R.Rodriguez, Dixie NF
M.Rath, FWL

INTRODUCTION:

A working group was established by the Intermountain Region (R4) in 1993, to create a conservation assessment of northern goshawk habitat in R4. The working group is chaired by Ron Rodriguez and includes Steve Anderson, Tim Craig, Brian Ferguson, John Erickson, Jim Kelley, Shane Jeffries, Robin Garwood, and Wend Reinmuth. The group met on April 13, 1993 at the Regional Biologist and Botanist Workshop in Salt Lake City, Utah. At the meeting the group determined that its first task would be to prepare a document displaying survey protocol and field inventory forms for northern goshawks. This document would be distributed to biologists throughout R4 prior to the 1993 field season to expedite regional consistency and shared information in conducting field surveys for northern goshawks.

This document describes suitable goshawk nesting habitat, suggested equipment to conduct surveys, a specific protocol for conducting goshawk surveys, likely indicators of goshawk nesting activity, and field forms for goshawk inventories, monitoring, and nest searches.

SUITABLE GOSHAWK NESTION HABITAT

The literature describes goshawk nests as frequently occurring on gentle or moderate slopes (0-30%) with northerly exposures (NW-NE) (Reynolds et al. 1982). Nest areas are also described as containing or adjacent to quiet or ephemeral streams or springs. Nest sites were typically located on the lower portion of the slope, near water (Reynolds 1983). Goshawk nests in Oregon were in stands ranging from those with closed, mature canopies with few shade-tolerant understory trees, to stands with more open, mature canopies and many understory trees (Reynolds 1983). High percent canopy closures coupled with northerly aspects produce shady, cool conditions below the forest canopy. Bartelt (1974), McGowan (1975), and Reynolds et al. (1982) found that goshawks require trees with big limbs to support their large nests, and tended to place their nests in one of the larger trees in the nest area. In Oregon, goshawks nests in 150+ year old conifer stands (Reynolds 1983).

In Nevada, a typical goshawk nest is located in aspen stringers near perennial streams. Over 85% of documented nesting activity in Nevada occur in aspen vegetative communities. About 98% of the observed nests occur within 100 feet of water. A typical goshawk nest in Nevada occurs in mature trees, 35-50 feet tall. Within a nesting territory, there are usually numerous nests that were constructed in previous years (Heron et al. 1985). Aspen used as nest trees are typically the largest in the stand and or located northerly or easterly exposures where terrain is not steep (4-39%) (Younk and Bechard 1992).

EQUIPMENT:

The equipment described in this section only relates to broadcast vocalization surveys for northern goshawks and assumes that all proper outdoor and safety gear are provided by the unit and/or the individual conducting the survey (i.e. hardhat, boots etc.) Furthermore, equipment mentioned in this section is only recommended because of its wide use and performance. **It should be noted that other audio equipment manufacturers produce callers that are probably adequate.**

Audio Equipment: Currently the most widely used wildlife callers are modified and distributed by James Garey. The package includes a megaphone produced by Radio Shack which is selected because of its light weight, clarity of sound, and broad range. The megaphone is modified by Garey to include: a three foot cable with a stereo phone plug, a switch to select between microphone and tape player, and the removal of the musical functions. Cost of the megaphone is \$95.00 plus shipping.

The cassette player is a Sony Sports Walkman selected for its weather resistance and reliability. Sony's standard jack has been replaced with a highly durable stereo phono connector appropriate for rugged use. The cost of the cassette player is \$80.00 plus shipping.

Garey also offers a fanny pack with a specially fitted pocket for accessible operation of the tape player, a Velcro strap and hard plastic clip plate for secure carrying, and a zippered back pouch for carrying accessories. The cost of the cassette player belt back is \$40.00 plus shipping.

To order, contact: James Garey
516 99th Ave. NE
Bellevue, WA 98004-9413
(206) 637-9573

Or buy a Radio Shack bullhorn and take it and an old caller (for an example) down to an electronic shop and have them modify it for you.

Vocalization Tapes: We recommend that vocalization tapes be recorded from compact disk. Peterson Field Guides to Western Bird Songs from Cornell Laboratory of Ornithology/Interactive Audio is preferred because it includes songs and calls of 522 birds including all of the birds which occur on the Region 4 sensitive species list. The compact disk offers superior clarity and minimizes the background noise and feedback which often occur when recording tape to tape.

We recommend recording from compact disk to a high quality cassette tape made specifically for recording from compact disks. These tapes can be purchased at retailers which sell cassette tapes. Record an entire sequence of calls which will occur at a calling station on the cassette tape and include pauses. For example, the northern goshawk protocol requires that at each calling station the warning call will be played for 10 seconds then a 30 second pause occurs. This sequence continues three times at each calling station.

Field technicians should be able to push the play button on the cassette and allow it run until all three sequences at the calling station have been completed. This will allow the technician to concentrate on looking and listening for an approaching bird instead of rewinding the tape and timing the pause. This will also reduce the wear and tear on the cassette player and the tape since the cassette is only rewound once when the broadcast has been completed at a calling station. If noise from the megaphone is impairing to the observer during a pause, simply release the trigger on the megaphone until the next vocalization is about to begin.

Once the entire sequence has been recorded from compact disk to a high quality tape, we recommend that the broadcast be recorded from the high quality cassette tape to a 7 ½ minute (or shorter) cassette tape. Shorter length cassette tapes are thicker and thus more durable to continual play and field use. If a short length field tape is damaged or destroyed simply record the sequence from the high quality cassette tape to another short length field tape. If the high quality cassette tape begins to wear out simply purchase a new one and re-record the sequence from the compact disk.

To Order Peterson Field Guides to Western Bird Songs, contact:

Bird Watchers Digest
PO Box 110
Marietta, OH 45750
(800) 879-2473

cost: \$40.00 = shipping

To order short length cassette tapes check your yellow pages for retailers who specialize in recording or cassette tapes and compact disks or contact

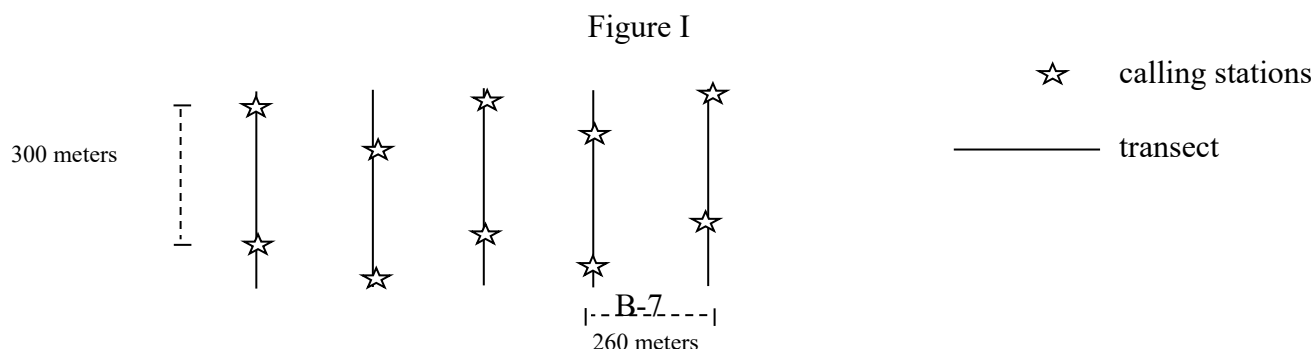
Custom Recording & Sound, Inc.
3907 Custer Drive
Boise, ID 83705
(208) 344-3535

cost: about 85 cents per tape

This past spring (1993), the Regional Office sent out vocalization tapes to all units in the region. **These tapes are of a lower quality than those described above, however they are adequate if the caller is capable of producing adequate volume to achieve coverage between transects.**

OCCURRENCE SURVEY PROTOCOL

Goshawks respond more frequently to broadcast vocalization during the nestling period than the fledgling period in some areas of the Region. Optimal survey times (nestling period) occur from late May thru mid-July. Within the Southern portions of the Region responses were more frequent during the fledgling period July-September. Responses can be solicited throughout the day. Survey all suitable goshawk nesting habitat in the analysis area (more intensive surveys may include area adjacent to or beyond suitable habitat). Once suitable nesting habitat has been delineated, identify survey routes or transects so that they lie about 260 meters apart (850 feet). Locate calling stations every 300 meters (985 feet) along each transect (Figure 1).



It may be desirable to modify this survey design to better fit local topography and vegetation patterns in some areas. For example, in steep terrain, incised by long narrow drainages, calling stations may be spaced further than 300 meters apart when a transect occurs in a ravine that is so narrow that birds across the ravine can hear the recordings. In this instance, both sides of the ravine are being called from one transect. Similarly, on steep hillsides or where patches of appropriate nesting habitat are scattered, transect lines or calling stations may be placed further apart to accommodate patches of habitat. The important point is to design the survey for efficiency but also to ensure that complete coverage is achieved.

Upon arriving at a calling station, look and listen for 1-2 minutes. If no observations occur begin the broadcast vocalization tape holding the megaphone in a fixed position about head high (it is important to note that the broadcast should only be played at about the same volume as you would expect to hear from an adult northern goshawk). The alarm call should play for 10 seconds then a 30 second pause will occur (Joy et al. 1993 and Kennedy et al. 1993). During the pause, rotate 120 degrees for the next vocalization but continue to look and listen in all directions for an approaching goshawk. There is no difference in response rates during the nesting of fledging period between males and females; however, males tend to approach silently while females tend to approach while vocalizing. The tape will then begin the second 10 second broadcast alarm call. When the 30 second pause begins rotate another 120 degrees to face a new direction and look and listen for an approaching goshawk. After the third and final 10 second alarm call has been played remain at the calling station for 30 seconds to look and listen for a response (Joy et al. 1993). If none are heard continue to the next calling station and repeat the process.

If a vocalization or sighting of a goshawk occurs stop the broadcast immediately and record the direction and compass bearing of the approach or vocalization. To avoid excessive disturbance to the nesting pair, leave the area and concentrate survey efforts on transects away from goshawk vocalization or sighting. Use the compass bearing and direction of approach for subsequent nest searches. Remember to send documented sightings of northern goshawks to the Conservation Data Center (CDC). We recommend providing CDC observation report forms to field crews prior to field surveying so that information on the form can be recorded at the location of the observation and sent in immediately.

GOSHAWK INVENTORY AND PRIORITIZATION

INVENTORY:

Inventory suitable habitat for habitat modifying projects. Use the following approach:

1. Forests are required to complete at least one year of survey for all habitat manipulation projects with decision notices signed before July 1, 1994.
2. Because goshawks change nest locations frequently, two years of survey are strongly recommended. Whenever possible conduct two years of survey for all habitat manipulation projects with decision notices signed after July 1, 1994. At a minimum, Forests are required to conduct one year of survey.
 - a. If a goshawk nest area is found during the first year of inventory, establish a management unit. A second year of inventory is not needed.
 - b. If goshawks are not found during the first year of inventory, and suitable habitat (nesting, fledging or foraging) exists, conduct an inventory the following year.
3. Conduct a complete inventory based on the protocol as described in this document where existing or historic nests have been located or in high priority stands (see prioritization section below).

4. Conduct a “walk through” in low and medium priority stands (see prioritization section below). If plucking perches, molted feathers, nests, goshawk vocalizations are encountered while conducting a “walk through”, conduct a complete inventory based upon the protocol found in this document.

PRIORITIZATION:

1. Identify stands as “high” priority if successional stages 5 and 6 (based on tree species and site capability) dominate the stand.
2. Identify stands as “medium” priority if successional stages 4 (based on tree species and site capability) dominate the stand.
3. Identify stands as “low” priority if successional stages 1-3 (based on tree species and site capability) dominate the stands.

INDICATORS OF ACCIPITER NESTING ACTIVITY

The following indicators are not definite indicators of accipiter nesting in the area, but the presence of any or all of these indicators suggest more intensive surveys may be necessary. These indicators should be noted along with a precise description of the location of their occurrence.

1. **Presence of “plucking perches”.** Accipiters often deplume prey before it is taken to the nest. The object used as a perch is usually a downed log, leaning tree or a stump. These perches can be inconspicuous. However, the presence of some scattered prey feathers, blood and/or an accipiter defecation (slice) indicate that a perch has been used in this manner and its location should be noted.
2. **Molted accipiter feathers.** Since nesting birds molt flight and body feathers it is important to record the location of any feathers found while in the field. Since feather identification can be difficult it is suggested that crew members carry plastic sandwich bags and collect feathers for later verification by a knowledgeable ornithologist. It is important to be sure that anyone who collects migratory bird feathers is covered by the proper State and Federal collectors permits since the possession of most bird feathers is prohibited by Federal Law.
3. **Hunger begging vocalizations.** Young accipiters vocalize loudly in the presence of their parents even late in the summer. Field crews should become familiar with these sounds and record the location of any vocalizations heard. The chances of hearing vocalizations by nestlings is greatest in the morning and evening.
4. **Presence of Adults.** The location of any accipiter observed should be recorded. In addition, the behavior of these birds should be noted. Vocalizations or aerial defense in the presence of another raptor, the presences of an accipiter soaring up out of or diving into the woods or the presence of two adults or a single adult which does not immediately flee from humans in the early nesting season could all indicate an active nesting territory.

5. “White-wash” below a tree. The presence of multiple defecations below a tree should always be noted and the location of the tree precisely recorded. The presence of accipiter “white-wash” will persist even into the late fall.

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Ashley National Forest – Northern Goshawk Inventory Data Form *(form currently used)*[illegible]

Observation Summary

Goshawks detected	Yes	No	Total #	Ad. male	Ad female	unknown	nestlings	fledglings
Nest Search conducted	Yes	No	Nest located	Yes	No	Alternate nest	New territory	

Codes: Detected- Use 4-letter common name code for species responding (e.g. NOGO, COHA, GRJA, etc.); A/V- A = audio detection, V = visual detection; Age – A = adult, N = nestling, F = fledgling, U = unknown; Sex – m = male, f = female, U = unknown; Forest type – Use 4-letter code (e.g. PICO, PIPO, etc.).

Definition of Terms from Goshawk Inventory and Monitoring Protocol

Johnsgard, P. 1990. Hawks, Eagles, & Falcons of North America. Smithsonian Inst. Press, Washington.

Active Nest. A nest known to have contained incubated eggs. A nest need not be successful to be considered active. The number of “active nests” is an important unit of measure for comparisons among years, study areas, treatments, and experimental areas. INCUBATING or BROODING is indicated by an adult (almost always the female) sitting on the nest.

ALTERNATE NEST. In this context: A nest at which a nest attempt has been documented at sometime in the past and is within 1 mile (may be in adjacent tree) of another nest that has also had a nest attempt.

COURTSHIP BEHAVIOR. Described fully in Johnsgard 1990. Includes aerial displays of “high circling”, “slow flapping”, “undulating flight”, “sky dance”, or diving and chasing flights by the pair.

FAILED NEST. An active nest in which the eggs or nestlings are lost (e.g. to predators, weather) or abandoned by the adult(s). No young fledged.

NATIONAL I.D.#. The number begins with the Region #, followed by: Forest #, Ranger District #, and Goshawk Territory #. An example would be R03F02D0110. This means Region 3, Caron National Forest, Canjilon Ranger District, Goshawk Territory #10.

NEST ATTEMPT. An attempt to nest as evidenced by observed courtship behavior within a nest site or new nest construction or reconstruction of an old nest (addition of new sticks or greenery).

NEST SITE. In this context: The nest, nest tree, and area surround the nest that includes the stand of trees containing prey handling areas, perches, and roosts. Synonymous with “micro-nest site” which includes the immediate nest area. (As opposed to macro-nest site which includes 10-30 acres of area around the nest.)

NEST TREE. The tree containing the nest.

SUCCESSFUL NEST. A nest from which at least one young is fledged.

TERRITORY OCCUPIED. In monitoring, an auditory or visual confirmation of adult goshawks near previous nest stands during the Courtship Period confirms territory occupancy.

Determining Age of Goshawks

ADULT. Birds in their definitive plumage. See Johnsgard 1990 for description. Males: Iris orange-red, becoming deeper red to mahogany in older adults. Females: Iris orange-yellow in older adults.

SUBADULT. (sexes alike) Similar to adults, but see Johnsgard 1990. An individual in a plumage condition transitional between its juvenile and definitive plumage. The term is also sometimes used more loosely to refer to all fledged individuals that have not yet reached their definitive plumage (“immature birds”). Iris remains bright yellow until about the fourth year, and some juvenile brown may be retained until the second year. Initial breeding may occur at two or three years, even occasionally at one year. Unless observer is positive of SUBADULT status, consider all breeding birds as adults.

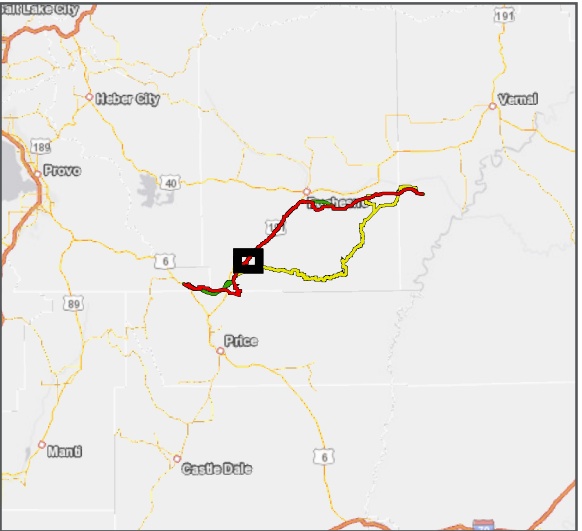
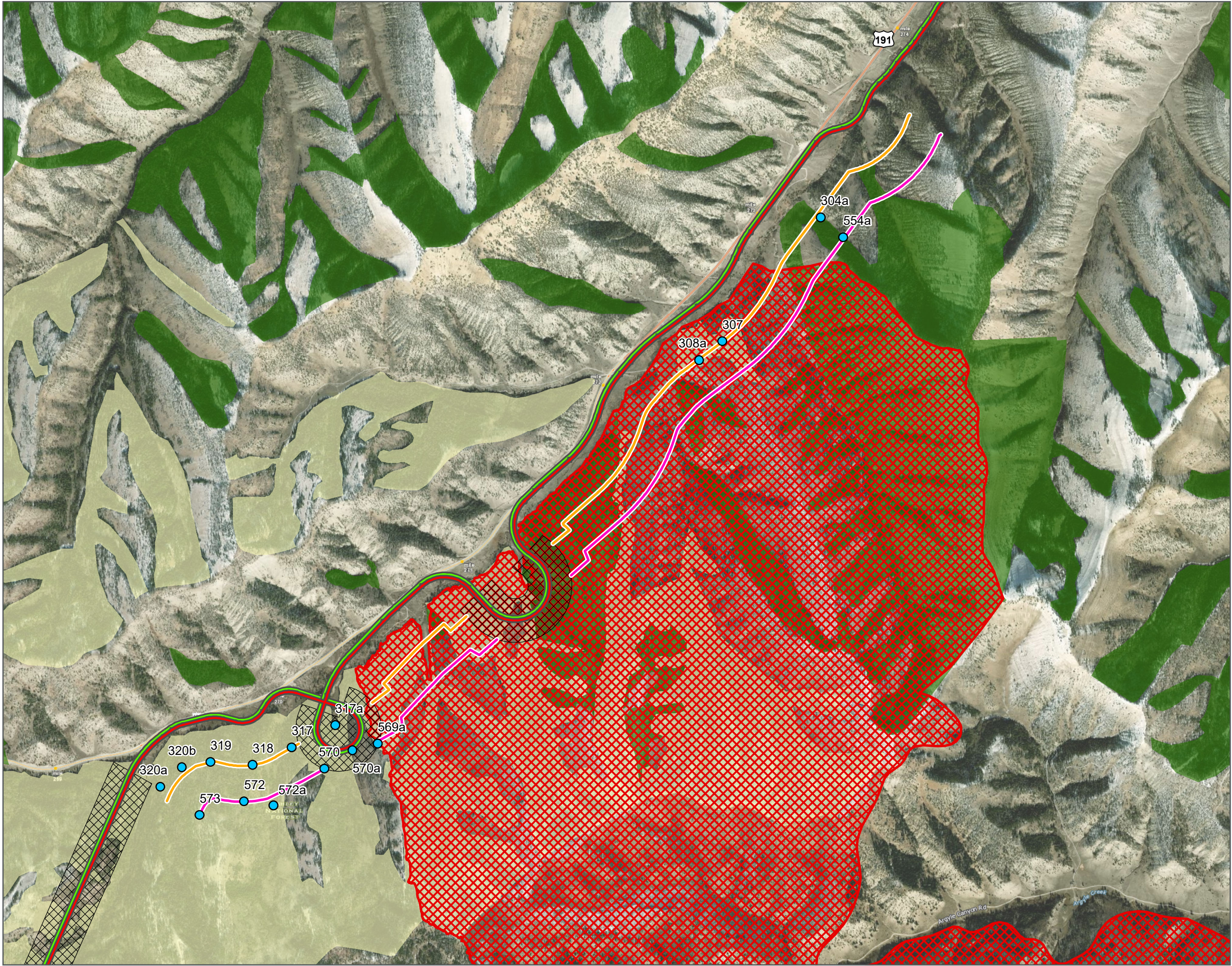
JUVENILE. (sexes alike) A bird exhibiting part or all of its first plumage of nondowny feathers (juvenile plumage).

FLEDGLINGS are JUVENILES that have recently attained the power of flight and are still dependent on the adults.

NESTLINGS. Unfledged birds still in the nest. Older NESTLINGS may have a portion of their juvenile plumage and thus are JUVENILES. Young NESTLINGS exhibit all downy plumage.

APPENDIX C

Northern Goshawk Calling Station Overview



LEGEND

- Indian Canyon Centerline
Alternative 11/22/19
- Wells Draw Centerline
Alternative 11/22/19
- Whitmore Park Centerline
Alternative 2/12/20
- Calling Stations
- Lower Survey Transect, 300 m from centerline
- Upper Survey Transect, 550 m from centerline
- Tunnel Areas
- Church Camp Fire Boundary (2012)

Northern Goshawk (*Accipiter gentilis*) Habitat

- Coniferous Forest
- Deciduous Forest
- Seral Deciduous Forest

**USFS NORTHERN GOSHAWK
SURVEY TRANSECT AND
CALLING LOCATIONS**

0 1
MILES

APPENDIX D

Calling Station Representative Photographs

Calling Station 304a



Calling Station 307



Calling Station 308a



Calling Station 317a



Calling Station 317



Calling Station 318



Calling Station 319



Calling Station 320b



Calling Station 320a



Calling Station 554a



Calling Station 569a



Calling Station 570a



Calling Station 570



Calling Station 572a



Calling Station 572



Calling Station 573



APPENDIX E

Goshawk Survey Data Forms

Ashley National Forest – Northern Goshawk Inventory Data Form (form currently used)

Analysis Area Indian Canyon Date: 6/16/2020

Observers: Josh McMillan & Nathan Jones Time Begin: 8:15 am Time End: see pg. 2

Effort: (Circle one) 1st yr of survey 2nd yr of survey

Follow-up to unsuccessful monitoring? Yes No Territory Name: _____

Weather: Wind Cloudy Precipitation None Lt Drizzle Rain Fog

Stage: (Circle one) Courtsip Incubation Nestling Fledgling Other

Call Used: (Circle one) Alarm Wail Fledgling begging

Transect #	Station #	Start time	End time	Response?	A/V	Direction	Age/Sex	Forest type	Comments
Lower	320a	8:35 am	8:38 am	No	—	—	—		39.901278, -110.712518
Upper	573	8:56 am	9:01 am	No	—	—	—		
Upper	572	9:15 am	9:20 am	No	—	—	—		
Upper	572a	9:30 am	9:35 am	No	—	—	—		39.900051, -110.708296
Upper	570	10:00 am	10:03 am	No	—	—	—		
Lower	317	10:11 am	10:15 am	No	—	—	—		
Lower	318	10:33 am	10:40 am	No	—	—	—		
Lower	319	10:51 am	10:53 am	No	—	—	—		Red-tail Hawk nearby
Lower	320b	11:06 am	11:11 am	No	—	—	—		39.902502, -110.715339
Lower	317a	12:21 pm	12:24 pm	No	—	—	—		39.905066, -110.703184
Upper	570a	12:33 pm	12:38 pm	No	—	—	—		39.903487, -110.70779
Upper	569a	12:50 pm	12:56 pm	No	—	—	—		39.903878, -110.699729
Upper	569								Not surveyed, but not Forest Habitat.
Lower	316								Unsuitable for Goshawk
Lower	315								
Lower	314								
Upper	568								
Upper	567								
Upper	565								
Upper	564								

Observation Summary

Goshawks detected	Yes	No	Total #	Ad. male	Ad. female	unknown	nestlings	fledglings
Nest Search conducted	Yes	No	Nest located	Yes	No	Alternate nest	New territory	

Codes: Detected- Use 4-letter common name code for species responding (e.g. NOGO, COHA, GRJA, etc.); A/V- A = audio detection, V = visual detection; Age - A = adult, N = nestling, F = fledgling, U = unknown; Sex - m = male, f = female, U = unknown; Forest type - Use 4-letter code (e.g. PICO, PIPO, etc.).

Analysis Area: Indian Canyon

Observers: Josh McMILLIN & Nathan Jones

Effort: (Circle one) 1st yr of survey

Follow-up to unsuccessful monitoring? Yes

Weather: Calm AM and mid, wind PM

Stage: (Circle one) Courtship

Call Used: (Circle one) Alarm

Date: 6/16/2020

Time Begin: 8:15 am

Time End: 3:45 pm

Territory Name: _____

_____ Lt Drizzle Rain Fog

_____ Nestling Fledgling Other

_____ Fledgling begging

[illegible]

Observation Summary

Goshawks detected	Yes	No	Total #	Ad. male	Ad female	unknown	nestlings	fledglings
Nest Search conducted	Yes	No	Nest located	Yes	No	Alternate nest	New territory	
Codes: Detected	1	4	later	common				

Codes: Detected-	Use 4-letter common name code for species responding (e.g. NOGO, COHA, GRJA, etc.); A/V- A = audio detection, V = visual detection; Age ♀ A = adult, N = nestling, F = fledgling, U = unknown; Sex - m = male, f = female, U = unknown; Forest type - Use 4-letter code (e.g. PICO, PIPO, etc.).	NO	ES	Alternate nest	New territory

Ashley National Forest – Northern Goshawk Inventory Data Form (form currently used)

Analysis Area	<u>UBRY - Indian Gyn (HDR)</u>						Date:	<u>6/22/2020</u>
Observers:	<u>J. McMillan + N. Jones</u>						Time Begin:	<u>0846</u>
Effort: (Circle one)	<u>1st yr of survey</u>						Time End:	<u>1416</u>
Follow-up to unsuccessful monitoring?	Yes No						Territory Name:	
Weather:	<u>Lgt Wind</u>						Precipitation	<u>(None)</u>
Stage: (Circle one)							Incubation	Nesting
Call Used: (Circle one)							Courtship	Fledgling
							Alarm?	Other
							Wail	Fledgling begging
								Fog
								Rain
								Clear ~ 80°

[illegible]

Observation Summary

Goshawks detected	Yes	No	Total #	Ad. male	Ad female	unknown	nestings	fledglings
Nest Search conducted	Yes	No		Yes	No	Alternate nest	New territory	

Codes: Detected- Use 4-letter common name code for species responding (e.g. NOGO, COHA, GRJA, etc.); A/V - A = audio detection, V = visual detection; Age - A = adult, N = nestling, F = fledgling, U = unknown; Sex - m = male, f = female, U = unknown; Forest type - Use 4-letter code (e.g. PICO, PIPO, etc.).

6> MxD: Mixed Conifer, AC: Aspen/Conifer, wDLD: Woodland