

**2004 WILDLIFE DIVERSITY SMALL GRANT REPORT**

**SURVEYS FOR RARE OWL SPECIES IN THE BLACK HILLS**



Submitted By:

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## INTRODUCTION

The unknown status of owl species in the Black Hills is a significant void in the natural heritage knowledge of the area. In 2002 a flammulated owl was discovered by Bill Given and verified by Rocky Mountain Bird Observatory biologists and accepted by the South Dakota Rare Bird Committee leading to the addition of the owl to the state bird list. There have also been reports of boreal owl calling and suspected sightings of barred owls, two species not currently documented in the Black Hills. Clearly there is one species (flammulated) that occurs with a totally unknown distribution and there may well be other species that need to be documented. If they do exist undiscovered they may not far into the future without proper management. There is no group of birds, except possibly rails, about which so little is known as the owl group (Sutton 1994). However, survey efforts have greatly increased the knowledge of distribution of owl species throughout North America and the Black Hills are currently an important missing piece to survey for the Rocky Mountain region.

The Black Hills contains many of the same habitat types that are found throughout the Rocky Mountain region but it is an isolated island of these habitat types. The range for the northern saw-whet owl demonstrates this phenomenon as it ranges throughout the northern forests and the western mountain ranges and then the island of the Black Hills. A comparison of the known ranges for owl species shows that four other species, not well documented in the Black Hills, largely overlap with the northern saw-whet and that for them to occur in the Black Hills would be a similar spatial jump making it appear quite plausible.

This research consisted of conducting targeted surveys for five owl species in the Black Hills of South Dakota, including the barred owl (*Strix varia*), flammulated owl (*Otus flammeolus*), northern pygmy-owl (*Glaucidium gnoma*), northern saw-whet owl (*Aegolius acadicus*), and boreal owl (*Aegolius funereus*). All of these species are cavity nesters, very small in size (less than 10" tall except the barred), and mostly active in low light making them extremely hard to locate. All of these species will respond to tape broadcasts of their call (Sutton 1994) and thus can be actively surveyed for with great success. Thorough surveying should increase the understanding of the status within the Black Hills for each of the species.

## PROJECT METHODS

### Survey Site Selection

With limited resources it was important to strategically cover as much ground as possible. Through consultation with the South Dakota Heritage program and the Rocky Mountain Bird Observatory routes were chosen that were representative of major habitat types and that were vehicle accessible to maximize spatial coverage.

Survey Calling Points were set at approximately 1/2 mile intervals as habitat dictated. See results section for mapped routes and number of Survey Calling Points.

### Tape/Broadcast Response Survey

There are numerous acceptable protocols that differ on the amount of time to play tapes. This protocol was developed based on the recommendations of Rich Levad at the Rocky Mountain Bird Observatory who has been surveying owls in Colorado.

Surveys began approximately one hour after sunset (except for northern pygmy-owls, which could begin one hour before sunset). Upon arrival at a survey calling point there was a one minute listening period followed by three alternating periods of thirty seconds of tape calling and thirty seconds of silent listening. If there was no response the same protocol began for the next target owl if it was a multiple species survey site. Owls were surveyed in order of size calling the smallest first at multiple species sites. If an owl responded by voice broadcasting continued to try to lure it into sight. When possible the owl was spotted in a flashlight beam for visual identification. Once an owl had been visually identified calling ceased and the owl was no longer lighted. Survey data was recorded and the surveyors then proceeded to the next survey point. At each point a hand held global positioning system was used to record map coordinates. The time, date, and each species surveyed was recorded whether the species was found or not.

## RESULTS

Six separate transects were surveyed totaling 163 Survey Calling Points over a distance of approximately 83.67 miles. The results are organized by survey route. A summary sheet is included for each survey route that details the logistics, target species and results. A map for each route displays the area covered, including the distances and number of survey calling points. Points where owls were located are shown on the maps with their corresponding GPS coordinates. None of the target species were located, however, barn and great horned owls were.

## **Hanna Transect**

Date: 05/28/04

General Habitat: Spruce-fir forest

Target species: barred owl, boreal owl, flammulated owl

Transect distance: 13.3 miles

Survey Calling Points: 27

Results: No owls were located during 2004. This is the same transect that resulted in the positive identification of a flammulated owl in 2002.

Discussion: This transect was surveyed again in hopes of relocating the flammulated owl identified in 2002. The survey failed to turn up any of the target species. Field technicians with the Rocky Mountain Bird Observatory reported a long eared owl in 2003 in the vicinity of where the flammulated owl had occurred. It is possible that the flammulated owl has changed locations due to the larger owl in 2003.



Flammulated owl – copyright R&N Bowers



**Clayton Transect**

Date: 5/29/04

General Habitat: Spruce-fir forest

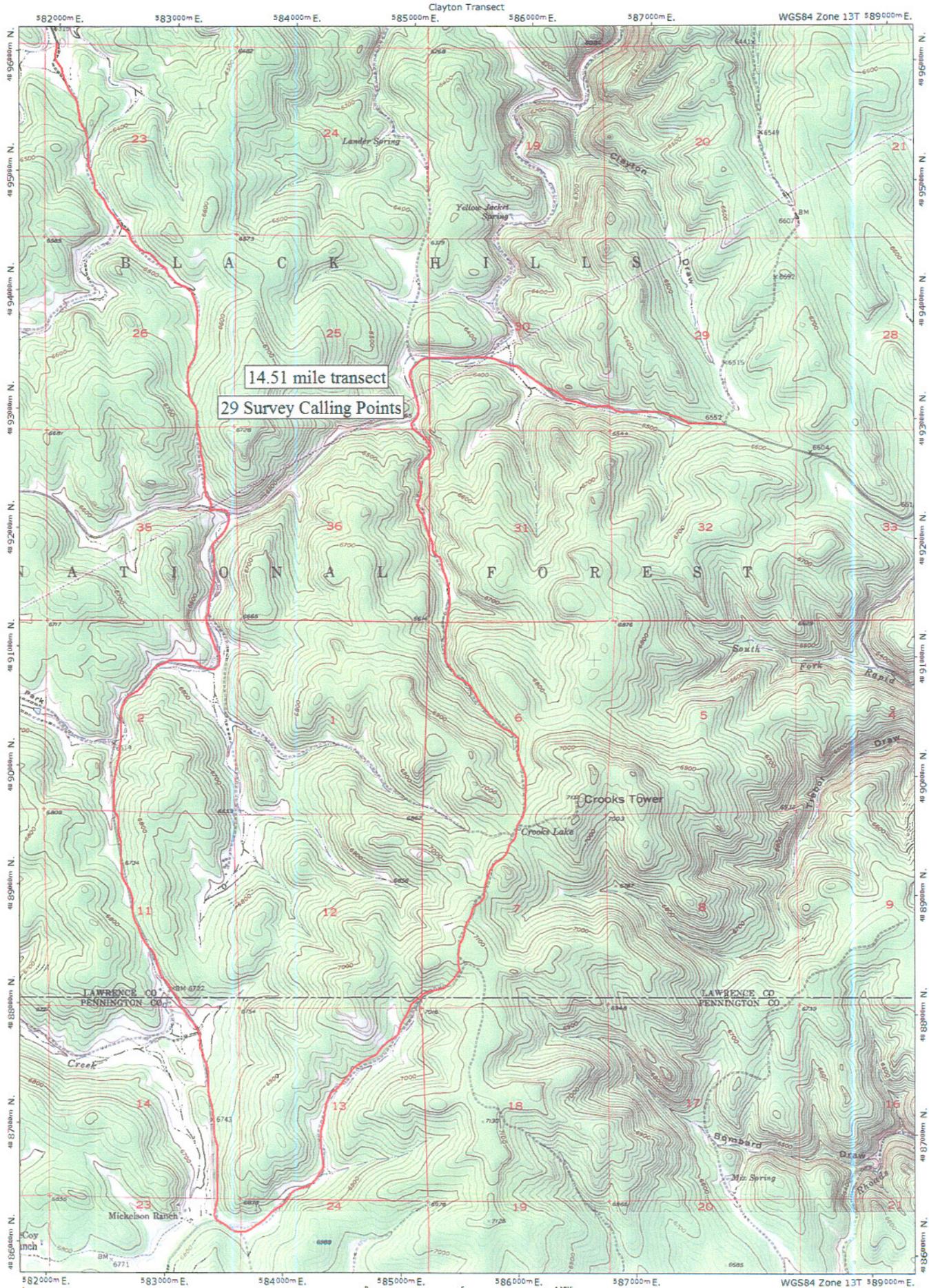
Target species: barred owl, boreal owl, flammulated owl

Transect distance: 14.51 miles

Survey Calling Points: 29

Results: No owls were located.

Discussion: This area was chosen because it is in close proximity to the Hanna transect where the flammulated owl was located and the high elevation spruce-fir forest provides some of the best potential boreal owl and barred owl habitat.



14.51 mile transect  
29 Survey Calling Points

Map created with TOPO! © 2002 National Geographic (www.nationalgeographic.com/topo)

## **Hell Canyon Transect**

Date: 6/16/04

General Habitat: Canyon habitat, Ponderosa pine

Target species: flammulated owl, northern pygmy owl

Transect distance: 12.74 miles

Survey Calling Points: 25

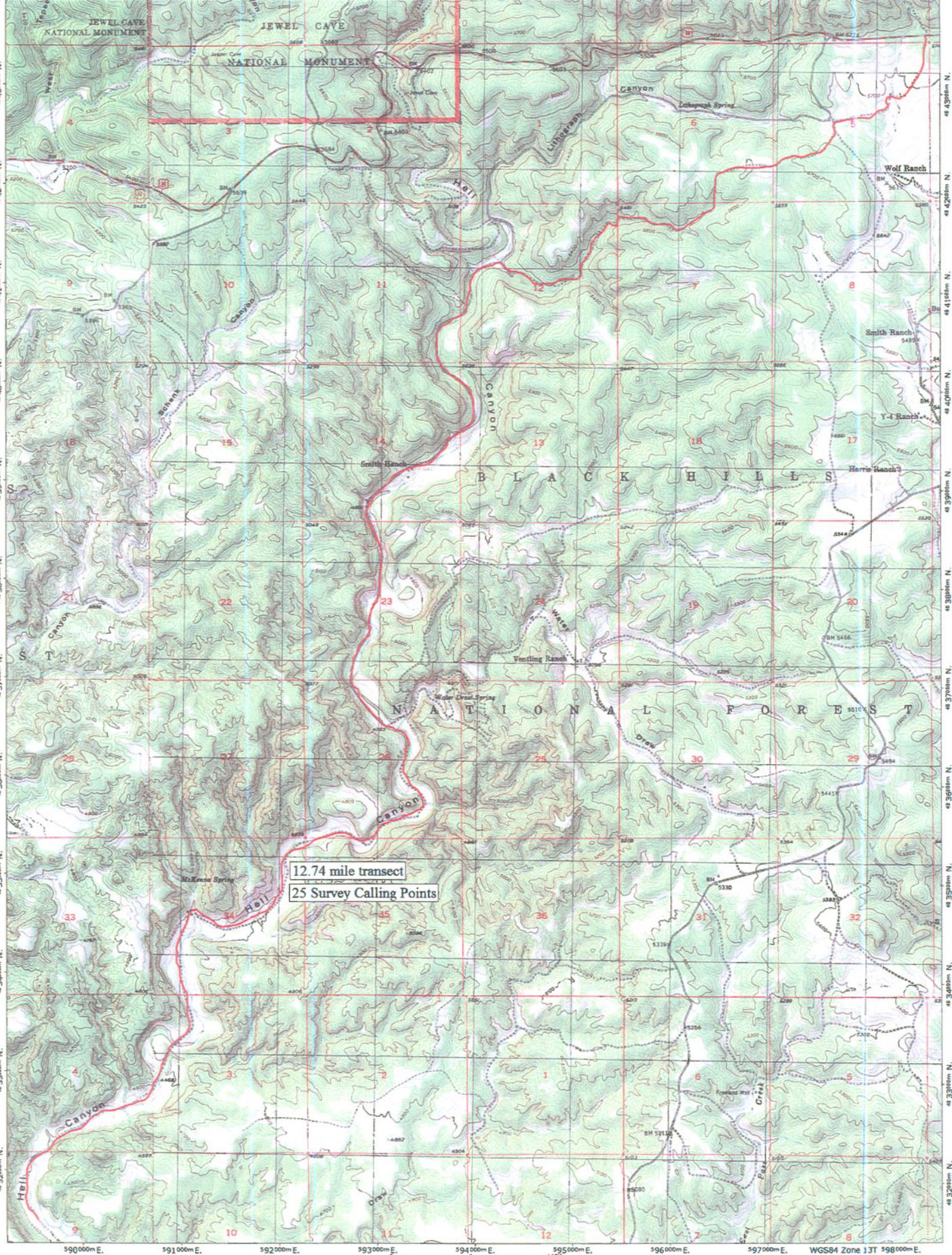
Results: No owls were located.

Discussion: Ponderosa pine in canyon terrain provides good potential habitat for the northern pygmy-owl. The ponderosa forest in this area is generally openly spaced, making it suitable habitat for flammulated owls as well.



Pygmy-owl

90°00'00" E. 91°00'00" E. 92°00'00" E. 93°00'00" E. Hell Canyon Transect 94°00'00" E. 95°00'00" E. 96°00'00" E. 97°00'00" E. WGS84 Zone 13T 98°00'00" E.



12.74 mile transect  
25 Survey Calling Points



## West Hell Canyon Transect

Date: 6/17/04

General Habitat: Ponderosa pine, spruce-fir

Target species: flammulated owl, northern saw-whet owl, boreal owl, northern pygmy-owl

Transect distance: 7.48 miles

Survey Calling Points: 15

Results: None of the target owl species were located. A great horned owl was located (see map).

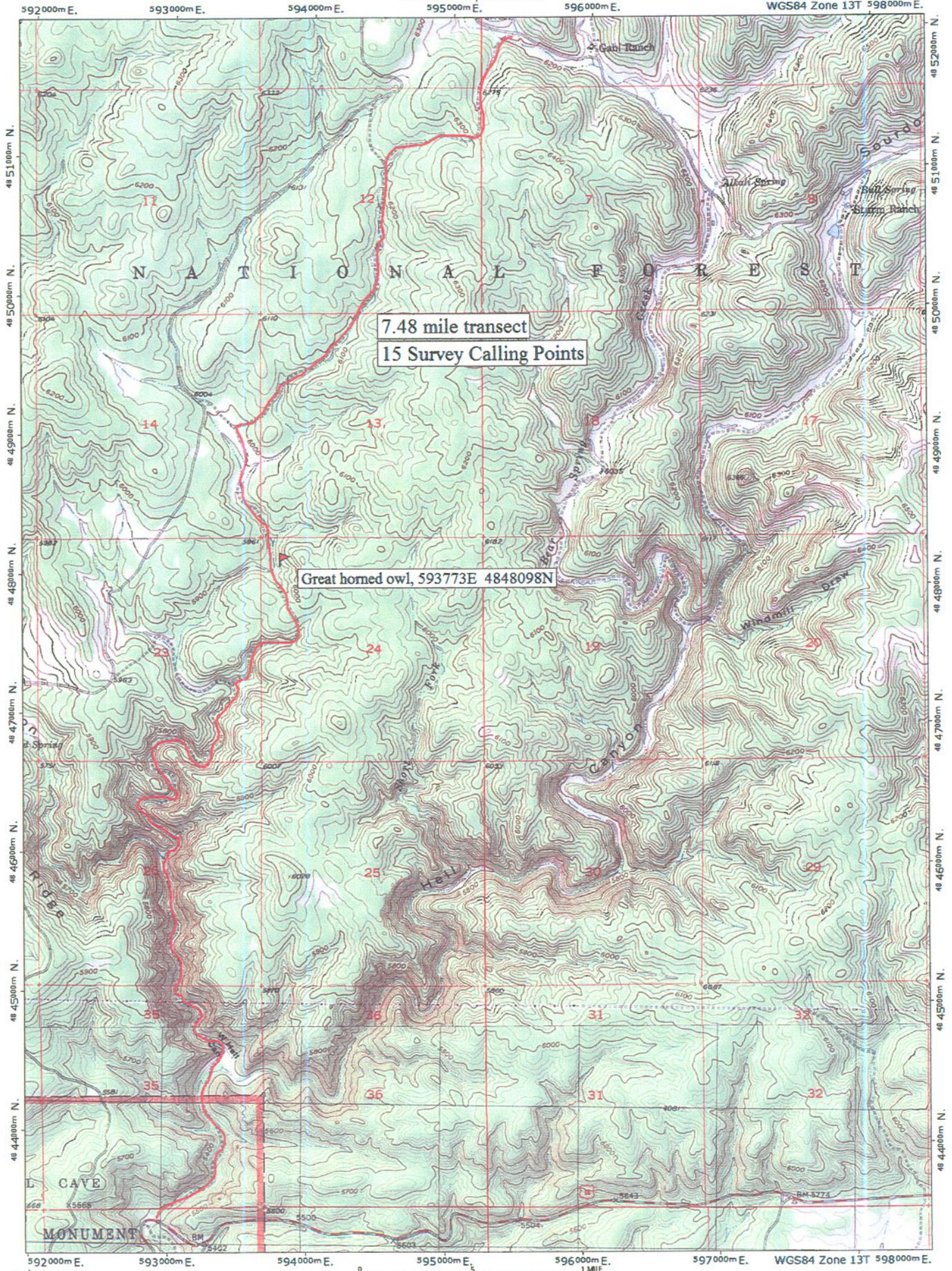
Discussion: This route was interesting because of the habitat transitions. Burn areas around Jewell Cave National Monument have created open habitat. Associated with ponderosa pine. Heading north the elevation rises 600-700 feet and habitat changes to a spruce-fir dominance. The presence of the great horned owl could complicate surveying as smaller owls are reluctant to call if great horned owls are common in their area.



Great horned owl

West Hell Canyon Transect

WGS84 Zone 13T 598000m E.



7.48 mile transect  
15 Survey Calling Points

Great horned owl, 593773E 4848098N

## **Beaver Creek Transect**

Date: 7/15-16/04

General Habitat: Ponderosa pine, spruce-fir forest, some aspen

Target species: flammulated owl, northern saw-whet owl, barred owl

Transect distance: 18.81 miles

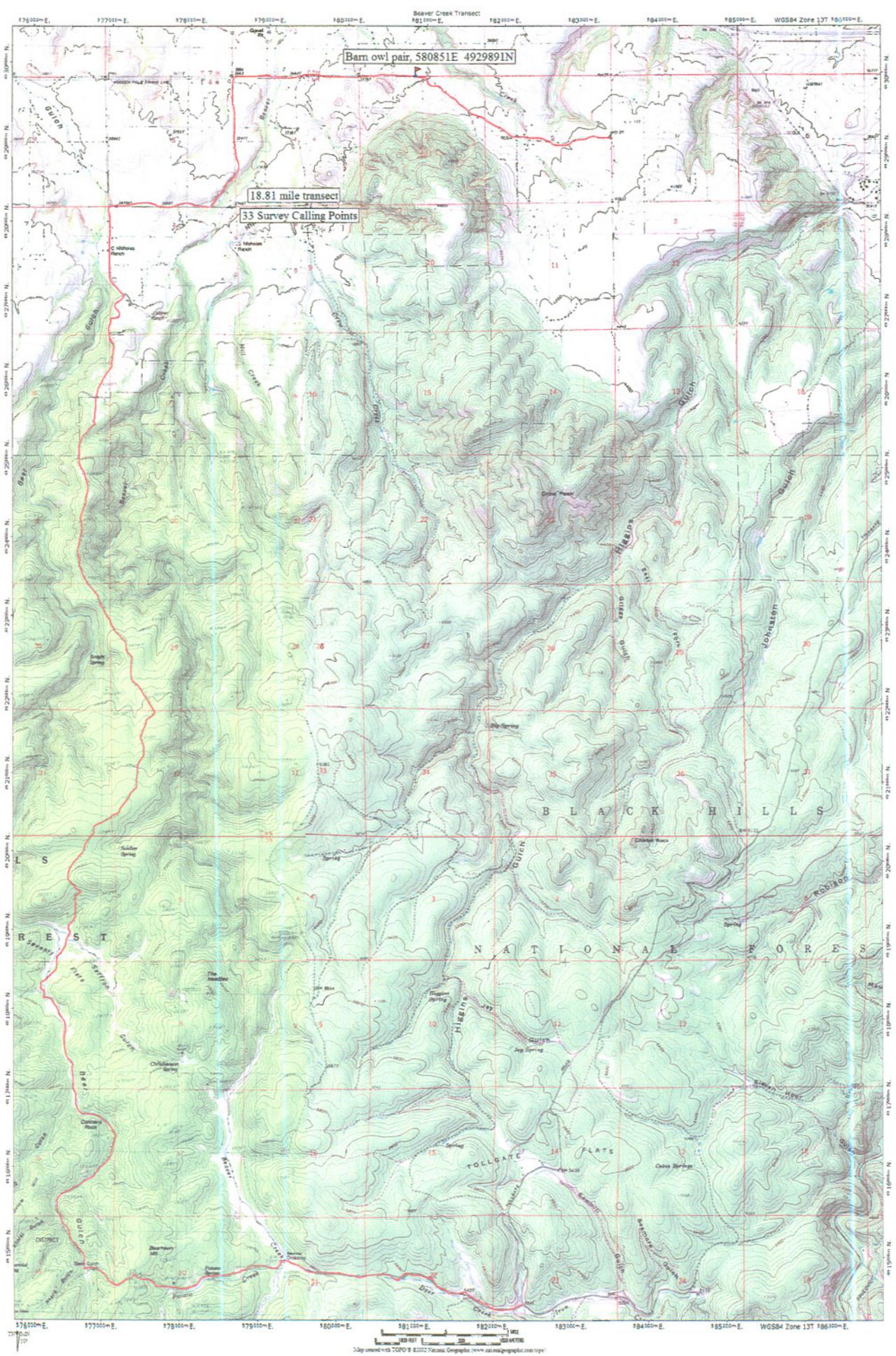
Survey Calling Points: 33

Results: No target owl species were located. A pair of barn owls was located (see map).

Discussion: This route was chosen for spatial coverage as it lies at the furthest northwest area of the South Dakota Black Hills and it was recommended by the South Dakota Natural Heritage Program as potentially good habitat.



Barn owl



Barn owl pair, 580851E 4929891N

18.81 mile transect

33 Survey Calling Points

**Higgins Gulch Transect**

Date: 7/17-18/04

General Habitat: Ponderosa & lodgepole pine, Douglas fir – some areas have been logged

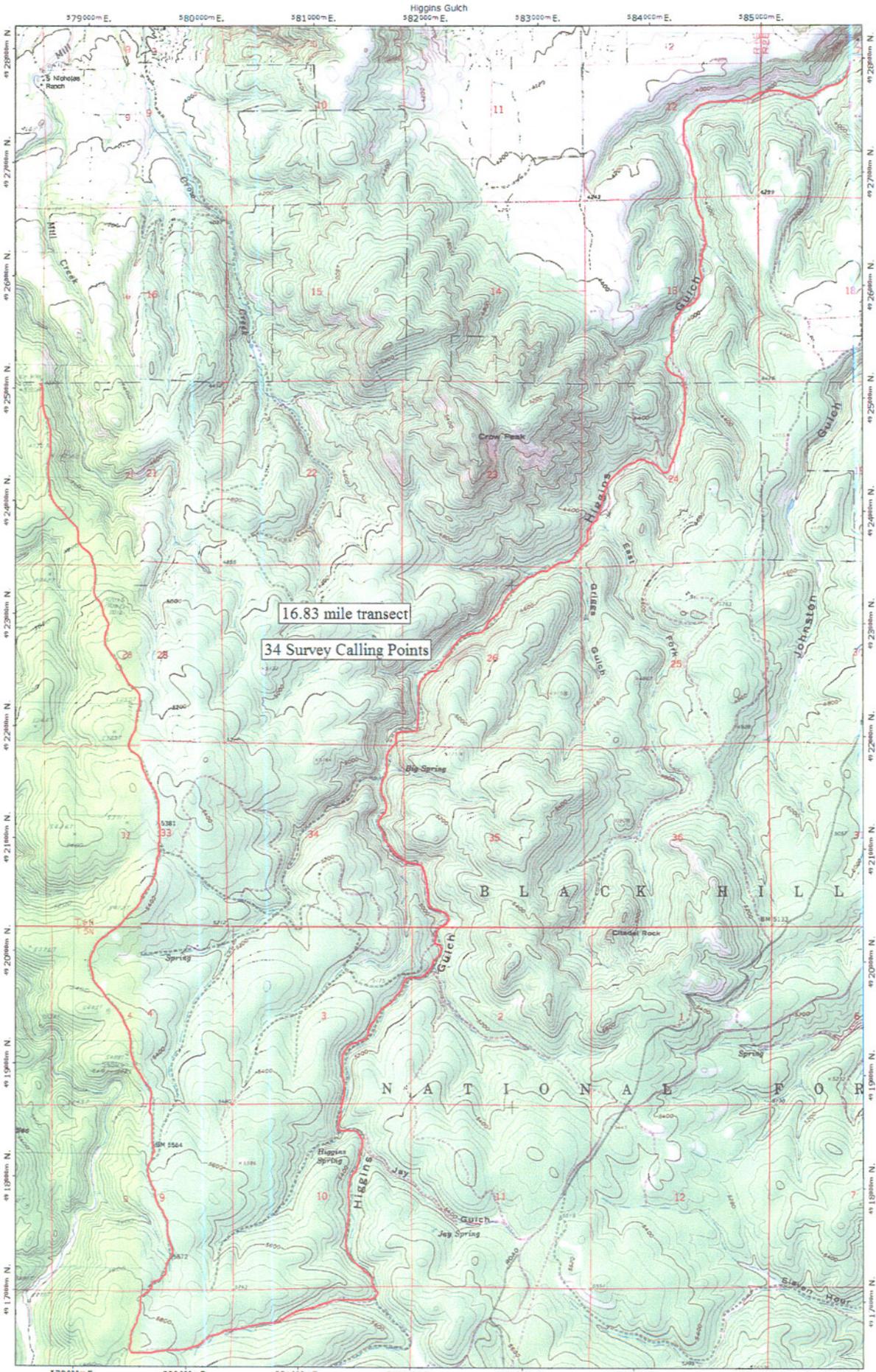
Target species: flammulated owl, northern saw-whet owl, barred owl

Transect distance: 16.83 miles

Survey Calling Points: 34

Results: No owls were located.

Discussion: This route was recommended by the South Dakota Natural Heritage Program for potentially good habitat. Some logging in the area has occurred which is interesting as it opens up more edge and open habitat.



16.83 mile transect  
34 Survey Calling Points

Scale: 100 FEET, 50 METERS, 100 METERS  
Map created with TOPO! © 2002 National Geographic (www.nationalgeographic.com/topo!)

## SUMMARY

During the 2004 field season a large sampling of varying habitats were surveyed for the five target species, with almost 84 miles of transects being covered. Despite the large area covered none of the target species were located. A pair of barn owls was an unusual occurrence in the Black Hills, located along an edge just at the start of ponderosa pine forest adjacent to large meadow habitat. Additionally one great horned owl was located.

Spatial coverage was well distributed to survey habitat for each of the target species. However, there are many areas of interest that remain to be surveyed. In particular, higher elevation pockets in the central Black Hills are a priority for the boreal owl. The Elk Mountains are an interesting island of habitat that could be suitable for northern saw-whet, flammulated and northern pygmy-owls. Finally, as the flammulated owl has been documented to occur it is still very likely that more can be found. Further, early indications are that 2005 is suspected to have an irruption of northern birds increasing the chance that boreal owls could be discovered.

The negative data supports that the target owl species are very rare in the Black Hills if they occur at all, which we know that the northern saw-whet and flammulated owl do. Continued surveys are essential to further document the existence of flammulated owls in the Black Hills as well as to determine if northern saw-whets are confined to the western region. Reports of boreal calling and barred owl sightings also need further investigation to discover if they occur in the Black Hills and have simply gone undetected like the flammulated owl had previously. This study continues to be a valuable investigation into the status of these owls. However, as species fluctuate from year to year and high quality habitat remains unsurveyed it is critical to continue strategic survey efforts to increase spatial coverage and further our understanding of these species within the Black Hills.



Barred owl

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