

Appendix 3M  
Wild Horse Ridge Bat and Owl Survey

**Bat and Flammulated Owl  
Survey Report  
C. W. Mining Company  
Bear Canyon Mine**



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## Introduction

On the nights of 18 and 19 May, and 31 May and 1 June 2004, JBR Environmental Consultants inc. (JBR) conducted bat and flammulated owl (*Otus flammeolus*) surveys in the Wild Horse Ridge area near the Bear Creek Canyon Mine, Carbon County, Utah (Figures 1 and 2). These surveys were conducted as required under an existing Utah Division of Oil, Gas, and Mining permit, due to the potential for subsidence in the area as a result of activities at C.W. Mining Companies mine operation.

## Inventory Area

The Inventory Area lies at 7,200 – 9,300 feet elevation and is comprised of 4 general vegetation communities (Figure 3): (1) a cliff/rock habitat that is dominated by mountain mahogany (*Cercocarpus ledifolius*), Juniper (*Juniperus spp.*), and barren rocky outcrops; (2) an open sagebrush (*Artemisia spp.*)/grass community; (3) a community characterized by grassy



(*Agropyron smithii*) slopes on ridge tops; and a (4) coniferous forest co-dominated by bristlecone pine (*Pinus aristata*) and Douglas-fir (*Pseudotsuga menziesii*). Other species found in the coniferous forest community include juniper (*Juniperus spp.*), common juniper (*Juniperus communis*), limber pine (*Pinus flexilis*), mountain mahogany, gooseberry (*Ribes spp.*), aspen (*Populus tremuloides*), white fir (*Abies concolor*), and includes a small area containing mature ponderosa pine (*Pinus ponderosa*).

As a function of the vast expanses of rock outcrops and associated fissures and cracks, and plentiful snag habitat, the Inventory Area contains a virtually unlimited potential for day and night bat roosting sites. No known caves, open mine shafts, adits, or other man made structures that might provide additional habitat is known to exist in the Inventory Area. Perhaps the only habitat feature limiting bat presence within the Inventory Area is the availability of water for drinking and foraging. The only known standing water in the Inventory Area is a series of seeps/ponds located at flammulated owl calling station #1 (Figure 2).

As summarized in Rodriguez (2002), flammulated owls show a preference for mature pine and mixed conifer habitat types, and are obligate secondary cavity nesters that rely on previously excavated cavities in large diseased or dead trees for nest habitat.

The Inventory Area provides these types of habitats, and therefore provides potential habitat for the flammulated owl.

### **Methodology**

JBR used an ANABAT II Bat Detector and an ANABAT CF Storage Zero Crossing Analysis Interface Module (ZCAIM) manufactured by Titley Electronics, Ltd., Ballina, NSW, Australia. JBR biologists ran the ANABAT at each of the 6 flammulated owl stations and at occasional strategic points between stations for 5-15 minutes at each station. Bat surveys were performed at stations 1, 2, and 5 on 18 and 31 May, and at stations 1, 2, 3, 4, and 6 on 19 May and 1 June. Surveys were performed between 9:00 and 11:30 pm.

In addition to the above surveys, the ANABAT was also situated at station #1 from 19 to 30 May. When left unattended the bat detector and ZCAIM were enclosed in a weatherproof container. The bat detector's ultrasound transducer was positioned at a 45-degree angle to an acrylic reflector plate. This arrangement allowed the transducer to remain dry while recording bat calls unattended. Bat calls were recorded automatically; the equipment was programmed to turn on at 9:00 pm and to turn off at 6:00 am.

The ANABAT system records bat echolocation calls and stores them as digital format computer files. The file names specify the date and time the files were recorded. The recorded files were analyzed on a desktop computer using Anlook software version 4.9g. The call identification process consists of visually comparing time-frequency displays of recorded call sequences against reference files (provided with the ANABAT system), which were recorded from known species that were hand released under controlled conditions. The analysis is somewhat subjective because it depends on making a visual comparison. The training and experience of the biologist doing the analysis is also important. At present there is no objective, standardized procedure that can be used to analyze and identify the recorded calls. For this reason, JBR will provide upon request the recorded files so that they may be archived for future reference or analyzed by other biologists experienced with the ANABAT hardware and software.



The ability of the ANABAT system to detect bat calls depends on factors such as the bat species, the call frequency, air temperature, relative humidity, distance from the

bat, and orientation of the detector's transducer. Bat activity at a given location is known to be highly variable, both from one night to the next and at different times during the night. Because JBR recorded bat calls on 15 evenings in different locations on the Inventory Area, the recordings should be a good representation of bat activity at the site.

The main purpose of the bat investigation was to detect the presence of Townsend's big-eared bats (*Corynorhinus townsendii*) and spotted bats (*Euderma maculatum*); therefore, JBR's analysis of the bat call files focused on these two species. Spotted bat calls are easily recognized because they are generally between 7 and 12 kHz, much lower than most other species (and within the range of human hearing). Townsend's bat calls are not quite as distinctive but they have one character that allows them to be identified with some confidence. Although bat calls normally consist of a fundamental frequency and one or more harmonics, the ANABAT system records only the most dominant frequency component. In Townsend's bat calls, the dominant frequency often switches between the fundamental and second

harmonic, a character not usually observed in other species' calls.



Vocalization surveys for flammulated owls were conducted to USFS protocol by playing a CD recording of a male flammulated owl's territorial call over a megaphone. The call was played for two 30-second bouts, each separated by a 2-minute pause, during which time biologists looked and listened for

responses. The process was repeated throughout the course of the field visit at all 6 calling stations in the Inventory Area. Surveys were conducted for flammulated owls at stations 1, 2, and 5 on 18 and 31 May, and at stations 1, 2, 3, 4, and 6 on 19 May and 1 June (Figure 2). All surveys were conducted after sunset between the hours of 9:00 and 11:30 pm.

While a detailed survey was not required for bristlecone pine, JBR biologists documented the general occurrence of this species while on site conducting other required surveys.

**Results**

During the 15 days of recording bat calls, 778 bat call files were produced. Of these, 356 files contained only noise or had too few calls to be useful for identification. These files were excluded from analysis. Each of the 422 remaining call files were examined for the presence of spotted bat calls, and then another pass through all the files was made to look for Townsend’s big eared calls. No calls of either species were detected. JBR did not attempt to identify all bat calls that were recorded, because that was not the purpose of this investigation. However, it appears that most of the recorded bat calls were *Myotis* species (See Table 1).

Table 1. ANABAT results and their status in Utah

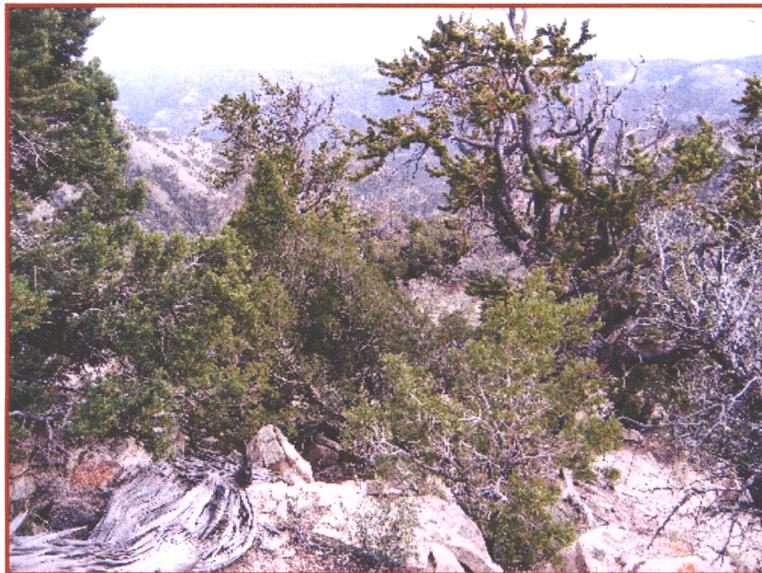
Species	Abundance In Utah <sup>1</sup>	Classification In Utah <sup>2</sup>
<i>Eptesicus fuscus</i> (Big Brown Bat)	Abundant	
<i>Lasionycteris noctivagans</i> (Silver-haired Bat)	Common	
<i>Myotis ciliolabrum</i> (Small-footed Myotis)	Uncommon	
<i>Myotis volans</i> (Long-legged Myotis)	Abundant	
<i>Myotis thysanodes</i> (Fringed Myotis)	Uncommon	Species of Concern

1. Oliver, G. V. 2000. The bats of Utah, a literature review. Utah Division of Wildlife Resources. Publication Number 00-14.

2. Utah Division of Wildlife Resources Sensitive Species List. 18 December 2003.

No flammulated owls were observed or heard by JBR Biologists during the course of the field visits. A great horned owl (*Bubo virginianus*) was heard on 1 June from the biologist’s campsite located near station 2. Incidentally, a pair of golden eagles (*Aquila chrysaetos*) were also observed on 18 May soaring above the Inventory Area.

Concerning bristlecone pine, it and Douglas-fir are co-dominant species within the upper elevations of the conifer forest vegetation community (Figure 3). This species is relatively abundant and occurs at varying sizes and age classes, and the local population generally appears healthy.

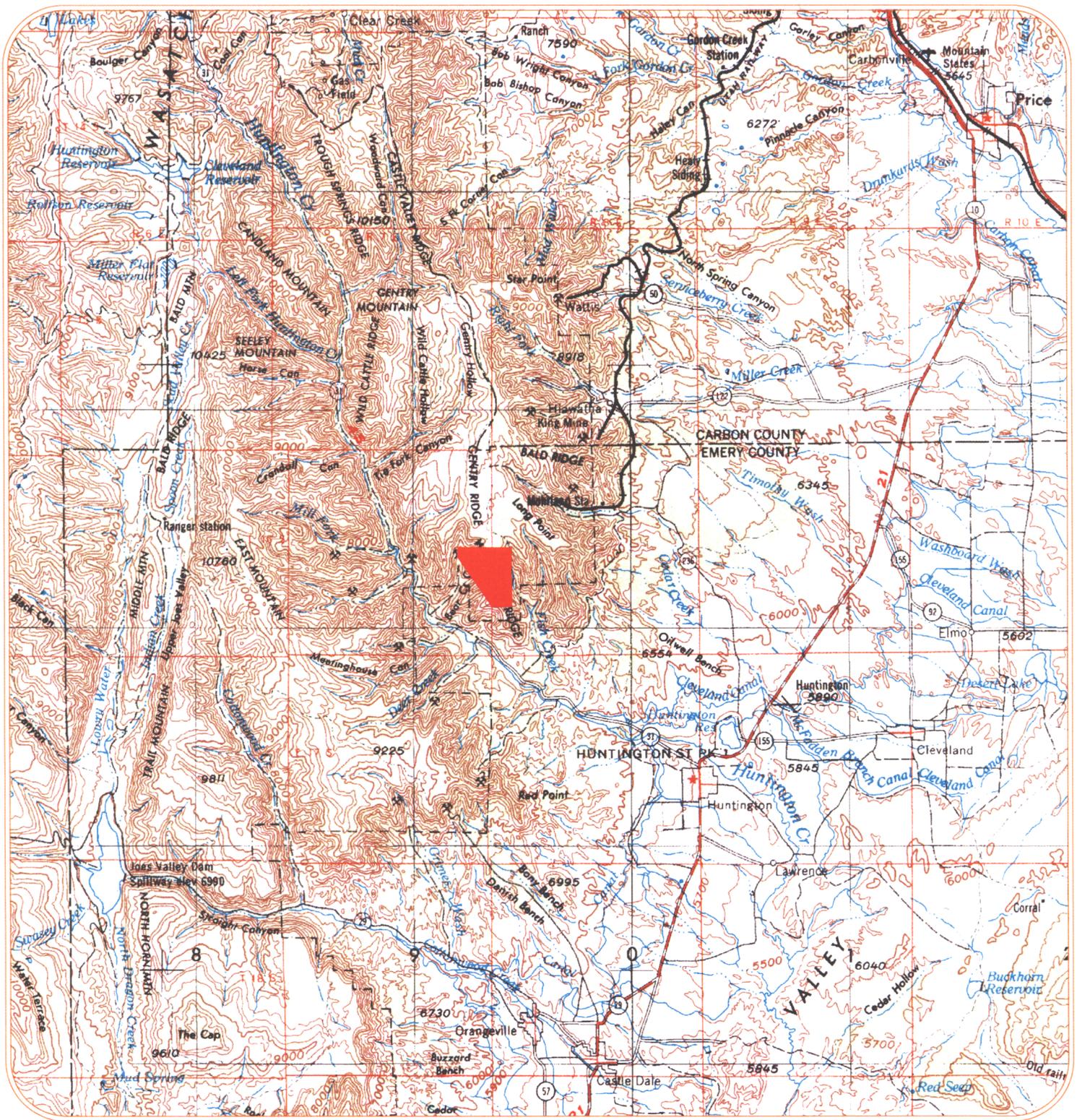


**Summary**

The Wild Horse Ridge area provides habitat for and is used by numerous bat species. A minimum of 5 different bat species were identified within the Inventory Area. All 5 bat species are previously known to occur within Utah and none of the species are protected under the Endangered Species Act. Because of their limited distribution and/or declining populations in the state, one species (fringed myotis) of bat detected is considered a species of special concern by the Utah Division of Wildlife Resources. The Inventory Area also provides potential habitat for flammulated owls, although none were detected. Concerning bristlecone pine, this species is a co-dominant species within the upper elevations of the conifer forest vegetation community.

**References**

Rodriguez, R. Contributors: P. Summers, J. Schoppe, L. Young, and J. Stenten. 2002. Life history and analysis of endangered, threatened, candidate, sensitive, and management indicator species of Dixie National Forest. Version 2. Dixie National Forest, US Forest Service.



**Figure 1. Inventory area.**

Base: Hiawatha, Utah - 1:24,000 (USGS)

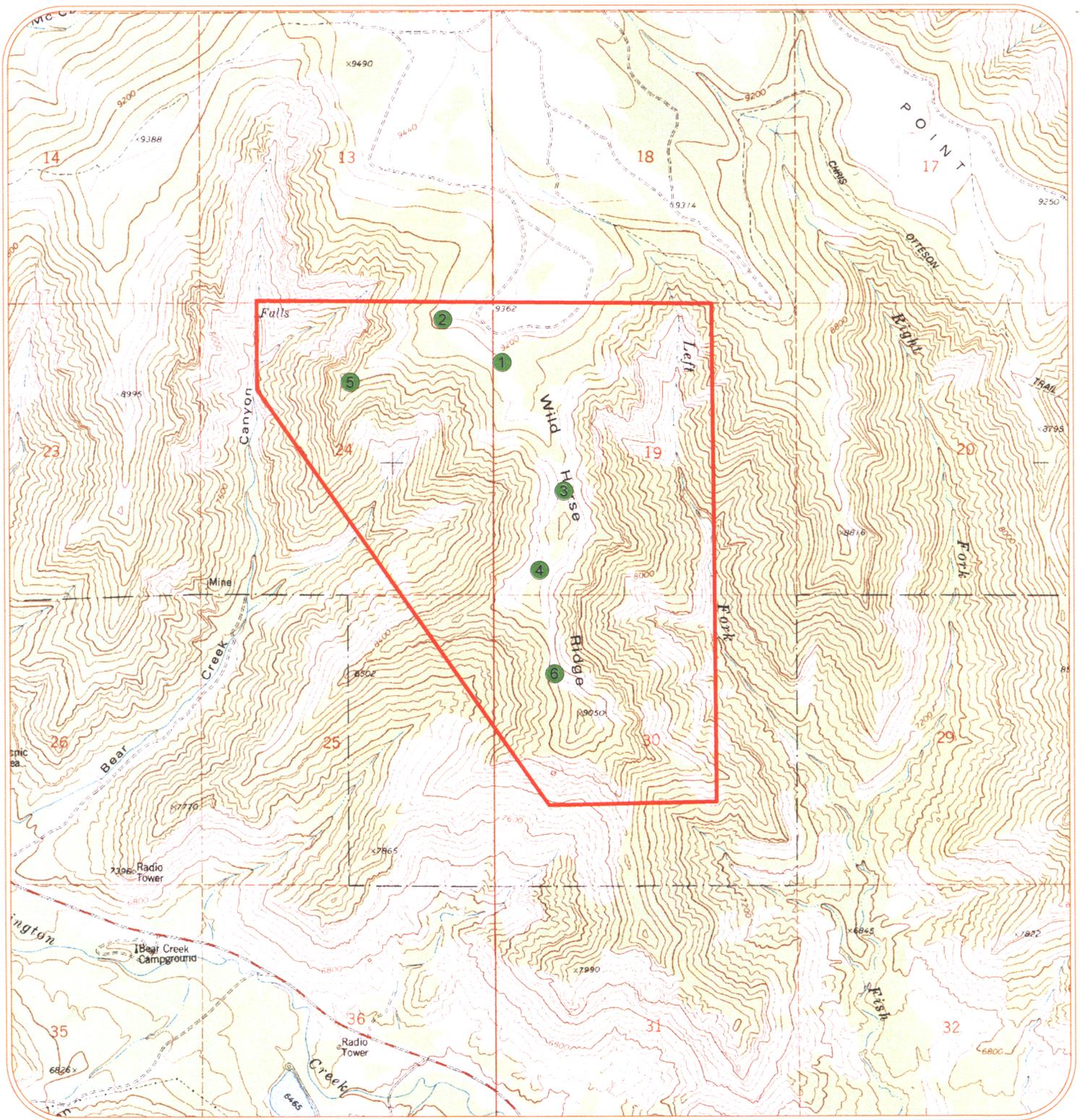
T16S R08W Sections 19 and 30

T16S R07W Sections 24 and 25

1:250,000

 Inventory Area





**Figure 2. Flammulated owl calling stations.**

Base: Hiawatha, Utah - 1:24,000 (USGS)

T16S R08W Sections 19 and 30

T16S R07W Sections 24 and 25

 Inventory Area

 Calling Stations

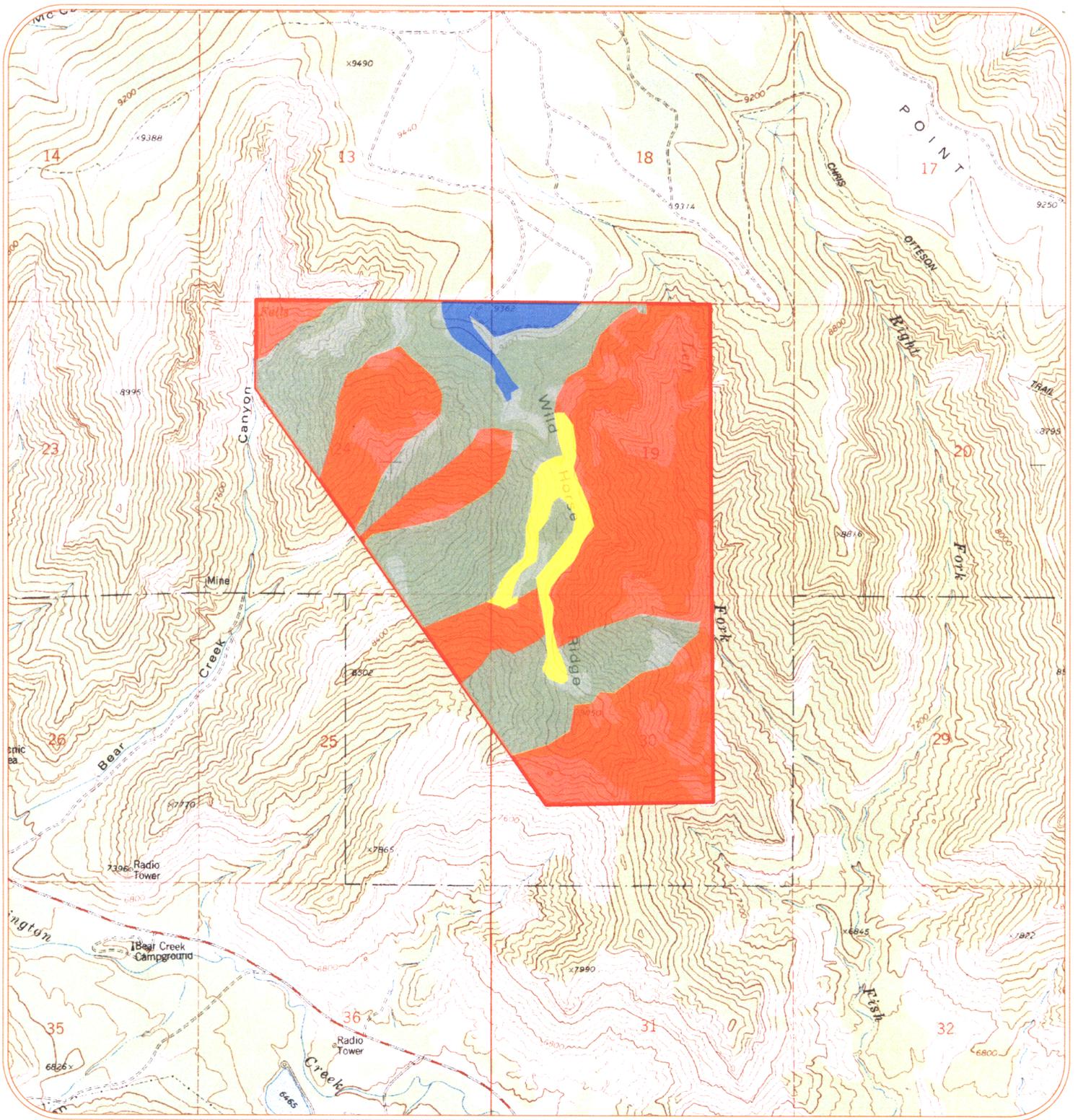
1:30,000



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**Figure 3. General vegetation communities.**

Base: Hiawatha Aerial Photograph  
 T16S R08W Sections 19 and 30  
 T16S R07W Sections 24 and 25

1:30,000



- Inventory Area
- Sagebrush/Grass
- Grass Slope
- Conifer Forest
- Cliff/Rock



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