CONTINUED MONITORING OF BOISE'S WINTERING BALD EAGLES, AND MONITORING OF THE DEAD DOG CREEK BALD EAGLE ROOST SITE, WINTERS 1997/1998 AND 1998/1999

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EXECUTIVE SUMMARY

This document outlines results from surveys of the Barber Pool and Dead Dog Creek Communal Roosts, and presents results from regular surveys of known eagle foraging areas conducted throughout the winters of 1997-1998 and 1998-1999. The main objectives of this study were to:

1. Monitor bald eagle use of the Barber Pool and Dead Dog Creek communal night roosts simultaneously through the winter.
2. Monitor bald eagle use of known foraging areas in conjunction with roost monitoring.
3. Describe how weather variables and factors influencing microclimate at roost areas are related to bald eagle use throughout the winter.

A total of 45 roost surveys were conducted at Barber Pool between 1 December 1997 and 13 March 1998. An average of 4.4 bald eagles were observed using the Barber Pool Communal Roost nightly during the 1997-1998 winter season. A total of 43 roost surveys were conducted at Barber Pool between 2 December 1998 and 10 March 1999. An average of 5.1 bald eagles were observed using the Barber Pool Communal Roost nightly during the 1998-1999 winter season. This compares to an average of 8.4 eagles during the 1996-1997 winter, 12.0 during the 1995-1996 winter, 3.0 during the 1994-1995 winter, and 10.0 during the 1993-1994 winter. Roost counts peaked at 13 eagles during early January 1998, and again at 13 eagles during late January and mid-February 1999, corresponding with some of the season's coldest temperatures. Bald eagles were observed roosting within Barber Pool in three separate locations (or subroosts): the 'Barber Pool Roost', near Eckert Road (formerly referred to as the 'Raptor Ridge' roost), and on the east side of the river on property owned by Oliver Gregerson (the 'Gregerson Roost'). The Barber Pool subroost was used only a few times during the 1997-1998 and 1998-1999 winters. The 'Gregerson' subroost was used most consistently by eagles during the majority of the 1997-1998 and 1998-1999 winters. The Gregerson subroost consisted of 6-10 live cottonwood trees located immediately next to the river channel, upstream of the Gregerson house and compound.

A total of 15 roost surveys were conducted at Dead Dog Creek between 3 December 1997 and 11 March 1998. A total of 15 roost surveys were conducted at Dead Dog Creek between 9 December 1998 and 24 March 1999. Consistently more eagles used the Dead Dog Creek Communal Roost than the Barber Pool Communal Roost throughout both winters of this study. An average of 15.7 and 16.2 bald eagles were observed using the Dead Dog Creek Communal Roost nightly during the 1997-1998 and 1998-1999 winter seasons, respectively. Roost counts peaked at 35 eagles during late January and early February 1998. Roost counts peaked at 28 eagles during mid-January 1999. Peak roost counts at Dead Dog Creek did not coincide with the season's coldest temperatures, nor were they related to snow depth or amount of snow on roost trees. Two main subroosts were identified within the Dead Dog Creek roost stand.

The roost stand was approximately 76 ha (188 ac.) in size, and contained mixed-conifer habitat dominated by Douglas-fir and ponderosa pine. The main vegetation type within the stand was Douglas-fir/mountain ninebark. Trees within the stand were mostly even-aged Douglas-fir and

ponderosa pine that were approximately 60-85 years old. Fire burned through the stand approximately 90 years ago, sparing some Douglas-fir and ponderosa pine which are now 140-200 years old. Bald eagles used these remnant trees exclusively for perching and roosting. These trees were taller, had greater girths, and were older than the majority of trees within the stand.

A total of 15 surveys of known foraging areas were conducted during the winter of 1997-1998. A total of 14 surveys of known foraging areas were conducted during the winter of 1998-1999. We recorded an average of 17.6 and 17.2 bald eagles on all surveys of foraging areas combined during the 1997-1998 and 1998-1999 winters, respectively. During both winters of the study, eagles were most numerous on Lucky Peak and Arrowrock Reservoirs, and least numerous in the desert south of Boise. We recorded an average of 5.1 and 5.3 bald eagles per weekly foraging survey of the Boise River during the 1997-1998 and 1998-1999 winters, respectively. The majority of eagles observed on the Boise River were recorded upstream from Eckert Road in Barber Pool, the canyon between Diversion Dam and Lucky Peak Dam, and near Lucky Peak Dam. We suggest that the majority of eagles roosting at Dead Dog Creek made daily foraging flights to Lucky Peak and Arrowrock Reservoirs or to foothills foraging areas. We suggest that the majority of eagles roosting at Barber Pool made daily foraging flights to the Boise River or desert foraging areas.

One objective of this report is to provide recommendations to the public agencies involved for management of the Dead Dog Creek Communal Roost. Recommendations are made to ensure the continued use of Dead Dog Creek or other suitable or potential habitats by bald eagles for communal roosting throughout the short- and long-term future.

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ACKNOWLEDGMENTS

I wish to thank Community Planning Association and O'Neill Enterprises, Inc. for their continued interest in Boise's wintering bald eagles. Their support, coordination, and funding has made this yearly research possible. Their sincere efforts will help ensure the continued use of the Boise River and Barber Pool by wintering bald eagles. The U.S. Bureau of Land Management, U.S. Forest Service, and Idaho Department of Fish and Game have taken a sincere interest in describing bald eagle use patterns at the newly-found roost site at Dead Dog Creek. Their funding, in-kind support, coordination, and assistance in the field made the monitoring at Dead Dog Creek possible. I wish to thank Jack LaRocco (BLM) and Larry Donohoo (FS) for their interest and support of this monitoring project. Jerry Scholten (IDFG) granted access to the Boise River Wildlife Management Area (WMA), provided use of an ATV and snowmobile, and provided labor to assist with roost monitoring and carcass placement. The monitoring project could not have been accomplished without his constant and much-needed assistance. Results from annual Midwinter Eagle Counts, literature on bald eagle wintering behavior, and technical assistance developing monitoring protocol were provided by Karen Steenhof, U.S. Geological Survey, Snake River Field Station. Karen Steenhof and Trent Brown assisted with roost surveys. Trent Brown assisted with surveys of bald eagle foraging areas. Tom Zariello, U.S. Geological Survey, Snake River Field Station, prepared maps contained in the report. Greg Townley conducted field work associated with the Dead Dog Creek stand exam, and assisted with compilation of stand exam data and preparation of the stand description contained in this report.

INTRODUCTION

The bald eagle (*Haliaeetus leucocephalus*) is the only North American representative of the fish or sea eagles (Brown and Amadon 1968), and is endemic to North America. The breeding range formerly included most of the continent, but eagles now nest mainly in Alaska, Canada, the Pacific Northwest states, the Great Lake states, Florida, and the Chesapeake Bay. The winter range includes most of the breeding range, but extends from southern Alaska and southern Canada southward. In 1978, the bald eagle was federally listed as endangered in all of the continental U.S. except Minnesota, Wisconsin, Michigan, Oregon, and Washington, where it was classified as threatened. The listing of the species as endangered in Idaho required federal and state agencies to identify and protect important bald eagle habitats. Consistent increases in bald eagle numbers over the past decade resulted in the down-listing of the species from endangered to threatened in 1994. In 1998, the U.S. Fish and Wildlife Service proposed de-listing of the species.

Bald eagles both breed and winter in the Boise River Drainage of southwest Idaho (Kaltenecker and Bechard 1995). Bald eagles wintering in the Boise River Corridor are valued by the local public, and are a component of what many consider quality of life in the Boise area (Steenhof 1992). The Boise River Bald Eagle Task Force, comprised of representatives of federal, state, and local government agencies, initiated a study of wintering bald eagles on the Boise River in 1993 (Kaltenecker et al. 1994). The goal of the study was to outline the best management strategies for conservation and enhancement of wintering bald eagle numbers on the Boise River.

The study described results from surveys of bald eagles during the 1993-1994 winter season. Continued interest in Boise's wintering bald eagles resulted in further study during subsequent winter seasons. Both surveys of eagles along the Boise River and at the Barber Pool Communal Roost were conducted during the 1994-1995 winter season (Kaltenecker 1995). This research described similar patterns of eagle use to those identified during the previous season, but showed a significant decrease in use of the Barber Pool Communal Roost. Concern over this apparent decrease and potential effects from ongoing development projects in the vicinity of the roost resulted in continued study during the next three winter seasons. Projects under construction near Barber Pool during this period included the ITD Highway 21 connector bridge, sewer construction at the bridge site, the Surprise Valley housing development, and the Shakespeare Festival amphitheater construction. Eagles have continued to use the Barber Pool Communal Roost throughout the past three winter seasons, showing variable use of the area. Both numbers and use patterns of eagles using the Barber Pool Communal Roost have varied during each winter of this study (Kaltenecker 1997).

During the 1996-1997 winter, additional monitoring was conducted at nearby known eagle foraging areas including Lucky Peak and Arrowrock Reservoirs, in the nearby foothills, the desert south of Boise, and the Boise River. Surveys of foraging areas were conducted to better understand how total numbers of eagles in the nearby area affect counts of eagles at the Barber Pool Communal Roost. During the 1996-1997 winter, the majority of foraging eagles were observed on the Boise River upstream of Eckert Road (Kaltenecker 1997).

Also during the 1996-1997 winter, searches were conducted in the Boise foothills for other suspected night roosts. A major bald eagle roost was found at Dead Dog Creek, a tributary of More's Creek, near Lucky Peak Reservoir (Kaltenecker 1997). Numbers of bald eagles using the Dead Dog Creek Communal Roost varied from 10-30 individuals during February and March 1997. Golden eagles (*Aquila chrysaetos*) also were observed perching within the stand on several occasions. Dead Dog Creek is located on the northeast slope of the Lucky Peak/Shaw Mountain complex. The area is unroaded, and thus inaccessible to motor vehicles. Dead Dog Creek is the southernmost timbered drainage on Lucky Peak, and contains mixed-conifer habitat dominated by Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*). Bald eagles were observed using a timber stand within this drainage for communal roosting in T3N, R4E, sections 7, 17, and 18. Dead Dog Creek is located on the Lucky Peak USGS topographic quadrangle map. The roost area was located using the Global Positioning System (GPS), and coordinates of the center point are 43°36.54'N by 116°01.32'W. The roost stand is located in Ada County, and ownership is shared by the U.S. Forest Service, the U.S. Bureau of Land Management, and Idaho Department of Fish and Game.

Monitoring of bald eagle use of the Barber Pool Communal Roost continued during the 1997-1998 and 1998-1999 winter seasons. In addition, regular monitoring of the newly-found roost at Dead Dog Creek also occurred throughout these two winters. Surveys of nearby eagle foraging areas were also conducted to describe how habitat use, foraging, and roosting are interrelated in the local area and at the two communal roosts. The objectives of this study were to:

1. Monitor bald eagle use of the Barber Pool and Dead Dog Creek communal night roosts simultaneously through the winter.

2. Monitor bald eagle use of known foraging areas in conjunction with roost monitoring.

3. Describe how weather variables and factors influencing microclimate at roost areas are related to bald eagle use throughout the winter.

This document outlines results from a 2-year study of the Barber Pool and Dead Dog Creek Communal Roosts, and presents results from regular surveys of known eagle foraging areas conducted throughout the winters of 1997-1998 and 1998-1999. Methods described in this report for surveys of the Barber Pool Communal Roost allowed for duplication of surveys conducted during the previous four winter seasons, so results from all six winters can be directly compared. Also contained in this report are recommendations for future study of both communal roosts, and recommendations for best management of the Dead Dog Creek Communal Roost.

METHODS

Barber Pool Communal Roost Surveys

Surveys of the Barber Pool Communal Roost were conducted three times per week from 1 December 1997 through 13 March 1998, and from 2 December 1998 through 10 March 1999. Roost surveys were conducted every Monday, Wednesday, and Friday, starting approximately two hours before sunset and continuing until darkness. Roost surveys lasted approximately three hours in duration, and were conducted under all weather conditions. We recorded general weather conditions during each roost survey including precipitation, temperature, wind speed and direction, and amount of snow both on the ground and on roost trees. All roost surveys were conducted from the south side of the river from the Surprise Valley development. During roost watches, the entire length of the Surprise Valley property was driven while observers scanned throughout Barber Pool for eagles. All eagles, their ages (adult or immature), exact perching locations, and movements within Barber Pool were recorded in field notes and on topographic maps. The main observation point for roost watches was located on the rim above Barber Pool on a road leading to the New York Canal (click here to view Figure 1). All main subroost areas could be easily viewed from this observation point. Observers ended roost watches by driving to the north side of the river near the Crow Inn Restaurant to make a final count of eagles using the Barber Pool and Gregerson subroosts. After sunset, a more accurate count of eagles in these subroosts could be made from the north side of the river. The roost trees near Eckert Road were checked for roosting eagles when observers drove from Surprise Valley to the Crow Inn.

Dead Dog Creek Roost Surveys

Monitoring of the Dead Dog Creek Communal Roost was conducted once per week on Wednesday evenings from 3 December 1997 through 11 March 1998, and from 9 December 1998 through 24 March 1999. Dead Dog Creek roost surveys were conducted simultaneously with surveys at Barber Pool. Roost surveys started approximately 2-3 hours before sunset and continued until total darkness, lasted approximately 3-4 hours in duration, and were conducted under all weather conditions. We recorded general weather conditions during roost surveys including temperature, precipitation, wind speed and direction, and amount of snow both on the ground and on roost trees. We recorded species (bald or golden eagles), age (adult or immature), perch locations, direction from which eagles entered the roost, and movements of eagles within the roost. We recorded eagle behavior, eagle movements within the roost stand, and exact roost locations in field notes and on topographic maps. Observers reached the roost by driving (4-WD vehicle, ATV, or snowmobile) to the bottom of Dead Dog Creek along an unmarked 2-track road located west of More's Creek, then hiked to observation points on the hillside north of the roost (click here to view Figure 2).

Dead Dog Creek Roost Stand Exam

We conducted a thorough exam of the conifer stand containing the Dead Dog Creek Communal Roost during July and August 1998. We used methods modified from Keister et al. (1983) and Dellasala et al. (1998). We first delineated the roost stand by establishing a fixed boundary around the timbered area containing all roost trees (click here to view Figure 3). We estimated area within this boundary from a USGS topographic map. We determined general forest type and identified dominant plant species present, then sampled roost stand vegetation within thirty-four

0.1 ha (0.25 ac., 18 m, 59 ft. radius) nested circular plots that were systematically positioned at 100 m (328 ft.) intervals along parallel transects. Transects were positioned perpendicular to topographic contours and were spaced at 200 m (656 ft.) intervals (click here to view Figure 3). Transect lengths varied from 300 to 1600 m (984-5250 ft.). We randomly determined the starting point used to position the vegetation plots along each transect.

We measured all dominant and co-dominant trees within the 0.1 ha plots. We defined dominant and co-dominant trees as those trees ≥35 cm (13.8 in.) diameter at breast height (dbh) and taller than or the same height as the adjacent trees forming the upper canopy, respectively. We then measured all trees 10-35 cm (4.0-13.8 in.) dbh within a 0.05 ha (0.125 ac.) plot (13.5 m, 41.4 ft radius) nested within the 0.1 ha plot. Lastly, we measured all seedlings and saplings within a 0.01 ha (0.025 ac.) plot (3.8 m, 11.6 ft radius) nested within the 0.05 ha plot. We recorded species and coverage of brush and herbaceous vegetation within each 0.01 ha plot, and noted the amount of downed woody debris and duff for fire potential. At each plot center, we measured slope and aspect using a clinometer and USGS topographic map.

For all trees, we determined species, height was measured with a clinometer, dbh was determined with a tape, and age was determined by increment coring at breast height. Ten-year radial growth (amount of growth within the last 10-year period) was determined from increment cores.
We also determined crown class (five classes: open grown, dominant, co-dominant, intermediate, and suppressed), crown ratio (percent of tree with live limbs), and crown shape for all trees within vegetation plots. Crown shape (structure class) was modified from Keister et al. (1983) and Keen (1943). We placed trees into five crown shape categories:

1. Growing stock: Healthy, fast growing, young to middle-aged trees with live crowns and good form.

2. Growing stock, but with <50% live crown or poor form.

3. Over mature trees: Older, dominant live trees with crowned or flat tops, with >75% live crowns.

4. Dead top: Growing stock or Over mature trees with completely dead tops.

5. Snag: Dead trees with >75% of their original form.

In addition to vegetation plots, all trees within the Dead Dog Creek Communal Roost used by bald eagles for perching or roosting were identified throughout the 1997-1998 winter and were plotted on USGS topographic maps. Eagle use trees were returned to during July 1998, and we recorded species, height, dbh, age, 10-year radial growth, crown class, crown ratio, and crown shape as described above for trees measured within vegetation plots.

Surveys of Foraging Areas

Morning surveys of foraging areas were conducted once each week on Wednesdays from 3 December 1997 through 11 March 1998, and from 9 December 1998 through 10 March 1999. We recorded eagles using five different known foraging areas including Arrowrock Reservoir, Lucky Peak Reservoir, the foothills, the desert south of Boise, and the Boise River from Lucky Peak Dam to Eagle Island. Surveys of foraging areas began at sunrise, and continued until approximately 1300 hours. We recorded general weather conditions during foraging area surveys including precipitation, wind speed and direction, ice conditions, and amount of snow. All eagles (both bald and golden eagles), their ages (adult or immature), locations, and activities were recorded in field notes or on topographic maps. Due to the expanse of the area covered, surveys could not be conducted by one observer. Two observers were used on each survey day, and separate routes were covered simultaneously by each. Arrowrock Reservoir and the Boise River were surveyed by one observer, while the other surveyed Lucky Peak Reservoir, foothill feeding areas, and locations in the desert south of Boise.

Reservoir Foraging Areas

Arrowrock Reservoir was surveyed from Road 268. We first drove from Arrowrock Dam upstream to Willow Creek campground at the backwaters of the reservoir, then surveyed downstream toward the dam to avoid direct glare from the morning sun. Surveys of Arrowrock Reservoir began shortly after sunrise and were completed between 0900-1000 hours. We scanned all stands of trees, rock outcrops, and other likely perch locations for eagles. We also scanned for eagles in flight during the entire survey. We recorded proximity of eagles to prey sources such as deer (*Odocoileus hemionus*) or elk (*Cervus elaphus*) carcasses.

We surveyed Lucky Peak Reservoir from Road 268 and from Highway 21 beginning at Arrowrock Dam, working downstream to Highway 21. We then drove north along Highway 21 to Robie Creek. We returned along Highway 21 to Lucky Peak Dam, stopping to scan near More's Creek Bridge and from the dam itself. Surveys of Lucky Peak Reservoir began at approximately 0900 hours, and were usually completed by 1000 hours. We scanned all stands of trees, rock outcrops, and other likely perch locations for eagles. We also scanned for eagles in flight throughout the entire survey. We recorded proximity of eagles to prey such as deer or elk carcasses.

Foothills Foraging Areas

Surveys of known foraging areas in the Boise foothills were conducted from a 4-WD vehicle on an unmarked road on the Boise River WMA near the maintenance shop/office. The area manager had routinely placed road-killed deer and elk carcasses in this area for several winters (Jerry Scholten, IDFG, pers. comm.). Surveys of foothills foraging areas took place between 1000 and 1100 hours. During surveys, we drove to areas where carcasses had been placed and scanned for eagles feeding, perching nearby, and soaring in the vicinity.

Desert Foraging Areas

Surveys of known foraging areas in the desert south of Boise were conducted from a 4-WD vehicle on Black's Creek/Kuna Mora Road, South Cole Road, Pleasant Valley Road, and Gowen Road. Observers began at Black's Creek Reservoir, continued west on Kuna Mora Road to South Cole Road, turned south on South Cole Road and continued to the Iowa Beef Processing Plant (IBP), then surveyed north toward Boise along Pleasant Valley Road, and continued east to Interstate I-84 along Gowen Road. Observers scanned for eagles at Black's Creek Reservoir, near IBP, and south of IBP near the sewage facilities. Observers also scanned for eagles while traveling along Kuna Mora Road, Pleasant Valley Road, and Gowen Road, recording all eagles observed in flight, perched on the ground near prey, or perched on power or fence poles.

Boise River Surveys

Surveys of eagles along the Boise River began between 0900 and 1000 hours at Lucky Peak Dam. We drove downstream along Highway 21 in an auto, counting all eagles observed perched or soaring near Lucky Peak Dam, between Lucky Peak and Diversion Dams, and between Diversion Dam and the Highway 21 bridge. We then scanned Barber Pool from the State Historical Marker and the Crow Inn on the north side of the river, and from the main roost observation point and the lower end of the Surprise Valley development on the south side of the river. We continued along Amity Road to Barber Park, scanning the cottonwood perches near Eckert Road as we passed. We parked in Barber Park and began riding bicycles downstream along the greenbelt pathway. We continued until we reached the downstream end of the Riverside Village residential development near the upstream end of Eagle Island. Boise River surveys lasted 2-3 hours, and were completed by 1300 hours. All locations of eagles observed during surveys were recorded in field notes and on topographic maps.

RESULTS

Barber Pool Roost Surveys

A total of 45 and 43 roost surveys were conducted at Barber Pool between 1 December 1997 and 13 March 1998, and between 2 December 1998 and 10 March 1999, respectively. An average of 4.4 and 5.1 bald eagles were observed at the Barber Pool Communal Roost nightly during the 1997-1998 and 1998-1999 winters, respectively (click here to view Figure 4). This compares to an average of 8.4 eagles during the 1996-1997 winter, 12.0 during the 1995-1996 winter, 3.0 during the 1994-1995 winter, and 10.0 during the 1993-1994 winter (click here to view Figures 5, 6). Bald eagle use of Barber Pool for night roosting increased slightly during the 1998-1999 winter compared to the previous season. As during past winters, a higher proportion of adult eagles were observed roosting in Barber Pool than immatures. During the 1997-1998 winter, 71 percent of all eagles observed roosting in Barber Pool were adults, and only 29 percent were immatures (click here to view Figure 7). During the 1998-1999 winter, 66 percent of all eagles roosting in Barber Pool were adults, and only 34 percent were immatures (click here to view Figure 8). Roost counts peaked at 13 eagles during early January 1998, and in mid-January 1999 and again in mid-February 1999, corresponding to some of the season's coldest temperatures. Similar to past winters, eagle numbers at Barber Pool were found to be inversely correlated to

average daily temperatures recorded at Idaho City, Idaho during the 1997-1998 and 1998-1999 winters (click here to view Figures 9, 10).

During the 1997-1998 winter, bald eagles were observed roosting within Barber Pool in four separate locations (or subroosts): the 'Barber Pool' subroost, the 'Canal' subroost, near Eckert Road (the 'Raptor Ridge' subroost), and on the east side of the river on property owned by Oliver Gregerson (the 'Gregerson' subroost) (click here to view Figures 1, 11). Eagles were observed using the Canal subroost during late afternoon only a few times throughout the 1997-1998 winter, but were never observed roosting there. Eagles were never observed using the Canal subroost during the 1998-1999 winter. Use of this traditional subroost has continued to decline over the past few winters. The winter of 1997-1998 was the first season since initiation of this study that no eagles were observed roosting in the Canal subroost. The Canal subroost once was considered the primary subroost in Barber Pool, but was replaced by the Barber Pool subroost during the winters of 1994-1995 and 1995-1996. It is unknown why eagles no longer use the Canal subroost.

Eagles continued to use the Barber Pool subroost throughout the 1997-1998 winter, but use of this subroost declined and changed. During past seasons, use of this subroost was limited to one large live cottonwood tree, referred to as the 'Barber Pool Roost Tree'. During the 1997-1998 winter, eagles used the Barber Pool Roost Tree and several smaller cottonwood trees in its vicinity for night roosting. During past winters, the Barber Pool subroost was used throughout the season by roosting eagles, however, during the 1997-1998 winter, eagles used the Barber Pool subroost only during early December and again during early-mid March. During the 1998-1999 winter, use of the Barber Pool subroost continued to decline, and use of the Gregerson subroost increased (click here to view Figure 12). During the 1998-1999 winter, the Barber Pool subroost was only used once by one roosting bald eagle. It is unknown why eagles no longer use the Barber Pool subroost.

The newly-described 'Gregerson' subroost, was used most consistently by eagles during the majority of the 1997-1998 and 1998-1999 winters. Eagles began using this new subroost east of the Boise River during late December 1997, and continued roosting there throughout the 1997-1998 and 1998-1999 winters (click here to view Figures 11, 12). The Gregerson subroost consisted of 6-10 live cottonwood trees located immediately next to the river channel, upstream of the Gregerson house and compound (click here to view Figure 1). The Gregerson subroost was located across the river and downstream from the Barber Pool subroost.

Eagles also were observed roosting in three different cottonwood trees located near Eckert Road at the proposed Raptor Ridge housing development throughout both the 1997-1998 and 1998-1999 winters (click here to view Figures 1, 11, 12). During the 1997-1998 winter, two adult bald eagles were consistently observed roosting at the Raptor Ridge subroost. It was suspected that they were a mated pair. During the 1998-1999 winter, only one adult bald eagle was consistently observed roosting at the Raptor Ridge subroost.

During previous winters, eagles often staged in Barber Pool during the early evening, only to leave the area before dark. This pattern continued during the 1997-1998 and 1998-1999 winters, but was not as regular as in past seasons. Generally, eagles observed in Barber Pool during surveys roosted at one of the subroosts described above. Eagles observed leaving Barber Pool generally flew upstream, then east into the foothills, likely heading for the Dead Dog Creek Communal Roost site.

On numerous occasions, bald eagles were observed approaching Barber Pool from the south, flying low over the Surprise Valley development. Eagles also were observed flying along the lower rim, especially on days when winds were from the southeast. Both patterns of flight were described during earlier winters before construction of development projects began. Concern was raised over whether or not these flight patterns would continue after developments were completed. These patterns were still common during the 1997-1998 and 1998-1999 winters.

During past winters, we recorded potential disturbances to bald eagles in Barber Pool such as fishermen, canoeists, pedestrians, campers, ATV's, and feral dogs. We continued to observe these activities during the 1997-1998 and 1998-1999 winters, but they were confined to the east side of the river. Considerable human use of lands east of the river near the Crow Inn continued, but these activities had no apparent affect on eagles using either the Barber Pool or Gregerson subroosts. No human activity was recorded in Barber Pool west of the river during the 1997-1998 winter.

Shakespeare Festival amphitheater construction was ongoing throughout the 1997-1998 winter, but construction activities had no apparent effect on eagle perching, foraging, or roosting behavior within Barber Pool.

Dead Dog Creek Roost Surveys

A total of 15 roost surveys were conducted at Dead Dog Creek between 3 December 1997 and 11 March 1998. A total of 15 roost surveys were conducted at Dead Dog Creek between 9 December 1998 and 24 March 1999. An average of 15.7 and 16.2 bald eagles were observed at the Dead Dog Creek Communal Roost nightly during the 1997-1998 and 1998-1999 winters, respectively (click here to view Figure 13). Roost counts peaked at 35 eagles during late January and early February 1998, and the following winter at 28 eagles during mid-January 1999 (click here to view Figure 13). Unlike Barber Pool, counts of bald eagles at the Dead Dog Creek Communal Roost were not related to average daily temperatures at Idaho City (click here to view Figures 14, 15). Peak roost counts at Dead Dog Creek did not coincide with the season's coldest temperatures (click here to view Figure 12), nor were they related to snow depth or amount of snow on roost trees.

Consistently more eagles used the Dead Dog Creek Communal Roost than the Barber Pool Communal Roost. Unlike the Barber Pool Communal Roost, the proportion of adults using the Dead Dog Creek Communal Roost was close to 50 percent. During the 1997-1998 winter, 47 percent of eagles roosting at the Dead Dog Creek Communal Roost were adults, and 41 percent

were immatures (click here to view Figure 7). During the 1998-1999 winter, 54 percent of eagles roosting at the Dead Dog Creek Communal Roost were adults, and 42 percent were immatures. Twelve and 4 percent of eagles roosting within the Dead Dog Creek Communal Roost could not be identified to age due to poor viewing conditions which occurred during periods of inclement weather, respectively, during the 1997-1998 and 1998-1999 winters (click here to view Figures 7, 8).

Two main subroosts were identified within the Dead Dog Creek roost stand. Eagles generally roosted within the lower or upper subroosts (click here to view Figure 2). The lower subroost was located at the eastern edge of the stand near the creek bottom, and consisted of one dead Douglas-fir tree, and a few live Douglas-fir trees surrounding it. The majority of eagles roosting in the lower subroost used the dead tree. The upper subroost was located at the west end of the stand, also very near the creek bottom, and consisted of several large live and dead Douglas-fir and ponderosa pine trees. More eagles consistently roosted in the upper subroost than the lower subroost throughout both winters of this study (click here to view Figures 16, 17). Many other perches were used by eagles throughout the stand during roost surveys (click here to view Figure 2), but the majority of eagles moved to one of the two subroosts described above shortly before dark.

Eagles approached the stand from two general directions during surveys. The majority of eagles approached the roost stand by flying west up the creek bottom. Less commonly, eagles entered the roost from the south, flying over the main ridge south of Dead Dog Creek. Compared to the Barber Pool Communal Roost, eagles often entered the Dead Dog Creek Communal Roost later into the evening. At Dead Dog Creek, it was common for eagles to enter the roost well after sunset, even after total darkness.

Dead Dog Creek Roost Stand Exam

The Dead Dog Creek bald eagle roost stand is located within the Dead Dog Creek Drainage, approximately 1.6 km (1 mi.) west of the More's Creek arm of Lucky Peak Reservoir. Dead Dog Creek is a tributary of More's Creek and is located on the northeastern slope of the Lucky Peak/Shaw Mountain complex. The area is unroaded, and thus inaccessible to motor vehicles. Dead Dog Creek is the southernmost forested drainage on Lucky Peak, and is located on the Lucky Peak USGS topographic quadrangle map. Eagle roost areas were identified within T3N, R4E, sections 7, 17, and 18. Coordinates of the roost stand were located using the Global Positioning System (GPS), and the center point of the stand is 43°36.54'N by 116°01.32'W. The stand varies in elevation from 1340-1460 m (4,400-4,800 ft.) along the main ridge south of Dead Dog Creek, to 1100-1220 m (3,600-4,000 ft.) along Dead Dog Creek, has an average aspect of 25° (NE), and an average slope of 58.8%. Several shallow drainages separated by steep finger ridges are oriented NE/SW throughout the stand. The stand is located in Ada County, and ownership of lands in this area is shared by the U.S. Forest Service, the U.S. Bureau of Land Management, and Idaho Department of Fish and Game. The majority of the roost stand is located on BLM lands, however, the main subroost within the stand was located on lands administered by the U.S. Forest Service.

The roost stand was approximately 76 ha (188 ac.) in size, and contained mixed-conifer habitat dominated by Douglas-fir and ponderosa pine. The main vegetation type was Douglas-fir/mountain ninebark (*Physocarpus malvaceus*, PSME/PHMA), though other mountain shrub species were common including cherry (*Prunus* spp.), elderberry (*Sambucus* sp.), serviceberry (*Amelanchier* sp.), maple (*Acer* sp.), and willow (*Salix* spp.). The stand received moderate to heavy cattle grazing until approximately ten years ago, and during the summer of 1998, old livestock trails had mostly grown over, making ground travel within the stand difficult. Post-grazing recovery of underbrush and forbes had been rapid, and thick stands of young mountain brush (avg. 54% coverage, range 10-100%) were present throughout the stand. Litter and humus layers averaged >10 cm (4 in.) under the forest canopy and in brush field areas. Fuels from brush were moderate, while fuels from downed and dead timber and suppressed conifers were low.

Soils present in the Dead Dog Creek Drainage are coarse-loamy, mixed, frigid Pachic Haploxerolls and loamy-skeletal, mixed, mesic Aridic Argixerolls in the Ola-Searles complex (Collett 1980). These soils are present on side slopes and mountains from 915-1524 m (3,000-5,000 ft.) elevations, generally on north aspects between 30-60% slope. The Ola-Searles soils are formed mainly from weathered granite, and unweathered granite bedrock is usually only 51-102 cm (20-40 in.) below the surface. Runoff in these soils is very rapid, and the hazard of erosion is high.

Trees within the stand were mostly even-aged Douglas-fir (186.0 stems/ha, 75.0 stems/ac., all size categories) and ponderosa pine (16.5 stems/ha, 6.7 stems/ac., all size categories) that were approximately 60-85 years old. Fire burned through the stand approximately 90 years ago, sparing some Douglas-fir and ponderosa pine which are now approximately 140-200 years old (7.6 stems/ha, 3.0 stems/ac., both species combined). All remnant old-growth trees contained fire scars at their bases. The main forest canopy was approximately 18-27 m (60-90 ft.), but remnant old-growth trees reached from 33-40m (100 to130 ft.). Forest canopy densities varied from 10 percent at dry sites, to 80 percent in bottoms and wind-protected areas. Average dbh for both Douglas-fir and ponderosa pines within 0.1 ha. plots was approximately 51cm (20 in.), and ranged from 18.7 cm (7.8 in.) for ponderosa pines to 23.0 cm (9.0 in.) for Douglas-firs in 0.05 ha plots (Table 1). Average 10-year radial growth values for trees within 0.1 and 0.05 ha plots were 1.6 and 1.57 cm (0.64 and 0.62 in.), respectively, indicating that the co-dominant and younger trees within the stand were very fast-growing. Old-growth remnant trees had much lower average 10-year radial growth values (0.86 cm, 0.34in.), indicating that they were likely approaching maximum height and radial growth potentials for the Dead Dog Creek site. Flat tops and horizontal branching of remnant trees also indicated maturity in terms of size.

Douglas-fir trees were approximately ten times more dense than ponderosa pines within the Dead Dog Creek roost stand (Table 1). Douglas-firs were older and taller than ponderosa pines measured (Table 1). We found little or no regeneration of Douglas-firs within closed-canopy areas, but seedlings and saplings were widely scattered in open areas and at forest edges. We found no regeneration of ponderosa pines within vegetation sampling plots (Table 1). Crown shape of trees measured in 0.1 and 0.05 ha plots was low (range 1.5-2.8), indicating that the

majority of trees within the stand were growing stock (Table 1). Pockets of dead-topped trees were scattered throughout the stand. These injuries were caused by an unknown foliar pathogen or defoliator.

Table 1. General characteristics of conifer trees within the Dead Dog Creek communal bald eagle roost stand.

Tree Type	# Measured	Density trees/ha (ac.)	Avg. dbh cm (in.)	Avg. age (yrs.)	Avg. height m (ft.)	Avg. crown shape
Plot Size 1, dbh > 35 cm (13.8 in.)						
Douglas-fir	209	61.5 (24.9)	50.0 (19.7)	94.6	23.2 (76.1)	1.7
Ponderosa pine	22	6.5 (2.6)	51.8 (20.4)	80.3	19.5 (63.8)	1.5
Plot Size 2, dbh 10-35 cm (4.0-13.8 in.)						
Douglas-fir	191	112.4 (45.5)	22.9 (9.0)	49.8	13.4 (43.8)	2.0
Ponderosa Pine	17	10.0 (4.0)	19.8 (7.8)	38.6	9.5 (31.2)	2.8
Plot Size 3, saplings and seedlings						
Douglas-fir	4	11.8 (4.8)	4.6 (1.8)	31.9	3.6 (11.8)	1.25
Ponderosa Pine	0	--	--	--	--	--

All trees used by bald eagles for perching and roosting within the Dead Dog Creek roost stand were old-growth remnant trees. These trees were taller, had greater girths, and were older than the majority of trees within the stand (Tables 1, 2). Although only 9 percent of trees in the Dead Dog Creek stand were ponderosa pines, 35 percent of eagle use trees were pines (Tables 1, 2). Eagle use trees had higher crown shape values (range 3.4-4.2) than trees measured within vegetation plots, indicating that more use trees had dead tops or were snags.

The Dead Dog roost stand was inspected during September 1999 by a BLM fire specialist and biologist, and was assessed for fuel loading and wildfire potential. Options for management actions to reduce fire potential within the stand were explored and discussed at this time, and it was agreed that no immediate actions were warranted or feasible to reduce the risk of catastrophic wildfire within the stand. It was determined that fuel loads were not excessive compared to similar stands in the nearby area.

Table 2. Characteristics of trees used by roosting bald eagles within the Dead Dog Creek stand.

Tree Species	# Identified	Avg. dbh cm (in.)	Avg. age (yrs.)	Avg. height m (ft.)	# Alive	# Dead tops	# Dead	Avg. crown shape
Douglas-fir	26	95.0 (37.4)	172	31.4 (103.0)	18	3	5	3.4
Ponderosa pine	9	92.5 (36.4)	177	26.0 (85.2)	2	3	4	4.2

Surveys of Foraging Areas

A total of 15 surveys of known foraging areas were conducted during the winter of 1997-1998, and a total of 15 surveys of known foraging areas were conducted during the winter of 1998-1999. During both winters, eagles were most numerous on Lucky Peak and Arrowrock Reservoirs during surveys of foraging areas, and least numerous in the desert south of Boise (click here to view Figures 18, 19). We recorded an average of 17.6 and 17.2 bald eagles on all surveys of foraging areas combined during the 1997-1998 and 1998-1999 winters, respectively (click here to view Figures 20, 21).

Reservoir Foraging Areas

We recorded an average of 11.0 and 8.2 bald eagles per weekly survey on Lucky Peak and Arrowrock Reservoirs combined during the 1997-1998 and 1998-1999 winters, respectively (click here to view Figures 20, 21). During the first winter of the study, eagle numbers on the reservoirs peaked during mid-December 1997, and then again during mid-January through early February 1998 (click here to view Figure 18). Similarly, during the second year of the study, eagle numbers peaked during late December 1998, and again during mid-February 1999 (click here to view Figure 19). During the 1997-1998 winter, 48 percent of all eagles observed on reservoir foraging areas were adults, and 50 percent were immatures (click here to view Figure 22). During the 1998-1999 winter, 59 percent of all eagles observed on reservoir foraging areas were adults, and 39 percent were immatures (click here to view Figure 23). The majority of eagles encountered during reservoir surveys were associated with carcasses of winter-killed big game. Large concentrations of eagles were observed regularly in the More's Creek arm of Lucky Peak Reservoir, and at the upper end of Arrowrock Reservoir near Cottonwood Creek. Small concentrations of eagles also were common throughout the winter near Trail Creek on Arrowrock Reservoir. In these areas, deer carcasses were available to feeding eagles throughout much of the winter. Throughout both winters of the study, golden eagles were also commonly observed during reservoir surveys.

Foothills Foraging Areas

We recorded an average of 0.8 and 2.7 bald eagles per weekly survey at foothills carcass feeding areas during the 1997-1998 and 1998-1999 winters, respectively (click here to view Figures 20, 21). Eagles were more numerous at foothills feeding areas during the second year of the study than during the first. During the 1997-1998 winter, 33 percent of all bald eagles observed at foothills foraging areas were adults, and 50 percent were immatures (click here to view Figure

22). During the 1998-1999 winter, 45 percent of all bald eagles observed at foothills foraging areas were adults, and 55 percent were immatures (click here to view Figure 23) During the first winter of the study, 17 percent of all bald eagles observed at foothills foraging areas were of unknown age due to poor visibility during periods of inclement weather (click here to view Figure 22). Golden eagles also were commonly observed at foothills foraging areas throughout both winters of the study. Road-killed deer carcasses were placed in foothills foraging areas by Idaho Department of Fish and Game personnel approximately twice per week (Jerry Scholten, IDFG, pers. comm.). This continual supply of carrion attracted both bald and golden eagles. More golden eagles were observed at foothills foraging areas than bald eagles during the 1997-1998 winter. During the first winter of the study, bald eagles were counted most often at foothills foraging areas during the first part of the winter, and were not recorded there after 21 January 1998 (click here to view Figure 18). During the second year of the study, bald eagles were counted most often at foothills foraging areas during early January 1999 (click here to view Figure 19).

Desert Foraging Areas

We recorded an average of 0.7 and 1.0 bald eagles per weekly survey of desert foraging areas during the 1997-1998 and 1998-1999 winters, respectively (click here to view Figures 20, 21). During the 1997-1998 winter, 91 percent of bald eagles observed in desert foraging areas were adults, and 9 percent were immatures (click here to view Figure 22). During the 1998-1999 winter, 71 percent of bald eagles observed in desert foraging areas were adults, and 14 percent were immatures (click here to view Figure 23). During both winters of the study, bald eagles were observed most often near IBP during surveys of desert foraging areas. At IBP, large concentrations of wintering waterfowl likely attracted eagles. In past winters, eagles regularly fed on wastes from IBP butchering processes that were spread on nearby agricultural fields as fertilizer. During past winters, concentrations of 10-20 eagles were observed near the plant. Recent changes in plant operation, however, have curtailed the practice of fertilizing nearby fields with butcher waste, likely contributing to low numbers of eagles recorded there during this study. Bald eagles also were recorded at Black's Creek Reservoir, and along Pleasant Valley and Gowen Roads. During both winters of the study, bald eagle sightings in desert foraging areas increased during late February and early March (click here to view Figures 18, 19). Eagles were observed at this time mainly along Pleasant Valley and Gowen Roads. It is suspected that eagles were foraging on ground squirrels which were plentiful during this period.

Boise River Surveys

We recorded an average of 5.1 and 5.3 bald eagles per weekly foraging survey of the Boise River during the 1997-1998 and 1998-1999 winters, respectively (click here to view Figures 20, 21). During the 1997-1998 winter, 90 percent of bald eagles observed on the Boise River during foraging area surveys were adults, and 10 percent were immatures (click here to view Figure 22). During the 1998-1999 winter, 81 percent of bald eagles observed on the Boise River during foraging area surveys were adults, and 19 percent were immatures (click here to view Figure 23). During surveys of the Boise River, bald eagles were observed in Barber Pool upstream from Eckert Road, the canyon between Diversion Dam and Lucky Peak Dam, and near Lucky Peak

Dam, and downstream from downstream from Eckert Road in Barber Park, between Barber Park and Broadway Avenue (several different perches), near the Red Lion Riverside Hotel, and in the vicinity of Heron Hollow and Lake Harbor (see Kaltenecker et al. 1994). More bald eagles were counted downstream from Eckert road during the 1998-1999 winter than during the previous winter. During the second year of the study, numbers of bald eagles counted on the Boise River declined markedly after river flows increased during mid-February 1999.

DISCUSSION AND FUTURE STUDY

Barber Pool Communal Roost

Use of Barber Pool by roosting bald eagles declined during the 1997-1998 winter compared to the previous two winters. Numbers of roosting eagles at Barber Pool increased slightly during the second winter of the study, but were still below the long-term average. We recorded the fewest eagles roosting in Barber Pool during the 1994-1995 winter (click here to view Figure 5). It is unknown if the decrease in eagle use over the past three winters represents a declining trend, or normal fluctuations in wintering eagle numbers. Yearly fluctuations in bald eagle wintering populations are a normal occurrence and can be caused by the availability of open water, food, or general weather conditions (Steenhof 1978). Use of bald eagle communal roosts also is likely dependant upon availability of open water, food, or weather conditions (Stalmaster 1976, Steenhof 1976, Krauss 1977, Kiester and Anthony 1983, Stalmaster 1987).

As during past seasons, we found that eagle numbers at Barber Pool were inversely correlated with ambient temperatures at higher elevations within the Boise River Drainage. Weather conditions at Idaho City were likely representative of those affecting eagles wintering at higher elevations within the Boise River Drainage or other nearby river systems. Colder temperatures and adverse weather conditions apparently concentrated eagles at lower elevations such as Barber Pool. Data from this study and from Spahr (1990) suggest that numbers of eagles roosting in Barber Pool increase as ambient temperatures decrease.

The past 3-4 winters have been mild in southwest Idaho. Mild temperatures have resulted in presence of open water and lack of snow cover throughout southwest Idaho, especially within the Boise River Drainage. Mild weather conditions likely caused wintering eagles to disperse. Both Midwinter Eagle Counts and surveys of foraging areas conducted during this study indicate that many eagles were present on Lucky Peak and Arrowrock Reservoirs during the past two winters. Eagles were not concentrated at lower elevations such as the Boise River, likely resulting in lower use of Barber Pool for communal roosting.

We documented a significant change in roosting behavior at Barber Pool during the two winters of this study. During the first winter of the study, eagles began using a new subroost east of the river channel on lands owned by Oliver Gregerson. Use of the Barber Pool subroost declined compared to previous winters, and we documented no eagle use of the Canal subroost. During the second winter of the study, use of the Barber Pool subroost continued to decline, and eagles used the new Gregerson subroost almost exclusively. It is unknown why eagles have changed

roosting locations within Barber Pool. It could be argued that eagles moved roost locations farther from disturbances at Surprise Valley. It should be noted, however, that a decline in use of the Canal subroost began prior to initiation of the Surprise Valley development. Additionally, the Gregerson subroost is closer to human disturbances at the Gregerson residence and on the Greenbelt pathway than the Barber Pool subroost. We recorded regular human activity on the Gregerson property in the vicinity of roosting eagles. Eagles were apparently unaffected by nearby pedestrian and vehicle traffic on the Gregerson property.

It is recommended that Barber Pool roost surveys be continued for at least one more winter to fully document eagle use of the area through and after completion of nearby development projects. By the end of the 1999-2000 winter, the Surprise Valley development project should be fully completed. It is unknown how development or associated human disturbances might affect bald eagle use of the area. Potential increases in human traffic within Barber Pool could result from developments. Any increase in human activity within Barber Pool could adversely affect eagle use of the area.

As a result of this monitoring project, good data exist on bald eagle use of Barber Pool from winters both previous to and during construction projects. The most useful scientific and practical information to obtain would be pre-, during-, and post-development use of the area by eagles. At least one more winter of data need be collected to complete this scenario. It may be argued that monitoring should continue beyond next winter to document potential changes in eagle use which may lag behind completion of development projects. Lish and Lewis (1975) found that eagles abandoned a roost after a nearby housing development was completed at Grand Lake, Oklahoma. Because areas surrounding Barber Pool are changing so rapidly, it is critical that roost monitoring continue to discern normal fluctuations in use from downward trends that may be related to development.

Future roost monitoring should follow methods outlined in this report. Surveys should begin no later than early December and continue through mid- to late March. At least three surveys should be conducted per week, each approximately three hours in duration. The south side of the river provides the best view of the Canal, Barber, and Gregerson subroosts. Observers should end each survey by driving to the north side of the river to obtain an accurate count of eagles in the Barber Pool and Gregerson subroosts, and to scan cottonwoods near Eckert Road.

Products anticipated from continued roost monitoring at Barber Pool should include yearly progress reports and publishing of final results in a peer-reviewed scientific journal. The publication should present scientific analysis of results from this study, showing the long-term effects of nearby development on bald eagle use of a communal roost site. Graphics in the publication should include GIS maps produced by COMPA showing changes in human population densities near Barber Pool both before and during the study. The publication also should provide a detailed review of current literature on the subject, and implications for management and monitoring of bald eagles, human disturbance, and urban development near roost sites. Preparation of the publication should take place after collection of sufficient post-treatment data.

Dead Dog Creek Communal Roost

The Dead Dog Creek Communal Roost was used regularly by bald eagles throughout both winters of this study. Results from roost counts at Dead Dog Creek were comparable to preliminary surveys conducted during the 1996-1997 winter (Kaltenecker 1997). Eagle numbers at Dead Dog Creek were less variable throughout both winters of this study than at Barber Pool (click here to view Figures 4, 13). We found no obvious relationship between counts of eagles at the Barber Pool Communal Roost and the Dead Dog Creek Communal Roost (click here to view Figures 4, 13). During both years of this study, when roost counts at Dead Dog Creek declined during mid-winter, we recorded no significant increase in numbers of eagles roosting at Barber Pool. Likewise, when roost counts peaked at Dead Dog Creek, roost counts at Barber Pool were not correspondingly low.

We described important stand characteristics at the Dead Dog Creek Communal Roost. Our results agree with other authors who have described characteristics of other communal roosts in the Pacific Northwest. Roost stands generally contain the largest, most open-grown trees in the surrounding area (Kiester and Anthony 1983). Bald eagle roost trees are generally taller than trees in the surrounding stand, and snags and dead-topped trees are often preferred (Kiester and Anthony 1983). In addition to the characteristics of trees within the Dead Dog Creek stand, slope, aspect, and topography of the area create ideal conditions for roosting by providing protection from harsh weather conditions, an important feature of bald eagle communal roost sites (Steenhof 1980). Both subroosts within the Dead Dog Creek stand were located near the creek bottom in micro-sites which likely provided good thermal cover and protection from winds. Density of understory trees likely contributed to thermal cover within both the upper and lower subroosts.

Many authors have suggested management of bald eagle roosts in the West to maintain stand conditions preferred by roosting eagles (Kiester and Anthony 1983, Dellasala et al. 1998). Authors have stressed the need to maintain large trees within multi-layered stands (Anthony et al. 1982). Timber management should enhance desirable conditions for communal roosting, and clear-cutting or harvest of larger trees should be avoided (Kiester and Anthony 1983). Commercial timber harvest has recently occurred near the Dead Dog Creek Communal Roost on state and private lands. These logging operations have occurred within the Deer Creek, Schoonover Gulch, and Robie Creek Drainages, and have likely adversely affected potential bald eagle roosting habitat. In these areas, logging has removed the majority of overstory trees, shown to be preferred by roosting eagles in the Dead Dog Creek roost stand. Due to high erosion potential of the Ola-Searles soils and the steepness of slopes where they occur, these sites are often difficult to regenerate after logging or other major disturbances (Collet 1980). In the Deer Creek Drainage, numerous examples of increased erosion were visible in areas which were logged and roaded in the recent past.

We identified no need for active timber management within the Dead Dog Creek Communal Roost. Presently, stand conditions create ideal bald eagle roosting habitat. We found no overcrowding of trees within the stand, or conversion to less desirable tree species as shown by

Dellasala et al. (1998) in the Klamath Basin. Natural thinning is presently occurring among understory trees within the Dead Dog Creek stand. Recent forest pathogen outbreaks have killed numerous small patches of understory trees, and a natural defoliator is killing the tops of understory trees throughout the stand. These dead-topped trees should provide for adequate numbers of suitable future roost trees. Old-growth remnant trees within the Dead Dog Creek stand are healthy, and contain minimal rot. Remnants are not being lost to blowdown at a high rate, and sufficient numbers should remain until understory trees reach maturity. We recommend no active management of the Dead Dog Creek Communal Roost to maintain or change stand conditions for roosting bald eagles. We feel that current stand conditions are sufficient to maintain characteristics preferred by roosting bald eagles.

Authors also have suggested management of stands to reduce the risk of catastrophic fire (Dellasala et al. 1998). In many areas, modern fire-suppression policies have created conditions conducive to stand-replacing wildfire due to the buildup of fuels and the presence of fuel ladders caused by high densities of small trees (Dellasala et al. 1998). In many areas, commercial thinning and prescribed burns have been used to reduce the threat of catastrophic fire in bald eagle habitat (USDI 1988). Recent wildfires in the Boise area including the 1992 Foothills fire and the 1995 8th Street fire have shown that timber stands within the Boise River Drainage are at high risk of catastrophic burn. Undoubtably, the Dead Dog Creek roost stand also is at risk of wildfire. However, we feel that the stand is at risk of catastrophic fire more because of slope, aspect, and summer moisture conditions than from excess fuels. We found that fuels from downed and dead timber within the stand were low, and fuels from brush were only moderate. Because we found little regeneration of conifers within the stand, ladder fuels from small or suppressed trees also were low. We recommend that fuel levels within the stand be monitored over time. If fuels from brush continue to increase, future thinning with prescribed fire or other means should be considered, but are not necessary at this time. Such management actions should be agreed upon by all management agencies involved, and should be conducted by agency specialists. Care should be taken during any prescribed burn to protect roost trees and potential roost trees by removing fuels from around their bases (Dellasala et al. 1998).

To maintain current roosting conditions within the stand, we recommend that the Dead Dog Creek Communal Roost be considered highest priority for fire suppression. Wildfire within Dead Dog Creek would likely reduce the usefulness of the area to roosting eagles by reducing potential roost sites and changing thermal characteristics of the stand. It must be pointed out, however, that past wildfires created current conditions within the stand which are optimum for roosting eagles. Wildfire would certainly change short-term usefulness of the stand to roosting bald eagles, but may help to create or maintain the characteristics preferred by roosting eagles over the long-term.

We recorded no human disturbances to bald eagles within the Dead Dog Creek Communal Roost. The literature suggests that eagles are most susceptible to disturbance in roost areas during winter. Sabine and Klimstra (1985) recommended that roost areas in southern Illinois should be closed to the public. Buehler et al. (1991) found that none of the roost sites in the Chesapeake

Bay area of Maryland were in areas of human disturbance. Sabine (1987) suggested that human access to eagle roost areas in Rush Valley, Utah, be restricted. Hansen (1978) found eagles to be tolerant of people at roost sites, but few people disturbed roosts in his study. The Pacific Bald Eagle Recovery Plan (USFWS 1986) stipulates that there should be a 400 m (1,312 ft.) buffer zone established around eagle roost areas during their periods of use.

We identified no major conflicts from human disturbances at the Dead Dog Creek Communal Roost. The roost was located in a remote, roadless area, and we recorded no human activity near the roost during surveys. Eagles appeared tolerant of observers' presence during surveys, and we observed no adverse impacts to eagles from observers during surveys. Nonetheless, we suggest that all measures possible be taken by management agencies to maintain low levels of human activity near the Dead Dog Creek Communal Roost. The roost should not be promoted as a wildlife viewing opportunity, and human access to the roost area should be discouraged. No new roads or trails should be built in the Dead Dog Creek Drainage, and existing roads and trails should remain closed to public travel during winter months. Snowmobile travel near the roost site also should be restricted. Future roost monitoring at Dead Dog Creek is likely not necessary in the near future, but management agencies should consider routine monitoring of eagle use at this site every 5-10 years. Future monitoring should follow methods established during this study.

Foraging Areas

Surveys of foraging areas were conducted to provide an estimate of total eagle numbers wintering in the local area, and to show how eagle use of specific roosts was related to abundance and proximity of food sources. We found that the total number of eagles recorded during surveys of foraging areas was comparable to the total number of eagles recorded at the Dead Dog Creek and Barber Pool Communal Roosts. This indicates that the majority of eagles recorded during surveys of foraging areas likely roosted in one of the communal roosts monitored during this study. An important factor of bald eagle communal roosts is their close proximity to reliable food sources. Bald eagles usually roost in suitable forest stands which are as close as possible to feeding areas (Hansen et al. 1980, Kiester and Anthony 1983, Isaacs et al. 1993, Isaacs et al 1996). Depending on wintering area, eagles roost from <1-24 km (<0.6-15 mi.) away from feeding areas (Edwards 1969, Hansen et al. 1980, Kiester and Anthony 1983).

We found the greatest concentrations of foraging eagles on Lucky Peak and Arrowrock Reservoirs. The largest groups of feeding eagles were observed within the More's Creek arm of Lucky Peak Reservoir, only 1-2 km (0.6-1.2 mi.) from the Dead Dog Creek Communal Roost. Eagles observed within reservoir foraging areas were generally associated with carcasses of winter-killed deer. Individual carcasses were temporary food sources, and were used by eagles for no more than two weeks. However, carcasses were commonly found throughout the winter near the reservoirs, providing a reliable food source for eagles. Our results agree with those of Kaltenecker and Bechard (1995) who found that bald eagles commonly fed on deer carcasses throughout the upper Boise River Drainage. We found that numbers of eagles recorded during surveys of reservoir foraging areas were similar to numbers of eagles using the Dead Dog Creek Communal Roost (click here to view Figures 24, 25). Approximately 50 percent of eagles

observed within reservoir foraging areas were immatures, similar to age ratios of eagles recorded using the Dead Dog Creek Communal Roost (click here to view Figures 26, 27).

We found bald eagle use of foothills foraging areas to be variable. The number of bald eagles recorded during surveys at this foraging area was dependant upon the number and condition of carcasses. Carcasses at foothills foraging areas did not last long, as they also were scavenged heavily by golden eagles, ravens (*Corvus corax*), magpies (*Pica pica*), coyotes (*Canis latrans*), and other mammals. More golden eagles were recorded using carcasses at this foraging area than bald eagles. Perhaps golden eagles excluded bald eagles from feeding on carcasses. Bald eagle use of this foraging area was not consistent during the first winter of this study. During this first winter, they were observed feeding there only during December 1997 and January 1998. Eagle use of this foraging area was more consistent during the second winter of the study. Bald eagles were seldom recorded at foothills feeding areas after 1 February, even though carcasses were present for the remainder of the winter. During both winters of the study, over 50 percent of the bald eagles observed at foothills foraging areas were immatures, similar to the Dead Dog Creek Communal Roost (click here to view Figures 26, 27). We suggest that the majority of eagles roosting at Dead Dog Creek made daily foraging flights to Lucky Peak and Arrowrock Reservoirs or to foothills foraging areas.

We recorded 5.1 and 5.3 bald eagles per survey of Boise River foraging areas during both years of this study (click here to view Figures 20, 21). This corresponds closely to the number of bald eagles using the Barber Pool Communal Roost (click here to view Figures 28, 29). It is likely that the majority of eagles recorded in Boise River foraging areas roosted nightly at Barber Pool. Age ratios of eagles counted during foraging area surveys on the Boise River were similar to those identified at the Barber Pool Communal Roost (click here to view Figures 30, 31). We suggest that the majority of eagles roosting at Barber Pool made daily foraging flights to the Boise River or desert foraging areas.

We recorded the least number of bald eagles during surveys of desert foraging areas (click here to view Figures 18, 19). Recent changes in operation at the IBP plant have apparently adversely affected eagle use of the area. Butcher wastes are no longer spread on nearby agricultural fields, and eagles are no longer attracted to the area in large numbers. The only eagles recorded near the IBP plant during surveys were associated with concentrations of feeding or roosting waterfowl. The majority of eagles recorded during surveys of desert foraging areas were adults, similar to age ratios of eagles using the Barber Pool Communal Roost (click here to view Figures 30, 31). Desert foraging areas are closest to the Barber Pool Communal Roost, and it is likely that eagles foraging in desert areas roosted at Barber Pool. A decline in eagle use of desert foraging areas due to changes in IBP plant operation could have contributed to lower numbers of eagles roosting at Barber Pool.

During early spring, we recorded numerous eagles dispersed throughout desert areas, likely feeding on ground squirrels which had recently surfaced from winter hibernation (click here to view Figures 18, 19). This feeding behavior is likely common during early spring, and has been

described by other authors (Kiester et al. 1987).

MANAGEMENT RECOMMENDATIONS FOR THE DEAD DOG CREEK COMMUNAL ROOST

One objective of this report is to provide recommendations to the public agencies involved for management of the Dead Dog Creek Communal Roost. These recommendations are designed to ensure the continued use of Dead Dog Creek or other suitable or potential habitats by bald eagles for communal roosting throughout the short- and long-term future.

Objective 1
Give the Dead Dog Creek Communal Roost long-term protective status to ensure its continued protection and management for roosting bald eagles by the administering federal agencies.

Issue
The Dead Dog Creek Communal Roost is a critical wildlife habitat area that requires special protection and management to maintain conditions preferred by roosting bald eagles throughout the short- and long-term future.

Actions
1. Retain the Dead Dog Creek Communal Roost within the federal public lands system. Do not consider the area for land exchange or disposal to any state or private entity.

2. Designate the portion of the Dead Dog Creek Communal Roost administered by the U.S. Bureau of Land Management as an Area of Critical Environmental Concern (ACEC) to afford it the status, protection, and management concern of this designation.

3. Amend the Boise National Forest Plan so that the portion of the Dead Dog Creek Communal Roost administered by the U.S. Forest Service is designated an Area of Special Environmental Interest, and is given the status, protection, and management concern of this designation.

Objective 2
Identify and manage other suitable or potential habitats for bald eagle communal roosting.

Issue
The Dead Dog Creek Communal Roost is vulnerable to stand-replacing wildfire. Agencies should identify, protect, and manage other suitable stands as replacement habitats should the Dead Dog Creek stand be lost to fire and become unsuitable for bald eagle communal roosting.

Actions

1. Identify all timber stands on public and private lands within 3.3 km (2 mi.) of the main Boise River Corridor or its impoundments that have characteristics similar to the Dead Dog Creek Communal Roost in terms of slope, aspect, topography, density of trees, and understory vegetation. Important consideration should be given to the numbers and densities of overstory trees as they were shown to be preferred by roosting eagles at Dead Dog Creek. Timber stands which are not presently suitable but which could be actively managed to create suitable roosting conditions also should be considered.

2. Retain potential habitats identified on federal public lands. Lands containing suitable roosting habitats should not be considered for exchange or disposal to any state or private entities.

3. Designate potential habitats identified on lands administered by the U.S. Bureau of Land Management as an Areas of Critical Environmental Concern (ACEC) to afford them the status, protection, and management concern of this designation.

4. Amend the Boise National Forest Plan so that potential habitats identified on lands administered by the U.S. Forest Service are designated Areas of Special Environmental Interest, and are given the status, protection, and management concern of this designation.

5. Attempt to acquire and place under federal management those potential habitats identified on private lands through land exchange or other means.

6. Follow all recommendations made in this document for management of potential roost habitats with regard to timber harvest, monitoring of fire potential, fire suppression, and human activity.

Objective 3

Maintain suitable stand characteristics of the Dead Dog Creek Communal Roost.

Issue

The Dead Dog Creek timber stand contains considerable merchantable timber in both overstory and understory trees. Overstory trees were used exclusively by roosting bald eagles. Understory trees likely contributed to thermal properties conducive to bald eagle communal roosting. Any harvest of timber within the Dead Dog Creek stand could adversely affect its use by roosting bald eagles. Timber harvest should not be necessary to maintain roost stand characteristics preferred by bald eagles in the future.

Actions

1. No commercial harvest of timber should occur within the Dead Dog Creek Drainage.

2. No commercial harvest of timber should occur within potential roost habitats unless it is deemed necessary to create or maintain stand characteristics preferred by roosting bald eagles.

Objective 4

Prevent catastrophic, stand-replacing wildfire within the Dead Dog Creek Communal Roost.

Issue

Topography and summer moisture conditions at the Dead Dog Creek site make it susceptible to stand-replacing wildfire. Recent wildfires have shown that timber stands on the Boise Front are at high risk of catastrophic fire. Even though historic fires created optimum present conditions at Dead Dog Creek for bald eagle communal roosting, a catastrophic fire would likely render the stand useless to roosting bald eagles for many decades. Without suitable replacement roosting habitat, winter use of the Boise River Drainage by bald eagles could be significantly reduced if the Dead Dog Creek stand were lost to fire. Land management agencies should reduce the risk of catastrophic fire at the Dead Dog Creek Communal Roost.

Actions

1. Dead Dog Creek and all surrounding drainages should be highest priority for agency fire suppression. It should be understood among all agency fire crews (BLM, USFS, and State of Idaho) that these areas are highest priority for fire suppression.

2. Monitor fuels by agency fire specialists within the immediate future at Dead Dog Creek to establish a baseline of information on current fuel load and fire potential. Fuel levels should be assessed for their potential to carry fire to the upper canopy.

3. Routinely (every 5-10 years) monitor fuels within the stand for fire potential throughout the long-term future.

4. If fuel levels reach hazardous levels, thinning of underbrush and ladder fuels with prescribed fire should be considered. Prescribed fire should only be attempted during cool periods of the year, and should be conducted by agency specialists. Large crews should be used to maintain control of the burn, and care should be taken near overstory and co-dominant trees to remove underbrush and other fuels from their bases to minimize mortality to these trees.

Objective 5

Maintain low levels of human activity near the Dead Dog Creek Communal Roost.

Issue

Bald eagles are most susceptible to human disturbance in roost areas during winter. Increased human activity near or within the Dead Dog Creek Communal Roost during winter could jeopardize its continued use by roosting bald eagles. Agencies to attempt to maintain low levels of human disturbance near the Dead Dog Creek Communal Roost. Human access to the roost area should be discouraged.

Actions

1. Do not promote the Dead Dog Creek Communal Roost as an opportunity for public wildlife viewing or publicize its exact location. Ample opportunities exist for viewing of eagles and public education within foraging areas or in urban areas.

2. Allow no new roads or trails within Dead Dog Creek or the surrounding drainages.

3. Maintain seasonal closures of existing roads within Dead Dog Creek or the surrounding drainages.

4. Snowmobile travel on roads or trails within Dead Dog Creek or the surrounding drainages should be restricted from 1 December-15 March.

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Figure 1. Location of Barber Pool study area showing main observation points, roost trees, and subroost areas.

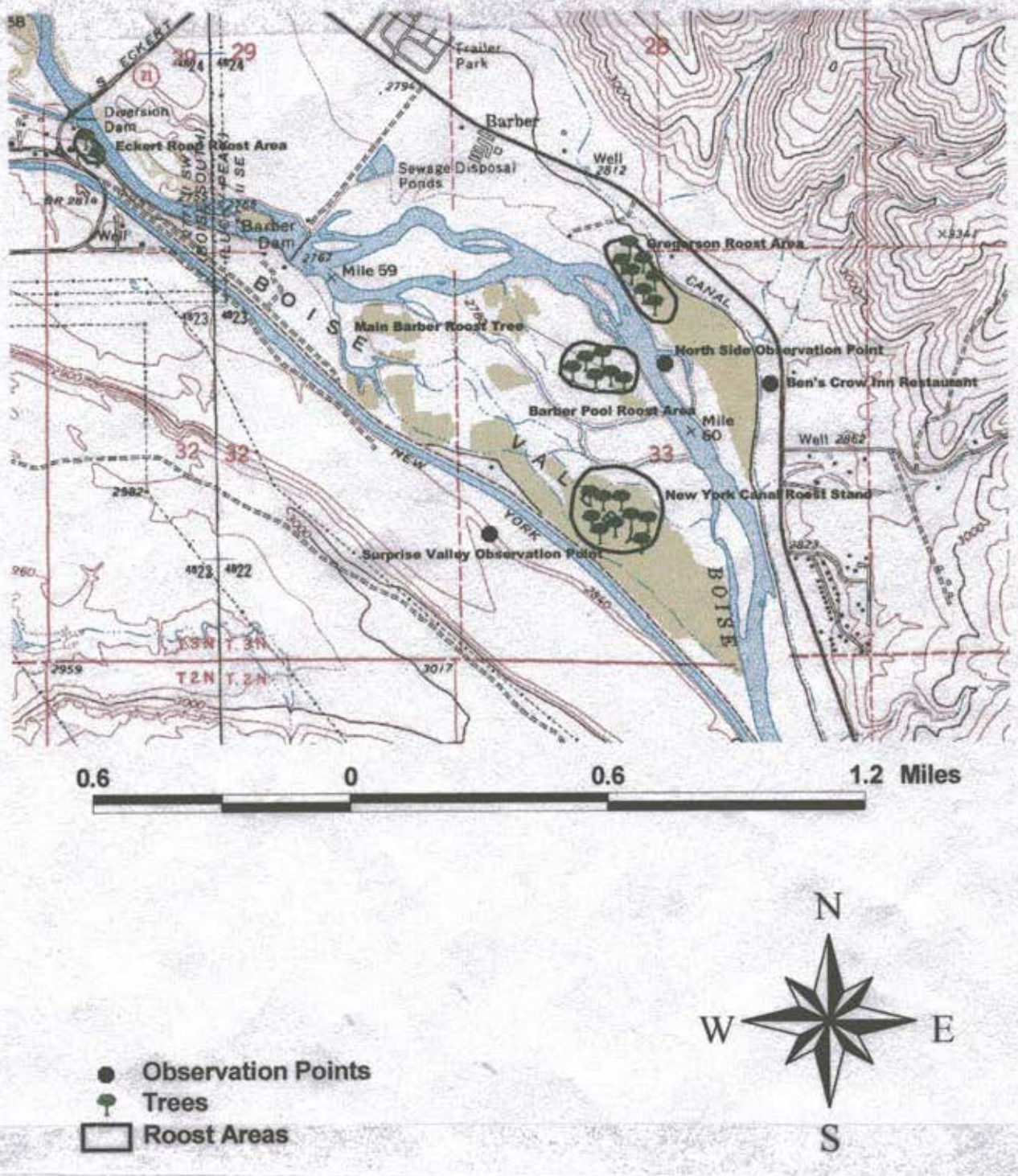


Figure 2. Location of Dead Dog Creek study area showing main observation points, roost trees, and subroost areas.

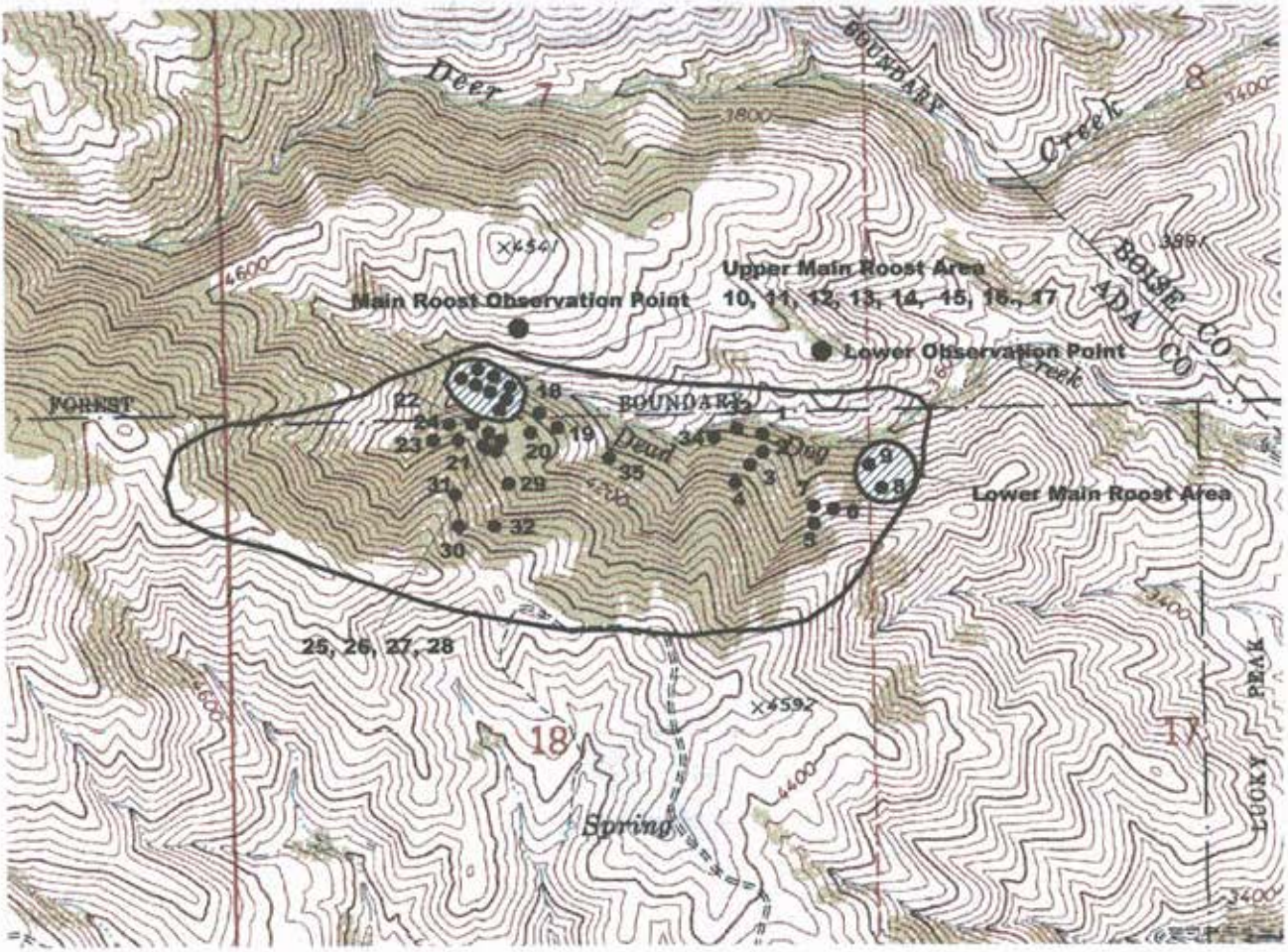


Figure 3. Location of Dead Dog Creek study area showing delineation of forested roost area and location of vegetation sampling plots.

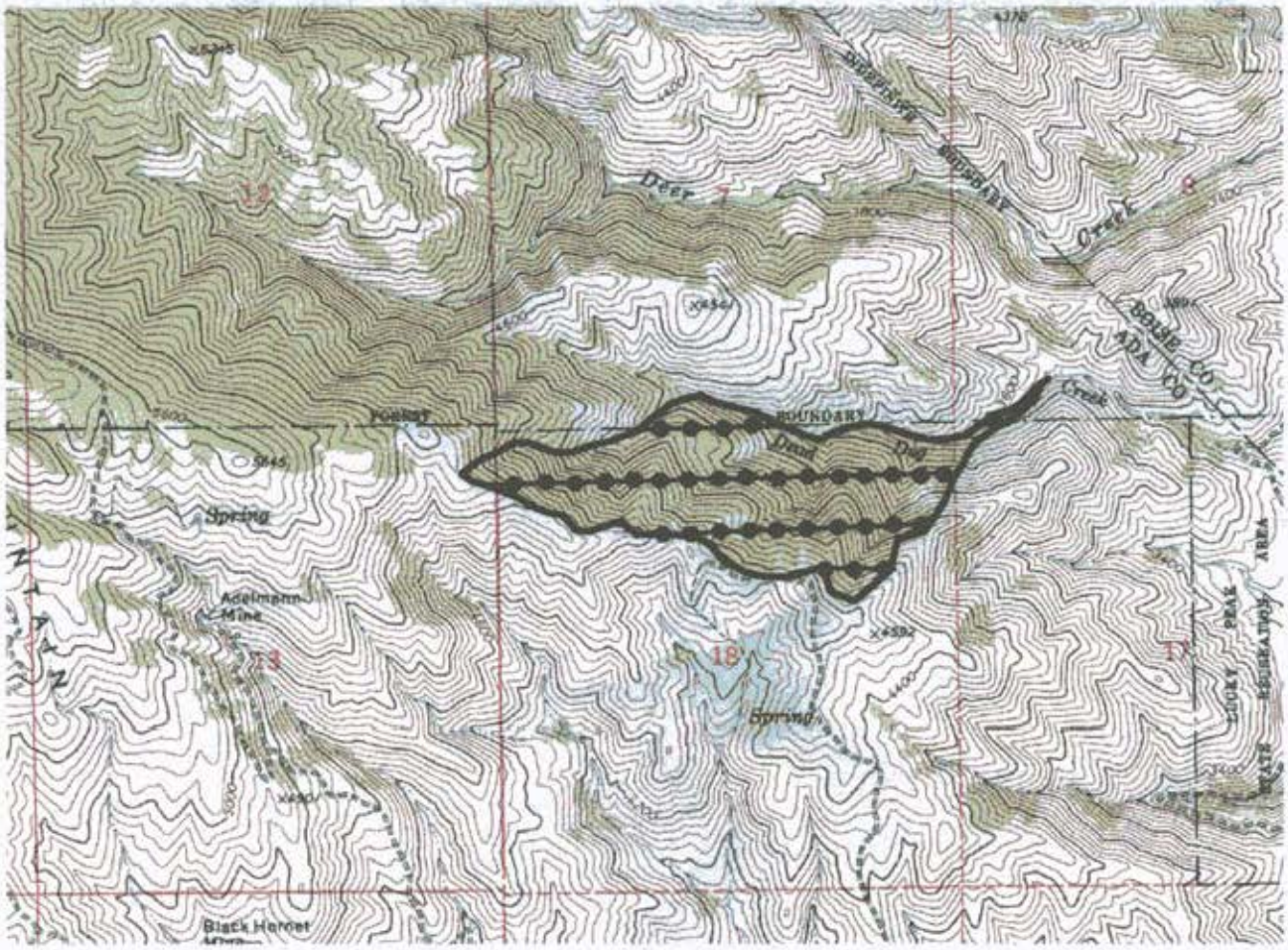


Figure 4. Total number of bald eagles using Barber Pool communal roost areas, winters 1997/1998, and 1998/1999.

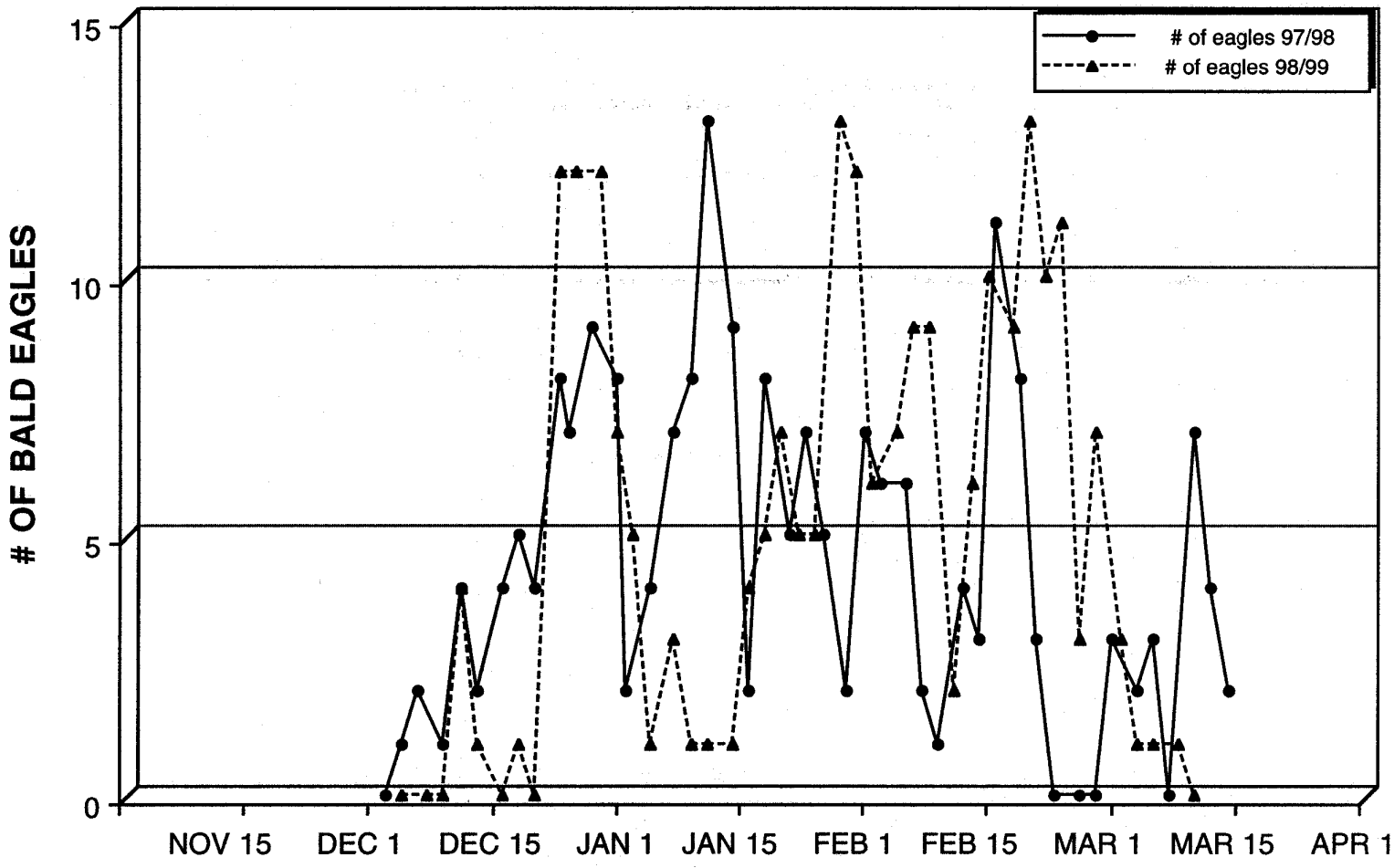


Figure 5. Average number of bald eagles using Barber Pool communal roost areas, winters 1993/1994 - 1998/1999.

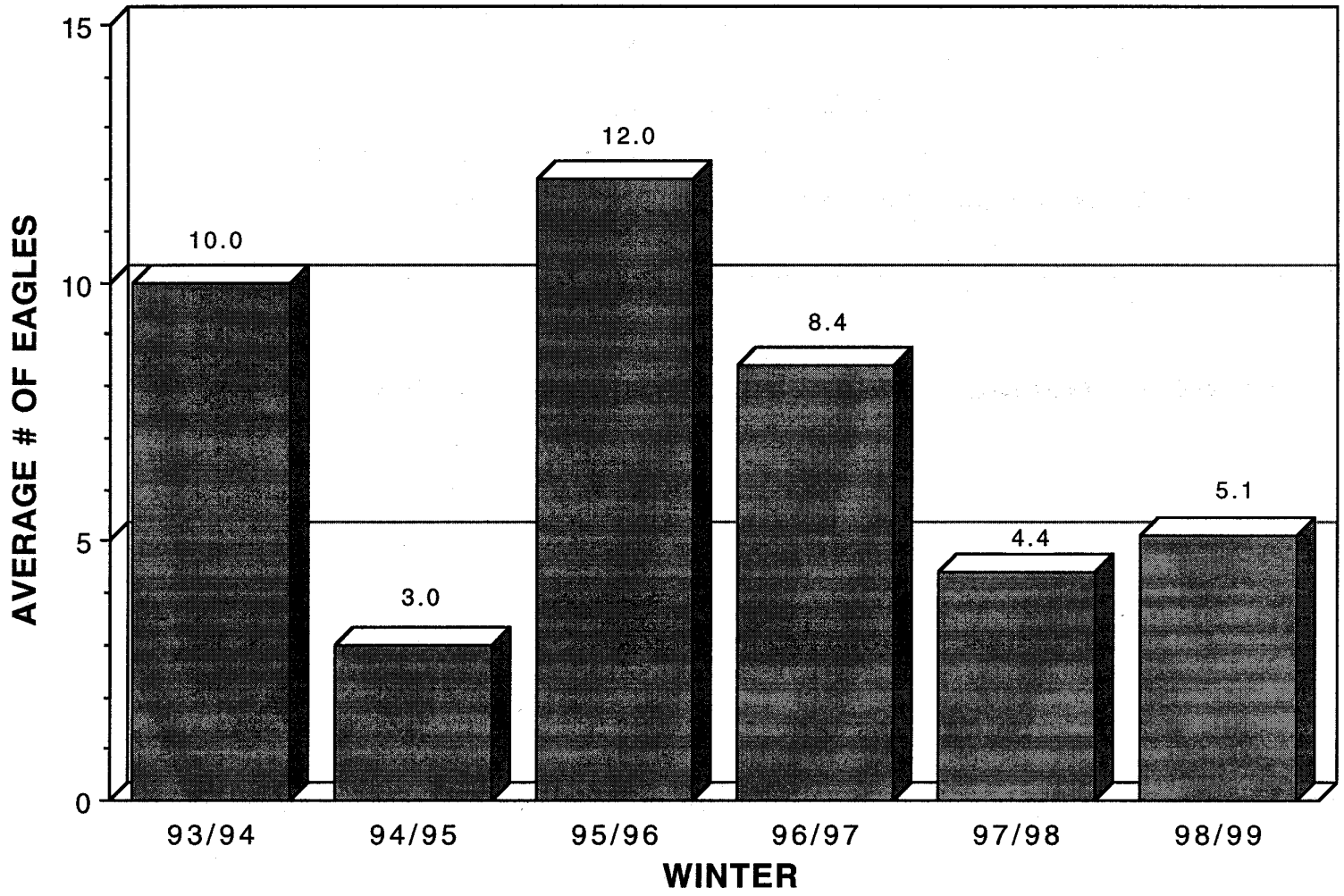


Figure 6. Total number of bald eagles using Barber Pool communal roost areas, winters 1993/1994 - 1998/1999.

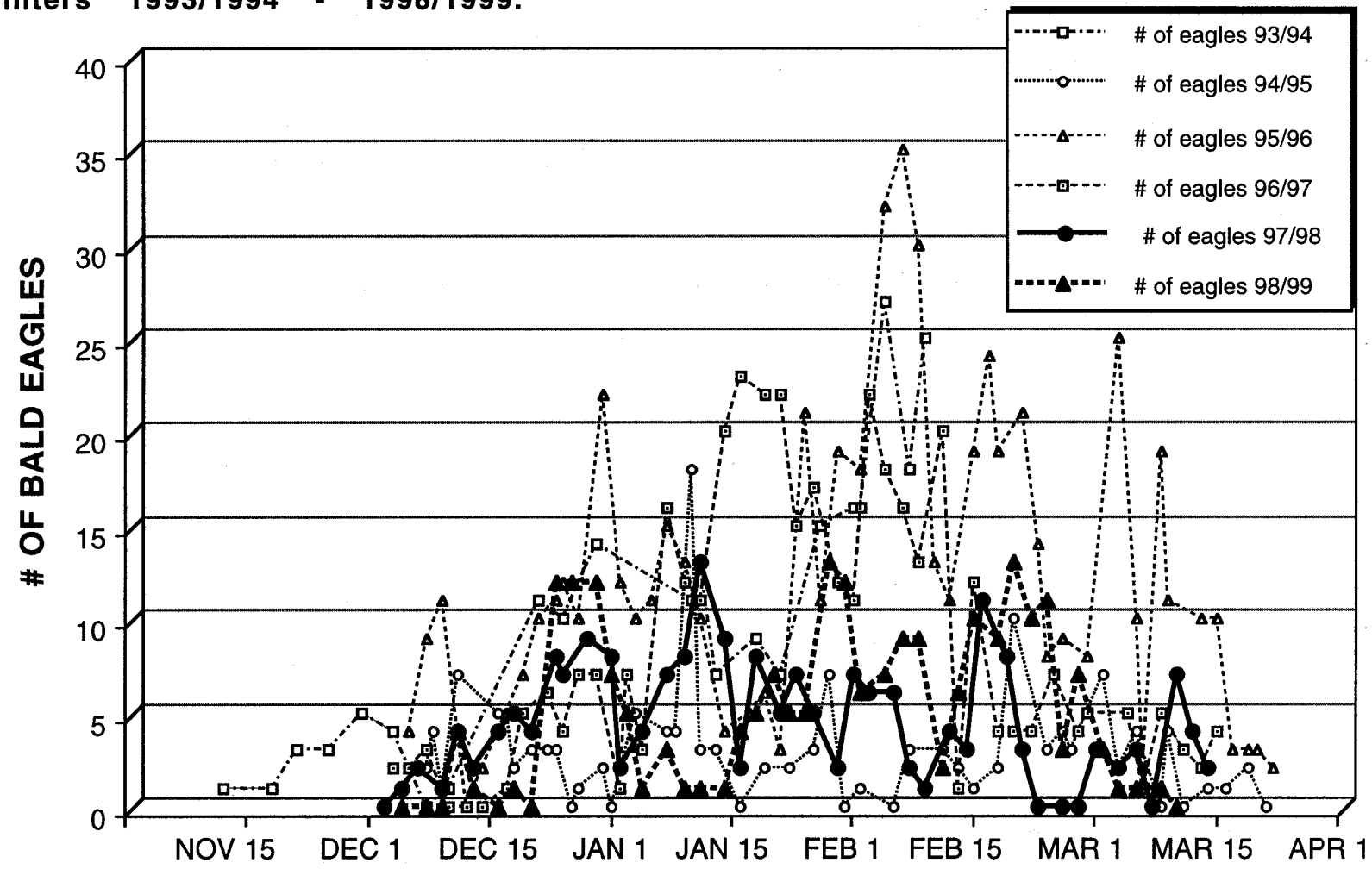


Figure 7. Percent adult and percent immature bald eagles using the Barber Pool and Dead Dog Creek communal roost sites, winter 1997/1998.

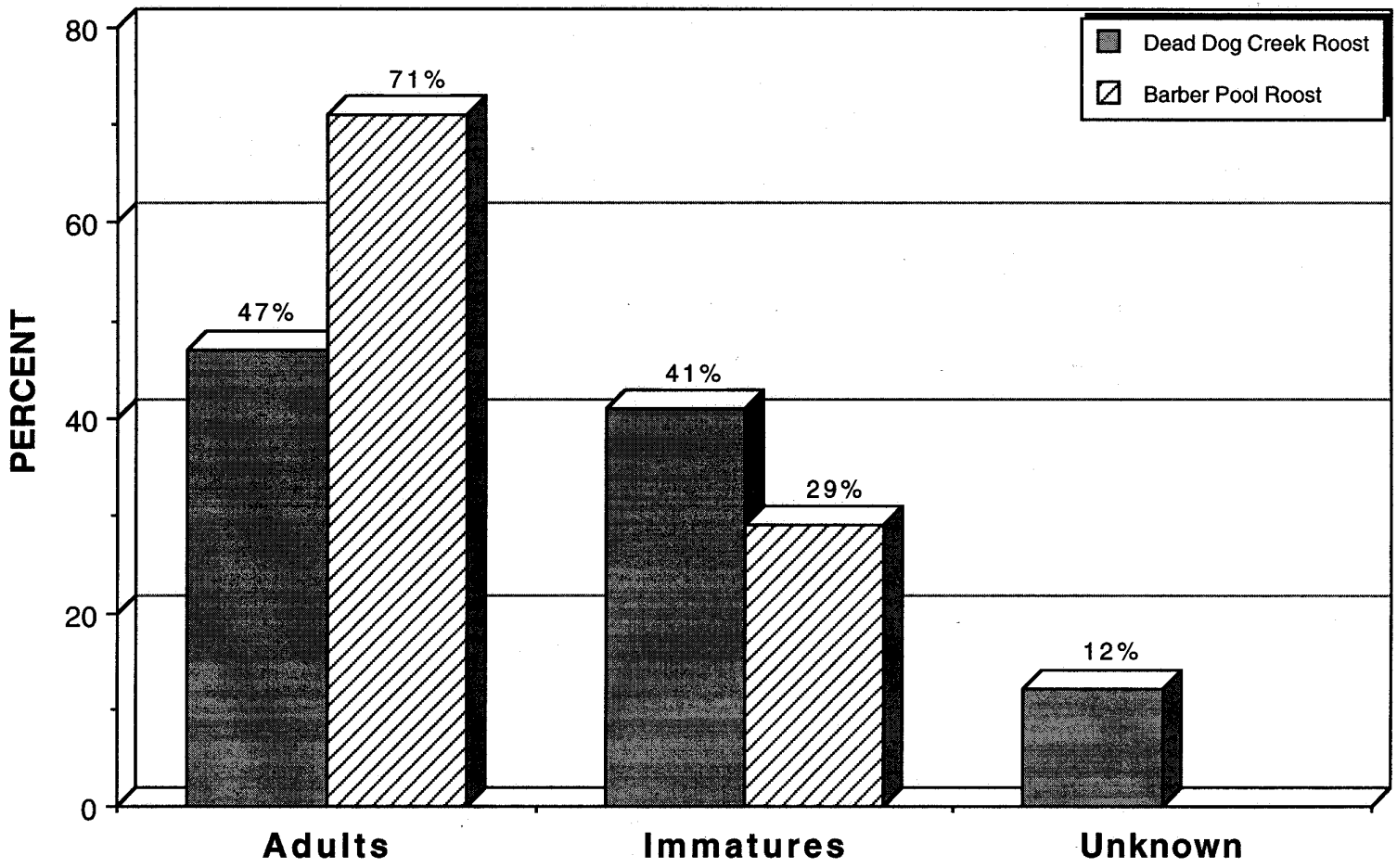


Figure 8. Percent adult and percent immature bald eagles using the Barber Pool and Dead Dog Creek communal roost sites, winter 1998/1999.

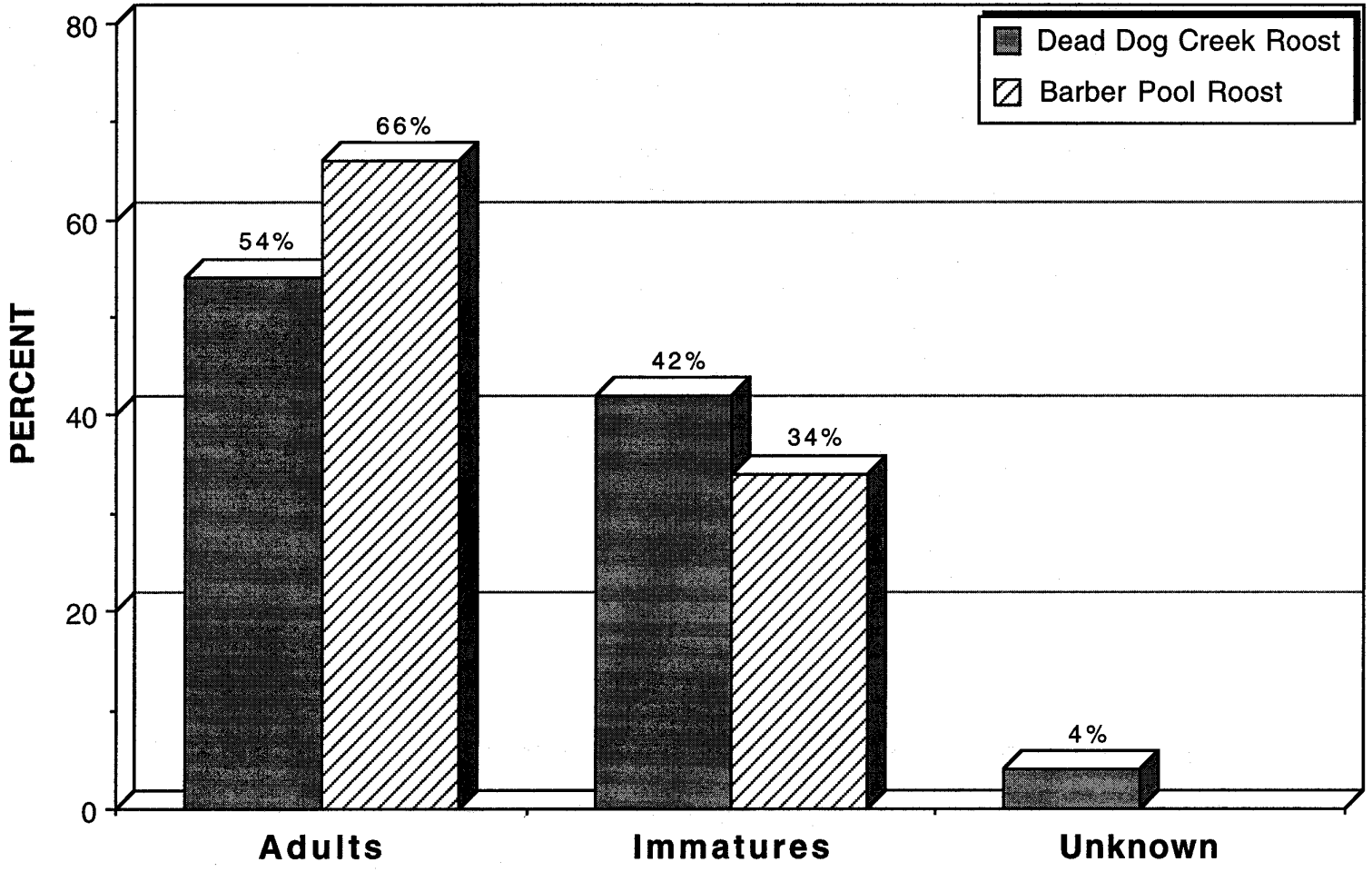


Figure 9. Number of bald eagles using Barber Pool communal roost areas compared to average daily temperatures at Idaho City, Idaho, winter 1997/1998.

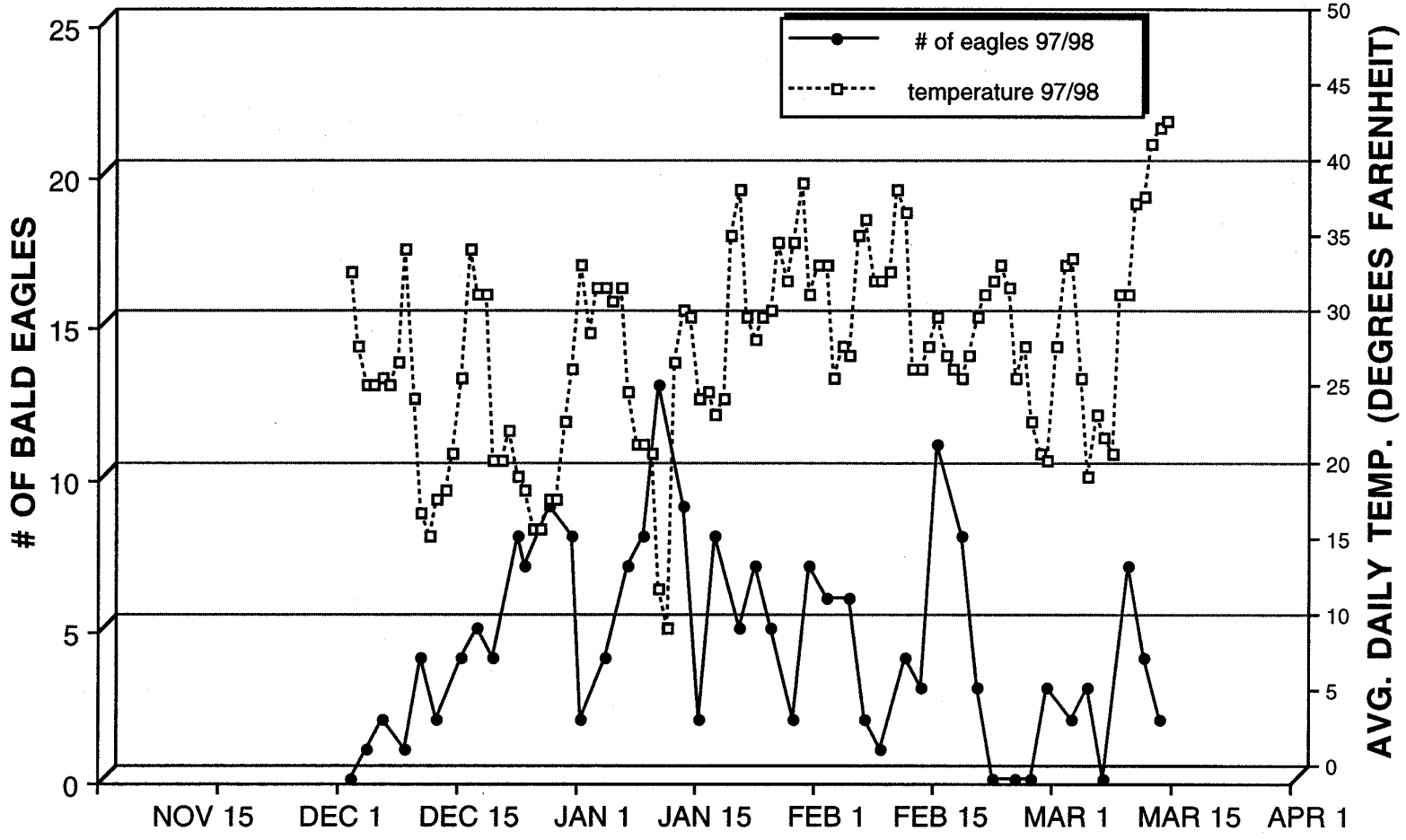


Figure 10. Number of bald eagles using Barber Pool communal roost areas compared to average daily temperatures at Idaho City, Idaho, winter 1998/1999.

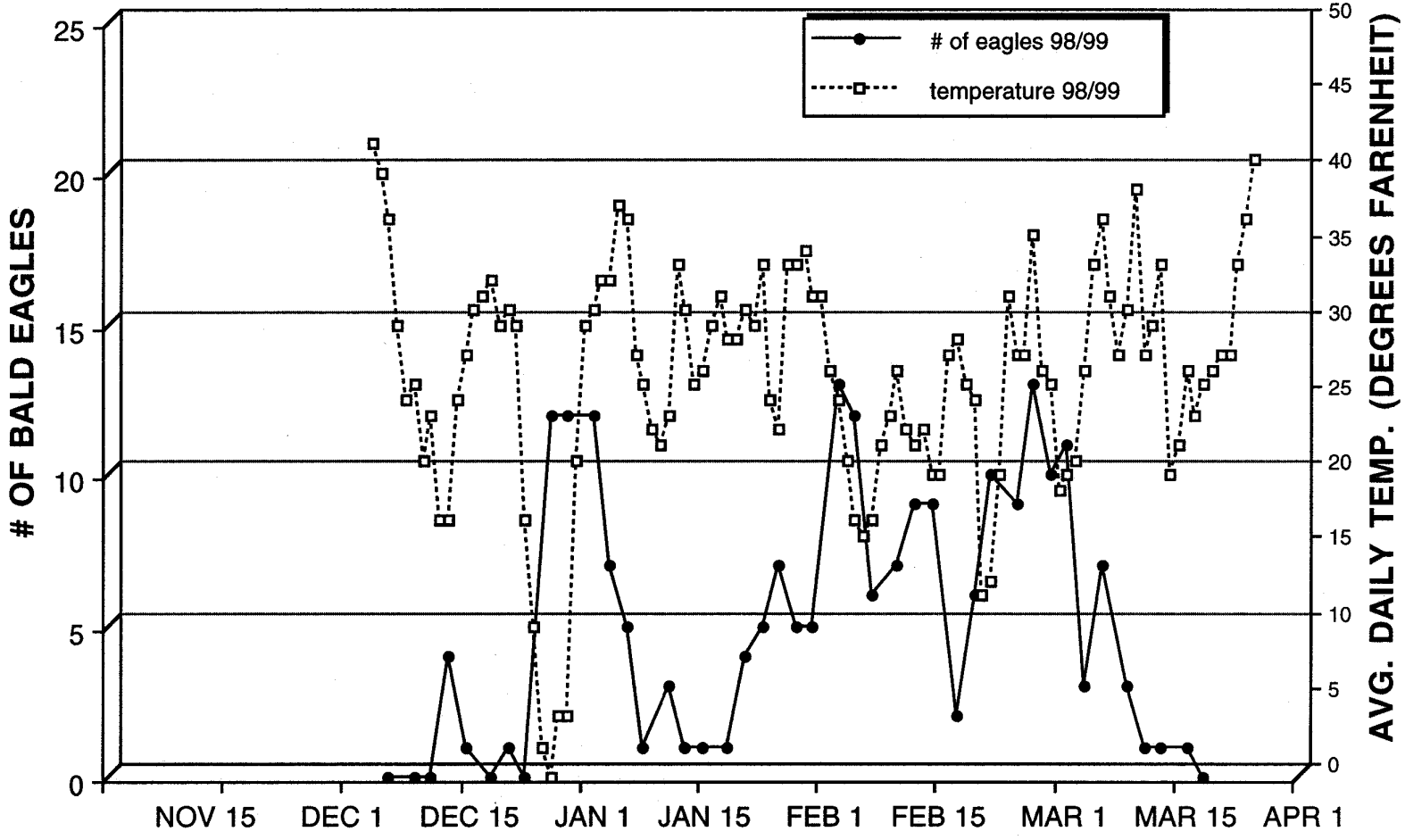


Figure 11. Number of bald eagles at each subroost, Barber Pool, winter 1997/1998.

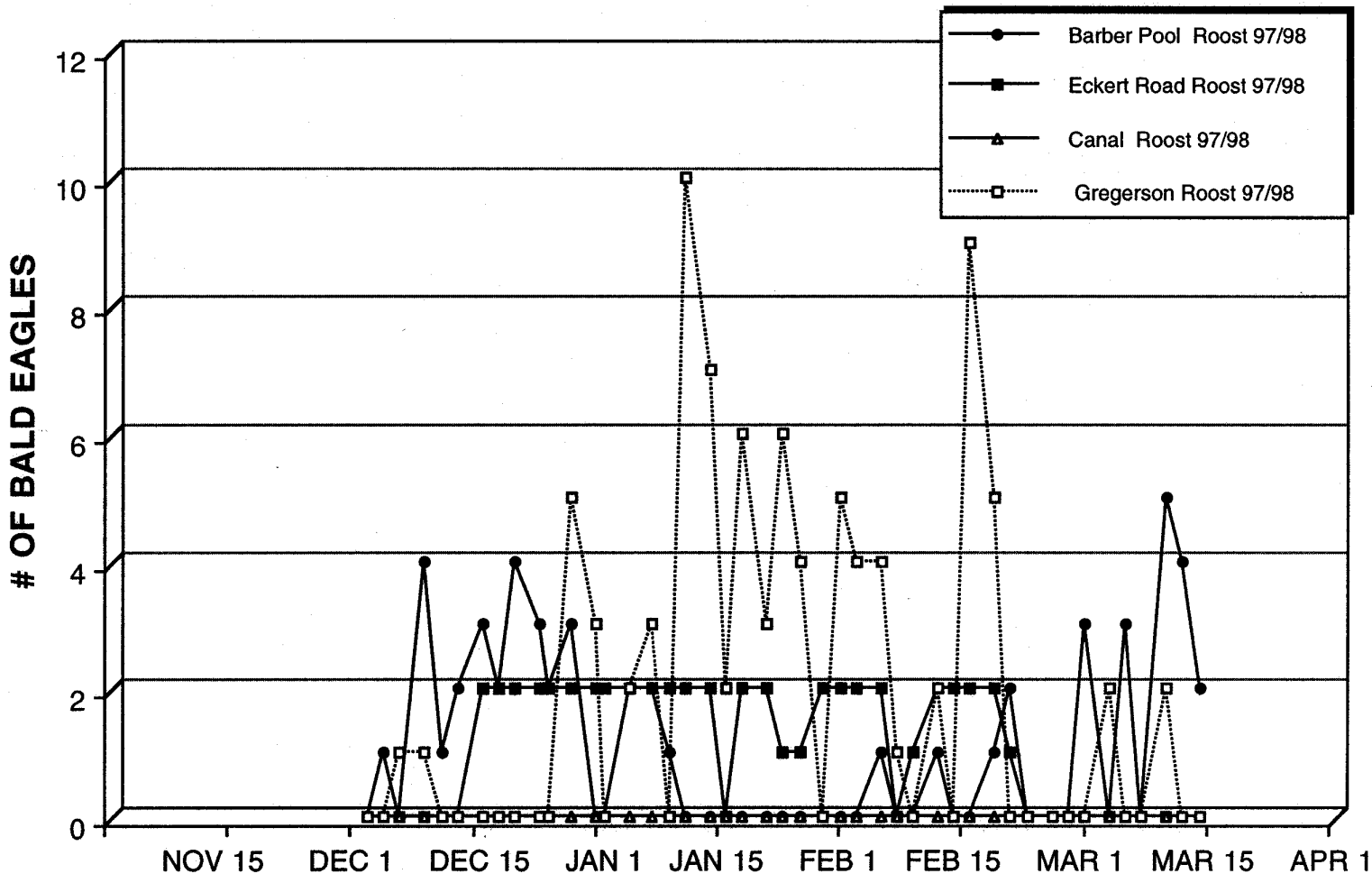


Figure 12. Number of bald eagles at each subroost, Barber Pool, winter 1998/1999.

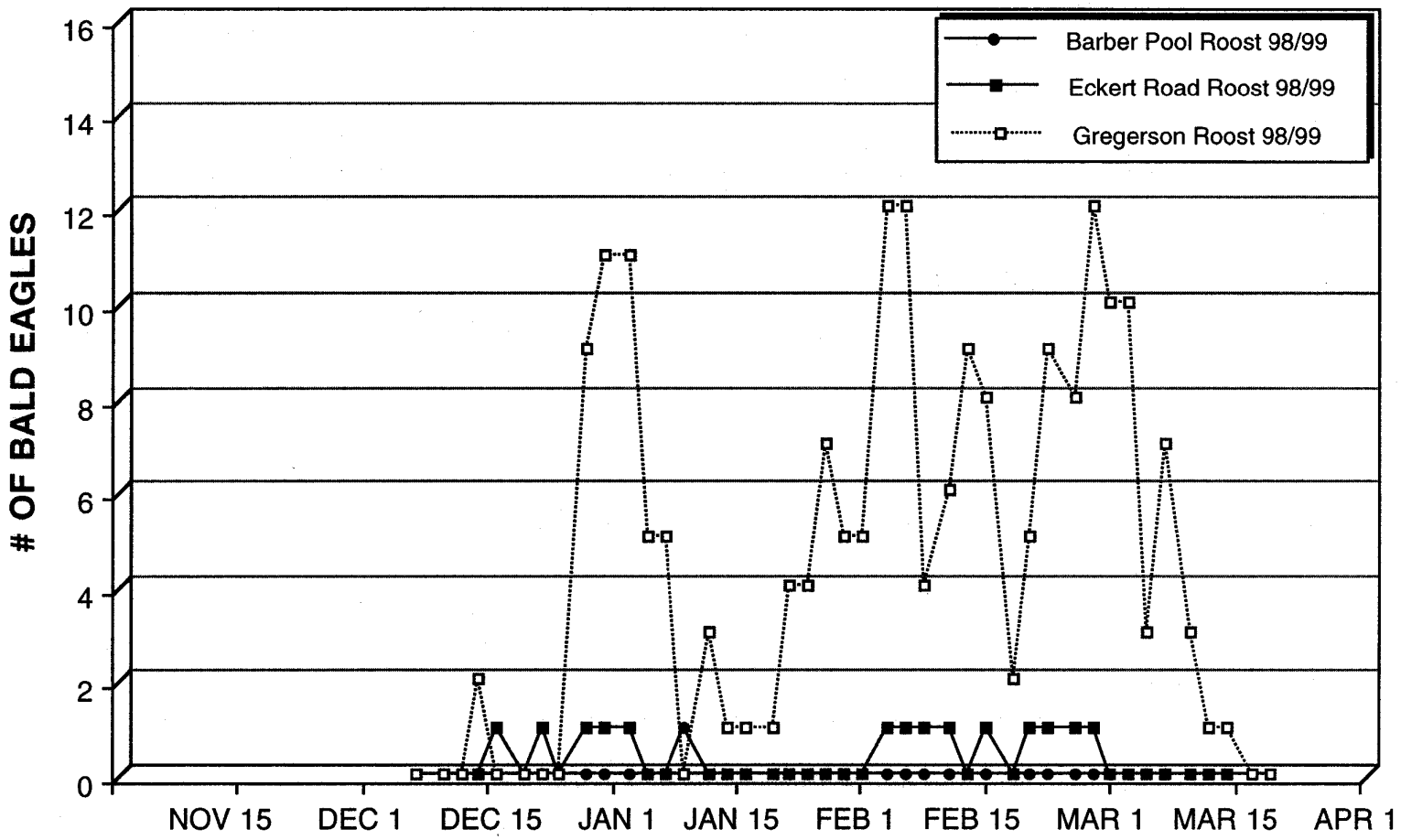


Figure 13. Total number of bald eagles using the Dead Dog Creek Communal Roost, winters 1997/1998 and 1998/1999.

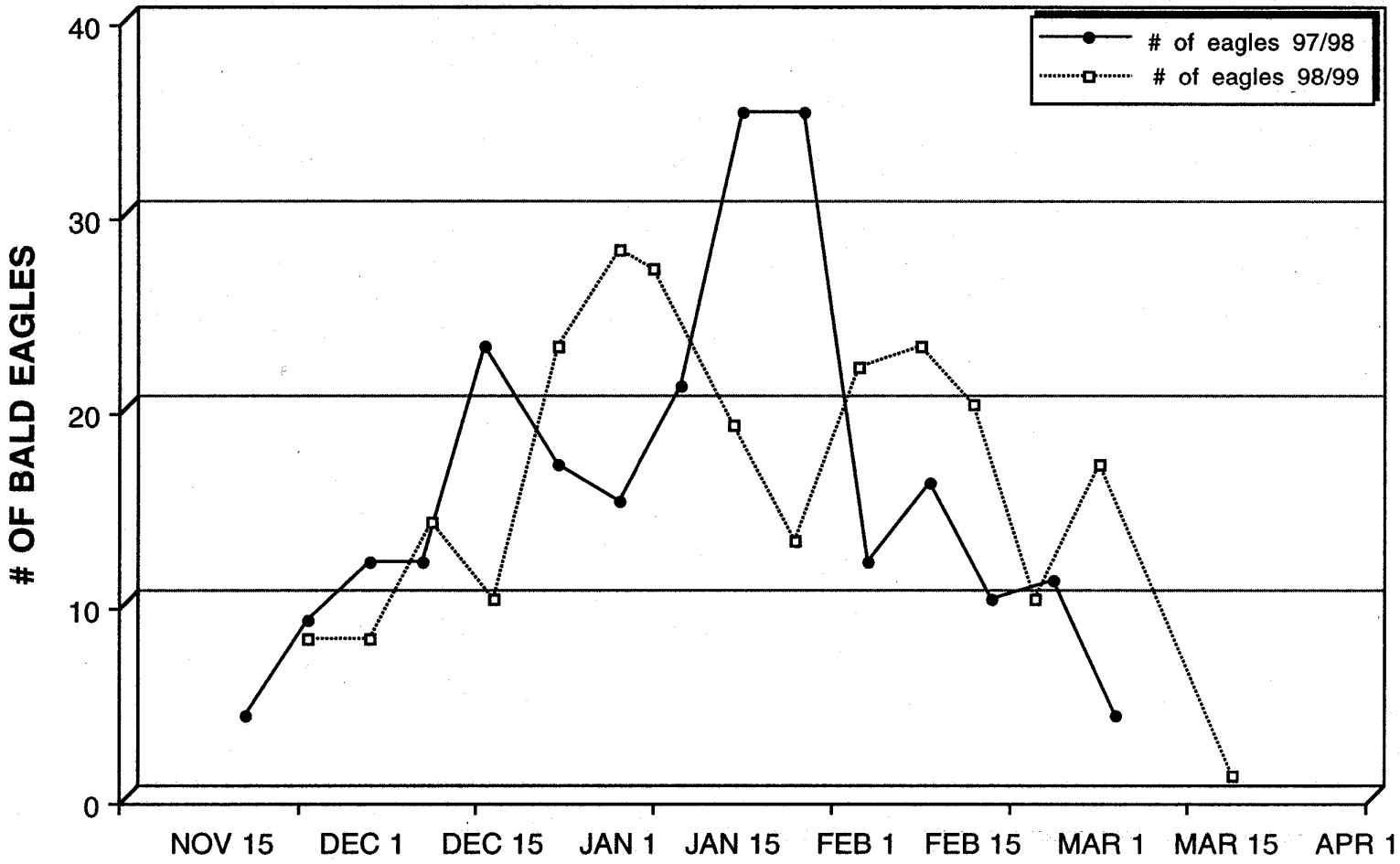


Figure 14. Number of bald eagles using Dead Dog Creek communal roost compared to average daily temperature at Idaho City, Idaho, winter 1997/1998.

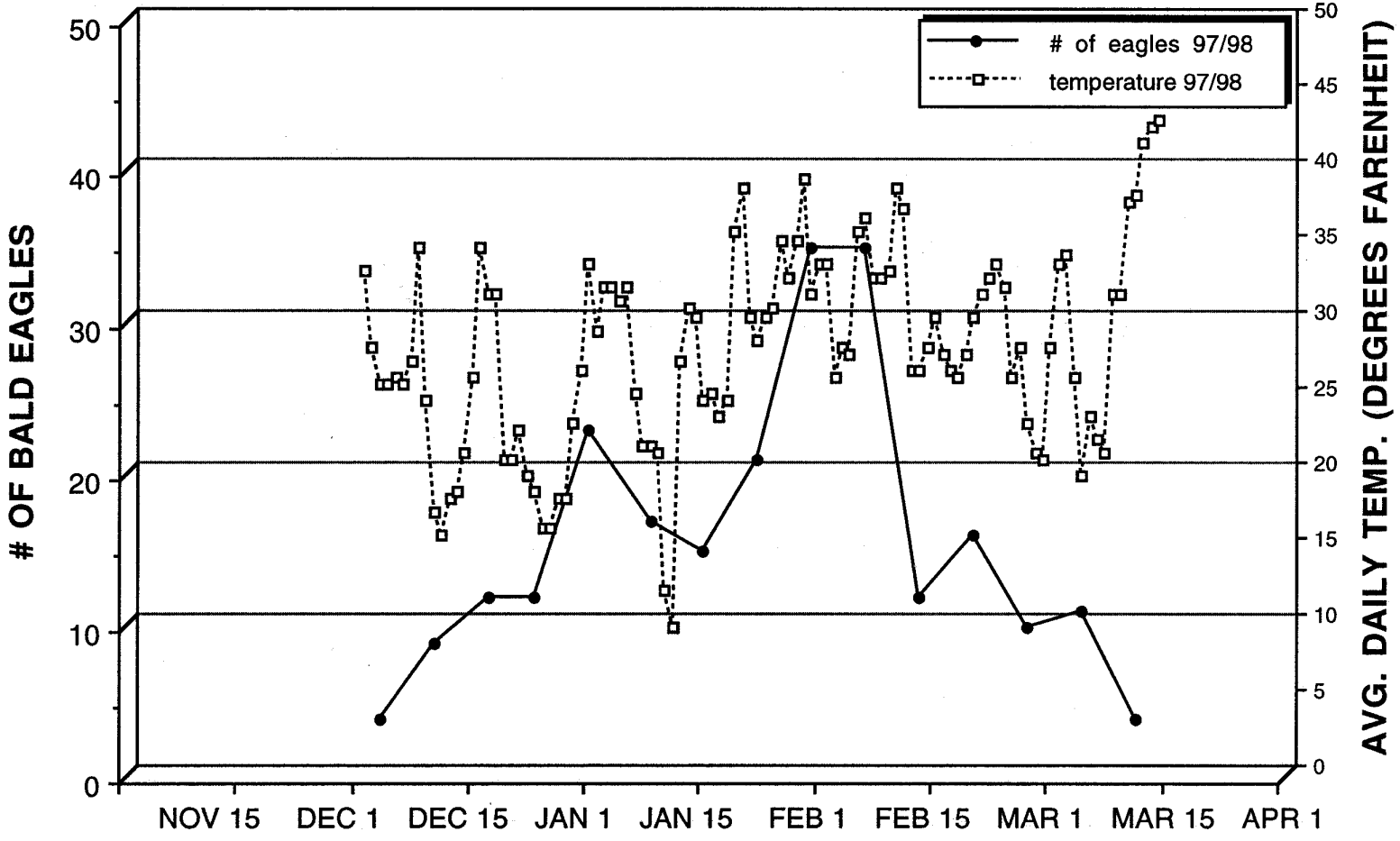


Figure 15. Number of bald eagles using Dead Dog Creek communal roost compared to average daily temperatures at Idaho City, Idaho, winter 1998/1999.

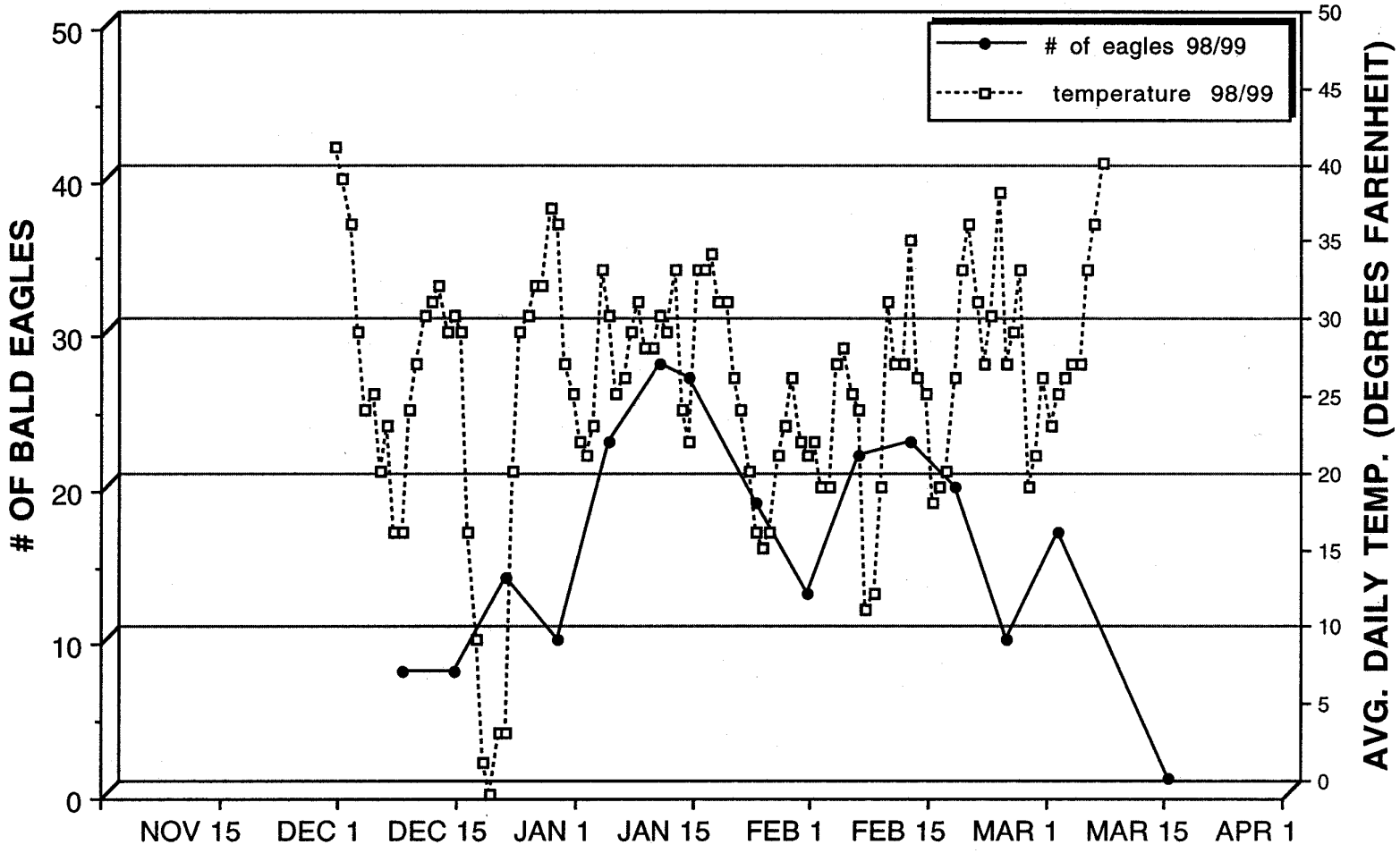


Figure 16. Number of bald eagles using different subroost areas within the Dead Dog Creek communal roost stand, winter 1997/1998.

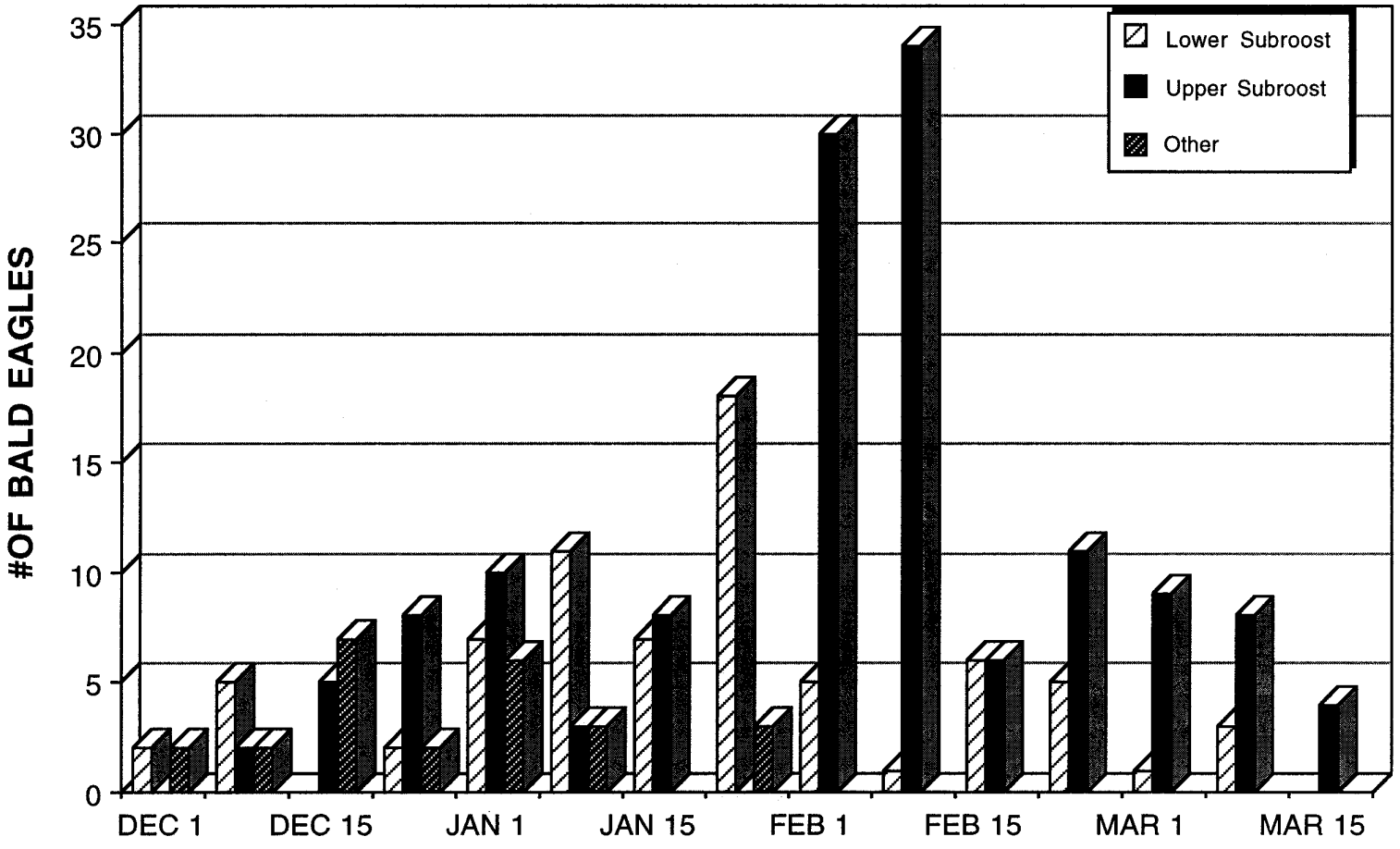


Figure 17. Number of bald eagles using different subroost areas within the Dead Dog Creek communal roost stand, winter 1998/1999.

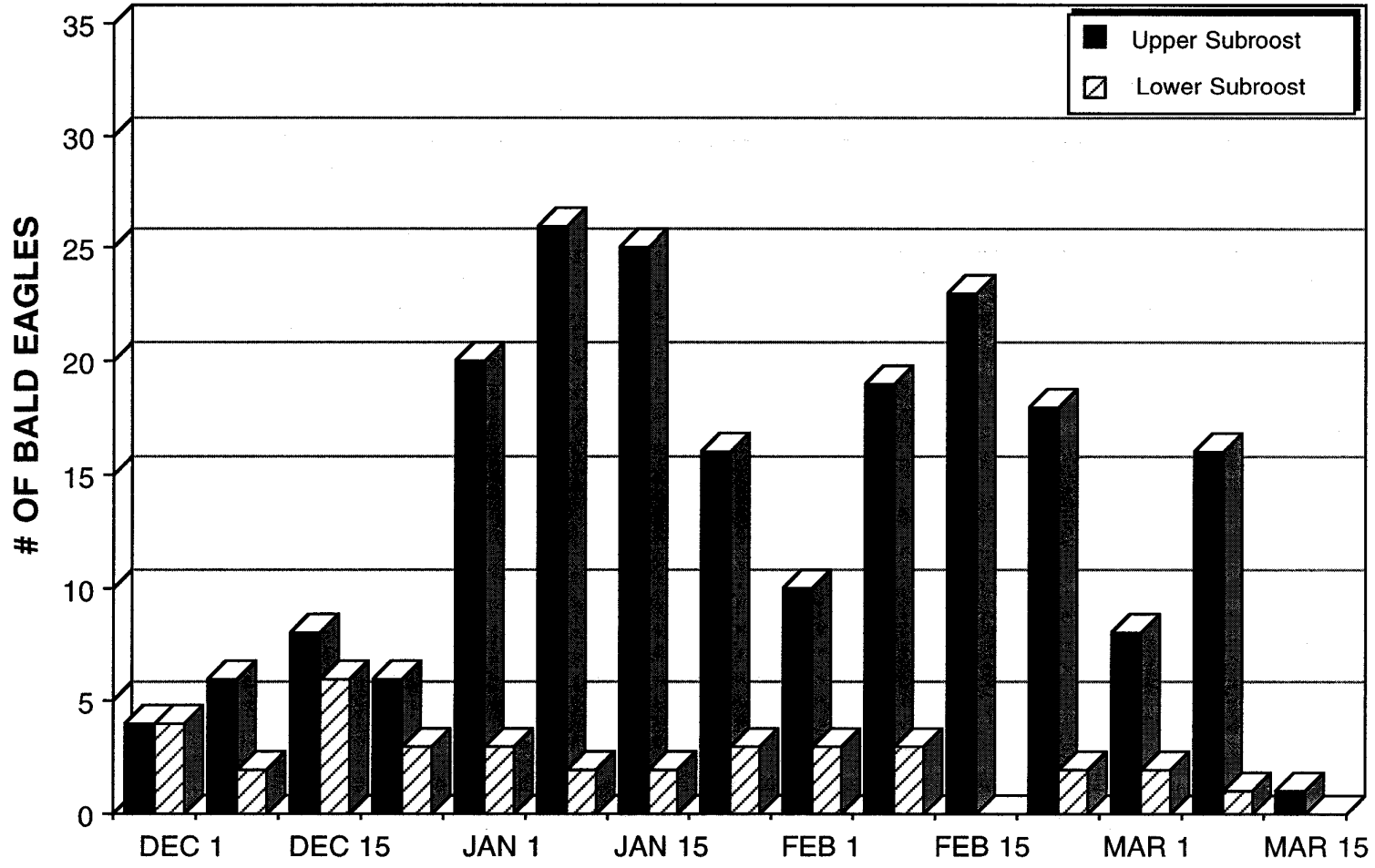


Figure 18. Numbers of bald eagles counted during surveys of main foraging areas, winter 1997/1998.

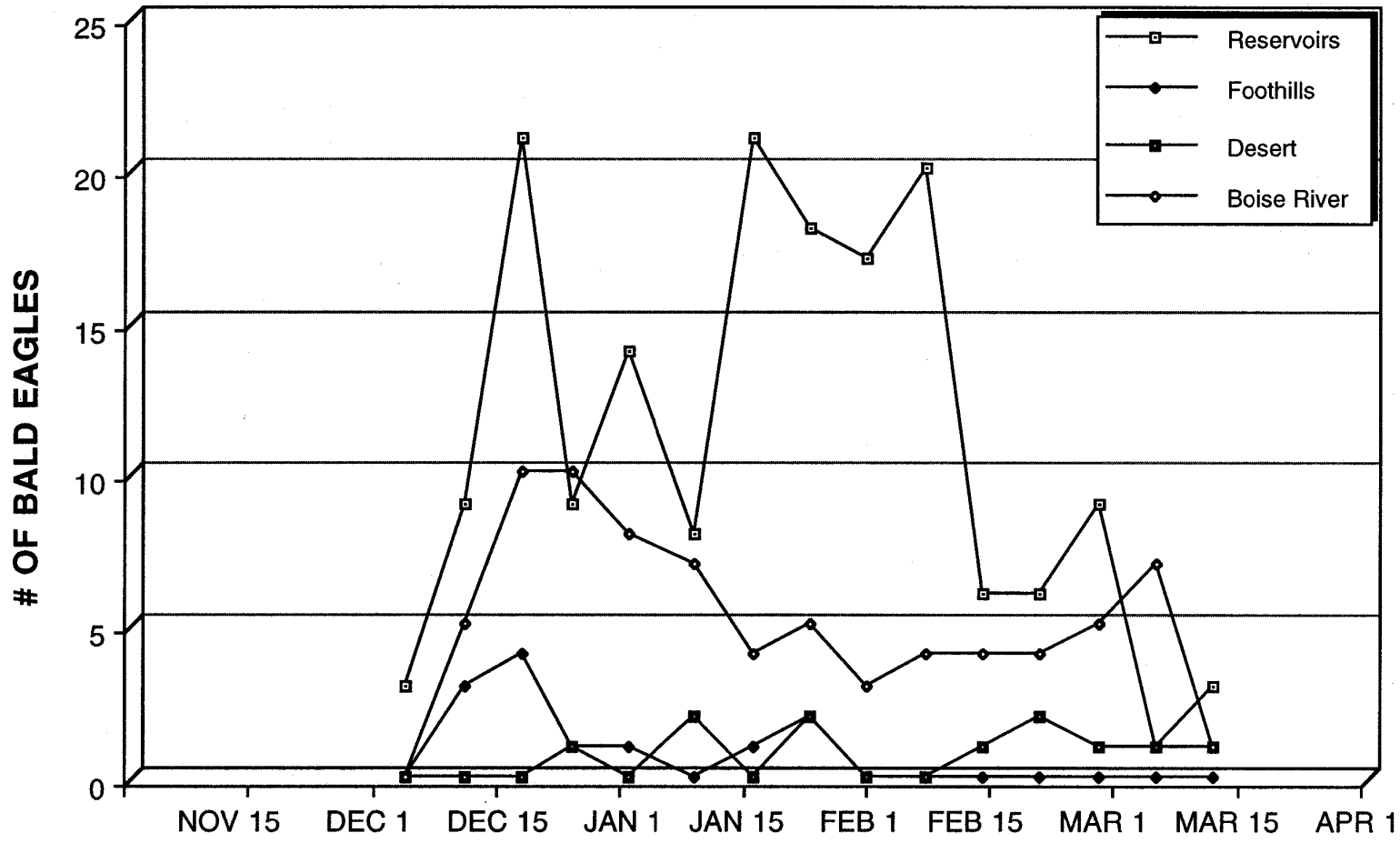


Figure 19. Numbers of bald eagles counted during surveys of main foraging areas, winter 1998/1999.

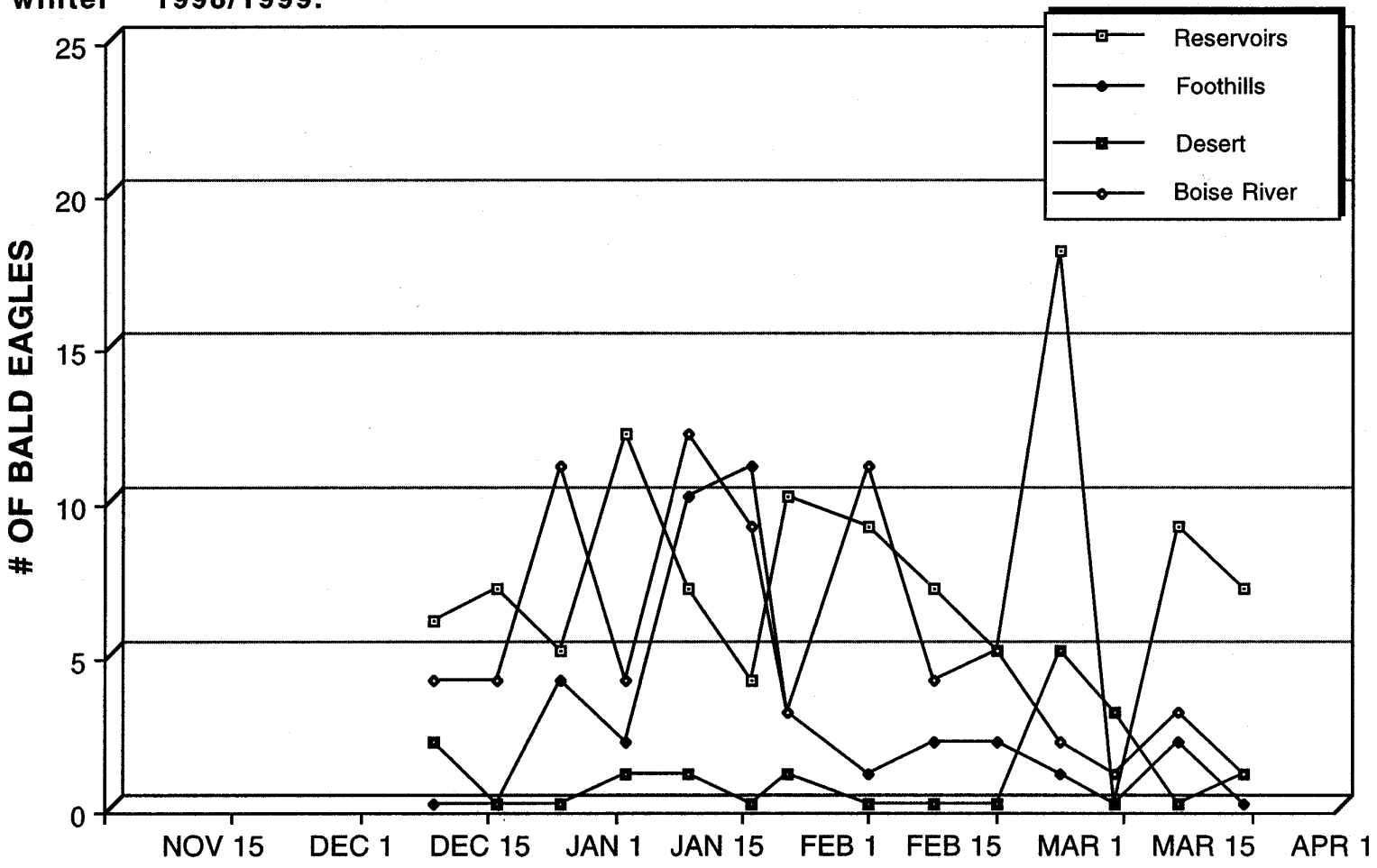


Figure 20. Average number of bald eagles counted during surveys of main foraging areas, winter 1997/1998.

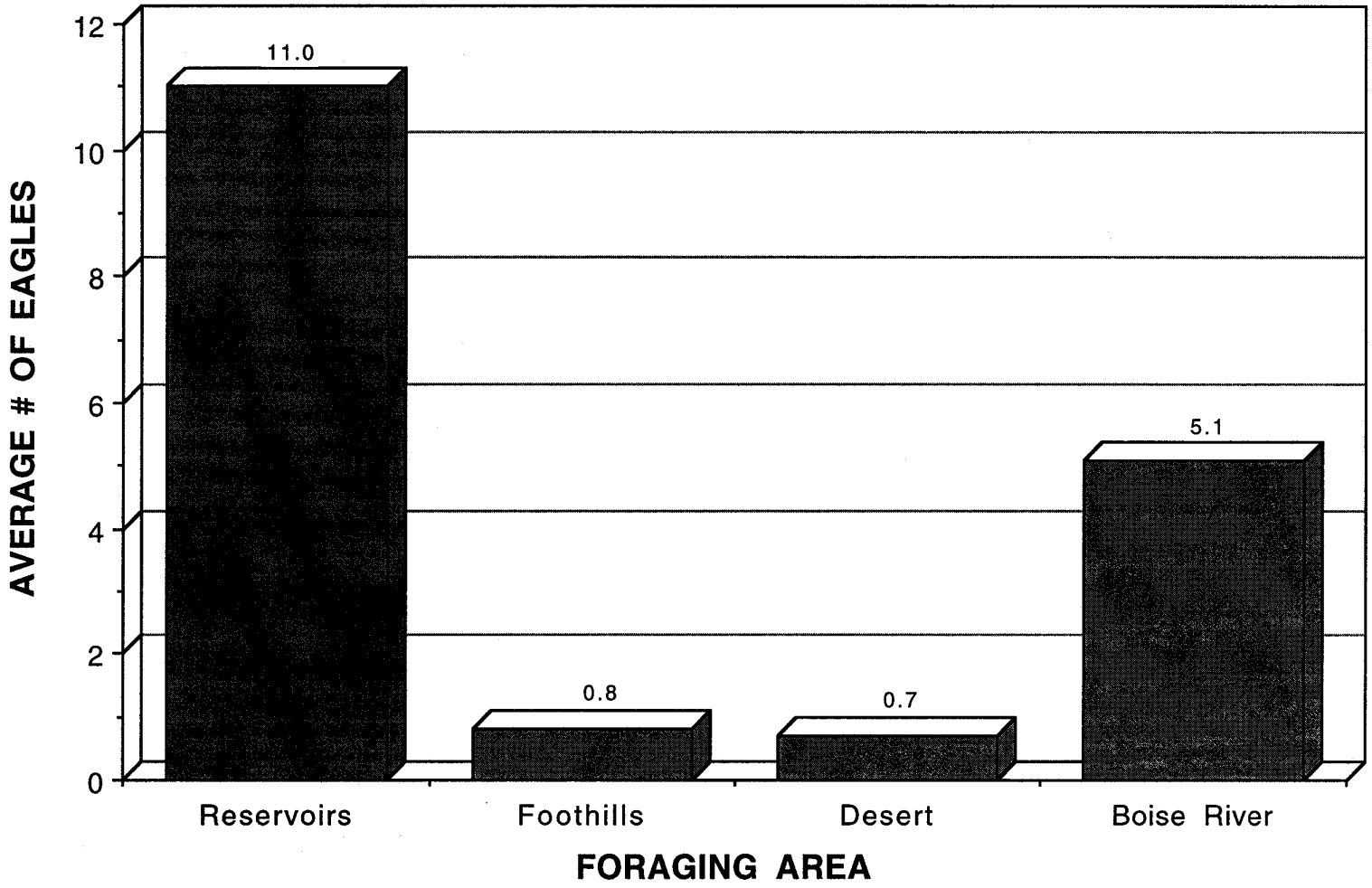


Figure 21. Average number of bald eagles counted during surveys of main foraging areas, winter 1998/1999.

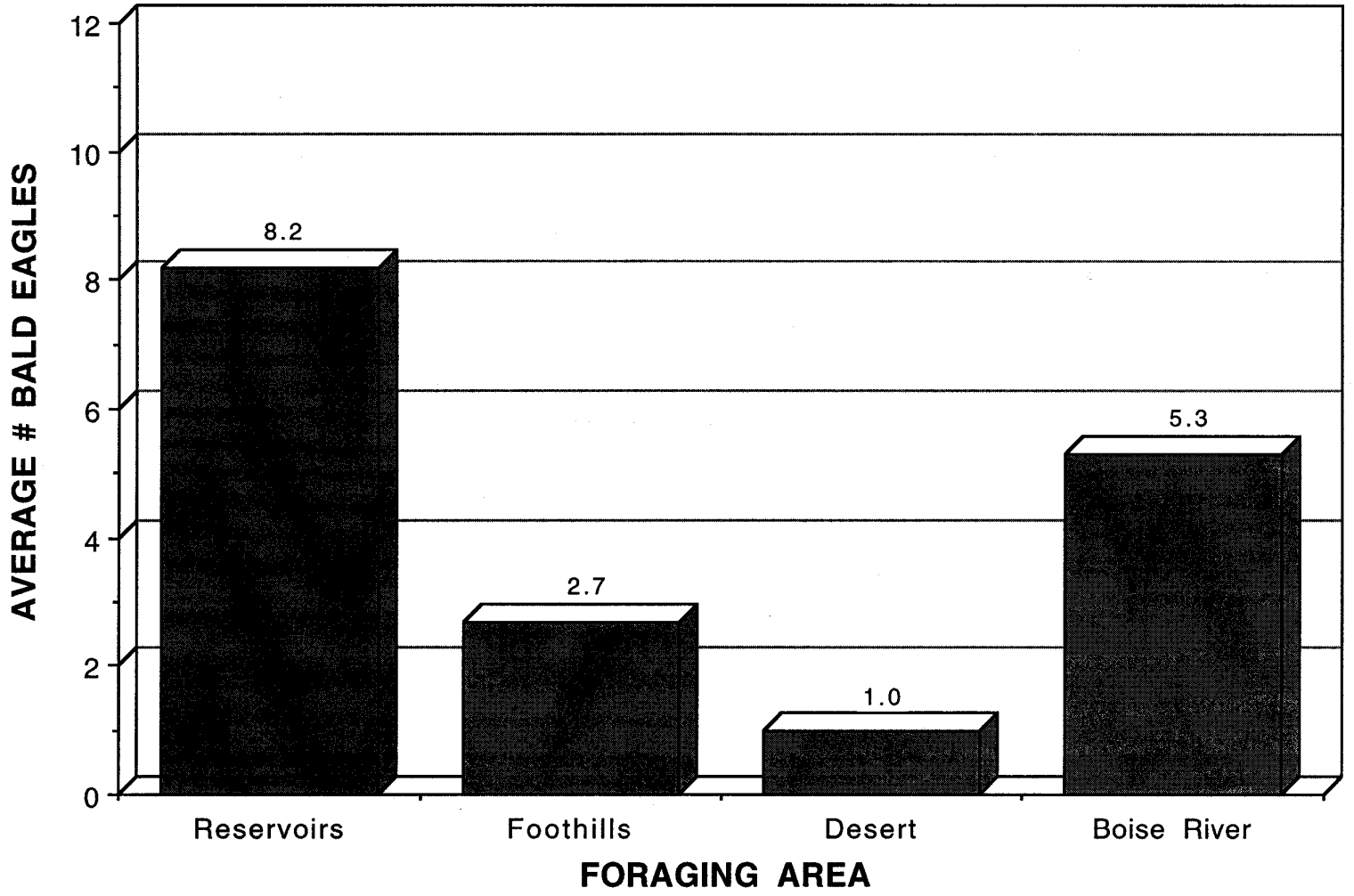


Figure 22. Percent adult and percent immature bald eagles counted during surveys of main foraging areas, winter 1997/1998.

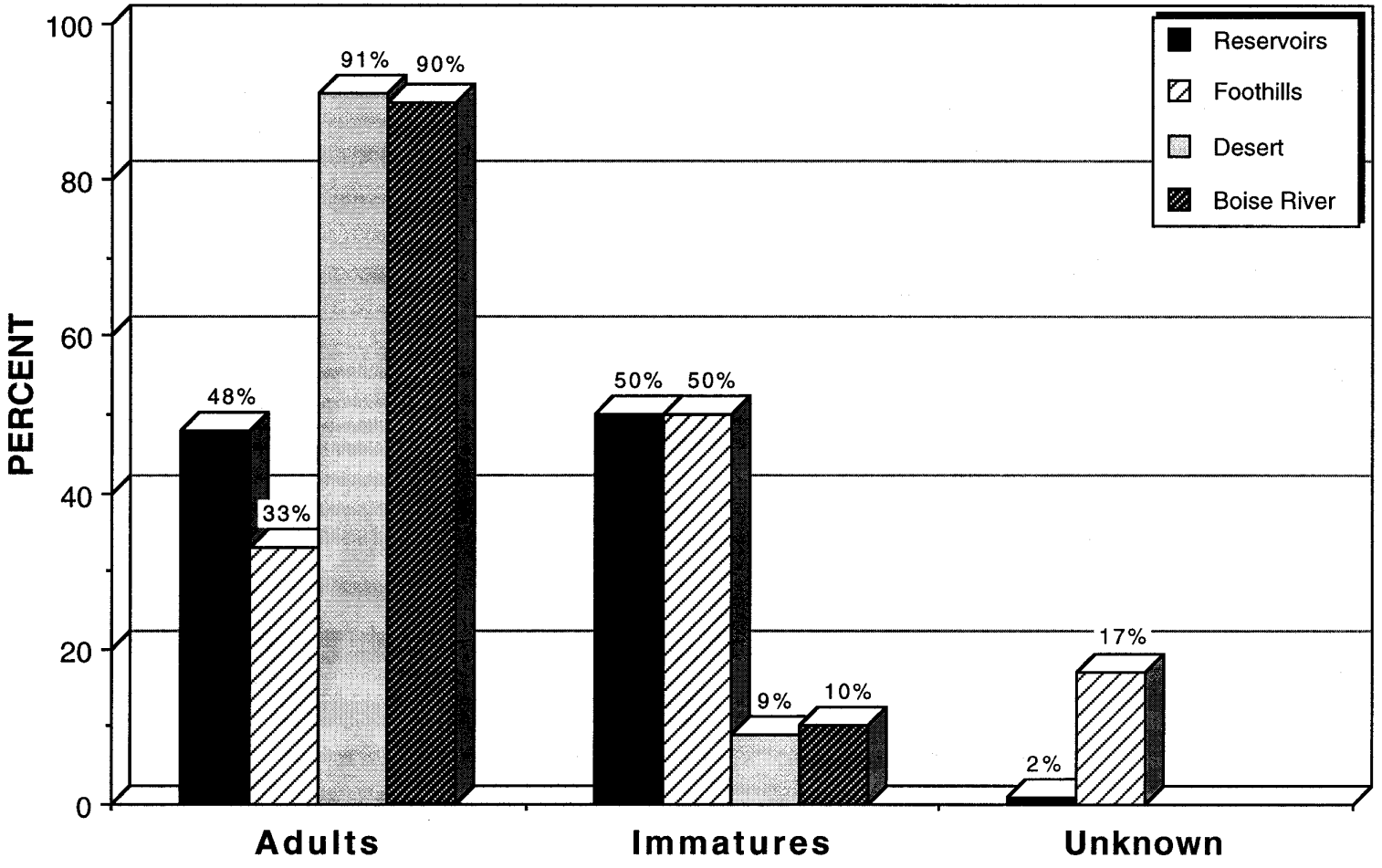


Figure 23. Percent adult and percent immature bald eagles counted during surveys of main foraging areas, winter 1998/1999.

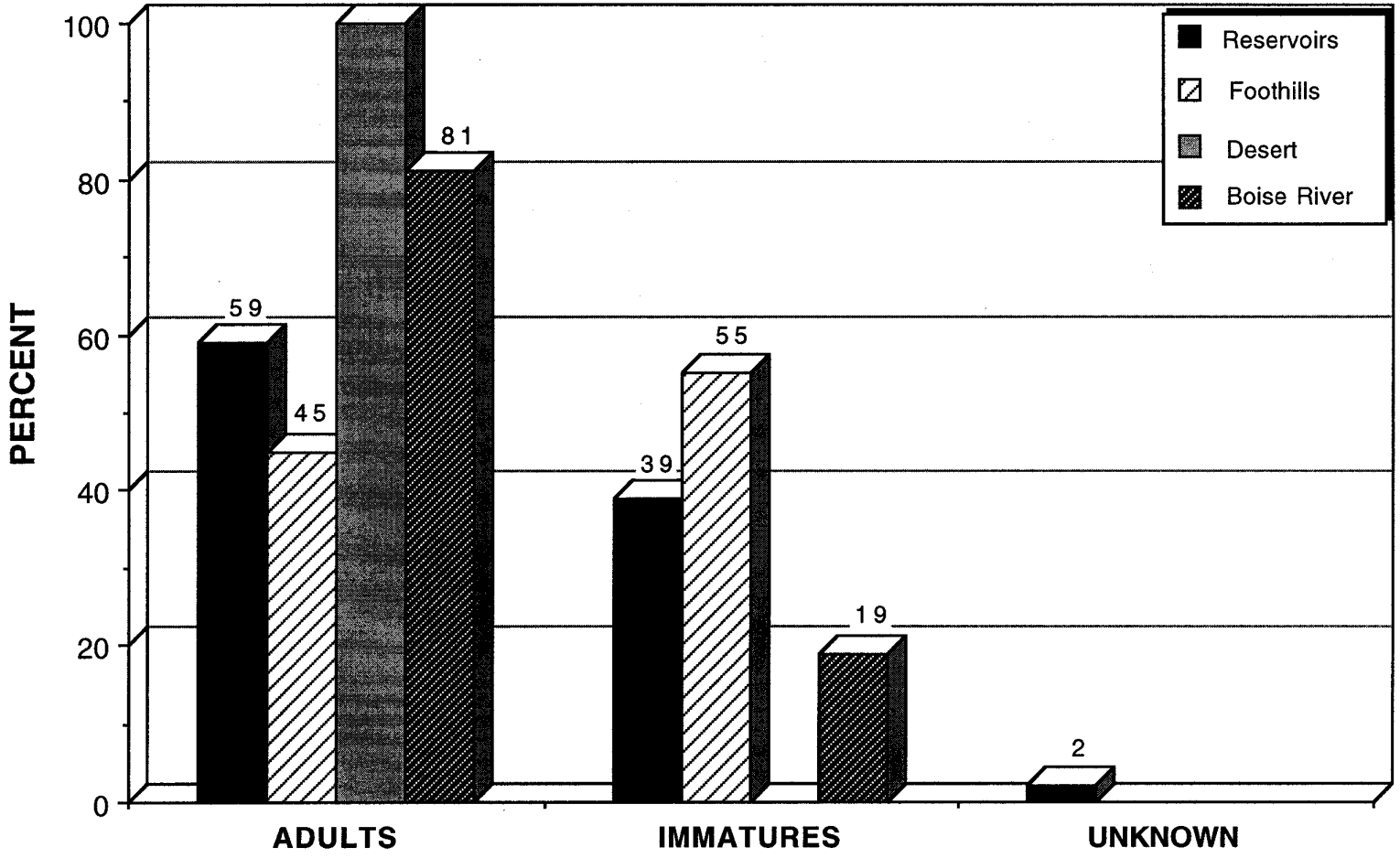


Figure 24. Total number of bald eagles counted during surveys of reservoir and foothills foraging areas compared to numbers of eagles at the Dead Dog Creek Communal Roost, winter 1997/1998.

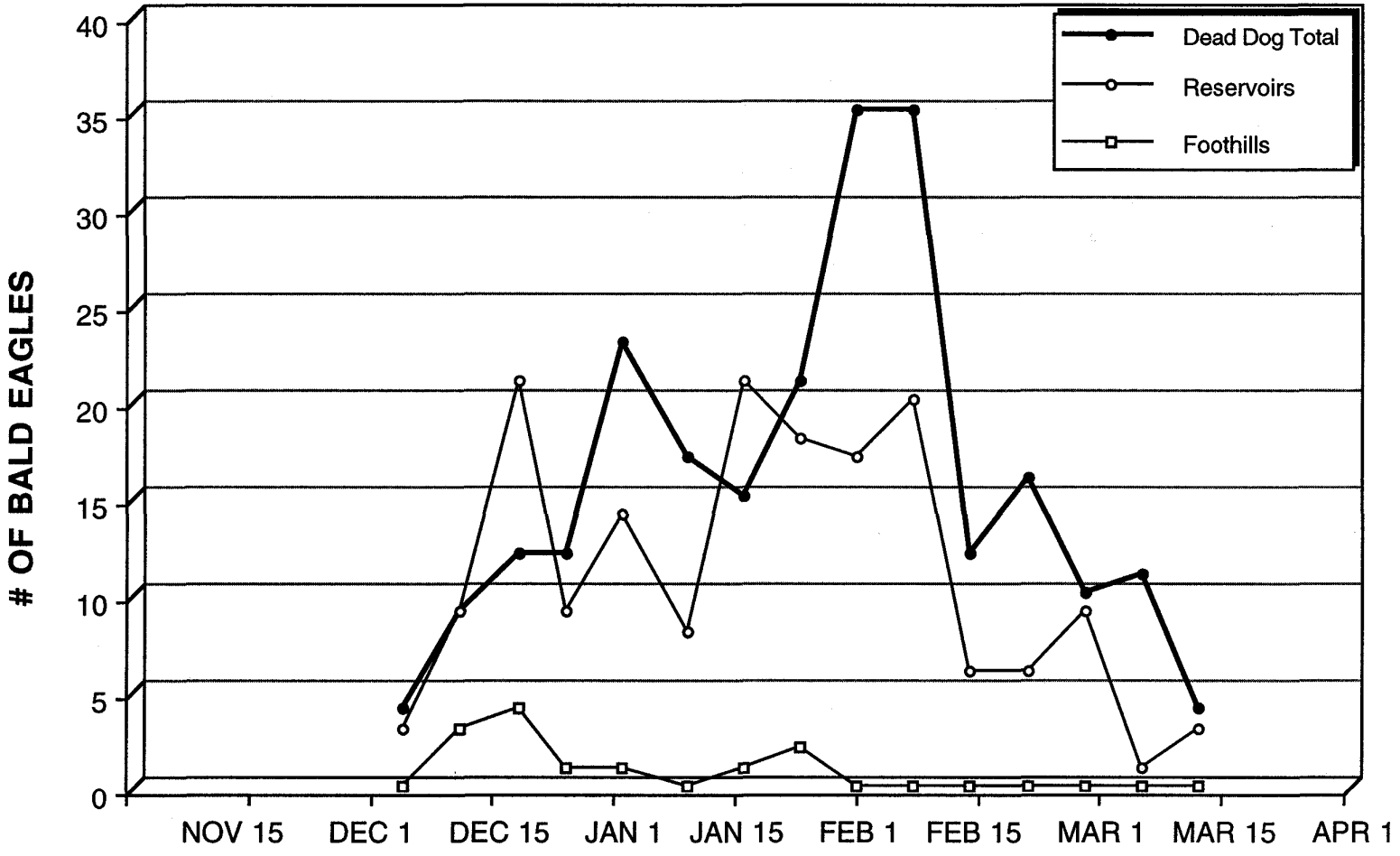


Figure 25. Total number of bald eagles counted during surveys of reservoir and foothills foraging areas compared to numbers of eagles at the Dead Dog Creek Communal Roost, winter 1998/1999.

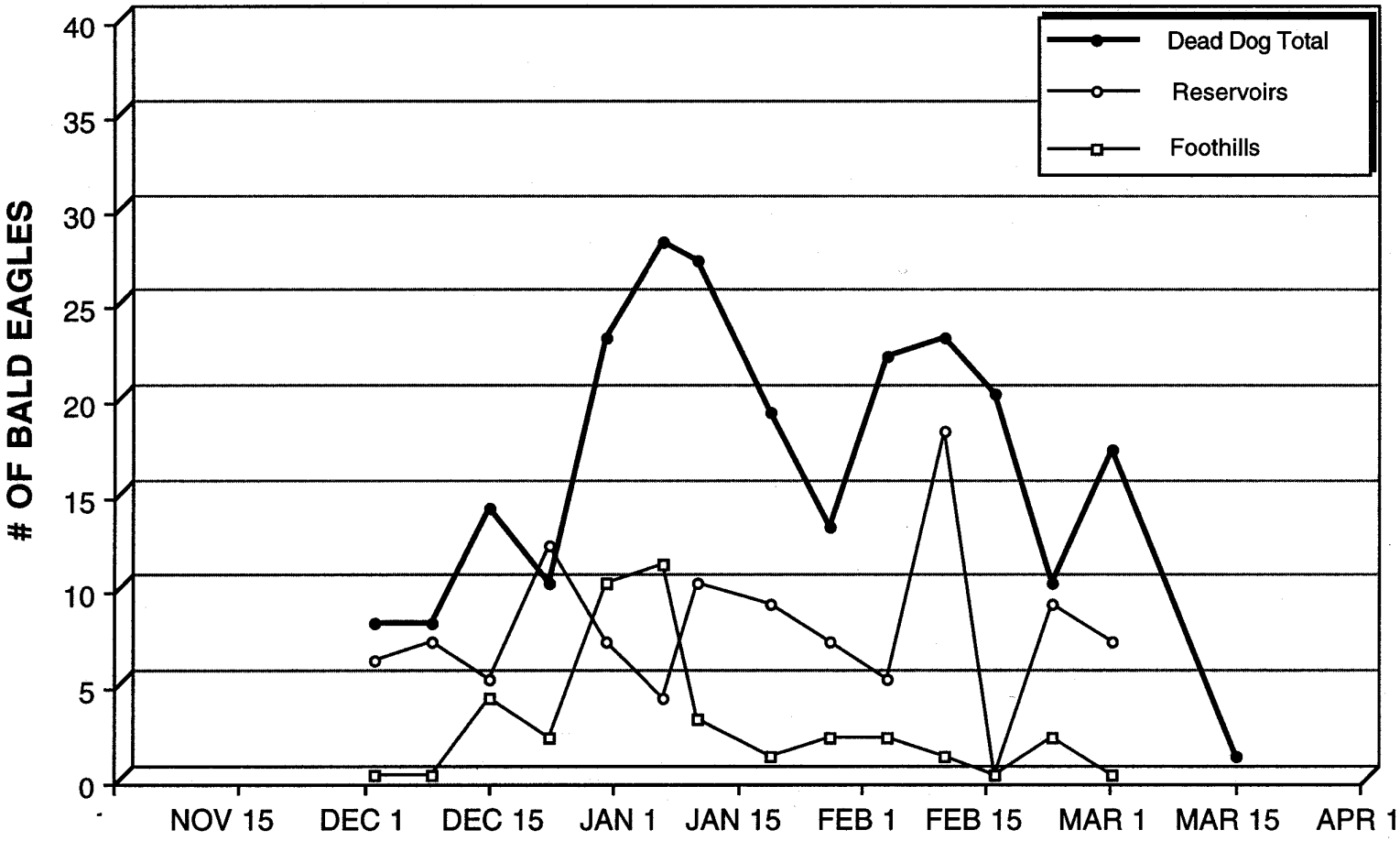


FIGURE 26. Percent adult and percent immature bald eagles counted during surveys of reservoir and foothills foraging areas, and at the Dead Dog Creek Communal Roost, winter 1997/1998.

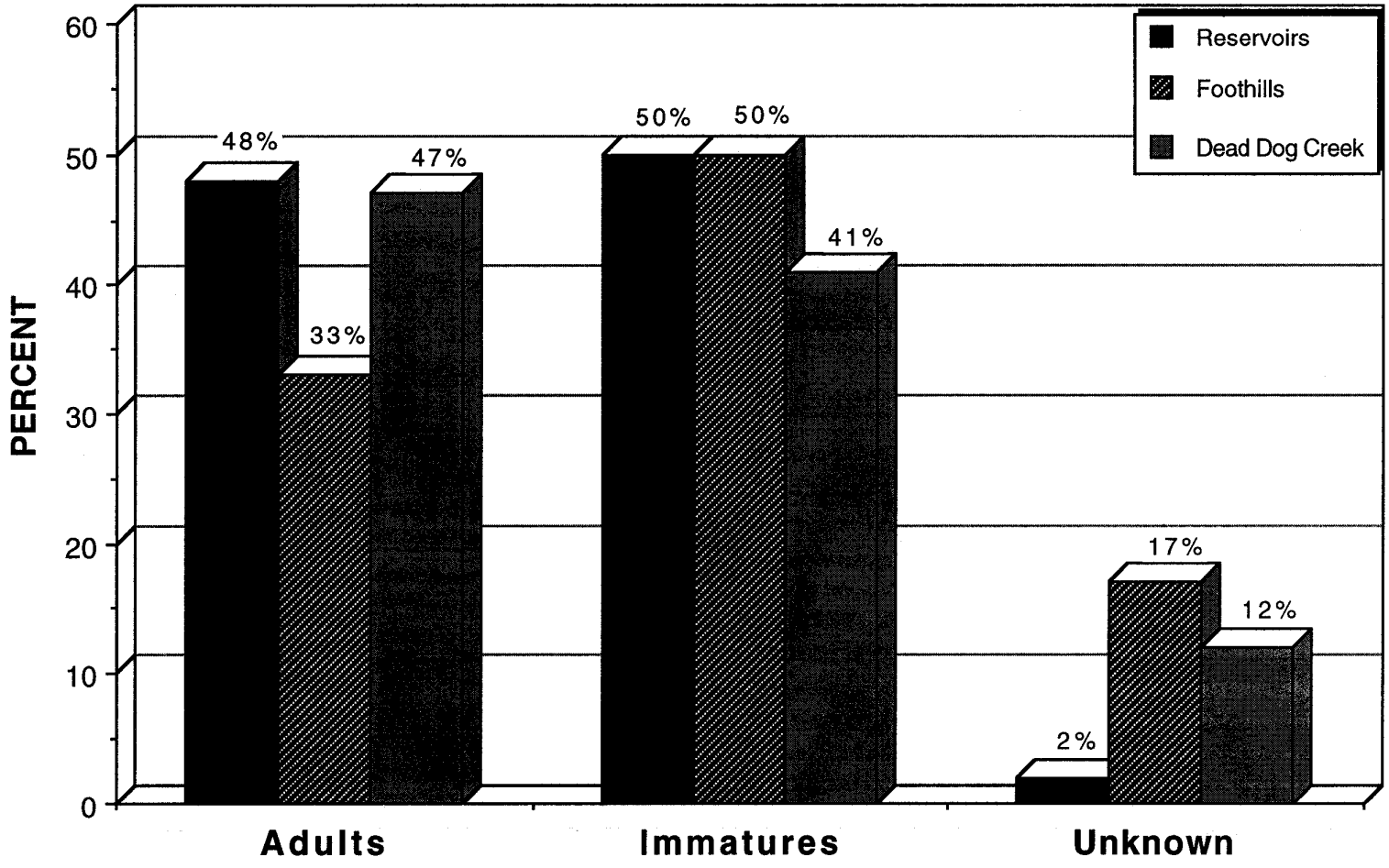


FIGURE 27. Percent adult and percent immature bald eagles counted during surveys of reservoir and foothills foraging areas, and at the Dead Dog Creek Communal Roost, winter 1998/1999.

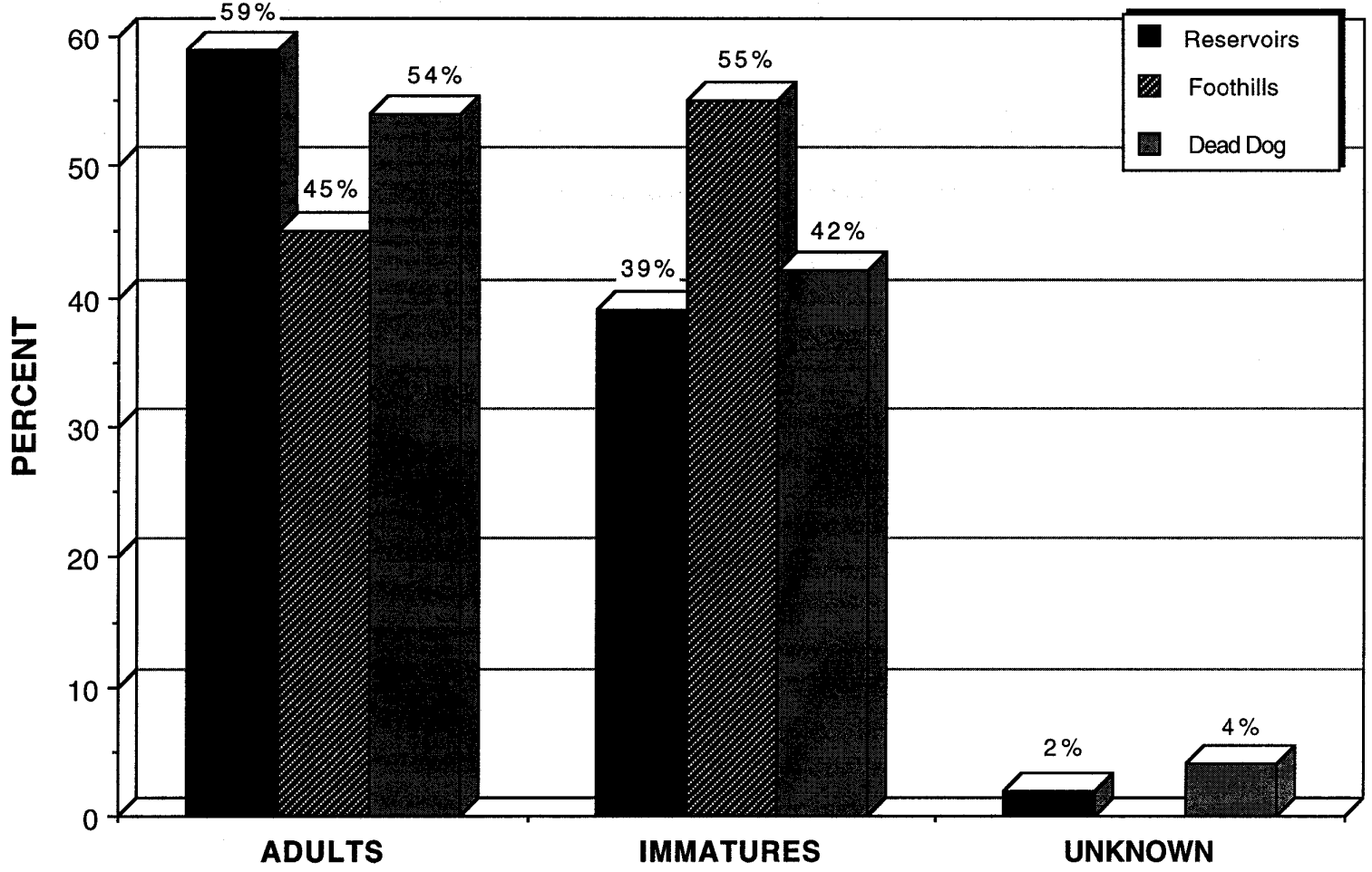


Figure 28. Total number of bald eagles counted during surveys of Boise River and desert foraging areas compared to numbers of eagles at the Barber Pool Communal Roost, winter 1997/1998.

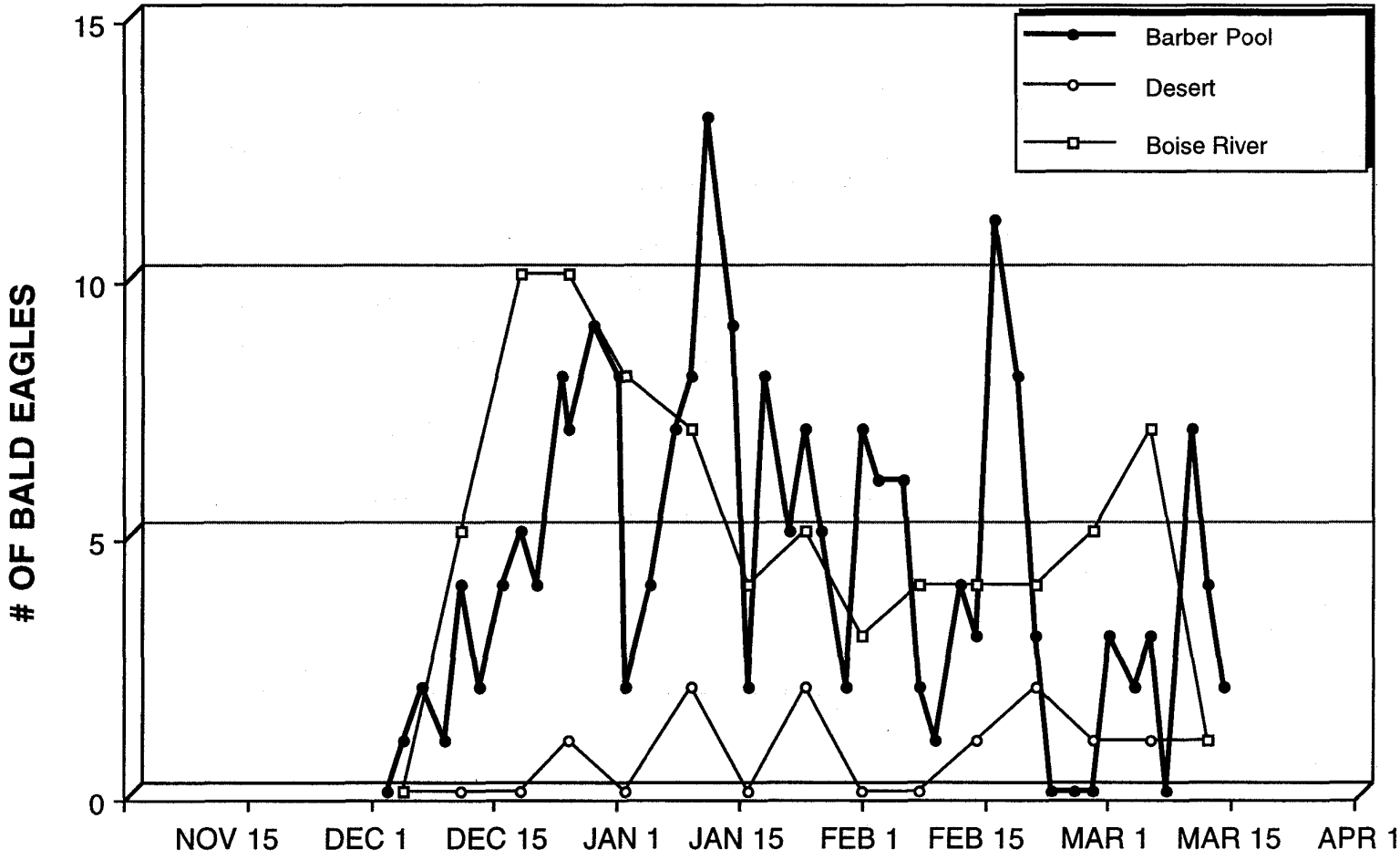


Figure 29. Total number of bald eagles counted during surveys of Boise River and desert foraging areas compared to numbers of eagles at the Barber Pool Communal Roost, winter 1998/1999.

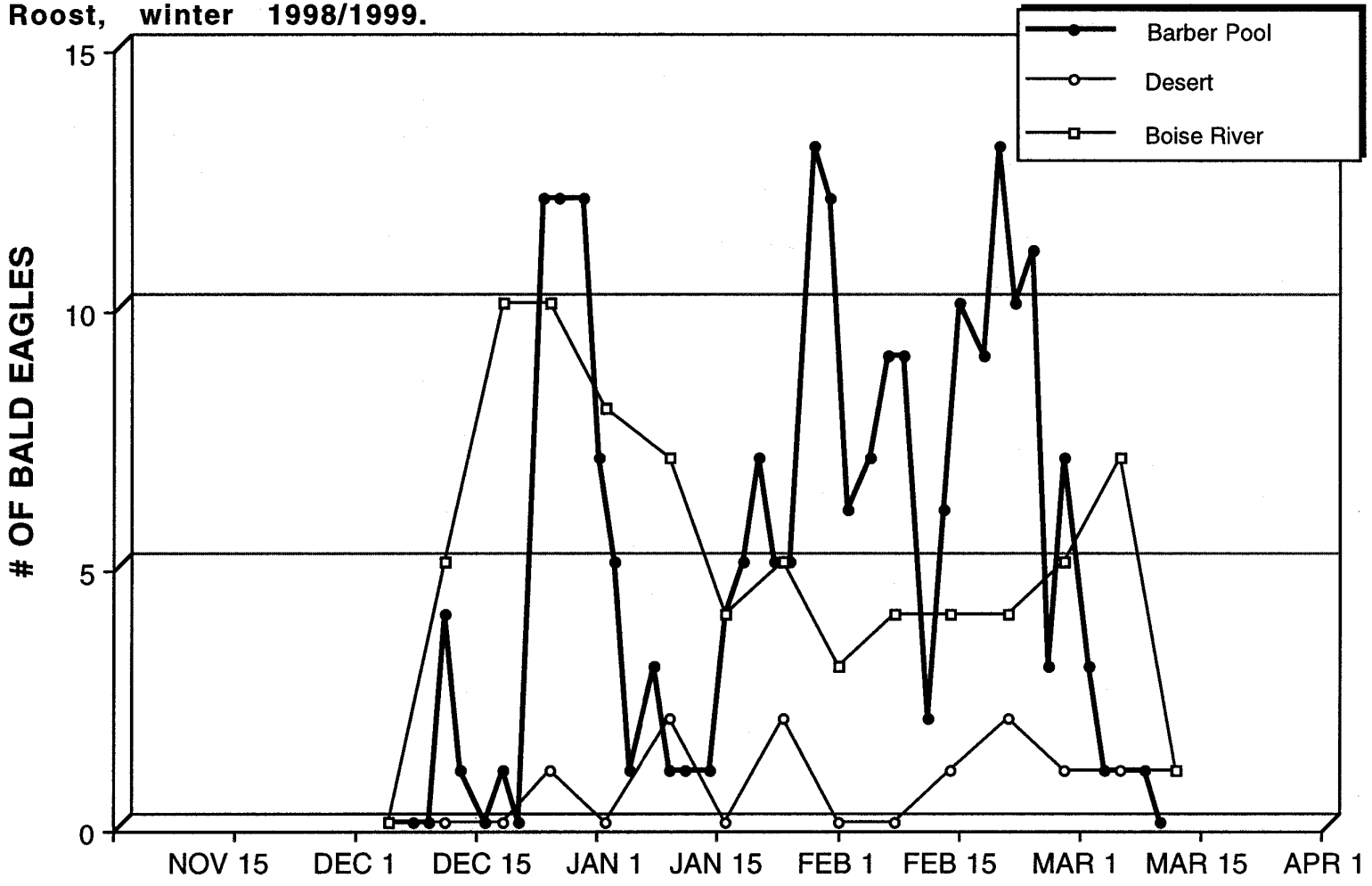


Figure 30. Percent adult and percent immature bald eagles counted during surveys of Boise River and desert foraging areas, and at the Barber Pool Communal Roost, winter 1997/1998.

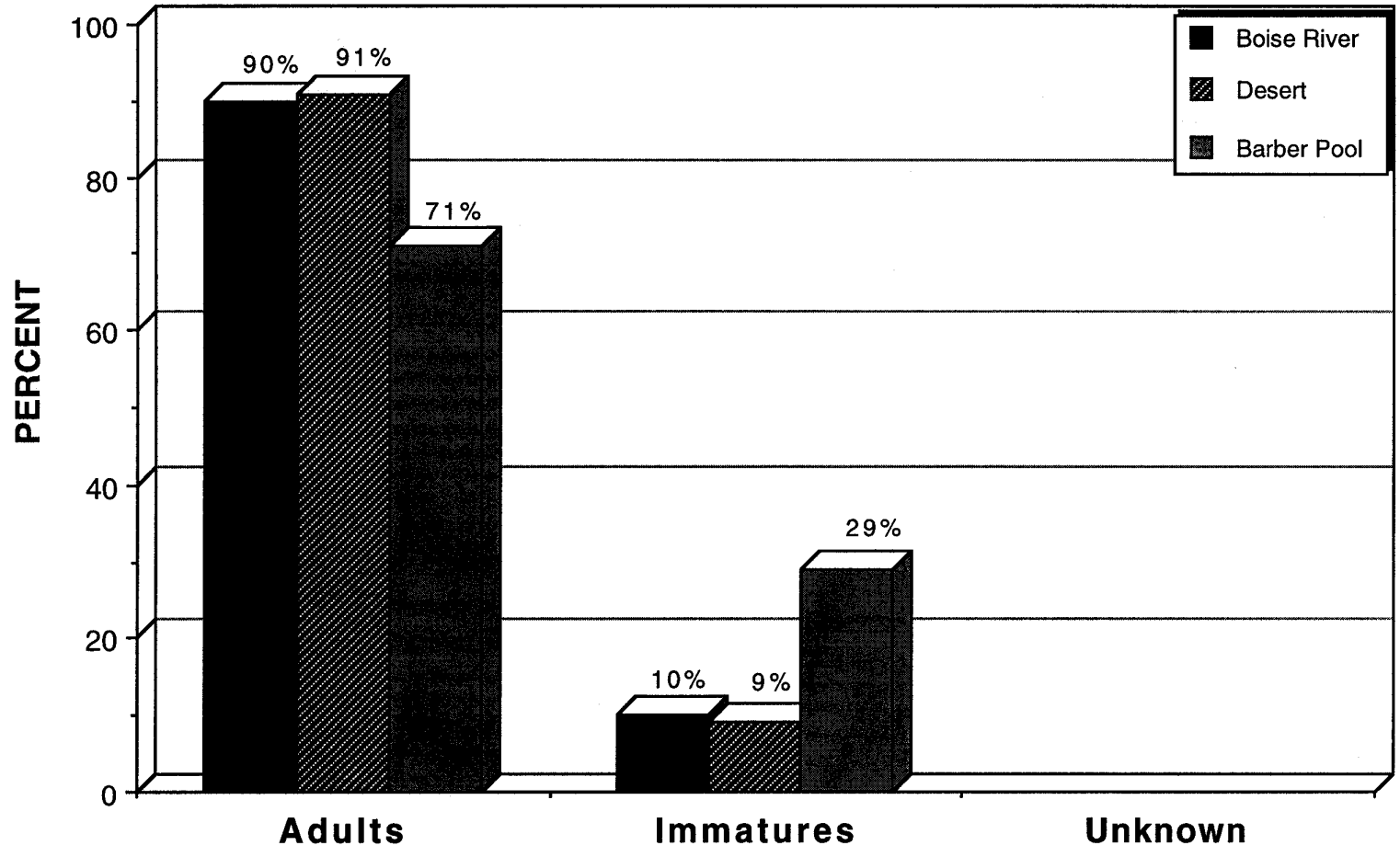
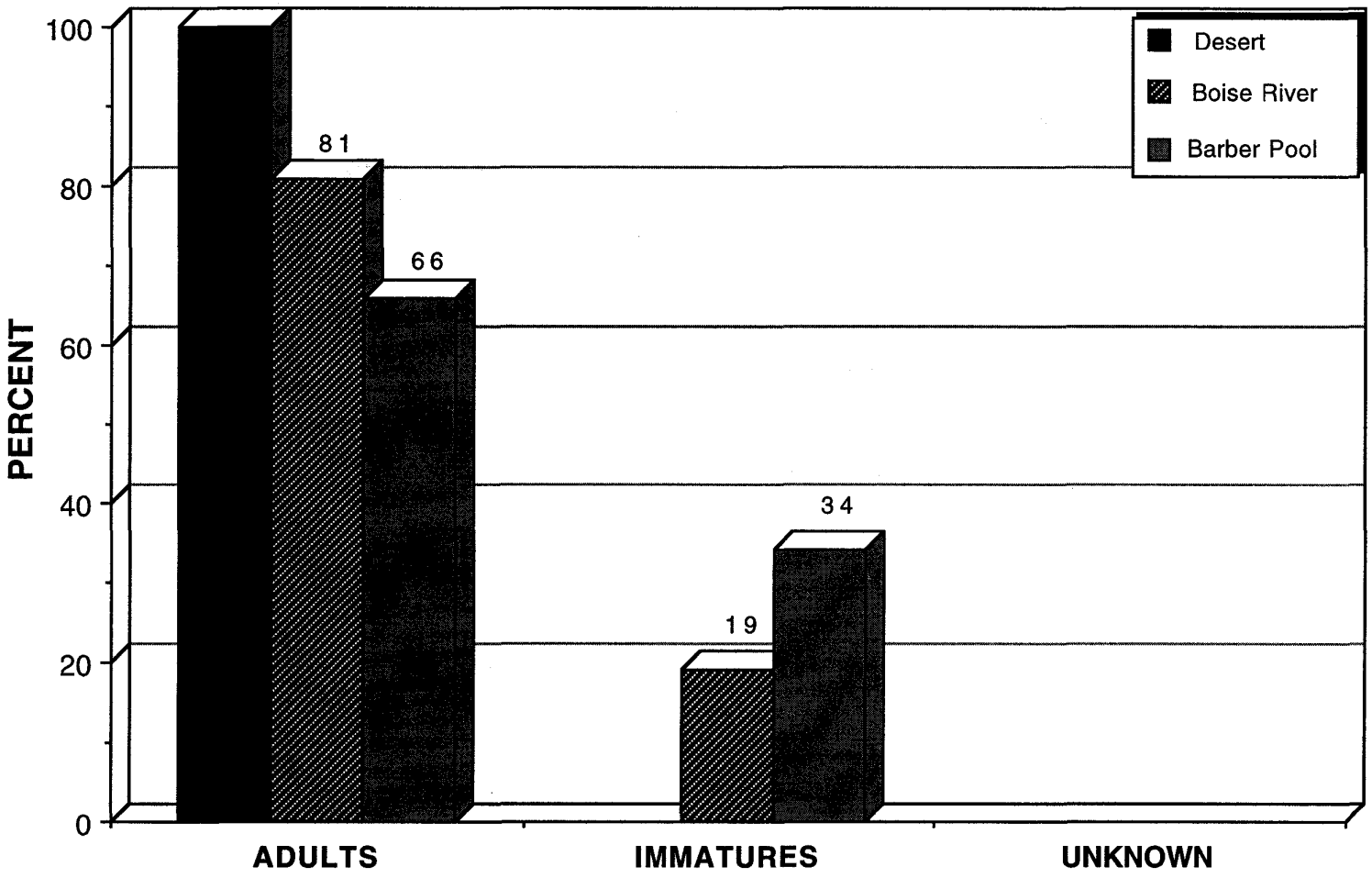


Figure 31. Percent adult and percent immature bald eagles counted during surveys of Boise River and desert foraging areas, and at the Barber Pool Communal Roost, winter 1998/1999.



Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

Plot #	Tree #	Plot size	Species	DBH	10 yr radial growth	Age	Height class	Height	Crown Ratio-uncompacted	Crown ratio- cp	Crown class	Crown shape	Comments	Aspect	Slope
1-1	1	1	1	31.8	0.30	155	2	76	90	80	2	3		0	67
1-1	2	1	1	20.1			1		80	60	3	3	Forked		
1-1	3	1	1	33.0			2		90	80	2	3			
1-1	4	1	1	22.2			1		90	70	3	3			
1-1	5	1	1	14.9	0.30	74	1	82	90	70	3	1			
1-1	6	1	1	14.0			1		60	50	2	1			
1-1	7	1	1	15.8			1		60	50	2	1			
1-1	1	2	1	5.8	0.35	58		30	70	40	4	2			
1-1	2	2	1	10.1					70	40	3	2			
1-1	3	2	1	4.8					70	40	5	2			
1-1	4	2	2	5.9	0.20	50		41	50	30	4	2			
1-1	5	2	1	11.0					80	50	3	1			
1-1	6	2	1	6.0					80	60	4	1			
1-1	7	2	1	9.5					60	50	3	1			
1-1	8	2	1	9.2					60	50	3	1			
1-1	9	2	1	6.1					60	40	4	2			
1-1	10	2	1	7.0					40	30	4	2			
1-1	11	2	1	7.5					50	40	3	2			
1-1	12	2	1	8.2					40	30	3	2			
1-1	13	2	1	10.1					60	40	3	2			
1-1	14	2	2	6.1					70	40	3	2			
1-1	15	2	1	9.9					40	30	3	2			
1-1	16	2	1	11.0					40	30	3	2			
1-1	17	2	1	8.0					40	30	3	2			
1-1	18	2	1	10.0					50	40	3	2			
1-1	19	2	1	11.1				61				7			
1-1	20	2	1	12.0					40	30	3	2			
1-1	21	2	1	7.5					50	20	4	2			
1-1	22	2	1	8.2					30	20	3	2			
1-1	23	2	1	8.5					50	40	3	2			
1-1	24	2	1	7.0					40	20	4	2			
1-1	25	2	1	11.0							3	7	Dead 2yrs, beetles		
1-1	26	2	1	12.5					50	50	3	1			
1-1	27	2	1	11.1					50	40	3	2			
1-1	28	2	1	8.8							4	7			
1-1	29	2	1	6.6					40	30	4	2			
1-1	30	2	1	5.2							4	7			
1-1	31	2	1	10.1					30	30	3	2			
1-1	32	2	1	11.0					50	40	3	2			
1-1	33	2	1	8.0					50	40	3	2			
1-1	34	2	1	10.0					80	50	3	1			
1-1	35	2	1	5.1					40	30	4	2			
1-1	36	2	1	4.6					50	30	4	2			
1-1	37	2	1	7.0					50	40	4	2			
1-1	38	2	1	4.8					50	40	5	2			

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

1-1	1	3	1	1.8		45		13	50	30	5	2			
1-2	1	1	1	18.2	0.70	72	2	76	90	70	2	1		63	47
1-2	2	1	1	19.0			2		70	60	2	1			
1-2	3	1	1	17.5			2		70	60	2	1			
1-2	4	1	1	20.1			2		70	70	2	1			
1-2	5	1	1	18.8			2		90	80	1	1			
1-3	1	1	1	24.6	1.30	70	1	67	90	90	1	1		50	63
1-3	2	1	1	14.2			1	46	90	70	1	6			
1-3	3	1	2	18.8	1.90	42	1	59	90	90	1	1			
1-3	4	1	1	22.7					90	90	1	1			
1-3	1	2	2	10.2	1.40	25		35	80	80	1	6			
2-1	1	1	1	37.4	0.25	161	2	94	80	40	2	6	multiple forks, moderate mistletoe	330	71
2-1	3	1	1	15.4	0.60	69	1	60	90	80	3	1			
2-1	4	1	1	19.8			2		90	80	2	1	forked		
2-1	5	1	1	15.6			1		80	70	3	1	Forked		
2-1	2	1	2	28.1	0.60	105	2	82	90	80	2	1			
2-1	6	1	2	14.8	0.25	70	1	38	90	80	3	2	Poor form, forked		
2-1	7	1	2	37.0	0.25	142	1	66	90	90	2	3			
2-1	8	1	2	31.8			1	71	80	70	2	3			
2-1	1	2	1	7.5	0.30	60	1	33	90	50	4	2			
2-1	2	2	1	13.1			1		90	50	4	6			
2-1	3	2	1	13.7					90	80	3	1			
2-1	4	2	1	11.6					80	70	3	1			
2-1	5	2	1	6.0					90	50	4	2			
2-1	6	2	1	12.1					90	70	3	1			
2-1	7	2	1	7.8					80	70	3	1			
2-10	1	1	2	21.2	0.65	61	1	59	70	60	2	1		42	64
2-10	2	1	1	18.3			1		70	50	2	2			
2-10	3	1	1	15.4			1		80	70	3	1			
2-10	4	1	1	18.9			1		70	70	2	1			
2-10	5	1	2	18.5			1		70	60	3	1			
2-10	6	1	1	20.3			1		70	60	2	1	multiple forks		
2-10	7	1	2	19.2			1		70	50	2	1			
2-10	8	1	1	14.8			1		80	70	3	1			
2-10	9	1	1	21.1			1		90	80	2	1			
2-10	10	1	1	27.8	0.95	62	1	58	90	80	2	1			
2-10	11	1	2	17.4			1		80	70	2	1			
2-10	12	1	1	17.1			1		60	50	2	1			
2-10	13	1	2	18.0			1		80	50	2	1			
2-10	14	1	2	18.8			1		70	60	2	1			
2-10	1	2	1	9.0	0.80	40		30	90	90	4	1			
2-10	2	2	2	9.1					30	20	3	2	multiple forks		
2-10	3	2	2	5.5					80	70	4	1	multiple forks		
2-10	4	2	2	9.1					50	40	4	2			
2-10	5	2	2	11.1					80	50	3	2			
2-10	1	3	1	1.9		40		11	90	70	5	1			

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

2-2	1	1	1	20.6	0.40	68	2	84	70	60	2	1			
2-2	2	1	1	14.3			1	66	60	40	3	6			
2-2	3	1	1	17.8			1	71	80	60	3	6			
2-2	4	1	1	17.5			2		90	80	2	1			
2-2	5	1	1	16.5			1		80	70	3	1			
2-2	6	1	1	13.9			1		80	50	3	2			
2-2	7	1	1	14.8			1		90	70	3	1			
2-2	8	1	1	17.9			2		60	50	2	1			
2-2	9	1	1	32.4	0.30	141	2	95	70	60	2	3			
2-2	1	2	1	12.6				69	80	50	3	1		345	71
2-2	2	2	1	6.5				30	80	60	4	1			
2-2	3	2	1	13.2					70	40	3	2	FORKED		
2-2	4	2	1	9.8				26	90	70	5	2			
2-2	5	2	1	11.1					70	50	3	2			
2-2	6	2	1	13.6					70	40	3	2			
2-2	7	2	1	7.1					50	40	4	2			
2-2	8	2	1	5.5					80	30	4	2			
2-2	9	2	1	8.0					90	40	4	2			
2-2	10	2	1	9.5				44	90	40	4	2			
2-2	11	2	1	11.2					50	40	3	2			
2-2	12	2	1	10.5				55	50	40	3	2			
2-2	13	2	1	8.6				51				7	Last year's beetle kill		
2-2	14	2	1	12.6					80	60	3	1			
2-2	15	2	1	9.8					80	50	4	2			
2-2	16	2	1	7.7					90	50	4	2			
2-2	17	2	1	10.0					60	40	4	2			
2-2	18	2	1	10.1					80	50	4	2			
2-3	1	1	1	20.5			1	75	90	90	1	1		80	69
2-4	1	1	1	13.9			1	57	80	60	3	6		10	35
2-4	2	1	1	16.8	0.60	60	1	73	90	70	3	1			
2-4	3	1	1	14.8			1		80	60	3	1			
2-4	4	1	1	14.0			1		70	60	3	1			
2-4	5	1	1	16.4			2		90	70	2	1			
2-4	6	1	1	34.4	0.30	168	2	78	90	80	2	6			
2-4	7	1	1	26.0			2		90	80	2	3			
2-4	8	1	1	32.5			2		90	80	2	3			
2-4	1	2	1	12.9					90	80	3	1			
2-4	2	2	1	12.1					80	60	3	1			
2-4	3	2	1	11.8					90	70	3	1			
2-4	4	2	1	12.0					80	60	3	1			
2-4	5	2	1	11.1					80	50	3	2			
2-4	6	2	1	10.8					80	60	3	1			
2-4	7	2	1	9.0					90	60	3	1			
2-4	8	2	1	10.8					90	70	3	1			
2-5	1	1	1	15.6			1		90	70	3	1			
2-5	2	1	1	24.8	0.40	138	2	88	60	40	2	3			

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

2-5	3	1	1	16.9			1		80	50	2	3				
2-5	4	1	1	27.9			2		80	60	2	3				
2-5	5	1	1	33.8			2		90	80	2	3				
2-5	6	1	1	28.5			2		90	60	2	3				
2-5	1	2	1	8.5	0.45	53		48	90	60	4	1		23	71	
2-5	2	2	1	9.4					90	70	4	1				
2-5	3	2	1	7.4					90	60	4	1				
2-5	4	2	1	11.2					90	70	3	1				
2-6	1	1	1	15.1	0.50	68	1	74	50	50	2	1		50	54	
2-6	2	1	1	15.4			1		50	40	3	2				
2-6	3	1	1	17.4			2		70	60	2	1				
2-6	4	1	1	16.1			2		50	50	2	1				
2-6	5	1	1	15.0			1		50	50	3	1				
2-6	6	1	1	14.0			1		50	50	3	1				
2-6	7	1	1	30.0			2		50	40	2	6				
2-6	8	1	1	39.1			2		70	60	2	3				
2-6	1	2	1	8.8					40	40	4	2				
2-6	2	2	2	8.0				15				7				
2-6	3	2	1	6.4					40	30	4	2				
2-6	4	2	1	12.0					40	40	3	2				
2-6	5	2	1	7.1					50	40	4	2				
2-6	6	2	1	5.1					50	30	5	2				
2-6	7	2	1	4.8					40	30	5	2				
2-6	8	2	1	10.1					40	30	3	2				
2-6	9	2	1	10.5					40	30	3	2				
2-6	10	2	1	8.8					40	30	3	2				
2-6	11	2	1	7.5					30	30	4	2				
2-6	12	2	1	6.4					30	30	4	2				
2-6	13	2	1	7.0					30	30	3	2				
2-6	14	2	1	11.5					40	30	3	2				
2-6	15	2	1	8.5					30	30	5	2				
2-6	16	2	1	12.5					40	30	3	2				
2-6	17	2	1	8.5					40	30	4	2				
2-6	18	2	1	11.1					40	30	4	6				
2-6	19	2	1	9.0					50	30	3	2				
2-6	20	2	1	10.2					40	40	3	2				
2-6	21	2	1	9.8					20	10	4	6				
2-6	22	2	1	10.1				63	30	20	3	6				
2-6	23	2	1	9.5					40	30	3	2				
2-7	1	1	1	15.1	0.70	71	2	67	60	50	2	1				
2-7	2	1	1	14.1			1		50	40	3	2				
2-7	3	1	1	16.9			2		50	50	2	1				
2-7	4	1	1	18.5			2		40	40	2	2	Forked top			
2-7	5	1	1	15.1			2		50	40	2	6				
2-7	6	1	1	14.8			2		70	60	2	1				
2-7	7	1	1	15.5			1		50	40	3	2				
2-7	8	1	1	18.0			2		70	60	2	1				

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

2-7	1	2	1	7.4				30	60	30	5	2		20	56
2-7	2	2	1	11.8					40	30	3	2			
2-7	3	2	1	9.0					30	30	3	2			
2-7	4	2	1	13.0				66				7	Dead 2 yrs., beetles		
2-7	5	2	1	6.0					20	20	4	2			
2-7	6	2	1	5.5					30	20	4	2			
2-7	7	2	1	7.4					30	30	3	2			
2-7	8	2	1	10.1				58				7			
2-7	9	2	1	10.5				10				10			
2-7	10	2	1	9.1					40	30	3	2			
2-8	1	3	1	3.5		22		18	90	90	1	1		90	42
2-9	1	1	1	24.5	0.90	61	1	69	90	90	1	1		85	28
3-1	1	1	1	19.1			1	51	90	80	3	1			
3-1	2	1	1	31.5	0.35	180	2	90	80	80	2	3		0	72
3-1	3	1	1	16.5			1		90	70	3	1			
3-1	4	1	1	16.5	0.60	72	1	68	80	70	2	1			
3-1	5	1	1	34.0			2	91				7			
3-1	6	1	1	19.5			1	62	80	50	3	6			
3-1	1	2	1	10.6					90	70	4	1			
3-1	2	2	1	11.1					90	80	3	1			
3-1	3	2	1	8.5					90	80	3	1			
3-1	4	2	1	12.0					90	80	3	1			
3-1	5	2	1	9.5				42	90	60	4	6			
3-1	6	2	1	5.0					80	60	4	1			
3-1	7	2	1	4.2					90	60	4	1			
3-1	8	2	1	7.1					60	50	4	2			
3-1	9	2	1	10.0					80	70	3	1			
3-1	10	2	1	12.1					50	40	3	6			
3-1	11	2	1	12.3					50	40	3	6			
3-1	12	2	1	8.8					80	60	3	6			
3-1	13	2	1	11.0					80	70	3	1			
3-1	14	2	1	7.5					80	70	4	1			
3-1	15	2	1	6.1					90	30	4	6			
3-10	1	1	1	15.0			2		50	30	3	6		75	58
3-10	2	1	1	26.2			2		90	90	2	1			
3-10	3	1	1	16.0			1		50	40	3	2			
3-10	4	1	1	21.0	0.90	66	1	66	90	80	3	1			
3-10	5	1	1	26.0			1		90	90	1	1			
3-10	6	1	1	15.0			1		80	70	1	6			
3-11	1	1	1	14.5			1	60	90	70	2	1		50	63
3-11	2	1	1	18.2	1.05	64	1	72	90	80	2	1			
3-11	3	1	1	32.5	0.25	195	1	74	90	80	2	3			
3-11	4	1	1	16.8			1		80	70	3	1			

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

3-11	5	1	1	16.2			1		80	70	2	1				
3-11	1	2	1	10.5					80	70	3	1				
3-11	2	2	1	7.2					70	60	4	1				
3-12	1	2	1	4.1		28		20	90	90	1	1			320	66
3-12	2	2	2	5.1		25		19	90	80	1	1				
3-13	1	1	1	21.5	1.15	65	2	91	70	60	2	1				
3-13	2	1	1	28.1			2		80	70	2	1				
3-13	3	1	1	22.0			2		60	50	2	1				
3-13	4	1	1	18.0			1		60	50	3	1				
3-13	5	1	1	22.5			2		60	50	2	1				
3-13	6	1	1	16.8			1		60	50	3	1				
3-13	7	1	1	21.0			2		90	70	2	1				
3-13	8	1	1	20.5			2		90	70	2	6				
3-13	9	1	1	16.0			1		70	60	3	1				
3-13	10	1	1	16.0			1		30	30	3	2				
3-13	11	1	1	15.5			1		40	30	3	2				
3-13	12	1	1	15.5			1		60	50	2	1				
3-13	13	1	1	20.0			2		60	50	2	1				
3-13	14	1	1	24.1			2		70	60	2	1				
3-13	1	2	2	7.0					50	20	4	6			35	59
3-13	2	2	1	4.0					90	60	5	1				
3-13	3	2	1	9.1					50	50	3	1				
3-13	4	2	1	11.0					40	30	3	2				
3-13	5	2	1	12.7					60	50	3	1				
3-13	6	2	1	9.0					30	20	3	2				
3-13	7	2	1	5.5							5	7				
3-13	8	2	1	12.1					40	30	3	2				
3-13	9	2	1	5.0					50	40	5	2				
3-13	10	2	2	5.0							5	7				
3-14	1	1	2	17.2	0.50	68	1	68	80	60	2	1				
3-14	2	1	2	14.4			1		50	50	3	1				
3-14	3	1	2	21.0	0.55	66	1	73	70	60	2	1				
3-14	4	1	2	16.8			1		60	50	3	1				
3-14	5	1	2	19.0			1		80	70	3	1				
3-14	6	1	2	16.2			1		50	30	4	6				
3-14	7	1	2	19.5			1		80	70	3	1				
3-14	8	1	1	16.1			1		70	60	2	1				
3-14	9	1	1	16.5			1		80	70	2	1				
3-14	10	1	2	15.0			1		70	40	3	2				
3-14	11	1	1	24.0			2		80	70	2	1				
3-14	12	1	1	16.8			1		50	20	2	6				
3-14	1	2	1	11.4					70	50	3	1			5	62

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

3-14	2	2	1	11.0					40	30	3	1			
3-14	3	2	1	11.9					80	60	3	1			
3-14	4	2	1	12.5					90	60	4	2			
3-14	5	2	1	5.5					60	50	4	1			
3-14	6	2	1	5.9					80	70	4	1			
3-14	7	2	1	6.8					90	70	4	1			
3-14	8	2	2	10.1					60	30	5	6			
3-14	9	2	2	5.5					50	20	5	6			
3-14	10	2	2	6.5					60	30	5	6			
3-14	11	2	1	4.5					50	40	5	2			
3-14	12	2	1	12.2					80	70	3	1			
3-14	13	2	2	10.0					70	60	3	1			
3-14	14	2	1	10.1					40	30	4	2			
3-14	1	3	1	0.0		20		5	70	60	4	1			
3-15	1	1	1	14.0	1.40	41	1	48	90	80	3	1		30	57
3-15	2	1	1	23.1	0.65	61	1	68	90	80	2	1			
3-15	3	1	1	16.7			1		80	70	3	1			
3-15	4	1	1	24.0			1		90	80	2	1			
3-15	5	1	1	22.2			1		90	80	2	1			
3-15	6	1	1	16.1			1		80	50	3	1			
3-15	7	1	1	18.5			1		90	70	3	1			
3-15	8	1	1	14.1			1		90	80	3	1			
3-15	1	2	2	9.7	0.40	60		33	50	40	5	6			
3-16	1	1	1	20.6	1.20	69	2	80	90	80	2	1		55	50
3-16	2	1	1	27.5	1.00	65	2	91	90	80	2	1			
3-16	3	1	1	20.5			1		80	60	3	1			
3-16	4	1	1	25.6			2		80	70	2	1			
3-16	5	1	1	18.8			1		60	70	3	1			
3-16	6	1	1	17.5			1		80	70	3	1			
3-2	1	1	1	15.5	0.50	63	2	78	70	60	3	1		355	57
3-2	2	1	1	17.4	0.50	64	2	87	50	50	2	2			
3-2	3	1	1	17.4			2		80	60	3	1	forked		
3-2	4	1	1	19.6			2		80	60	2	1			
3-2	5	1	1	14.2			1		40	30	4	6			
3-2	6	1	1	14.1					90	70	3	1			
3-2	7	1	1	18.1			2		90	90	2	1			
3-2	8	1	1	17.6			2		60	50	2	1			
3-2	9	1	1	21.5			2	86	90	80	2	1			
3-2	1	2	1	12.8	0.55	60		67	80	70	3	1			
3-2	2	2	1	7.0				31	90	50	4	6			
3-2	3	2	2	9.1	1.15	33		44	80	80	3	1			
3-2	4	2	1	12.2					70	60	3	1			

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

3-2	5	2	1	4.0					50	30	5	2			
3-2	6	2	1	9.1					80	50	4	2			
3-2	7	2	1	11.5					90	60	4	1			
3-3	1	1	1	14.4	0.45	50	1	71	80	70	3	1		70	48
3-3	2	1	1	25.6			3		80	70	2	1			
3-3	3	1	1	17.4			2		70	60	3	1			
3-3	4	1	1	16.0			2		80	50	3	2			
3-3	5	1	1	28.9			3		80	70	2	1			
3-3	6	1	1	24.1	0.90	67	2	95	80	70	2	1			
3-3	7	1	1	17.3			2		80	50	3	2			
3-3	8	1	1	22.5			2		80	60	2	1			
3-3	9	1	1	18.1			2		70	60	3	2			
3-3	10	1	1	44.1	0.35	165	3	114	80	70	2	3			
3-3	1	2	1	9.1				42	70	40	4	2			
3-3	2	2	1	7.0				31	70	60	5	2			
3-3	3	2	1	6.0					70	50	4	2			
3-4													No trees, low stocking	345	57
3-5	1	1	1	17.5			1	59			3	7		345	62
3-5	2	1	1	16.9			1	68	90	80	3	1			
3-5	3	1	1	20.8			2	78	90	80	2	1			
3-5	4	1	1	39.2	0.50	151	2	86	80	80	2	3			
3-5	5	1	1	40.2			2		90	90	2	3			
3-6	1	1	1	18.4			2		70	50	2	2		40	41
3-6	2	1	1	17.2			1		60	50	3	2			
3-6	3	1	1	19.4			2		90	70	2	6			
3-6	4	1	1	19.4			2		50	50	2	2			
3-6	5	1	1	15.3			1		90	70	3	1			
3-6	6	1	1	26.6	0.45	73	2	91	60	60	2	1			
3-6	7	1	1	15.6			1	80	90	70	3	2			
3-6	8	1	1	18.6			2		90	80	2	1	forked		
3-6	9	1	1	21.0			2		80	60	2	1			
3-6	10	1	1	14.5			1		80	50	3	6			
3-6	11	1	1	15.8			1		70	60	3	2			
3-6	12	1	1	15.5			1		70	50	3	2			
3-6	1	2	1	12.2				62	80	60	3	2			
3-6	2	2	1	11.1				42	90	30	4	6			
3-6	3	2	1	13.1					80	60	3	2			
3-7	1	1	1	15.9			1		90	80	2	1		25	38
3-7	2	1	2	20.0	0.75	65	1		90	90	2	1			
3-8	1	1	1	18.0			1		80	70	1	2	Forks	44	72
3-8	2	1	1	27.8			1		90	90	1	1	Lighting damage		
3-9	1	1	1	16.8			2		70	60	3	1		20	62

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

3-9	2	1	1	18.5			2	96	70	60	3	2				
3-9	3	1	1	19.8			2		70	60	3	2				
3-9	4	1	1	18.6			2		70	50	3	2				
3-9	5	1	1	26.0			3	108	90	80	2	1				
3-9	6	1	1	19.6			3		80	70	2	1				
3-9	7	1	1	16.6			2		60	50	3	2				
3-9	8	1	1	25.0			3		60	50	2	1				
3-9	9	1	1	13.9			2		60	50	3	2				
3-9	10	1	1	15.8			2		70	60	2	2				
3-9	11	1	1	22.0			3		80	70	2	1				
3-9	12	1	1	19.8			2	92	70	60	2	1				
3-9	13	1	1	21.7			3	100	70	60	2	1				
3-9	1	2	1	7.3					80	60	5	2				
3-9	2	2	1	12.2					70	50	4	2				
3-9	3	2	1	7.5					60	50	5	2				
3-9	4	2	1	8.6					70	50	4	2				
4-1	1	1	1	27.0			1	51	90	90	1	1			320	61
4-2	1	1	1	17.5			2	80	80	70	2	1			45	78
4-2	2	1	1	19.9			2		80	70	2	1				
4-2	3	1	1	15.3			1		80	70	3	1				
4-2	4	1	1	24.2			2		70	60	2	1				
4-2	5	1	1	23.5			2		60	50	2	2				
4-2	6	1	1	21.0			2		50	40	2	2				
4-2	7	1	1	17.5			2		60	50	2	2				
4-2	8	1	1	16.0			2		80	70	2	1				
4-2	9	1	1	14.8			1		80	70	3	1				
4-2	10	1	1	25.0			2		70	60	2	1				
4-2	1	2	1	4.3					30	30	5	2				
4-2	2	2	1	4.8					80	40	5	2				
4-2	3	2	1	8.3					60	50	5	2				
4-2	5	2	1	7.5					50	40	4	2				
4-2	6	2	1	12.5					60	50	3	2				
4-2	7	2	1	9.2					80	50	4	2				
4-2	8	2	1	7.6					80	50	4	2				
4-3	1	1	2	26.8	0.40	140	1	62	50	20	3	6	Roost tree, mostly dead		25	67
4-3	2	1	1	14.5			1		80	50	3	6				
4-3	3	1	1	18.2				25				8				
4-3	4	1	1	16.5			1		50	40	3	2				
4-3	5	1	1	18.0			2		90	80	2	1				
4-3	6	1	1	16.5			2		60	50	2	2				
4-3	7	1	1	19.0			2		70	60	2	1				
4-3	8	1	1	15.0			2		90	80	2	1				

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

4-3	9	1	1	14.0			1		70	60	3	1				
4-3	1	2	1	10.6					60	50	3	2				
4-3	2	2	1	12.9					70	60	3	1				
4-3	3	2	1	13.3					60	40	3	6				
4-3	4	2	1	10.0					50	30	3	6				
4-3	5	2	1	5.2					70	60	4	1				
4-3	6	2	1	12.3					40	30	3	2				
4-3	7	2	1	9.7					50	40	3	2				
4-3	8	2	1	5.5					80	50	4	2				
4-3	9	2	1	7.0					70	40	3	2				
4-4	1	1	1	16.5	0.25	66	2	82	70	60	2	6				
4-4	2	1	1	17.3			2	89	80	70	2	6				
4-4	3	1	1	14.1			2		40	30	3	2				
4-4	4	1	1	19.3			2		60	50	2	1				
4-4	5	1	1	13.9			1		50	50	3	2				
4-4	6	1	1	16.2			1		60	50	3	1				
4-4	7	1	1	14.3			1		60	50	3	2				
4-4	8	1	1	24.2			2	78	80	70	2	1				
4-4	9	1	1	15.2			2		50	40	2	6				
4-4	10	1	1	14.7			1		90	80	3	1				
4-4	11	1	1	23.0			2		80	70	2	1				
4-4	12	1	1	16.5			2		70	60	2	1				
4-4	13	1	2	19.9	0.90	42	1	60	80	80	1	1				
4-4	1	2	1	12.8					80	70	3	1			44	40
4-5	1	1	1	14.2			1		60	50	2	1			335	80
4-5	2	1	1	13.9			1	69	70	60	3	1				
4-5	3	1	1	16.3			1		50	30	3	6				
4-5	4	1	1	14.0			2		70	60	2	1				
4-5	5	1	1	14.9			2		80	70	2	1				
4-5	6	1	1	15.4			2		80	70	2	1				
4-5	7	1	1	31.1		190	2	98	90	80	2	6				
4-5	8	1	1	15.4			2		80	70	2	1				
4-5	9	1	1	15.7			1		90	80	2	1				
4-5	1	2	1	8.9				44			3	7				
4-5	2	2	1	4.8							5	7				
4-5	3	2	1	4.9					80	70	4	1				
4-5	4	2	1	9.7				52	70	40	4	2				
4-5	5	2	1	13.6					50	40	3	2				
4-5	6	2	1	4.9					40	30	4	6				
4-5	7	2	1	5.3					40	30	4	6				
4-5	8	2	1	10.0					50	40	3	2				
4-5	9	2	1	13.5					80	50	3	2				
4-5	10	2	1	7.0					80	60	3	1				
4-5	11	2	1	7.5					80	60	4	6				

Appendix A-1. Dead Dog Creek roost stand exam data from vegetation sampling plots.

4-5	12	2	1	6.5					70	50	4	2				
4-5	13	2	1	4.2					60	40	4	2				
4-5	14	2	1	6.0					70	50	4	2				
4-5	15	2	1	5.0					70	50	4	2				
4-5	16	2	1	12.6					50	40	3	2				

Appendix A-2. Dead Dog Creek bald eagle roost tree data

Tree #	Date	Rec.	Subrst	Sp.	Alive/Dead	Ht.	DBH	Age	Crn Shp.	Crn Rat. cp	Crn Rat. uncp	Crn Class	10 Yr.	Comments
1	7/8/98	GK		DF	A	126	38	150	3	60%	80%	Dom	0.8	prey remains
2	7/8/98	GK		DF	A	79	50	170	3	90%	100%	Dom	0.5	
3	7/8/98	GK		DF	A	106	42.5	200	3	90%	100%	Dom	0.4	pellets
4	7/8/98	GK		DF	A	100	36.5	150	3	70%	90%	Co-dom	0.5	
5	7/8/98	GK		DF	A/Dead Top	71	29	unk	6	n/a	n/a	Co-dom		
6	7/8/98	GK		DF	Dead	75	30	unk	7	n/a	n/a	Co-dom		burn scars
7	7/8/98	GK		DF	A	103	35	210	3	75%	85%	Dom	0.3	
8	7/8/98	GK	lower	DF	Dead	116	39	unk	7	n/a	n/a	Dom		lower roost
9	7/8/98	GK	lower	DF	A	136	42	200	3	75%	80%	Dom	0.3	
10	7/9/98	GK	upper	PP	Dead	79	28	unk	7	n/a	n/a	Dom		upper roost
11	7/9/98	GK	upper	PP	A/Dead Top	84	32	150	6	20%	30%	Dom	0.7	upper roost
12	7/9/98	GK	upper	DF	A	128	33	150	3	80%	95%	Dom	0.2	upper roost
13	7/9/98	GK	upper	PP	A	120	50	200	3	50%	60%	Dom	0.6	upper roost
14	7/9/98	GK	upper	DF	A	96	42	200	3	80%	90%	Dom	0.2	upper roost
15	7/9/98	GK	upper	DF	Dead	100	27	unk	7	n/a	n/a	Dom		upper roost
16	7/9/98	GK	upper	DF	A	110	42	200	3	70%	80%	Dom	0.2	upper roost
17	7/9/98	GK	upper	DF	A	85	36	150	3	60%	70%	Dom	0.3	upper roost
18	7/9/98	GK		DF	A/Dead Top	94	38	150	6	50%	60%	Co-dom	0.2	
19	7/9/98	GK		DF	A/Dead Top	106	40	175	6	50%	60%	Co-dom	0.15	
20	7/9/98	GK		DF	A	110	42	200	3	85%	90%	Dom	0.15	
21	7/9/98	GK		PP	A	100	40	200	3	60%	80%	Dom	0.6	
22	7/9/98	GK		DF	A	104	29	125	3	75%	80%	Dom	0.2	
23	7/9/98	GK		DF	A	100	36	150	3	80%	90%	Dom	0.2	
24	7/9/98	GK		PP	Dead	51	28	unk	7	n/a	n/a	Co-dom		
25	7/9/98	GK		DF	A	120	46.5	200	3	85%	95%	Dom	0.2	

Appendix A-2. Dead Dog Creek bald eagle roost tree data

Tree #	Date	Rec.	Subrst	Sp.	Alive/Dead	Ht.	DBH	Age	Crn Shp.	Crn Rat. cp	Crn Rat. uncp	Crn Class	10 Yr.	Comments
26	7/9/98	GK		PP	Dead	60	39	unk	7	n/a	n/a	Co-dom		
27	7/9/98	GK		PP	A/Dead Top	95	25	175	6	50%	60%	Co-dom	0.5	
28	7/9/98	GK		DF	A	105	36	150	2	80%	90%	Co-dom	0.2	
29	7/9/98	GK		DF	Dead	92	37	unk	7	n/a	n/a	Dom		
30	7/9/98	GK		PP	Dead	98	44	unk	7	n/a	n/a	Dom		
31	7/9/98	GK		DF	A	100	36	175	3	70%	80%	Dom		
32	7/9/98	GK		DF	A	105	36.5	180	3	70%	80%	Dom		
33	7/9/98	GK		DF	Dead	110	38	unk	7	n/a	n/a	Dom		
34	7/9/98	GK		DF	A	110	36	150	3	65%	80%	Dom		
35	7/9/98	GK		PP	A/Dead Top	80	42	160	6	40%	55%	Co-dom		

Appendix A-2. Dead Dog Creek bald eagle roost tree data

Tree #	Date	Recorder	Subroost	Species	Alive/Dead	Height	DBH	Age	Crown shape	Crown Ratio Compacted	Crown Ratio Uncompacted	Crown Class	Comments
13	7/9/98	GK	upper	PP	A	120	50	200	3	50%	60%	Dom	
21	7/9/98	GK		PP	A	100	40	200	3	60%	80%	Dom	
11	7/9/98	GK	upper	PP	A/Dead Top	84	32	150	6	20%	30%	Dom	
27	7/9/98	GK		PP	A/Dead Top	95	25	175	6	50%	60%	Co-dom	
35	7/9/98	GK		PP	A/Dead Top	80	42	160	6	40%	55%	Co-dom	
10	7/9/98	GK	upper	PP	Dead	79	28	unk	7	n/a	n/a	Dom	
24	7/9/98	GK		PP	Dead	51	28	unk	7	n/a	n/a	Co-dom	
26	7/9/98	GK		PP	Dead	60	39	unk	7	n/a	n/a	Co-dom	
30	7/9/98	GK		PP	Dead	98	44	unk	7	n/a	n/a	Dom	
						767	328	885					

Appendix A-3. Weekly counts of bald eagles from surveys of Barber Pool and Dead Dog Creek communal roost areas and surveys of main foraging areas, winter 1997-1998.

	Foraging Areas																Communal Roosts							
Date	Reservoirs				Foothills				Desert				Boise River				Barber Pool				Dead Dog Ck.			
	A	I	U	T	A	I	U	T	A	I	U	T	A	I	U	T	A	I	U	T	A	I	U	T
3 Dec 97	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4	0	0	4
10 Dec 97	6	3	0	9	1	2	0	3	0	0	0	0	5	0	0	5	4	0	0	4	4	5	0	9
17 Dec 97	10	11	0	21	2	2	0	4	0	0	0	0	8	2	0	10	4	1	0	5	9	3	0	12
23 Dec 97	5	2	2	9	0	0	1	1	1	0	0	1	9	1	0	10	5	2	0	7	8	4	0	12
30 Dec 97	6	8	0	14	1	0	0	1	0	0	0	0	7	1	0	8	2	0	0	2	17	6	0	23
7 Jan 98	2	6	0	8	0	0	0	0	2	0	0	2	6	1	0	7	6	2	0	8	3	3	11	17
14 Jan 98	7	14	0	21	0	1	0	1	0	1	0	1	4	0	0	4	2	0	0	2	8	0	7	15
21 Jan 98	8	10	0	18	0	1	1	2	1	0	0	1	4	1	0	5	2	5	0	7	7	13	1	21
28 Jan 98	8	9	0	17	0	0	0	0	0	0	0	0	3	0	0	3	4	3	0	7	12	23	0	35
4 Feb 98	9	11	0	20	0	0	0	0	0	0	0	0	4	0	0	4	1	1	0	2	14	21	0	35
11 Feb 98	5	1	0	6	0	0	0	0	1	0	0	1	4	0	0	4	3	0	0	3	2	6	4	12
18 Feb 98	6	0	0	6	0	0	0	0	2	0	0	2	3	1	0	4	2	1	0	3	8	8	0	16
25 Feb 98	3	6	0	9	0	0	0	0	1	0	0	1	5	0	0	5	0	0	0	0	7	3	0	10
4 Mar 98	1	0	0	1	0	0	0	0	1	0	0	1	6	1	0	7	2	1	0	3	7	2	2	11
11 Mar 98	1	2	0	3	0	0	0	0	1	0	0	1	1	0	0	1	3	1	0	4	3	1	0	4

Appendix A-4. Weekly counts of bald eagles from surveys of Barber Pool and Dead Dog Creek communal roost areas and surveys of main foraging areas, winter 1998-1999.

	Foraging Areas																Communal Roosts							
Date	Reservoirs				Foothills				Desert				Boise River				Barber Pool				Dead Dog Ck.			
	A	I	U	T	A	I	U	T	A	I	U	T	A	I	U	T	A	I	U	T	A	I	U	T
9 Dec 98	4	2	0	6	0	0	0	0	2	0	0	2	4	0	0	4	4	0	0	4	6	2	0	8
16 Dec 98	5	2	0	7	0	0	0	0	0	0	0	0	3	1	0	4	1	0	0	1	2	6	0	8
23 Dec 98	3	2	0	5	3	1	0	4	0	0	0	0	9	2	0	11	5	7	0	12	10	4	0	14
30 Dec 98	9	3	0	12	2	0	0	2	1	0	0	1	4	0	0	4	3	2	0	5	8	2	0	10
6 Jan 99	4	3	0	7	5	5	0	10	1	0	0	1	7	5	0	12	1	0	0	1	14	7	2	23
13 Jan 99	4	0	0	4	2	9	0	11	0	0	0	0	7	2	0	9	2	2	0	4	14	12	2	28
20 Jan 99	6	4	0	10	1	2	0	3	1	0	0	1	3	0	0	3	2	3	0	5	17	8	2	27
27 Jan 99	3	5	1	9	0	1	0	1	0	0	0	0	9	2	0	11	6	7	0	13	9	7	3	19
3 Feb 99	4	3	0	7	1	1	0	2	0	0	0	0	3	1	0	4	8	1	0	9	5	8	0	13
10 Feb 99	3	2	0	5	1	1	0	2	0	0	0	0	5	0	0	5	5	1	0	6	15	7	0	22
17 Feb 99	9	8	1	18	1	0	0	1	1	2	2	5	2	0	0	2	8	5	0	13	10	13	0	23
24 Feb 99	-	-	-	-	0	0	0	0	3	0	0	3	1	0	0	1	2	1	0	3	7	12	1	20
3 Mar 99	7	2	0	9	1	1	0	2	0	0	0	0	2	1	0	3	1	0	0	1	5	5	0	10
10 Mar 99	3	4	0	7	0	0	0	0	1	0	0	1	1	0	0	1	0	0	0	0	9	8	0	17
24 Mar 99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	1