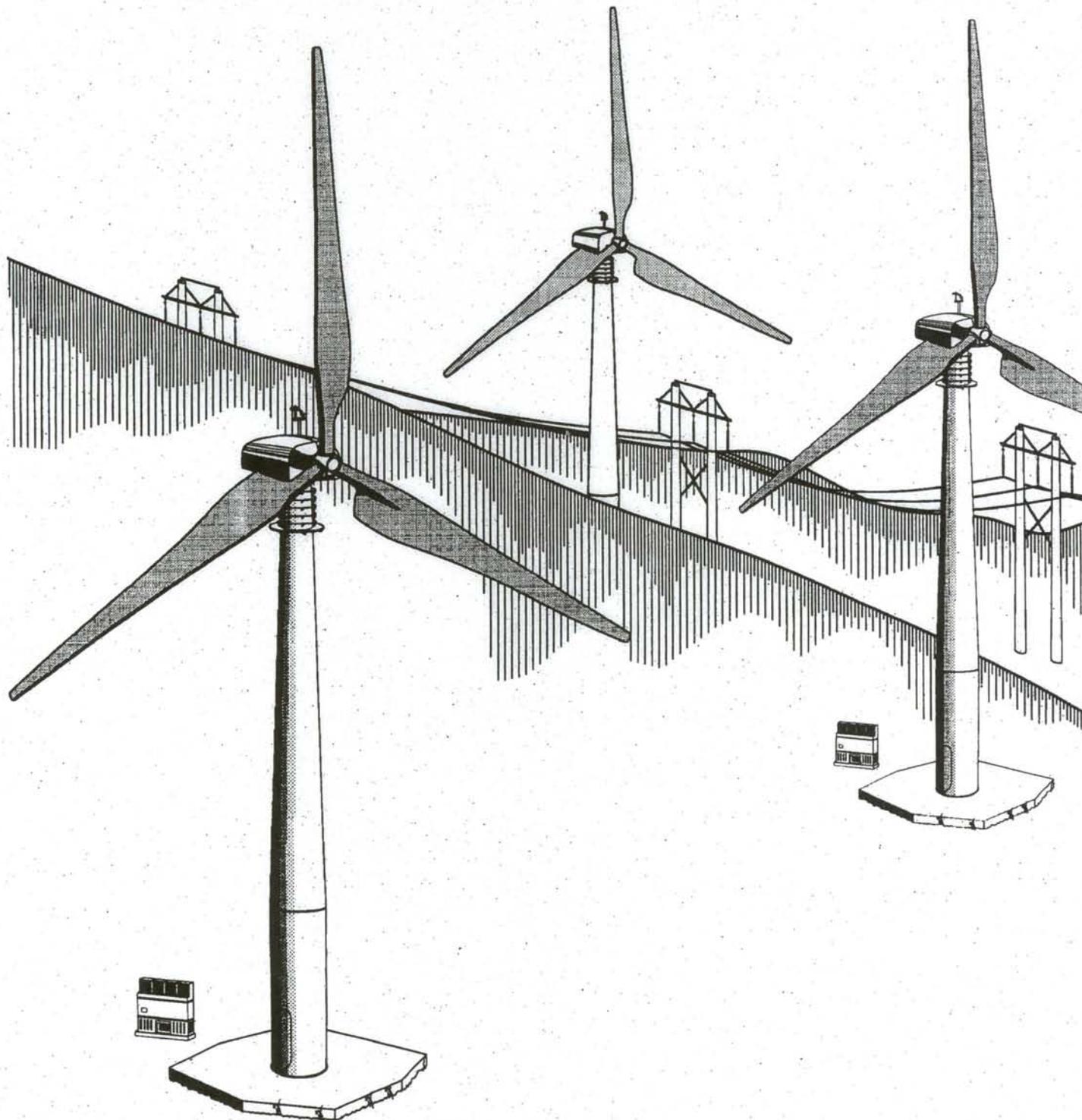




U.S. Department of the Interior
Bureau of Land Management
Rawlins District

August 1995

FINAL KENETECH/PacifiCorp Windpower Project Environmental Impact Statement



The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield to produce a combination of uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness, and natural, scenic, scientific, and cultural values.

FES-95-29

**FINAL ENVIRONMENTAL IMPACT STATEMENT
KENETECH/PACIFICORP WINDPOWER PROJECT
CARBON COUNTY, WYOMING**

Prepared for

**Great Divide Resource Area
Rawlins District
Bureau of Land Management
Rawlins, Wyoming**

By

**Mariah Associates, Inc.
Laramie, Wyoming
MAI Project 1071**

August 1995

**FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE
KENETECH/PACIFICORP WINDPOWER PROJECT
CARBON COUNTY, WYOMING**

() Draft

(X) Final

U.S. Department of the Interior
Bureau of Land Management

Abstract:

The Draft and Final Environmental Impact Statements (DEIS and FEIS) assess the environmental consequences of a proposed windpower energy development in the area between Arlington and Hanna, Carbon County, Wyoming. This abbreviated FEIS revises and supplements the DEIS for the KENETECH/PacifiCorp Windpower Project (DES-95-2) and addresses comments and concerns expressed during the public comment period for the DEIS. The DEIS was made available to the U.S. Environmental Protection Agency (EPA) and the public on January 13, 1995, and a Notice of Availability was published in the Federal Register on January 27, 1995. Two public meetings were held, one in Rawlins, Wyoming on February 8, and one in Laramie, Wyoming, on February 9, 1995. Comments on the DEIS were accepted until April 18, 1995.

Public and agency comments on Chapters 1.0 through 4.0, 6.0 and 7.0 and Appendices A and B of the DEIS are incorporated into this document as errata. Section 3.2 of the DEIS is reproduced in its entirety because an additional 3.5 months of field data, which were not available at the time the DEIS was prepared, were incorporated into the FEIS and because a substantial number of comments were received on this section. Chapter 5.0 was reorganized and expanded to define applicant-committed, project-wide, and resource-specific mitigation measures. All mitigations described in the DEIS and FEIS are recapitulated in Chapter 5.0 and summarized in Table 2.11 in the FEIS. Chapter 8.0 in the FEIS presents a summary of comments received at the public meetings and discusses 12 major issues raised during the public comment period. All comments are reproduced in Chapter 8.0, and Bureau of Land Management (BLM) responses are presented.

Revisions made to the DEIS, while extensive, do not warrant preparation of a supplemental DEIS because

- the BLM did not make substantial changes to the proposed action that are relevant to environmental concerns, and
- there are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 C.F.R. 1502.9).

The proposed project entails the erection of approximately 1,390 wind turbine generators and associated facilities (e.g., roads, substations, distribution and communications lines) by KENETECH Windpower, Inc. A 230-kV transmission line would be built by PacifiCorp, Inc. to connect a proposed substation on Foote Creek Rim near Arlington to the Miner's substation near Hanna. The proposed project would use standard procedures as currently employed by other right-of-way projects, plus additional project-specific and site-specific mitigation measures to ensure that project impacts are minimized on all important resources. Impacts to most resources would be negligible to moderate during the life-of-project. Potentially significant impacts resulting from the project include avian mortality; declining avian populations; threatened, endangered, candidate, and/or state sensitive species mortality and/or habitat loss; disturbance to nearby residents due to noise; changes in visual resources; disturbance of important Native American traditional sites; changes in plant community species composition due to snow redistribution; displacement of big game due to windfarm operation; and loss of sage grouse nesting habitat. The proposed project could also have numerous beneficial impacts including increased revenues generated by taxes, increased employment, and benefits derived from using a nonpolluting resource for electric power generation.

KENETECH Windpower Final EIS

Comments on this EIS should be directed to:

Walter George, Project Leader
Rawlins District Office
Bureau of Land Management
1300 3rd Street North
Rawlins, Wyoming 82301

For further information contact Walter George at the Rawlins District Office, (307) 324-7171.



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

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In Reply Refer To:

1793
WYW-130382
Kenetech Windpower
(930JJJohnson)
PHONE NO: 307-775-6116
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Dear Reviewer:

This abbreviated Final Environmental Impact Statement (FEIS) on the Kenetech/PacifiCorp Windpower Project, located in eastern Carbon County, Wyoming, is provided for your information and use. This FEIS is a supplement to the Draft Environmental Impact Statement (DEIS), published in January 1995. The FEIS incorporates by reference the material presented in the DEIS and identifies changes to the DEIS as a result of additional information and public comment subsequent to the publishing of the DEIS. It also contains comments received on the DEIS and responses to those comments. The DEIS was not reprinted as an economy measure. Changes made to DEIS materials do not significantly alter the proposed action or outcome of the analysis. The DEIS must accompany this final document because only the modification, corrections, and additions are provided.

This FEIS is not a decision document. A Record of Decision (ROD) will be prepared and made available to the public, but not until at least 30 days after the Environmental Protection Agency (EPA) has published the FEIS Notice of Availability in the Federal Register. During the 30-day period, written comments on the FEIS or concerns that should be considered in the decision process will be accepted by writing or faxing to: **Walter E. George, Project Leader, Rawlins District Office, 1300 Third Street, Rawlins, WY 82301, (fax) 307-328-1474, (telephone) 307-324-7171.** Comments received during this period will be considered in the decisionmaking process. The date by which comments must be received is October 2, 1995.

Please retain this volume of the EIS for future reference. A copy of the FEIS has been sent to affected Government agencies and to those persons who responded to scoping or otherwise indicated to BLM that they wished to receive a copy of the FEIS. Copies of the EIS are available for public inspection at the following locations:

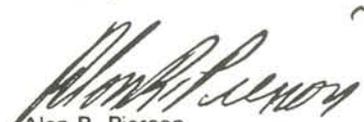
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812 E. Murray
Rawlins, Wyoming 82301

Bureau of Land Management
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1300 Third N. Street
Rawlins, Wyoming 82301

Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
Cheyenne, Wyoming 82001

The BLM would like to thank the individuals and organizations who provided suggestions and comments on the DEIS. Their help has been invaluable in preparing this FEIS.

Sincerely,



Alan R. Pierson
State Director

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PREFACE

The Draft Environmental Impact Statement (DEIS) for the KENETECH/PacifiCorp Windpower project was released for public review on January 13, 1995. The Notice of Availability was published by the Bureau of Land Management (BLM) in the Federal Register on the same date (60 FR 3256). A Notice of Availability was published in the Federal Register by the Environmental Protection Agency on January 27, 1995 (60 FR 5388). A 60-day comment period, closing on March 28, 1995, was provided. Two public meetings on the DEIS were held. The first was held in Rawlins, Wyoming at the Jeffrey Center on February 8, 1995. The second meeting was held in Laramie, Wyoming at the Albany County Library on February 9, 1995. Comments received through April 18, 1995 were considered in this FEIS.

A total of 47 comment letters was received. Twenty-two (22) commenters supported the project. Twelve (12) of the support comments represented units of county or local governments and the governor of Wyoming. Other support for the project came from one environmental group and individuals. Eight comments provided information and did not state a position on the project. Three comments were concerned with a potential conflict with coal resources. One commenter expressed concern with the economic rationale for the project. One comment addressed compliance with cultural resource laws. Thirteen commenters expressed opposition to the project or wide concern about potential impacts and completeness of the environmental analysis. These comments were made by one state agency, one federal agency, one environmental group, and individuals.

Over 460 individual comments on the DEIS were identified. Many comments address the same concern each time it appeared in the text of the DEIS. BLM categorized and consolidated the comments and identified 12 encompassing, broad issues, each of which is addressed in the introductory section of Chapter 8.0 of this FEIS.

Each comment received has been reproduced in Section 8.2.13. Each comment letter has been assigned a letter or pair of letters and each comment within a letter has been assigned a number. For example, the Wyoming Game and Fish Department comment letter is designated AE. There are 164 individual comments within this letter labeled AE-1 through AE-164.

Where comments could be responded to in brief text, the response is printed beside the reproduced text of the letter. Comments that are addressed under the consolidated category responses are referenced to each consolidated category. As a cross reference, individual comments addressed under the consolidated category response are identified at the beginning of each discussion.

This abbreviated FEIS revises and supplements the DEIS for this project. Public and agency comments on Chapters 1.0 through 4.0, 6.0 and 7.0, and Appendices A and B in the DEIS are incorporated into this document as errata. The DEIS will be required to accompany this FEIS because only the modifications, corrections, and additions are provided in the following material (with the exceptions of the Executive Summary, Section 3.2, part of Chapter 5.0, and Chapter 8.0). Section 3.2 of the DEIS is reproduced in its entirety because an additional 3.5 months of field data, which were not available at the time of the DEIS was prepared, were incorporated into the FEIS and because a substantial number of comments were received on this section. Chapter 5.0 was reorganized to define applicant-committed, project-wide, and resource-specific mitigation measures. All mitigations described in the DEIS and FEIS are recapitulated in Chapter 5.0 and summarized in Table 2.11 in the FEIS. Chapter 8.0 in the FEIS presents a summary of comments received at public meetings and discusses 12 major issues raised during the public comment period. All comments are reproduced in Chapter 8.0, and BLM responses are presented.

Revisions made to the DEIS, while extensive, do not warrant preparation of a supplemental DEIS because

- the BLM did not make substantial changes to the proposed action that are relevant to environmental concerns, and
- there are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 C.F.R. 1502.9).

For ease of reference, modifications to the DEIS are presented under the chapter numbers and headings by page number, column, paragraph, and line with information as to inserts, deletions, and other modifications as appropriate.

EXECUTIVE SUMMARY

The Draft and Final Environmental Impact Statements were prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, to consider potential environmental consequences (both positive and negative) of a proposed 500-megawatt (MW) Windplant™ in the Foote Creek Rim - Simpson Ridge area between the towns of Hanna and Arlington in southeastern Wyoming. The proposed KENETECH Windpower, Inc. (KENETECH)/PacifiCorp, Inc. (PacifiCorp) project area (KPPA) is defined as the Foote Creek Rim and Simpson Ridge project areas plus three alternate transmission line routes. Under the Proposed Action, the Bureau of Land Management (BLM) would issue a 30-year renewable right-of-way (ROW) grant to KENETECH for construction of the full 500-MW Windplant and a ROW grant to PacifiCorp to construct a 230-kilovolt (kV) transmission line along one of the three alternate routes. The Proposed Action is the BLM preferred alternative for the project. Alternative transmission line Route No. 3 is the BLM preferred alternate. The BLM is the lead agency for Environmental Impact Statement (EIS) preparation; the Bonneville Power Administration (BPA), which would buy a portion of the electric power, is a cooperating agency. Two alternatives (Alternative A and a No Action Alternative) were analyzed. Alternative A would involve construction of a 300-MW Windplant plus the 230-kV transmission line. Under the No Action Alternative, BLM would deny the ROW grant and BPA would not execute a power purchase agreement with PacifiCorp. The No Action Alternative is not expected to result in direct development of another energy source within the KPPA, the Great Divide Resource Area, or the area serviced by Bonneville Power Administration, PacifiCorp, Tri-State Generation and Transmission Company, Public Service Company of Colorado, or Eugene Water and Electric Board. A scoping statement was mailed to potentially interested parties and the media in January 1994. Issues and concerns identified by the public, BLM, and other

governmental organizations regarding the Proposed Action and analyzed in this EIS are as follows:

Key issues

- wind turbine effects on birds,
- direct and indirect wildlife habitat loss,
- big game winter range and migrations,
- threatened, endangered, candidate, and state sensitive (TEC&S) and priority plants and animals and their habitats,
- cultural resources and Native American spiritual values, and
- reasonable access to public land.

Other issues and concerns raised during public scoping

- visual resources and aesthetics,
- benefits/disadvantages of wind energy vs. other energy sources,
- noxious weed control,
- highly erodible and unstable soils,
- wetlands and riparian areas,
- paleontological resources,
- reclamation potential,
- surface and groundwater,
- conformance with current and future land uses,
- compatibility with management plans and objectives,
- noise impacts on residents and wildlife,
- displacement and reduced habitat effectiveness to wildlife from turbine noise and motion effects,
- impacts to recreation (e.g., hunting and access),
- social and economic effects on local communities,
- revenue generation and job availability,
- areawide transmission capabilities,
- impacts to existing pipelines,
- impacts to other potential wind developers,
- compatibility with other energy industries,
- increased traffic on roads and increased human activity, and
- public safety, law enforcement, and travel management.

All written and verbal comments received on the proposed project were considered in the preparation of the DEIS and FEIS. The proposed project, as planned, is in conformance with the BLM Great Divide Resource Area Resource Management Plan, BPA's Resource Supply Expansion Program, the State of Wyoming Land Use Plan, and the Carbon County Land Use Plan.

The purposes of the Proposed Action, or project, are to provide wind-generated electricity from a site in Wyoming; test the ability of wind energy to provide a reliable, economical, and environmentally acceptable energy resource in the region; and develop a further market for Wyoming-sourced wind-generated electricity. Utilities providing electrical power to Rocky Mountain and southwestern states have forecast that greater than 9,000 MW of new generating capacity will be needed during the next 20 years to meet base load and peak load electricity demands.

The project, as proposed by KENETECH, is to construct and operate wind turbines and associated facilities in phases on approximately 60,619 acres (ac) of federal (28%), state (10%), and private (62%) lands within R78W-R82W, T19N-T22N, in Carbon County of southcentral Wyoming. Southern Wyoming has some of the most consistent high wind speeds in the conterminous United States [U.S. wind speeds average 10-17 miles per hour (mph) (4.5-7.8 meters per second [m/s])]. The KPPA is located within a unique gap in the Rocky Mountains which accelerates winds to an annual average of 21.5 mph (9.6 m/s). The Windplant (including turbines and operations, maintenance, communications, and transmission facilities) would be developed in phases, beginning with approximately 201 wind turbines to generate 70.5 MW along the Foote Creek Rim area and a 230-kV transmission line from Foote Creek Rim to the existing Miner's substation near Hanna. PacifiCorp would own the first phase of the Windplant and would construct the 230-kV transmission line. KENETECH proposes to use Model KVS-33 wind turbine generators supported by 80-120 ft (24-37 m) tall tubular towers spaced

approximately 162-216 ft (49-66 m) apart within rows and approximately 1,080-1,620 ft (329-494 m) between rows. Additional turbines and facilities would be erected in 50 to 100-MW phases over the next 10-12 years as utilities in the western United States seek additional capacity to satisfy base load and peak electrical power demands. The complete Windplant would consist of approximately 1,390 turbines, with up to 575 turbines (generating 200 MW) at the Foote Creek Rim area and 815 turbines (generating 300 MW) in the Simpson Ridge area.

Considered in this EIS are the Proposed Action, an alternative representing a 40% reduction in the Proposed Action, and a No Action Alternative. Three alternate transmission line routes are also analyzed in this DEIS, as part of the Proposed Action and Alternative A. Four other alternatives to the Proposed Action (i.e., selecting an alternate project location, expanding or reducing the project area size, constructing the project in one phase, and generating the 500 MW of power via other energy sources) were considered but rejected because they did not meet the purpose and need or were not reasonably feasible.

The proposed project would initially disturb 319 ac for Phase I and 1,787 ac for the 500-MW Windplant, including the Windplant (136-1,595 ac), substations (4-13 ac), and the 230-kV transmission line route (148-179 ac, depending on which of three alternate routes selected). Under Alternative A, 1,146 ac of initial disturbance would occur, including the Windplant (957 ac), substations (10 ac), and the 230-kV transmission line (156-179 ac). Approximately 439 ac of existing disturbance from roads (166 ac), pipeline (241 ac), telephone cables (22 ac) and oil and gas wells (10 ac) is already present in the area. Nearly 70% of initially disturbed lands will be in the predominantly sagebrush shrubland and mixed grass sagebrush shrubland vegetation types. Planned mitigation measures would reduce the life-of-project (LOP) disturbance area to 68 ac for Phase I and 715 ac for the 500-MW Windplant, or 431 ac for Alternative A.

It is anticipated that 126 people per day would be required during construction of the first phase of development, with most construction work to be completed between April and September in a given year. Road construction may commence during the 1995-1996 winter. Additional phases would employ 86 to 172 people, depending on the size of the phase being constructed. Operation and maintenance (O&M) of the Windplant would require up to nine Windsmiths (specially trained O&M personnel) for the first phase of development and an additional 20 Windsmiths to operate and maintain the full 500-MW Windplant. During construction, the average number of daily vehicle trips to the site would range from 30-70, while the average number of vehicles actually working on-site would be 15-40. During normal O&M, daily traffic to and on the site would include five 4-wheel drive pickups for the first phase of development and 10 pickups for the full 500-MW Windplant.

The KPPA is located in an area characterized by steep and flat-topped ridges bounded on the south by the Medicine Bow Mountains; on the north by the Seminoe, Shirley, and Freezeout Mountains; and on the west and east by the Hanna and Laramie Basins, respectively. Climate in the area is classified as continental, semiarid, cold desert with an average annual precipitation of 10-14 inches (25-35 cm). Air quality is generally good with suspended particulates comprising the principal air quality pollutant. The area is cut by several perennial and numerous ephemeral streams. Groundwater and surface water are variable in quality. Major land uses within and adjacent to the KPPA are agriculture (primarily cattle and sheep grazing); wildlife habitat; oil and gas exploration, development, and transportation; and dispersed outdoor recreation. No developed recreation resources exist within the KPPA; however, the Wick Brothers Wildlife Habitat Area, which includes approximately 77% of the Foote Creek Rim area, is managed by the Wyoming Game and Fish Department (WGFD) for recreational purposes.

No coal or uranium development and only limited oil and gas development are presently occurring within the KPPA and the potential for development of these resources in the foreseeable future is moderate to low. Salable minerals are being excavated from local sources within the project area. There is one known fossil locality in the area, and local rock formations are known to contain important and abundant fossils, both locally and in other parts of Wyoming.

A wide variety of soils occurs within the KPPA due to varying parent materials, topographic position, local hydrology, vegetation, and other factors. On top of Foote Creek Rim, soils are predominantly gravels and are well suited to the type of development proposed. In other parts of the KPPA, particularly in the Simpson Ridge area, soils exhibit sensitivity to disturbance from development activities, having moderate to high water erosion and severe wind erosion potentials. Vegetation is predominantly a mixed grassland/sagebrush shrubland comprised of big sagebrush and other shrubby species and a variety of shortgrass and forb species. The density of the vegetation varies greatly from one location to another, and is controlled by extremes in soils, available nutrients, pH, and soil moisture. Livestock annual range productivity varies from near 0 lbs/ac (on extreme sites) to 3,500 lbs/ac on meadow/riparian areas in excellent condition during years with normal precipitation. The latter type occupies <1% of the KPPA. Potential wetlands are sparsely scattered throughout the project area and are commonly associated with ephemeral drainages, impoundments, and major stream channels.

Four big game mammal species commonly occur within or adjacent to the project area: pronghorn antelope, mule deer, elk, and white-tailed deer. Nearly all of the wildlife habitat on the Foote Creek Rim area and two-thirds of the habitat on the Simpson Ridge area is considered winter/yearlong range for all but white-tailed deer. Seven percent of the wildlife habitat in the Simpson Ridge area is considered crucial winter/yearlong range for pronghorn. The entire

KPPA is considered suitable habitat for raptor hunting, foraging, and perching, and these, along with other nonraptor bird species, are considered vulnerable to collisions with wind towers. Also of concern are 44 sage grouse breeding areas known to exist within the KPPA. A number of threatened, endangered, candidate, and sensitive plant and animal species are known to occur or could occur in the KPPA. Of primary concern among those known to occur are the bald eagle, peregrine falcon, mountain plover, and ferruginous hawk. The mountain plover, a candidate for threatened and endangered (T&E) listing, has been frequently observed in the Foote Creek Rim area. Approximately 35% of the Simpson Ridge area is classified as a primary management zone (PMZ) for the reintroduction of black-footed ferrets (BFFs).

The negative impacts on air quality, topography, mineral/gas and oil development, geologic hazards, paleontological resources, surface water and groundwater resources, odor, vegetation (with the possible exception of changes in plant community composition due to snow redistribution and potential unsuccessful reclamation), wetlands, socioeconomics, land use, and hazardous materials are expected to be negligible. Impacts could be negligible to beneficial for air quality (by replacing a proportion of the electrical generation and associated pollutants, which would otherwise come from the burning of fossil fuels), for socioeconomics (through increased federal, state, and local revenues), and for land use (potential increased tourism). Moderate negative impacts are expected in terms of increased soil erosion potentials, increased noise levels within important wildlife habitats during critical periods, and for land use (possible changes in recreational use of the KPPA) due to the construction and presence of facilities. Potentially significant impacts resulting from the proposed project include:

- direct losses of big game crucial habitat;
- indirect displacement and/or stress of big game due to noise, movement, or human activity associated with construction and/or operation of proposed facilities;

- raptor mortality due to collisions with wind towers or power lines;
- declining raptor populations;
- loss of sage grouse nesting habitat;
- mortality or displacement of any listed or candidate T&E species or disturbance of their critical habitat;
- possible unsuccessful long-term (5-year) revegetation on some sites;
- disturbance of important Native American traditional sites;
- increased noise levels near residences; and
- modification of the basic elements (form, line, color, or texture) of visual resources by presence of Windplant facilities.

A number of other potential impacts to wildlife (e.g., declines in common nonraptor species), cultural resources (e.g., disturbance/destruction of important sites, loss of important cultural materials due to private collection or vandalism), and socioeconomics (e.g., increase in population, increase in demand for local services) were considered, but were estimated to be negligible.

A number of project-wide mitigation measures are proposed to avoid, reduce, or eliminate project impacts. Because wildlife impacts of wind energy generation are not completely understood for this area at this time, an extensive monitoring program has been proposed as an integral part of the mitigation package. Data from early phases of this study program will be utilized by the BLM, KENETECH, and a technical advisory committee involving other cooperating agencies to adjust facility operations and to further reduce project impacts in later phases of development, if necessary. The 22 project-wide mitigation measures to be implemented from the outset may be summarized as follows:

- 1) Mitigation measures would be adhered to on federal and state lands, and on private lands, subject to landowner preferences.
- 2) Windplant facilities (e.g., turbine towers, roads, power lines) would be placed to minimize or avoid disturbance in areas

- with high value wildlife habitat (e.g., crucial winter range, wetlands, and riparian areas).
- 3) Areas with high erosion potential and/or rugged topography (i.e., steep slopes, dunes, floodplains, unstable soils) would be avoided, where feasible. If disturbance in these areas is necessary, stringent erosion control and soil stabilization measures would be implemented immediately.
 - 4) Surface disturbance or occupancy would not occur on slopes in excess of 25%, where feasible, nor would construction occur when soils are wet or frozen, whenever feasible.
 - 5) Removal or disturbance of vegetation would be kept to a minimum through construction site management (e.g., utilizing previously disturbed areas, using existing ROWs, designating limited equipment/materials storage yards and staging areas, scalping, etc.).
 - 6) Topsoil disturbance would be kept to a minimum through construction site management. Topsoil would be salvaged prior to construction to facilitate revegetation. After construction, all salvaged topsoil would be spread evenly over all surfaces to be revegetated and seeded. All seeding would use an approved mixture of native and/or introduced species. Because of the extended LOP, no topsoil would be stockpiled beyond completion of post-construction reclamation.
 - 7) Revegetation methods would include:
 - a) deep ripping of compacted soil prior to reseeding, where necessary;
 - b) broadcast or drill seeding, depending on site conditions;
 - c) fall seeding (September 15 to freeze-up), where feasible;
 - d) spring reseeding (after the ground thaws and prior to April 15) if fall seeding is not feasible;
 - e) utilization of native cool season grasses, forbs, and shrubs in a mixture specified by KENETECH and PacifiCorp and approved by the landowner or BLM;
 - f) addition of BLM-approved introduced species (e.g., crested wheatgrass, Russian wildrye) to the seed mixture if attempts at revegetation with native species are unsuccessful;
 - g) installation of waterbars on disturbed slopes with grades of 6% or greater to reduce erosion (waterbars may be installed on disturbed slopes with grades less than 6% in areas with unstable soils); and
 - h) possible fencing of sensitive reclamation sites.
 - 8) Vegetation and soil removal would be accomplished in a manner that would minimize erosion and sedimentation.
 - 9) Construction would be avoided within 500.0 ft (152.4 m) of surface water or wetland areas where feasible. Where wetlands, riparian areas, or ephemeral stream channels must be disturbed, the following measures would be employed:
 - a) Wetland areas would be crossed during dry conditions (i.e., late summer, fall, or dry winters).
 - b) Streambeds would be crossed perpendicular to flow, where feasible.
 - c) Streams, wetlands, and riparian areas disturbed during project construction would be restored to pre-project conditions. If impermeable soils contributed to wetland formation, soils would be compacted to restore impermeability.
 - d) Recontouring and appropriate/adapted species would be used to revegetate the banks to aid in soil stabilization.

- e) Revegetation operations would begin on impacted areas immediately after completion of project construction activities.
- 10) Intermittent and ephemeral drainages would be protected from surface disturbance within 75.0 ft (22.9 m) of the channel or the inner gorge, whichever is closer, where feasible.
- 11) Temporary erosion control measures such as mulch, jute netting, sediment traps, or other appropriate methods would be used on unstable soils, steep slopes, and wetland areas to prevent erosion and sedimentation until vegetation becomes established.
- 12) 230-kV transmission line structures would be located at least 40.0 ft (12.2 m) from pipelines where feasible, and conductors would be at least 30.0 ft (9.1 m) above ground level at all pipeline and road crossings. Structures would be located at least 100.0 ft (30.5 m) from all streams where feasible. Stream crossings would be avoided during materials-hauling and structure assembly and erection by using existing roads to access the ROW, where feasible. Where conductors must be strung across perennial streams, ropes would be used to haul the conductors across the stream. Intermittent or ephemeral channels would be crossed during periods of no flow.
- 13) Surface disturbance within 0.75 mi (1.2 km) of active raptor nest sites (i.e., used within the last three years) would be avoided during the nesting season (February 1 through July 31). If the area must be impacted, project activities would occur outside the nesting season. Extensive raptor nesting studies are being completed as part of the baseline avifauna studies and would continue as part of the monitoring program for the project.
- 14) Windplant facilities would be designed or equipped to prevent raptor perching (e.g., using tubular rather than lattice towers, equipping power poles within the Windplant with raptor antiperching devices).
- 15) All poles for collection and transmission lines located within 0.25 mi (0.4 km) of sage grouse leks would be equipped with raptor antiperching devices to minimize the opportunities for raptors to prey on sage grouse. All poles located near prairie dog colonies within the BFF PMZ also would be equipped with raptor antiperching devices to minimize the take of prairie dogs or the potential take of BFFs by birds of prey.
- 16) To protect important big game winter habitat, construction activities would not be allowed from November 15 to April 30 within certain areas encompassed by the ROW grant. The same criterion would apply to defined big game birthing areas from May 1 to June 30.
- 17) Known active sage grouse leks and adjacent areas [2.0 mi (3.2 km) radius from lek centers] would be avoided during the breeding and nesting seasons from March 1 through June 30. No construction activities would be conducted on public lands within 0.25 mi (0.4 km) of known lek sites; and project activities, other than those required for O&M along existing roads within 0.25 mi (0.4 km) would be curtailed during the period from

- 1 hr before daylight to 9:00 a.m. from March 1 through April 30.
- 18) All substations and other areas that would be hazardous to wildlife would be fenced as directed by the BLM.
- 19) Paleontological and archaeological surveys would be completed prior to disturbance, with monitoring as necessary during disturbance of impacted areas with high resource potential. Paleontological or cultural resource sites would be avoided or mitigated, as necessary, prior to disturbance. Any cultural or paleontological resource discovered by the operator or any person working on his or her behalf would be immediately reported to the BLM. All construction operations within 50.0 ft (15.2 m) of such a discovery would be suspended as required by BLM regulations until written authorization to proceed is issued by the Authorized Officer (AO). An evaluation of the discovery would be made by the AO to determine appropriate actions to prevent the loss of significant cultural or scientific values.
- 20) Approval from the BLM AO in consultation with other agency personnel [e.g., WGFD, U.S. Fish and Wildlife Service (USFWS)] would be required prior to construction in areas (e.g., crucial winter ranges, near raptor nests) where federal regulations are applied to protect sensitive resources (e.g., wildlife). This action would allow project activities to proceed in restricted areas and/or during periods of restriction (e.g., mild winters, abandoned raptor nest sites, etc.), if deemed appropriate.
- 21) KENETECH would continue to work with BLM and Native American tribes on mitigative measures for cultural resources through each phase of the project.
- 22) All livestock control fences would conform to BLM Manual Handbook H-1741-1 for the passage of wildlife.

GENERAL NOTES

1. Since the DEIS was issued, KENETECH has changed the turbine model number from "33M-VS" to "KVS-33".
2. On August 11, 1995, the bald eagle was downlisted from endangered to threatened in Wyoming.

1.0 INTRODUCTION

Page 1-1, column 1, paragraph 2, line 21. Replace "PacificCorp" with "PacifiCorp".

Page 1-1, column 1, paragraph 2, line 15. Replace "will" with "would".

Page 1-4, column 1, paragraph 1, line 12. After "phases." insert "In response to comments received on the DEIS, BLM would also complete a formal NEPA analysis for each subsequent phase (see Section 8.2.6 in the FEIS). Therefore, this EIS is programmatic for the entire project, and includes site-specific environmental analyses for Phase I of the development."

Page 1-4, column 2, paragraph 2, line 1. Delete "BPA and".

Page 1-5, column 1. Replace paragraph 3 with the following paragraph:

1.1 PURPOSE AND NEED

The primary purpose of the Proposed Action is to provide wind-generated electricity from a site in Wyoming and to develop a further market for Wyoming-sourced wind-generated electricity. BPA's purposes of the Proposed Action are:

- to test the ability of wind energy to provide a reliable, economical, and environmentally acceptable energy resource;
- to assure consistency with BPA's statutory responsibilities, including the Pacific Northwest Electric Power Planning and Conservation Act, the Northwest Power Planning Council's Conservation and Electric Power Plan, and its Fish and Wildlife Program (Section 1.2.1); and
- to assure consistency with BPA's Resource Programs. The acquisition of a wind resource is consistent with BPA's Resource Programs EIS (BPA 1993a), and the EIS for the proposed windpower project is tiered to the Resource Programs EIS. (Tiering is a way to incorporate by

reference a discussion of issues that have been covered in a previous EIS).

BPA will decide whether to execute a power purchase agreement with PacifiCorp and other utilities participating in the project.

Page 1-5, column 2, paragraph 3, line 3. Insert "of some utilities" after "facilities".

Page 1-5, column 2, paragraph 3, line 4. Delete "BPA 1993a;".

Page 1-6, column 1. Replace paragraph 2 with the following paragraph: "In the Pacific Northwest, additional non-power requirements aimed at improving salmon survival in the Columbia River Basin (primarily spill and flow requirements) have reduced the generating capacity of the federal hydrosystem. The closure of the Trojan Nuclear Power Plant in early 1993 contributed to further losses of generating capacity. BPA presently has a surplus of generating capacity, but developing small-scale wind demonstration projects will test the ability of wind resources to meet future needs.

1.1.2 The Wyoming Wind Resource

Page 1-6, column 2, paragraph 3, line 10. Add "The annual capacity factor for the entire Windplant is expected to average 25-35%." after "capacity)."

Page 1-7. Add the following footnote to Table 1.2: "Note: Estimated costs (cents/kWh) reflect costs to the utilities, not to consumers.

Page 1-8, column 1, paragraph 1, line 3. Replace "Resource Management Plan (RMP)" with "Resource Management Plan/EIS (RMP/EIS)"

Page 1-8, column 1, paragraph 2, line 11. Replace last sentence of paragraph ("Every two . . .") with "This EIS is also tiered to BPA's 1993 Resource Programs Environmental Impact Statement (BPA 1993a)."

1.3 AUTHORIZING ACTIONS

Page 1-8, column 2, paragraph 3, line 13. Insert the following paragraph as a new paragraph prior to "Common stipulations . . .".

The ROW Grant for this project would authorize KENETECH to use public lands for wind generation, for the collection and transmission of electric power, and for related activities. If the project is approved, BLM is committed to governing Windplant development, operation, and maintenance in a manner that would minimize impacts to the human environment on public land and on private land subject to landowner consent. Stipulations necessary for minimizing impacts, many of which would be taken directly from the EIS, would be included in the ROW grant. Other stipulations may be developed during preparation of the ROD for the project and also included in the ROW grant.

Page 1-9, Table 1.3. Under the U.S. Bureau of Land Management, list the following Action: "Hazardous Materials Summary" and Authority: "BLM Instruction Memoranda Nos. WY-93-344 and WY-94-059."

Page 1-9, Table 1.3. Under the U.S. Fish and Wildlife Service, add to Action column: "Issue take permits and/or other approvals under MBTA, BEPA, and ESA."

Page 1-9, Table 1.3. Under Wyoming Department of Environmental Quality-Water Quality Division, list the following Action: "Stormwater Pollution Prevention Plan" and

Authority: "Clean Water Act of 1977, amended 1987 (33 U.S.C. Sections 1251-1376); Wyoming Water Quality Rules and Regulations Chapter XVIII."

Page 1-9, Table 1.3, third column, line 10. Replace "Conversation" with "Conservation"

Page 1-9, Table 1.3, column 3, lines 22 and 24. Change "U.S.E." to "U.S.C."

Page 1-10, column 1. Insert the following two paragraphs after "• visual resources."

BLM has the authority to terminate the ROW grant if a material default in the performance of KENETECH's obligations under the ROW agreement occurs and remains in default. If KENETECH fails to adhere to any stipulation promulgated in the ROW grant, BLM would notify KENETECH in writing of the default, and specify the means to correct the default and a deadline for implementing the correction and regaining compliance with the ROW grant. For example, if the ROW grant stipulates that KENETECH will relocate individual towers associated with high collision-related mortality, BLM has the authority to require relocation or terminate the ROW grant if the specified tower(s) are not moved within a certain time period.

Upon termination of the ROW grant, KENETECH would remove all aboveground windpower facilities from public land and reclaim all disturbed areas as specified in the reclamation plans included in the PODs.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

2.1.1 Overview

Page 2-2, Table 2.1(a), caption. Insert "Surface" after "Proposed". Insert the following before "Assumptions . . ." in footnote 1: "At this time the BLM is unable to quantify displacement effects or loss of habitat function from project activities. Monitoring studies are designed to detect gross changes of habitat use around windplant facilities. The need for mitigation tied to displacement will be addressed in environmental analysis for subsequent phases."

Page 2-4, Table 2.1(c), caption. Insert "Surface" after "Comparison of".

2.1.2 Plan of Development

Page 2-5, column 1, paragraph 3, line 8. After "Whereas the" insert "programmatic".

Page 2-5, column 2, paragraph 1, line 3. Replace "the BLM has included provisions in the EIS for agency consultation and public involvement during POD development and monitoring (Figure 2.1). The process of POD development, agency consultation, construction, and monitoring illustrated in Figure 2.1 would be a binding provision of the NEPA document (i.e., a programmatic project-wide mitigation measure)." with "the BLM would also complete a formal NEPA analysis of each subsequent phase, including agency consultation and public involvement (Figure 2.1)(see Section 8.2.6 in the FEIS). The POD for each phase would include information from the site-specific environmental analysis completed for the NEPA document plus site-specific engineering information. Mitigations developed during the NEPA analysis and prescribed in the POD would become a binding part of the ROW grant."

Page 2-5, column 2, paragraph 3. Replace the entire paragraph with "A description of the

existing environment in each proposed development area would be included in the POD using information from the programmatic EIS and subsequent NEPA documents. Commensurate with the NEPA documents, potential impacts would be described and appropriate site-specific mitigation measures would be defined. Sufficient data would be collected during preparation of subsequent NEPA documents and PODs to address BLM's, other agencies', and the public's resource concerns. Cumulative impacts on wildlife from previous phases would be documented and assessed.

Page 2-6. Replace Map 2.1 in the DEIS with Map 2.1 in the FEIS.

Page 2-7, Figure 2.1. Replace Figure 2.1 in the DEIS with Figure 2.1 in the FEIS.

2.1.3 The Windplant

Page 2-8, column 2, paragraph 3, line 5. After "environmental analysis in the" insert "programmatic". Line 6, after "future" insert "NEPA documents and".

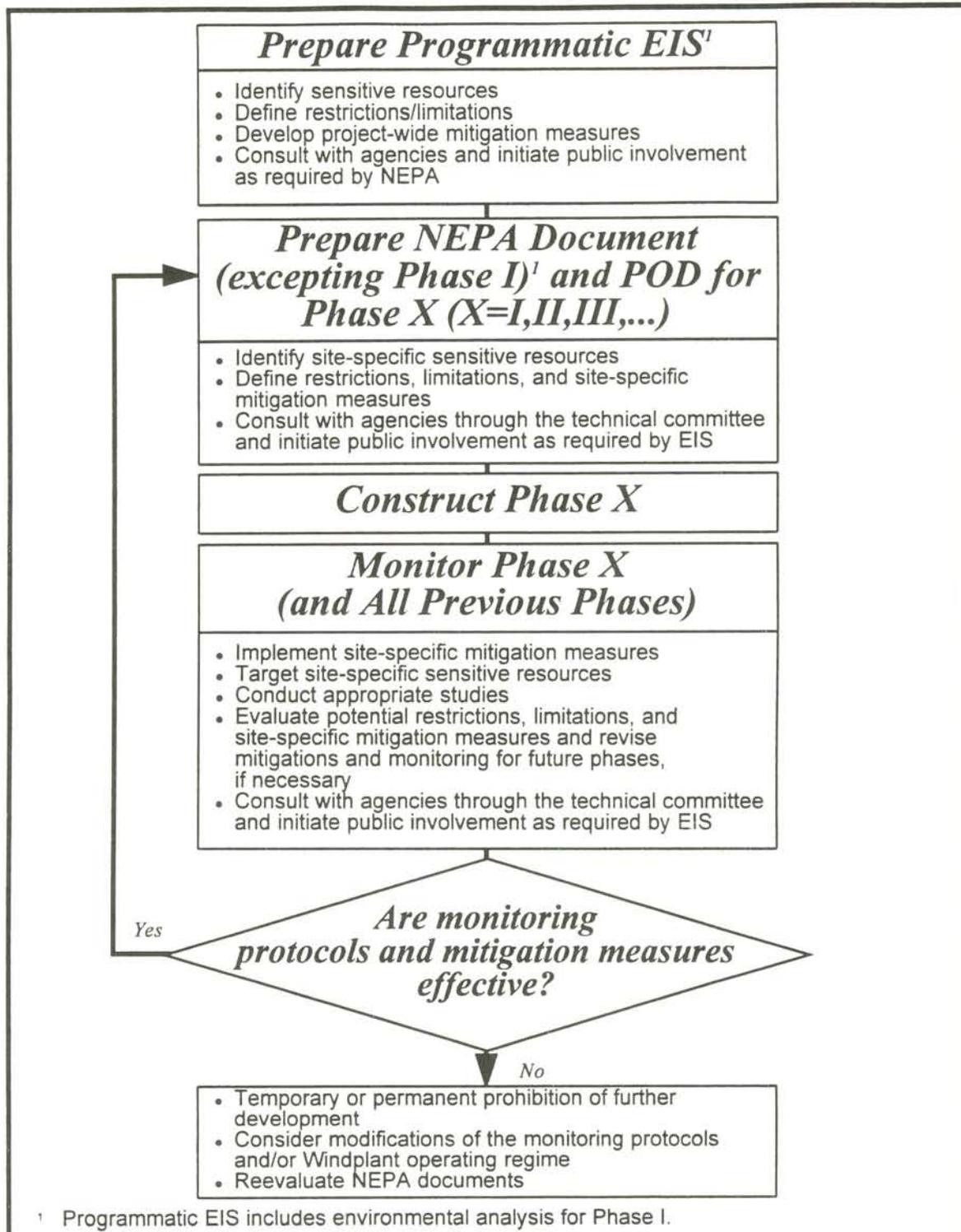
Page 2-8, column 2, paragraph 3, line 10. Replace "(Section 4.6)" with "(Appendix F)".

Page 2-8, column 2, paragraph 3, line 16. Replace "Further environmental analysis may be required for the PODs for subsequent phases in the Simpson Ridge area." with "Further environmental analysis would be conducted for the NEPA documents and PODs for subsequent phases in the Simpson Ridge area."

Page 2-9. Replace Figure 2.2 in the DEIS with Figure 2.2 in the FEIS.

Page 2-10. Replace Figure 2.3 in the DEIS with Figure 2.3 in the FEIS.

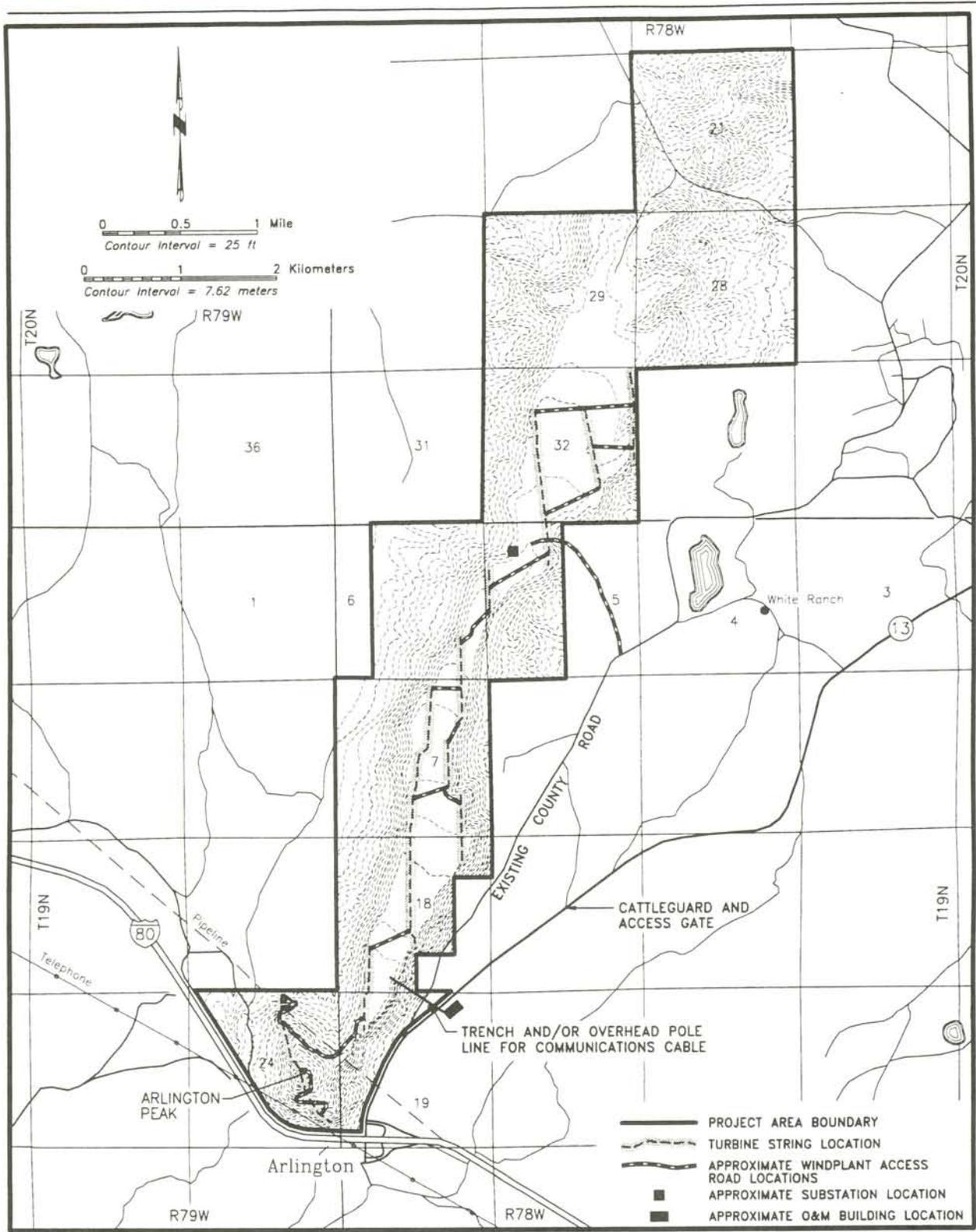
Page 2-12. Replace Figure 2.4 in the DEIS with Figure 2.4 in the FEIS.



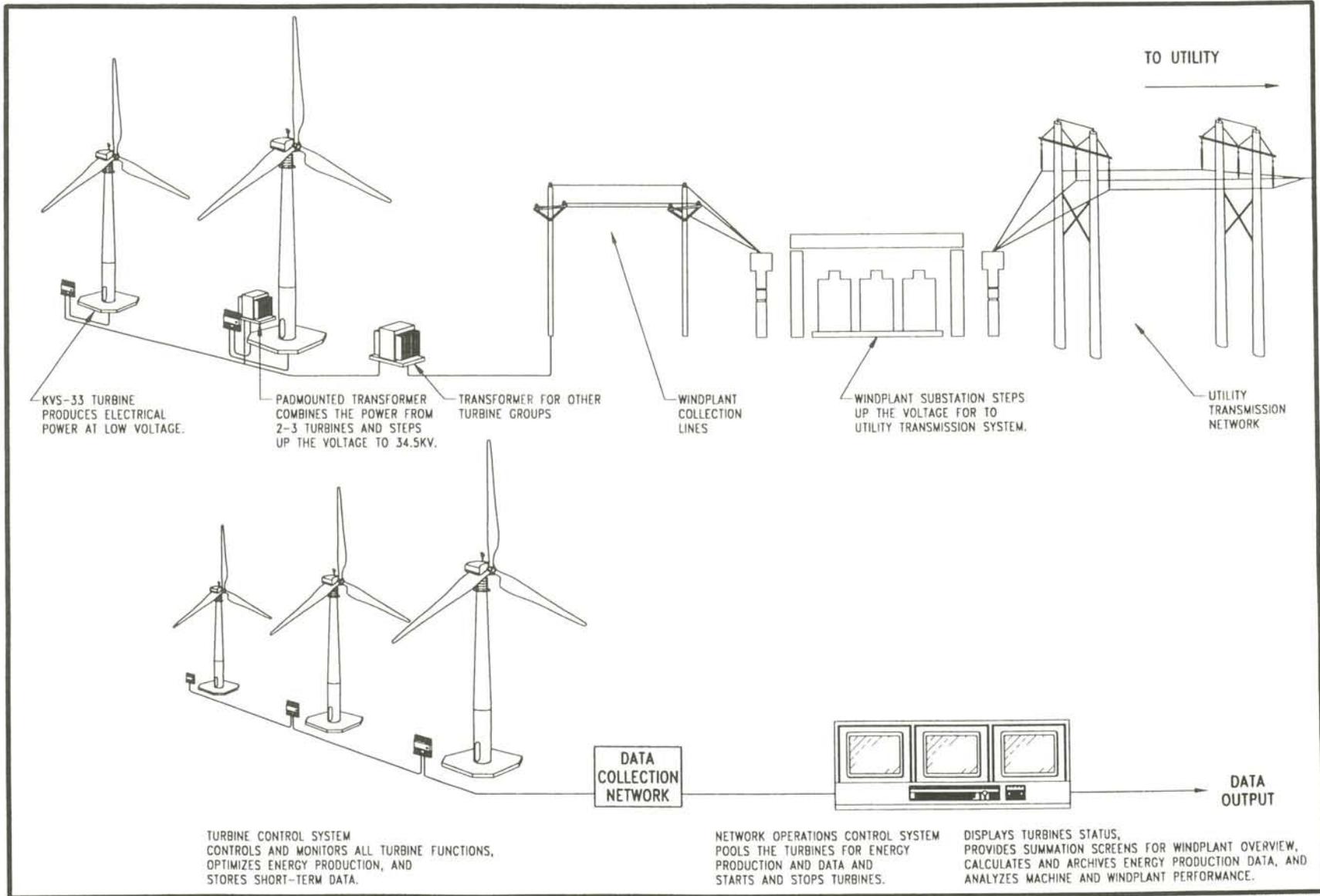
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Figure 2.1 Flow Chart Showing Environmental Review Process and Agency and Public Consultation.

KENETECH Windpower Final EIS

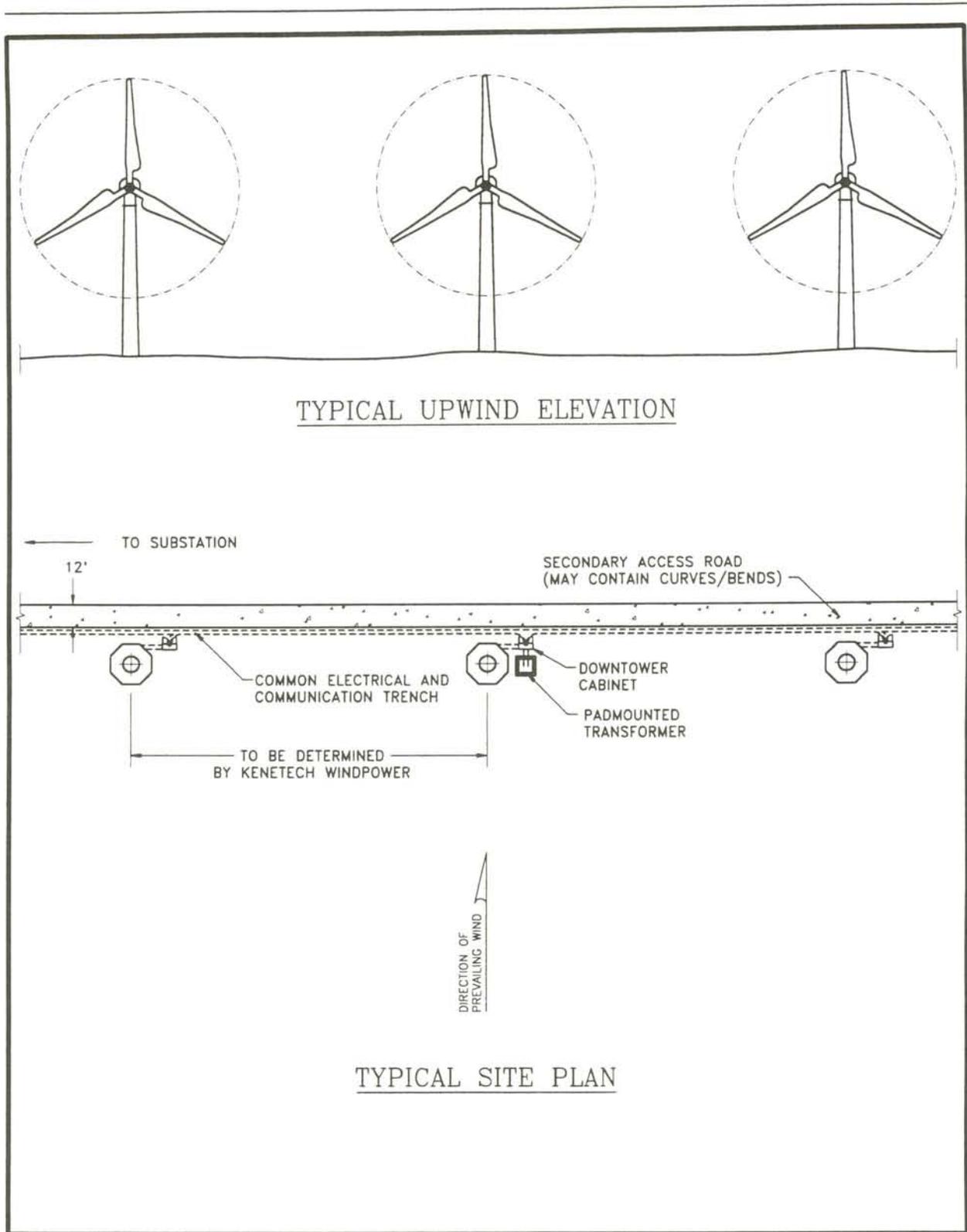


Map 2.1 Proposed Locations of Turbine Strings and Access Roads for the First Phase of Windplant Development on Foote Creek Rim.



1071\01\WINDPL-B

Figure 2.2 Components of a Typical KVS-33 Windplant.



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Figure 2.3 Typical Site Plan of Turbine String Corridors and Roads.

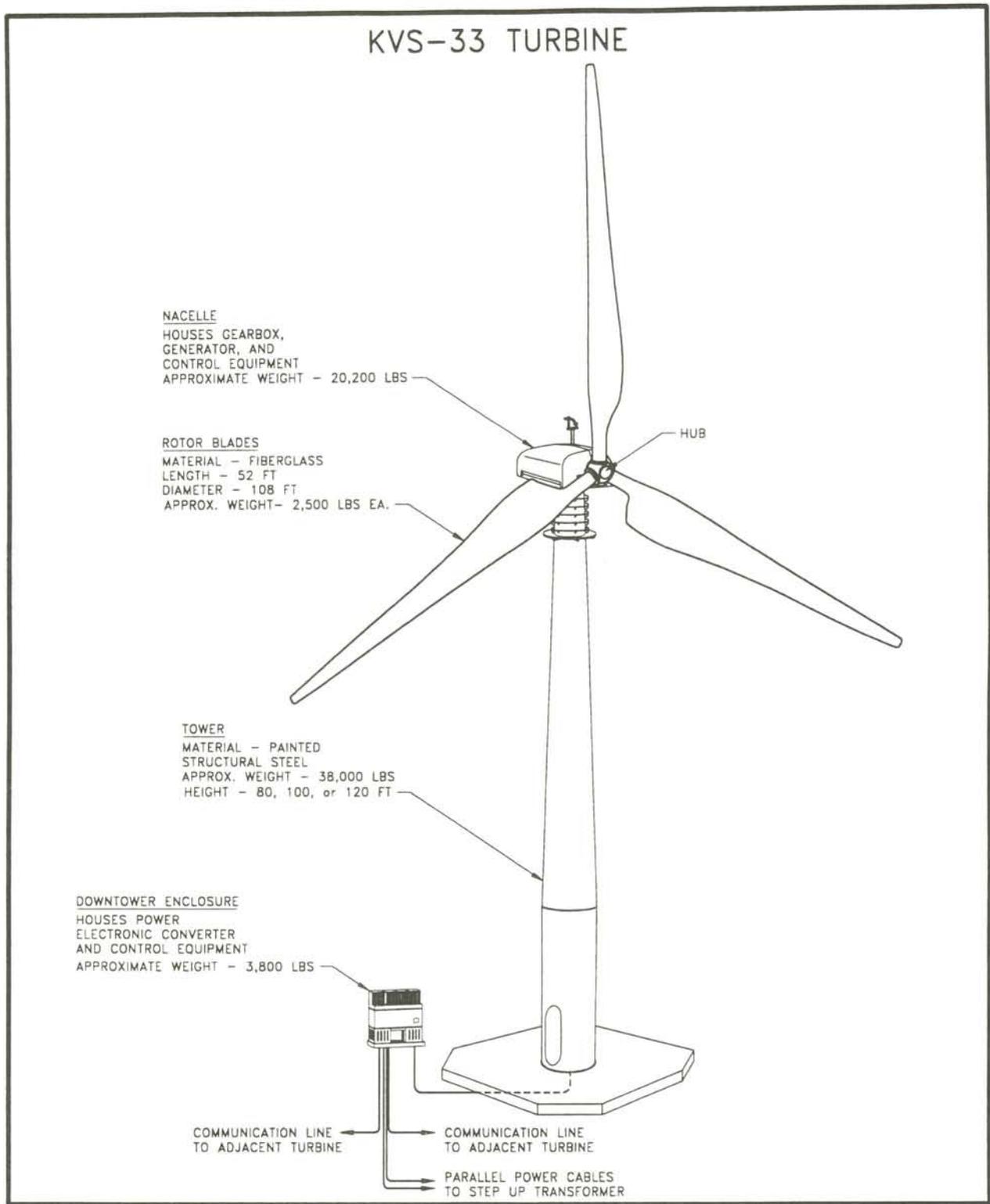


Figure 2.4 Diagram of a Typical Tubular Tower-supported KVS-33 Wind Turbine Generator.

2.1.3.4 Access

Page 2-14, column 1, paragraph 2, line 4. Replace "will" with "would".

2.1.4 Construction

Page 2-15, column 2, paragraph 1, line 10. Insert a line between the last bullet sentence and the sentence beginning "Table 2.2 presents . . .".

2.1.4.1 Road and Pad Construction

Page 2-18, column 1, paragraph 1, line 3. Delete "as possible" and insert "as feasible" after "road construction."

2.1.4.2 Foundations and Tower Erection

Page 2-18, column 1. Replace paragraph 5 with the following paragraph: "Foundations would consist of footings and slabs which would vary in configuration depending on soil characteristics. Foundations would consist of steel reinforcements and poured concrete. Anchor bolts would be embedded in concrete and used to secure the tower. Foundations would be allowed to cure prior to tower erection."

2.1.4.4 Overhead Electric Power and Communications Construction

Page 2-19, column 1, paragraph 3, line 11. After "175-ft (53.3-m)" add "to 250-ft (76.2-m)" and add "(in accordance with NESC loading criteria)" after "substation".

Page 2-19, column 1, paragraph 3, line 12. Delete "Temporary disturbance width would average 20.0-ft (6.1-m), and". Line 13. Capitalize "All".

Page 2-19, column 1, paragraph 3, line 15. Delete "Approximately 175 structures and 5.0 mi (8.0 km) of overhead collection lines would be erected for the first phase of the project. The

200-MW/Foote Creek Rim portion of the Windplant would require 11.0 mi (17.7 km) of overhead collection lines and 492 structures. The 500-MW would require an estimated 55.0 mi (88.5 km) of overhead collection lines and 2,550 structures."

2.1.5 Public Access and Safety

Page 2-22, column 2, paragraph 1, line 13. Add the following to the end of the paragraph: "The KVS-33 machine proposed for this project is not likely to cause wildfires. In older machines, the yaw system could not be controlled and after several revolutions, electrical cables running down the towers would become twisted and break, causing sparks and sometimes fires. The yaw system on the KVS-33 is programmed to shut down the turbine and unwind after three revolutions, thereby preventing cables from twisting and breaking."

2.1.6 Operations and Maintenance

Page 2-23, column 1, paragraph 1, line 18. Replace "(i.e., without using a crane to remove the turbine from the tower)." with "(i.e., Windsmiths would climb the tower to service the turbine so that a crane usually would not be necessary to remove the turbine)."

2.1.9 Hazardous Materials

Page 2-27, column 1, paragraph 2, line 8. Replace "the possibility for accidental leakage is minimal" with "accidental leakage is highly unlikely".

Page 2-27, column 1, paragraph 2, line 17. Replace "All vehicular maintenance would be performed off-site at an appropriate facility." with "Whenever feasible, vehicular maintenance would be performed off-site at an appropriate facility. When equipment breakdowns necessitate on-site repairs, proper procedures would be utilized to prevent fluid spills."

2.1.10 Reclamation and Abandonment

Page 2-28, column 1, paragraph 2, line 3. Change "(BLM 1990a)" to "(BLM 1990b)".
Line 5. Replace "possible" with "it is feasible".

2.1.11 Project-wide Mitigation Measures

Page 2-29, column 1, paragraph 1, line 8. Insert "collision-related" before "avian mortality".

Page 2-29, column 1, bullet item 2, line 9. Replace "as much as possible" with "if feasible".

Page 2-29, column 2, bullet item 1, line 4. Insert "collision-related" before "mortality".

Page 2-29, column 2, paragraph 3, line 1. Insert "Collision-related" before "Mortality" and drop "Mortality" to lower case. Line 10. Add "NEPA document and" before "POD for".

Page 2-29, column 2, paragraph 3, line 5. Insert "BLM would consult with state and federal wildlife agencies as to the monitoring results and their application to future phases." after "upon request."

Page 2-29, column 2, paragraph 4, line 3. Replace "Retrofit of prior phases would not include replacement of capital items (e.g., rotors, towers, nacelles), but could include removing the rotor from turbines associated with high mortality rates, painting turbine rotors, or other measures not requiring capital expenditure." with "Retrofit of prior phases could include but is not limited to relocating turbines, painting blades, and installing warning devices. If the operations of the project causes an asserted violation of federal law (e.g., MBTA, ESA, or BEPA), the USFWS (in conjunction with other federal agencies) can initiate legal proceedings to enforce the provisions of such law. These proceedings may lead to a court order limiting or enjoining project operation until specified actions are taken or other conditions met. If project operations cause a violation of stipulations promulgated in the ROW grant, BLM

may require KENETECH to take measures to correct the violation and may revoke the ROW grant for use of public land if KENETECH fails to correct the violation.

Page 2-30, column 1, item 6, line 1. Insert "Topsoil disturbance would be kept to a minimum through construction site management." before "Topsoil would be salvaged.."

Page 2-30, column 2, item 8, line 3. Replace the word "prevent" with "minimize".

Page 2-31, column 2, item 15, lines 1 and 6. Insert "All" at the beginning of the first two sentences of item 15.

Page 2-31, column 2, item 17, line 9. Replace "nest" with "lek".

Page 2-32, column 1, item 18, line 1. Insert "All" at the beginning of the sentence.

Page 2-32, column 1, item 2, line 6. Replace "water" with "winter".

2.2 ALTERNATIVE A

Page 2-32, column 2, paragraph 3, line 8. After ". . . power grid.", insert "Because the wind regime on the Foote Creek Rim area is superior to that on the Simpson Ridge area, Windplant development on the Foote Creek Rim area would probably proceed to or near the full 200 MW, unless restricted by the BLM due to environmental concerns. Under this scenario, by reducing the overall size of the Windplant to 300 MW, only about 100 MW (275 turbines) would be constructed in the Simpson Ridge area. Alternatively, if construction is prohibited on the Foote Creek Rim area due to environmental concerns (e.g., loss of mountain plover habitat), the 300-MW Windplant would be constructed entirely within the Simpson Ridge area.

Page 2-32, column 2, paragraph 5, line 11. Insert "A NEPA document and" before "A POD".

2.3 NO ACTION ALTERNATIVE

Page 2-33, column 1, paragraph 2, line 16. Delete "BPA or".

Page 2-33, column 1, paragraph 2, line 17. Add the following sentence to the end of the paragraph: "If BPA does not purchase the energy output associated with this project, then BPA would forego the opportunity to address regional barriers to cost-effective wind development and gain hands-on experience with the operation and integration of commercial windfarms."

2.4 ALTERNATIVES CONSIDERED BUT REJECTED

Page 2-33, column 1, paragraph 3, line 3. Add the following sentence after "feasible.": "A conservation alternative was analyzed by BPA (BPA 1993a), and this EIS is tiered to the BPA EIS."

Page 2-33, column 1, paragraph 4, line 8. Insert "[See Section 1.1]" before the closing parenthesis.

Page 2-33, column 2. Replace paragraph 2 with the following paragraph: With appropriate meteorological data, power output can be estimated and used to compare generating potential among different sites. Expected power output data

(Table 2.9) show that Foote Creek Rim would have a net output of 1,300 MWh per turbine per year. Turbines in the Simpson Ridge area are predicted to produce 1,175 MWh per turbine per year. Expected output from other locations in southern Wyoming range from 945 to 460 MWh per turbine per year (i.e., other locations would have 35% to 65% less output per turbine than Foote Creek Rim). As power output decreases, the cost to utilities (computed over a 25-year period) increases. For example, at the next best site outside of the proposed project area (Medicine Bow), costs would be 126% of expected costs for power from Foote Creek Rim. At other sites, the additional costs borne by the utilities would range from 132% to 276% higher than costs from Foote Creek Rim. Section 8.2.1 in the FEIS presents the results of an independent evaluation of this analysis.

Page 2-34, Table 2.9. Replace Table 2.9 in the DEIS with Table 2.9 in the FEIS.

Page 2-35, column 2, paragraph 3, line 8. Replace "(BPA 1993)" with "(BPA 1993a)".

2.5 SUMMARY OF ENVIRONMENTAL IMPACTS

Pages 2-38 through 2-45. Replace Table 2.11 in the DEIS with 2.11 in the FEIS.

Table 2.9 Estimated Power Output and Cost for Alternative Sites.¹

Area	Annual Per Turbine Net Output (MWh) ²	Estimated Output as % of Output from Foote Creek Rim	Real Levelized Cost as % of Real Levelized Cost from Foote Creek Rim ³
Foote Creek Rim	1,300	100%	100%
Simpson Ridge	1,175	90%	104%
Chugwater	850	65%	141%
Kemmerer	870	67%	138%
Medicine Bow	945	73%	126%
Rock River South	900	69%	133%
Rock Springs	460	35%	250%
Rawlins	830	64%	143%
Coyote Springs	800	62%	148%
Bridger Butte	675	52%	173%
Rock River North	880	68%	135%
Medicine Bow SW	880	68%	137%
Medicine Bow SE	850	65%	139%
Wheatland Reservoir 1	850	65%	139%
Fish Hatchery	840	65%	132%
Medicine Bow Airport	790	61%	149%
Wheatland Reservoir 2	770	59%	154%
Casper	650	50%	179%
Laramie	580	45%	202%
Cheyenne	530	41%	220%
Ferris	575	44%	205%
Buzzard Ranch	575	44%	208%
Red Desert	460	35%	276%

¹ Source: KENETECH Windpower, Inc. All costs for each site include cost of transmission line construction which was estimated to be \$170,000 per mile.

² Estimated output uses current wind data collected through December 1994. Confidence is 90-95%.

³ Real Levelized Cost = real levelized cost of delivered energy to the purchasing utility over 25 years of project operation, calculated using PacifiCorp's financial analysis of the project. Assumes 201 KENETECH Windpower, Inc. Model KVS-33 variable speed wind turbines.

Table 2.11 Summary of Impact Analysis for the Proposed Action, Alternative A, and No Action.

Impact by Environmental Resource	Post-mitigation Impacts			
	Proposed Action	Alternative A	No Action	Mitigation(s)
CLIMATE AND AIR QUALITY				
Snow redistribution and subsequent impacts on wildlife, vegetation, soils, hydrology, and geologic hazards	Negligible to moderate - facilities could cause local changes in snow deposition patterns	Negligible to moderate; may be some reduction in impacts compared with Proposed Action, depending on facilities	No impact	Avoid fencing facilities where feasible; place downtower boxes within modified tubular towers where feasible; avoid snow accumulation areas.
Airborne particulates and emissions will increase but remain within state and federal standard.	Negligible - small increases in dust and emissions adjacent to turbine locations, roads, and ancillary facilities; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Regularly maintain roads and equipment.
No additional pollutant emissions due to fossil fuel burning for electricity generation	Beneficial ¹ (national or global scale); LOP and beyond	Beneficial (national or global scale); adverse and beneficial effects reduced by approximately 40% from Proposed Action	Electric power may be generated by a polluting resource; negligible; LOP	None.
TOPOGRAPHY/PHYSIOGRAPHY				
Cuts and fills along turbine corridors, roads, substations, transmission line ROWs	Negligible - no major landscape alterations; site-specific; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid significant features.
Alteration of surface drainages	Negligible - no long-term modifications to drainages; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid drainages where feasible; reestablish and reclaim drainages; use appropriate road and culvert design; acquire 404 Permits as appropriate.
MINERALS/GAS AND OIL				
Localized temporary loss of access to oil and gas reserves	Negligible-wind, oil, and gas development may be compatible	Negligible and reduced 40% from Proposed Action	Possible negative impacts on oil and gas reserves	Avoid potential future gas and oil development areas, if possible.
Localized temporary loss of access to mineral reserves	Low to moderate impacts to coal if mining becomes economical during the LOP; negligible impacts to uranium	Low to moderate impacts to coal if mining becomes economical during the LOP and reduced approximately 40% from the Proposed Action; negligible impacts to uranium	Possible negative impact on coal reserves	Avoid gravel quarries and potential future coal and uranium mine sites, where feasible.

Table 2.11 (Continued)

Impact by Environmental Resource	Post-mitigation Impacts			
	Proposed Action	Alternative A	No Action	Mitigation(s)
GEOLOGIC HAZARDS				
Flood damage to facilities	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid floodplains and flood prone areas, where feasible.
Increased landslide potential due to snow accumulation	Negligible; LOP	Negligible; LOP	No impact	Locate facilities to avoid snow deposition on landslide prone areas, where feasible.
Reactivation of dunes due to ground cover removal	Negligible - no dunes and only a few windblown deposits in the KPPA; LOP	Negligible; LOP	No impact	Avoid windblown deposits where feasible; implement appropriate and timely reclamation, erosion control, and revegetation.
Earthquake damage to facilities	Negligible - very low earthquake potential; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Construct turbines and power lines to withstand moderate earthquakes.
Landslides and slumping at construction sites	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid unstable areas where feasible; implement appropriate and timely reclamation and erosion control.
Subsidence during or after construction	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid mined out areas, where feasible.
Subsidence, gas, and fires associated with abandoned coal mines	Negligible; site-specific; LOP	Negligible and reduced by approximately 40% from the Proposed Action	No impact	Avoid abandoned mine areas.
PALEONTOLOGICAL RESOURCES				
Disturbance/destruction of important fossils	Negligible during construction and LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid, recover, and/or monitor as determined during preconstruction BLM paleontological surveys; educate employees.
Loss of important fossil materials due to private collection or vandalism	Negligible during construction and LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid, recover, and/or monitor as determined during preconstruction BLM paleontological surveys; educate employees.
Discovery of previously unknown fossils	Beneficial during construction	Same as Proposed Action but reduced by approximately 40% from Proposed Action	Negligible - no new fossil discovery	None.

Table 2.11 (Continued)

Impact by Environmental Resource	Post-mitigation Impacts			
	Proposed Action	Alternative A	No Action	Mitigation(s)
SOILS				
Disturbance and erosional loss of soils	Moderate during construction and negligible for the LOP; 1,787 ac initial disturbance and 715 ac new disturbance for LOP	Same as Proposed Action and reduced to 1,146 ac initial disturbance and 431 ac of new disturbance for LOP	No impact	Avoid erosion-prone areas where feasible; implement appropriate and timely use of erosion and sedimentation control techniques/devices; adhere to NEPA documents and PODs.
Increased soil moisture due to snow accumulation	Beneficial - increased productivity; LOP	Beneficial; reduced from Proposed Action; LOP	No impact	None.
Increased erosion potential due to saturated soils in snow accumulation areas	Moderate on steeper slopes; LOP	Moderate on steeper slopes, reduced approximately 40% from Proposed Action; LOP	No impact	Avoid steep slopes and erosion-prone soils, where feasible; implement appropriate and timely use of erosion and sediment control techniques/devices; adhere to NEPA documents and PODs.
Soil compaction and decreased productivity	Moderate during construction; negligible for the LOP	Reduced by approximately 40% from Proposed Action	No impact	Use appropriate reclamation techniques; restrict off-road vehicle travel.
Contamination due to accidental hazardous material spills	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Adhere to hazardous materials management and spill prevention and control countermeasure plans.
SURFACE WATER RESOURCES				
Increased turbidity, salinity, and sedimentation of surface waters due to runoff from disturbed areas	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Use appropriate erosion and sedimentation control techniques/devices; adhere to NEPA documents and PODs.
Contamination of surface waters from accidental hazardous material spills	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Adhere to hazardous materials management and spill prevention and control countermeasure plans.
Alteration of surface water runoff patterns due to snow redistribution	Negligible; LOP	Negligible and reduced from Proposed Action, depending on facilities placement	No impact	Avoid snow accumulation areas, where feasible.
GROUNDWATER RESOURCES				
Contamination of groundwater from accidental hazardous material spills	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Adhere to hazardous materials management and spill prevention and control countermeasure plans.

Table 2.11 (Continued)

Impact by Environmental Resource	Post-mitigation Impacts			
	Proposed Action	Alternative A	No Action	Mitigation(s)
NOISE				
Increased noise levels near residences and within crucial wildlife habitats during critical periods	Moderate during construction; negligible for Phase I; possibly significant for the Foote Creek Rim 200-MW phase; probably negligible for future phases	Moderate during construction; negligible for the first phase; possibly significant for the Foote Creek Rim 200-MW phase; probably negligible for future phases; incidences reduced by approximately 40% from Proposed Action	No impact	Avoid residences; no construction activities within crucial wildlife habitats during critical periods; use equipment mufflers; ensure regular maintenance of WTGs; avoid crucial and/or breeding and nesting habitats where feasible; design road use specifications to keep traffic to a minimum.
ODOR				
Presence of offensive odors proximal to facilities and roads	Negligible; LOP	Negligible and incidences reduced by approximately 40% from Proposed Action	No impact	Ensure regular equipment maintenance.
ELECTRIC AND MAGNETIC FIELDS				
Adverse human health effects	Negligible; LOP	Same as Proposed Action	No impact	None necessary.
Television (TV) or radio interference	Negligible; LOP	Same as Proposed Action	No impact	Fiberglass rotors on wind turbines.
VEGETATION				
Removal of vegetation	Negligible - 1,787 ac initial disturbance and 715 ac for LOP	Negligible and reduced to 1,146 ac new initial disturbance and 431 ac new disturbance for LOP	No impact	Minimize number and size of disturbance areas; implement appropriate and timely reclamation, erosion control, and revegetation; adhere to NEPA documents and PODs.
Changes in vegetation diversity following reclamation (i.e., shrubland to grassland) and potential weed infestation	Negligible - 1,787 ac initial disturbance and 715 ac for LOP	Negligible and reduced to 1,146 ac new initial disturbance and 431 ac new disturbance for LOP	No impact	Use appropriate weed control; restrict off-road vehicle travel; revegetate with native/approved species.
Disturbance of wetlands	Negligible - no net loss of wetlands; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid wetlands where feasible; limit development of crossings to dry periods; obtain Army Corps of Engineers (COE) 404 Permits as necessary; adhere to NEPA documents and PODs.
Reclamation unsuccessful after five years	Negligible to significant; LOP and beyond	Negligible to significant and reduced by approximately 40% from Proposed Action	No impact	Implement further BLM-approved reclamation efforts until successful revegetation achieved.

Table 2.11 (Continued)

Impact by Environmental Resource	Post-mitigation Impacts			
	Proposed Action	Alternative A	No Action	Mitigation(s)
VEGETATION (Continued)				
Changes in plant community composition due to snow redistribution	Negligible to potentially significant; LOP	Negligible to potentially significant, reduced depending on facilities placement; LOP	No impact	Avoid snow accumulation areas; use proper snow removal techniques.
Wetland loss	Negligible; LOP	Negligible; LOP	No impact	Avoid wetlands, where feasible; mitigate all wetland disturbance.
Riparian area disturbance	Negligible; LOP	Negligible; LOP	No impact	Avoid riparian areas, where feasible; use best management practices during construction adjacent to riparian areas.
WILDLIFE				
Loss of big game crucial habitat	Moderate; initial disturbance of 140 ac pronghorn crucial range and 42 ac mule deer crucial range	Moderate; initial disturbance of 106 ac pronghorn crucial range and 42 ac mule deer crucial range	No impact	Minimize project activities in these areas; implement appropriate reclamation with shrub species.
Big game displacement and/or stress	Negligible (white-tailed deer) to potentially significant (elk); variable responses noted in literature; LOP	Same as Proposed Action	No impact	Avoid construction and minimize other activities within crucial habitats during crucial periods; during winter, provide escape openings along access roads; properly muffle all equipment; fence Windplant substations to prevent big game access.
Overall wildlife (i.e., small mammals, amphibians, and reptiles) habitat degradation	Negligible - 1,787 ac initial disturbance and 715 ac for LOP	Negligible and reduced to 1,146 ac new initial disturbance and 431 ac new disturbance for LOP	No impact	Use appropriate erosion control and reclamation techniques; appropriate monitoring, containment, and disposal of hazardous material.
Increased nonavian wildlife mortality from activities of man	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Use appropriate road design; adhere to posted speed limits; educate employees; appropriately contain and dispose of hazardous material; avoid snow accumulation areas.
Potential violation of federal and state laws protecting avifauna due to collision-related mortality	Significant; LOP	Significant; LOP	No impact	Comply with stipulations upon which issuance of permits or other agreements are contingent.
Declining raptor populations	Potentially significant; LOP	Possibly significant; reduced from Proposed Action depending on facilities placement	No impact	Design and place Windplant facilities to minimize avian mortality; use monitoring to improve designs to further mitigate impacts and to determine population trends; avoid construction within a 0.75-mi radius of active raptor nests.

Table 2.11 (Continued)

Impact by Environmental Resource	Post-mitigation Impacts			
	Proposed Action	Alternative A	No Action	Mitigation(s)
WILDLIFE (Continued)				
Potential destruction of big game movement patterns and reduction of habitat effectiveness	Moderate for pronghorn and mule deer; potentially significant for elk	Moderate for pronghorn and mule deer; potentially significant for elk	No impact	Minimize disturbance, use appropriate erosion control and reclamation techniques; train O&M personnel to minimize disturbance to wildlife.
Loss of sage grouse nesting habitat	Potentially significant; initial disturbance of 1,185 ac probable nesting habitat	Potentially significant; reduced to 754 ac new disturbance from Proposed Action	No impact	Minimize project activities in these areas, especially during breeding season on lek sites; implement appropriate reclamation with shrub species; equip power lines within 0.25 mi of sage grouse leks with raptor antiperching devices.
Declining nonraptor populations	Potentially significant for mountain plover and horned lark; probably negligible for other nonraptor species; LOP	Potentially significant for mountain plover and horned lark; probably negligible for other nonraptor species; LOP	No impact	Design and place Windplant facilities to minimize avian mortality; use monitoring to improve designs to further mitigate impacts and to determine population trends.
Degradation of surface waters resulting in fish population reductions	Negligible; LOP	Negligible; LOP	No impact	Avoid riparian areas and implement proper erosion control techniques.
THREATENED AND ENDANGERED SPECIES/STATE SENSITIVE SPECIES				
Mortality or disturbance of any listed or candidate T&E species or disturbance of critical habitat for listed and candidate T&E species	Significant- bald eagle, peregrine falcon, and ferruginous hawk known to use the area, mountain plover known to nest on Foote Creek Rim; negligible- no confirmed black-footed ferret or swift fox sightings; no surface water withdrawal; LOP	Significant; LOP	No impact	Design and place Windplant facilities to minimize avian mortality; use monitoring to improve designs to further mitigate impacts; minimize habitat disturbance; avoid prairie dog colonies where feasible; implement black-footed ferret surveys as required; equip power poles near prairie dog colonies with raptor antiperching devices; implement appropriate and timely reclamation and revegetation.
Reduction in state sensitive species due to mortality or habitat removal	Negligible; LOP	Negligible; LOP	No impact	Avoid habitats of potential occurrence, where feasible.
Destruction of TEC&S plant species or their habitat	Negligible; LOP	Negligible; LOP	No impact	Pre-disturbance surveys for TEC&S; avoidance of individuals or habitat, where feasible.

Table 2.11 (Continued)

Impact by Environmental Resource	Post-mitigation Impacts			
	Proposed Action	Alternative A	No Action	Mitigation(s)
CULTURAL RESOURCES				
Disturbance/destruction of important sites	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Complete cultural surveys and data recovery as required; avoid cultural sites where feasible; avoid areas adjacent to perennial water and aeolian deposits.
Loss of important cultural materials due to private collection or vandalism	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Ensure employee education; use disciplinary action as appropriate.
Disturbance of important Native American religious or culturally significant sites	Possibly significant for Phase I; unknown for future phases	Possibly significant for Phase I; unknown for future phases	No impact	Continue consultations with Native American groups to mitigate impacts. Complete Section 106 process prior to issuing the ROD.
SOCIOECONOMICS				
Increase in population	Negligible - adequate infrastructure exists; LOP	Negligible; LOP	No impact	Employ as many local personnel as possible; distribute impact assistance funds.
Increase in demand for temporary housing	Negligible to beneficial - numerous vacancies exist; LOP	Negligible; LOP	No impact	Employ as many local personnel as possible; distribute impact assistance funds.
Increase in demand for local government facilities or services	Negligible - adequate infrastructure exists and increased revenues will be available; LOP	Negligible; LOP	No impact	Employ as many local personnel as possible; distribute impact assistance funds.
Increase in demand for school services	Negligible - adequate classroom space available	Negligible; LOP	No impact	Employ as many local personnel as possible.
Disruption or change of character of communities	Negligible - towns developed during boom and bust cycles; LOP	Negligible; LOP	No impact	Employ as many local personnel as possible; distribute impact assistance funds.
Increase in tax revenue and royalties and stimulation of local economy	Beneficial - increased federal, state, and local revenues; LOP	Beneficial; LOP	Moderate- no increased revenues	None.
Increased employment	Beneficial; LOP	Beneficial; LOP	No impact	None.
LAND USE				
Reduction of animal unit months (AUMs) for livestock and forage for wildlife	Negligible - initial reduction of 243 AUMs and LOP loss of 93 AUMs	Negligible - initial reduction of 40 AUMs and LOP loss of 8 AUMs	No impact	Implement appropriate and timely reclamation; revegetate with palatable and productive species.
Loss of forage and/or wildlife due to fires started by the Windplant	Negligible; facilities monitored daily by O&M personnel and continually via communications systems; LOP	Negligible and reduced by approximately 40% from Proposed Action	Negligible- no early warning	Maintain WTGs in proper working condition at all times; prohibit outdoor smoking during high fire hazard periods; restrict vehicular traffic to approved roads.

Table 2.11 (Continued)

Impact by Environmental Resource	Post-mitigation Impacts			
	Proposed Action	Alternative A	No Action	Mitigation(s)
LAND USE (Continued)				
Temporary loss of mineral development opportunities	Low to moderate impacts to coal and possibly to salable minerals if mining/quarrying becomes economical during the LOP; negligible impacts to uranium	Low to moderate impacts to coal and possibly to salable minerals if mining/quarrying becomes economical during the LOP; negligible impacts to uranium; reduced by approximately 40% from the Proposed Action	No impact	Avoid quarries and potential coal development areas, where feasible.
Temporary loss of oil and gas development opportunities	Negligible - wind, oil, and gas may be compatible land uses	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid potential development areas, if possible.
Changes in character and recreational uses of the area due to construction, presence of facilities, noise, dust, odor, and increased human activities	Moderate - no developed recreation areas occur on KPPA; LOP	Moderate and reduced from Proposed Action depending on facilities placement	No impact	Maintain roads as appropriate; use equipment mufflers; minimize disturbance areas; implement appropriate and timely reclamation.
Potential increased tourism opportunities	Beneficial to local businesses	Beneficial but reduced approximately 40% from Proposed Action	No impact	Minimize disturbance areas; implement appropriate and timely reclamation.
Infringement on prior rights	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Avoid existing ROWs where feasible; use appropriate construction at ROW crossings.
VISUAL RESOURCES				
Modification in the basic elements (form, line, color, or texture) of visual resources by presence of facilities and equipment	Significant; LOP	Significant, but reduced by approximately 40% from Proposed Action, depending on facilities placement	No impact	Paint facilities with standard environmental colors and, where feasible, locate to blend with surrounding landscape; minimize cuts and fills and other visible landscape alterations; implement appropriate and timely reclamation and revegetation.
HAZARDOUS MATERIALS				
Soil, surface water, and groundwater contamination and wildlife exposure	Negligible; LOP	Negligible and reduced by approximately 40% from Proposed Action	No impact	Adhere to hazardous materials management and spill prevention and control countermeasure plans; implement appropriate monitoring, containment, and disposal of hazardous material.

¹ The term "beneficial" is used to describe the favorable impact of using a nonpolluting resource to generate electricity; it is not intended to reflect proactive air quality improvement (i.e., cleanup).

3.0 AFFECTED ENVIRONMENT

Page 3-1, column 1, paragraph 1, line 5. After "100-ft" insert "(30.5-m)".

Page 3-1, column 1, paragraph 2, line 1. Replace "(BLM 1988a)" with "(BLM 1988)".

3.1 PHYSICAL RESOURCES

3.1.1 Climate and Air Quality

Page 3-1, column 1, paragraph 4, line 2. Delete "Mean" and capitalize "Annual".

Page 3-2, column 1, paragraph 2, line 3. Insert "NEPA documents and" before "the PODs".

3.1.3 Geology

3.1.3.1 Mineral Resources

Page 3-5, column 2, paragraph 3, line 1. Insert "federal" before "coal".

Page 3-5, column 2, paragraph 3, line 3. Add "In February 1995, the SE 1/4 of Section 16, T21N, R80W was leased for coal by the State of Wyoming." after "(. . . BLM, Rawlins)".

Page 3-5, column 2, paragraph 3, line 4. Replace "The Simpson Ridge project area lies on the eastern side of the Hanna Coal Field" with "The Simpson Ridge project area lies to the east of the Hanna Basin Known Recoverable Coal Resource Area (KRCRA) and the southeastern portion of the project area lies within the boundaries of the Carbon Basin KRCRA."

Page 3-5, column 2, paragraph 3, line 7. Replace "Although there are areas of known thick or abundant coal underlying portions of the project area, only the northwestern portion of the Simpson Ridge area has coal development potential (BLM 1987:120-121)." with "Although the project area is underlain by numerous coal seams of various thicknesses, only the southeastern portion of the Simpson Ridge area has coal development potential

(personal communication, April 1995, with Brenda Vosika, Mining Engineer, BLM, Rawlins)."

Page 3-5, column 2, paragraph 3, line 12. Replace "In-place coal reserves in the Hanna Coal Field are estimated at 3.27 billion tons (2.97 billion metric tons) (Wood and Bour 1988). As of 1979, the estimated remaining strippable reserve was 648.29 million tons (588.12 million metric tons) (Glass and Roberts 1979), primarily from the Hanna, Ferris, Mesaverde, and Medicine Bow Formations (Glass and Jones 1991)." with "Economically strippable reserves in the Hanna Basin are being depleted. The Seminoe No. 2 and Medicine Bow Mines will have exhausted their economically recoverable reserve base as of 1998. Much of the remaining strippable reserves are lower in quality (low BTU, high sulfur) than most contracts now existing in the basin allow. Carbon Basin coal could help meet contracts requiring high BTU, low sulfur coal."

Page 3-5, column 2, paragraph 3, line 20. Insert "recently" after "has".

Page 3-6, column 1, paragraph 1, line 4. Replace "Hanna" with "Carbon".

Page 3-6, column 1, paragraph 1, line 5. Replace "Hanna" with "Carbon".

Page 3-6, column 1, paragraph 1, line 6. Replace "compared with coal in the Powder River Basin, and" with "and generally much thinner than the thick coals mined in the Powder River Basin (personal communication, January 26, 1995, with Gary Glass, State Geologist, Wyoming State Geological Survey);".

Page 3-6, column 1, paragraph 1, line 8. Add the following sentence to the end of the paragraph: "However, Carbon Basin coal could become attractive to developers contracting with utilities that require certain quality parameters that cannot be filled by Powder River Basin coals."

Page 3-6, column 1, paragraph 2, line 14. Replace "Harris" with "Ferris".

Page 3-6, column 2, paragraph 2, line 6. Insert "Several known gold placer deposits occur in gravels along Rock Creek, but none are currently being mined (Hausel et al. 1992, 1994)" after "(BLM 1987:126)."

3.1.3.2 Geologic Hazards

Page 3-7, column 2, paragraph 1, line 6. Replace "but no surface subsidence is known to have occurred within the KPPA" with "and extensive coal mine subsidence has occurred in Sections 26 and 35, T22N R80W (personal communication, January 26, 1995, with Gary Glass, State Geologist, Wyoming Geological Survey). There was also a fire in the underground structures of a mine in this area."

3.1.3.3 Paleontological Resources

Page 3-7, column 2, paragraph 4. Replace "A Class I paleontological survey is currently being completed by a BLM-approved paleontologist (Dr. Gus Winterfeld) and will be included in the FEIS for this project." with "Results of a Class I paleontological survey are included as Appendix G in the FEIS."

Page 3-7, column 2, paragraph 4, line 6. Replace "1992" with "1993a".

3.1.5 Water Resources

3.1.5.2 Groundwater

Page 3-16, column 2, paragraph 3, line 4. Replace "only minimally" with "insignificantly".

3.1.6 Noise and Odor

Page 3-18, column 2, paragraph 3, line 10. Insert "(courtship and breeding areas)" after "sage grouse leks".

Page 3-18, column 2, paragraph 4, line 7. Replace "(55 dBA)" with "(60 dBA)".

3.1.7 Electric and Magnetic Fields

Page 3-21, column 2, paragraph 2, line 1. Replace "Electric and magnetic fields" with "EMFs".

Page 3-21, column 2, paragraph 3, line 4. Replace "Zanfanella" with "Zaffanella".

Page 3-23, Table 3.7, footnote 1. Replace "(n.d.)" with "(BPA n.d.)".

3.2.1 Vegetation

Page 3-24, column 1, paragraph 2, line 15. Replace "Additional vegetation mapping of the Simpson Ridge area and the selected transmission line route would be completed, if necessary, as part of a future POD prior to construction of future phases." with "Additional vegetation mapping of future development areas would be completed as part of the NEPA analysis and POD for future phases."

Page 3-28, Table 3.9, caption. After "Acreage", insert "¹". Add the following footnote to the bottom of the table: ¹ Multiply acres by 0.4047 to compute number of hectares."

3.2.2 Wildlife and Fisheries and

3.2.3 Threatened and Endangered/State Sensitive Species

Due to the large number of changes made to incorporate additional data and respond to comments, Sections 3.2.2 Wildlife and Fisheries and 3.2.3 Threatened and Endangered/State Sensitive Species have been replaced in their entirety.

3.2.2 Wildlife and Fisheries

The topography, soils, water resources, and vegetation within the KPPA provide habitats used by numerous wildlife species as discussed below.

In general, wildlife field observation data for the KPPA included in this FEIS were collected between February 13 (Simpson Ridge) or February 16 (Foote Creek Rim), 1994, and March 17, 1995. Appendix D in the DEIS and corrections to Appendix D in the FEIS contain the common and scientific names of animal species known to occur or potentially occurring within or adjacent to the project area. Quantitative and qualitative wildlife observations were initiated within the KPPA in October 1993. The types of data collected, methods used, and observation periods are presented for each species or group of species in the following sections and in Appendix A of the DEIS.

3.2.2.1 Big Game

Four big game mammal species occur within or adjacent to the KPPA: pronghorn, mule deer, white-tailed deer, and elk. Moose, although they may be rare visitors to drainages in the area (e.g., Rock Creek, Medicine Bow River), do not regularly occur within the KPPA (written communication, March 1994, Pat Hnilicka, Wildlife Biologist, WGFD). Therefore, they will not be addressed further in this EIS. Specific information concerning big game hunting and harvest in the KPPA is described in Section 3.5.4 of the DEIS.

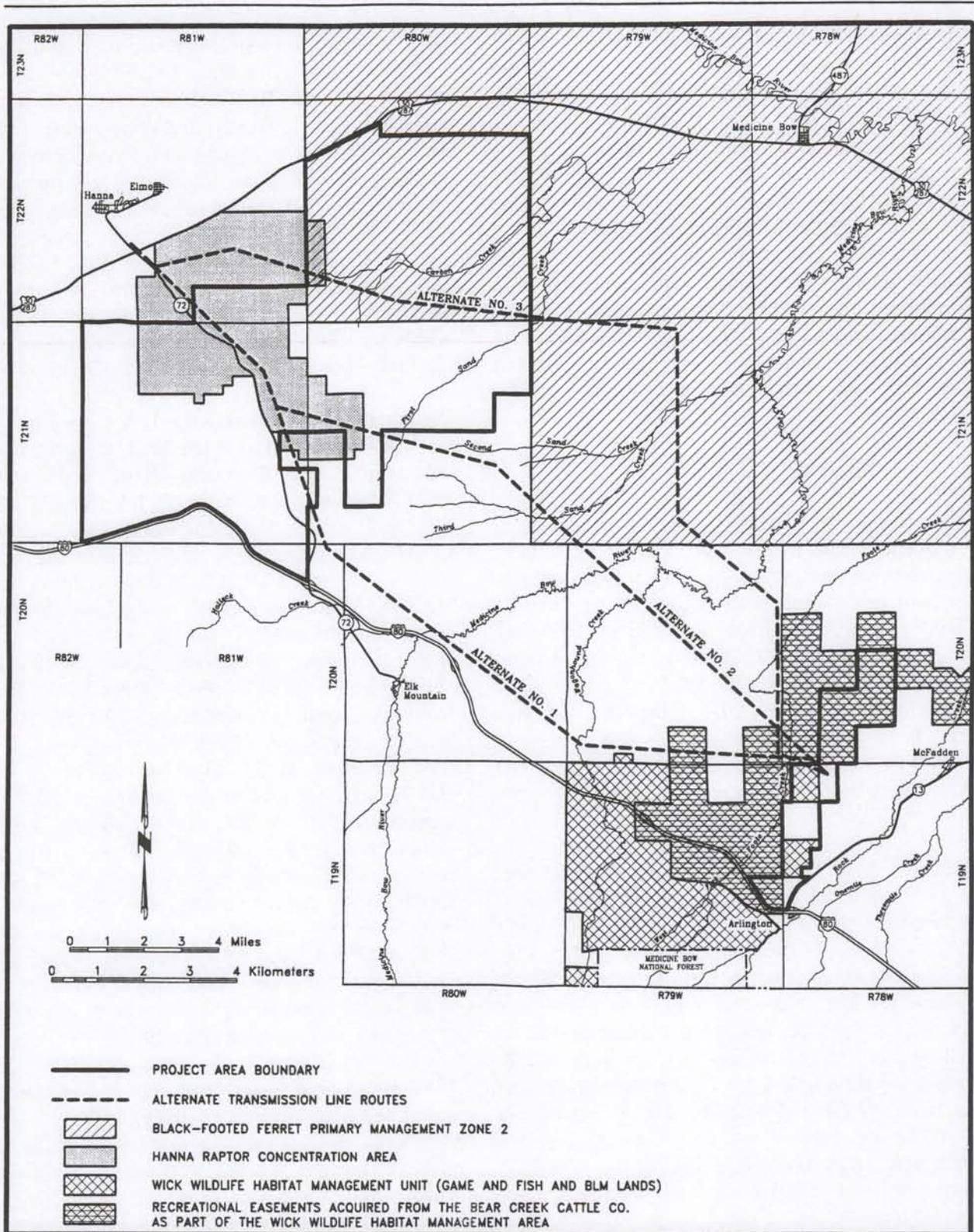
The 10,344-ac Wick Wildlife Habitat Management Unit (Wick Unit) and Management Area covers approximately 6.4% (3,854.4 ac) of the KPPA and 77.1% of the Foote Creek Rim area (Map 3.9). Originally established in 1964 to provide winter range for elk, the Unit and Area are "now managed to provide quality year-round habitat for all wildlife species which use the area and to provide public access for quality experience with wildlife" (WGFD 1990). The Wick Unit and Area provide important winter and yearlong range for elk, deer, and pronghorn. Much of the Wick Unit south of I-80 is designated as crucial range for mule deer and elk. Crucial range "describes that component which is the determining factor in a population's ability to maintain and reproduce

itself at population objectives over the long term" (WGFD 1990). The Wick Unit and Area are a mixture of deeded WGFD land, leased state land, federal land (i.e., BLM), and private land made available through a cooperative agreement between WGFD and the Bear Creek Cattle Company (WGFD 1990). A memorandum of understanding between the BLM and WGFD reserves grazing use on the 286 ac of BLM-managed land for wildlife on BLM-managed lands (BLM 1987:201). Portions of the Wick Management Area that occur within the KPPA consist of recreational easements acquired from the Bear Creek Cattle Company.

Pronghorn. Pronghorn in the KPPA are part of the Medicine Bow Herd; the Centennial, Cooper Lake, and Elk Mountain Herd Units are immediately adjacent to the KPPA (Map 3.10). The Medicine Bow Herd Unit includes Hunt Areas 41, 42, and 46 through 48, and occurs on the area north of I-80 and west of Wyoming Highway 13. The WGFD current population objective for this herd is 45,000 animals, and the estimated post-season population in 1993 was 25,761, or 57.2% of the objective (WGFD 1994a) (Table 3.10). The five-year population average (1989-1993) was 34,873 animals, or 77.5% of objective. The Medicine Bow Herd was most recently at its highest population level (approximately 39,000 animals) in 1990 and 1991, and has since declined to 1993 levels. A combination of severe winter kill (i.e., 30% mortality in winter of 1992-93) and higher hunter harvest during the 1993 season contributed to the recent population decline (WGFD 1994a). The WGFD reduced the number of licenses for the 1994 season, and it is anticipated that the herd will increase to objective in four to seven years (WGFD 1994a).

The entire Foote Creek Rim area is considered winter/yearlong pronghorn range (Table 3.10, Map 3.10). Winter/yearlong range is that range of which a portion is used yearlong, but during winter has a substantial influx of animals from other seasonal ranges (WGFD n.d.). No crucial range for pronghorn occurs on or within 2 mi (3 km) of the Foote Creek Rim area.

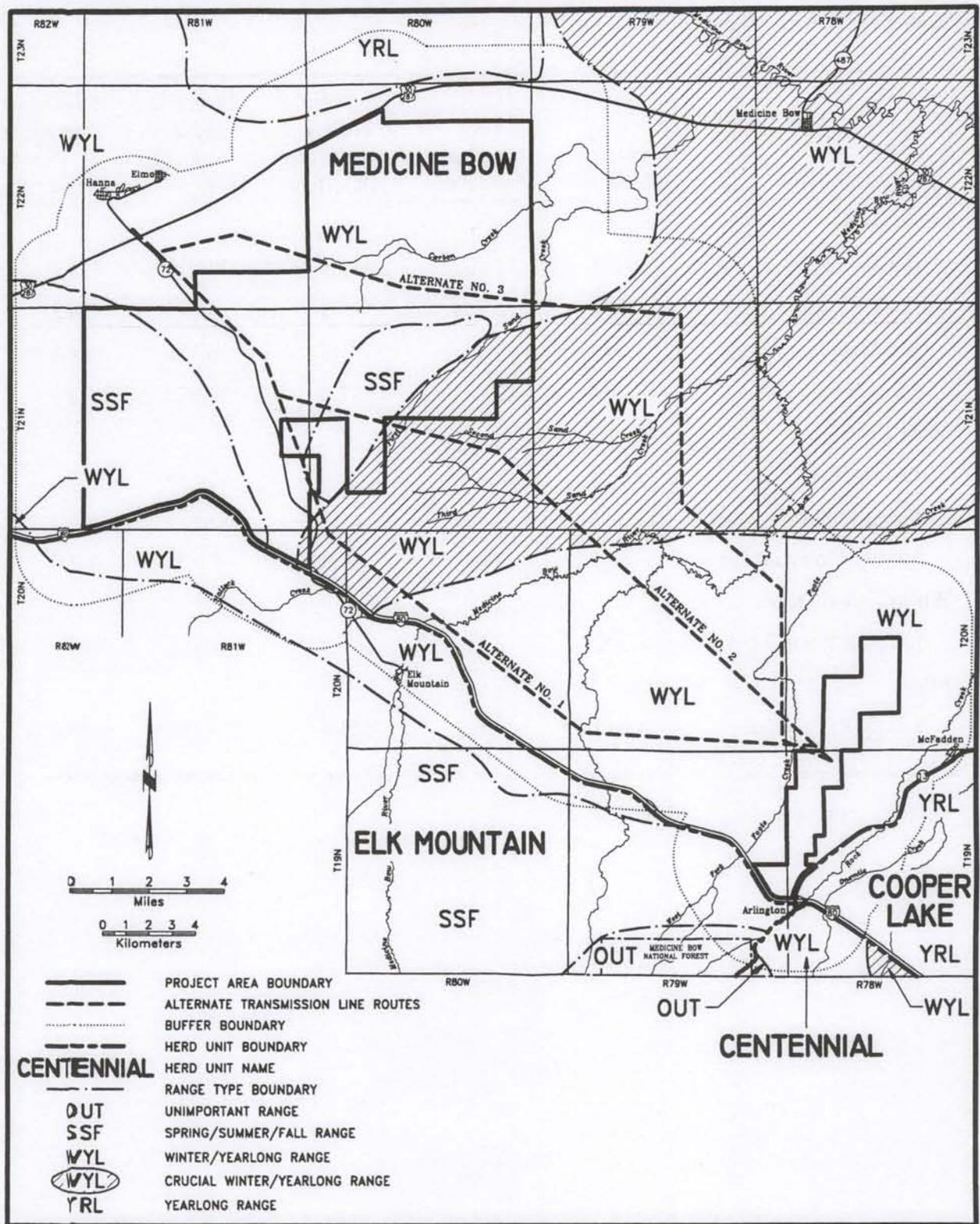
KENETECH Windpower Final EIS



1071\01\RANGE\HABITAT

Map 3.9 State and Federal Wildlife Management Areas.

KENETECH Windpower Final EIS



1071\01\ RANGE\ PRONGHORN

Map 3.10 Pronghorn Herd Units and Range Types.

Table 3.10 Selected Big Game Herd Unit Attributes¹.

Species/Herd Unit	Population Objective	1993 Post-season Population	1993 Population as % of Objective	Five-Year Population Average (1989-1993)	Population Average as % of Objective
Pronghorn					
Centennial Herd	6,000	11,362	189.4	14,113	235.2
Cooper Lake Herd	3,000	2,584	86.1	5,048	168.3
Elk Mountain Herd	5,000	5,160	103.2	6,738	134.8
Medicine Bow Herd	45,000	25,761	57.2	34,873	77.5
Mule Deer					
Platte Valley Herd	20,000	16,289	81.4	18,685	93.4
Sheep Mountain Herd	15,000	11,360	75.7	13,428	89.5
Shirley Mountain Herd	10,000	7,091	70.9	9,202	92.0
White-Tailed Deer					
Laramie River Herd	1,000	1,022	102.2	1,189	118.9
Elk					
Snowy Range Herd	4,900	6,888	140.6	6,188	126.3

¹ Information taken from WGFD (1994a).

The majority of the Simpson Ridge area (61.8%) is pronghorn winter/yearlong range (Table 3.11, Map 3.10). Pronghorn crucial winter/yearlong range occurs in the southeastern portion of the area and covers about 7.0% (3,841 ac) of the Simpson Ridge area. The remaining 31.2% (17,110 ac) of the Simpson Ridge area is pronghorn spring-summer-fall range, which is generally used between May 1 and November 30 (WGFD n.d.).

The majority of pronghorn crucial winter/yearlong range within the KPPA occurs in the central area between the Foote Creek Rim and Simpson Ridge areas (Map 3.10). All three alternate transmission line routes [i.e., 100-ft (30.5-m) ROWs] pass through pronghorn crucial winter/yearlong range (Table 3.11). Alternate 1 crosses the least amount of pronghorn crucial range (42 ac); Alternate 3 crosses the greatest amount of the three (107 ac). The majority of pronghorn range crossed by the three routes is winter/yearlong range.

The 4,072 ac of pronghorn crucial winter/yearlong range within the KPPA represents approximately 1.8% of the total crucial winter/yearlong range for the Medicine Bow Herd. Approximately 6.5% (39,437 ac) of the winter/yearlong range for the Medicine Bow Herd is contained within the KPPA. The KPPA encompasses approximately 6.1% (17,111 ac) of the spring-summer-fall range for the Medicine Bow Herd.

Pronghorn have been observed throughout the Foote Creek Rim area during passerine and raptor surveys; 4,680 incidental pronghorn observations were recorded within 1 mi (1.6 km) of the Foote Creek Rim area between March 16, 1994 and March 17, 1995 (Mariah 1994a, 1995). The majority of these observations (62.9%) were made between July and September. Of the 2,489 pronghorn observations on Foote Creek Rim between July 1, 1994 and March 17, 1995 for which sex and age was recorded, approximately 57% were adults; 86.8% of these adults were females.

Most pronghorn observations in early/mid-spring (i.e., March and April) occurred in the northern portion of the Foote Creek Rim area. Pronghorn were observed most frequently along the top of the rim and associated ridges. By May and June, pronghorn occurred throughout the rim, both on top and along both slopes. Pronghorn were frequently observed in the hayfields east of Foote Creek Rim during these months. Pronghorn were observed more frequently along the base and sides of Foote Creek Rim during July. In August, most pronghorn were observed along Foote Creek and its tributaries on the western side of the rim, in the hayfields at the base of the rim on the eastern side, and on the northern and western slopes of Arlington Peak; it is likely that these areas were the last to contain green and/or palatable vegetation. From September through November, pronghorn were again observed along the top of the rim and the western slope. During the hunting season (i.e., late September to late October), pronghorn moved into the less accessible areas at the northern end of the rim; some continued to frequent the top and western slope. Between December 1, 1994 and March 17, 1995, only 177 pronghorn were observed within 1 mi (1.6 km) of the Foote Creek Rim area; 127 of these observations occurred during March. It is possible that the mild winter of 1994-1995 resulted in less rimp use by pronghorn and other big game than was observed during 1994.

Pronghorn have been observed throughout those portions of Simpson Ridge surveyed for passerines and raptors (Mariah 1994a, 1995). Six hundred and eighteen pronghorn observations were recorded in the Simpson Ridge area between February 13 and November 30, 1994 (i.e., approximately 20 survey days). Of the 448 observations for which age and sex information was recorded, 278 observations (62.1%) were adult females, 52 (11.6%) were adult males, and 118 (26.3%) were fawns. Pronghorn were not observed between December 1, 1994 and March 12, 1995 (i.e., 9 survey days) along the passerine survey routes; however, access was

Table 3.11 Acreage and Percentage of Wildlife Habitats Within the KPPA, 1994.

Wildlife Resources	Acreage of Wildlife Habitat Within the Foote Creek Rim Area		Acreage of Wildlife Habitat Within the Simpson Ridge Area		Acreage of Wildlife Habitat Along Alternate 1		Acreage of Wildlife Habitat Along Alternate 2		Acreage of Wildlife Habitat Along Alternate 3	
		% ¹		% ¹		% ¹		% ¹		% ¹
Pronghorn Antelope										
Medicine Bow Herd										
Crucial winter/yearlong range	0	0	3,841	7.0	42	13.5	82	27.7	107	30.1
Spring-summer-fall range	0	0	17,110	31.2	11	3.5	22	7.4	0	0
Winter/yearlong range	5,000	100.0	33,943	61.8	257	82.9	192	65.0	249	69.9
Mule Deer										
Platte Valley Herd										
Winter/yearlong range	-- ²	--	7,299	13.3	--	--	--	--	--	--
Yearlong range	--	--	10,414	19.0	--	--	--	--	--	--
Sheep Mountain Herd										
Crucial winter/yearlong range	0	0	0	0	112	36.1	66	22.3	83	23.3
Winter/yearlong range	5,000	100.0	37,179	67.7	195	62.9	227	76.7	270	75.8
Shirley Mountain Herd										
Yearlong range	--	--	--	--	4	1.3	4	1.4	4	1.1
White-tailed Deer										
Laramie River Herd										
Winter/yearlong range	149	3.0	0	0	0	0	0	0	0	0
Yearlong range	0	0	0	0	23	7.4	28	9.5	30	8.4
Elk										
Snowy Range Herd										
Winter/yearlong range	5,000	100.0	36,147	65.8	308	99.4	293	99.0	354	99.4

Table 3.11 (Continued)

Wildlife Resources	Acreage of Wildlife Habitat Within the Foote Creek Rim Area		Acreage of Wildlife Habitat Within the Simpson Ridge Area		Acreage of Wildlife Habitat Along Alternate 1		Acreage of Wildlife Habitat Along Alternate 2		Acreage of Wildlife Habitat Along Alternate 3	
		% ¹		% ¹		% ¹		% ¹		% ¹
Raptors										
Potential habitat ³	5,000	100.0	54,893	100.0	310	100.0	296	100.0	356	100.0
Nesting buffers ⁴	2,771	55.4	36,170	65.9	211	68.1	177	59.8	229	64.3
Sage Grouse										
Probable nesting habitat ⁵	98	2.0	47,549	86.6	182	58.7	195	65.9	212	59.6
Potential breeding habitat ⁶	0	0	3,110	5.7	10	3.2	5	1.7	9	2.5

¹ % = Percentage of total specified area (i.e., Foote Creek Rim area, Simpson Ridge area, Alternates 1-3).

² -- = Herd unit not present within specified portion of project area.

³ Assumes that the entire KPPA is suitable raptor habitat.

⁴ Areas within 0.75 mi (1.2 km) of all known raptor nests on or adjacent to the KPPA.

⁵ Areas within 2.0 mi (3.2 km) of known lek sites on or adjacent to the KPPA.

⁶ Areas within 0.25 mi (0.4 km) of known lek sites on or adjacent to the KPPA.

limited primarily to Highway 72 throughout most of this period. Approximately 200 pronghorn were observed on March 13, 1995, near the old Carbon townsite in an area not routinely surveyed.

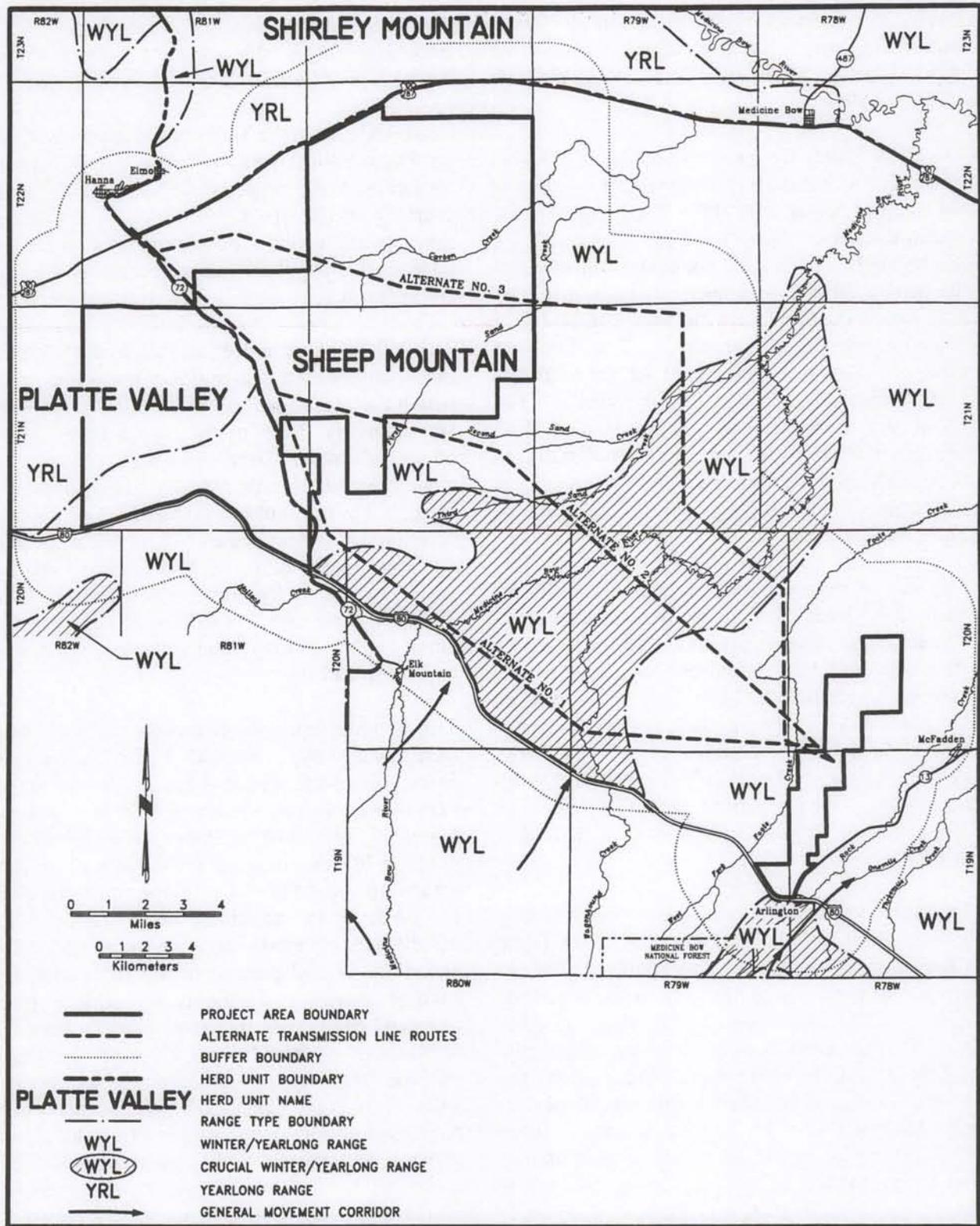
No specific seasonal movement patterns for pronghorn within the KPPA have been delineated by the WGFD. The timing of seasonal movements and the extent to which crucial winter/yearlong range is used are dependent on weather and snow depth (Yoakum 1978, Guenzel 1986, Deblinger 1988). It is likely that pronghorn move to the crucial winter/yearlong range in the central KPPA during severe winters and during periods of severe weather within otherwise normal winters. Ryder and Irwin (1987) determined that winter habitat selection by pronghorn in southcentral Wyoming was dependent on the density and height of big sagebrush and black greasewood in protected terrain. High pronghorn densities occurred 1) in habitats containing an average of 0.5 big sagebrush per 10 ft² (1 m²) on northwestern ridges and benches and 2) in those habitats containing black greasewood mixed with big sagebrush in stands averaging 0.4 shrubs per 10 ft² (1 m²) in draws and lowland flats. The sagebrush shrubland and greasewood vegetation types cover much of the western KPPA, including most of the Simpson Ridge area (Table 3.9), and likely provide areas of appropriate winter habitat for pronghorn. Pronghorn may use habitats with less dense and lower sagebrush (e.g., top and slopes of Foote Creek Rim) only when snow depths prevent foraging in more protected areas; however, prolonged use of these windblown sites may stress pronghorn (Ryder and Irwin 1987). Pronghorn collared as part of a seasonal movement study for an earlier wind turbine project immediately north of the KPPA moved seasonally within the immediate area of the Medicine Bow River (Yeo et al. 1984). Some pronghorn also moved east into the Foote Creek drainage during the winter months and returned again to the Medicine Bow River in spring. Pronghorn tended to make circular movements through the northern and central portions of the KPPA, selecting habitats based on weather and vegetative structure (Yeo et al. 1984).

The majority of roads within the KPPA are unimproved two-tracks that are only occasionally used by landowners or, seasonally, by hunters. It is unlikely that these unimproved roads impede pronghorn movement within the KPPA. Two improved roads, State Highway 72 (paved) and a county road (gravel), traverse the KPPA from north to south; it is possible that these roads occasionally limit pronghorn movement due to periods of heavy traffic or, during the winter, deep snow in adjacent ditches (Bruns 1977).

Fences can impede pronghorn movement (Autenrieth 1983, Deblinger 1988). Deep snow and poor fence design (e.g., low bottom wire, sheep mesh), in combination, have been reported as significant sources of winter mortality (Yoakum 1978, Deblinger 1988). The fenced ROW along State Highway 72, although passable for most of the year, may impede pronghorn during periods of heavy snowfall in the winter. Some fences within the KPPA likely impede local and seasonal movements of pronghorn; however, no specific problem fences have been reported by the BLM or WGFD.

Mule Deer. Mule deer in the KPPA are part of three herd units: the Platte Valley, Sheep Mountain, and Shirley Mountain Herds (Map 3.11).

The Sheep Mountain Herd occurs on a majority of the KPPA, including all of the Foote Creek Rim area, more than half of the Simpson Ridge area, and in the area between Foote Creek Rim and Simpson Ridge. This herd unit contains Hunt Areas 61 and 74 through 77 (WGFD 1994a). The WGFD population objective for the Sheep Mountain Herd is 15,000 animals, and the estimated post-season population in 1993 was 11,360 animals, or 75.7% of objective (Table 3.10). The five-year population average (1989-1993) was 13,428 animals, or 89.5% of objective. Population estimates for the Sheep Mountain Herd increased from 1986 to 1992, then declined to the 1993 level (WGFD 1994a). Reasons for the decline included high mortality during the winter of 1992-93 and the 1993 harvest



Map 3.11 Mule Deer Herd Units and Range Types.

level. A conservative hunting season in 1994 is expected to result in a population increase of approximately 17% over the 1993 estimate (WGFD 1994a).

The Platte Valley Herd occurs on 29% (17,714 ac) of the KPPA, exclusively in the western portion of the Simpson Ridge area (Map 3.11). Hunt areas within the Platte Valley Herd are 78 through 81, 83, and 161. The WGFD population objective for the herd is 20,000 mule deer; the estimated 1993 post-season population for the herd was 81.4% of objective, or 16,289 animals. The five-year population average (1989-1993) for the herd was 18,685 deer, or 93.4% of objective. The population trend for the Platte Valley Herd between 1989 and 1993 was similar to that for the Sheep Mountain Herd; the 1994 population is anticipated to be slightly more than 96% of objective (i.e., 19,242 deer) (WGFD 1994a).

The Shirley Mountain Herd is located immediately north of Highway 30 and covers the northernmost 4.9 ac of the three transmission line routes near Hanna (Map 3.11). Population attributes of this herd are described in Table 3.10. The Shirley Mountain Herd peaked in 1991 at approximately 11,000 animals, and declined in 1992 and 1993 (WGFD 1994a). The WGFD anticipates that the population of this herd will increase to approximately 85% of objective (i.e., 8,537 deer) in 1994.

The Sheep Mountain Herd covers approximately 71% (42,890 ac) of the KPPA. All of the Foote Creek Rim area (5,000 ac) and 68% (37,179 ac) of the Simpson Ridge area are winter/yearlong range for this herd (Map 3.11). The only mule deer crucial winter/yearlong range within the KPPA occurs between Foote Creek Rim and Simpson Ridge in dissected terrain associated with the Medicine Bow River. Oedekoven and Lindzey (1987) determined that mule deer in southwestern Wyoming tended to use sagebrush habitats at lower elevations in areas with the least snow depth and cover during winter. Mule deer generally avoid areas where snow depth is greater than 18 inches (50 cm) (Gilbert et al. 1970).

All three transmission line routes cross crucial mule deer range, with acreage traversed ranging from 66 ac (Alternate 2) to 112 ac (Alternate 1).

The remainder of the Simpson Ridge area is within the Platte Valley Herd Unit, and is split between winter/yearlong range [7,299 ac (13%)] and yearlong range [10,414 ac (19%)]. Yearlong range is that which a population or a substantial portion of a population uses throughout the year (WGFD n.d.).

The 260 ac of mule deer crucial winter/yearlong range crossed by the three transmission line routes within the central portion of the KPPA represents approximately 0.2% of this range type for the Sheep Mountain Herd. About 6% of the winter/yearlong range for the Sheep Mountain Herd is located within the KPPA. The KPPA encompasses approximately 1% of the mule deer winter/yearlong range and about 5% of the yearlong range for the Platte River Herd. Virtually none (i.e., <0.1%) of the yearlong range for the Shirley Mountain Herd is located within the KPPA.

Two hundred and one observations of mule deer were incidentally recorded during raptor and passerine surveys within 0.5 mi (0.8 km) of the Foote Creek Rim area between April 20, 1994 and March 17, 1995 (Mariah 1994a, 1995). Nearly all of the mule deer observed in the Foote Creek Rim area were along the eastern slope and were close to trees. In addition, three bucks were consistently observed crossing back and forth across the central portion of the rim during the summer months. Excluding the cushion plant grassland community that covers most of the top of Foote Creek Rim (Map 3.7), mule deer likely use the majority of communities within and adjacent to Foote Creek Rim. Of 96 mule deer observations within the Foote Creek Rim area between September 1, 1994 and March 17, 1995, for which age and sex information was recorded, 49 (51.0%) were adult females, 14 (14.6%) were adult males, and 33 (34.4%) were fawns.

Eighty-five mule deer observations were incidentally recorded during avian surveys within or immediately adjacent to the Simpson Ridge area between March 10, 1994 and March 13, 1995 (Mariah 1994a, 1995). Mule deer were observed in several locations along the various survey routes, but were invariably seen in areas of relatively dense sagebrush cover and/or steep terrain; many were also observed close to stands of trees (e.g., aspen). Of 65 observations within the Simpson Ridge area between February 13, 1994 and March 13, 1995, 47 (72.3%) were adult females, 2 (3.1%) were adult males, and 16 (24.6%) were fawns.

Based on general movement patterns delineated by the WGFD, mule deer generally migrate onto crucial ranges within the KPPA from the south (i.e., across I-80) (Map 3.11). Crucial winter/yearlong range within the KPPA is associated with the riparian habitat along the Medicine Bow River. Although specific mule deer movement patterns within the KPPA are unknown, it is likely, especially during severe winters, that mule deer move out of the Simpson Ridge and Foote Creek Rim areas and into this range.

As with pronghorn, existing roads within the KPPA probably do not interfere with mule deer migration routes. Easterly et al. (n.d.) found that roads associated with oil and gas fields in mule deer crucial winter range (central Wyoming) did not interfere with mule deer use of the area. However, occasional heavy traffic (e.g., along State Highway 72) may preclude mule deer crossings for short periods of time. Although fences generally do not impede mule deer movement, deep snow and startling events (e.g., the rapid approach of a vehicle) can make fences a source of mortality. Fence kills accounted for 13% of 144 mule deer deaths caused by factors other than hunting and winterkill in the Ruby-Butte Deer Herd in Nevada (Papez 1976). It is likely that the only fences within or immediately adjacent to the KPPA that substantially impede mule deer movements are those south of the area along I-80 (these are 8 ft 2 in [2.5 m] high).

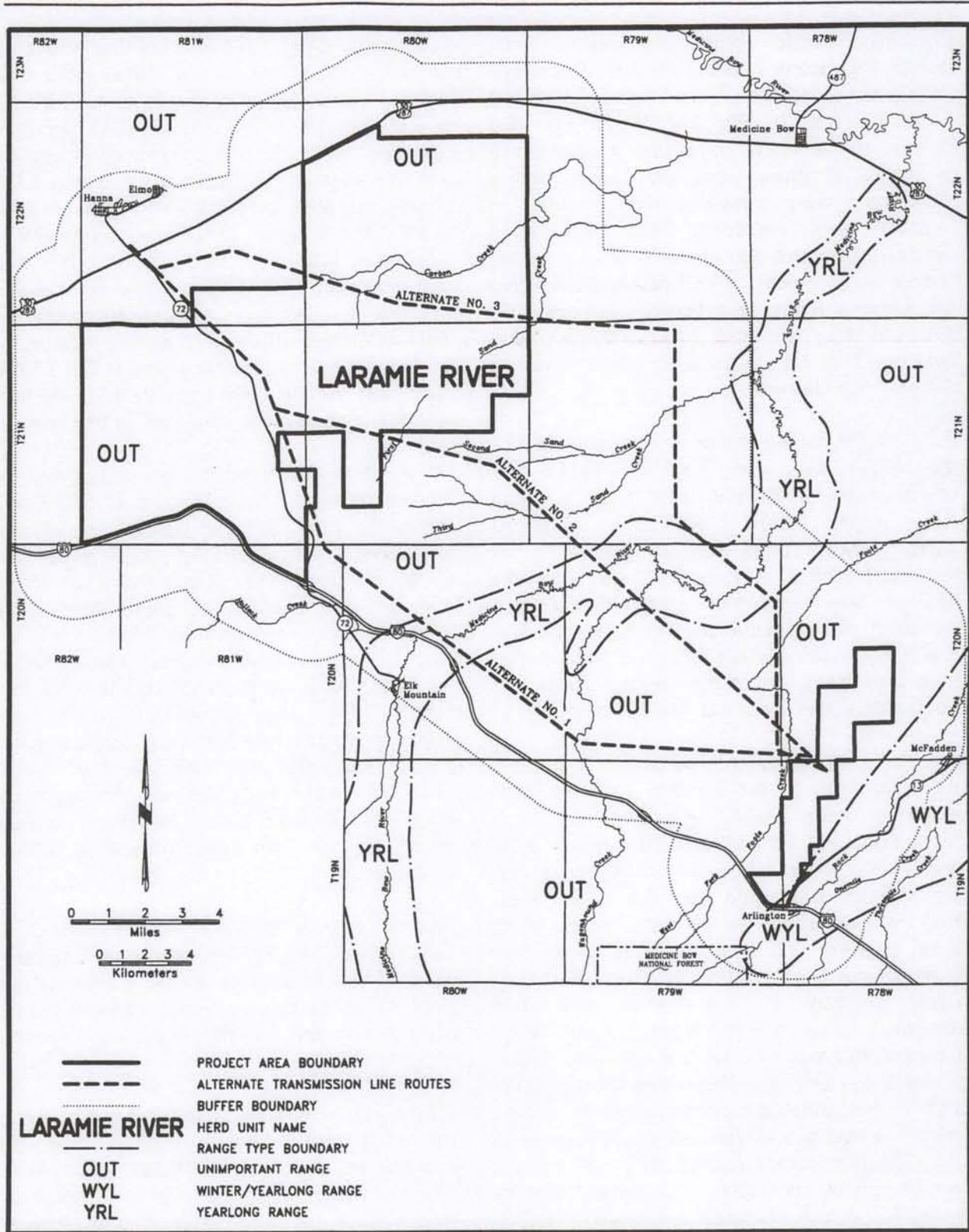
White-tailed Deer. White-tailed deer within the KPPA belong to the Laramie River Herd Unit, which consists of Hunt Areas 70 through 81, 83, and 161 (WGFD 1994a). The WGFD population objective for this herd is 1,000 animals, and the 1993 post-season population estimate was 1,022 white-tailed deer, or 102.2% of objective (Table 3.10). The five-year population average (1989-1993) was 118.9% of objective, or 1,189 deer. The population of the Laramie River Herd peaked in 1992 at 1,284 deer; the dramatic decline in 1993 was largely due to high mortality during the winter of 1992-93 (WGFD 1994a). The WGFD anticipates that the 1994 population for the herd will be slightly less than objective, or 983 animals.

Dense deciduous riparian communities are the favored habitat of white-tailed deer (Clark and Stromberg 1987). In the areas within and adjacent to the KPPA, white-tailed deer habitat is restricted to the Medicine Bow River and Rock Creek drainages and adjacent floodplains (Map 3.12). The southernmost portion of the Foote Creek Rim area (149 ac) is considered winter/yearlong range; the remainder is not considered white-tailed deer habitat (Table 3.11). According to WGFD range maps, no white-tailed deer habitat occurs within the Simpson Ridge area. All three transmission line routes cross white-tailed deer yearlong range associated with the Medicine Bow River; acreage traversed ranges from 23 ac (Alternate 1) to 30 ac (Alternate 3).

The 149 ac of white-tailed deer winter/yearlong range within the KPPA represents approximately 0.1% of this range type for the Laramie River Herd. Yearlong range traversed within the KPPA (81 ac) represents less than 0.1% of this habitat within the herd unit.

Twelve observations of white-tailed deer occurred within 0.5 mi (0.8 km) of the Foote Creek Rim area between April 20, 1994 and November 2, 1994. All twelve observations were below the eastern slope of Foote Creek Rim in areas of aspen and other dense vegetation. No white-tailed deer were observed between November 3, 1994 and March 17, 1995 (Mariah 1994a, 1995).

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Map 3.12 White-tailed Deer Herd Units and Range Types.

White-tailed deer have not been observed within the Simpson Ridge area (Mariah 1994a, 1995).

White-tailed deer movement within and adjacent to the KPPA occurs along the Medicine Bow and Rock Creek drainages and adjacent floodplains and wet meadows. Seasonal movement is limited in extent and likely consists of localized shifts [i.e., 10 to 20 mi (16-32 km)] within the riparian corridors (Halls 1978).

Elk. Elk in the KPPA are part of the Snowy Range Herd, which includes Hunt Areas 8 through 12, 110, and 114 (WGFD 1994a) (Map 3.13). The WGFD population objective for the Snowy Range Herd is 4,900 animals, and the estimated post-season population in 1993 was 6,888 elk, or 140.6% of objective (Table 3.10). The five-year population average (1989-1993) was 6,188 animals, or 126.3% of objective. The population of the Snowy Range Herd increased from 1991 to 1993, at which point it was at its highest level since 1986 (WGFD 1994a). A liberal hunting season in 1994 is expected to reduce the population slightly, to approximately 6,515 elk.

Elk winter range is generally associated with foothills, rugged terrain, and washes located within sagebrush-grassland habitats (Lyon and Ward 1982). Winter range is that range used by a population or portion of a population annually in substantial numbers only during winter, and crucial winter range is defined as winter range which determines whether a population maintains and reproduces itself at or above the WGFD population objective over the long-term (WGFD n.d.).

All of the Foote Creek Rim area is considered winter/yearlong habitat for the Snowy Range Herd, as are 36,147 ac (65.8%) in the Simpson Ridge area (Table 3.11). The remainder of the Simpson Ridge area is outside of any elk herd unit and is considered unimportant to elk. The central area between Foote Creek Rim and Simpson Ridge contains elk winter/yearlong range. Between 207 ac (Alternate 2) and 269 ac (Alternate 3) of

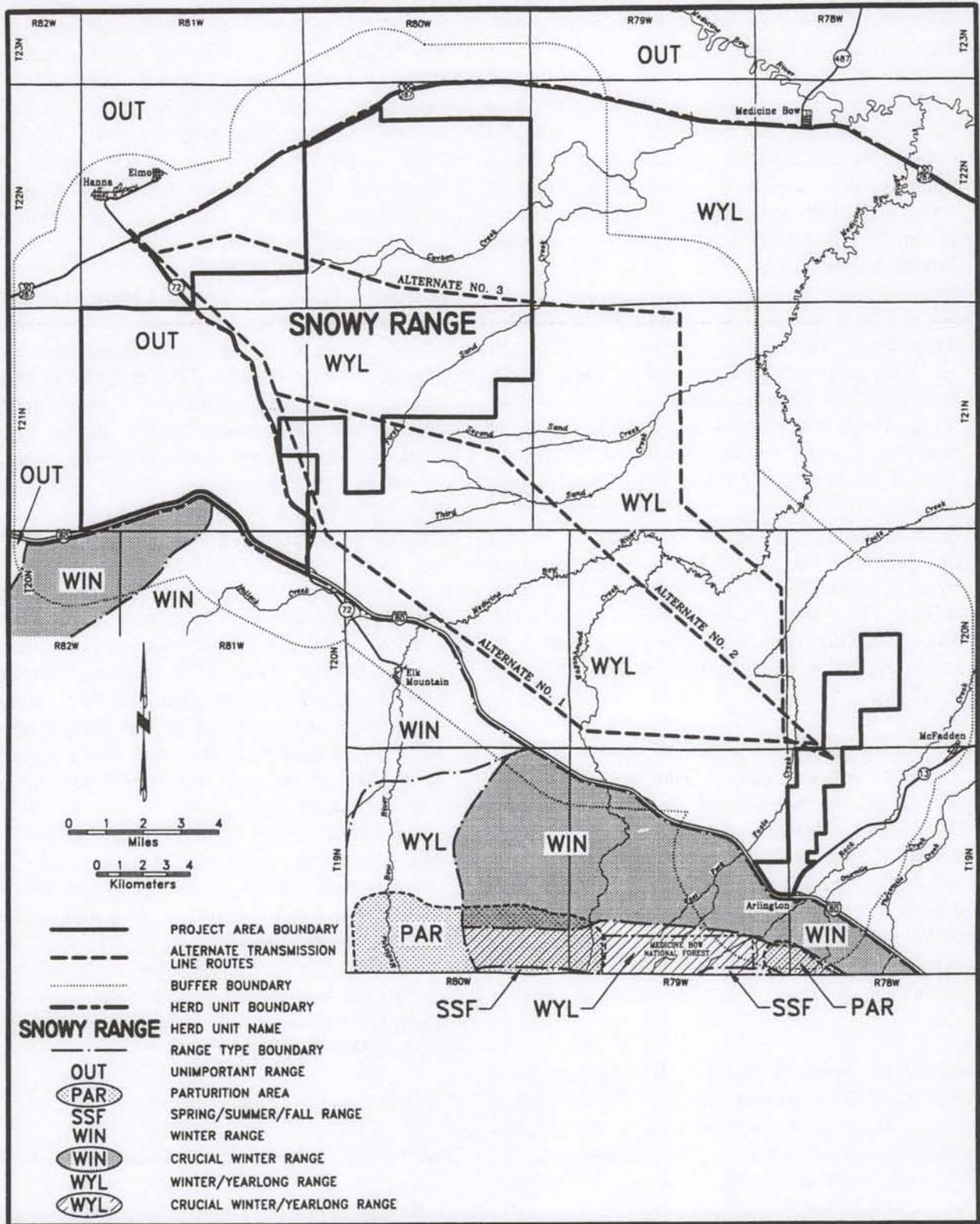
elk winter/yearlong range would be crossed by the proposed transmission line. Elk crucial winter and winter/yearlong range exists across I-80 immediately south of Foote Creek Rim; parturition (birthing) areas are also located south of I-80 and Foote Creek Rim. The 41,858 ac of elk winter/yearlong range within the KPPA represents approximately 19% of this range type within the Snowy Range Elk Herd.

Between February 23, 1994 and March 17, 1995, 245 observations of elk were recorded within 0.5 mi (0.8 km) of the Foote Creek Rim area (Mariah 1994a, 1995). The majority of these observations (79.2%) occurred during March, although elk have been observed in the Foote Creek Rim area every month of the observation period except September-November 1994 and February 1995. A herd of 40 to 50 bull elk was observed on several occasions during March 1994 both on the top of Foote Creek Rim and the flats below the western slope of the rim. Also, approximately 25 cow elk and young were observed using the eastern slope of the rim in March 1994 and March 1995. Although some of these elk may move south across I-80 to access higher elevation summer range, it is likely that the majority remain in the Foote Creek Rim area year-round. Winter use of the rim is evidenced by the large amount of sign and tracks observed in the central and southern portions of the rim during February, March, and April. Approximately 550 elk were observed repeatedly between January 20 and March 8, 1995, 1-2 mi (2-3 km) southwest of the Foote Creek Rim area.

No elk have been incidentally observed within the Simpson Ridge area during raptor and passerine surveys (Mariah 1994a, 1995).

3.2.2.2 Other Mammals

Based on field observations (Mariah 1994a, 1995) and range and habitat preference (Clark and Stromberg 1987, WGFD 1992), 54 mammal species are known to occur or are likely to occur within the KPPA (Appendix D).



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Map 3.13 Elk Herd Units and Range Types.

Predator species known to occur or potentially occurring in the area are coyote, red fox, swift fox, black bear, raccoon, ermine, long-tailed weasel, mink, badger, western spotted skunk, striped skunk, mountain lion, and bobcat (Clark and Stromberg 1987, WGFD 1992, Mariah 1994a, 1995).

Lagomorph species include desert cottontail, mountain cottontail, and white-tailed jackrabbit (Clark and Stromberg 1987, WGFD 1992, Mariah 1994a, 1995).

Sciurids (i.e., squirrels) known to occur or potentially occurring within the KPPA include least chipmunk, yellow-bellied marmot, Wyoming ground squirrel, thirteen-lined ground squirrel, golden-mantled ground squirrel, white-tailed prairie dog, and red squirrel (Clark and Stromberg 1987, WGFD 1992, Mariah 1994a, 1995). Other rodents in the area include northern pocket gopher, olive-backed pocket mouse, Ord's kangaroo rat, beaver, deer mouse, western harvest mouse, white-footed mouse, northern grasshopper mouse, bushy-tailed woodrat, several species of voles (i.e., heather, montane, long-tailed, prairie, and sagebrush), muskrat, western jumping mouse, and porcupine. Several species of shrews (i.e., masked, dusky, water, and Merriam's) and bats (i.e., silver-haired, big brown, hoary, and little brown myotis) are also likely to occur on the KPPA.

3.2.2.3 Raptors

All raptors and their nests are protected from take or disturbance under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-711) and Wyoming Statute (W.R.S. 23-1-101, 23-3-101, and 23-3-108 and Chapter LII, Section 4, of the WGFD Regulations). Certain species are also afforded protection under the Bald Eagle Protection Act (BEPA) (16 U.S.C. 668-688d) and Endangered Species Act (ESA) (16 U.S.C. 1513-1543). Section 4.2.3.3 contains a discussion of laws protecting birds inhabiting or using the KPPA.

During weekly passerine surveys conducted in the Foote Creek Rim area between mid-February 1994 and mid-March 1995, the locations of all raptors observed were mapped. Quantitative raptor use data also were collected using a skyline watch technique (Mariah 1979). Raptor species composition in the Simpson Ridge area was determined through biweekly surveys; more quantitative surveys will be implemented in this area prior to Windplant development. See Appendix A in the DEIS for details regarding raptor sampling methodology.

The entire KPPA is considered suitable habitat for raptor hunting, foraging, and perching (Table 3.11). Raptor species observed within the KPPA and adjacent areas in 1994 are turkey vulture, osprey, bald eagle, northern harrier, sharp-shinned hawk, northern goshawk, broad-winged hawk, Swainson's hawk, red-tailed hawk, ferruginous hawk, rough-legged hawk, golden eagle, American kestrel, merlin, peregrine falcon, prairie falcon, great horned owl, short-eared owl, and northern saw-whet owl (Mariah 1994a, 1995). Other raptor species observed within or adjacent to the KPPA in past years include Cooper's hawk, barn owl, eastern screech owl, and long-eared owl (WGFD 1994b). Most breeding species in the area migrate south during the winter; however, golden eagles, bald eagles, and great horned owls remain year-round. Rough-legged hawks move into the KPPA during the winter and move north during the breeding season. Peregrine falcons were observed hunting in the KPPA during all seasons except winter 1994-95 (Section 3.2.3).

The total number of raptor species observed during passerine surveys (i.e., February 1994 to March 1995) ranged from 1 (February 1994, January-February 1995) to 13 (May) on the western side of Foote Creek Rim, and from 0 (January 1995) to 9 (June and July) on the eastern side; the eastern side of the rim was not surveyed between February and mid-May 1994. The number of raptor species observed during raptor use surveys (i.e., June 1994 to March 1995)

ranged from 2 (December 1994, February-March 1995) to 10 (August) on the western side, and 1 (December 1994, February 1995) to 11 (August) on the eastern side.

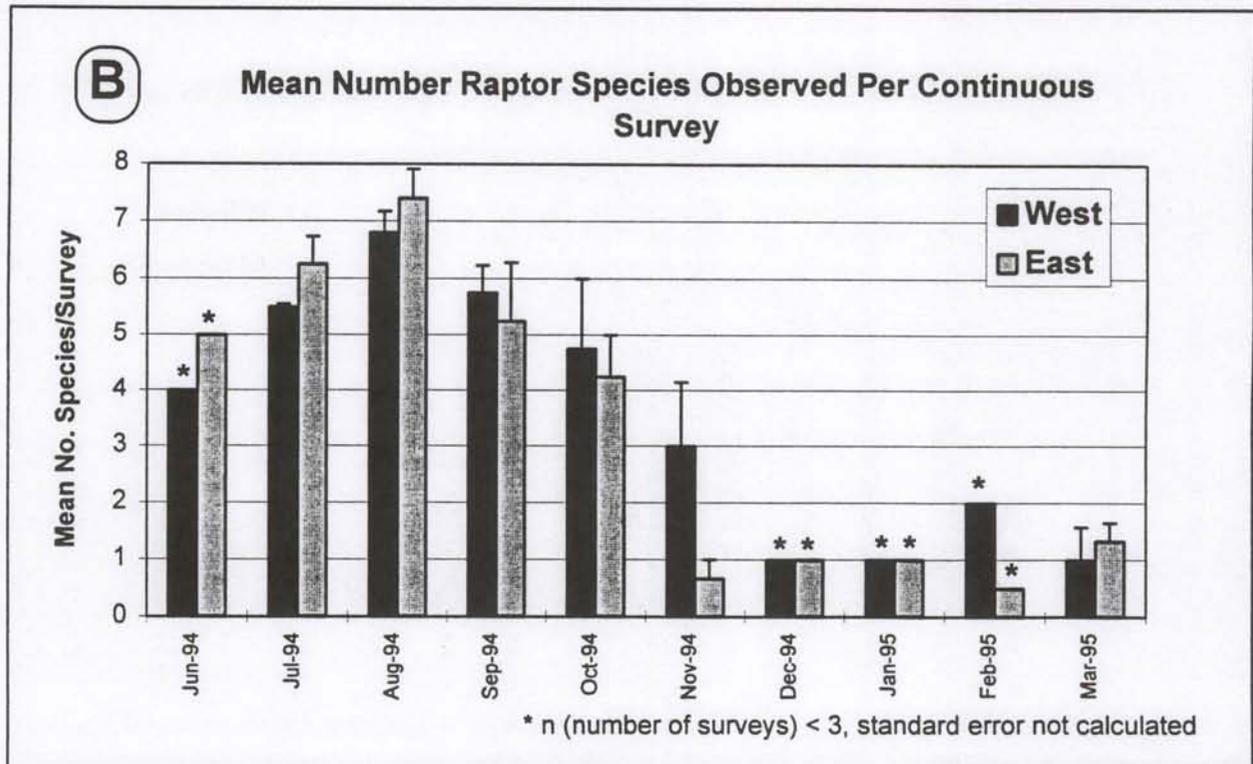
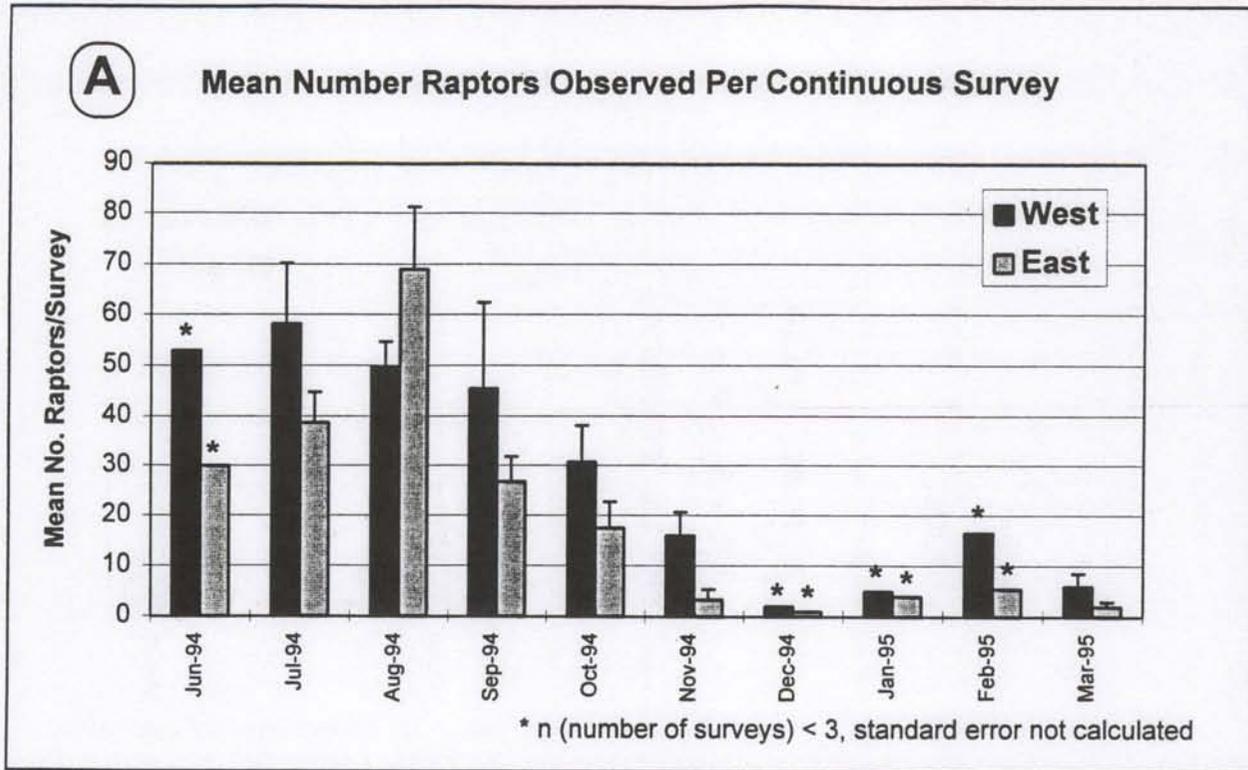
Raptor species observation data were summarized by averaging the number of raptor species observed per survey for each month [Figures 3.2(A), 3.2(B)]. These numbers are slightly higher than those presented in the DEIS, which were calculated by dividing the total number of species observed per month by the number of survey days in that month. This resulted in the lower averages in the DEIS, since many species were observed during more than one survey day per month. The mean number of raptor species observed during passerine surveys along Foote Creek Rim was highest from April to September, and decreased with the approach of winter [Figure 3.2(A)]. The mean number of raptor species observed during raptor use surveys peaked in August and September, possibly indicating a southbound movement of migrating species through the area; the increase may also have resulted from dispersal of young from nests in the area [Figure 3.2(B)]. The mean number of raptor species observed per month was relatively low throughout the winter, with 0-3 species observed per month. Overall, the mean number of raptor species observed during raptor use surveys was higher than that observed during passerine surveys due to the longer observation period associated with the former survey method.

Along the western side of Foote Creek Rim, the highest mean number of raptor observations per passerine survey occurred in June, July, and August [Figure 3.2(C)]. Except for September and October, the mean number of raptor observations per passerine survey was greatest along the western side during every month surveyed. This greater use of the western side is probably related to the favorable soaring conditions generated by the prevailing westerly and southwesterly winds flowing up and over the western side of the rim. Along the eastern side of the rim, the mean number of raptor observations per raptor use survey was highest in August [Figure 3.2(D)].

Possible reasons for this peak include a large number of American kestrel observations (including juveniles) along the eastern side and a period of southeasterly and east-southeasterly winds during the month. Raptor observations declined in October and November, and remained low throughout the winter. In general, golden eagles comprised the majority of raptors observed in all months during both passerine and raptor surveys; American kestrels and red-tailed hawks were also frequently observed during the spring and summer months. Raptor observations during the winter included several rough-legged hawks, a common winter resident of the area.

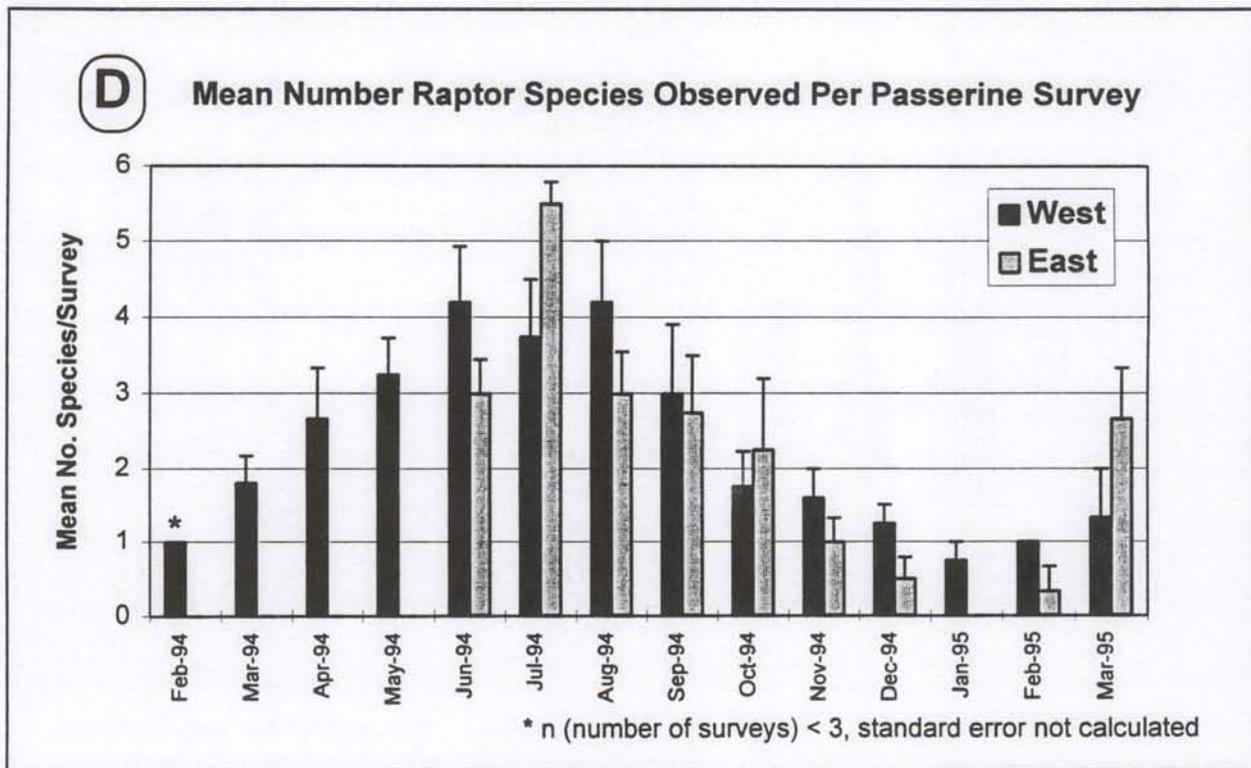
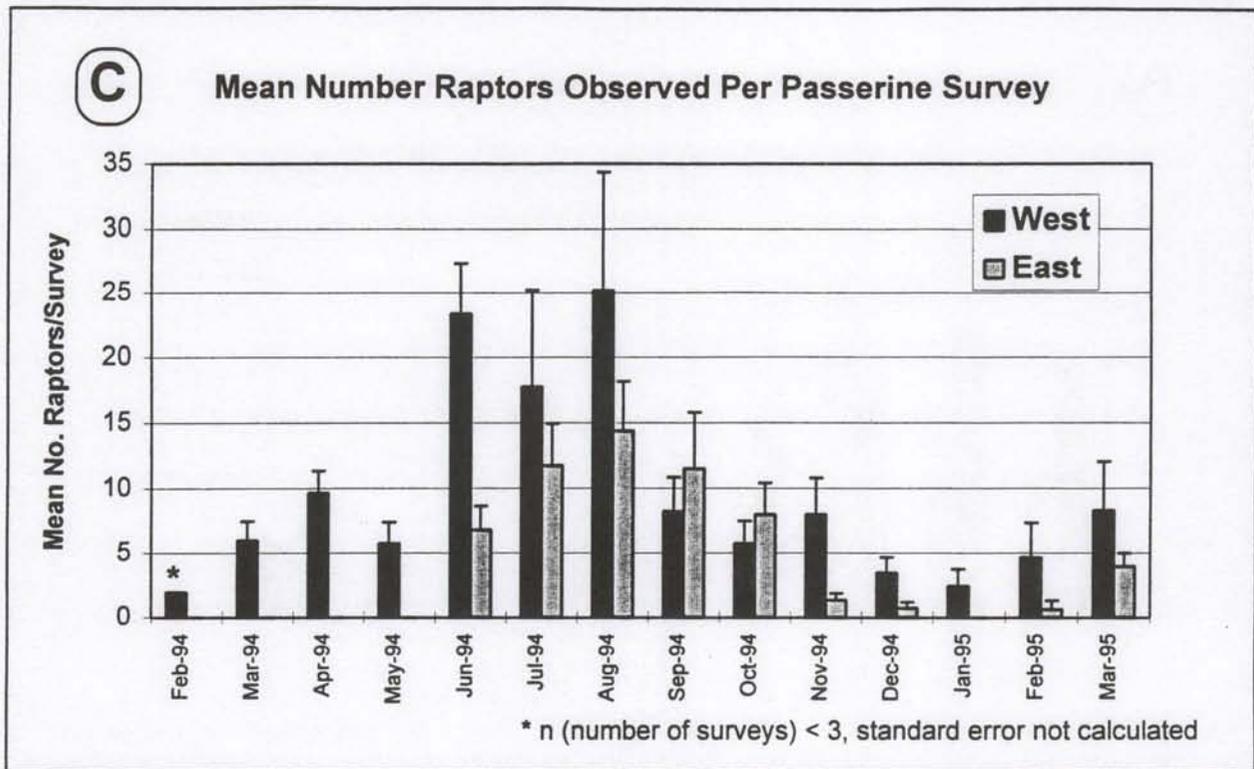
The intensity of raptor activity within the Foote Creek area is displayed in Maps 3.14-3.16. Overall, raptor use of Foote Creek Rim was concentrated along the western edge of the rim. Eagles (i.e., golden and bald) were observed most frequently along the western side of the rim. Two areas accounted for the majority of eagle observations--the central western slope and a ridge jutting from the northwestern portion of the rim. It is likely that a combination of favorable winds for soaring, a substantial prey base, and preferred perch sites are present in these areas; no nests were found in the areas, and it is unlikely that these areas offer substantial nesting habitat. Eagle use was similar between breeding and nonbreeding seasons (Maps 3.14A-3-14D).

Although somewhat more common on the western side, *buteos* were observed throughout the Foote Creek Rim area. Ferruginous hawk observations were most concentrated in the vicinity and north of the ridge jutting from the northwestern portion of the rim, and breeding and nonbreeding distributions were similar (Maps 3.15A and 3.15B). Red-tailed hawks were observed primarily in the southern half of the Foote Creek Rim area, and used the east side of the rim much more frequently than any other *buteo*. Breeding season observations were concentrated in the Arlington Peak area and along the central western slope. Red-tailed hawk distribution during the breeding season appears to be, at least in part, the result of several active red-tailed hawk nests in



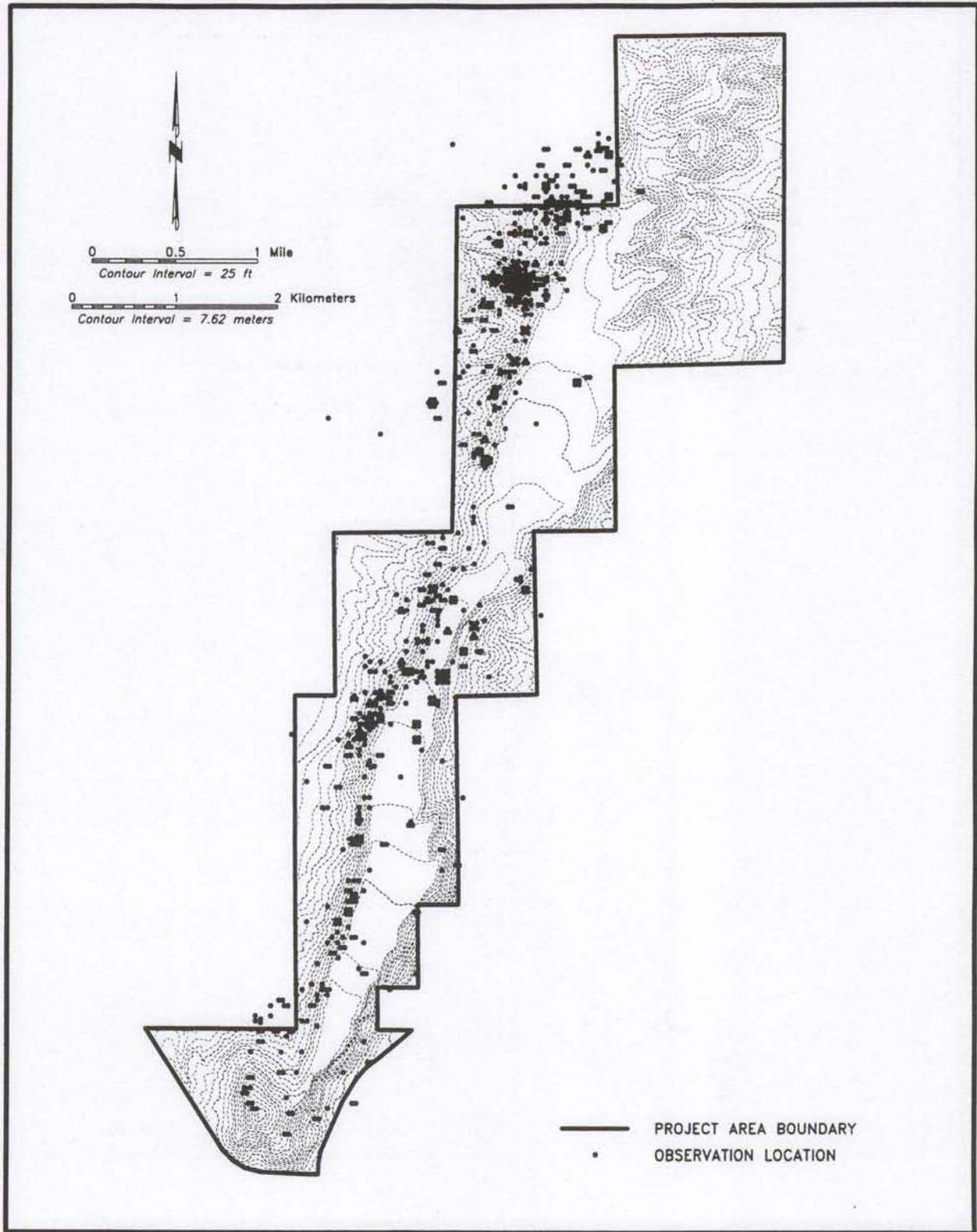
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Figure 3.2 Mean Number of Raptor Observations and Mean Number of Raptor Species Observed during Raptor Use (Continuous) and Passerine Surveys.

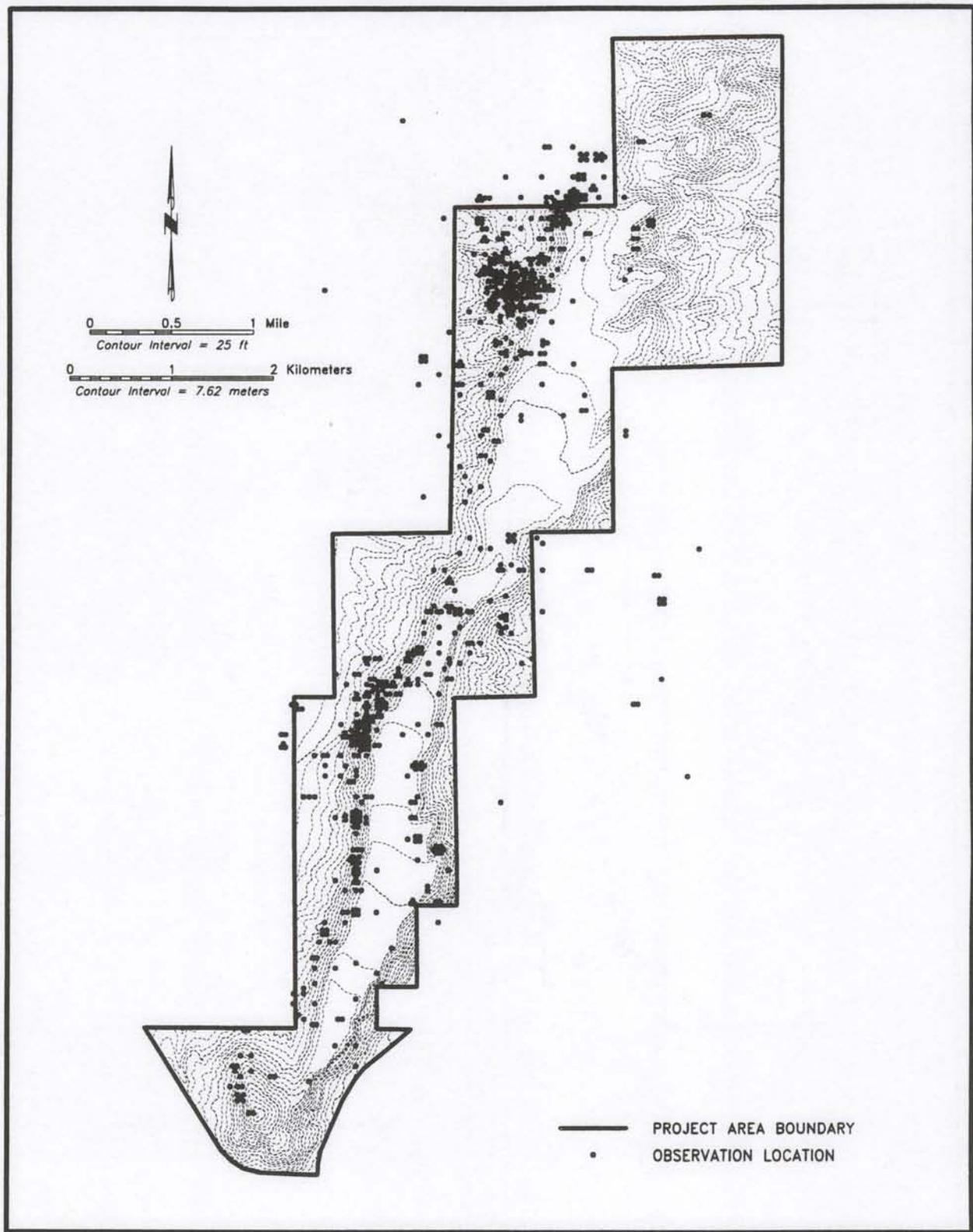


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Figure 3.2 (Continued)

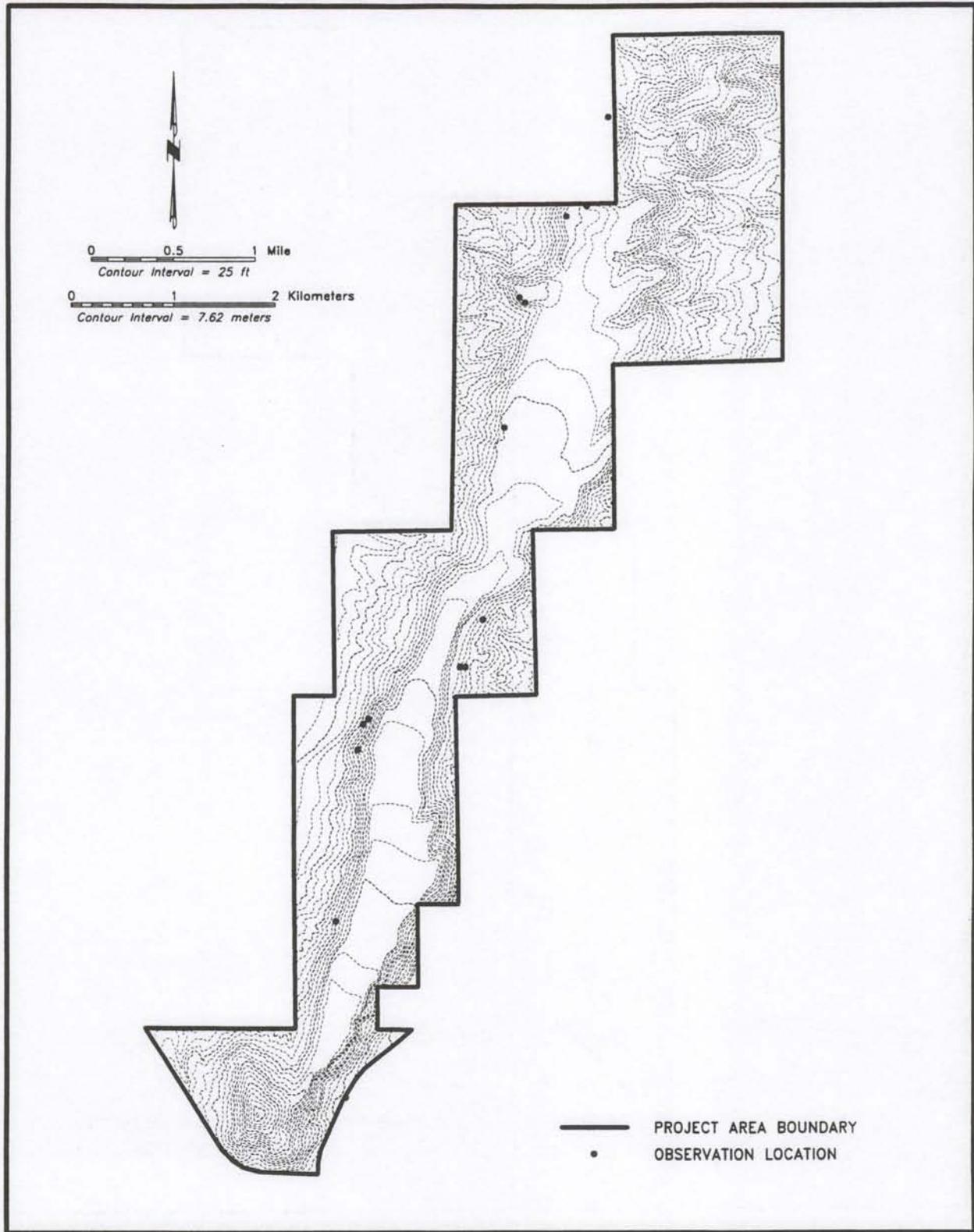


Map 3.14A Eagle Distribution on Foote Creek Rim, Breeding Season, 1994-1995 (n = 792).

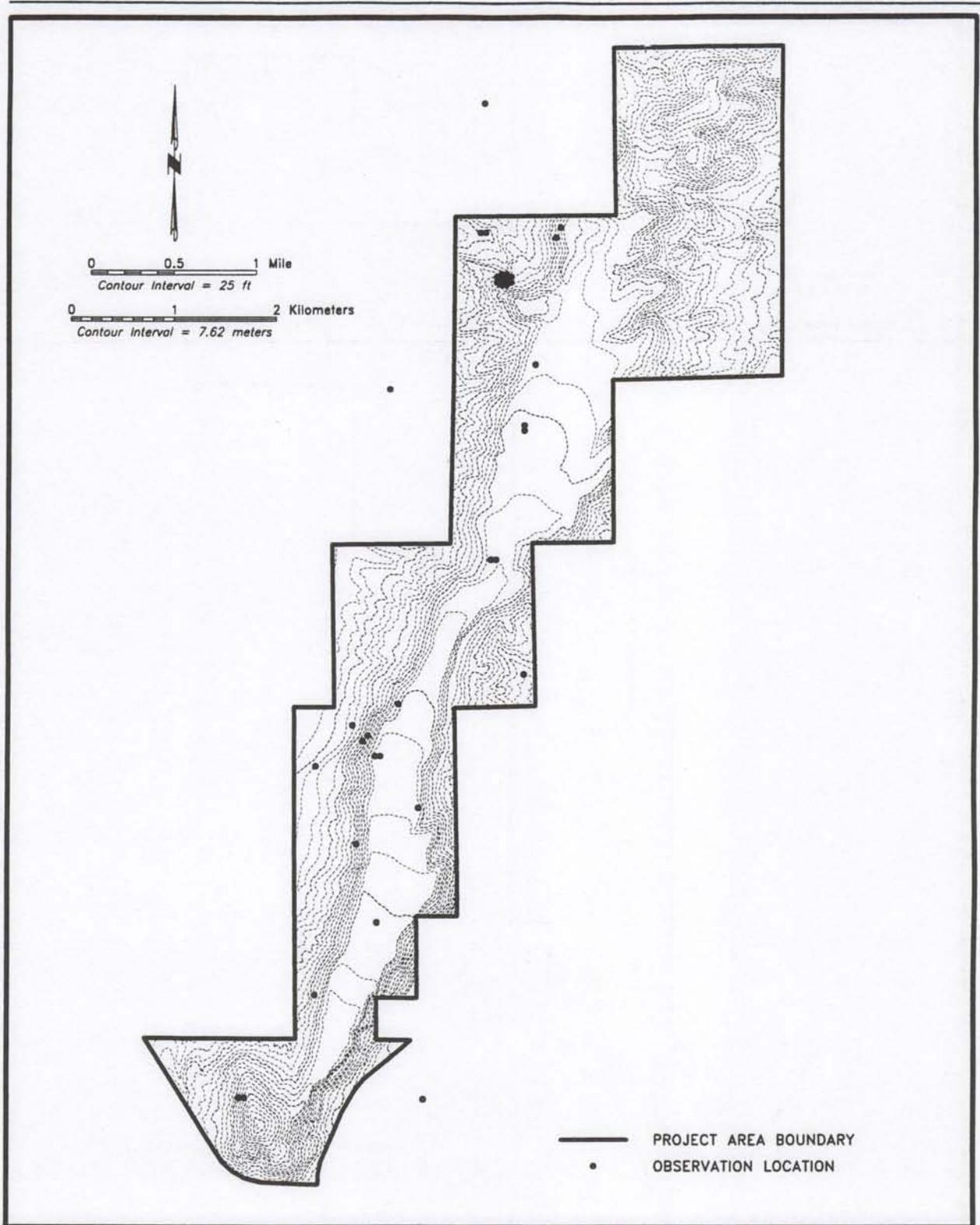


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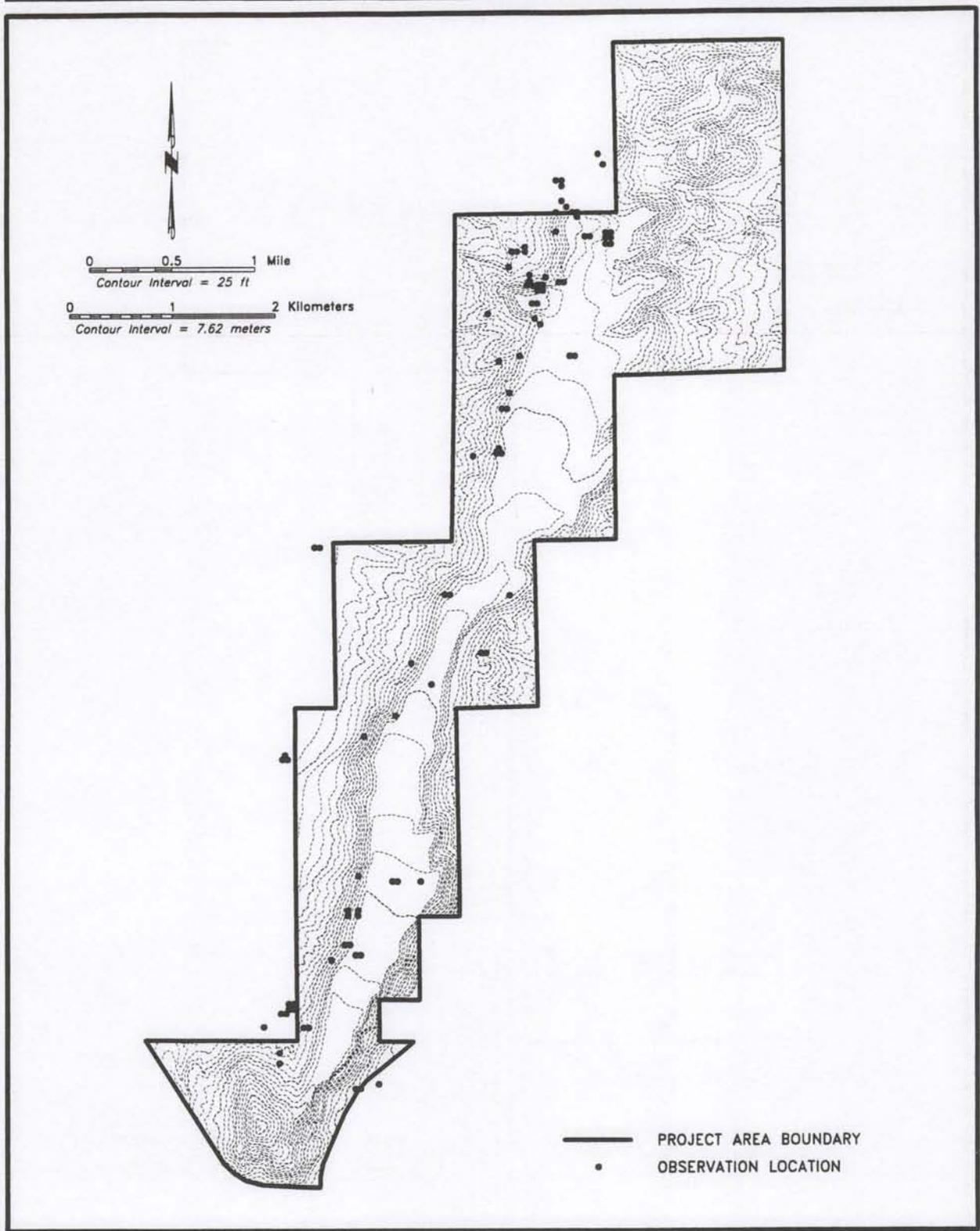
Map 3.14B Eagle Distribution on Foote Creek Rim, Nonbreeding Seasons, 1994-1995 (n = 771).



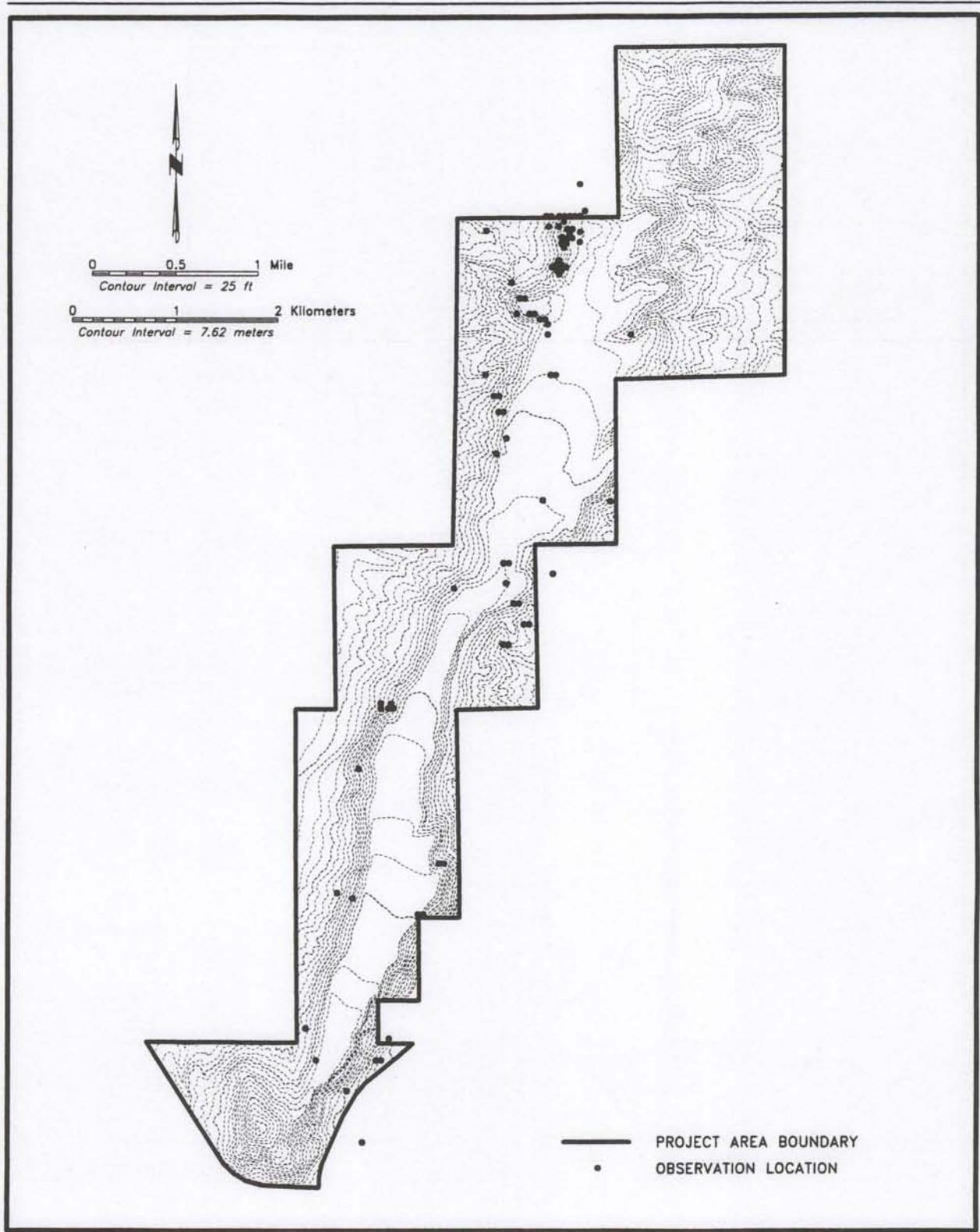
Map 3.14C Bald Eagle Distribution on Foote Creek Rim, Breeding Season, 1994-1995 (n = 14).



Map 3.14D Bald Eagle Distribution on Foote Creek Rim, Nonbreeding Seasons, 1994-1995 (n = 36).



Map 3.15A Ferruginous Hawk Distribution on Foote Creek Rim, Breeding Season, 1994-1995 (n = 93).



Map 3.15B Ferruginous Hawk Distribution on Foote Creek Rim, Nonbreeding Seasons, 1994-1995 (n= 84).

cottonwood trees along Foote Creek. Nonbreeding season observations were similar to breeding season observations, with the exception of a notable absence of observations in the Arlington Peak area and less frequent use of the central western rim (Maps 3.15C and 3.15D). The majority of Swainson's hawk observations occurred during the breeding season. Distribution was relatively even in the southern half of the area, with a few scattered observations in the north (Map 3.15E). Rough-legged hawks were observed almost exclusively during the winter season, and were distributed along the western edge of the rim (Map 3.15F).

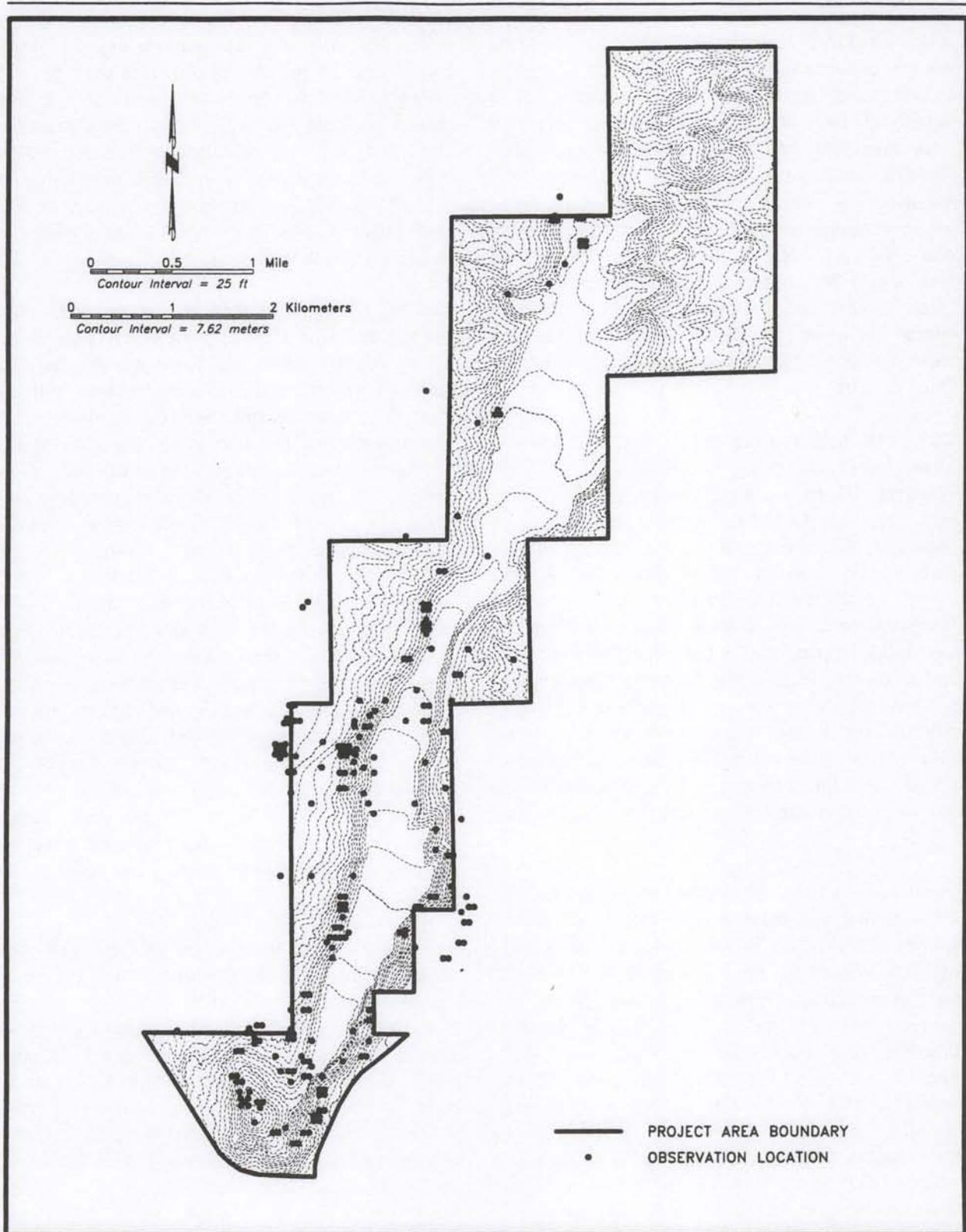
Large falcon (peregrine and prairie) observations were distributed along the length of the rim. Peregrine falcons were primarily seen on the west side, and unlike most of the raptor species observed, used the top of the rim as frequently as eastern and western edges (Maps 3.16A and 3.16B). During the breeding season, prairie falcons were observed most frequently along the west edge, particularly in the Arlington Peak area and along the ridge jutting from the northwestern portion of the rim. Distribution during nonbreeding seasons shows a notable absence of observations in the Arlington Peak area, as well as a decline in the frequency of observations in the northwestern portion of the rim (Maps 3.16C and 3.16D).

Small falcons (i.e., American kestrel and merlin) were among the most evenly distributed raptor species observed on Foote Creek Rim, frequently using the top of the rim, as well as both the east and west edges. American kestrel use of the northern half of the rim was similar between breeding and nonbreeding seasons, but three distinct loci of observations occurred in the southern half of the rim during the summer breeding season which were absent during nonbreeding seasons (i.e., along the section line north of Arlington Peak, along the trees in the southeastern portion of the rim, and along the central western portion of the rim (Maps 3.16E and 3.16F). Merlin observations were distributed throughout the rim (Map 3.16G). Use of point

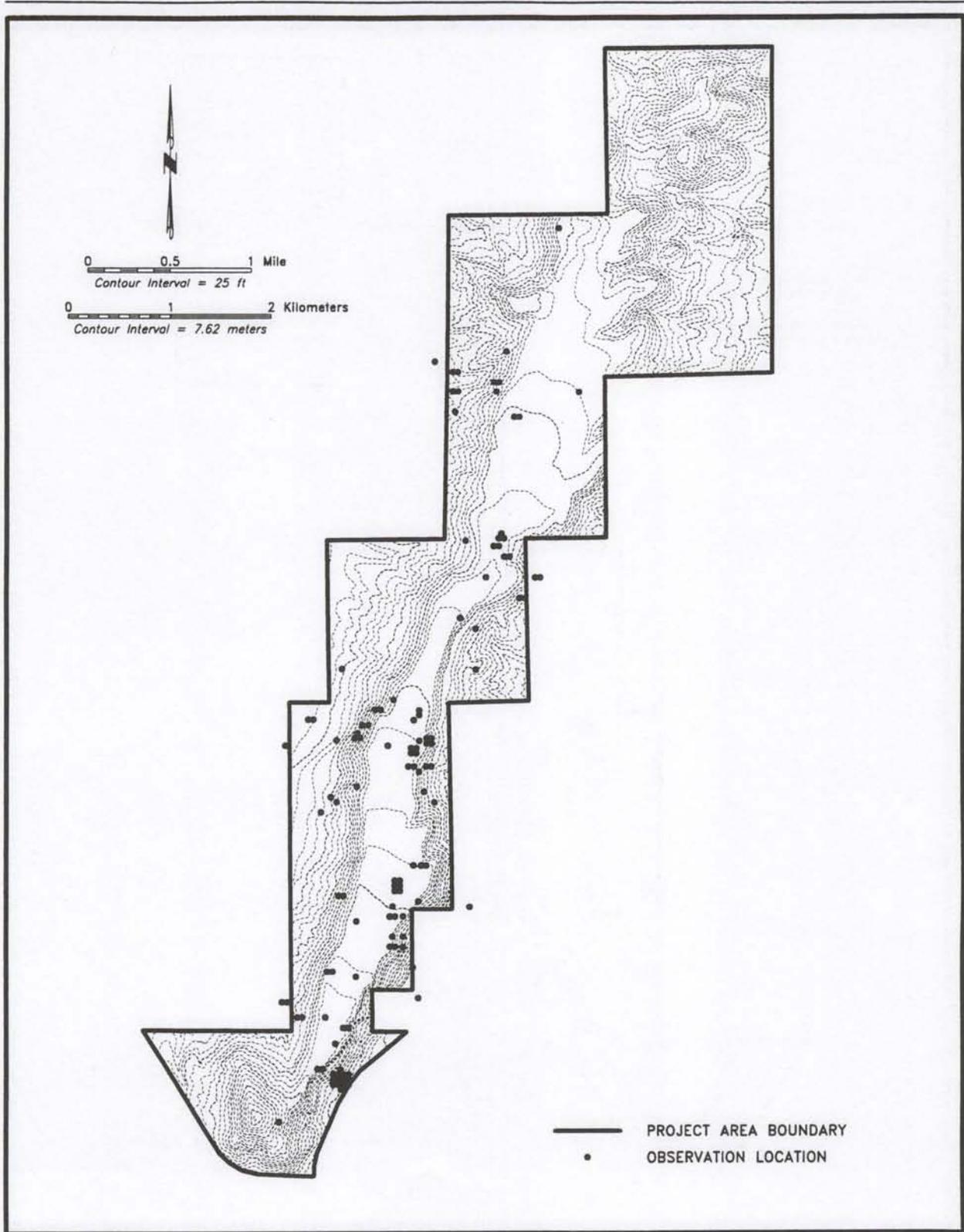
count data to show distribution may be biased because the probability of detection declines with distance from the observation point. The bias should be slight for larger raptors such as eagles and hawks but may be consequential for smaller birds such as kestrels. Map 3.16E may represent a biased distribution; however, some clusters of bird observations are real because kestrels frequently perch on fences.

The flight heights of raptors observed within the Foote Creek Rim area are presented in Table 3.12. Flight height classes are based on the physical parameters of the proposed wind turbines, with the interval between 26 and 184 ft (8-56 m) above the rim representing the area of turbine rotor sweep for those turbines placed on top of the rim. Fifty percent of raptor observations occurred in this flight class; 45% of the raptors were observed 0-26 ft (0-8 m) above the rim. Golden and bald eagles and ferruginous, rough-legged, and red-tailed hawks were observed at the 26-184 ft (8-56 m) flight height class more frequently than at any other class; these birds often soar and hunt within this height class. Peregrine and prairie falcons, Swainson's hawks, and turkey vultures were also commonly observed within this height class. Small falcons (i.e., American kestrel and merlin) and northern harriers were observed most frequently in the 0-26 ft (0-8 m) flight height class. These species hunt by soaring and hovering low over the ground and pouncing on prey (Scott 1987).

Most raptor nests are located in topographically diverse areas, and the numerous rock outcrops, riparian drainages, and cliffs within and adjacent to the KPPA provide suitable substrates for raptor nesting. Aerial and ground surveys for raptor nests within and adjacent to the KPPA were conducted during the spring and summer of 1994. The surveys focused primarily on suitable raptor nesting habitat as defined above, and encompassed the Foote Creek Rim area plus a 10-mi (16-km) buffer (excluding forested land south of I-80) and the Simpson Ridge area and proposed alternate transmission line routes plus a 2-mi (3-km) buffer (see Map 3.16½). The survey area around Foote

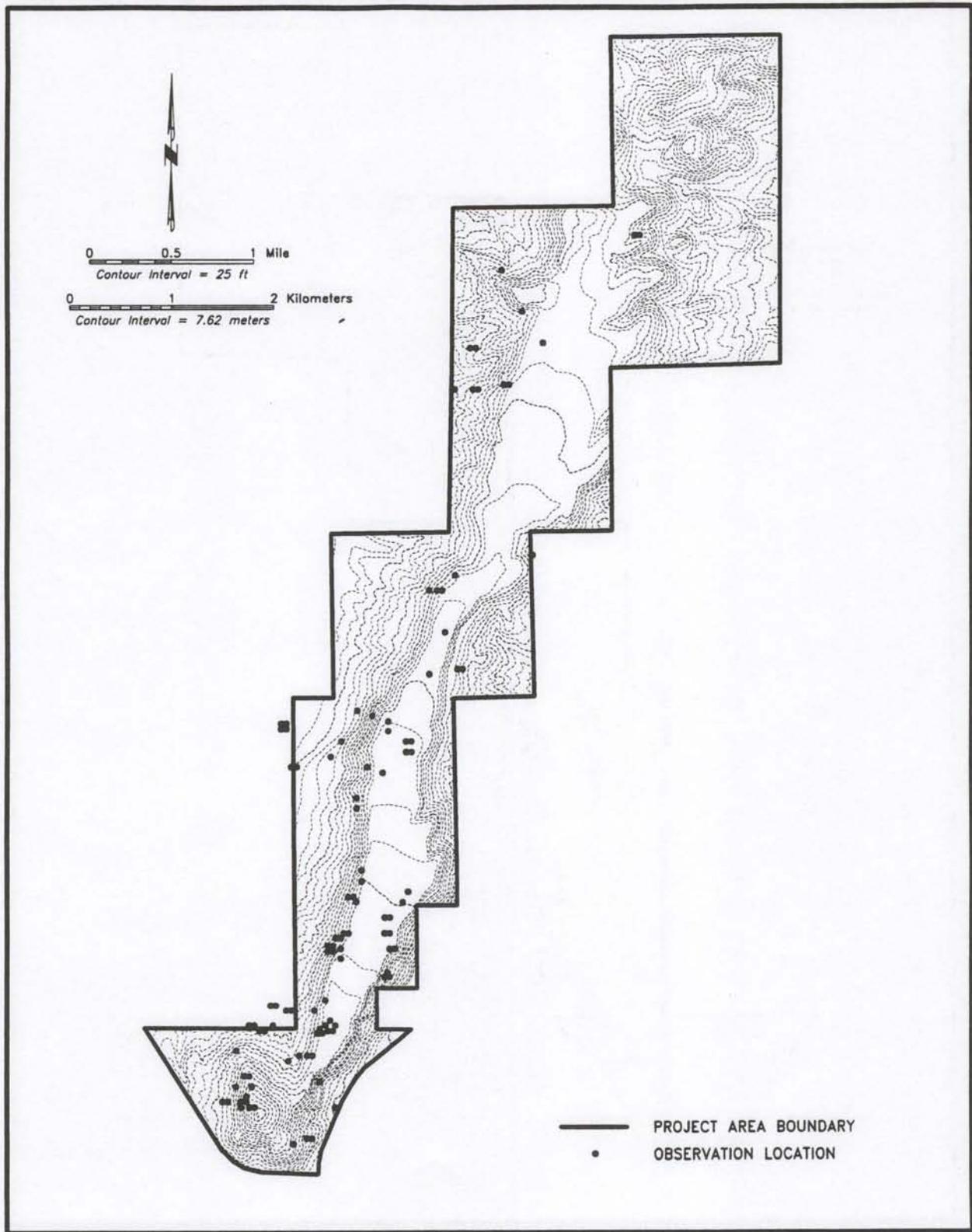


Map 3.15C Red-tailed Hawk Distribution on Foote Creek Rim, Breeding Season, 1994-1995 (n = 225).

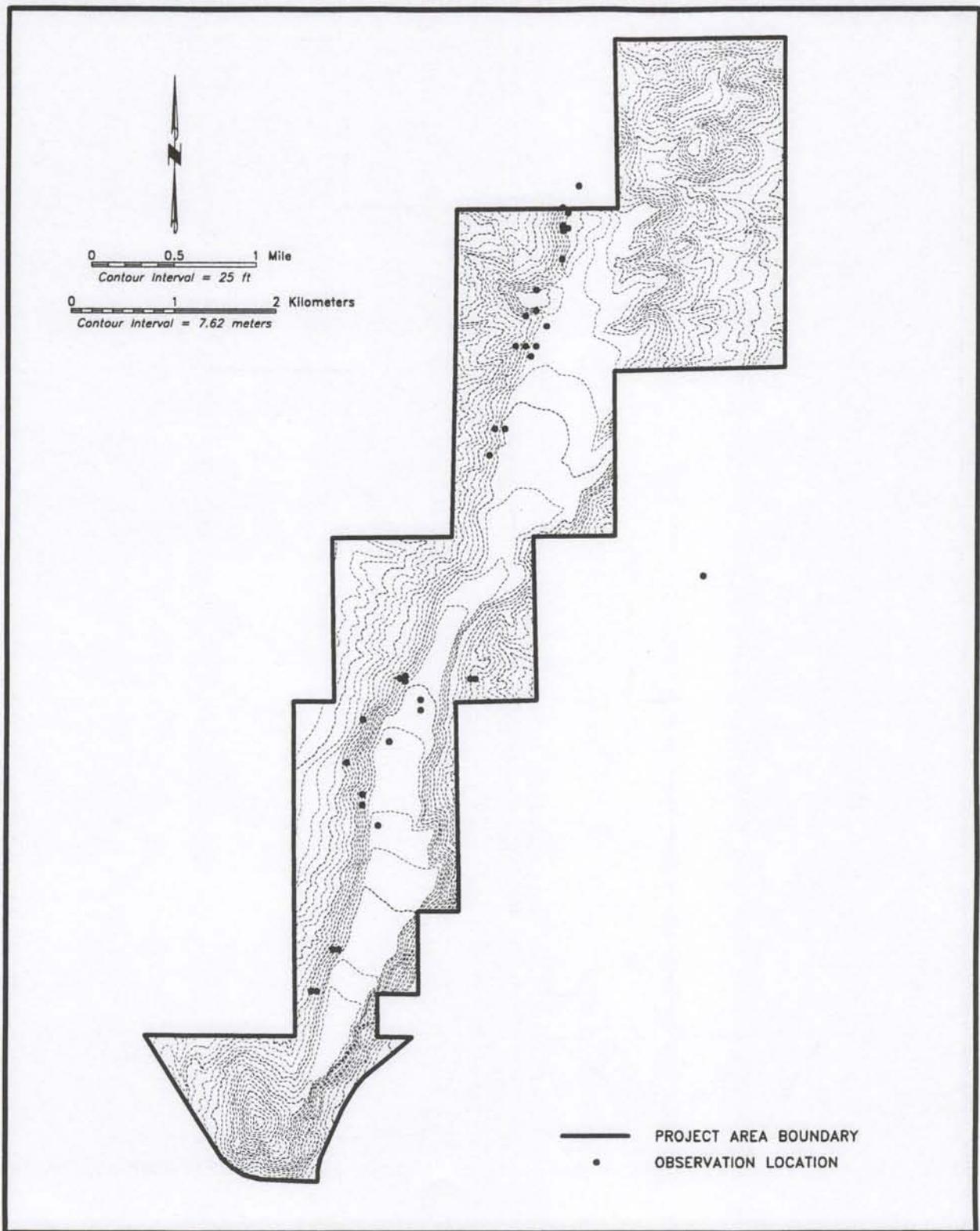


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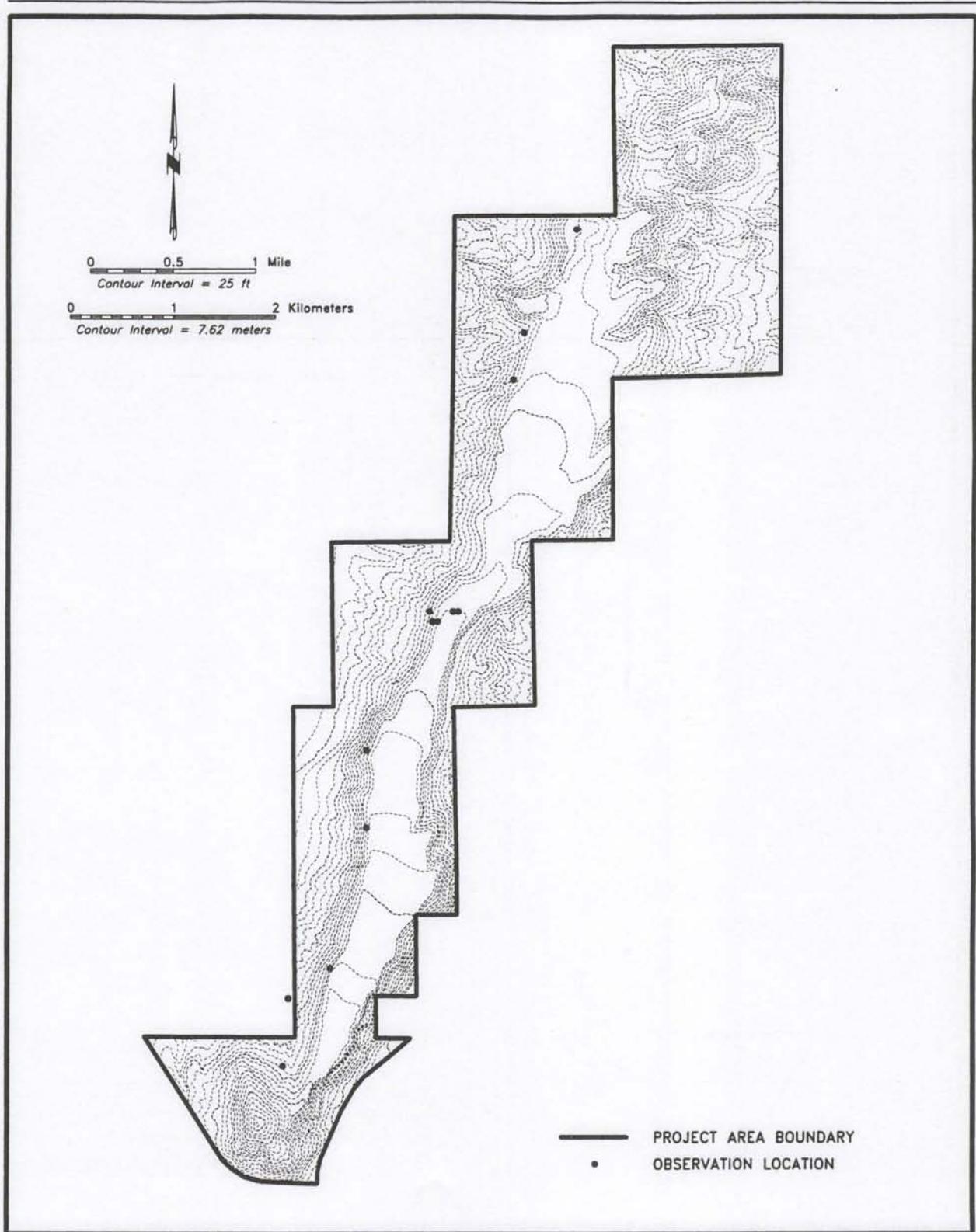
Map 3.15D Red-tailed Hawk Distribution on Foote Creek Rim, Nonbreeding Seasons, 1994-1995 (n = 120).



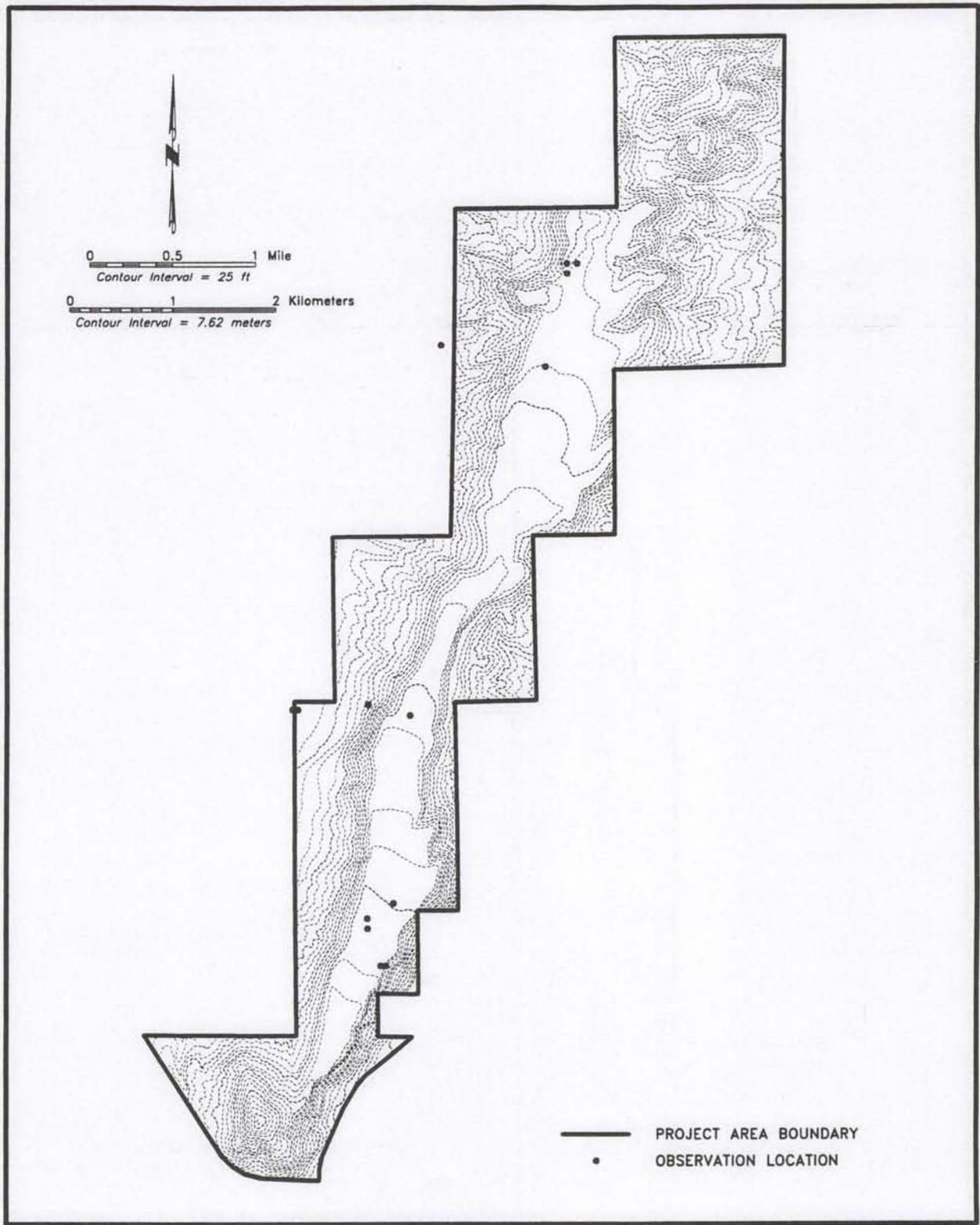
Map 3.15E Swainson's Hawk Distribution on Foote Creek Rim, All Seasons, 1994-1995 (n = 108).



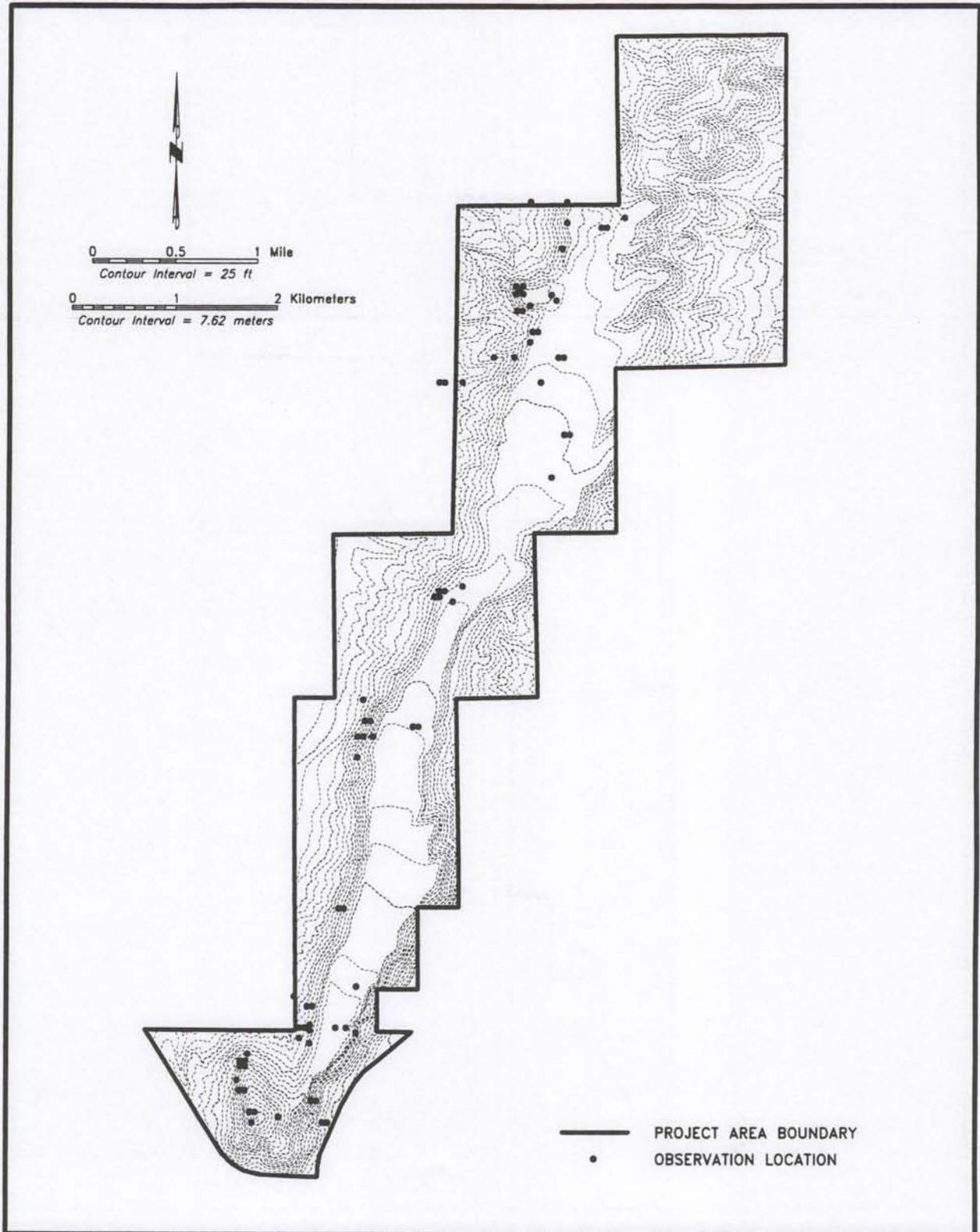
Map 3.15F Rough-legged Hawk Distribution on Foote Creek Rim, All Seasons, 1994-1995 (n = 36).



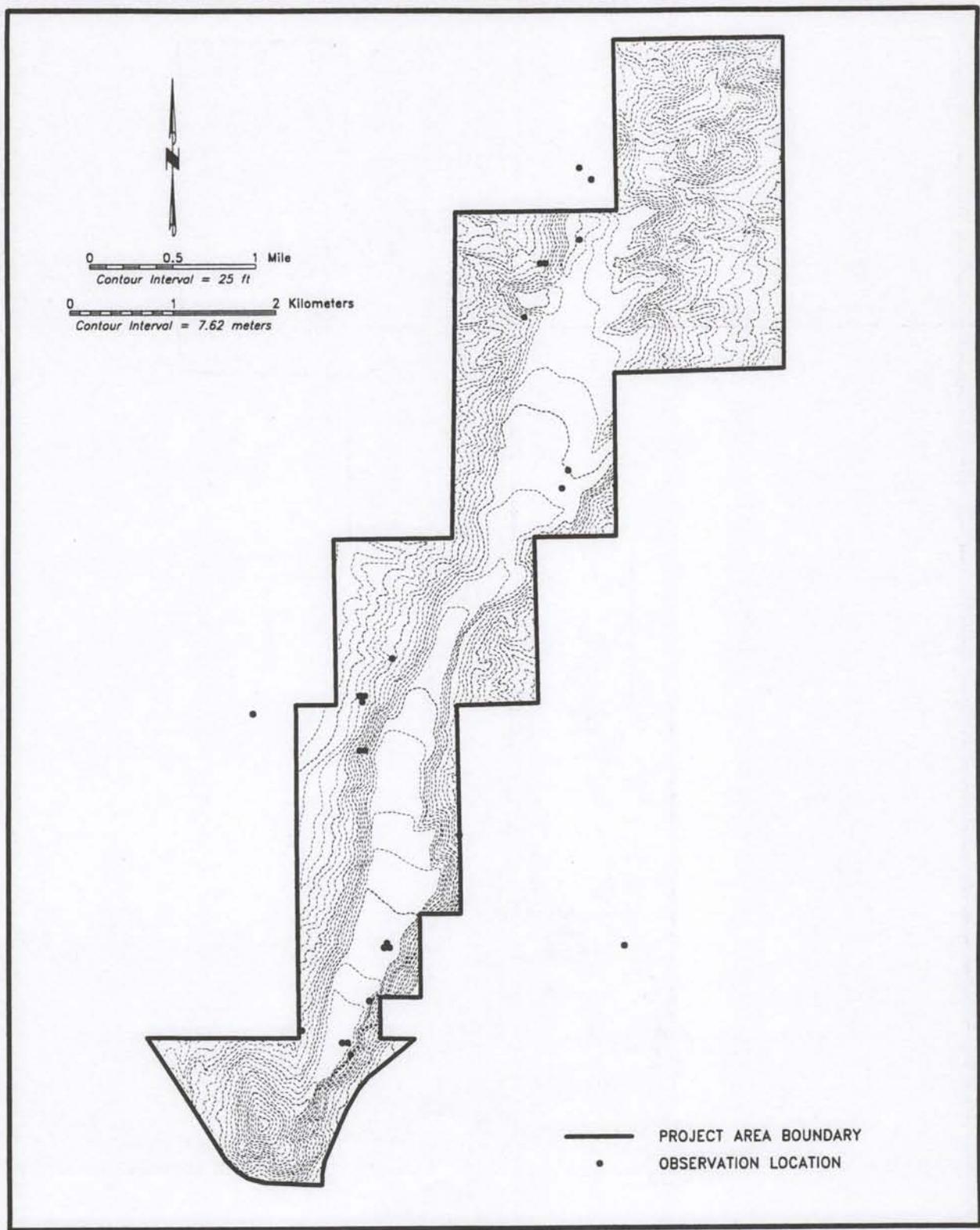
Map 3.16A Peregrine Falcon Distribution on Foote Creek Rim, Breeding Season, 1994-1995 (n = 13).



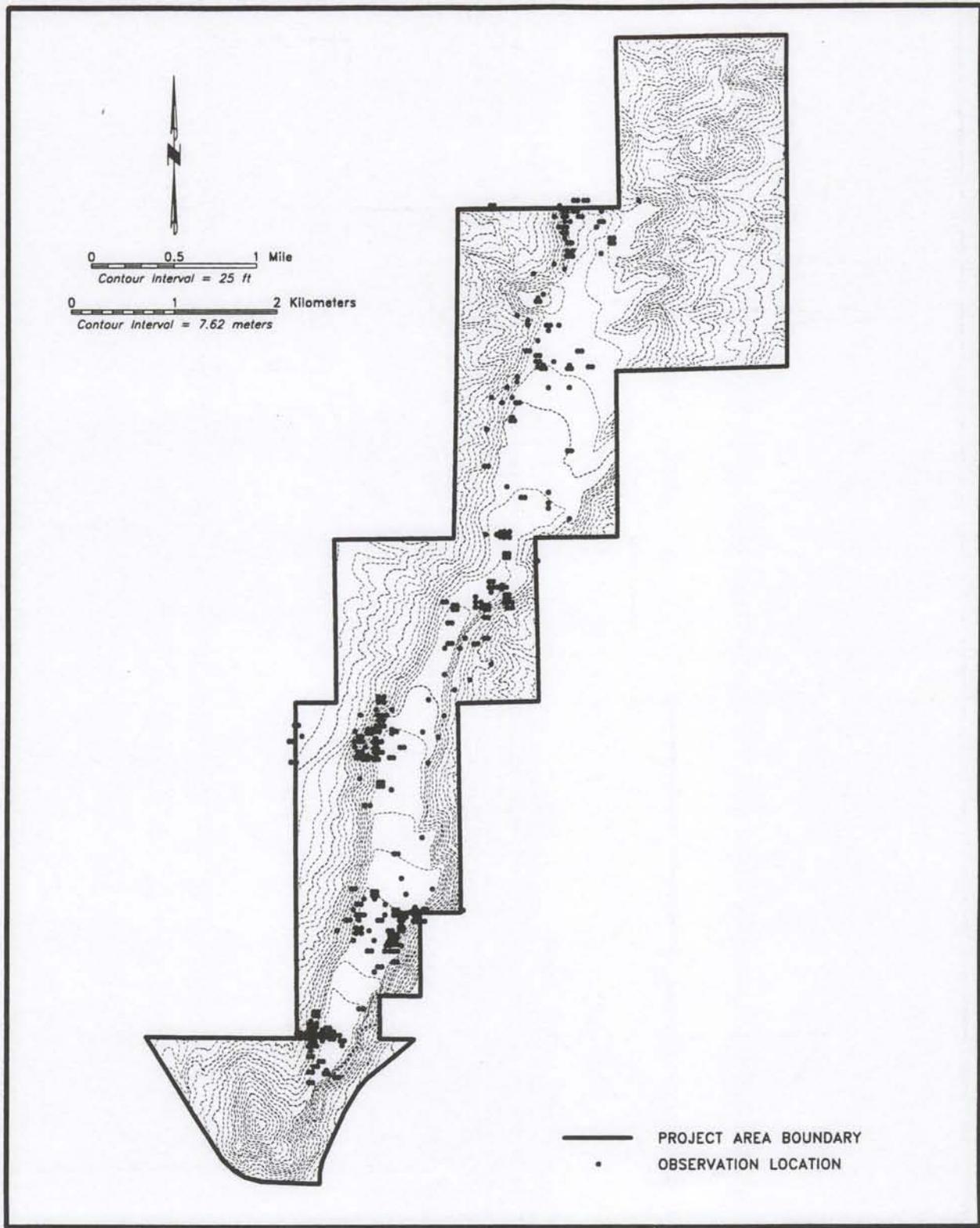
Map 3.16B Peregrine Falcon Distribution on Foote Creek Rim, Nonbreeding Seasons, 1994-1995 (n = 14).



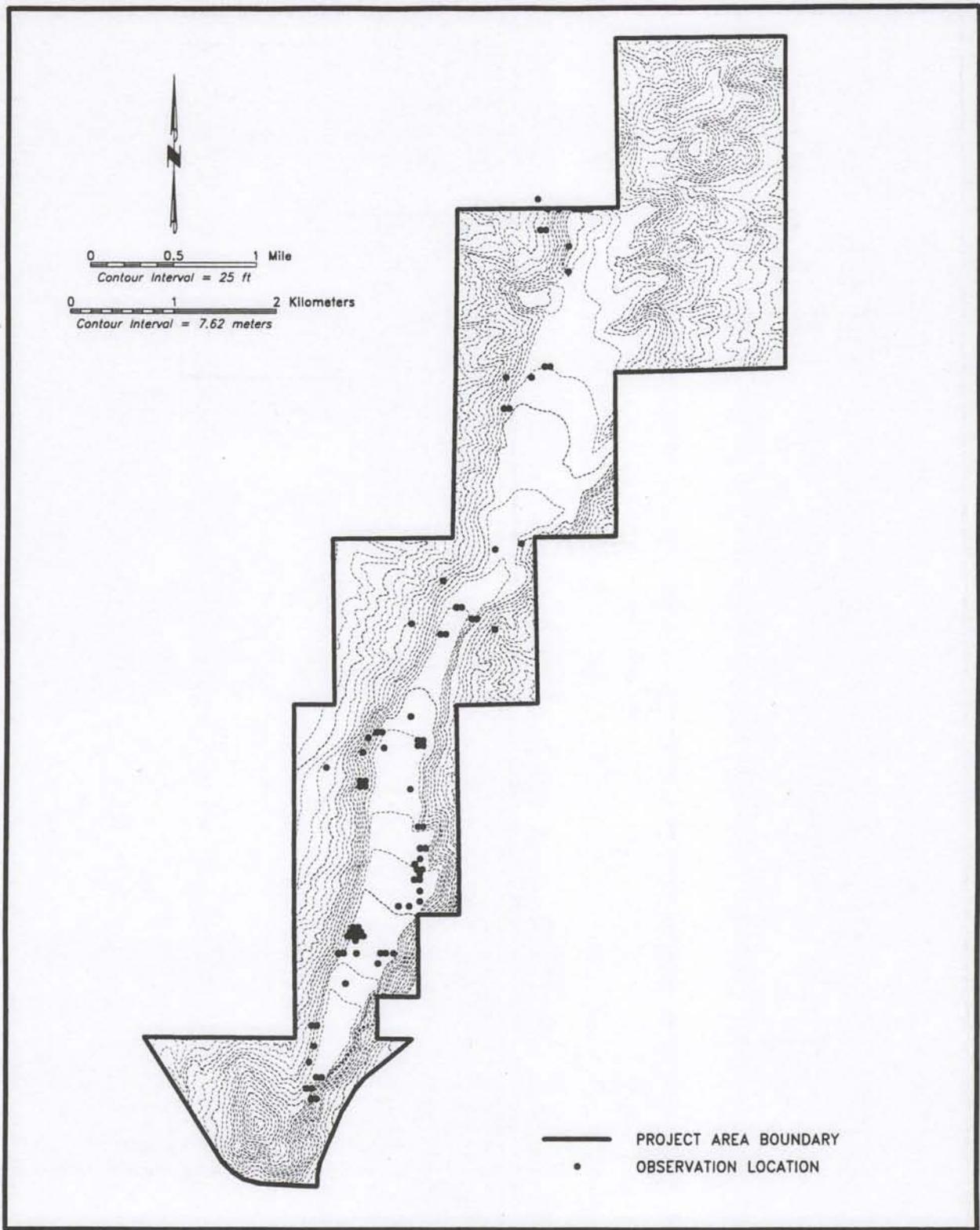
Map 3.16C Prairie Falcon Distribution on Foote Creek Rim, Breeding Season, 1994-1995 (n = 77).



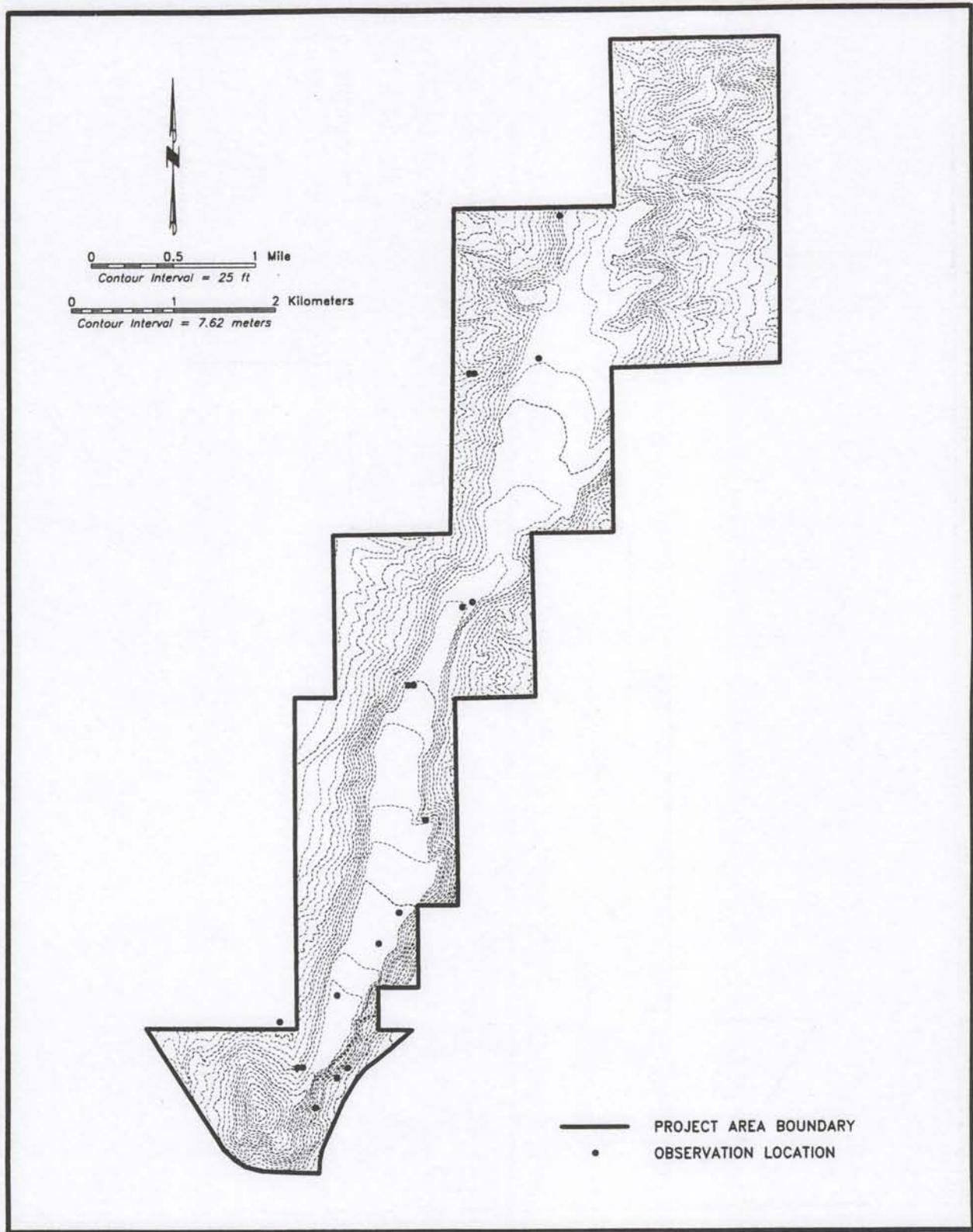
Map 3.16D Prairie Falcon Distribution on Foote Creek Rim, Nonbreeding Seasons, 1994-1995 (n = 25).



Map 3.16E American Kestrel Distribution on Foote Creek Rim, Breeding Season, 1994-1995 (n = 401).



Map 3.16F American Kestrel Distribution on Foote Creek Rim, Nonbreeding Seasons, 1994-1995 (n = 87).



Map 3.16G Merlin Distribution on Foote Creek Rim, All Seasons, 1994-1995 (n = 18).

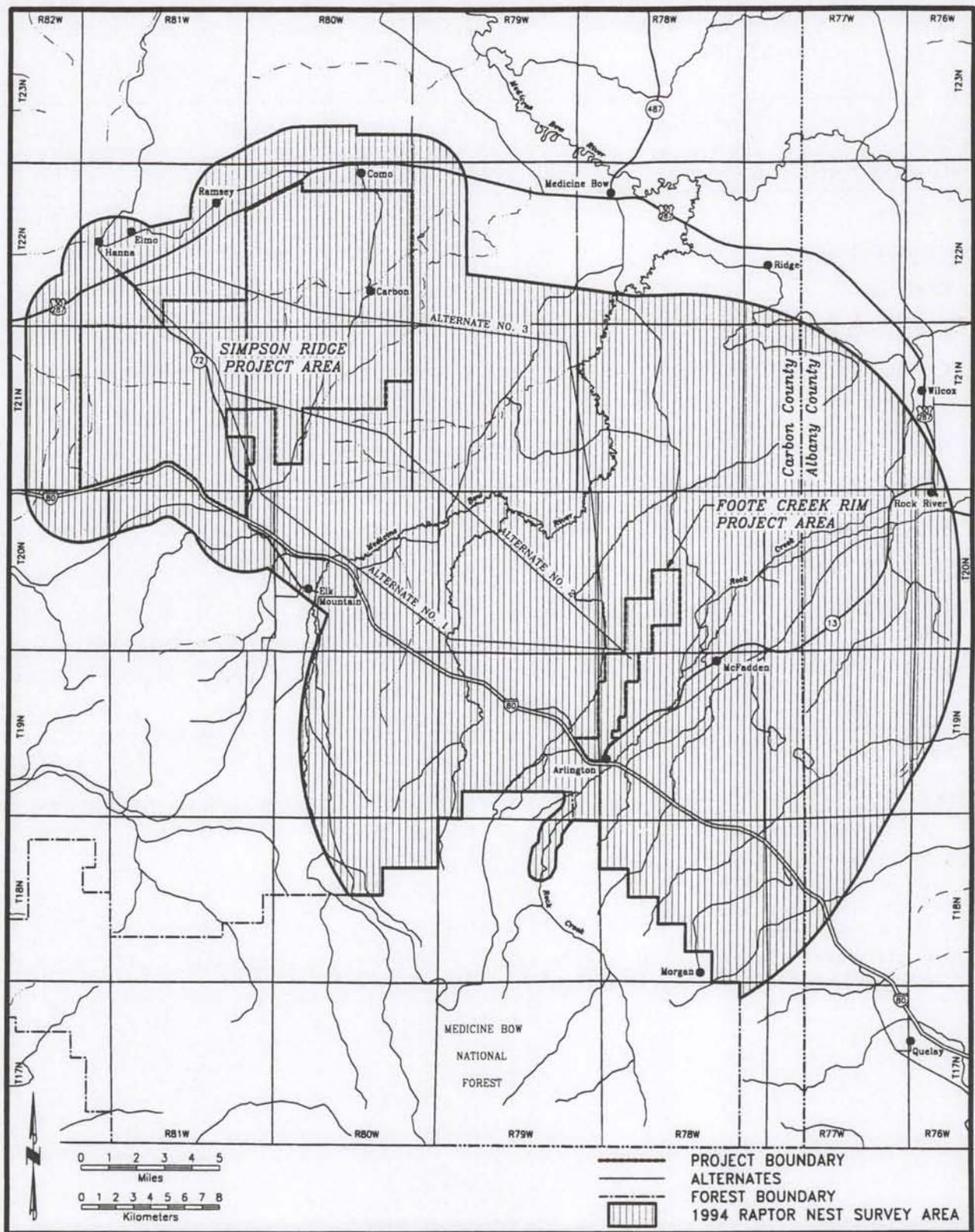
Table 3.12 Flight Heights of Raptors Observed Within the Foote Creek Rim Area, February 16, 1994 - March 17, 1995.

Taxonomic Group or Species	Total No. of Observations in Sample	Flight Height Class ¹					
		C-	B-	A-	A+	B+	C+
Accipiters	6	0 (0)	0 (0)	0 (0)	2 (33)	1 (17)	4 (67)
American kestrel	359	7 (2)	23 (6)	142 (40)	240 (67)	131 (36)	17 (5)
Bald eagle	31	3 (10) ²	6 (19)	5 (16)	5 (16)	15 (48)	12 (39)
Ferruginous hawk	128	3 (2)	6 (5)	29 (23)	50 (39)	81 (63)	42 (33)
Golden eagle	1,181	38 (3)	142 (12)	298 (25)	456 (39)	630 (53)	424 (36)
Merlin	12	0 (0)	2 (17)	6 (50)	7 (58)	4 (33)	0 (0)
Northern harrier	105	1 (1)	12 (11)	17 (16)	74 (70)	27 (26)	9 (9)
Peregrine falcon	21	1 (5)	4 (19)	11 (52)	17 (81)	14 (67)	3 (14)
Prairie falcon	75	2 (3)	6 (8)	21 (28)	42 (56)	41 (55)	10 (13)
Red-tailed hawk	272	13 (5)	35 (13)	54 (20)	88 (32)	147 (54)	90 (33)
Rough-legged hawk	23	0 (0)	0 (0)	4 (17)	6 (26)	20 (87)	6 (26)
Swainson's hawk	90	1 (1)	8 (9)	13 (14)	43 (48)	38 (42)	36 (40)
Turkey vulture	13	1 (8)	1 (8)	1 (8)	3 (23)	6 (46)	6 (46)
Total	2,316	70 (3)	245 (11)	601 (26)	1,033 (45)	1,155 (50)	659 (28)

- ¹ A = 0-26 ft (0-8 m)
 B = 26-184 ft (8-56 m)
 C = > 184 ft (> 56 m)
 + = above rim
 - = below rim

- ² Percentage of total number of individual observations in parentheses; percentages do not total 100 since more than one flight height class may be assigned to a single observation.

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Map 3.16 1/2 1994 Raptor Nest Survey Area.

Creek Rim was expanded to 10 mi (16 km) because this was regarded as the potential zone of influence of the first phase of Windplant development on golden eagles and prairie falcons (Call 1978; unpublished data, Snake River Birds of Prey Study). Aerial surveys were conducted between May 31 and June 5, 1994. Ground survey dates varied, depending on raptor species and nesting chronology, as follows:

Golden eagle	June 17 - July 13,
Bald eagle	June 19 - August 1,
Ferruginous hawk	June 16 - July 26,
Red-tailed hawk	May 30 - August 9,
Swainson's hawk	June 19 - August 16, and
Prairie falcon	June 16 - July 26.

The complete methodology for raptor nest surveys is described in Appendix A in the DEIS. These surveys confirmed the status of known nests in BLM and WGFD databases, and resulted in the initial observation of many previously unknown nests.

Three hundred nine raptor nests were located within the 377,728-ac raptor nest survey area in 1994 (Table 3.13). One hundred fifty-seven nests were located within the Foote Creek Rim area and associated 10-mi (16-km) buffer [238,976 ac or 373.4 mi² (967.1 km²)], and 143 nests were within the Simpson Ridge area and associated 2-mi (3-km) buffer [123,072 ac or 192.3 mi² (498.1 km²)]; nine raptor nests were outside of these areas but within 2 mi (3 km) of the alternate transmission line routes [15,680 ac or 24.5 mi² (63.5 km²)]. The majority (73.1%) of known raptor nests within the survey area belong to red-tailed hawks (128 nests) and ferruginous hawks (98 nests). Inactive raptor nests observed in trees (mostly limber pines) were assigned to either red-tailed hawks or ferruginous hawks. Other raptor nests observed during the survey belong to golden eagle (43 nests), bald eagle (1 nest), Swainson's hawk (30 nests), American kestrel (2 nests), and prairie falcon (7 nests). Of the 66 known active raptor nests observed during the survey, the majority (77.2%) belonged to red-tailed hawk (20 nests), ferruginous hawk (18 nests), or Swainson's hawk (13 nests) (Table 3.13). The remaining active nests include golden eagle (5 nests), bald eagle

(1 nest), American kestrel (2 nests), and prairie falcon (7 nests). Other raptor species reported to have nested within the survey area include great horned owl and eastern screech owl (WGFD 1994b).

A total of 119 raptor nests was located within 2 mi (3 km) of the three alternate transmission line routes (Table 3.14). Approximately 22% of these nests were active, with the majority (88%) of these active nests used by ferruginous hawk (7 nests), prairie falcon (6 nests), red-tailed hawk (6 nests), and Swainson's hawk (4 nests). Fifty raptor nests occur within 2 mi (3 km) of Alternate 3, 28 nests within 2 mi (3 km) of Alternate 2, and 19 nests within 2 mi (3 km) of Alternate 1. The remaining 22 raptor nests are within 2 mi (3 km) of joint routes.

Density of raptor nests is greatest in the Simpson Ridge area and associated 2-mi (3-km) buffer, with approximately 0.75 nest/mi² (0.3 nest/km²) [0.192 active nests/mi² (0.74 active nests/km²)]. Within the potential zone of influence for the Foote Creek Rim area [i.e., Foote Creek Rim area and associated 10-mi (16-km) buffer], raptor nest density is 0.44 nest/mi² (0.2 nest/km²) [0.06 active nests/mi² (0.02 active nests/km²)]. Overall, there is approximately 0.53 nest/mi² (0.2 nest/km²) [0.11 active nests/mi² (0.044 active nests/km²)] within the 1994 raptor nest survey area. Table 3.15 presents the density of active nests by species for the 1994 raptor nest survey area. The raptor nest densities found within the survey area [i.e., 0.44-0.75 nest/mi² (0.2-0.3 nest/km²)] are similar to those reported for areas immediately north of the survey area. Raptor nest data from a coalbed methane project north of Hanna, Wyoming (Mariah 1992) indicate a raptor nest density of 0.78 nest/mi² (0.2 nest/km²), which is similar to nest density within the Simpson Ridge area. The overall raptor nest density within the 1994 survey area [0.53 nest/mi² (0.2 nest/km²)] is similar to the density of 0.48 nest/mi² (0.2 nest/km²) extrapolated from raptor surveys at coal mines adjacent to Hanna, Wyoming (Mariah 1989). A relatively high raptor nest density of 2.0 nests/mi² (0.7 nest/km²) has been noted within the permit

Table 3.13 Number of Active and Inactive Nests of Raptor Species Within the 1994 Raptor Nest Survey Area.

Raptor Species	1994 Nest Status ¹	Foote Creek Rim Area ²	Simpson Ridge Area ³	Other Areas Within the KPPA ⁴	Total Raptor Nest Survey Area
American kestrel ⁵	Active	0	2	0	2
	Inactive	0	0	0	0
Bald eagle	Active	0	1	0	1
	Inactive	0	0	0	0
Ferruginous hawk	Active	7	10	1	18
	Inactive	24	56	0	80
Golden eagle	Active	2	2	1	5
	Inactive	29	9	0	38
Prairie falcon	Active	0	5	2	7
	Inactive	0	0	0	0
Red-tailed hawk	Active	11	7	2	20
	Inactive	75	31	2	108
Swainson's hawk	Active	2	10	1	13
	Inactive	7	10	0	17
Subtotal	Active	22	37	7	66
	Inactive	135	106	2	243
Total		157	143	9	309

¹ A nest was considered active if one of the following was observed:

- a) eggs were laid,
- b) young were present, or
- c) an adult was observed in incubating posture on the nest (Postupalsky 1974).

² Includes associated 10-mi (16-km) buffer (excluding forested land south of I-80).

³ Includes associated 2-mi (3-km) buffer.

⁴ Areas within 2 mi (3 km) of alternate transmission line routes but outside of the Foote Creek Rim and Simpson Ridge areas.

⁵ Due to the difficulty of locating American kestrel nests, nests of this species were not a focus of the 1994 nest survey; however, two nests were incidentally located during the survey.

Table 3.14 Number of Active and Inactive Nests of Raptor Species Within 2 Mi (3 km) of Alternate Transmission Line Routes, 1994.

Raptor Species	1994 Nest Status ¹	Alternate 1	Alternate 2	Alternate 3	Alternates 1 and 2 ²	Alternates 1, 2, and 3 ²	Total All Alternate Routes
American kestrel	Active	0	0	1	0	0	1
	Inactive	0	0	0	0	0	0
Ferruginous hawk	Active	4	1	1	1	0	7
	Inactive	2	2	12	2	5	23
Golden eagle	Active	1	0	1	0	0	2
	Inactive	0	10	4	2	0	16
Prairie falcon	Active	0	1	2	3	0	6
	Inactive	0	0	0	0	0	0
Red-tailed hawk	Active	1	2	2	1	0	6
	Inactive	7	12	24	6	0	49
Swainson's hawk	Active	1	0	2	0	1	4
	Inactive	3	0	1	0	1	5
Subtotal	Active	7	4	9	5	1	26
	Inactive	12	24	41	10	6	93
Total		19	28	50	15	7	119

- ¹ A nest was considered active if one of the following was observed:
a) eggs were laid,
b) young were present, or
c) an adult was observed in incubating posture on the nest (Postupalsky 1974).
- ² Refers to segments where the alternate routes merge near Hanna.

area of a surface coal mine located about 115 mi (185 km) west of the KPPA (Mariah 1994b).

While anecdotal nesting information is available for the general KPPA, the 1994 raptor nest survey and monitoring is the first complete record of raptor nesting activity for the proposed development area. As with any biological survey, it is difficult to obtain a 100% census during any one year. Additionally, because reproduction varies temporally and only one year of complete raptor reproductive information exists, it is unknown if 1994 was a typical year for raptor reproduction on the KPPA. In fact, 1994 appeared to be a poor year for raptor reproduction in southeastern Wyoming. For example, golden

eagle reproduction was much lower in 1994 compared to previous years (personal communication with Jim Orpet, Intermountain Resources, Laramie, May 1995). Thus, parameters such as nest density, productivity, or percentage of KPPA included in raptor buffers, may increase over the next few years of monitoring, as additional nests missed during previous surveys are located; eventually, these parameters would be expected to fluctuate over time. Collection of reproductive data for successive years will clarify reproductive trends and how much of the KPPA is used for breeding by raptors and will enable definition of presently unknown reproductive parameters, such as number

of territories located within the raptor nest survey area.

In 1994, approximately 36.7% of the KPPA (22,248 ac) was included within raptor nest buffers [i.e., areas within 0.75 mi (1.21 km) of a known active raptor nest]; these buffers covered 36.8% of the Simpson Ridge area (20,218 ac) and 38.4% of the Foote Creek Rim area (1,920 ac). However, as previously noted, activity status of raptor nests varies from year to year (Mariah 1988a, 1988b; Newton 1979) and until the actual number of raptor territories can be determined, it is not possible to calculate the number of acres that would be encompassed within raptor nest buffers in any given year. The purpose of these raptor nest buffers is to protect active nests and immediately surrounding habitat from surface-disturbing activities (and associated noise, dust, etc.) during the breeding season (i.e., February 1 to July 31) (BLM 1987:471-472).

Sixty-six nests were occupied within the 1994 raptor nest survey area; 55 nests produced nestlings; and final nest status, or nest success, was known for 48 nests (Table 3.15). Nest success ranged from a low of 67% for the prairie falcon to a high of 100% for both eagle species. Average number of fledged young ranged from 1.0 for the bald eagle to 2.2 for the ferruginous hawk (Table 3.15). Ground surveys were not conducted for two incidentally located American kestrel nests, thus these two nests are excluded from Table 3.15.

The Hanna RCA covers approximately 17.4% (9,575 ac) of the Simpson Ridge area (Map 3.9), and likely contributes to the relatively high nest density observed within the Simpson Ridge area. RCAs are areas in which raptors nest in high densities on cliffs or other formations year after year. While RCAs do not have any associated regulatory or planning stipulations, BLM recognizes that surface disturbance and human activity can upset stable raptor populations (BLM 1987:205). Therefore, management actions for RCAs include minimization of surface disturbance to reduce disturbance to raptors and their habitat.

The GDRA RMP/EIS (BLM 1987) specifies that there will be a case-by-case examination of proposals to determine potential adverse effects and to develop appropriate mitigations. All three alternate transmission line routes traverse the Hanna RCA; Alternate 3 crosses the least amount of acreage (58 ac) and Alternate 2 crosses the greatest amount (92 ac).

3.2.2.4 Upland Game Birds

Three species of upland game birds--sage grouse, blue grouse, and mourning dove--occur on or adjacent to the KPPA.

Sage Grouse. Sage grouse habitat is characterized by an interspersed mixture of sagebrush and grassland. In winter, sage grouse use tall, dense stands of sagebrush that remain relatively exposed through deep snow (Greer n.d.); low sagebrush on windswept knolls are also used as feeding sites. During the spring, sage grouse gather on breeding grounds, or leks, characterized by open areas (e.g., meadows, low sagebrush zones) surrounded by denser sagebrush cover (Greer n.d.). Sage grouse return year after year to these leks, although the exact location may shift slightly between years. The area within 0.25 mi (0.40 km) of a lek center is considered potential breeding habitat and is protected from surface disturbance through a BLM surface disturbance stipulation (BLM 1987:204). Sage grouse tend to nest within 2 mi (3 km) of the lek center (BLM 1987:202, Greer n.d.); this area is considered probable nesting habitat, and is closed to surface-disturbing activity from March 1 through June 30 (personal communication with Larry Apple, BLM Great Divide Resource Area [GDRA], May 11, 1995). Wallestad and Pyrah (1974) determined that 68% of sage grouse nests were within 1.5 mi (2.4 km) of leks in central Montana. Braun et al. (1977) confirmed that the area within 2 mi (3 km) of a lek often includes 60 to 80% of the nesting sage grouse from the lek. A large proportion (92%) of sage grouse nests may be protected from disturbance through application of a 2-mi (3-km) buffer (Wakkinen et al. 1992). Sage grouse select sagebrush-grassland habitats with relatively tall

Table 3.15 Reproductive Information for Raptors that Nested Within the 1994 Raptor Nest Survey Area¹.

Species	No. Occupied Nests ²	Nest Density ³	Nest Success (%) ⁴	Ave. No. Young Fledged/Nest
Bald eagle	1	0.002/mi ² (0.001/km ²)	100	1
Ferruginous hawk	18	0.029/mi ² (0.011/km ²)	91 ⁵	2.20 ± 0.919
Golden eagle	5	0.008/mi ² (0.003/km ²)	100 ⁶	1.33 ± 0.577
Prairie falcon	7	0.012/mi ² (0.005 km ²)	67 ⁷	2.00 ± 0.816
Red-tailed hawk	20	0.034/mi ² (0.013/km ²)	82 ⁸	1.714 ± 0.726
Swainson's hawk	13	0.022/mi ² (0.009/km ²)	80 ⁹	2.125 ± 0.353

¹ The 1994 raptor nest survey area includes the Foote Creek Rim area and associated 10-mi (16-km) buffer, Simpson Ridge area and associated 2-mi (3-km) buffer, and the three alternate transmission routes with associated 2-mi (3-km) buffers (590 mi² [1,475 km²]).

² A nest was considered active if one of the following was observed:

- a) eggs were laid,
- b) young were present, or
- c) and adult was observed in incubating posture on nest (Postupalsky 1974).

³ Based on number of active nests.

⁴ At least one well-feathered nestling or fledged bird observed.

⁵ Nest success known for 11 nests, and unknown for three active nests. Four nests where nestlings were observed but not seen when revisited were excluded.

⁶ Nest success known for three nests, and two nests where nestlings were observed but not seen when revisited were excluded.

⁷ Nest success known for six nests, and unknown for one nest.

⁸ Nest success known for 17 nests, and unknown for two active nests. One nest where nestlings were observed but not seen when revisited was excluded.

⁹ Nest success known for 10 nests, and unknown for three active nests.

sagebrush and canopy coverage ranging from approximately 10 to 40% in which to build nests (Wallestad and Pyrah 1974, Rothenmaier 1979).

Forty-four sage grouse leks occur within the KPPA and its adjacent 2-mi (3-km) buffer; 36 of these leks are historic sites (i.e., inactive in 1994) noted in BLM (1994a) and WGFD (1994b) records. Since all 44 leks represent sites chosen by sage grouse for reproductive activity, then approximately 3,110 ac within the Simpson Ridge area (5.7%) is potential sage grouse breeding habitat; no breeding habitat occurs within the Foote Creek Rim area (Table 3.11). All three proposed transmission line alternate routes pass through potential breeding habitat, with the acreage traversed ranging from 4.8 ac (Alternate 2) to 9.7 ac (Alternate 1). A majority of the Simpson Ridge area (86.6% or 47,549 ac) is probable sage grouse nesting habitat, while only 98 ac within the Foote Creek Rim area (2.0%) would be suitable nesting habitat. All three alternate transmission line routes cross probable nesting habitat [182 ac (Alternate 1) to 212 ac (Alternate 3)].

Aerial and ground surveys in 1994 revealed that eight of the 44 leks within and adjacent to the KPPA were active. Seven were located within the Simpson Ridge area and one was located approximately 1.0 mi (1.6 km) southeast of the Simpson Ridge area. Based on only these eight active leks, approximately 848 ac within the Simpson Ridge area (1.5%) is potential sage grouse breeding habitat and 34,930 ac (63.6%) is probable nesting habitat. All three proposed transmission line alternates traverse probable active nesting habitat--Alternate 1 crosses 47 ac, Alternate 2 crosses 90 ac, and Alternate 3 crosses 141 ac. None of the routes traverse potential active sage grouse breeding habitat.

Ten sage grouse observations were recorded between April 20 and August 29, 1994, for the Foote Creek Rim area (Mariah 1994a). Only one of the observations occurred near the rim itself; all the rest occurred near bodies of water immediately east of the Foote Creek Rim area.

Forty-eight observations of sage grouse were made incidental to raptor and passerine surveys in the Simpson Ridge area between April 11 and August 16, 1994 (Mariah 1994a). Thirty-nine of these observations occurred on an active lek; the other nine occurred in sagebrush habitat along the eastern portion of Simpson Ridge.

Blue Grouse. Blue grouse prefer mountain shrubland, aspen-conifer woodland, and various forest types which are common throughout Wyoming (BLM 1987:204). Edges between these habitat types and riparian areas within and adjacent to these types are frequented.

Within the KPPA, blue grouse have only been observed on the eastern slope of Foote Creek Rim in a grassland-shrubland transitional zone (Mariah 1994a). It is likely that blue grouse occur in other areas within the KPPA, but they are probably restricted to limited areas of suitable habitat (e.g., wooded riparian zones, pine-grassland ecotones).

Mourning Dove. This species is a common breeding bird in habitats that occur in the KPPA. The birds migrate from the area in the fall and winter. Mourning dove concentrations are usually highest around power lines, buildings, and other areas of human disturbance, which occur on only a small portion of the KPPA. Doves prefer the shrub-covered areas along perennial water sources and washes that provide nesting and roosting cover.

Thirty-two observations of mourning doves were incidentally recorded during passerine and raptor surveys within the Foote Creek Rim area between May 4 and September 27, 1994 (Mariah 1994a). The majority of these observations were along the eastern slope of the rim in areas of sagebrush-grassland interspersed with trees and large shrubs; mourning doves likely bred in this area. Only one mourning dove was actually observed on top of Foote Creek Rim.

Only six observations of mourning doves were incidentally recorded for the Simpson Ridge area between April 25 and September 12, 1994 (Mariah

1994a). As with Foote Creek Rim, all of these observations were in areas of sagebrush-grassland intermixed with trees and shrubs; one observation was in the vicinity of an abandoned homestead.

3.2.2.5 Waterfowl, Shorebirds, and Waders

Several species of waterfowl have been observed on the various impoundments, reservoirs, and perennial creeks and rivers within and immediately adjacent to the KPPA. The most common waterfowl species observed in the KPPA are Canada goose, northern pintail, American wigeon, mallard, lesser scaup, and redhead (Mariah 1994a, 1995). Other species observed were snow goose, canvasback, ring-necked duck, bufflehead, common merganser, gadwall, green-winged teal, blue-winged teal, cinnamon teal, northern shoveler, ruddy duck, and American coot. Waterfowl species not observed but potentially occurring on the KPPA based on range and habitat preference (Scott 1987, WGFD 1992) include wood duck, common goldeneye, and red-breasted merganser. Waterfowl, as well as shorebirds and waders, use the KPPA during migration (spring and fall), and some species (e.g., Canada goose, mallard) probably breed in the area during spring and summer.

Shorebird and wading species observed on or adjacent to the KPPA were common loon, pied-billed grebe, American white pelican, double-crested cormorant, great blue heron, white-faced ibis, Virginia rail, sandhill crane, mountain plover, semipalmated plover, killdeer, American avocet, greater yellowlegs, spotted sandpiper, upland sandpiper, long-billed dowitcher, common snipe, Wilson's phalarope, Franklin's gull, California gull, and Caspian tern (Mariah 1994a, 1995). Many of these species are known to breed (e.g., mountain plover) or are likely to breed (e.g., American avocet) within the KPPA. Based on range and habitat preference (Scott 1987, WGFD 1992), several other species of grebes, herons, egrets, plovers, sandpipers, gulls, and terns may frequent or occasionally move through the KPPA (Appendix D).

The majority of waterfowl and shorebird observations within 1 mi of the Foote Creek Rim area (85% or 7,265 observations) were located immediately east of the Foote Creek Rim area along a series of reservoirs and impoundments; these observations were noted during monthly reconnaissance surveys along the eastern slope of Foote Creek Rim and incidental to other surveys between March 1994 and March 1995 (Mariah 1994a, 1995). Common waterfowl species observed were redhead (2,942 observations), mallard (895), Canada goose (803), American wigeon (344), gadwall (158), common merganser (125), cinnamon teal (58), northern pintail (63), and lesser scaup (51). The majority of redheads were observed in large congregations on the reservoirs during March and April. Other waterfowl species observed included green-winged teal (33), northern shoveler (31), ring-necked duck (28), bufflehead (7), ruddy duck (3), and blue-winged teal (2). Shorebirds, waders, and other water birds observed immediately east of Foote Creek Rim include Franklin's gull (41 observations), pied-billed grebe (18), sandhill crane (15), American coot (14), killdeer (13), double-crested cormorant (13), great blue heron (12), American avocet (10), common loon (7), American white pelican (4), Caspian tern (2), California gull (1), spotted sandpiper (1), white-faced ibis (1), semipalmated plover (1), and Virginia rail (1).

Eight hundred twenty-five observations of waterfowl and shorebirds were recorded between March 1994 and March 1995 (Mariah 1994a, 1995) during passerine and raptor surveys on Foote Creek Rim. Many of these birds were seen on top of the rim or flying along the top or upper slopes. Waterfowl species included Canada goose (384 observations), mallard (28), and ring-necked duck (1). Shorebird, wader, and other water bird species observed on top of or flying above the rim were mountain plover (134 observations), sandhill crane (36), gull species (36), American white pelican (28), upland sandpiper (23), double-crested cormorant (17), California gull (13), white-faced ibis (12), killdeer (11), common merganser (10),

long-billed dowitcher (10), great blue heron (10), common snipe (2), American avocet (1), Caspian tern (1), and Franklin's gull (1). An additional 444 waterfowl/shorebirds/waders were observed incidental to passerine and raptor surveys, including Wilson's phalarope and snow goose, as well as many of the previously mentioned species. Of those observed flying over or immediately adjacent to Foote Creek Rim, 86% of the waterfowl and 22% of shorebird/waders were flying between 26 and 184 ft (8 and 56 m) above the rim (i.e., at proposed wind turbine rotor height) (Table 3.16).

One thousand and one waterfowl and shorebird observations were noted during, and incidental to, surveys within the Simpson Ridge area between March 1994 and March 1995 (Mariah 1994a, 1995). Approximately 90% of these observations occurred on or immediately adjacent to seven bodies of water located within the Simpson Ridge area: Seven Mile Lake (northwest Section 32, T21N, R80W), Fiddler's Green Reservoir (Section 21, T21N, R80W), Sixmile Spring (Sections 17 and 18, T21N, R80W), Jacks Spring (Section 5, T21N, R80W), Soda Lakes (Section 23, T21N, R81W), a tributary of Percy Creek (Section 11 to 14, T21N, R81W) and an unnamed pond (Section 13, T21N, R81W). Waterfowl species commonly observed within the Simpson Ridge area were mallard, Canada goose, northern pintail, American wigeon, and lesser scaup. Other waterfowl species occasionally seen were green-winged teal, redhead, canvasback, gadwall, common merganser, blue-winged teal, northern shoveler, and ring-necked duck. Shorebird, wader, and other water bird species observed within the Simpson Ridge area were American coot (a single observation of 150 individuals), American avocet (73 observations), killdeer (54), Wilson's phalarope (47), great blue heron (4), American white pelican (3), and greater yellowlegs (2).

3.2.2.6 Passerines

Ninety-four species of passerine birds were observed within the KPPA between February 1994 and March 1995 (Mariah 1994a, 1995). During

timed passerine surveys of the Foote Creek Rim and the Simpson Ridge areas, the horned lark was the most commonly observed species with 6,028 sightings. Other common species included mountain bluebird (684 sightings), cliff swallow (574), Brewer's blackbird (484), vesper sparrow (387), green-tailed towhee (351), sage thrasher (208), black-billed magpie (206), northern flicker (180), American goldfinch (173), Brewer's sparrow (168), western meadowlark (163), American robin (99), eastern bluebird (95), tree swallow (92), and yellow warbler (91). Additional passerine species known to occur or likely to occur (Scott 1987, WGFD 1992) within the KPPA are listed in Appendix D in the DEIS (see also corrections to Appendix D in the FEIS).

Systematic surveys of passerines were conducted weekly within the Foote Creek Rim area and biweekly for the Simpson Ridge area between mid-February 1994 and mid-March 1995. The complete methodology for passerine surveys is described in Appendix A in the DEIS. Passerine sampling methodology and effort was equivalent between the western and eastern sides of Foote Creek Rim for late May 1994 through mid-March 1995; therefore, data from these months are used for trend comparisons. The mean number of passerine species observed per survey along the western side of the rim peaked in May at 12.0 species/survey, and then gradually declined throughout the summer and into the fall; during December 1994 and January 1995, no passerines were identified to species [Figure 3.3(A)]. This seasonal decline is a result of species that breed in the area moving south as the weather cools. The mean number of passerine species observed per survey along the eastern side of the rim peaked in June (26 passerine species/survey), and then, as with the western side, declined to <1 species/survey in December and January [Figure 3.3(A)]. In every month, more passerine species were observed along the eastern side of the rim than along the western side. This higher passerine species diversity is likely a reflection of the greater vegetational structure and diversity of habitats along the eastern edge of Foote Creek Rim. Grassland species (e.g., horned lark and

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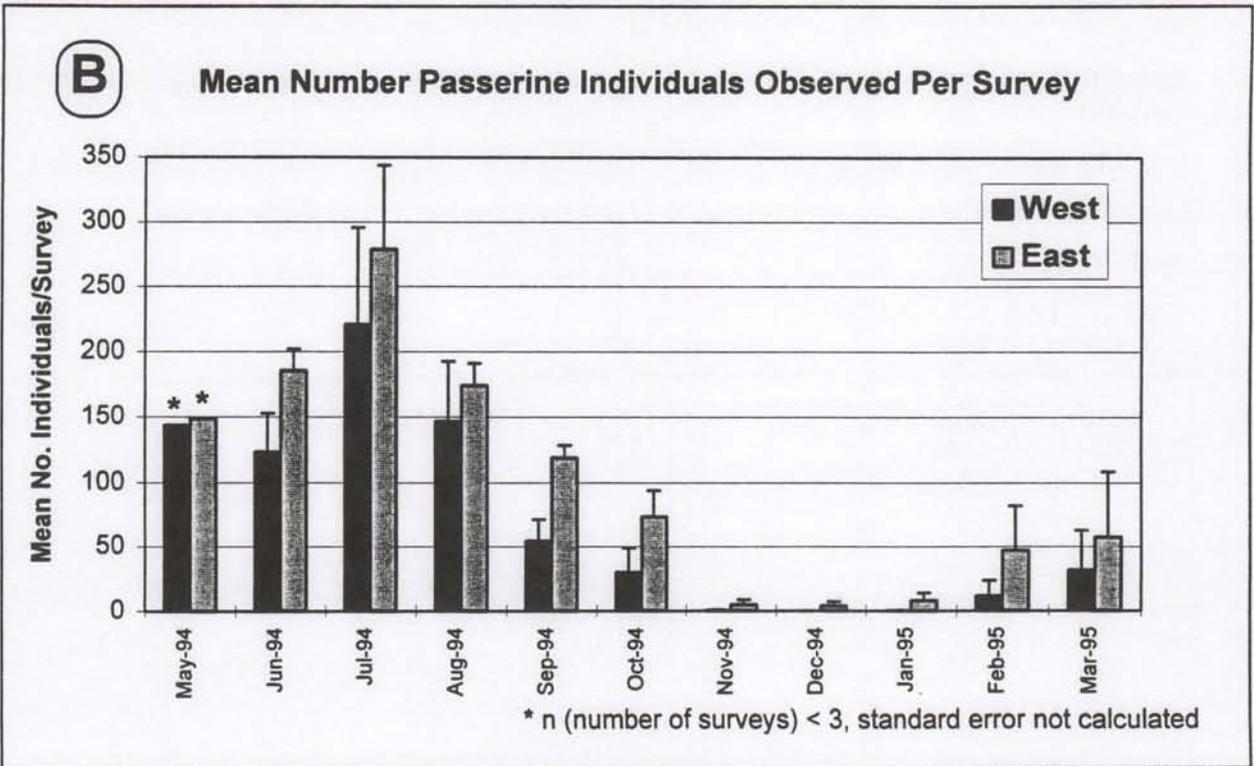
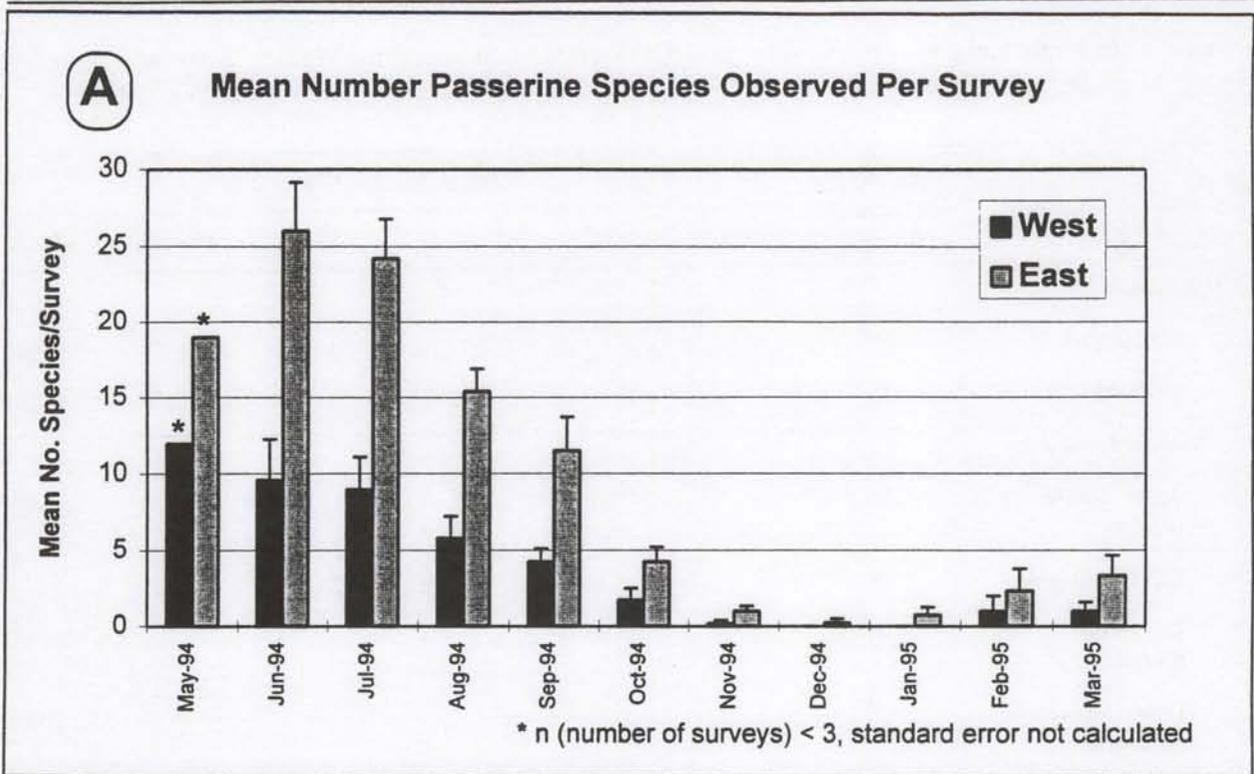
Table 3.16 Flight Heights of Selected Species of Waterfowl and Shorebird/Waders Observed Flying Over or Immediately Adjacent to Foote Creek Rim, February 16, 1994 - March 17, 1995.

Taxonomic Group or Species	Total No. of Individuals in Sample	Flight Height Class ¹					
		C-	B-	A-	A+	B+	C+
Waterfowl							
Canada goose	205	--	--	20 (10)	34 (17)	199 (97)	73 (36)
Mallard	18	--	--	1 (6)	8 (44)	7 (39)	16 (89)
Shorebird/waders							
American white pelican	33	--	--	--	--	5 (15)	28 (85)
California gull	16	--	5 (31)	6 (38)	12 (75)	5 (31)	--
Common merganser	10	--	--	--	--	7 (70)	3 (30)
Double-crested cormorant	12 ³	--	--	--	--	--	12 (100)
Great blue heron	9	--	--	--	--	8 (89)	9 (100)
Long-billed dowitcher	19	--	--	10 (53)	10 (53)	9 (47)	--
Franklin's gull	40 ³	--	--	--	--	--	40 (100)
Mountain plover	47	--	3 (6)	8 (17)	40 (85)	8 (17)	--
Sandhill crane	8	--	3 (38)	1 (13)	2 (25)	1 (13)	2 (25)
White-faced ibis	12 ³	--	--	--	--	--	12 (100)

- ¹ A = 0-26 ft (0-8 m)
 B = 26-184 ft (8-56 m)
 C = >184 ft (>56 m)
 + = above rim
 - = below rim

² Percentage of total number of individual observations in parentheses; percentages do not total 100, since more than one flight height class may be assigned to a single observation.

³ Represents a single observation of a flock of individuals.



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Figure 3.3 The (A) Mean Number of Passerine Species Observed Per Survey and (B) Mean Number of Passerine Observations Per Survey Along the West and East Sides of Foote Creek Rim, May 1994 to March 1995.

Brewer's blackbird) were frequently observed along the open western edge of Foote Creek Rim, while species favoring mixed grassland/shrub habitats (e.g., green-tailed towhee and northern flicker) were more common along the eastern edge of the rim.

The mean number of passerine observations per survey along the western side of Foote Creek Rim peaked in July (221.25 observations/survey) and August (147.20 observations/survey), and then gradually declined through December and January (0 and 0.25 observations/survey, respectively) [Figure 3.3(B)]. As with the western side, passerine observations along the eastern side of the rim peaked in July (279.00 observations/survey), and then declined through December (4.25 observations/survey). The mean number of passerine observations/survey was greater along the eastern side than along the western side for every month surveyed. The relatively large number of observations in May for east and west Foote Creek Rim (149 and 144 observations/survey, respectively) probably was a result of the compound effect of an influx of breeders mixing with northbound migrants. The large number of passerine observations in July along both sides of Foote Creek Rim is probably the result of the offspring of local breeders entering the visible population.

The number of passerine observations (i.e., between May 24, 1994 and March 17, 1995) at each survey location along both the western and eastern sides of Foote Creek Rim is portrayed in Figure 3.4. Along the western side of Foote Creek Rim, passerines were most commonly observed between sample points 8 and 11, and sample points 21 and 28 (Figure 3.4). These areas of higher bird activity may differ from other areas along the western side of Foote Creek Rim in such variables as topography, habitat structure, and/or microclimate. That portion of the eastern side of Foote Creek Rim surveyed for passerine observations (also between May 24, 1994 and March 17, 1995), on the other hand, possessed a relatively uniform amount of passerine activity along its length (Figure 3.4). Only along the

northern and southern ends of the transect, where vegetation diversity and structure decrease, is there a drop in passerine observations.

Although it is likely that the vast majority of passerines that migrate through the KPPA in the spring continue moving to points north of the area, many individuals stay and breed in the area (e.g., horned lark, mountain bluebird, northern flicker, western meadowlark). Riparian areas such as the Rock Creek and Medicine Bow drainages provide natural corridors for migratory movements of passerines (i.e., north-south), as do the north and south-oriented ridges in the KPPA. Although specific migratory movement patterns have not yet been determined for the KPPA, it is likely the majority of passerines migrating through the KPPA follow these natural features (Mariah 1993, 1994a, 1995). In October 1993, several flocks of mountain bluebirds were observed moving south along the western slope of Foote Creek Rim (Mariah 1993). Between September and November 1994, numerous flocks of passerines (e.g., horned lark, mountain bluebird, eastern bluebird, northern flicker, pine siskin, purple finch, rosy finch, dark-eyed junco) were observed flying south along the rim. One large flock (approximately 460 birds) of purple finches was observed moving south along the eastern edge of Foote Creek Rim on September 28, 1994 (Mariah 1994a).

The flight heights of passerines observed within the Foote Creek Rim area are presented in Table 3.17. The four most commonly observed species (horned lark, Brewer's blackbird, cliff swallow, and mountain bluebird) are presented separately from the other passerine species due to their prevalence in the total sample. In general, passerines were observed flying 0-26 ft (0-8 m) below the rim and 0-26 ft (0-8 m) above the rim more frequently than in any other height classes. Since most observations of flying passerines were of birds moving during local foraging bouts, it would be expected that their flight height would be relatively low. Horned larks (89%) and mountain bluebirds (87%) were observed more frequently in the 0-26 ft (0-8 m) flight height class than cliff

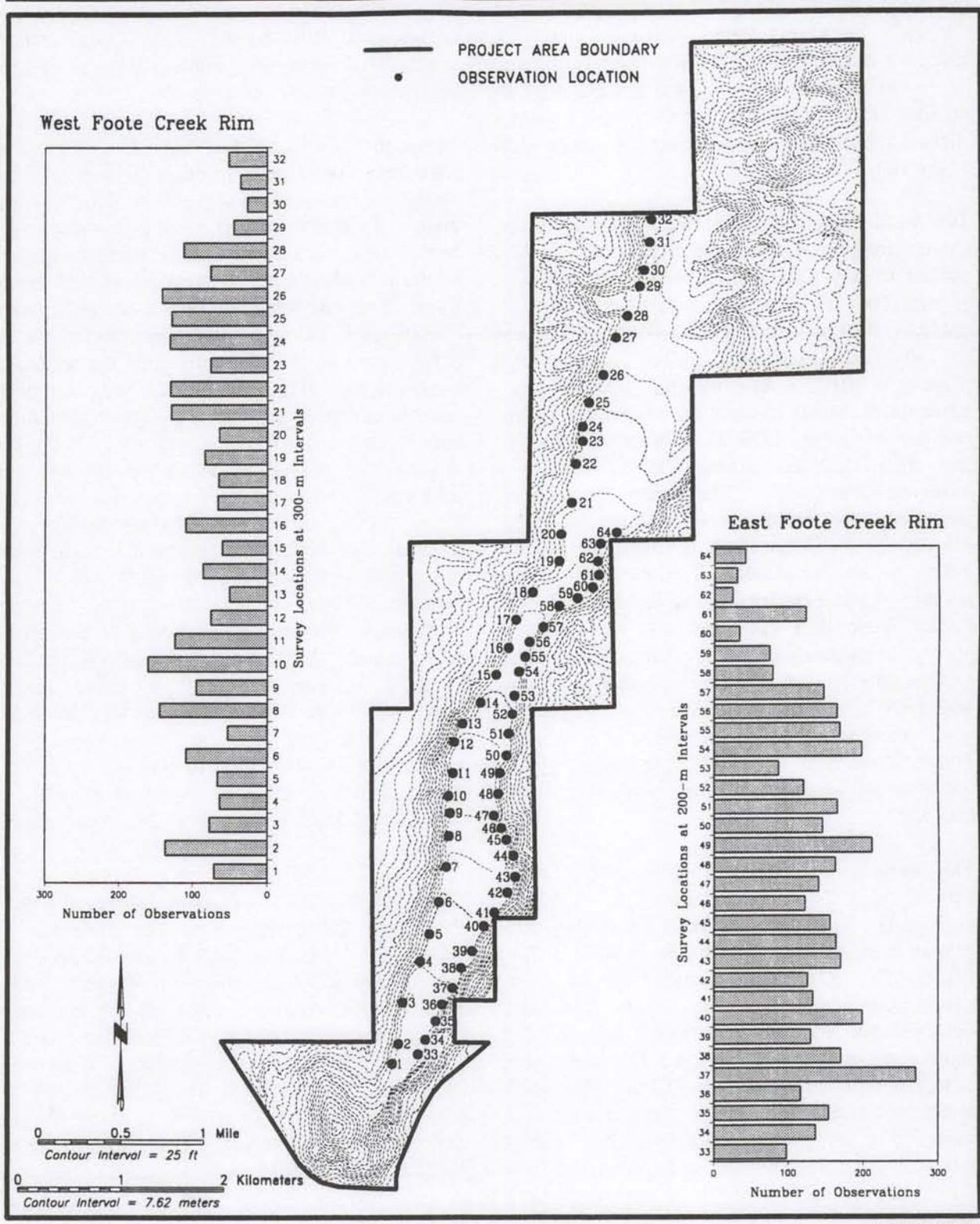


Figure 3.4 Number of Passerines Observed Along the West and East Sides of Foote Creek Rim, May 1994 to March 1995.

swallows (65%), Brewer's blackbirds (60%), or other passerines (55%). These species tend to perch and forage on the ground or on low structures (i.e., fences) on the rimpop. Relatively few passerines fly at the height of the proposed wind turbine rotors.

3.2.2.7 Amphibians and Reptiles

Based on range and habitat preference (Stebbins 1966; Baxter and Stone 1985), three amphibian and three reptile species are likely to occur within the KPPA. Amphibian species include tiger salamander, chorus frog, and leopard frog. Amphibians on the KPPA primarily occur in and adjacent to ephemeral, intermittent, and perennial water habitats. Reptile species potentially occurring on the KPPA include sagebrush lizard, short-horned lizard, and western terrestrial garter snake. Historic habitat for the federally endangered Wyoming toad occurs in the Rock Creek drainage east of Foote Creek Rim (see Section 3.2.3.3) [Wyoming Natural Diversity Database (WNDD) 1994].

3.2.2.8 Fisheries

Oberholtzer (1985) provides a comprehensive survey of fish species within all of the major drainages in the KPPA. The only WGFD Class 3 stream (WDEQ Class 2 surface water) within or immediately adjacent to the KPPA is the section of Rock Creek immediately east of Foote Creek Rim. A WGFD Class 3 stream is a trout fishery of statewide importance (WGFD 1991). A WDEQ Class 2 surface water currently supports game fish or has the potential to support game fish populations (WDEQ 1990). Game fish species within this section of Rock Creek are rainbow trout, brown trout, and brook trout (personal communication, May 15, 1995 with Don Miller, WGFD); nongame species include creek chub, longnose dace, white sucker, and longnose sucker. WGFD provides public access to Rock Creek in several locations.

The Medicine Bow River, Wagonhound Creek, and Foote Creek are all WGFD Class 4 streams

and WDEQ Class 2 surface waters. WGFD Class 4 streams are considered low production trout waters that may be fisheries of local importance, but are generally incapable of sustaining substantial fishing pressure (WGFD 1991). The section of the Medicine Bow River within the KPPA supports a variety of fish species, including brown trout, rainbow trout, walleye, longnose dace, longnose sucker, white sucker, common carp, creek chub, silver shiner, and johnny darter. Wagonhound Creek, which flows through the Wick Unit southwest of the Foote Creek Rim, contains primarily brown trout, as well as several nongame species already mentioned (personal communication, May 15, 1995 with Don Miller, WGFD). Foote Creek, which flows along the western side of Foote Creek Rim, contains rainbow trout and a few brook trout.

The remainder of the drainages within the KPPA (i.e., Dry Creek; Watkins Creek; Bear Creek; and First, Second, and Third Sand Creeks) are either intermittent/ephemeral streams that do not support any fish populations or are perennial streams that may support small populations of brook trout and nongame species (Oberholtzer 1985).

Lakes or reservoirs within or adjacent to the KPPA may contain game fish, but are dependent upon private or state restocking efforts to maintain viable populations. Two reservoirs immediately east of Foote Creek Rim are privately owned and are managed as trout fishing clubs by local ranchers. East Allen Lake, located northeast of the KPPA, is a popular public trout fishery for Carbon and Albany County residents.

3.2.3 Threatened and Endangered/State Sensitive Species

The ESA (16 U.S.C. 1531-1543) protects listed T&E plant and animal species and their critical habitats. To ensure compliance with this act, a Biological Assessment (BA) analyzing the effects of the proposed project on T&E and candidate species was prepared and submitted to the USFWS in February 1995. A biological opinion will be obtained from USFWS prior to issuing the ROD

Table 3.17 Flight Heights of Passerines Observed Within the Foote Creek Rim Area, 1994-1995.

Taxonomic Group or Species	Total Number of Individuals in Sample	Flight Height Class ¹					
		C-	B-	A-	A+	B+	C+
Brewer's blackbird	444	2 (<1)	9 (2)	37 (8)	266 (60)	90 (20)	5 (1)
Cliff swallow	372	10 (3)	45 (12)	174 (47)	240 (65)	29 (8)	21 (6)
Horned lark	4,098	20 (<1) ²	71 (2)	671 (16)	3,647 (89)	520 (13)	12 (<1)
Mountain bluebird	353	1 (<1)	6 (2)	53 (15)	306 (87)	96 (27)	0 (0)
Other passerines	1,293	6 (<1)	227 (18)	689 (53)	717 (65)	275 (21)	6 (<1)
Total	6,560	39 (1)	358 (5)	1,624 (25)	5,176 (79)	1010 (15)	44 (1)

- ¹ A = 0-26 ft (0-8 m)
 B = 26-184 ft (8-56 m)
 C = >184 ft (>56 m)
 + = above rim
 - = below rim

- ² Percentage of total number of individual observations in parentheses; percentages may not total 100, since more than one flight height class may be assigned to a single observation.

for this project. The BA is available from the BLM. In addition, surveys for T&E and candidate species will be conducted on a case-by-case basis as directed by the USFWS and BLM as components of the pre-construction process.

The USFWS was contacted to initiate informal consultation and to obtain a list of T&E species potentially present within and adjacent to the KPPA. Their response indicated that the bald eagle, peregrine falcon, black-footed ferret and whooping crane are the only T&E species that may occur in or adjacent to the KPPA; however, numerous candidate species for federal listing also occur or potentially occur in the area (Table 3.18). In addition, observation records obtained from the WGFD and WNDD provided a list of state sensitive species that occur on or adjacent to the KPPA.

Species that are proposed for listing as T&E are grouped into one of three candidate categories: Category 1 (C1), Category 2 (C2), or Category 3 (3C). C1 species are those for which the USFWS has sufficient data to list as T&E, but for which proposed rules have not yet been issued. C2 species are those that are being considered for listing, but for which sufficient data are not yet available for a listing decision. 3C species are those that were once considered for listing as T&E, but now no longer receive such consideration; they are either more widespread or abundant than previously believed or are not subject to identifiable threats. State sensitive and WNDD designations are defined in the footnotes of Table 3.18.

Although whooping cranes may migrate through the KPPA, there have been no observations of this species in the area (WGFD 1994a); therefore, this

species is not addressed further in this EIS. Since there will be no downstream water depletion of the Platte River due to the proposed project, such downstream T&E species as the piping plover, least tern, and pallid sturgeon will not be impacted by the project and are not addressed further in the EIS.

TEC&S animal and plant species occurring or potentially occurring on or adjacent to the KPPA are discussed below.

3.2.3.1 Mammals

Black-footed Ferret. This federally endangered species was once distributed throughout the high plains of the Rocky Mountain and western Great Plains regions (Forrest et al. 1985). Prairie dogs are the main food source of BFFs (Sheets et al. 1972) and few ferrets have been historically collected away from prairie dog colonies (Forrest et al. 1985). BFFs were considered extinct until a small population was discovered near Meeteetse, Wyoming, in 1981. Following outbreaks of canine distemper, surviving ferrets were brought into captivity and a captive breeding program was initiated (USFWS 1988). BFFs were reintroduced in the Shirley Basin region of central Wyoming in 1991; this reintroduction effort continues with the aid of annual supplemental releases.

One probable BFF sighting was reported in August 1988, in an area along the southern border of the Simpson Ridge area (Jobman 1992). This is the most recent potential observation of a BFF within or adjacent to the KPPA. No BFF sightings have been confirmed in the KPPA since the reintroduction of ferrets into Shirley Basin (personal communication, 1993, with Bob Oakleaf, Nongame Coordinator, WGFD). Several historic sightings of BFFs have been recorded in an area north and east of Foote Creek Rim and Alternate 3 (WNDD 1993b, 1994).

Approximately 35% (19,107 ac) of the Simpson Ridge area is classified as BFF PMZ2 (Map 3.9). PMZs are areas designated by the WGFD, BLM, and USFWS to assist in the management of the

BFF reintroduction effort (WGFD and BLM 1991). PMZ1 (Shirley Basin) was established as the preferred release site in the Management Area and PMZ2 (Medicine Bow) was designated as a secondary release site. Ferrets have been reintroduced into PMZ1 under an experimental/nonessential designation, and movement outside of the PMZ is anticipated as the ferrets become established and disperse throughout the area. The area south and east of the North Platte River was declared ferret-free prior to the reintroduction of ferrets in Shirley Basin (WGFD and BLM 1991). BFF searches would not be required by the WGFD, BLM, and USFWS within the KPPA due to the experimental/nonessential designation and management guidelines presented in the ferret plan (WGFD and BLM 1991).

Although it is very unlikely that BFFs are present on or near the KPPA, white-tailed prairie dog colonies are scattered throughout the KPPA and adjacent areas and could provide a potential prey base and suitable habitat for ferrets. Prairie dog colonies within the Foote Creek Rim area and along Alternate 3 were mapped in June 1994. Three historic prairie dog colonies encompass approximately 979 ac (20%) of the Foote Creek Rim area; the acreage covered by active prairie dog colonies is smaller. Alternate 3 passes through approximately 6.7 mi (10.7 km) of historic prairie dog colonies (81 ac), some of which are greater than 500 ac in size.

Long-legged Myotis (Bat). This C2 species is one of eight small mouse-eared bats known to occur in Wyoming. Long-legged myotis live throughout the western half of North America and have been reported as the most abundant mouse-eared bat in the western United States (Clark and Stromberg 1987, WGFD 1992). They have been observed in a variety of habitats in Wyoming, including coniferous (e.g., ponderosa pine) and deciduous forests, basin-prairie and mountain-foothills shrublands, and riparian areas. Long-legged myotis nest in tree hollows, snags, buildings, rock crevices, mines, and caves. This species may hibernate in Wyoming during the winter, and is extremely susceptible to disturbance during

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Table 3.18 Threatened, Endangered, Candidate, and State Sensitive (TEC&S) Animal and Plant Species Known to Occur or Potentially Occurring Within the KPPA.¹

Common Name	Location ²	Date of Last Observation ³	Status ⁴
Mammals			
Black-footed ferret	Several historic observations north and east of FCRA and Alternate 3; most recent probable observation along the southern boundary of the SRA; potential resident of prairie dog colonies within the area	August 1988 (probable)	LE, I-WYGF, S1, G1
Hoary bat	Approximately 2.0 mi (3.2 km) south of the FCRA	May 16, 1992	III-WYGF, S3, G5
Long-legged myotis (bat)	Likely visitor (potential resident) of the KPPA	—	C2, S5?, G5
North American lynx	Approximately 3.0 mi (4.8 km) south of the FCRA	September 26, 1987	C2, III-WYGF, S2, G5
Swift fox	Potential visitor to grassland habitats within the KPPA	—	C2, S3, G4
White-footed mouse	Approximately 4.0 mi (6.4 km) north of the SRA	July 24, 1979	III-WYGF, S3, G5
Birds			
American bittern	Approximately 3.0 mi (4.8 km) northwest of the SRA	July 8, 1985	II-WYGF, S2B, SZN, G4
American white pelican	Numerous observations both within and adjacent to the KPPA	1994	I-WYGF, S1B, S3N, G3
Baird's sparrow	Unlikely summer visitor to the KPPA	—	C2, S2?, G3
Bald eagle	Numerous observations throughout the KPPA; a single active nest within 2.0 mi (3.2 km) of the SRA	1995	LT, S1B, S2N, G3
Bushtit	Two observations along Wagonhound Creek, approximately 4.0 mi (6.4 km) west of the southern FCRA	June 13, 1986	III-WYGF, S3B, SZN, G5
Caspian tern	Two observations approximately 1.0 mi (1.6 km) east of FCR	1994	I-WYGF, S1B, S3N, G5
Ferruginous hawk	Numerous observations throughout the KPPA	1995	C2, III-WYGF, S4B, SZN, G4
Great blue heron	Numerous observations throughout the KPPA	1994	III-WYGF, S4B, S4N, G5
Loggerhead shrike	Several observations throughout FCR	1994	C2, S4B, SZN, G4
Long-billed curlew	Approximately 0.5 mi (0.8 km) south of the SRA	April 17, 1987	3C, III-WYGF, S3B, S4N, G5
Merlin	Several observations along FCR and the southeastern SRA.	1994	II-WYGF, S2, S3B, SZN, G4

Table 3.18 (Continued)

Common Name	Location ²	Date of Last Observation ³	Status ⁴
Birds (Continued)			
Mountain plover	Numerous observations on top of FCR; plover chicks observed during June and July	1994	C1, S3B, S4N, G3
Northern goshawk	Southern FCR and approximately 1.0 mi (1.6 km) east of FCR	1994	C2, S4B, SZN, G4
Peregrine falcon	Numerous observations along FCR and northwest of the SRA	1994	LE, S1B, S1N, G3T2
Plain titmouse	Several observations along the eastern slope of FCR	1994	III-WYGF, S3B, SZN, G5
Trumpeter swan	Approximately 4.0 mi (6.4 km) east-northeast of the SRA; unlikely migrant through the area	October 23, 1988	C2, I-WYGF, S1, S2B, S2N, G4
Upland sandpiper	Several observations on central and northern FCR	1994	II-WYGF, S2B, S3N, G5
Western burrowing owl	Three observations, two north and one approximately 0.5 mi (0.8 km) south of the SRA	April 27, 1986	C2, II-WYGF, S2, S3B, SZN, G5
Western snowy plover	Potential rare migrant through the KPPA	—	3C, S1, G4?
White-faced ibis	Thirteen observations on and adjacent to FCRA and two observations 2.0-3.0 mi (3.2-4.8 km) northwest of the SRA	1994	C2, I-WYGF, S1B, S2N, G5
Whooping crane	Unlikely migrant through the area	—	LE, SHB, S1N, G1
Amphibians and Reptiles			
Wyoming toad	Possible historic habitat in Rock Creek Drainage east of the FCRA	—	LE, S1, G5T1
Eastern short-horned lizard	Two observations in the SRA and one on FCR	1994	C2, S5, G5
Plants			
Bun milk-vetch	Northern end of Alternate ROWs	June 1920	WYLST 2, S3, G3
Contracted Indian ricegrass	Potential habitat throughout the KPPA	—	C2, WYLST 2, S2, G4T2
Slender-trumpet ipomopsis	Approximately 3.0 mi (4.8 km) west-southwest of the southern FCRA	August 9, 1993	WYLST 3, S1, G?
Ute lady's tresses	Potential occurrence in wetland areas throughout the KPPA	—	LT, WYLST 1, S1, G2

Table 3.18 (Continued)

- ¹ WNDD (1993b, 1994); WGFD (1994); Mariah (1994a, 1995).
² FCRA = Foote Creek Rim Area.
 SRA = Simpson Ridge Area.
 FCR = Foote Creek Rim.
³ All observations made in 1994 and 1995 occurred as a result of raptor and passerine field surveys (Mariah 1994a, 1995).
⁴ Status definitions as given by the WNDD (1991, 1993a).

Federal Status:

- LE = Listed as federally endangered.
 LT = Listed as federally threatened.
 C1 = USFWS Notice of Review, Category 1. Species for which current information supports the biological appropriateness of proposing to list as endangered or threatened, but proposed rules have not yet been issued.
 C2 = USFWS Notice of Review, Category 2. Species for which current information indicates that proposing to list as endangered or threatened is possibly appropriate, but insufficient information is on file to support an immediate ruling.
 3C = USFWS Notice of Review, Category 3C. Taxa that were once considered for listing as endangered or threatened, but now no longer receive such consideration. Taxa are more widespread or abundant than previously believed, or are not subject to identifiable threats.

State Status:

- I-WYGF = Priority I; includes federally endangered and threatened wildlife. Also includes species in need of immediate attention and active management to ensure that extirpation or a significant decline in the breeding population does not occur.
 II-WYGF = Priority II; includes species which are in need of additional study to determine whether intensive management is warranted or whether low-level management (such as monitoring population trends) will suffice. Until intensive management is necessary, low-level management will be implemented.
 III-WYGF = Priority III; includes species whose needs should be accommodated in resource management planning. However, intensive management programs to maintain or enhance populations are not warranted at present. Populations of these species should be monitored to determine if low levels of management continue to be adequate. Knowledge of some of these species often is very limited.

WNDD Status:

- WYLST 1 = High priority; contains: 1) species that are vulnerable to extinction throughout their range or within Wyoming; 2) federally listed and proposed threatened and endangered species, C1 and C2 candidates, and U.S. Forest Service (USFS) and BLM sensitive species; and 3) species that are regionally rare or significantly disjunct, but which presently have no formal protection status.
 WYLST 2 = Medium priority; contains: 1) species on designated watch lists for federal lands, or that are being recommended for watch lists by the WNDD; and 2) other species that are suspected to be moderately rare and/or somewhat threatened globally or regionally.
 WYLST 3 = Low priority; contains: 1) species that were previously considered higher priority for protection, but which have been down-ranked as new information has become available; and 2) species that are rare in Wyoming but common and secure in adjacent areas.
 S1 = Critically imperiled in Wyoming because of extreme rarity (5 or fewer occurrences or very few remaining individuals) or because of some factor(s) making it especially vulnerable to extirpation within the state.
 S1B = Statewide breeding status of S1.
 S1N = Statewide nonbreeding status of S1.
 S2 = Imperiled in Wyoming because of rarity (6 to 20 occurrences or few remaining individuals) or because of some factor(s) making it very vulnerable to extirpation within the state.
 S2B = Statewide breeding status of S2.
 S2N = Statewide nonbreeding status of S2.
 S3 = Rare or uncommon in Wyoming (on the order of 21 to 100 occurrences).
 S3B = Statewide breeding status of S3.
 S3N = Statewide nonbreeding status of S3.
 S4 = Apparently secure in Wyoming with many occurrences.
 S4B = Statewide breeding status of S4.
 S4N = Statewide nonbreeding status of S4.
 SH = Historical occurrence in the state, perhaps having not been verified in the past 20 years, and suspected to still be extant. Upon verification of an existing occurrence, SH rank elements would typically receive an S1 rank.
 SHB = Statewide breeding status of SH.
 SZN = Species which are not of significant concern when migrating through or wintering in Wyoming. This includes relatively uncommon migrants in the state with irregular, transitory, or dispersed occurrences. Includes rare species for which important habitats that could be protected are difficult or impossible to define. Also refers to abundant species wintering in, or migrating through, Wyoming.
 G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals) or because of some factor(s) making it especially vulnerable to extinction.
 G2 = Imperiled globally because of rarity (6 to 20 occurrences) or because of factors demonstrably making it vulnerable to extinction.

Table 3.18 (Continued)

- G3 = Either very rare and local throughout its range, found locally (even abundant at some locations) in a restricted range, or vulnerable to extinction throughout its range.
 G3T2 = Subspecies has G2 status.
- G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
 G4T2 = Subspecies has G2 status.
- G5 = Demonstrably secure globally and essentially ineradicable under present conditions.
 G5T1 = Subspecies has G1 status.
- G? = Exact global status unknown.

hibernation. Long-legged myotis feed exclusively on flying insects, especially moths.

Although long-legged myotis have not been observed in the KPPA, this may, at least in part, be due to the nocturnal activity of this species. It is likely that this bat species occasionally forages over habitats within the KPPA; however, it is unlikely that it is a common resident or visitor in the area.

North American Lynx. A C2 species, North American lynx are found in extensive tracts of high elevation, dense coniferous forests; they favor areas containing subalpine fir and Englemann spruce (WGFD 1992). Lynx prey on snowshoe hares, mice, grouse, and squirrels, and often occupy areas of heavy winter snow accumulations (Clark and Stromberg 1987).

WGFD records indicate that a lynx was sighted 3 mi south of Foote Creek Rim in 1987, along the edge of the Medicine Bow National Forest. No other lynx sightings have been reported in the area. Because the KPPA lies outside typical lynx habitat, this species is not anticipated to frequent the project area; short duration visits during hunting forays may occasionally occur during winter months.

Swift Fox. The swift fox, a C2 species, is a resident of the northern Great Plains, from the Rocky Mountain foothills to Texas (Clark and Stromberg 1987). In Wyoming, this species inhabits the eastern Great Plains grasslands, occasionally utilizing agricultural lands and irrigated native meadows. Prey items include small mammals, insects, and birds (WGFD 1992).

No recent sightings of swift fox have been reported on or near the KPPA. However, much of the KPPA is potential swift fox habitat. Swift fox may, at least infrequently, use the KPPA and adjacent areas.

State Sensitive Species. Two state sensitive mammal species have been observed in the vicinity of the KPPA: the hoary bat and white-footed mouse.

The relatively large hoary bat inhabits greasewood flats, shortgrass prairies, and aspen/pine forests (Clark and Stromberg 1987). Although this bat has been observed throughout the state, the overall rarity of observations has resulted in a poor understanding of the biology of this species. A hoary bat was observed about 2 mi (3 km) south of Foote Creek Rim in 1992 (WGFD 1994b), and it is likely that this species occurs within the KPPA during the summer months.

A white-footed mouse was collected approximately 4 mi (6 km) north of the Simpson Ridge area in 1979 (WGFD 1994b). This mouse species generally occurs east of the Rocky Mountains (Burt and Grossenheider 1976, Clark and Stromberg 1987); it is at the western extreme of its range in the vicinity of the KPPA. White-footed mice inhabit deciduous woodlands and associated riparian habitats (Clark and Stromberg 1987). Although it is probably not a common species in the vicinity of the KPPA, it may occur along such wooded drainages as the Medicine Bow River and Rock Creek.

3.2.3.2 Birds

Bald Eagle. The bald eagle is a federally threatened species which requires cliffs, large trees, or sheltered canyons associated with concentrated food sources (e.g., fisheries or waterfowl concentration areas) for nesting and/or roosting areas (Edwards 1969, Snow 1973, Call 1978, Steenhof 1978, Peterson 1986). Bald eagles forage widely during the non-nesting season (i.e., fall and winter) and scavenge on animal carcasses such as deer and elk.

During 1994, one active bald eagle nest was documented approximately 2 mi (3 km) south of the Simpson Ridge area. It is located approximately 5 mi (8 km) northwest of Elk Mountain, Wyoming, and is visible from I-80. One immature bald eagle successfully fledged from this nest in 1994.

Bald eagles have been observed throughout the KPPA (Mariah 1994a, 1995; WGFD 1994b). Thirty-seven bald eagle observations occurred within the Foote Creek Rim area during raptor and passerine surveys conducted between February 1994 and March 1995. Twenty-two of the observations (59%) were immature bald eagles, while the remaining 15 observations (41%) were adults. No portion of the rim was excluded from use by bald eagles, although bald eagle observations were most common in the western and northern portions of the rim. The majority of bald eagle observations occurred either over or immediately adjacent to the top of Foote Creek Rim (see Maps 3.4C and 3.4D).

Thirteen bald eagle observations occurred within 1 mi of the Simpson Ridge area; ten of these were adult birds (77%) and three were juveniles (23%). Ten of these observations were of immature (1) and adult (9) bald eagles immediately south of I-80 on the southern boundary of the Simpson Ridge area. Two immature bald eagles were observed in the northern portion of the Simpson Ridge area. One adult was observed flying across Highway 72 near the central portion of the Simpson Ridge

area. Seven (54%) of the bald eagle observations occurred in August and September of 1994.

Although bald eagles apparently did not nest within the KPPA during 1994, it is likely that they use the area for foraging throughout the year. No communal winter bald eagle roosts are known to occur within the KPPA, but it is likely that cottonwood trees along the Medicine Bow River, Rock Creek, Foote Creek, and other perennial drainages within the area are regularly used as perches in the winter (personal communication, June 1994, with Bob Oakleaf, Nongame Coordinator, WGFD). Wintering bald eagles are known to feed on road-killed deer in the area (personal communication, 1993, with Bob Oakleaf, Nongame Coordinator, WGFD), and the Rock Creek drainage east of Foote Creek Rim may also serve as a bald eagle wintering site.

Peregrine Falcon. A federally endangered species, peregrine falcons nest on tall cliffs, usually within 1.0 mi (1.6 km) of a stream, river, or extensive brush or woodlands. These habitats provide concentrated food sources and open areas to hunt (Call 1978, Snow 1972). Peregrine falcons nest on substantial rock outcrops (usually southern exposure) in small caves or on overhanging ledges large enough to accommodate three to four full-grown nestlings (Wilderness Research Institute 1979). Peregrine falcons feed almost exclusively on birds, many of which are associated with riparian zones and large bodies of water (i.e., waterfowl).

While no known peregrine falcon nests were observed in the 1994 nesting survey area, peregrine falcons have been observed within the KPPA. WGFD personnel reported two sightings of peregrine falcons 5 mi (8 km) northwest of the Simpson Ridge area in June of 1983 (WGFD 1994b). Twenty-three observations of peregrine falcons occurred in the Foote Creek Rim area between February 16, 1994 and March 17, 1995; the majority of these observations (14, or 61%) occurred between July 19 and October 3, 1994. (Inclusion of instantaneous observations recorded during raptor surveys on Foote Creek

Rim resulted in slightly inflated numbers of total peregrine falcon and ferruginous hawk observations in the DEIS because some birds were counted several times. The FEIS totals have been modified accordingly. Please note, however, that instantaneous observations are included on raptor distribution/use maps, to give a better indication of actual use.) Although peregrine falcons were observed along the length of the rim, approximately 65% of these observations (15) were along the western side of the rim. Sixteen observations (70%) occurred directly over the rim, and another 6 (26%) occurred within 328 ft (100 m) of the rim edge (see Maps 3.16A and 3.16B). Three peregrine falcon observations occurred within the Simpson Ridge area during avian surveys in August 1994.

It is possible, due to the relatively large number of observations throughout the spring and summer, that peregrine falcons nest within or immediately adjacent to the KPPA. However, no peregrine falcon nests were found during the 1994 raptor nest survey, and the availability of suitable nesting cliffs in the area is limited. Also, no peregrine falcon nest records occur in the WGFD Wildlife Observation System database for the KPPA or surrounding region (WGFD 1994b). See response to comment AE90 in Section 8.2.1.3 of the FEIS for additional information on peregrine falcon nest surveys.

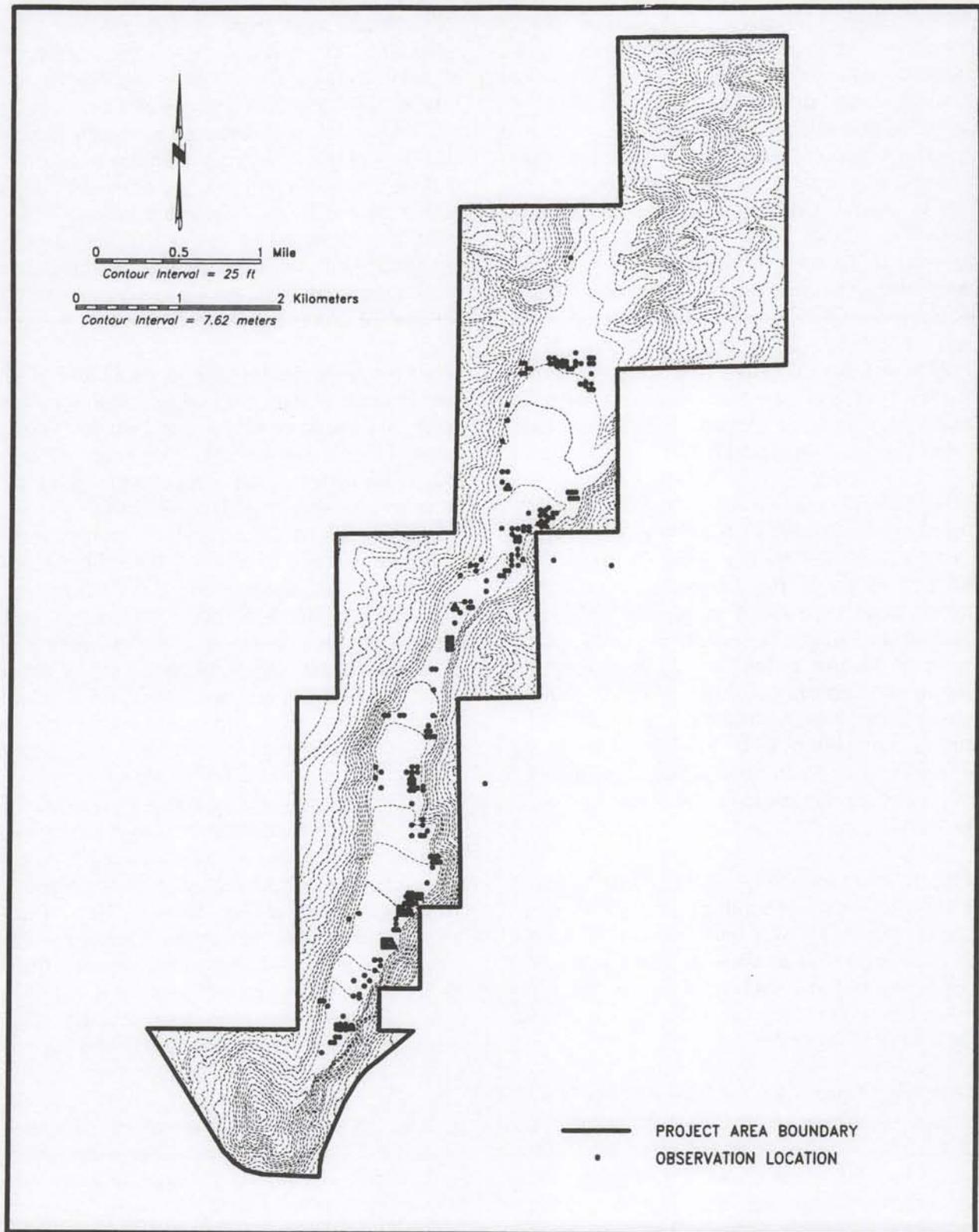
The KPPA, especially Foote Creek Rim, is occasionally used for hunting by peregrine falcons; several ponds and lakes immediately east of Foote Creek Rim provide an abundant source of potential waterfowl and shorebird prey. It is likely that wintering or migrating peregrine falcons also use the KPPA on occasion.

Mountain Plover. The mountain plover is a C1 species inhabiting the high, dry shortgrass plains east of the Rocky Mountains (Dinsmore 1983). The focus of breeding activity appears to be southeastern Wyoming and eastern Colorado (Graul and Webster 1976). Graul and Webster (1976) noted that mountain plover nesting habitat is associated with blue grama and buffalo grass,

although any short grass, very short shrub (e.g., saltbrush), or cushion plant type could be considered nesting habitat. Breeding bird surveys between 1966 and 1987 show an overall decline in the continental population of mountain plovers (USFS 1994a). Surveys completed in 1991 indicate that only 4,360 to 5,610 mountain plovers remain on the North American continent (USFS 1994b). Loss of breeding habitat due to cultivation and prey base declines resulting from pesticide use are major threats to mountain plover survival (Wiens and Dyer 1975).

While mountain plovers have not been observed on the Simpson Ridge area, they were routinely observed throughout early and mid-summer on top of Foote Creek Rim in 1994. Two hundred thirty-four observations of mountain plovers, representing approximately 15-20 breeding pairs, were recorded on Foote Creek Rim during the spring and summer of 1994 (Mariah 1994a). One nest was located during 1994, and all three eggs successfully hatched in mid-July; most observations in mid-summer were of adults with chicks of various ages. Habitat on top of Foote Creek Rim is monotypic, shortgrass prairie, which would suggest a random, area-wide plover distribution. Observations, however, indicate that plovers show a preference for the eastern (leeward) side of Foote Creek Rim (Map 3.17); an average of 5.6 plover observations per survey was recorded for the eastern side compared to 1.1 plover observations per survey on the western side for the ten survey periods between May 24 and July 26, 1994 (date of last observation). The majority (54%) of mountain plover flight observations were at heights between 0 and 26 ft (0-8 m) above the rim; approximately 26% (3 observations) were at proposed wind turbine rotor levels [i.e., 26-184 ft (8-56 m)].

Baird's Sparrow. This C2 species is a common summer resident of the upper Great Plains states (Scott 1987). The Baird's sparrow is rare in Wyoming; it is most likely to occur along the eastern edge of the state, where it prefers mid- to tallgrass prairie and hay meadows (Dorn and Dorn 1990, WGFD 1992).



Map 3.17 Distribution of Mountain Plover Sightings, Foote Creek Rim (n = 234).

Baird's sparrows have not been observed within or adjacent to the KPPA. However, since this species has been occasionally observed in the shortgrass prairies of eastern Wyoming, it should be considered an unlikely summer visitor to the KPPA. Any Baird's sparrows observed within the KPPA would probably be vagrant individuals temporarily feeding and resting in the area.

Ferruginous Hawk. The ferruginous hawk is a C2 species that breeds in semi-arid plains and intermountain areas of the Great Basin and Great Plains (Evans 1983). This species often nests on low cliffs, buttes, and cutbanks (Call 1978), as well as in junipers or sagebrush along the edges of pinyon-juniper communities. Ferruginous hawks feed primarily on small to medium-sized mammals such as jackrabbits, cottontail rabbits, ground squirrels and prairie dogs (Sherrod 1978).

One hundred sixty-six observations of ferruginous hawks occurred on the Foote Creek Rim area between February 16, 1994 and March 17, 1995 (Mariah 1994a, 1995). Many of these observations were of juvenile birds soaring in a relatively concentrated area along the western edge of the northern portion of the rim. Most ferruginous hawk observations were either immediately over or within 328 ft (100 m) of the rim.

Twenty-one ferruginous hawk observations were noted for the Simpson Ridge area, with approximately half (52%) occurring in the immediate vicinity of Simpson Ridge. It is anticipated that ferruginous hawks use the entire Simpson Ridge area, although only a portion of this area has been routinely surveyed.

Approximately 98 ferruginous hawk nests were found within the 1994 raptor nest survey area; the majority (67.3%) were located within the Simpson Ridge area and associated 2-mi (3-km) buffer (Table 3.13). Thirty-one ferruginous hawk nests were located within the Foote Creek Rim area and associated 10-mi (16-km) buffer. Eighteen ferruginous hawk nests were active in 1994 (Table 3.13). Nest success was known for all

11 nests, and was 91%. Average number of young fledged for the ferruginous hawk was 2.20 ± 0.919 .

Loggerhead Shrike. In Wyoming, the loggerhead shrike, a C2 species, inhabits sagebrush-grasslands associated with stands of pinyon-juniper and larger shrubs (WGFD 1992). These habitats provide ample open areas in which to forage for insects and small vertebrates (Craig 1978, Bystrak 1983), as well as trees and shrubs in which to build their large, bulky nests (Graber et al. 1973). Declines in loggerhead shrike populations have been noted over the past 40 years, and the declines appear to be most significant near the periphery of their range (Bystrak 1983). Reasons for the decline are unknown; habitat changes and pesticide use may play a role.

Seventeen loggerhead shrike observations were recorded for the Foote Creek Rim area between May 1 and September 9, 1994 (Mariah 1994a, 1995). Fourteen of these observations (82.4%) were along the eastern edge and slope of the rim in areas of sagebrush-grassland interspersed with trees and large shrubs. No observations of loggerhead shrikes were made within the Simpson Ridge area during avian surveys (Mariah 1994a, 1995), however one individual was incidentally observed in July 1995.

Although loggerhead shrike nests have not been observed on the KPPA, it is likely that nesting does occur along the sagebrush draws and riparian areas located within the project area (e.g., tree and shrub areas along the eastern slope of Foote Creek Rim). Most of the KPPA provides habitats conducive to shrike foraging and hunting activities.

Northern Goshawk. The northern goshawk, a C2 species, inhabits coniferous forests, especially those with a significant Douglas fir and lodgepole pine component (WGFD 1992). Goshawks forage in a variety of habitats, including sagebrush-grassland areas adjacent to stands of coniferous forest. Prey items include small mammals, waterfowl, song birds, and insects (Terres 1980). Nests are often built high [i.e., >30 ft (9 m)] in

coniferous trees; some goshawks have been observed nesting in mature cottonwoods along riparian corridors (Call 1978).

Northern goshawks have been observed on the KPPA, with two sightings in May and one in October 1994 (Mariah 1994a, 1995). One observation occurred along the southern edge of Foote Creek Rim; another was 1.0 mi (1.6 km) east of the rim; and a third observation occurred immediately adjacent to the southeastern portion of the rim. These birds were probably hunting in the area; it is unlikely, due to the lack of extensive coniferous forest on the Foote Creek Rim area, that goshawks nest within the area. No northern goshawk nests were found during the 1994 raptor nest survey; however, forested land south of I-80 was excluded from the 1994 survey area. The closest known nests are several miles south of the Foote Creek Rim area within the Medicine Bow National Forest (WGFD 1994b). No goshawks have been observed within the Simpson Ridge area; little, if any, potential goshawk habitat occurs within this area.

Trumpeter Swan. The trumpeter swan is a C2 waterfowl species. The majority of the population that occurs in Wyoming frequents the marshes, lakes, and rivers in the Greater Yellowstone Ecosystem during the spring and summer months and returns to Idaho for the winter (WGFD 1992). Nests are usually built on a muskrat house or very small island in a large pond or small lake (WGFD 1992).

A single observation of a trumpeter swan occurred approximately 4.0 mi (6.4 km) east-northeast of the KPPA in October 1993 (WGFD 1994b). This was likely a vagrant individual that temporarily stopped in the area to feed or rest prior to continuing its wanderings. If wetlands within the KPPA are used by this species, it is probably during these rare visits by transient individuals.

Western Burrowing Owl. This small, long-legged owl of shortgrass prairie has been recently identified as a C2 species. Burrowing owls are usually active during daylight, feeding on insects,

rodents, and birds. They nest in unoccupied mammal burrows, especially those of prairie dogs (Dorn and Dorn 1990, WGFD 1992).

According to WGFD (1994b) observation records, burrowing owls have occasionally been observed to the north and south of the Simpson Ridge area. Although no burrowing owls were observed during raptor and passerine surveys in 1994 (Mariah 1994a, 1995), it is possible that this species nests and forages within the KPPA. However, due to the lack of recorded observations for the KPPA and surrounding region, it is unlikely that burrowing owls are common in the area.

White-faced Ibis. The white-faced ibis is a C2 species that frequents marshes, wet-moist meadows, lake shores and irrigated meadows (WGFD 1992). Typical prey includes insects, leeches, earthworms, frogs, and fish (Terres 1980). The species breeds in colonies ranging from a few to several thousand birds in extensive freshwater marshes sporadically distributed from the Pacific Coast to the Great Plains (Erwin 1983). Breeding colonies have been observed at Hutton Lake National Wildlife Refuge in southeastern Wyoming and several locations in southwestern Wyoming (WGFD 1992).

Twelve white-faced ibis were observed flying across the narrow central portion of Foote Creek Rim on March 31, 1994. Another observation occurred approximately 2 mi (3 km) east of the Foote Creek Rim area on April 14, 1994, near a creek. This species was also observed northwest of the Simpson Ridge area on two separate occasions in the spring of 1994 (Mariah 1994a, 1995). All of these birds were likely transient individuals, resting and feeding in the area before continuing spring migration. No white-faced ibis breeding colonies occur within the KPPA.

Long-billed Curlew. A 3C species, the long-billed curlew breeds in arid grasslands and sagebrush/grasslands of the western Great Plains and Great Basin (Howe 1983). They arrive in the central Rocky Mountains in April (Behle and Perry

1975), and build shallow scrape nests in open areas of shortgrass prairie (Allen 1980).

Long-billed curlews have been observed on three separate occasions near the KPPA. One was observed about 0.5 mi (0.8 km) south of the Simpson Ridge area in 1983; the other two observations occurred in 1985 and 1987 in the vicinity of Elk Mountain, Wyoming, just southwest of Alternate 1 (WGFD 1994b). It is likely that curlews occasionally use wetland areas within the KPPA for foraging or as stopover areas during migration, but probably remain in the area for only short periods of time. Long-billed curlew nesting activity has never been documented for the KPPA, although appropriate nesting habitat is present over much of the area. Although unlikely, curlews could use areas such as Foote Creek Rim for nesting.

Western Snowy Plover. The western snowy plover, a 3C species, summers in states south and west of Wyoming (i.e., Utah, Nevada, California, and Oregon) (Scott 1987). This species feeds on insects and other invertebrates along the shores and sandy beaches of alkaline ponds (Dorn and Dorn 1990, WGFD 1992). Western snowy plovers have only been occasionally observed in Wyoming, and most of these observations have occurred in southwestern Wyoming (WGFD 1992).

No western snowy plovers have been observed within or adjacent to the KPPA (Mariah 1994a, 1995; WGFD 1994b). This species is unlikely to occur within the KPPA except as a rare summer migrant through the area.

State Sensitive Species. Nine state sensitive bird species occur, or potentially occur, within or adjacent to the KPPA: American bittern, American white pelican, burrowing owl, bushtit, Caspian tern, great blue heron, merlin, plain titmouse, and upland sandpiper (WGFD 1994b).

Four species (i.e., American bittern, American white pelican, Caspian tern, and great blue heron) frequent ponds, lakes, rivers, and wetland areas

within the state (WGFD 1992). Although all four of these species may occasionally pass through the KPPA during migration or while foraging, only the American white pelican, Caspian tern, and great blue heron were observed in the area in 1994. All three of these species were observed at the reservoir and wetland areas immediately east of the Foote Creek Rim area. Thirty-six of 55 observations (65.5%) of American white pelicans and nine of 25 observations (36.0%) of great blue herons were of birds flying over or immediately adjacent to Foote Creek Rim. Two observations of Caspian terns occurred over lakes immediately east of Foote Creek Rim. Between April and November 1994, American white pelicans and great blue herons were also observed within the Simpson Ridge area.

Seventeen observations of merlin, small falcons that often nest in mature cottonwood riparian zones, were noted within the Foote Creek Rim area between February 16, 1994 and March 17, 1995 (Mariah 1994a, 1995). Eleven of the observations (65%) occurred in October and November. Thirteen (76%) of the observations involved merlin flying over or within 164 ft (50 m) of the top of the rim. Nesting habitat for this species likely occurs within the Rock Creek drainage east of the rim, but no merlin nests were found during ground surveys. Three observations of merlin were recorded within the Simpson Ridge area; all three occurred at the southeastern tip of Simpson Ridge.

Seven observations of upland sandpiper occurred in the Foote Creek Rim area between May 5 and 17, 1994. Most observations were in the central portion of the rim, away from the edges. Foote Creek Rim, with its monotypic shortgrass prairie, provides appropriate nesting habitat for upland sandpipers, which build their nests in shallow depressions on open ground (WGFD 1992). Although several of the upland sandpiper observations on Foote Creek Rim involved displaying birds, none were observed nesting in the area. No upland sandpipers were seen in the Simpson Ridge area.

Bushtits and plain titmice have both been observed in the vicinity of the KPPA (Mariah 1994a, 1995; WGFD 1994b). Both species prefer riparian habitats with significant shrub cover, such as is found along the Medicine Bow River and Rock Creek drainages. In June and July 1994, plain titmice were observed nine times along the shrub-covered eastern edge of central Foote Creek Rim (Mariah 1994a, 1995).

3.2.3.3 Amphibians and Reptiles

Wyoming Toad. The Wyoming toad is a federally endangered species found exclusively in the Laramie Basin of southwestern Wyoming (Baxter and Stone 1985). Habitat for this species includes floodplains, ponds, and small seepage lakes within shortgrass prairie communities, where it feeds on a variety of ants, beetles, and other arthropods (Baxter and Stone 1985). Currently, the Wyoming toad is found in isolated populations at Mortenson Lake near Laramie, Wyoming, and Lake George near Hutton Lake in the Hutton Lake National Wildlife Refuge. A Wyoming toad captive breeding program, supervised by the WGFD, is underway at Sybille Wildlife Research and Conservation Education Unit north of Laramie, Wyoming.

No Wyoming toads have been observed within or adjacent to the KPPA, and the likelihood of their appearance within the area is extremely low. Historic Wyoming toad habitat occurs east of Foote Creek Rim, and includes portions of the Rock Creek drainage (WNDD 1993b). Many of these areas were searched in 1980, 1983, and 1991, but no toads were found during these surveys (WNDD 1993b). A series of intensive searches in the Laramie Basin [i.e., 20 mi (32 km) east of the KPPA] during the spring and summer of 1994 failed to find any Wyoming toads [Western EcoSystems Technology, Inc. (WEST) 1994].

Eastern Short-horned Lizard. A C2 species, the eastern short-horned lizard is found throughout most of Wyoming below about 6,500 ft (1,981 m); it is especially common in sagebrush-grassland

communities in the central and southwestern counties of the state (Baxter and Stone 1985). Short-horned lizards favor area with firm soils that are relatively flat and arid (Baxter and Stone 1985). These ground dwellers forage diurnally, primarily feeding on ants and beetles, and bear their young live in relatively large litters (Baxter and Stone 1985).

Eastern short-horned lizards have been observed within both the Simpson Ridge (two observations) and Foote Creek Rim (one observation) areas (Mariah 1994a). It is probably a relatively common resident of sagebrush-grassland and shortgrass habitats within the KPPA.

3.2.3.4 Plants

Ute Lady's Tresses. This federally threatened member of the orchid family was first identified in Wyoming in August 1993 (BLM 1994b). Although the Ute lady's tresses has only been found in Goshen County (i.e., eastern Wyoming), it is suspected to occur throughout appropriate habitats in southern Wyoming (BLM 1994b). This species grows along streams, rivers, ponds, reservoirs, as well as in bogs and wetland, riparian, or seepage areas. These habitats do occur within the KPPA, and will be avoided where feasible; areas to be disturbed within these habitats will be surveyed for this plant prior to construction.

Contracted Indian Ricegrass. Contracted Indian ricegrass, a C2 species, potentially occurs within the KPPA. This species flourishes on dry slopes at medium elevations in deserts and plains, usually in deep, sandy soil (Hitchcock 1971, Beetle 1977). Although much of the KPPA meets the necessary habitat requirements of contracted Indian ricegrass (personal communication, 1993, with Connie Breckenridge, BLM), an initial plant survey in 1994 did not reveal its presence in the area.

State Sensitive Species. Two state sensitive species, bun milk-vetch and slender-trumpet ipomopsis, have been found in areas adjacent to the KPPA (WNDD 1993a, 1993b, 1994). Bun

milk-vetch is a plant which inhabits bare slopes and ridges (Dorn 1992); this type of habitat occurs over much of the KPPA. The ipomopsis, on the other hand, prefers relatively moist hills, slopes, and woods (Dorn 1992). This habitat type is more likely to occur south of the KPPA (i.e., within and adjacent to the Medicine Bow National Forest) than within the project area itself.

3.3 CULTURAL RESOURCES

Page 3-78, column 1, paragraph 2, line 19. Replace "NRHP" with "National Register of Historic Places (NRHP)".

Page 3-78, column 1. Insert the following paragraph between paragraphs 2 and 3: "Site eligibility is evaluated according to NRHP criteria, pursuant to 36 C.F.R. 60.4 of the Advisory Council on Historic Preservation's regulation *Treatment of Historic Properties*:

The quality in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A) that are associated with events that have made a significant contribution to the broad pattern of our history; or
- B) that are associated with the lives of persons significant in our past; or
- C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

- D) that have yielded or may be likely to yield information important in history or prehistory."

Page 3-78, column 2, paragraph 3, line 16. Delete "Therefore, turbine erection may adversely affect the site's eligibility under this criterion."

3.3.1 Prehistoric Resources

Page 3-80, column 2, paragraph 3, line 4. Replace "National Register of Historic Places (NRHP)" with "NRHP".

3.4.7 Community Characteristics, Facilities, and Infrastructure

Page 3-100, column 2, paragraph 5, line 5. Insert "the Carbon County Library System," after "Community Development (1993)".

Page 3-103, column 1, paragraph 1, line 7. Replace "2,000" with "1,250".

Page 3-103, column 1, paragraph 2, line 5. Replace "8,000" with "4,500".

Page 3-103, column 2, paragraph 1, line 4. Replace "60,000" with "over 75,000".

Page 3-103, column 2, paragraph 2, line 4. Replace "10,000" with "8,300".

Page 3-103, column 2, paragraph 3, line 3. Replace "7,000" with "1,500".

3.5.3 Extractive Mineral Operations/Oil and Gas Production

Page 3-108, column 1, paragraph 6. Replace the entire paragraph with the following: "The potential for development of these coals during the LOP is low to moderate. Technology has changed dramatically since this area was first leased in 1982. Coal in the Carbon Basin is very similar in character to that currently mined by both surface and underground mining methods in the Hanna Basin."

Page 3-118, column 2, paragraph 3, line 19.
Replace "effected" with "affected".

Page 3-119, Table 3.40, column 3. Replace
column 3 with the following column:

Linear
Distance
mi (km)
20 (32.2)
0 (0)
6 (9.7)
6 (9.7)
0 (0)
18 (29.0)
8 (12.9)
0 (0)
22 (35.4)
1 (1.6)
0 (0)
0 (0)
<1 (<1)
0 (0)
0 (0)