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**HABITAT CONSERVATION FOR BIRDS OF PREY ON
WESTERN MOBILE BOULDER INC. LYONS PROPERTY**

Prepared By

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INTRODUCTION

I conducted a one season survey of nesting raptor populations on the Western Mobile Boulder Inc. (WMI) Lyons property. I also analyzed data from Boulder County Nature Association (BCNA) wintering raptor and nesting owl studies carried out along St. Vrain Creek immediately north of the property, along Hygiene Road immediately south of the property, and along US 36 immediately west of the property. The purpose of this report is to provide information which will help WMI and Boulder County Parks and Open Space manage the area to maximize nesting and foraging opportunities for birds of prey, with particular attention to Federal, State, U.S. Forest Service, and Boulder County species of special concern.

My previous work with Boulder County raptors includes organizing a 15-year census of wintering raptors and participating in a 15-year survey of cliff-nesting raptors for the Boulder County Nature Association. I conducted breeding bird studies for the City of Boulder Parks and Open Space departments from 1989-95. I also helped organize and carry out the Colorado Breeding Bird Atlas project, a comprehensive survey of breeding bird populations throughout the state.

Study Area

The WMI Lyons property lies east of the town of Lyons and south of St. Vrain Creek. It is bordered to the north by SR 66, to the east by 61st and 63rd streets, to the south by Hygiene Road and the Southwestern Portland Cement Plant, and to the west by US 36 (Figure 1). Current uses of the property include gravel mining, processing, and transport by truck and rail; cattle ranching; and farming (irrigated hay meadows). The current mining operation is confined to the eastern third of the property

(Miller Pit) where several ponds have been created during the reclamation process. Cattle grazing occurs throughout the property--on grasslands and irrigated hay meadows in the West Plant (Phase I), East Plant (Phase II), and Rockin' WP South (Phase III) areas, and within the St. Vrain Creek and South Branch riparian corridors. These riparian corridors are dominated by cottonwoods (Populus spp.), willows (Salix spp.), and a scattered understory of chokecherries (Padus virginiana), hawthorns (Crataegus spp.), and other shrubs (Weber 1992). Scattered stands of cottonwoods, willows, and box elders (Negundo aceroides) grow in the grasslands and hay meadows. Small wetlands and prairie dog colonies occur throughout the property.

The WMI Lyons property contains potential nesting habitat for three Boulder County raptor species of special concern: bald eagle, northern harrier, and eastern screech-owl. It contains potential foraging habitat for at least five additional raptor species of special concern: golden eagle, ferruginous hawk, peregrine falcon, prairie falcon, and short-eared owl. Golden eagles have nested at three sites within 5 km (3.1 miles) of the WMI Lyons property (Armstead and Lederer 1994). A pair of bald eagles constructed a "winter nest" (a nest constructed prior to spring migration that has not yet been used to rear young) on the property, beginning in 1995 (Virginia Dionigi and Joe Harrison, pers. commun.). Red-tailed hawks, American kestrels, and great horned owls have nested on the property (pers. observ.). Eastern screech-owls have been observed, and may nest, along St. Vrain Creek between US 36 and 61st Street (Joe Harrison, pers. commun.).

Methods

I drove and walked a 15 km survey route through and adjacent to the property on 24 April, 3 May, and 17 May (Figure 2). I

NOTES:
1. ALL CONTOURS WERE GENERATED USING AERIAL PHOTOGRAPHY PERFORMED BY CARROLL & LANGE IN 1994-95.

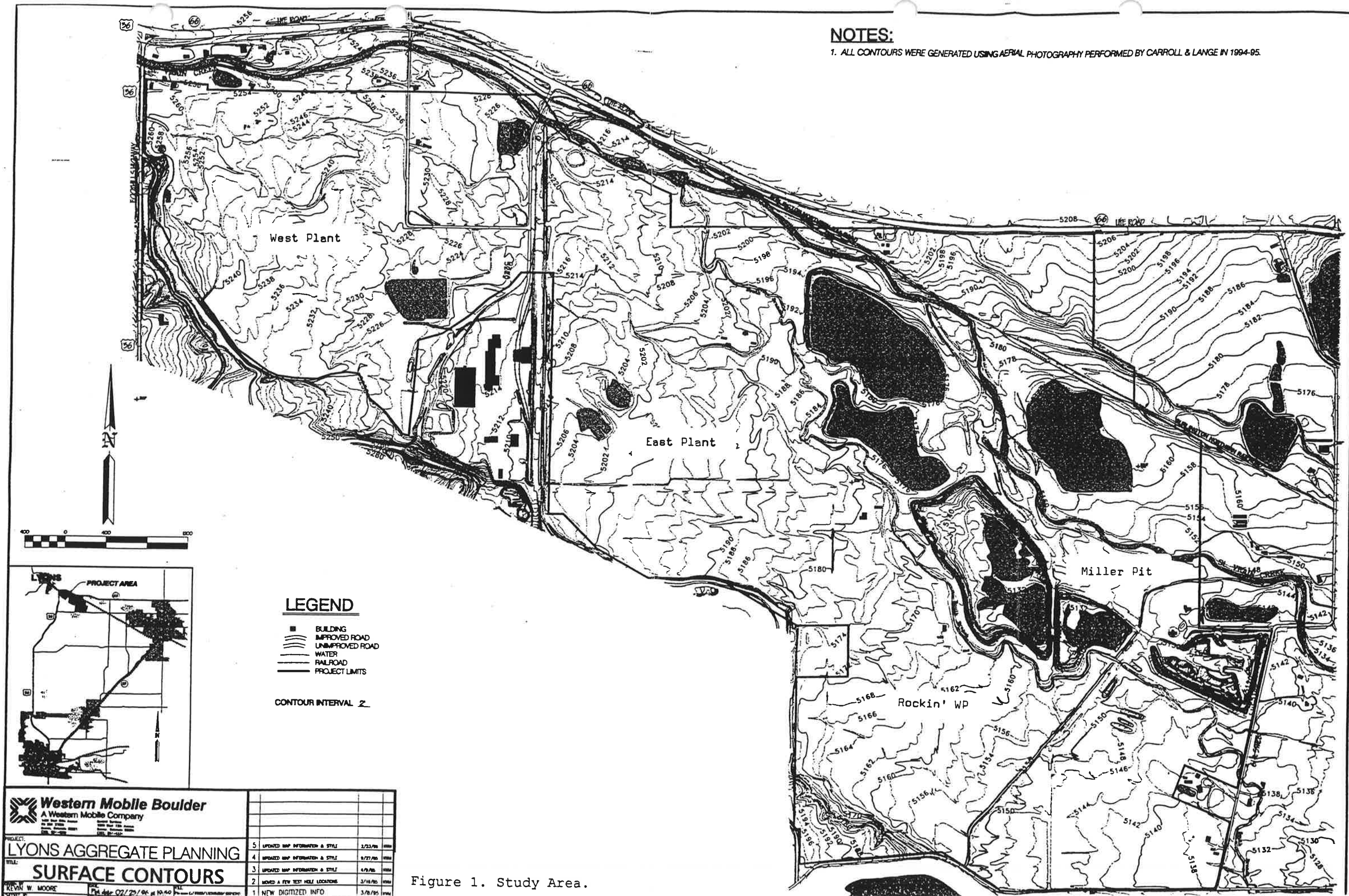


Figure 1. Study Area.

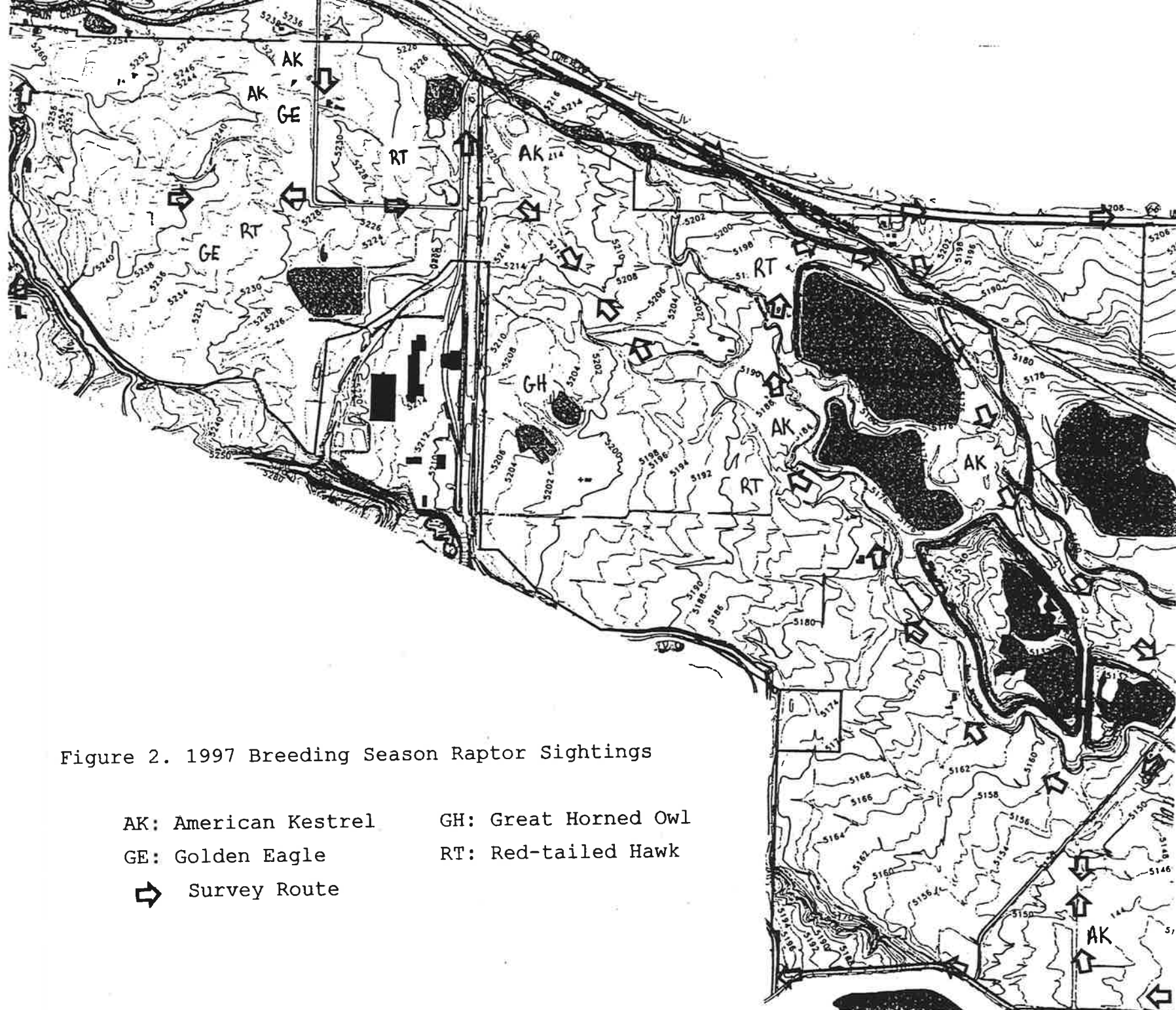


Figure 2. 1997 Breeding Season Raptor Sightings

AK: American Kestrel

GE: Golden Eagle

➡ Survey Route

GH: Great Horned Owl

RT: Red-tailed Hawk

stopped for five minutes every 300 m along the route to look for perched, soaring, or nesting raptors. I recorded all observations on a 7 1/2 minute topographic map. During subsequent visits (23 and 25 May, 13 and 15 June), I returned to suspected nest sites to verify nesting.

During the winters of 1993-94 to 1996-97, BCNA volunteers drove survey routes throughout eastern Boulder County to census wintering raptor populations (Gietzen, Jones, and McKee 1997). The "Rabbit Mountain" survey route included parts of Hygiene Road, US 36, and SR 66 adjacent to the WMI property. Although these surveys were not comprehensive enough to determine densities of wintering raptors on the property, they provided reliable information about which raptors were present. A BCNA eastern screech-owl survey, conducted along St. Vrain Creek during fall/winter 1995-96, provided information about nesting owl populations.

RESULTS AND DISCUSSION

American kestrels and great horned owls nested on the WMI property during spring 1997 (Figure 3). A pair of red-tailed hawks nested approximately 500 m northeast of the property near 63rd Street. The bald eagle pair was observed working on their nest, sharing food on the nest, and copulating on the nest throughout February and March (D. W. King and Joe Harrison, pers. commun.). The eagles were last seen in the vicinity of the nest on 23 March (D. W. King, pers. commun.).

Because red-tailed hawks, American kestrels, and great horned owls are habitat generalists, expanded gravel mining on the property should have little effect on breeding populations, so long as existing nest trees are retained. All of the nest trees observed during 1997 raptor surveys lie outside the area to be mined. Potential impacts of mining on bald eagles are discussed in detail, below, under "Species of Special Concern."

In addition to these nesting species, a number of raptors were observed on the property during winter/spring 1997. I observed golden eagles in the West Plant area on 24 April and 3 May. I observed turkey vultures soaring over the property on 25 May and 13 June. During winter raptor surveys, BCNA volunteers observed bald eagles, ferruginous hawks, red-tailed hawks, rough-legged hawks, American kestrels, and northern harriers perching on or flying over the property (Figures 4-5).

The BCNA wintering raptor data indicate consistent use of the property by wintering bald eagles, golden eagles, ferruginous hawks, and red-tailed hawks (Figures 4-8). During 58 surveys carried out from 1993-97, BCNA volunteers reported 28 bald eagle observations (.48/survey), 10 golden eagle observations (.17/survey), 14 ferruginous hawk observations (.25/survey), and

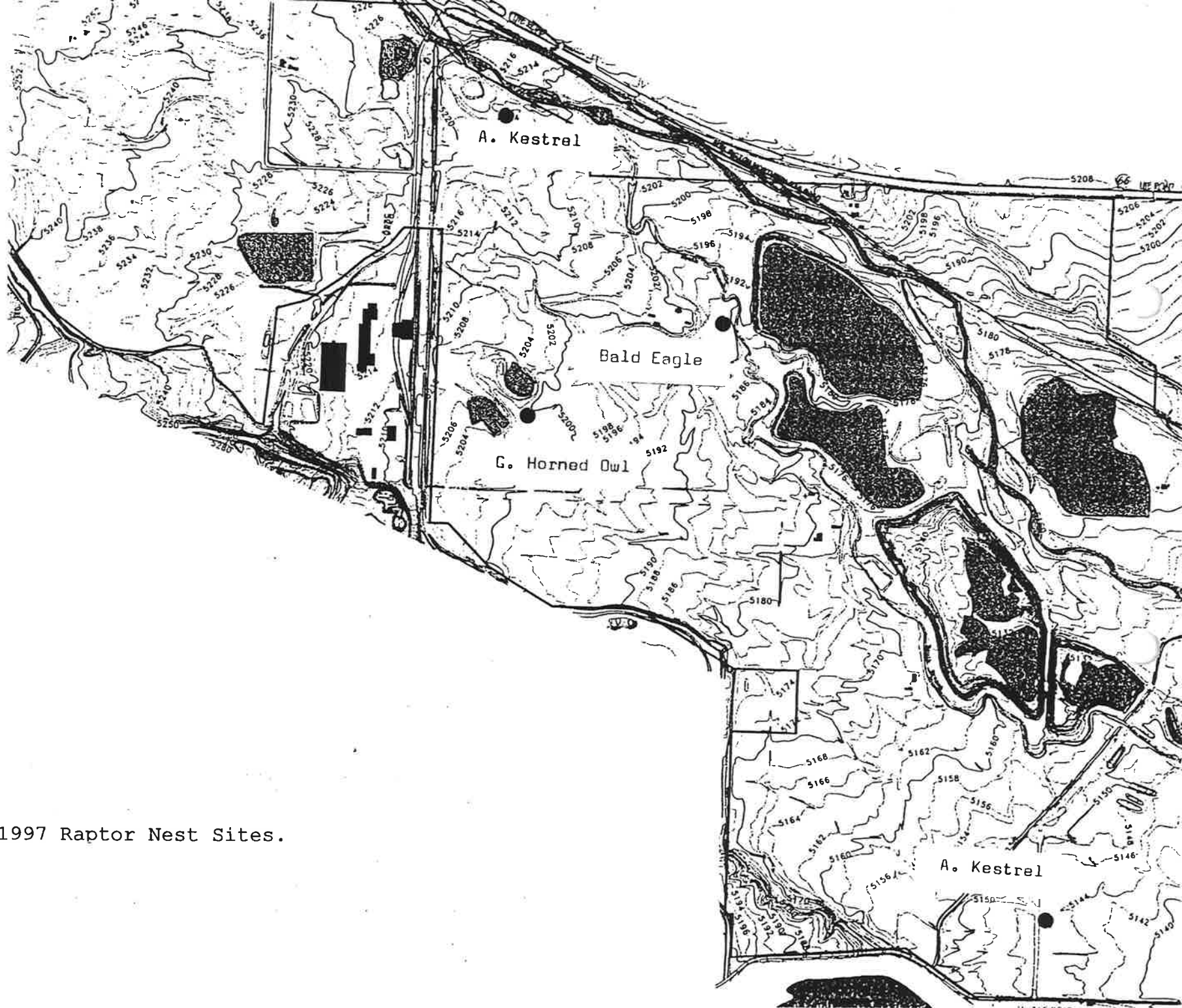


Figure 3. 1997 Raptor Nest Sites.

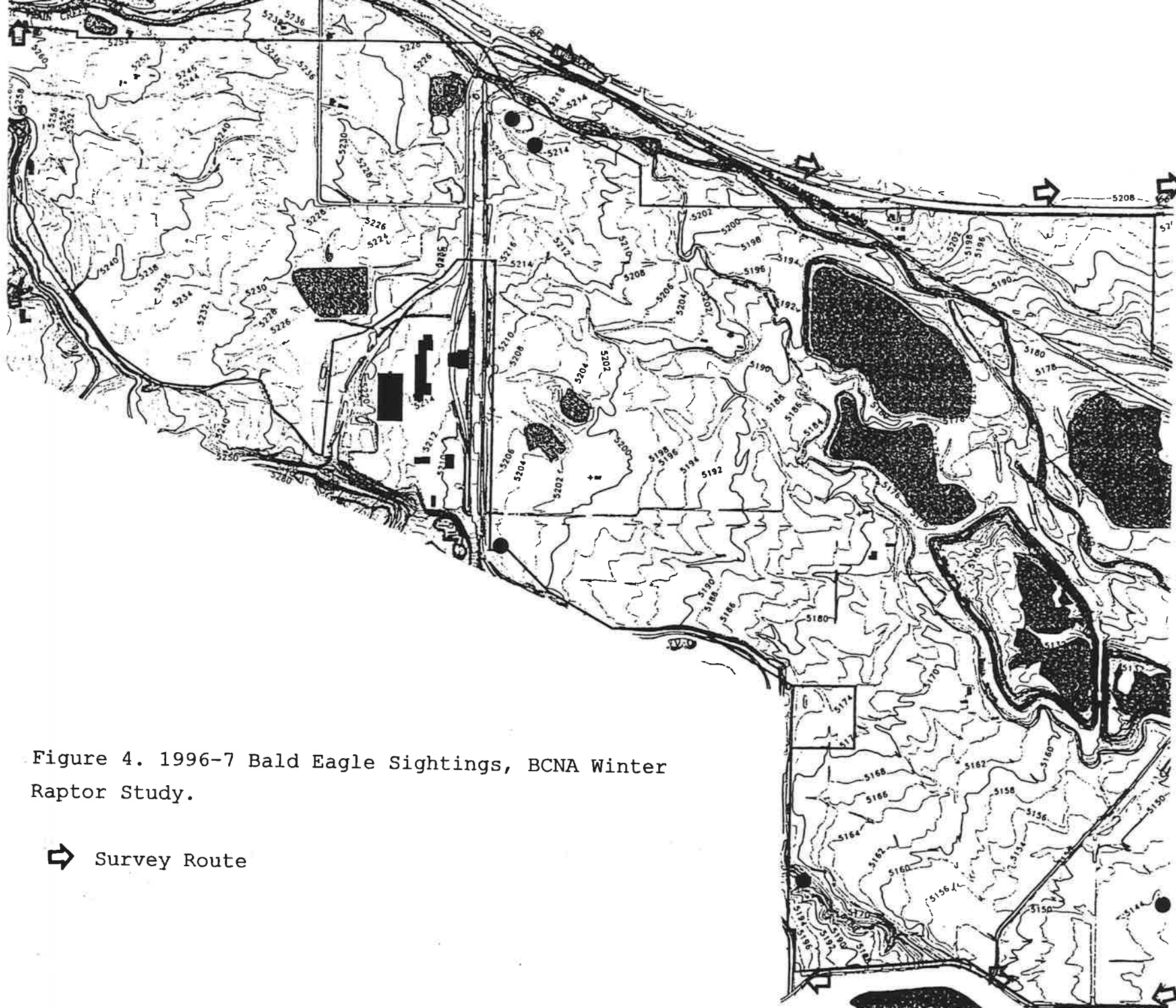


Figure 4. 1996-7 Bald Eagle Sightings, BCNA Winter Raptor Study.

➡ Survey Route

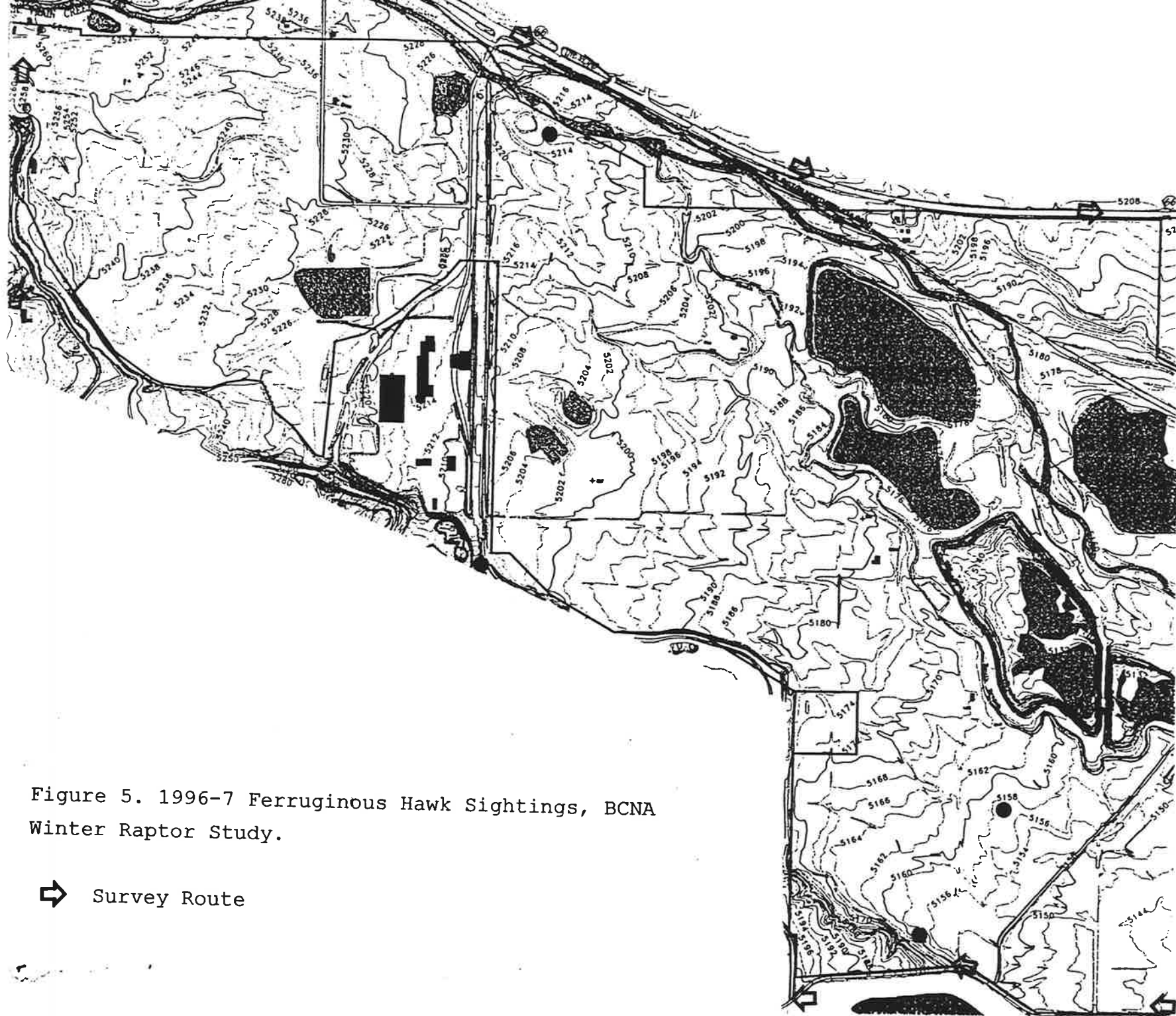


Figure 5. 1996-7 Ferruginous Hawk Sightings, BCNA Winter Raptor Study.

➡ Survey Route



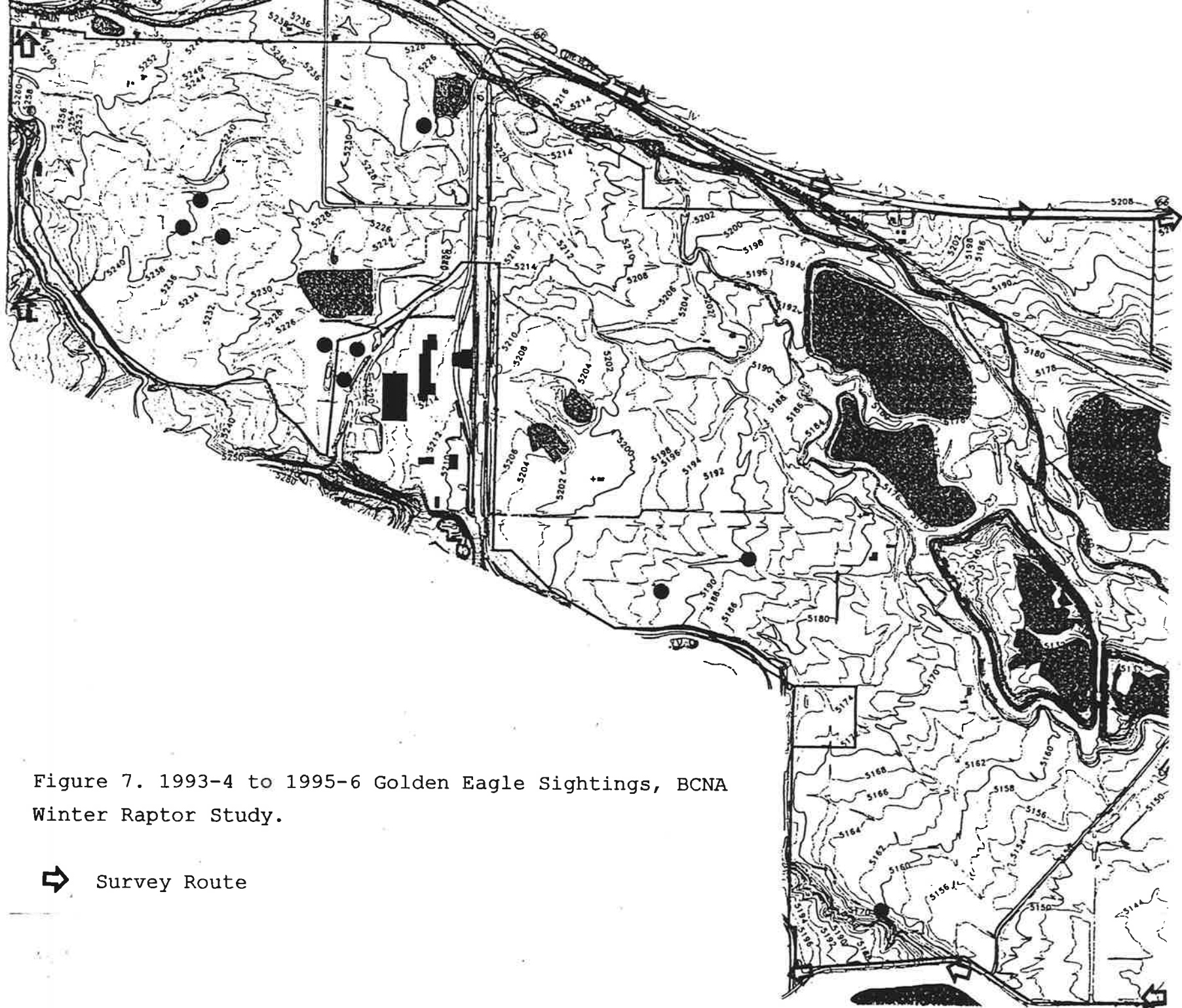
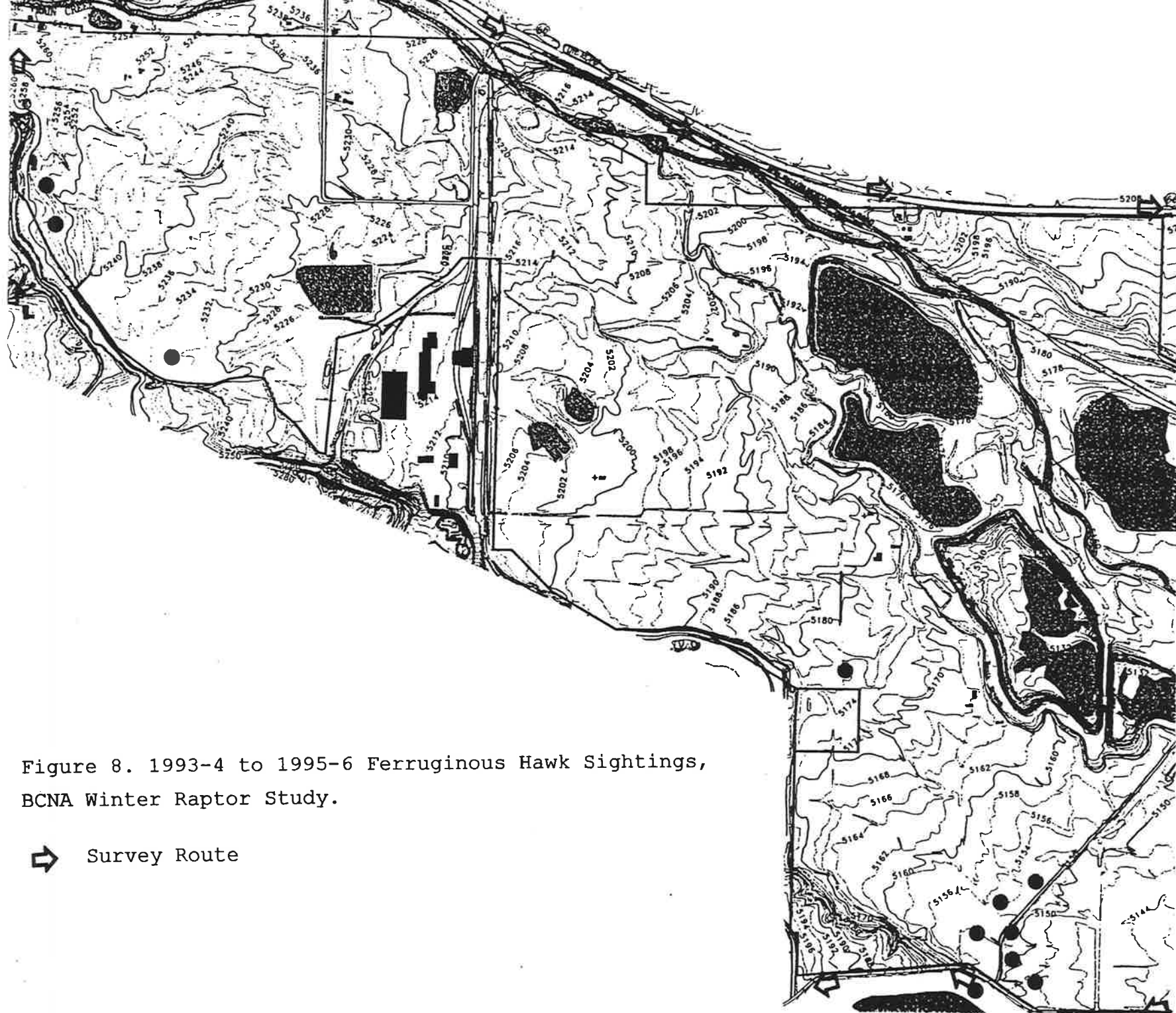


Figure 7. 1993-4 to 1995-6 Golden Eagle Sightings, BCNA Winter Raptor Study.

➡ Survey Route



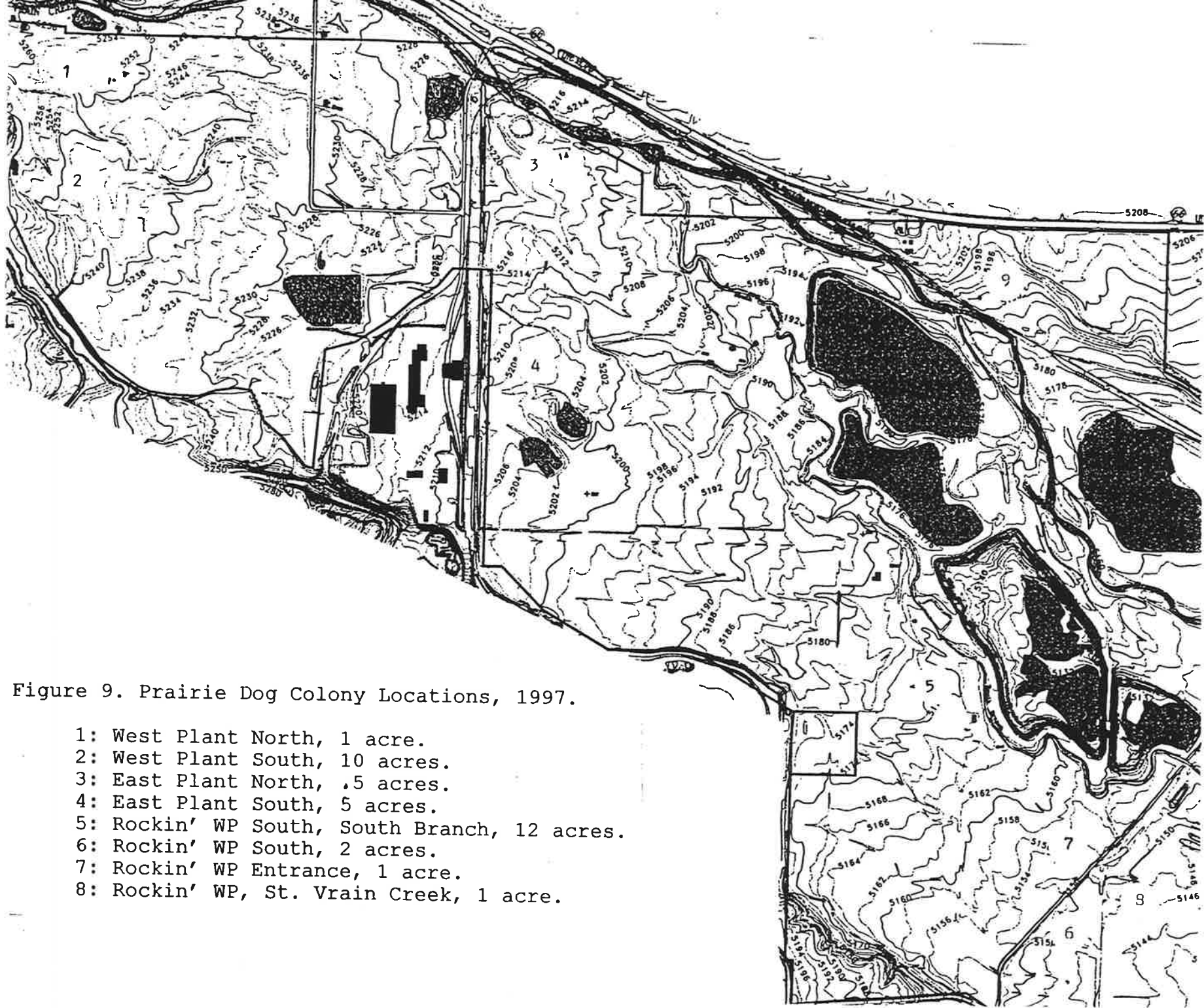
40 red-tailed hawk observations (.69/survey)¹.

Bald eagles, golden eagles, and ferruginous hawks all depend on prairie dogs for a significant portion of their winter and spring diets. Golden eagles and ferruginous hawks prey directly on prairie dogs. Bald eagles steal captured prairie dogs from other raptors (D'Ostilio 1954, Johnsgard 1988, Jones 1989). Local wintering populations of these three species rise and fall with local prairie dog populations. For example, in southern Boulder County, south of US 36, numbers of wintering bald eagles and ferruginous hawks declined by more than 85% from 1993-97 as prairie dog colonies were destroyed by urban development. Similar declines have been noted throughout the County in winters following plague epizootics (Gietzen, Jones, and McKee 1997).

A variety of other birds and mammals, including black-footed ferrets and burrowing owls, have been adversely affected by the eradication of prairie dogs throughout the Great Plains. A pamphlet distributed by the Biodiversity Legal Foundation (1994) estimated that prairie dog populations in the western United States have declined by more than 98% since the mid-nineteenth century. Numerous prairie dog colonies remain in Boulder County. However, many colonies are threatened by impending development. Although no data exist on prairie dog population trends within Boulder County, countywide populations of wintering bald eagles and ferruginous hawks have declined steadily during the past three years (Gietzen, Jones, and McKee 1997). Burrowing owls, a prairie dog-dependent species once common in the county, are now extremely rare (Boulder County Audubon Society. 1978-1997).

Although the WMI property contains no large prairie dog colonies, the 8-10 small (.4-6 ha; 1-15 acre) colonies scattered throughout the property probably provide a food source for bald

¹"Observation" is defined as one individual seen on one survey.



eagles, golden eagles, ferruginous hawks, and red-tailed hawks. Numerous perch trees, extensive grasslands, and scattered wetlands on the WMI property, along with several large prairie dog colonies on the adjacent Southdown properties, probably also lure raptors to this area (Thompson, Lederer, and Figgs 1995).

During four years of winter raptor surveys (58 trips), BCNA volunteers observed only two northern harriers and no short-eared owls on the WMI Lyons property. Northern harriers (rare and declining Boulder County nesting populations) and short-eared owls (rare Boulder County wintering populations) hunt over cattail marshes and grasslands, often near prairie ponds or reservoirs (Andrews and Righter 1992). Although several gravel pits on the site have been reclaimed as reservoirs, extensive cattail marshes have not developed on the site. The reclamation plan for future mining, which includes creation of shallow ponds and wetlands, should improve habitat for these two species.

Species of Special Concern

The Boulder County Parks and Open Space Department has compiled a list of Boulder County Avian Species of Special Concern (Hallock 1993). This list includes species that meet the following criteria:

- (1) Federal endangered, threatened, or special concern.
- (2) State endangered, threatened, or special concern.
- (3) U.S. Forest Service Rocky Mountain region special concern.
- (4) Boulder County rare and declining (three or fewer known nesting locations).
- (5) Boulder County rare and stable.
- (6) Boulder County declining but not yet rare.
- (7) Boulder County isolated populations.
- (8) Audubon "Blue List" of nationally declining species.

Individual accounts follow for raptor species that were observed on the BLM Lyons property and that meet one or more of the above criteria.

Bald Eagle (Federal threatened, State threatened)

There are no historical records of bald eagles nesting in Boulder County (Andrews and Righter 1992, Hallock 1993). About 30 pairs nested in Colorado in 1997. Pairs have nested at Standley Lake in Arvada, Barr Lake near Brighton, and along the South Platte River near Platteville. The state's nesting population has increased steadily since the mid-1960s (Gerry Craig, Colo. Div. of Wildl., pers. comm.).

Since the early 1980s, 40 to 100 bald eagles have wintered in Boulder County each year (Audubon Society Christmas Bird Counts 1950-96, Gietzen, Jones, and McKee 1997). These eagles are probably attracted to Boulder County by the county's numerous prairie dog colonies, open space preserves, and reservoirs (Jones 1989). Most, if not all of these eagles migrate north in early spring.

As part of pair-bonding behavior, wintering bald eagles sometimes begin nest construction before migrating north to their breeding grounds (Johnsgard 1990). I have observed bald eagles constructing "winter nests" at Sawhill Ponds, in Boulder, and near Haystack Mountain, north of Boulder. A pair of bald eagles wintering at the WMI Lyons site constructed and worked on a nest during winter and early spring of 1995, 1996, and 1997 (Virginia Dionigi, Joe Harrison, and Mike Figgs, pers. commun.).

Although the eagles have not reared young on this nest, they have demonstrated considerable site fidelity. Eagles have returned to this same site for at least three consecutive years. At least one individual has stayed in the area as late as 3 April, in 1996 (D. W. King, pers. comm.). They have been observed copulating and sharing food on the nest. Whether bald eagles will

eventually produce young at this site probably depends on the availability of prey (fish, waterfowl, and rodents), the eagles' genetic disposition to migrate, and the level of human disturbance of the nest site.

The nest is located in a cottonwood grove along the South Branch approximately 600 m (1970 ft.) from the Rockin' WP entrance to the Miller Pit area (Figure 3). Gravel mining was occurring within 600 m (1970 ft.) of this cottonwood grove when the eagles first began constructing the nest (Mike Hart, pers. commun.). Since then, mining operations have gradually moved eastward, away from the nest site. A conveyor belt used to transport gravel passes within 550 m (1640 ft.) of the site. This conveyor has been operating in this location since 1992. A private residence lies approximately 150 m (492 ft.) northwest of the nest. The Southwest Portland Cement Plant lies approximately 800 m (2625 ft.) west of the nest site. The Western Mobile processing plant lies approximately 600 m (1970 ft.) east of the nest site.

Biologists who have studied impacts of human activities on nesting bald eagles recommend maintaining a buffer zone of 250-800 m (820-2625 ft.) during the courtship and nesting period, which extends from early winter to mid-summer (Call 1979, Fraser 1983, Grier et al 1983, Col. Div. Wildl. 1995). The size of recommended buffer areas depends on visibility of the nest, degree of habituation to human activities, and the pair's nest site fidelity. These recommendations were developed for active nests (those with eggs or young).

During Phase I of mining, no mining will occur within 800 m of the potential nest site. The conveyor will run along the edge of the St. Vrain Creek riparian corridor, passing within approximately 330 m of the site.

Management: Steve Jones, Mike Hart (general consultant for WMI) and Dallas Glasser (WMI aggregate production manager) met

Management: Maintain several small prairie dog habitat areas within the permitted area. Maximize reclamation of mixed-grass prairie habitat.

Ferruginous Hawk (State special concern)

Though there are no nesting records for ferruginous hawks in Boulder County, several dozen of these large hawks winter in the county each year (National Audubon Society 1970-96, Gietzen, Jones, and McKee 1997). The hawks congregate around active prairie dog colonies (Jones 1989). Numbers have declined since 1993 as prairie dog colonies throughout the county were lost to urban development (Gietzen, Jones, and McKee 1997).

Ferruginous hawks were seen frequently on the WMI Lyons property during BCNA winter raptor surveys. Most of these ferruginous hawk observations were in the proximity of active prairie dog colonies (Figures 5 and 8).

Mining and subsequent reclamation will remove foraging habitat for this species by destroying some existing prairie dog colonies and grasslands. Because prairie dog colonies are disappearing throughout the high plains and ferruginous hawks appear to be dependent on prairie dogs, preservation of prairie dog habitat is important.

Management: See golden eagle, above.

Northern Harrier (Rare and declining in Boulder County)

During the past decade, northern harriers have nested in only three known locations in Boulder County (Dave Hallock and Michael Sanders, Boulder County Parks and Rec. Dept., pers. commun.). All three sites contain large cattail marshes partially surrounded by grasslands. The WMI Lyons property probably does not contain enough cattail habitat or undisturbed grassland habitat to support nesting populations of this species. Only two individuals were sighted on the property during four years of

BCNA winter raptor surveys. I observed no northern harriers during three spring raptor surveys.

Northern harriers prey primarily on small mammals, particularly meadow voles. They typically roost, nest, and hunt in and around wetlands (Johnsgard 1990). Mining and subsequent reclamation should improve nesting habitat for this species, so long as the reclamation creates expansive (more than 10 acre) cattail marshes and large areas of the property are closed to public access.

Management: Create expansive (larger than 10 acres) cattail marshes bordered by shallow wetlands and grasslands throughout reclaimed portions of the property. Restrict recreational access to grasslands and saturated meadows that are likely to support high vole populations.

Eastern Screech-Owl (Audubon Blue List)

Eastern screech-owl populations may be declining in parts of North America (Tate 1986). Little is known about population trends in Colorado. These screech-owls nest in tree cavities in deciduous woods, often near water. In the west, they often choose groves with large diameter cottonwoods and an open understory (Johnsgard 1988, Dorn and Dorn 1994).

BCNA volunteers found singing eastern screech-owls along St. Vrain Creek at the western and eastern ends of the WMI Lyons property during winter 1996 (Joe Harrison, pers. commun.). These observations occurred in riparian woodlands well outside the area to be mined. Since eastern screech-owls often nest in urban environments and often hunt around lakes and wetlands (Johnsgard 1988, Gelbach 1995), mining and subsequent reclamation should have little impact on their nesting success.

Management: Avoid disturbance of riparian corridor along St. Vrain Creek. Retain standing dead trees along South Branch and St. Vrain Creek.

MANAGEMENT RECOMMENDATIONS

The raptor management plan for the area to be permitted should be updated as mining is completed in each of the three permitted regions (Phase I, Phase II, and Phase III). Nesting raptors and prairie dog populations should be monitored annually throughout the property. I recommend that the raptor management plan for the property include the following features:

- (1) Retention of standing dead trees in unmined areas and protection of all trees containing active raptor nests.
- (2) Annual monitoring of the bald eagle nest site and annual implementation of a bald eagle nest site protection plan developed in cooperation with the Colorado Division of Wildlife.
- (3) Creation of three or more large (5-10 acre) cattail marshes throughout the property during reclamation.
- (4) Preservation of four 7.5-15 acre prairie dog habitat areas throughout portions of the property owned by Western Mobile.

1. Nest Tree Protection

Prior to opening new pods for mining, a raptor nest search should be carried out in the affected area. In areas to be mined, trees containing active nests should not be removed during the nesting season (Jan.15-Aug.15). Outside active mining areas, nest trees (trees containing active or inactive nests) and standing dead trees should be retained. The Colorado Division of Wildlife should be consulted concerning protection of nest sites of Federal or State listed species.

2. Bald Eagle Nest Site Protection

WMI is working with the Colorado Division of Wildlife to develop and implement a plan to protect the potential bald eagle

nest site. This plan will be completed and made available to interested parties by 1 November 1997. The plan will include, but not be limited to:

- (1) Annual monitoring of the nest site.
- (2) Minimizing human encroachment around the nest site.
- (3) Revising the plan, as needed, to protect nesting eagles.

3. Creation of Cattail Marshes

Creation of several large (5-10 acre) cattail marshes and adjacent mixed-grass prairie in reclaimed areas will benefit northern harriers (Boulder County rare and declining) and wintering short-eared owls (Boulder County rare, winter). A mosaic of cattail marshes, sedge/rush wetlands, and grasslands will maximize nesting and hunting opportunities for northern harriers and short-eared owls. Cattail marshes can also be created along the shores of lakes, ponds, and other open water.

4. Prairie Dog Habitat Areas

WMI can help preserve populations of raptors and other prairie dog-dependent species by maintaining a system of prairie dog habitat areas throughout portions of the Lyons property owned by WMI. During phases I and II of the mining plan, I recommend:

- (1) Designation of four 7.5-15 acre prairie dog habitat areas, with control permitted on the periphery, but not inside, the areas (see Figure 10). One of these habitat areas is situated outside all the areas to be mined. Three are situated within the Phase III area.

- (2) Annual monitoring of prairie dog populations.

Upon completion of Phases I and II, I recommend that new habitat areas be designated in reclaimed areas to replace those that will be disturbed during Phase III mining and that prairie dogs be humanely relocated from Phase III habitat areas.

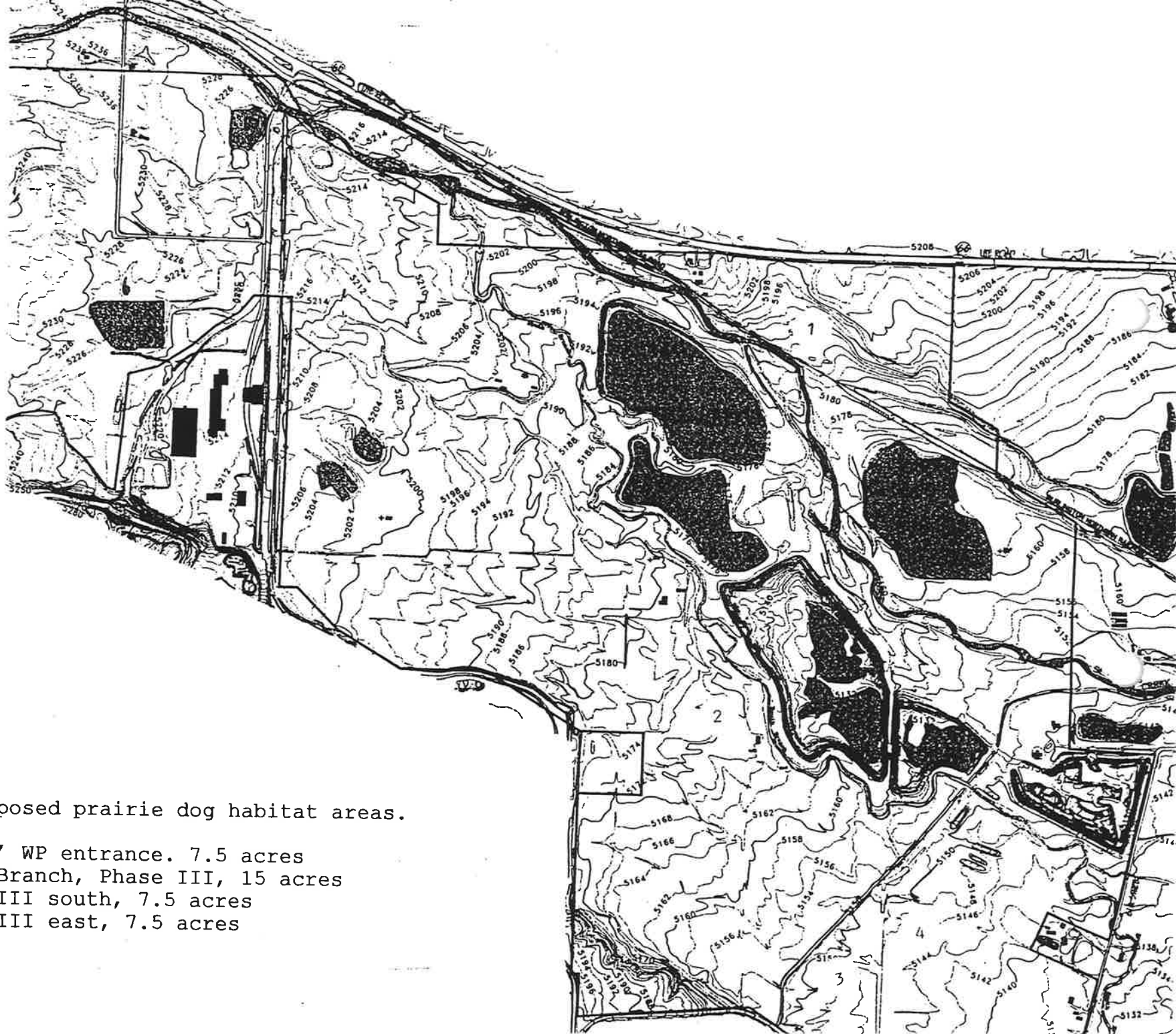


Figure 10. Proposed prairie dog habitat areas.

1. Rockin' WP entrance. 7.5 acres
2. South Branch, Phase III, 15 acres
3. Phase III south, 7.5 acres
4. Phase III east, 7.5 acres

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