BIRD INVENTORY FOR

KAKWA WILDLAND PROVINCIAL PARK,

NORTHWEST ALBERTA

BY

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PREPARED FOR:
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NOTE TO THE READER:
This report is based on information collected by the 2007 biophysical team and prepared by Kathy St. Laurent. The opinions and statements expressed by the author do not necessarily reflect the views of the Parks, Conservation, Recreation and Sports Division of Alberta Tourism, Parks, Recreation and Culture. The author is responsible for the accuracy of the data and analysis contained in the report.

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1.0 INTRODUCTION

1.1 BACKGROUND AND RATIONALE

The Alberta Special Places 2000 program was designed to preserve natural diversity in the province through a network of protected areas. At its conclusion in 2001, 81 new sites were established and 13 existing sites were expanded adding more than 2 million hectares to Alberta's protected areas land base (Government of Alberta 2006). In 1996, Kakwa Wildland Provincial Park (WPP) was established in the Rocky Mountain Natural Region along the Alberta/British Columbia border. Alberta's Kakwa WPP is bordered by British Columbia's Kakwa Provincial Park to the west and the Willmore Wilderness Area to the south. In 2006 the three sites were included and designated as Kakwa-Willmore Interprovincial Park.

Many of these newly designated areas have little or no published information on the natural features contained within them. Thus, biophysical studies are undertaken to fill in knowledge gaps and improve management of these areas.

Since 2000, eight of Alberta's protected areas have been inventoried through a biophysical study team made up of park staff, scientists and volunteers. Prior to these studies, many components of the biophysical makeup of these areas were lacking. For example, Kakwa Wildland Provincial Park, according to The Atlas of Breeding Birds of Alberta (Semenchuk 1992), had no atlas squares in it that were surveyed up to the date of the atlas's publication. With the knowledge gained from biophysical studies conducted in protected areas, park management can more effectively protect and maintain the biodiversity found within these important areas.

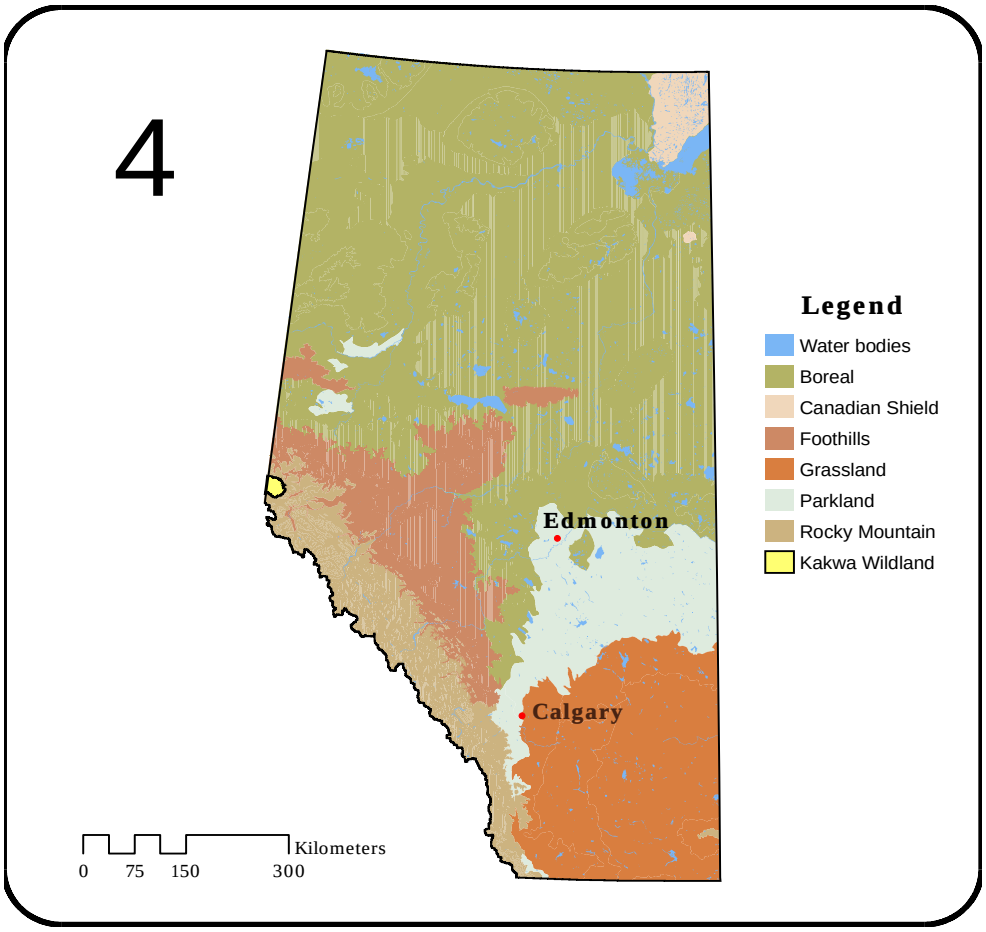
The main goal of this portion of the study was to compile an inventory of the bird species present in the Kakwa Wildland Provincial Park. An attempt was made to determine the breeding status for each of the species through behavioural observations and/or subsequent observations such as nests or young. Habitat

associations were recorded as well as a measure of relative abundance. All species recorded herein were encountered either in June or July 2006.

1.2 STUDY AREA

Alberta is divided into six natural regions defined geographically by vegetation, soil and physiographic features. The Kakwa Wildland Provincial Park, established in 1996, covers 649 km^2 wholly within the Rocky Mountain Natural Region (Figure 1).

Figure 1. Natural regions of Alberta.

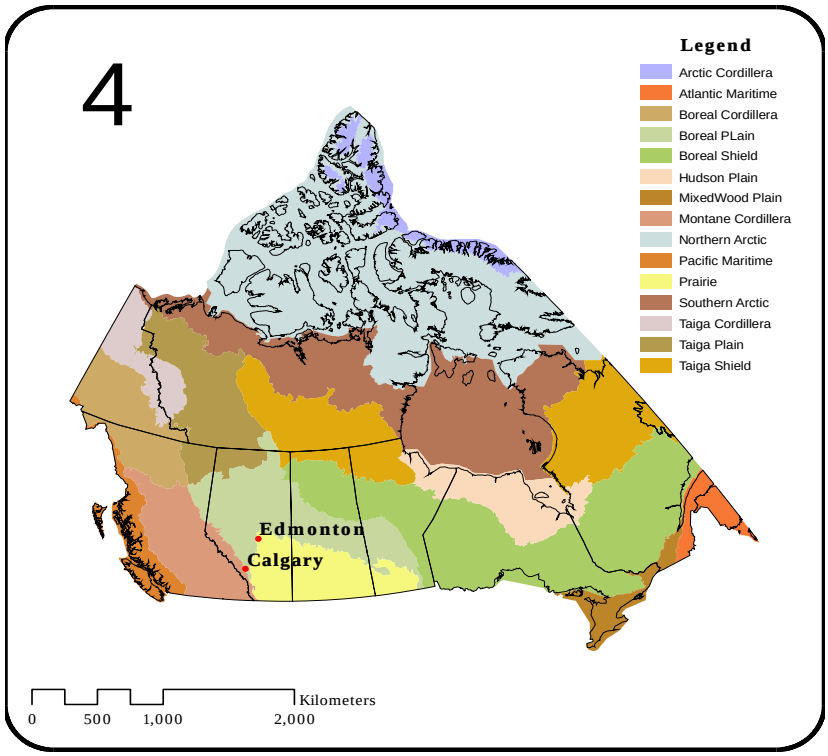


The Rocky Mountain Natural Region is underlain by up-thrust, folded carbonate and quartzitic bedrock and contains three natural subregions that reflect changes

in environmental conditions caused by altitude and aspect (Natural Regions Committee 2006). Kakwa Wildland Provincial Park contains two of these subregions: alpine and subalpine. The Alpine Subregion is treeless due to a short growing season and plant communities rely on micro-sites sheltered from the wind and temperature extremes. The highest elevations can be barren or permanently snow covered (Natural Regions Committee 2006). The Subalpine Subregion contains open coniferous forests with herbaceous meadows at high altitudes and at lower altitudes vegetation is predominantly lodgepole pine (*Pinus contorta*) and Engelmann spruce (*Picea engelmannii*) closed forest (Natural Regions Committee 2006).

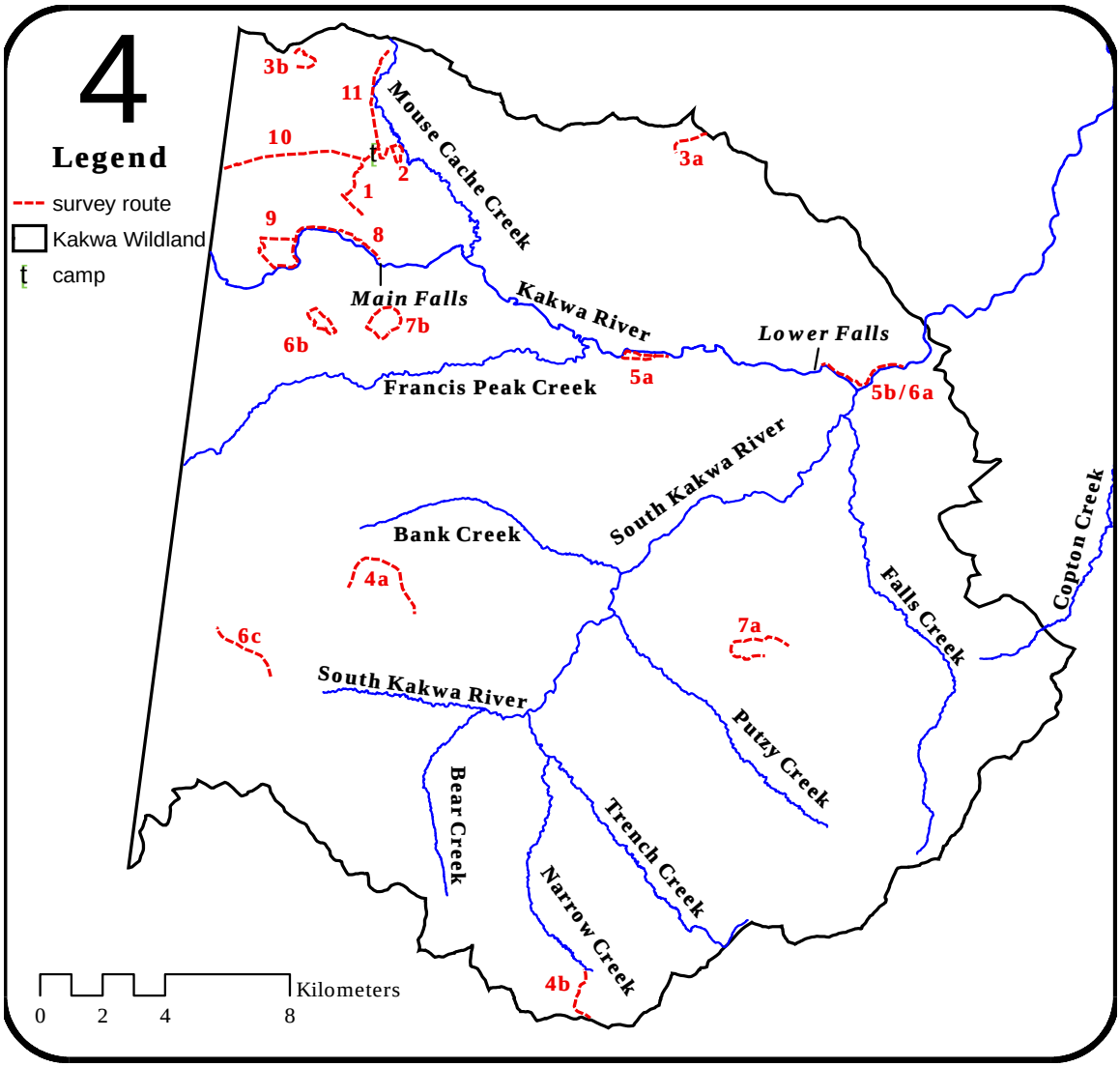
The Rocky Mountain Natural Region, within Alberta, coincides with the Montane Cordillera ecozone of Canada. The Montane Cordillera ecozone covers much of British Columbia and portions of western Alberta (Figure 2). It is the most diverse ecozone with climates that range from the hottest, wettest, coldest and driest conditions found in the country. Much of the region is rugged and mountainous with ecosystems ranging from alpine tundra to mixed conifer forests to grasslands (Wilken 1986). Kakwa Wildland is contained wholly within the Montane Cordillera ecozone. Mount May is its highest peak at 2450m above sea level.

Figure 2. Ecozones of Canada



Fifteen distinct sites were visited during the June study period and are referred to numerous times in the species accounts (Figure 3). Each day one to three sites were visited by combinations of observers (acronyms for observers can be found in 2.2 Explanation of Codes and Abbreviations under Attribution of Records). The physical properties of the sites are briefly described below including the date(s) visited and by which observers. The numbers (and letters in some cases) in Figure 3 illustrate the location and the days on which sites were surveyed.

Figure 3. Map of Survey Routes – June 2006



Day 1 – Truck trail south to unnamed lake

Date: June 15, 2006

Observers: DV, WN and KS

The truck trail from camp was followed south to a seismic line that ran to an unnamed lake in the NE quadrant of section 19 in 59-13-W6. Forest along the road was mature fir (*Abies spp*.) and lodgepole pine with lower lying sections of open herbaceous meadows. The northeast side of the lake was fairly sparse lodgepole pine while the southwest side had a large rock outcrop. An old trap line was found in the area.

Day 2 – Meadows around Dead Horse Meadows camp

Date: June 16, 2006

Observers: DV, WN and KS

We followed the open willow (*Salix spp*.) and grassy (sedge) (*Carix spp*.) meadows that extended south and east of camp along Mouse Cache Creek (SW sect. 32 in 59-13-W6). The meadows were primarily willow and bog birch (*Betula glandulosa*) and sedge surrounded by mature pine (*Pinus spp*.), spruce (*Picea spp*.) and fir forest.

Day 3 (a) – Sulphur Ridge

Date: morning of June 17, 2006

Observers: DV, WN and KS

Ferried by helicopter and dropped in an alpine meadow with subalpine fir (*Abies lasiocarpa*) krummholz. DV set up some pitfall traps while WN and KS ascended the mountain above the tree line. Followed a stream back down again through krummholz and willow meadow.

Day 3 (b) – Coal Ridge

Date: afternoon of June 17, 2006

Observers: DV, WN and KS

Dropped into an alpine meadow bowl and explored the snow pack areas. Descended a little lower into areas of subalpine fir krummholz.

Day 4 (a) – Mount May

Date: morning June 18, 2006
Observers: DV, WN and KS
Dropped into a barren alpine area and over the course of the morning descended the mountain through herbaceous alpine and subalpine meadows, subalpine fir krummholz, subalpine fir forest, riparian areas along a creek and Engelmann spruce/subalpine fir forest.

Day 4 (b) – Narrow Creek Headwaters

Date: afternoon June 18, 2006
Observers: DV, WN and KS
Dropped into the alpine zone and snow pack area. Followed the headwaters down though alpine meadow into subalpine fir krummholz into sparse subalpine fir forest.

Day 5 (a) – Kakwa River flats: riparian area

Date: morning June 19, 2006
Observers: DV, WN, KS and MH
Extensive willow flats adjacent to the Kakwa River (N sect. 8 in 59-12-W6). Small patches of lodgepole pine throughout riparian area. Continued into an old-growth patch of white spruce (*Picea glauca*) along the bend in the river.

Day 5 (b) – Deciduous-dominated area on north Kakwa River

Date: afternoon June 19, 2006
Observers: DV and KS

Deciduous-dominated forests along the north side of the Kakwa River (N sect. 11 and S sect. 13 in 59-12-W6). Followed an old horse trail through trembling aspen (*Populus tremuloides*) with lesser amounts of pine, spruce and fir.

Day 6 (a) – Deciduous-dominated area on north Kakwa River

Date: morning June 20, 2006
Observers: DV and KS
As described in 5a).

Day 6 (b) – Emerald Lakes

Date: morning June 20, 2006
Observers: WN and MH
Several marl lakes surrounded by mature to old-growth forests of pine and spruce with shorelines that ranged from rocky to boggy (W sect. 7 in 59-12-W6 and E sect. 12 in 59-13-W6).

Day 6 (c) – La Crèche Mountain

Date: afternoon June 20, 2006
Observers: WN, DV, MH and KS
Area of flowering alpine meadow with subalpine fir krummholz and willow meadows lower down.

Day 7 (a) – Patterned Fen near Rim Ridge

Date: morning June 21, 2006
Observers: DV, BR and KS
Extensive fen complex near Rim Ridge with willow, bog birch and mossy areas surrounded by wind-sheared subalpine fir (S sect. 16 and 15 and N sect. 9 in 58-12-W6).

Day 7 (b) – Plateau above Emerald Lakes

Date: morning June 21, 2006

Observers: WN and MH

This is a flat-topped plateau dominated by a large fen-complex (NW sect. 8, NE sect. 7 and SE sect. 18 in 59-13-W6). Part of it was burned in 1992. There are scattered clumps of pine/spruce forest in parts of it. Bog birch and a variety of fen wetland species are present.

Day 8 – Kakwa Falls

Date: morning June 22, 2006

Observers: DV, BR, MH and KS

From the day-use area, walked the footpath to the main falls and descended to the river bottom. Returned to the top and continued to follow the river for a short distance through pine and spruce mixed forest.

Day 9 – Kakwa River upstream of the main falls

Date: June 23, 2006

Observers: DV, MH and KS

From the day-use area at the main falls, followed the river for~1.5 km then cut through the forest to access two unnamed lakes (SE sect. 23 and NW sect. 14 in 59-14-W6). From the lakes we returned to the river and proceeded back to the day-use area. A variety of habitats were visited including pine forest, pine/spruce mixed forest, old-growth spruce forest, willow riparian areas, lakes and wetlands.

Day 10 – Snowmobile trail to British Columbia border

Date: June 24, 2006

Observers: DV, MH, RA, EN and KS

Accessed from the truck trail, a snowmobile trail to B.C.'s Kakwa Provincial Park was followed. The trail passed through a variety of habitats including pine/spruce

mixed forest, pine/fir mixed forest, fir/spruce mixed forest and willow-dominated wetlands in the low lying areas.

Day 11 – Truck trail north of camp

Date: June 25, 2006
Observers: DV and KS
We followed the truck trail north to the northern border of the park. The road passed through pine/spruce mixed forests, pine forest, spruce forest, willow and bog birch wetlands and riparian areas along Mouse Cache Creek.

1.3 PREVIOUS RESEARCH

Little previous work within Kakwa WPP has been done that relates to its avifaunal community. The Alberta Breeding Bird Atlas (Semenchuk 1992) indicates that no atlas squares (township squares) were surveyed within the park boundaries up to the time of the Atlas's publication. An aerial survey of creeks and rivers within Kakwa WPP was carried out by the Canadian Wildlife Service (CWS) and Alberta Sustainable Development (SRD) during the spring of 1999 to confirm the presence of harlequin ducks (*Histrionicus histrionicus*) (Gregoire, 1999). Harlequin duck surveys also were conducted in the area by Parks and Protected Areas staff in the spring of 2006. The Fish and Wildlife Management Information System (FWMIS) has a single record of a sora (*Porzana carolina*) from the Sulphur Basin area.

1.4 METHODS

The majority of bird data for the Kakwa Wildland Provincial Park was collected daily during peak breeding season activity from June 15th-25th, 2006. Sunrise was around 5:30AM each morning and crews began dawn surveys at about 6AM. The dawn chorus occurred relatively late in the morning and was delayed until the sun cleared the mountain tops (~7:30AM), though also likely due to the frigid temperatures preceding 'sunrise' (often a few degrees below zero). Incidental observations were added from the July expedition that ran from July 12th -26th,

2006. Although groups in July were not specifically looking for birds, reports from this time period allowed us to confirm the breeding status of many species as adults with young were often observed. Access into the park was by four-by-four vehicles as far as Dead Horse Meadows, where camp was established in both June and July. From here, researchers were ferried via helicopter to remote areas within the park while nearby areas were explored on foot.

The June data was collected predominantly by four researchers: Wayne Nordstrom, Drajs Vujnovic, Margot Hervieux and the author. In total, 36 man-days of fieldwork were completed in June amassing 980 bird records. Surveys began just after sunrise each morning and concluded by mid-afternoon. Surveys were conducted non-systematically with all species observed and heard recorded. Additional habitat information and any behavioural notes or other relevant observations that could be used to determine breeding status were recorded. Indirect evidence was also noted such as feeding signs (wells, bark sloughing), feathers, kill sites and excavations. Chickadee mobbing playbacks were used in some areas to elicit a response or to try to coax an unidentified bird to display itself as well as potentially gain a few additional observations that otherwise would not have been made. Researchers attempted to confirm visually any ambiguous aural records.

Areas slated for potential bird surveys were scouted previously by helicopter. Areas were identified that enabled the researchers to optimize the diversity and amount habitat surveyed. Each site was visited once in June except for the aspen-dominated stands along the Kakwa River. This area was visited twice as it was a unique habitat type within the park and was first visited in the afternoon after peak breeding bird activity. The information collected was summarized to produce the species accounts found below.

2.0 RESULTS

2.1 INTRODUCTION

Abundance measures, breeding status and habitat associations are reported for each species in addition to any conservation issues relating directly to the species. Key threats are identified for each species, where known, as well as population status which was predominantly determined from 1966-2004 Canadian Breeding Bird Surveys (BBS). The annotated checklist provides a comprehensive inventory of all bird species within the park known to the author. Key findings and a summary for the park can be found in the discussion section.

2.2 EXPLANATION OF CODES AND ABBREVIATIONS

Checklist Organization

The following annotated checklist is organized by bird families identified by the **ENGLISH NAME: (Scientific Name)**. Species common names are used below and scientific names can be found in Appendix I. Both the scientific name and taxonomic order adhere to *The Check-List of North American Birds (Seventh Edition)* (American Ornithologists' Union 1998) and it's *Forty-second* (AOU 2000) to *Forty-seventh* (AOU 2006) *Supplements*.

Components of the Individual Species Accounts

The format of the species accounts follow the same structure for all species observed during the June and July 2006 biophysical that occurred within park boundaries. Three categories of bird records are used within the report and can be distinguished by typeface.

- Category 1. **Species Name**. Species occurrence in the park confirmed by the biophysical crew in either June or July 2006.

- Category 2. **(Species Name)**. Species observed outside of the park boundary (though in close proximity) and presumed to also occur within the park.
- Category 3. ***(Species Name)***. Species occurrence in the park based on indirect physical evidence (i.e. feathers, excavations) observed in either June or July 2006.

The following is the general structure used for all species and is explained in more detail below:

Common Name: breeding status [code]; abundance; details; conservation information (CI).

Breeding Status [code]: Alberta Breeding Bird Atlas codes and definitions have been used within this report so results can be compatible with those used in the Atlas of Breeding Birds of Alberta (Semenchuk 1992) and past reports for other wildlands in Alberta (Thomas 2001, 2003a and 2003b). The breeding status and codes are defined in Table 1 on page 13.

Abundance: The numbers reported within are not accurate measures of the true population size of any given species; rather they reflect the relative abundance. The numbers represent the probability of a birder (assumed to be experienced in identification and in suitable habitat during the appropriate time of the year) observing a given species through the course of a day. The measures are defined as follows (taken from Thomas and Klauke 2001):

- **Common** – should be found on every visit, sometimes in good numbers.
- **Fairly common** – found on almost all visits, but can be missed (usually present in smaller numbers than common species).
- **Uncommon** – present every year, usually in fairly small numbers. Often missed.

- **Rare** – usually occurs annually – though in very limited numbers and/or is of very local distribution. May be absent in some years. Missed on a majority of visits.
- **Casual** – Non-annual. Very rare. Highly unlikely to be encountered, but species is anticipated to occur irregularly in the park again.

Table 1. Alberta Breeding Bird Atlas codes (Semenchuk 1992).

Within each of the levels, there are categories of evidence denoted by a letter-code representing behavioural and empirical evidence. All of these codes apply to a species seen or heard during its breeding season:
Observed
X – species identified, but no indication of breeding.
Possible breeder
H – species observed, or breeding calls heard, in suitable nesting HABITAT.
Probable breeder
P – PAIR observed in suitable nesting habitat T – TERRIRTORY presumed through territorial nesting behaviour in the same location on at least two occasions a week or more apart. C – COURTSHIP behaviour between a male and a female. V – VISITING probable nest-site, but no further evidence obtained. N – NEST-BUILDING or excavation of nest hole by wrens and woodpeckers.
Confirmed breeder
NB – NEST-BUILDING or adult carrying nest material; used for all species except wrens and woodpeckers. DD – DISTRACTION DISPLAY or injury feigning. UN – USED NEST or eggshells found. FL – recently FLEDGED young or downy young. ON – OCCUPIED NEST indicated by adult entering or leaving nest-site or adult seen incubating. CF – CARRYING FOOD; adult seen carrying food or faecal sac for young. NE – nest with EGGS. NY – nest with YOUNG.

Details: This section of the species account describes the sightings in detail including notes on habitat, behaviour and where the sighting(s) occurred.

Conservation Information: Abbreviated CI. This section includes conservation issues unique to the particular species. Migratory and/or nesting strategy is also noted here as some life history traits make a species especially vulnerable during particular time periods or to particular disturbances (*i.e.* secondary cavity-nesters vulnerability to harvesting activities due to removal of nest sites). A note about the species population trend within Canada, Alberta or within the montane cordillera ecozone is also mentioned here.

Attribution of Records: In most cases, species accounts do not include acknowledgement of the observer(s). Only in cases where rare or casual occurrences were reported are records attributed to a particular observer as well as some of the July observations that were not made by the original birding crew. The following acronyms for individuals were used: LA – Lorna Allen, RA – Reg Arbuckle, MH – Margot Hervieux , TJ – Ted Johnson, DM – Doug Macaulay, EN – Elaine Nepstad, WN – Wayne Nordstrom, BR – Bill Richards, KS – Kathy St. Laurent, KS2 – Karen Stroebel, TT – Terry Thormin and DV – Drajs Vujnovic.

Abbreviations and Acronyms: The following abbreviations and acronyms appear in this report:

ANHIC – Alberta Natural Heritage Information Centre
AOU – American Ornithologists' Union
BBS – The North American Breeding Bird Survey
CI – Conservation Information
DDE - dichlorodiphenyl dichloroethylene
DDT – dichlor-diphenyl-trichlorethane
DHM – Dead Horse Meadows
et al. – *et alia* (and others)
etc. – *et cetera*
FWMIS – Fish and Wildlife Management Information System
i.e. – *id est* (that is)
km - kilometre

m - metre

NABCI – North American Bird Conservation Initiative

NTM-F – Facultative Neotropical Migrant (a minority of this bird species' North American breeding population winters in the tropics – between the Tropic of Cancer and the Tropic of Capricorn)

NTM-O – Obligate Neotropical Migrant (all, or a large majority of this species' North American breeding population winters in the tropics as defined above)

PCB - polychlorobiphenyls

SDM – short-distance migrant

WPP – Wildland Provincial Park

2.3 ANNOTATED CHECKLIST OF BIRDS FOR KAKWA WPP

Species Accounts

LOONS: (Gaviidae)

Common Loon: Observed [X]; Rare (1 record in June); lone individual observed as a fly-over at the camp at DHM by several observers, no indication of breeding.

CI: Sensitive to human disturbance and susceptible to environmental contaminants such as bioaccumulation of mercury (Barr 1986) and lead (Pokras *et al*. 1993), DDT (dichlorodiphenyl trichloroethane), acid rain and oil spills (Tankersley and Ruggles 1993, Brinkley and Humann 2001) and thus potentially useful as bio-indicator species. Population increased significantly in Alberta from 1968-2004 though decreased across Canadian range during the same time period (Downes *et al*. 2004).

Pacific Loon: Observed [X]; Casual (1 record in June); one juvenile observed on Emerald Lake by WN and MH on June 20th, occasionally diving below the surface. Rare transient to interior western North America (Gilligan *et al*. 1994).

CI: Sensitive to disturbance and susceptible to pesticides and other contaminants (DDE – dichlorodiphenyl dichloroethylene and PCB – polychlorobiphenyls) (Gilbertson and Reynolds 1974). Some incidental death from commercial gill-net fisheries (Takekawa *et al.* 1990).

GEESE, SWANS AND DUCKS: (Anatidae)

Canada Goose: Confirmed breeder [FL]; Uncommon; two adults and two juveniles observed on Kakwa River on June 20th. Droppings observed on the edge of a beaver pond near the deciduous-dominated forests along the Kakwa River in July.
CI: Range expanding and numbers increasing in North America (Drut and Trost 2001).

Mallard: Confirmed breeder [P, FL]; Uncommon; ten birds recorded. Lone adult male observed on creek in meadow by DHM camp on June 16th and a pair observed on July 13th near Mouse Cache Creek (BR). Breeding was confirmed on June 21st with an observation of a female with seven chicks around the Emerald Lakes.
CI: Canadian BBS (1968-2004) data indicate stable populations in montane cordillera ecozone (Downes *et al.* 2004).

Green-winged Teal: Observed [X]; Rare; one individual seen on Emerald Lake on July 24th by DM.
CI: NTM-F. Listed as 'sensitive' in The General Status of Alberta Wild Species (2005) due to declining populations with no known cause. Canadian BBS (1968-2004) indicate stable populations across Canada.

Lesser Scaup: Confirmed breeder [FL, P]; Uncommon; three pairs observed on small, unnamed lake a few km south-southwest of camp.
CI: Widespread decline in North America likely due to habitat changes resulting from climate change, fire and logging (Austin *et al.* 2000).

Downes *et al*. (2004) report a significant population increase for the montane cordillera ecozone for 1968-2004.

Harlequin Duck: Probable breeder [P, FL]; Uncommon; one pair observed on unnamed lake (sect. 25 in 58-14-W6) by DV and KS in June. During a 1999 May aerial survey CWS and SRD staff observed 2 pairs on Kakwa River and one male on Putzy Creek. An aerial survey conducted on May 29, 2006, four pairs were identified (one on the main Kakwa River and three on the South Kakwa River) plus two single males (South Kakwa River) for a total of ten birds.
CI: Recent declines in populations due to over-hunting (Goudie 1989), habitat loss and habitat degradation through logging, mining, grazing and recreational activities (Breault and Savard 1991). Listed as 'sensitive' in Alberta (Alberta Sustainable Resource Development 2005) while the east coast population is listed as 'endangered' (Goudie 1991).

Common Goldeneye: Confirmed breeder [FL]; Rare; two females observed on small, unnamed lake a few kilometers south-southwest of camp on June 15th and a female observed with one duckling on July 14th in the meadows around camp. A female with ducklings was recorded on July 13th on Emerald Lake.
CI: Cavity nester. Overall populations are stable (BBS; 1968-2004) though loss of nest sites may occur through forestry activities.

Barrow's Goldeneye: Confirmed breeder [P, FL]; Rare; one pair observed on Emerald Lake on June 20th (WN and MH). Approximately one month later, on July 21st, one female (presumably the same one) was observed with seven ducklings on Emerald Lake. An aerial survey preformed on May 29th, 2006, identified 3-4 individual birds along the main Kakwa River.
CI: Cavity nester. Overall montane cordillera population is stable (BBS; 1968-2004) though across a restricted range.

Common Merganser: Confirmed breeder [FL]; Fairly common; group of seven males and one female observed on Kakwa River in June. Breeding was confirmed on July 24th with an observation of eight ducklings on Emerald Lake.
CI: Cavity nester. Canadian BBS indicates a stable population from 1968-2004 and non-significant downward trend for Alberta (Downes *et al.* 2004).

HAWKS AND EAGLES: (Accipitridae)

Northern Harrier: Observed [X]; Rare (3 records in June, 1 in July); lone male observed at patterned fen near Rim Ridge (BR, DV and KS) plus two other individuals observed by WN. DM observed an individual on Horn Ridge on July 14th.
CI: NTM-F. Sensitive to disturbance and has declined significantly in Canada during the last decade (Dunn *et al.* 2000). Listed as 'sensitive' in The General Status of Alberta Wild Species (2005) due to declining populations in Alberta and across North American range. Maintenance and preservation of wetlands important to species.

Northern Goshawk: Observed [X]; Rare; three individuals recorded in July (JG and WN). One adult female observed north of the Kakwa River in pine/spruce mixed forest. Another individual was observed again in pine/spruce mixed forest around the Emerald Lakes. One individual (sex unknown) observed flying across a meadow west of the DHM.
CI: Resident. Listed as 'sensitive' to logging, industrial development and human encroachment on nesting habitat in The General Status of Alberta Wild Species (2005).

Red-tailed Hawk: Observed [X]; Rare; two birds recorded. An individual observed flying along Kakwa River near the riparian area sampled on June 19th. Another observed on July 21st in the deciduous-dominated forest area along the Kakwa River (LA).

CI: NTM-F. Significant population increase in Canada and Alberta (1968-2004) likely in response to establishment of open, wooded habitat through logging activities (Preston and Beane 1993).

Golden Eagle: Probable breeder [P]; Uncommon (4 records in June representing 7 individuals); one pair observed at each of Sulphur Ridge, La Crèche and at Narrow Creek headwaters with an additional observation of one individual at Mount May.
CI: Long-term surveys show no decline in nesting populations in Canada (Kochert and Steenhof 2002) though population estimates suggests only 100-250 pairs in Alberta. Listed as 'sensitive' in The General Status of Alberta Wild Species (2005) as this species is vulnerable to disturbance from human-related activities. Accidental trauma (collisions with vehicles, power lines, or other structures) is the leading cause of death (27%), followed by electrocution (25%), gunshot (15%) and poisoning (6%); (Franson *et al*. 1995).

Bald Eagle: Observed [X]; Rare (2 records in June); one individual observed along the Kakwa River upstream of the main falls (DV). The remains of a second bird were found on the river bank at the lower falls.
CI: Populations have increased dramatically since 1980 as DDT levels dropped along with a reduction in human persecution through environmental awareness (Beuhler 2000). Recovering population now listed as 'sensitive' in The General Status of Alberta Wild Species (2005). Susceptible to the same accidental trauma listed above for the Golden Eagle.

FALCONS: (Falconidae)

Merlin: Observed [X]; Rare; one individual observed by TJ around DHM camp.
CI: Resident. Populations stable across Alberta and montane cordillera from 1968-2004 (Downes *et al*. 2004).

American Kestrel: Observed [X]; Rare (1 record in June); one individual heard calling near unnamed lake upstream of the main falls (DV).

CI: Cavity nester. The availability of suitable nesting sites is limiting across many areas of its breeding range (Smallwood and Bird 2002). Population across Canada, Alberta and the montane cordillera exhibited a non-significant downward trend from 1968-2004 (Downes *et al*. 2004).

Peregrine Falcon: Observed [X]; Uncommon; six individuals in total, recorded in July. One adult female observed perched and hunting on Coal Ridge. Other individual sightings all include lone adults observed (sex unknown) flying over Rim Ridge on July 18th, in the Sulphur Ridge area on July 19th, in the Paradise Basin area on July 20th, near Mount Compton on July 21st and another (possibly male) in the area south of Mount May on July 23rd.

CI: Listed as 'at risk' in The General Status of Alberta Wild Species (2005), 50-60 pairs in Alberta. Also listed as a 'threatened' species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2006). Through the release of >6,000 young produced or reared in captivity in Canada and the United States (Holdroyd and Banasch 1996, Cade 2000) by the 1990's, continent-wide populations reached pre-DDT levels and are continuing to increase into the twenty-first century (Tordoff and Redig 2001).

GROUSE AND ALLIES: (Phasianidae)

Spruce Grouse: Confirmed breeder [DD, FL]; Common; 35 individuals recorded during June and July expeditions. Lone male observed as well as displaying female with four chicks on quad/snowmobile trail to B.C. in June. All observations in July involve females observed with chicks (from one to seven) in the following locations: near the main falls, in the meadows around camp, on the truck trail near camp, in the deciduous-

dominated forest along the Kakwa River and on the horse trail to the Emerald Lakes.
CI: Resident.

(Blue Grouse): Observed [X]; Rare; observed on Horn Ridge in July (TJ) outside the park boundary.
CI: Often increases dramatically after clear-cutting, though short-lived, then declines to low levels as tree canopy closes (Zwickel and Bendell 1985).

Ruffed Grouse: Possible breeder [H]; Rare (1 record in June); male heard drumming in suitable habitat for breeding (KS and DV).
CI: Vulnerable to predation, hunting and successional aging of the forest (Rusch *et al.* 2000).

White-tailed Ptarmigan: Confirmed breeder [FL]; Fairly common; fourteen adults and several observations of females with chicks reported in July from various locations in the park occurring in alpine/subalpine habitats. DM recorded two females with five chicks each on Sulphur Ridge (July 15th), three adults on Coal Ridge (July 17th), two adults and four chicks on Mount May (July 19th) and two adults and nine chicks on Mount Compton (July 21st).
CI: Due to inaccessible alpine habitat and cryptic plumage, this species is not well studied but continues to occupy its historic range (Braun *et al.* 1993). Sensitive to development in alpine areas (ski trails, snow catchment fences, off-road vehicles) and hunting pressure (Braun *et al.* 1976).

Willow Ptarmigan: Confirmed breeder [FL]; Uncommon; two adults and 6 chicks observed in the valley east of Mount May on July 20th (BR).
CI: Very few breeding records exist for Alberta. Numbers may be regulated in winter through starvation and predation and in spring/fall through territorial spacing behaviour (Bergerud 1988).

RAILS: (RALLIDAE)

Sora: Observed [X]; Rare; DM recorded an individual at the Kakwa River riparian area near a beaver pond on July 18th. An additional record was obtained from FWMIS as "soras observed in Sulphur Basin area" with no further information.

CI: NTM-F. Declining across its range in the United States (Conway *et al.* 1994) but significant increases for the montane cordillera ecozone in Canada from 1966-1994 (Downes and Collins 1996).

SANDPIPERS AND ALLIES: (Scolopacidae)

Greater Yellowlegs: Probable breeder [P, V]; Uncommon; at least 3 pairs were observed on June 21st in the fen complex on the plateau above the Emerald Lakes either perching in the pine/spruce clumps or flying over the fen. Probable nest site(s) given the defensive alarm calling of the adults.

CI: NTM-O. Populations appear to have been stable across Canada from 1968-2004 (Downes *et al.* 2004).

Lesser Yellowlegs: Possible breeder [H]; Rare; two individuals heard near DHM camp.

CI: NTM-O. Downward trend, though non-significant, across breeding range in Alberta from 1968-2004 (Downes *et al.* 2004).

Least Sandpiper: Observed [X]; Rare; one individual recorded by DM at Little Berg Lake on July 20th. Adults of this species begin to migrate from the subarctic and northern boreal regions as early as late June (Butler and Kaiser 1994). This observation most likely represents a migrating adult.

CI: Populations thought to be stable in western and central Canada but declining in the east (Morrison *et al.* in press).

Solitary Sandpiper: Probable breeder [P]; Uncommon; seven birds recorded. A pair was observed in meadows by DHM camp along with

single individuals recorded at the patterned fen, on the snowmobile trail to B.C. and along the road north of camp in June. Pair observed in the patterned fen near Rim Ridge on July 19th and another individual recorded at Little Berg Lake on July 20th.
CI: NTM-O.

Spotted Sandpiper: Confirmed breeder [NE, P]; Fairly common; a total of 20 individuals recorded. Several pairs observed along the Kakwa River upstream of the main falls in June and another pair near the deciduous-dominated forests along the Kakwa River. Four individuals and a nest with four eggs along the shore of Emerald Lake were recorded in June.
CI: NTM-O. Significant population decrease across Canada from 1968-2004 (Downes *et al*. 2004).

Wilson's Snipe: Confirmed breeder [NE]; Uncommon; four to five individuals regularly heard winnowing in DHM by camp in June. Nest observed in the meadows around camp near a small mammal trap-line. One individual recorded at the Emerald Lake uplands on July 24th.
CI: NTM-F. Formerly known as Common Snipe. Vulnerable to loss of habitat through drainage and conversion of wetlands (Tuck 1972). Canadian BBS (1968-2004) population trend indicates non-significant, increasing populations across Canada, Alberta and the montane cordillera ecozone (Downes *et al*. 2004).

OWLS: (Strigidae)

Short-eared Owl: Observed [X]; Rare; one individual reported on July 21st, seen flying along the truck trail (bordered by mature pine/spruce mixed forest) south of DHM camp (WN and KS2).
CI: NTM-F. Irruptive. Designated as 'may be at risk' in The General Status of Alberta Wild Species (2005) as population is declining and the cause of the decline is unknown, though multiple threats exist including loss of its preferred habitat. Also listed as a species of 'special concern' by the

Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2006).

Northern Hawk Owl: Observed [X]; Rare; one adult observed in a regenerating burn (spruce and pine) adjacent to large fen wetland on the plateau above Emerald Lakes on June 21st (WN and MH).
CI: Listed as 'sensitive' in The General Status of Alberta Wild Species (2005). Widely distributed but uncommon, requires mature and burned forests.

HUMMINGBIRDS: (Trochilidae)

Calliope Humming bird: Observed [X]; Rare (3 confirmed records); individual female observed in aspen-dominated stand along Kakwa River, responding to black-capped chickadee mobbing recording (DV and KS). Individual observed near Little Berg Lake on July 16th (DM) and another in the Putzy Creek area on July 21st (JG). Two additional observations were made, believed to be this species though not confirmed, in the south Mount May area and Paradise Basin area on July 19th and 20th respectively.
CI: NTM-O. Population stable from 1968-2004 within restricted distribution (Downes *et al.* 2004); localized breeder.

KINGFISHERS: (Alcedinidae)

Belted Kingfisher: Observed [X]; Uncommon; five birds observed in June and July. One individual observed along creek in meadows by DHM camp in June and four observed along the Kakwa River in the area of the deciduous-dominated stands.
CI: NTM-F. Significant population decreases across Canadian range from 1968-2004 (Downes *et al.* 2004).

WOODPECKERS: (Picidae)

Three-toed Woodpecker: Observed [X]; Rare; one individual recorded in July from old-growth, spruce/pine mixed forest along the Kakwa River (WN and KS2).
CI: Resident. Irruptive. Cavity nester.

***(Pileated Woodpecker)*:** Indirect evidence of species occurrence obtained in June by the discovery of unique foraging excavations. Species is uncommon and sparsely distributed though documented to occur within the park (Sibley 2003).
CI: Cavity nester. Resident. Significant, long-term increase in population in Alberta and across Canada (Downes et al. 2004). Listed as 'sensitive' in Alberta under the General Status of Alberta Wild Species (2005) due to reliance on mature and old-growth forests for nesting.

Northern Flicker: Possible breeder [H]; Rare (2 records); male heard calling and drumming around camp in both June and July (WN). DM recorded an individual at the Emerald Lake Uplands on July 24th.
CI: Cavity nester. Significant, long-term declines across Canada (Dunn *et al*. 2000).

Yellow-bellied Sapsucker: Observed [X]; Rare; one adult was observed in riparian habitat along the Kakwa River on July 24th (TJ).
CI: Cavity nester.

FLYCATCHERS: (Tyrannidae)

Olive-sided Flycatcher: Possible breeder [H]; Uncommon (5 records); two males were heard singing at the Emerald Lake plateau on June 21st. Male heard singing upstream of the main falls near unnamed lakes on June 23rd. Two records from July note one bird in the meadows around camp and another at the Emerald Lakes.

CI: Species has undergone significant declines across much of its range in the last 30 years (Altman and Sallabanks 2000) though listed as 'secure' in Alberta under the General Status of Alberta Wild Species (2005). Downes *et al*. (2004) also report significant declines in Canada and the montane cordillera ecozone from 1968-2004.

Western Wood-pewee: Observed [X]; Rare; single adult observed in pine/spruce forest around in the Emerald Lakes area on July 24th (DM).
CI: Declining overall, though secure in Alberta (The General Status of Alberta Wild Species 2005). Included in the 57 species of North American birds 'most at risk as the destruction of tropical forests continue' (Terborgh 1989). Significant population decline reported for the montane cordillera from 1968-2004 (Downes *et al*. 2004).

Western Flycatcher: Possible breeder [H]; Rare; three individual males heard singing in June. Two birds along steep banks of the Kakwa River upstream of the main falls and one bird at the Kakwa Falls Day Use area (DV and KS).
CI: Area of suspected sympatry between Pacific-slope and Cordilleran flycatcher range near Kakwa WPP. Listed as 'undetermined' in The General Status of Alberta Wild Species 2005 as little information is known about these species.

Alder Flycatcher: Possible breeder [H]; Rare (1 record in June); two individuals heard singing in willow flats along Kakwa River by several observers in June.
CI: NTM-O. Significant population decline in the montane cordillera for 1968-2004 (Downes *et al*. 2004).

Least Flycatcher: Possible breeder [H]; Rare (1 record in June); one individual heard singing in the aspen-dominated forests along lower north Kakwa River (DV and KS).

CI: Listed as 'sensitive' in The General Status of Alberta Wild Species 2005 due to declining populations in Alberta potentially resulting from habitat changes on the wintering ground.

Dusky Flycatcher: Possible breeder [H]; Rare (1 record in June); two individuals observed and heard singing in willow flats along Kakwa River by several observers. One was singing from shrubby (5-6') willow and one singing from a small patch of old coniferous (white spruce) surrounded by willow shrub.
CI: NTM-O. Populations appear stable (BBS; 1968-2004) and exhibit an upward trend.

VIREOS: (Vireonidae)

Warbling Vireo: Possible breeder [H]; Rare (2 records in June); three individuals recorded over two visits (one most likely a repeat observance) in aspen-dominated stands along the lower north Kakwa River (DV and KS).
CI: NTM-O. Statistically significant increases in Alberta from 1966-1996 (Downes and Collins 1996, Sauer *et al*. 1997).

JAYS, CROWS AND ALLIES: (Corvidae)

Gray Jay: Confirmed breeder [FL]; Common; 31 individuals recorded, several family groups observed with 1-2 juveniles. Family group at DHM camp with two juveniles.
CI: Resident. Declines in last decade across Canada reported by Dunn *et al*. (2000) though Downes *et al*. (2004) report stable populations. Also highly vulnerable to small fur-bearing animal traps (de Vos *et al* 1959).

Common Raven: Probable breeder [P]; Uncommon; six individuals recorded (one most likely a repeat observance) including a pair observed in the aspen-dominated stands along the lower north Kakwa River.

CI: Resident. Significant population increases for Canada, Alberta and the montane cordillera from 1968-2004 (Downes *et al.* 2004).

LARKS: (Alaudidae)

Horned Lark: Confirmed breeder [CF]; Fairly Common; seven individuals (mixed flock of males and females) observed and heard singing in alpine region on Mount May on June 18th. In July, a female was observed carrying food in the valley southeast of Berg Lake and two birds (one female and another bird of unknown sex) were observed in a valley east of Mount May. Two adults were recorded in the alpine region of Coal Ridge and another on Sulphur Ridge on July 17th and 18th respectively.
CI: Significant negative trend in population across Canada (BBS; 1968-2004).

SWALLOWS AND MARTINS: (Hirundinidae)

Tree Swallow: Observed [X]; Rare (1 record in June); one individual male observed in flight over the willow flats riparian area along the Kakwa River by several observers.
CI: NTM-O. Cavity nester. Potential use as a bio-indicator (DeWeese *et al.* 1985). Increasing population in Alberta from 1968-2004 (Downes *et al.* 2004).

Cliff Swallow: Observed [X]; Rare; three birds in total observed in July (WN and KS2). Two birds were seen on a rocky slopes in the Coal Ridge area (July 17th) and another individual bird in the Paradise Basin area (July 20th).
CI: Colonial nester. Data suggest no overall change in total population size across North America and Canada (BBS; 1968-2004).

CHICKADEES: (Paridae)

Black-capped Chickadee: Possible breeder [H]; Uncommon; a total of six individuals observed. Five individuals observed over two days in the

aspen-dominated stands along the Kakwa River (one potentially a repeat observation) on June 19th and 20th. One individual observed in the same stand in July, also potentially a repeat observation. Responded to black-capped chickadee mobbing recordings performed in the area.
CI: Resident. Cavity nester. Significant population increase across Canada from 1968-2004 though downward, non-significant trend throughout montane cordillera (Downes *et al*. 2004).

Mountain Chickadee: Observed [X]; Rare (1 record in park boundary); individual observed around the patterned fen below Rim Ridge on July 19th (LA). Another individual observed at Sherman Meadows outside the park boundary (TT).
CI: Resident. Cavity nester. Stable population in the montane cordillera from 1968-2004 (Downes *et al*. 2004).

Boreal Chickadee: Probable breeder [P]; Fairly common; a total of nineteen individuals observed including five potential pairs. One observation on the edge of the meadow around DHM camp, a pair observed (male singing) in old-growth white spruce forest along Kakwa river, four birds (2 pairs?) responded to taped black-capped chickadee mobbing calls in aspen-dominated forest along lower north Kakwa River, three observed (one pair) upstream of the main falls in lodgepole pine/white spruce mixed forest, three encountered along snowmobile trail to B.C. and six (at least one pair) observed along the truck trail north of DHM camp.
CI: Resident. Cavity nester. Habitat specialist: old-growth conifer forest dependent. Population declines across Canada over last 30 years (Dunn *et al*. 2000).

NUTHATCHES: (Sittidae)

Red-breasted Nuthatch: Possible breeder [H]; Rare (2 records in June); two individuals detected on consecutive days (probably same

individual) in aspen-dominated forest along lower north Kakwa River (DV and KS).

CI: Resident. Cavity nester. Irruptive. Habitat specialist: old-growth conifer forest dependent (Steeger and Hitchcock 1998). Significant, positive population trend from 1968-2004 across Canada (Downes *et al.* 2004).

CREEPERS: (Certhiidae)

Brown Creeper: Possible breeder [H]; Rare; two birds recorded. One male was heard singing in old-growth spruce forest upstream of the main falls on June 23rd (DV, MH and KS) and one observed on a pine tree near the outfitter cabin in DHM east of the camp on July 14th (BR).

CI: Listed as 'sensitive' in The General Status of Alberta Wild Species 2005 due to dependence on mature forest and thus is vulnerable to forest fragmentation and certain forest management practices (*i.e.* removal of snags).

WRENS: (Troglodytidae)

Winter Wren: Possible breeder [H]; Uncommon; seven individuals recorded with the majority (4) occurring on the slopes of Mount May in thick, stunted subalpine fir. Several individuals observed singing from tree tops. One occurrence along lower, north Kakwa River in aspen dominated forest, one in pine/spruce mixed forest upstream of the main falls and one in pine/fir mixed forest along truck trail north of camp.

CI: Old-growth, interior forest dependent, sensitive to fragmentation and logging practices (Hejl *et al.* 2002).

DIPPERS: (Cinclidae)

American Dipper: Observed [X]; Uncommon; in June, subsequent sightings of an individual male at the main falls was made over several visits by separate groups as well as another individual at the lower Kakwa River falls. One adult recorded on July 16th at Little Berg Lake. Two birds

were observed at the outlet creek of Little Berg Lake on July 17th (possibly same bird as above) as well as another along a creek in the Paradise Basin on July 20th.

CI: Vulnerable to stream pollution and deforestation though increased stream temperature, erosion and subsequent alteration of food web (Sullivan 1973).

KINGLETS: (Regulidae)

Golden-crowned Kinglet: Confirmed breeder [CF, NB]; Common; 45 individuals recorded from June expedition. One observation of a bird carrying food and another observation of an individual carrying nesting material. Majority of observations (9 individuals) along the snowmobile trail to B.C. in old-growth spruce/pine mixed forest, along the truck trail north of camp in pine/fir mixed forest (9 individuals) and in the aspen dominated stands along the lower north Kakwa River (9 individuals). The latter observations are not typical golden-crowned kinglet habitat though observations were near, or in, interspersed patches of old pine and fir. As well, individuals may have been drawn from these patches to the chickadee mobbing play-backs performed in the area.

CI: Habitat specialist on old-growth coniferous forest. Canadian BBS (1968-2004) results indicate stable population in the montane cordillera and significantly increasing populations across Canada and Alberta (Downes *et al*. 2004).

Ruby-crowned Kinglet: Possible breeder [H]; Common; 28 individuals recorded in June. Observations occurred in pine/fir mixed forest on the edge of the meadows around DHM camp (4 birds) including two counter-singing males, along the snowmobile trail to B.C. (3 birds) and the truck trail north of camp (4 birds). Several observations from subalpine fir forests on Sulphur Ridge (1 bird), Mount May (2 birds), Narrow Creek headwaters (1 bird), around the edges of the patterned fen (3 birds) and around the edges of the Kakwa River flats (3 birds).

CI: NTM-F. Canadian BBS (1966-1994) shows no significant change in population for the montane cordillera (Downes and Collins 1996).

BLUEBIRDS AND THRUSHES: (Turdidae)

Townsend's Solitaire: Observed [X]; Rare; three individuals recorded, two on June 20th and one on June 21st (WN and MH). The first observation occurred near Emerald Lake in a stand of mature, mixed pine/spruce and the second observation of a lone individual occurred in pine/spruce mixed forest adjacent to the fen complex on the plateau above the Emerald Lakes.
CI: Canadian BBS data (1966-1994) show stable populations across Canada and within the montane cordillera (Downes and Collins 1996).

Swainson's Thrush: Confirmed breeder [CF]; Fairly common; twelve individuals detected in six different areas. One heard singing around camp, three heard singing in old-growth spruce along Kakwa River, one heard singing in aspen-dominated forest along lower north Kakwa River, three singing near the main falls day use area in lodegpole pine including one carrying food, four heard singing upstream of the main falls in old pine/spruce mixed forest and two heard singing in pine along the truck trail north of camp.
CI: NTM-O. Forest interior species. Recent trends (BBS; 1980-1996) show decrease in populations in Canada and across North America but significant increases for Alberta.

Hermit Thrush: Possible breeder [H]; Common; 26 individuals recorded from alpine fir around patterned fen (5 individuals) including an observed territorial dispute between two birds, pine/fir mixed forest along truck trail (6 individuals), pine/fir mixed forest along snowmobile trail to B.C. (5 individuals), pine/spruce mixed forest upstream of main falls (2 individuals), pine forest around camp in DHM (2 individuals), subalpine fir along Narrow Creek headwaters (2 individuals) and single observations

from subalpine fir on La Crèche, aspen-dominated forest along lower north Kakwa River and alpine fir on Mount May.
CI: NTM-O. Forest interior species. Populations stable in the montane cordillera though decreasing across Alberta (Downes *et al*. 2004).

Varied Thrush: Possible breeder [H]; Fairly common; 16 individuals recorded in June. Could be heard singing at camp nightly. Most observations occurred in pine along truck trail north of camp (5 individuals) and in subalpine fir along Narrow Creek headwaters (5 individuals).
CI: Recent studies show old-growth dependence and sensitivity to forest fragmentation (George 2000). Forest interior species (Hurt 1996).

Gray-cheeked Thrush: Possible breeder [H]; Rare (2 records in June and 1 in July); one individual heard singing across meadow from camp (KS) and one individual heard singing on Mount May in alpine fir on edge of willow thicket (WN, DV and KS). DM recorded an individual on July 13th at Emerald Lake.
CI: Listed as 'undetermined' in The General Status of Alberta Wild Species 2005 due to lack of sufficient information to reliably evaluate status. Breeding records in Alberta for this species are sparse.

American Robin: Possible breeder [H]; Common; 23 individuals observed from a variety of habitat types from barren alpine down to the pine/fir forests around DHM camp; most occurring on Mount May (7 individuals) and a flock of nine in the valley southeast of Berg Lake in July.
CI: NTM-F. Population levels were stable in the montane cordillera from 1966-1994 (Downes and Collins 1996).

PIPITS: (Motacillidae)

American Pipit: Observed [X]; Fairly common; three individuals (two males and one female) observed feeding around snow pack in the alpine

region of Mount May (WN, DV and KS). Three individuals recorded in July on Sulphur Ridge and Little Berg Lake. Subsequent observations of at least eight other individuals in the alpine regions of the park.
CI: May be sensitive to global climate change altering the upper tree line thereby reducing alpine habitat (Romme and Turner 1991).

WAXWINGS: (Bombycillidae)

Bohemian Waxwing: Observed [X]; Uncommon; a group of five individuals recorded in the regenerating burn on the Emerald Lake plateau. Subsequent observations of a pair of waxwings, not identified to species though believed to be Bohemians, were made in June around camp and on July 19th at the patterned fen below Rim Ridge.
CI: Resident. Irruptive.

WOOD-WARBLERS: (Parulidae)

Tennessee Warbler: Possible breeder [H]; Uncommon; nine individuals (one a probable repeat observation) recorded during June expedition. All recordings were of singing males. Five observations from fir/pine forests edging the Kakwa River flats with single observations from the aspen-dominated stands along the lower north Kakwa River (2 individuals on subsequent days – probably represents the same individual), the edge of the Kakwa River upstream of the main falls in a sparsely treed area at the confluence of Punchbowl Creek and Kakwa River and along the truck trail north of camp.
CI: NTM-O. Irruptive. Spruce budworm specialist. Populations appear stable across Canada (1968-2004) (Downes *et al*. 2004).

Orange-crowned Warbler: Possible breeder [H]; Uncommon; six individuals recorded all from the aspen-dominated stands along the lower north Kakwa River over two visits (one individual most likely represents a repeat observance). All recordings of singing males though a couple were

also observed responding to black-capped chickadee mobbing play-backs performed in the area.
CI: NTM-F. Species has undergone a significant increase in population in the Alberta and Canada (BBS; 1968-2004) (Downes *et al*. 2004).

Yellow Warbler: Observed [X]; Rare; one record of a male observed foraging on the ground in the patterned fen near Rim Ridge (LA).
CI: NTM-O. Species has shown a significant decrease in population in the montane cordillera from 1968-2004 though appear to be stable across Alberta and Canada (Downes *et al*. 2004).

Townsend's Warbler: Possible breeder [H]; Rare: one record of a single singing male in the aspen-dominated stands along the lower north Kakwa River (DV and KS). Responded to black-capped chickadee mobbing play-backs.
CI: NTM-O. Old-growth, forest dependent species.

Yellow-rumped Warbler: Confirmed breeder [CF]; Common; 73 individuals recorded during June expedition from a variety of habitat types including; pine/fir mixed forest, aspen dominated forest, pure pine forests and subalpine fir thickets on Mount May, at the Narrow Creek headwaters and edging the Rim Ridge patterned fen. Several pairs observed, including a territorial dispute, as well as two individuals observed carrying food.
CI: NTM- F. Species showed a significant increase in population levels across Canada and Alberta (BBS; 1968-2004) (Downes *et al*. 2004).

Blackpoll Warbler: Possible breeder [H]; Rare; four singing males recorded during June expedition (WN, DV and KS). One male observed in subalpine fir in the lower reaches of Mount May near a creek, one heard singing in the fir/pine forest along the truck trail south of camp and two

heard and seen along the truck trail north of camp in pine near Mouse Cache Creek.
CI: NTM-O. Statistically significant, downward population trend across Canada and non-significant downward trend in Alberta and the montane cordillera ecozone from 1968-2004 (Downes *et al*. 2004).

Common Yellowthroat: Possible breeder [H]; Uncommon; five males recorded singing all within extensive, scrubby willow meadows. Two males heard in the riparian zone along the lower Kakwa River, two males in the patterned fen below Rim Ridge and one in riparian area along Mouse Cache Creek along the truck trail north of camp.
CI: NTM-O. Significant declines across North American range from 1966-1993 (Rodriguez 2002) though stable in montane cordillera during that same period (Downes and Collins 1996).

MacGillivray's Warbler: Possible breeder [H]; Rare; one male heard and positively identified (after much searching) in clearing vegetated by 5-8' tall willow along the west side of the truck trail north of camp (DV and KS).
CI: NTM-O.

Northern Waterthrush: Possible breeder [H]; Rare; one male heard singing (one complete song only) near small wetland (beaver pond) along the west side of the truck trail north of camp on June 25th (DV and KS). An additional observation was made on June 20th at Emerald Lake (WN and MH).
CI: NTM-O. Species exhibited a positive, significant trend in population levels from 1968-2004 in the montane cordillera (Downes *et al*. 2004).

Wilson's Warbler: Confirmed breeder [CF]; Common; 68 individuals detected during the June expedition. Found at nearly every site visited (except Narrow Creek headwaters) in open, shrubby habitats across a wide

altitudinal range from the subalpine region to the lower meadows. An observation of an individual carrying food was made on July 18th.
CI: NTM-O. Long-term trend analysis indicates population declines particularly in western portion of range (Ammon and Gilbert 1999).

SPARROWS AND ALLIES: (Emberizidae)

Brewer's Sparrow: Possible breeder [H]; Rare; one male heard singing on Sulphur Ridge in subalpine fir krummholz (DV).
CI: NTM-F. Two subspecies in Alberta; *Spizella breweri breweri* and *S.b. taverneri*, the former is the prairie population and the latter is the 'timberline' population found in the Rocky Mountains. Listed as 'sensitive' in Alberta because of steep population declines since 1994 due to specific habitat requirements (Alberta Sustainable Resource Development 2005).

Clay-colored Sparrow: Possible breeder [H]; Uncommon; six males recorded in the riparian flats along the Kakwa River and one in the Rim Ridge patterned fen, all in shrubby willow.
CI: NTM-O. Population trend shows non-significant increases in montane cordillera though significant declines in Alberta (Downes *et al.* 2004).

Chipping Sparrow: Confirmed breeder [FL, NB]; Common; 94 individuals detected during June expedition. Widely distributed across a range of habitat types and altitudes including willow/birch meadows to old spruce forest to subalpine fir krummholz. Several pairs and individuals carrying nesting material observed including one fledgling along the truck trail north of DHM camp.
CI: NTM-F. This was the most common bird observed during the June expedition. Dunn *et al.* (2000) report that the population has declined in Canada over the past two decades.

Le Conte's Sparrow: Possible breeder [H]; Rare; one individual male singing, recorded on June 16 in the willow shrub around DHM camping area (WN, DV and KS).
CI: Observation is at extreme western edge of continental range.

Savannah Sparrow: Possible breeder [H]; Common; 44 individuals detected during June expedition. Majority of individuals (10 birds) found in the Rim Ridge patterned fen among the shrubby willow, upstream of the main falls (6 individuals) in willow thickets along the edge of the river, meadow around camp (5 birds) and the riparian flats along the Kakwa River (5 birds). Found across a wide altitudinal range within the park.
CI: NTM-F. Populations in the montane cordillera are stable (Downes and Collins 1996).

Golden-crowned Sparrow: Possible breeder [H]; Common; 30 individuals detected during June expedition and six recorded for July. Frequently encountered in the subalpine region among the subalpine fir krummholz on Coal Ridge (2 birds), Mount May (7 birds), Narrow Creek headwaters (3 birds), La Crèche mountain (8 birds) and the patterned fen on Rim Ridge (7 birds). In July, records were made from Horn Ridge, Sulphur Ridge and Little Berg Lake.
CI: Listed as 'secure' in the General Status of Alberta Wild Species (2005) but no information available from Canadian BBS (1966-1994).

White-throated Sparrow: Possible breeder [H]; Rare; four individuals detected in June by several observers. Male singing along edge of riparian flats along Kakwa River and two singing along the edge of the Rim Ridge patterned fen.
CI: A borderline ($0.05<p<0.15$) significant population increase for the montane cordillera from 1968-2004 (Downes *et al.* 2004).

White-crowned Sparrow: Possible breeder [H]; Common; 24 individuals detected in June. Found in shrubby willows in meadows around camp, the riparian flats along the Kakwa River, Rim Ridge patterned fen and also in the subalpine fir krummholz on Sulphur Ridge and Mount May.
CI: NTM-F. Canadian BBS (1968-2004) shows a stable population in the montane cordillera ecozone (Downes *et al*. 2004).

Fox Sparrow: Possible breeder [H]; Common; 26 individuals recorded. Several individuals singing and calling in the alpine and subalpine regions (subalpine fir krummholz) of Sulphur Ridge, Coal Ridge, Mount May, Narrow Creek headwaters, La Crèche and Rim Ridge patterned fen.
CI: Population shows stable trend in mountain cordillera ecozone from 1968-2004 (Downes *et al*. 2004).

Lincoln's Sparrow: Possible breeder [H]; Fairly common; 16 individuals detected during June expedition. All found in wet, riparian habitats containing willow and birch shrub across a range of locales including the camp meadow, Kakwa River flats, patterned fen on Rim Ridge, upstream of the main falls, along the truck trail north of camp and along the snowmobile trail to B.C.
CI: NTM-O. Populations show a significant increase across Canada and within the montane cordillera ecozone (Downes *et al*. 2004).

Dark-eyed Junco: Confirmed breeder [FL, CF]; Common; a total of 30 individuals recorded from June 16th-25th. Found across a variety of habitat types from open willow shrub to lodgepole pine/fir mixed forest to lodgepole pine/spruce mixed forest to pine dominant forest. One fledgling and an adult carrying food were observed on June 23rd near an unnamed lake upstream of the main falls. A researcher working on another component of the study saw what was determined to be a dark-eyed junco

fledgling in June. In addition, an Oregon form individual was observed on July 15th.

CI: Populations, from 1968-2004, in Alberta and the montane cordillera ecozone appear stable (Downes *et al.* 2004).

BLACKBIRDS, ORIOLES AND ALLIES: (Icteridae)

Brown-headed Cowbird: Confirmed breeder [FL]; Rare; one individual juvenile observed in the DHM camp area by several observers.

CI: NTM-F. Nest parasite. Species show a borderline ($0.05<p<0.15$) significant population decline from 1968-2004 in Alberta with the montane cordillera exhibiting a stable trend (Downes *et al.* 2004).

FINCHES: (Fringillidae)

Evening Grosbeak: Observed [X]; Uncommon; flock of five observed in DHM in July (DM).

CI: Resident. Stable populations in the montane cordillera ecozone and Alberta from 1968-2004 (Downes *et al.* 2004).

Pine Grosbeak: Probable breeder [P]; Rare; three birds recorded. One pair observed on June 21st (DV, BR ad KS). Birds were perched and foraging in subalpine fir treetops on the edge of the patterned fen on Rim Ridge. A lone female was observed on July 19th in the same area (BR).

CI: Resident. Significant declines in eastern portion of range in the last 30 years, though appear to be stable in the montane cordillera ecozone (Downes and Collins 1996).

Gray-crowned Rosy Finch: Observed [X]; Uncommon; flock of five observed on June 18th in alpine region on Mount May foraging on and around snow packs on top of steep cliff. In July, two adults were recorded on Mount May with an additional observation at Little Berg Lake.

CI: Listed as 'secure' in The General Status of Alberta Wild Species (2005) though little information could be found regarding population status.

White-winged Crossbill: Possible breeder [H]; Uncommon; six individuals recorded. Found exclusively in conifer forests as in subalpine fir on Mount May (1 bird), in the lodgepole pine/fir along the truck trail north of camp (2 birds) and in the fir/spruce along the snowmobile trail to B.C. (3 birds). Only the individual on Mount May was heard singing a complete song while the other observations were all flight calls.
CI: Resident. Irruptive.

Pine Siskin: Possible breeder [H]; Common; several flocks observed as well as single bird fly-overs totaling 38 individuals during June expedition. Generally observed in open, riparian habitat as fly-overs and then stopping to forage in small patches of conifer trees (subalpine fir and lodgepole pine). Most observations were from the riparian flats area along the Kakwa River (16 individuals) and along the truck trail north of camp (11 individuals).
CI: Resident. Irruptive.

2.4 SUMMARY AND DISCUSSION

A total of 94 species representing 30 families were recorded for the 2006 survey in Kakwa WPP. Summary tables are presented in Table 2 on page 40 and grouped by: (A) migratory status, (B) abundance measure, (C) breeding status and by the (D) four main bird groups as per the North American Bird Conservation Initiative (NABCI). Only Category 1 (species confirmed) records were used for this Table.

Boreal breeding bird communities in Canada are generally comprised of ~50% long-distance (neotropical) migrants, ~30% short-distance migrants (those that winter in temperate locations) and ~20% permanent residents (Erskine 1977). The bird community in Kakwa WPP was found to have ~56.5% neotropical migrants, 21.7% short-distance migrants and 21.7% permanent residents. This is not unexpected for the mountain breeding bird community as the largest discrepancy is for short-distance migrants.

Table 2. Summary tables for Kakwa Wildland Provincial Park

A) Migratory Status	No. of Species	Percent of Species Total
NeoTropical Migrant-Facultative	24	26.1
NeoTropical Migrant-Obligate	28	30.4
Short-Distance Migrant	20	21.7
Resident	20	21.7

B) Abundance	No. of Species	Percent of Species Total
Casual	1	1.1
Rare	45	49.5
Uncommon	23	25.3
Fairly Common	9	9.9
Common	14	15.4

C) Breeding Status	No. of Species	Percent of Species Total
Observed	28	30.4
Possible	37	40.2
Probable	8	8.7
Confirmed	19	20.7

D) NABCI - 4 main bird groups	No. of Species	Percent of Species Total
waterbird	3	3.3
waterfowl	8	8.7
landbird	74	80.4
shorebird	7	7.6

In the boreal system there are many water bodies and most short-distance migrants are waterfowl. The fewer number of waterfowl recorded in Kakwa WPP reflects the fewer number of productive water bodies and lakes in the mountain region. Many waterfowl species are conspicuously absent from the northern Rocky Mountain ranges. The greater percentage of residents in the WPP, compared to the boreal, is due to the inclusion of two species of ptarmigan (*Lagopus spp.*), the mountain chickadee (*Peocile gambeli*) and the blue grouse (*Dendragapus obscurus*) which are all found only in the mountain region, in addition to the resident species also found in the boreal.

The majority of species observations involved three or fewer individuals and thus were categorized as ‘rare’. With more thorough sampling this would be expected

to shift towards more species classified as 'uncommon' through to 'common'. There was ~15% classified as 'common' and these species represented some of the most widespread species occurrences across altitudinal and habitat gradients such as savannah sparrow (*Passerculus sandwichensis*), chipping sparrow (*Spizella passerine*), Wilson's warbler (*Wilsonia pusilla*) and yellow-rumped warbler (*Dendroica coronata*).

Due to the fairly strict guidelines set out by the Federation of Alberta Naturalists that has been used to determine breeding status in this report, the majority of species fell within the 'observed' and 'possible breeder' categories. Many of the 'observed' species were observations of raptors and birds of prey on the wing. Species classified as 'possible breeders' were generally heard singing in suitable habitat but no further evidence of breeding was obtained. It would not be surprising to find evidence of breeding for a majority of these species given more time and increased sampling effort.

The North American Bird Conservation Initiative (NABCI) identifies four main groups of birds each requiring unique conservation strategies: waterbirds, waterfowl, landbirds and shorebirds. In Kakwa WPP, the majority of species of birds recorded were landbirds (80.4%). Richards (2003a and 2003b) reported bird communities comprising 52%, 60% and 64% landbird species for three parks in Alberta's Canadian Shield Natural Region. As mentioned earlier, the paucity of water bodies and wetlands in mountain regions (as compared to the boreal) attests to fewer records of birds that are dependent upon these features (*i.e.* waterfowl and shorebirds) and thus the dominance of landbirds in Kakwa WPP.

The Alberta Natural History Information Centre (ANHIC) compiles two lists for monitoring certain Alberta bird species. The 'tracking' list is for species of high conservation priority and generally represents species that are uncommon and/or rare. The 'watch' list identifies species that are of conservation interest but are not yet designated as a high conservation concern. Two species observed in Kakwa WPP occur on ANHIC's watch list: Northern hawk owl (*Surnia ulula*)

and short-eared owl (*Asio flammeus*). Eight species recorded in Kakwa WPP exist on the tracking list and are as follows (ANHIC 2006):

- Pacific loon (*Gavia pacifica*) - common along the Pacific coast and across the tundra breeding grounds but a rare visitor elsewhere in western Canada (Sibley 2003). Current breeding status in Alberta is unknown; last breeding records are from 13 years ago.
- Harlequin duck (*Histrionicus histrionicus*) – no BBS trend data; breeding has been confirmed for 76 rivers and 10 lakes in Alberta.
- Golden eagle (*Aquila chrysaetos*) – rare and local breeder; estimated 100-250 breeding pairs in Alberta.
- Peregrine falcon (*Falco peregrinus*) – fewer than 60 breeding pairs in Alberta.
- Willow ptarmigan (*Lagopus lagopus*) – very localized and rare breeder in Alberta; very few breeding records exist.
- Calliope hummingbird (*Stellula calliope*) – uncommon with restricted distribution.
- Western flycatcher (*Empidonax spp.*) – status uncertain as species range limits uncertain; area of sympatry between Pacific-slope (*Empidonax difficilis*) and Cordilleran flycatcher (*E. occidentalis*).
- Brown creeper (*Certhia americana*) – relatively uncommon species dependent on old forest.
- Gray-cheeked thrush (*Catharus minimus*) – less than five breeding occurrences for Alberta.

Noteworthy absences for Kakwa WPP include many of the Icterids and woodpeckers that presumably breed in the park. Of the five Icterids that, according to range maps, regularly breed in the park, only one was recorded – the brown-headed cowbird. Red-winged blackbird (*Agelaius phoeniceus*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), Brewer's blackbird (*Euphagus cyanocephalus*) and rusty blackbird (*E. carolinus*) were not observed.

Of the seven woodpeckers that, according to range maps, regularly breed in the park, only three were confirmed, all during the July expedition. Only circumstantial evidence (bark sloughing, excavations and drumming heard but not identified) was recorded in June. With the current outbreak of the mountain pine beetle (*Dendroctonus ponderosae*) in the park, woodpecker numbers are expected to increase.

Ten of the thirteen wood warbler species presumed to breed in the park were observed. Of the three that were not detected (magnolia warbler (*Dendroica magnolia*), American redstart (*Setophaga ruticilla*) and palm warbler (*Dendroica palmarum*)), two favour second-growth or riparian, deciduous-dominated habitat that does not occur within the park. Of the fourteen sparrow species that presumably breed within the park, eleven were recorded. The three that were not recorded were the vesper sparrow (*Pooecetes gramineus*), song sparrow (*Melospiza melodia*) and swamp sparrow (*Melospiza georgian*a).

Two of the species recorded in Kakwa WPP are listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The peregrine falcon is designated as a 'threatened' species that is likely to become endangered if the proper precautions are not taken to reverse the cause(s) of decline. The short-eared owl is listed as a species of 'special concern' that is at risk to becoming threatened or endangered because of a combination of biological characteristics and identifiable threats.

The following species, recorded for Kakwa WPP, are also listed in the General Status of Alberta Wild Species 2005. Their status is as follows:

- American Green-winged Teal - sensitive
- Lesser Scaup - sensitive
- Harlequin Duck - sensitive
- Bald Eagle - sensitive
- Northern Harrier – sensitive

- Northern Goshawk - sensitive
- Golden Eagle - sensitive
- Peregrine Falcon - at risk
- Northern Hawk Owl – sensitive
- Short-eared Owl - may be at risk
- Pileated Woodpecker – sensitive
- Least Flycatcher - sensitive
- Western Flycatcher - undetermined
- Brown Creeper - sensitive
- Gray-cheeked Thrush - undetermined
- Common Yellowthroat - sensitive
- Brewer's Sparrow - sensitive

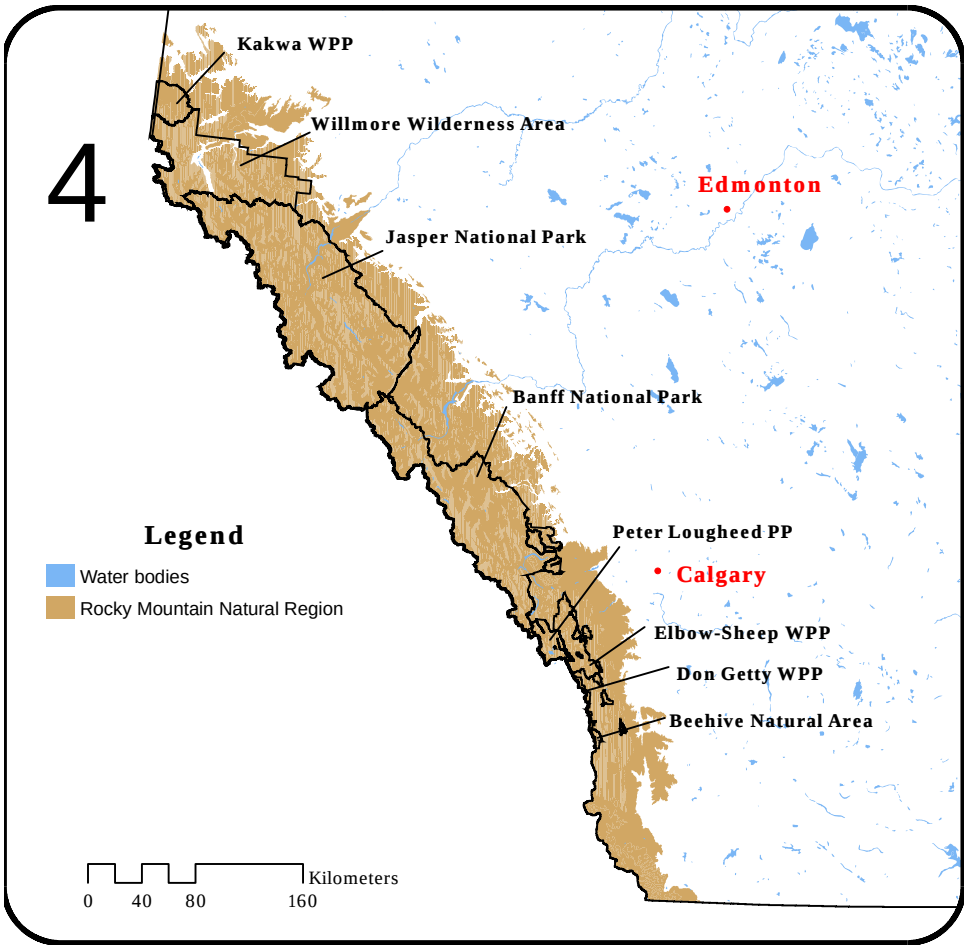
3.0 CONCLUSION

3.1 CONSERVATION ISSUES

Kakwa Wildland Provincial Park represents the northernmost part of a contiguous series of protected areas in the Rocky Mountain Natural Region, from Beehive Natural Area in the south continuing north to Willmore Wilderness Area (Figure 4). In addition to various wildlife species, the area provides critical habitat for the threatened woodland caribou (*Rangifer tarandus caribou*) and the grizzly bear (*Ursus arctos*), a species of special concern. Kakwa represents a relatively intact alpine ecosystem with little human influence due to rugged terrain, inaccessibility and remoteness.

Kakwa WPP supports a diverse and unique bird community. This is in part due to the altitudinal gradient along with the diversity of habitats ranging from old-growth conifer forests, willow and sedge meadows, deciduous forests, alpine meadows, subalpine fir krummholz and a variety of wetland and riparian habitats.

Figure 4. Protected Areas in the Rocky Mountain Natural Region



Although relatively intact, various threats to the parks' natural biodiversity exist. Intense oil and gas development encroach the park boundaries from the east and north. The mountain pine beetle infestation has spread to the park leaving infected and dying pine trees in its wake. All-terrain vehicle (ATV) use is restricted in the park to the truck trail to the main Kakwa Falls and along the east boundary to the Lower Kakwa Falls. Signs of misuse were seen in some areas of the park. In the winter, two snowmobile trails to the British Columbia border are accessible though off-trail use is prohibited. Hunting is permitted in the park and several prohibited, temporary hunting camps were observed in the area. Kakwa's greatest asset for protection is its remoteness and rugged terrain.

3.2 CONCLUDING REMARKS

The conservation of biodiversity is the single most important factor for maintaining functioning ecosystems and mitigating human induced change. Biodiversity can be maintained with the establishment of protected areas that secure wilderness and critical habitat thereby sustaining viable wildlife populations and functional ecosystems. Alberta's protected areas network strives to represent the six natural regions and maintain their associated wildlife and vegetation communities.

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Figure 5. Emerald Lake

Figure 6. Alpine meadow – La Crèche Mountain

Figure 7. Dead Horse Meadows – sedge meadows

Figure 8. Sulphur Ridge – subalpine fir krummholz

Figure 9. Emerald Lakes Plateau

Figure 10. Patterned Fen – Rim Ridge

Figure 11. Mount May slopes – willow meadows and subalpine fir

Figure 12. Dead Horse Meadows – willow meadow

Appendix I

Four-letter Code	Common Name	Latin Name
ALFL	Alder Flycatcher	*Empidonax alnorum*
AMDI	American Dipper	*Cinclus mexicanus*
AMKE	American Kestrel	*Falco sparverius*
AMPI	American Pipit	*Anthus rubescens*
AMRO	American Robin	*Turdus migratorius*
BAEA	Bald Eagle	*Haliaeetus leucocephalus*
BAGO	Barrow's Goldeneye	*Bucephala islandica*
BEKI	Belted Kingfisher	*Cerlye alcyon*
BCCH	Black-capped Chickadee	*Parus atricapillus*
BPWA	Blackpoll Warbler	*Dendroica striata*
BLGR	Blue Grouse	*Dendragapus obscurus*
BOWX	Bohemian Waxwing	*Bombycilla garrulus*
BOCH	Boreal Chickadee	*Parus hudsonicus*
BRSP	Brewer's Sparrow	*Spizella breweri*
BRCR	Brown Creeper	*Certhia americana*
BHCO	Brown-headed Cowbird	*Molothrus ater*
CAHU	Calliope Hummingbird	*Stellula calliope*
CAGO	Canada Goose	*Brant canadensis*
CHSP	Chipping Sparrow	*Spizella passerina*
CCSP	Clay-coloured Sparrow	*Spizella pallida*
CLSW	Cliff Swallow	*Petrochelidon pyrrhonota*
COGO	Common Goldeneye	*Bucephala clangula*
COLO	Common Loon	*Gavia immer*
COME	Common Merganser	*Mergus merganser*
CORA	Common Raven	*Corvus corax*
COYE	Common Yellowthroat	*Geothlypis trichas*
DEJU	Dark-eyed Junco	*Junco hyemalis*
DUFL	Dusky Flycatcher	*Empidonax oberholseri*
EVGR	Evening Grosbeak	*Coccothraustes vespertinus*
FOSP	Fox Sparrow	*Paserella iliaca*
GOEA	Golden Eagle	*Aquila chrysaetos*
GCKI	Golden-crowned Kinglet	*Regulus satrapa*
GCSP	Golden-crowned Sparrow	*Zonotrichia atricapilla*
GRJA	Gray Jay	*Perisoreus candensis*
GCTH	Gray-cheeked Thrush	*Catharus minimus*
GCRF	Gray-crowned Rosy-Finch	*Leucosticte tephrocotis*
GRYE	Greater Yellowlegs	*Tringa melanoleuca*
GWTE	Green-winged Teal	*Anas crecca*
HARD	Harlequin Duck	*Histrionicus histrionicus*
HETH	Hermit Thrush	*Catharus guttatus*
HOLA	Horned Lark	*Eremophila alpestris*
LCSP	Le Conte's Sparrow	*Ammodramus leconteii*
LEFL	Least Flycatcher	*Empidonax minimus*
LESA	Least Sandpiper	*Calidris minutilla*
LESC	Lesser Scaup	*Aythya affinis*
LEYE	Lesser Yellowlegs	*Tringa flavipes*
LISP	Lincoln's Sparrow	*Melospiza lincolnii*

Four-letter Code	Common Name	Latin Name
MGWA	MacGillivray's Warbler	*Oporornis tolmiei*
MALL	Mallard	*Anas platyrhynchos*
MERL	Merlin	*Falco columbarius*
MOCH	Mountain Chickadee	*Peocile gambeli*
NOFL	Northern Flicker	*Colaptes auratus*
NOGO	Northern Goshawk	*Accipiter gentilis*
NOHA	Northern Harrier	*Circus cyaneus*
NHOW	Northern Hawk Owl	*Surnia ulula*
NOWA	Northern Waterthrush	*Seiurus noveboracensis*
OSFL	Olive-sided Flycatcher	*Contopis borealis*
OCWA	Orange-crowned Warbler	*Vermivora celata*
PALO	Pacific Loon	*Gavia pacifica*
PSFL	Pacific-slope Flycatcher	*Empidonax difficilis*
PEFA	Peregrine Falcon	*Falco peregrinus*
PIWO	Pileated Woodpecker	*Dryocopus pileatus*
PIGR	Pine Grosbeak	*Pinicola enucleator*
PISI	Pine Siskin	*Carduelis pinus*
RBNU	Red-breasted Nuthatch	*Sitta canadensis*
RTHA	Red-tailed Hawk	*Buteo jamaicensis*
RCKI	Ruby-crowned Kinglet	*Regulus calendula*
RUGR	Ruffed Grouse	*Bonasa umbellus*
SASP	Savannah Sparrow	*Passerculus sandwichensis*
SEOW	Short-eared Owl	*Asio flammeus*
SORA	Sora	*Porzana carolina*
SOSA	Solitary Sandpiper	*Tringa solitaria*
SPSA	Spotted Sandpiper	*Actitis macularius*
SPGR	Spruce Grouse	*Falcipennis canadensis*
SWTH	Swainson's Thrush	*Catharus ustulatus*
TEWA	Tennessee Warbler	*Vermivora peregrina*
TTWO	Three-toed Woodpecker	*Picoides dorsalis*
TOSO	Townsend's Solitaire	*Myadetses townsendi*
TOWA	Townsend's Warbler	*Dendroica townsendi*
TRSW	Tree Swallow	*Tachycineta bicolor*
VATH	Varied Thrush	*Ixoreus naevius*
WAVI	Warbling Vireo	*Vireo gilvus*
WWPE	Western Wood Peewee	*Contopus sordidulus*
WCSP	White-crowned Sparrow	*Zonotrichia leucophrys*
WTPT	White-tailed Ptarmigan	*Lagopus leucura*
WTSP	White-throated Sparrow	*Zonotrichia albicollis*
WWCR	White-winged Crossbill	*Loxia leucoptera*
WIPT	Willow Ptarmigan	*Lagopus lagopus*
WISN	Wilson's Snipe	*Gallinago gallinago*
WIWA	Wilson's Warbler	*Wilsonia pusilla*
WIWR	Winter Wren	*Troglodytes troglodytes*
YBSA	Yellow-bellied Sapsucker	*Sphyrapicus varius*
YRWA	Yellow-rumped Warbler	*Dendroica coronata*
YWAR	Yellow warbler	*Dendroica petechia*