

**Hay-Zama Lakes Complex  
Wildlife Monitoring  
1998 / 99**



Alberta Conservation  
Association

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*Funded by Alberta Anglers, Hunters,  
and Other Conservationists*

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## Executive Summary

Results of the 1998 / 99 Hay-Zama Lakes Complex Wildlife Monitoring Project are presented in this manuscript. The project is a cooperative venture implemented by the Hay-Zama Committee (a joint industry / government / public committee designed to advise on operations within the complex). Monitoring of wildlife populations on the complex during critical waterfowl migration periods allows oil and gas production to continue until threshold levels in numbers of waterfowl are reached. The alternative, as defined by Alberta Energy and Utilities Board, is a general shut-in of production for this same time period. The monitoring program was initiated in 1995 / 96 and is proposed to continue until 1999 / 2000. In addition to waterfowl monitoring, studies of migrating neotropical birds and nesting raptors were completed in the 1998 / 99 study period.

This report summarizes activities for the fourth year of the proposed five-year program and will be distributed to all Hay-Zama Committee members. Information collected for this project will be used to direct further biological studies on the complex and to aid in the development and planning of industrial activity compatible with the needs of fisheries and wildlife. Migrating waterfowl populations during this study period were stable and well dispersed throughout the complex. Oil and gas wells were able to stay in production throughout the 1998 migration periods.

## Acknowledgements

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- Funding for the project was provided through contributions from: Alberta Conservation Association Trust Fund – Buck for Wildlife Program (formerly the Fish and Wildlife trust fund), Ducks Unlimited Canada, Dene Tha' First Nations, Amber Energy Inc., Colony Energy, Crestar Energy, Deep Basin Energy Inc., Gulf Canada Resources, Ltd., HCO Energy, Husky Oil Operations Inc., Imperial Oil Resources, Place Resources, Rainbow Pipeline Company Ltd., Samson, Scarlet Energy, Crispin Resources.
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## 1.0 INTRODUCTION

### 1.1 Project Background

The 1998 / 99 Hay-Zama Lakes Complex Wildlife Monitoring Project is part of a five-year program initiated in 1995 to monitor waterfowl migrations and to gain baseline data on other wildlife and fisheries resources on the Hay-Zama Lakes complex. The project is jointly funded by “Buck for Wildlife” through the Alberta Conservation Association, Ducks Unlimited Canada, Dene Tha' First Nation and by the oil and gas industry, through the Hay-Zama Committee (a joint industry / public / government committee designed to direct activities within the complex).

The complex is recognized internationally as a critical staging and nesting area for waterfowl and shorebirds. It was designated as a “Wetland of International Importance, especially as Waterfowl Habitat” by the Ramsar Convention in 1981, and was nominated in 1990 to the World Heritage Convention as a World Heritage Site. The province of Alberta has designated the complex as a “Wetland for Tomorrow”.

The complex also supports a great diversity of other wildlife. Furbearers, large carnivores and raptors are common, and flooded grasslands in the springtime provide critical spawning and rearing habitat for northern pike (*Esox lucius*) (Wright 1998; Shaffe and Wright 1997; Moller and Rosin 1994).

The oil and gas industry has a large presence in the Hay-Zama region, with several wells situated within the permanent waterbodies on man-made islands. To protect this unique and vulnerable wetland complex and minimize environmental impact, Alberta Energy and Utilities Board (EUB) drafted a series of Interim Directives to direct activities within the complex. The current Interim Directive (ID 96-1) provides the following clause as a general drilling and production requirement.

During a 5-week spring period (commencing mid-April) and a 8-week fall period (commencing mid-August) each year, the company shall:

- Suspend well production and helicopter operations, or
- AEP and operators within the Complex will monitor fish and wildlife activity in the Complex and, in consultation with the Fish and Wildlife Division of AEP, determine for which wells, if any, suspension of production and helicopter operations is required and for what period of time.

The criterion for suspension of production was defined by Fish and Wildlife in 1992 as 600 ducks and/or geese at an active well site. The Committee directed in 1995 that wildlife monitoring would be conducted by a Research Sub-Committee for a period of five years. This is the fourth year of the proposed five-year study.

## 1.2 Objectives

The objectives of the project were to assist in the development of a Hay-Zama Lakes management plan and continue our commitment with the various user groups in maintaining the integrity of the wetland by:

- Monitoring waterfowl numbers on the wetland complex as required by AEUB directive ID96-1.
- Monitoring raptor nesting success and collecting baseline data on presence and species composition of neotropical migrants (songbirds).

## 1.3 Study Area

Hay-Zama Lakes are part of a unique and diverse wetland complex situated approximately 100 kilometers west of High Level (Figure 1). The complex, comprised of over 50,000 hectares of open water, wet meadows, rivers and floodplain woodlands, is characterized by severe seasonal and annual fluctuation of water level (Fearon and Larsen, 1986).

The complex's major river system, Hay River, meanders through the complex, separated from lake cells by high levees. Other river systems entering the complex include Sousa Creek, Mega River, Amber River, Zama River, Moody Creek as well as several unnamed creeks. Major lake cells include Hay Lake, Zama Lake, Duck Lake and Sand Lake. Numerous unnamed sloughs make up the remainder of the complex's wetted area.

During spring runoff, high water in the Hay River backs up the Omega River and Sousa Creek, filling the complex. After peak runoff, the complex slowly discharges via these same drainage's. By mid-summer some of the large lake cells recede into vast grasslands.

Hay Lake Indian Reserve, Amber River Indian Reserve, and Zama Lake Indian Reserve all border the wetland complex. People of the Dene Tha' First Nation have used the complex extensively for hundreds of years and continue today with traditional uses. Hunting, fishing, trapping, gathering and traditional ceremonies occur on the complex and surrounding areas throughout the seasons.

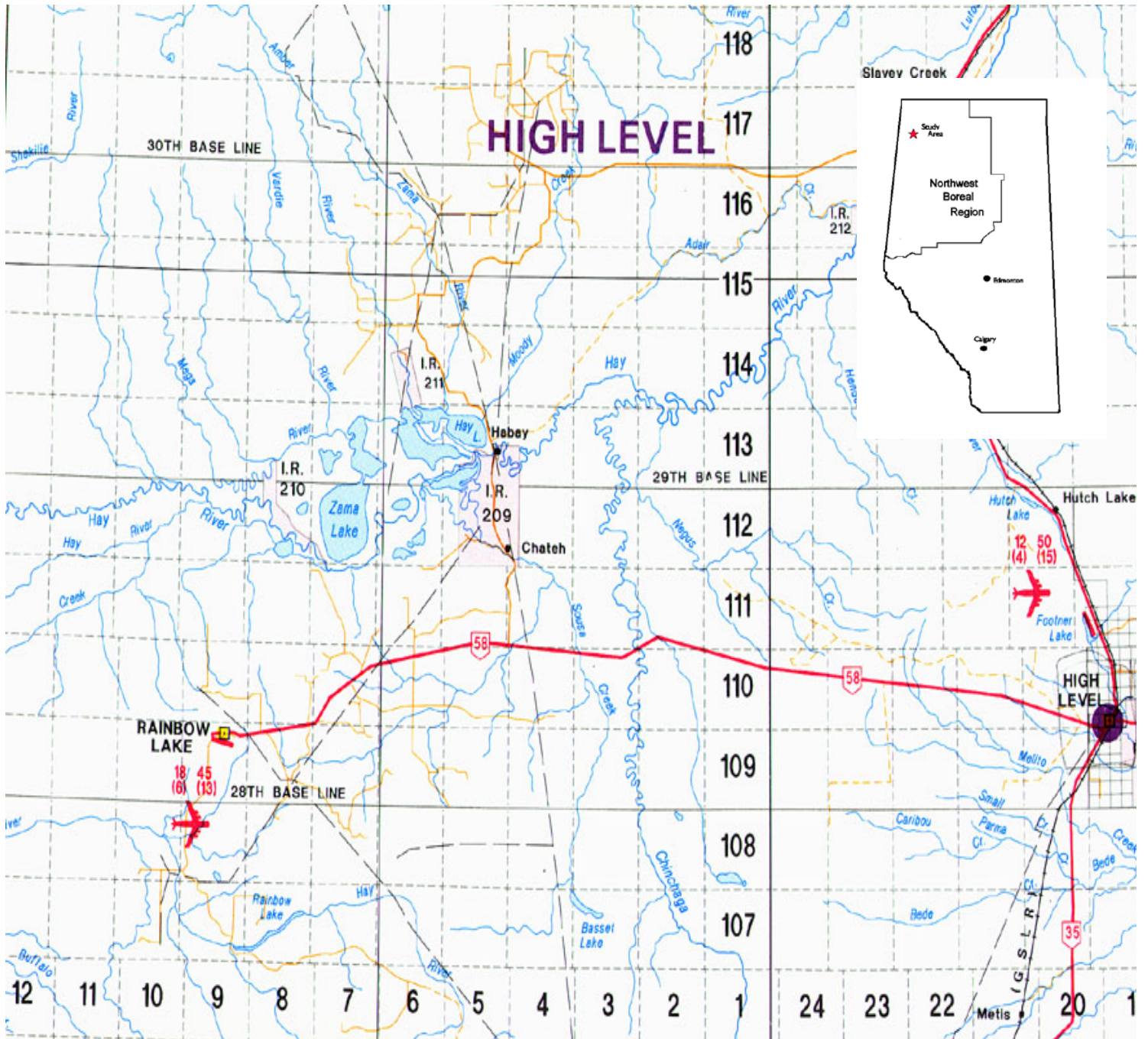


Figure 1. Location of Study Area



## 2.0 METHODS

### 2.1 Waterfowl Monitoring

Waterfowl populations on the Hay-Zama Lakes complex were monitored during spring migration from May 4 to May 22 and during fall migration from August 20 to October 19. Aerial surveys were conducted weekly in a 206 Jet Ranger rotary wing aircraft at approximately 30-meter altitude and 150 kilometer per hour ground speed. The survey route closely followed those from previous surveys and included flights over all active wells (Figure 2). All waterfowl observed on the survey route were recorded and, where practical, identified to species.

Due to an outbreak of avian botulism in the region, waterfowl populations on the complex were monitored for evidence of this disease. Sightings of ducks displaying symptoms of botulism were reported to Alberta Environmental Protection.

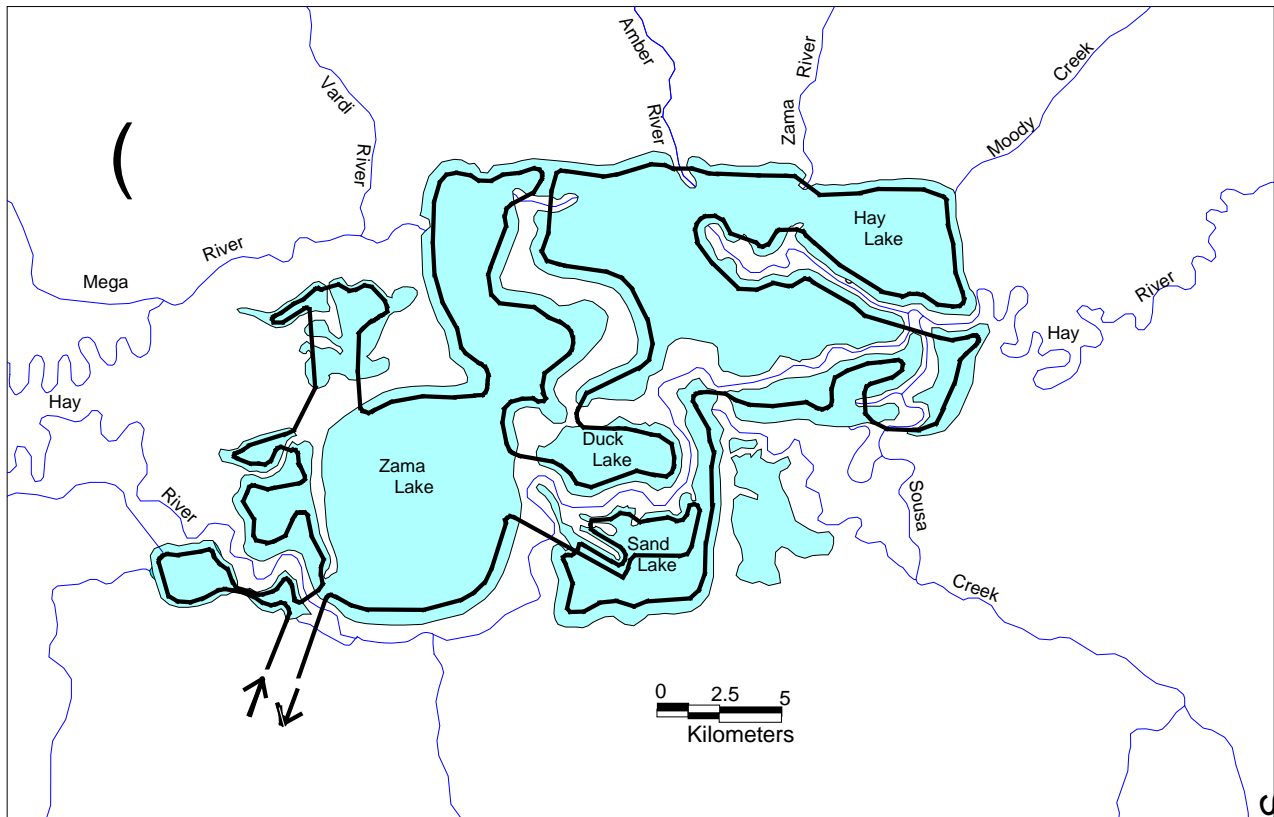


Figure 2. Aerial survey route for waterfowl monitoring

## 2.2 Raptor Nesting Survey

Raptor nesting sites on the complex were monitored in a single aerial survey May 29, 1998. The survey route covered areas with large mature trees suitable for nesting, and included all nesting sites identified in previous surveys (Saxena et al. 1994; Schaffe and Wright. 1997; Wright. 1997; Wright, 1998). Nest site locations were geo-referenced using the helicopter's GPS system (Figure 7). Numbers of bald eagle (*Haliaeetus leucocephalus*) adults, young or eggs were recorded and nest status was reported as brooding, if eggs or brooding adults were observed; rearing, if young were observed in the nest; or empty, if there was no evidence of nesting. In addition to the nesting survey, sightings of bald eagles and other raptors were recorded during other field operations.

## 2.3 Neotropical Migrant Bird Study

A mist-netting program was completed May 20 to June 5, 1998 to determine species presence/absence and relative abundance of migrating neotropical birds (songbirds) in the riparian portions of the complex. Three sites were selected, covering a diversity of riparian habitat types (Figure 7). Site one, on the east side of Hay Lake, was monitored throughout the mist-netting study period. Sites two and three were monitored for one and four days respectively.

Standard four shelf, 1 ½ inch (38 millimeter) mesh, 7 x 30 foot (2.1 x 9.1 meter), mist-nets were used. Nets were checked every 20 minutes. Birds captured in the nets were identified to species, examined for evidence of breeding, and released.

### 3.0 RESULTS AND DISCUSSION

#### 3.1 Waterfowl Monitoring

Numbers of waterfowl reported in this document represent observations on the survey route. Actual numbers present on the complex may be significantly higher.

##### 3.1.1 Spring Migration

Peak spring migration occurred May 8 for ducks, and May 4 for geese. Except for a few stragglers, geese were absent after their peak. The duck population decreased gradually after May 8, and remained relatively high into the breeding season. Waterfowl were well dispersed throughout the complex during spring migration and avoided concentrating near active well sites. Mallard (*Anas platyrhynchos*) was the most common duck species observed, followed by northern pintail (*A. acuta*) and northern shoveller (*A. clypeata*). Blue-winged teal (*A. discors*), gadwall (*Anas strepera*) and canvasback (*Aythya valisineria*) were abundant as well. Other species commonly observed include ruddy duck (*Oxyura jamaicensis*), scaup (*Aythya marila* or *A. affinis*), bufflehead (*Bucephala. albeola*) and green-wing teal (*Anas crecca*). Canada goose (*Branta canadensis*) was the most common goose species observed during spring migration. A few snow geese (*Chen caerulescens*) and greater white-fronted geese (*Anser albifrons*) were present on the first survey date.

Table 1. Summary of spring, 1998 waterfowl survey

DATE	DUCKS	CAGO <sup>1</sup>	GWFG <sup>2</sup>	GSGO <sup>3</sup>	SWANS
May 04	19,621	206	5	13	13
May 08	32,676	45	0	0	1
May 16	24,574	3	0	0	2
May 22	12,730	25	0	0	2
TOTAL	89,601	279	5	13	18

- 1 CAGO           Canada Goose
- 2 GWFG        Greater White-fronted Goose
- 3 GSGO        Greater Snow Goose

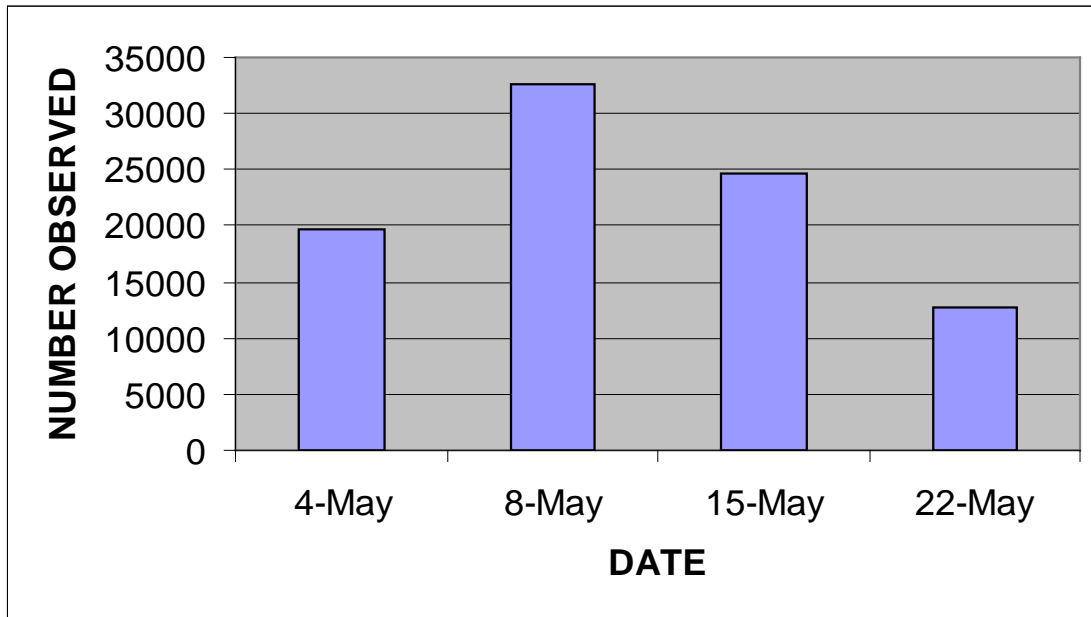


Figure 3. Numbers of ducks observed during spring migration, 1998

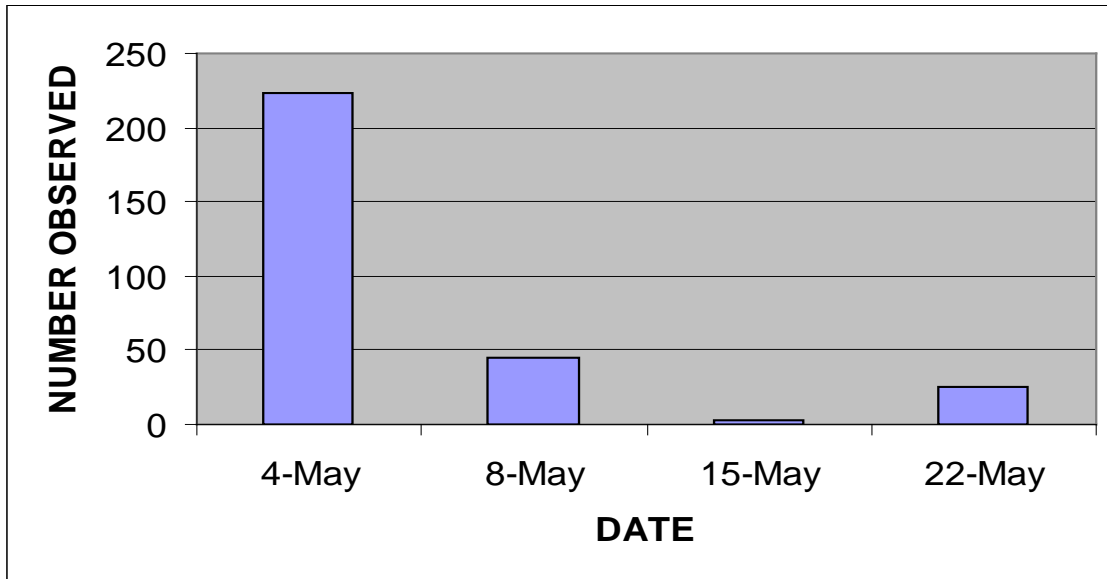


Figure 4. Numbers of geese observed during spring migration, 1998

### 3.1.2 Fall Migration

Peak fall migration occurred August 27 for ducks, and September 17 for geese. Ducks numbers dissipated quickly after the peak migration period, and geese were not observed on the complex after September 17. Waterfowl were well dispersed throughout the complex during fall migration and avoided concentrating near active well sites.

Mallard was the most common duck species observed, followed by northern shoveller, blue-winged teal and gadwall. Green-winged teal, northern pintail, canvasback and American widgeon (*Anas americana*) were abundant as well. Other species commonly observed include bufflehead, ruddy duck, scaup, common goldeneye (*Bucephala clangula*) and redhead (*Aythya americana*).

Canada goose was the most common goose species. Snow geese were absent for the first half of the fall monitoring period. The only significant observation of white-fronts occurred September 17, with a flock of approximately 400 birds.

Table 2. Summary of fall, 1998 waterfowl survey

DATE	DUCKS	CAGO <sup>1</sup>	GWFG <sup>2</sup>	GSGO <sup>3</sup>	SWANS
Aug 20	30,714	635	0	0	0
Aug 27	72,258	1,441	25	0	4
Sept 03	45,091	4,577	0	0	5
Sept 10	62,941	6,815	0	0	1
Sept 17	57,078	10,587	400	1	2
Sept 28	53,461	2,409	0	1	130
Oct 08	34,460	146	1	151	175
Oct 19	8,135	0	0	134	1,463
TOTAL	364,138	26,610	426	287	1,780

- 1 CAGO Canada Goose
- 2 GWFG Greater White-fronted Goose
- 3 GSGO Greater Snow Goose

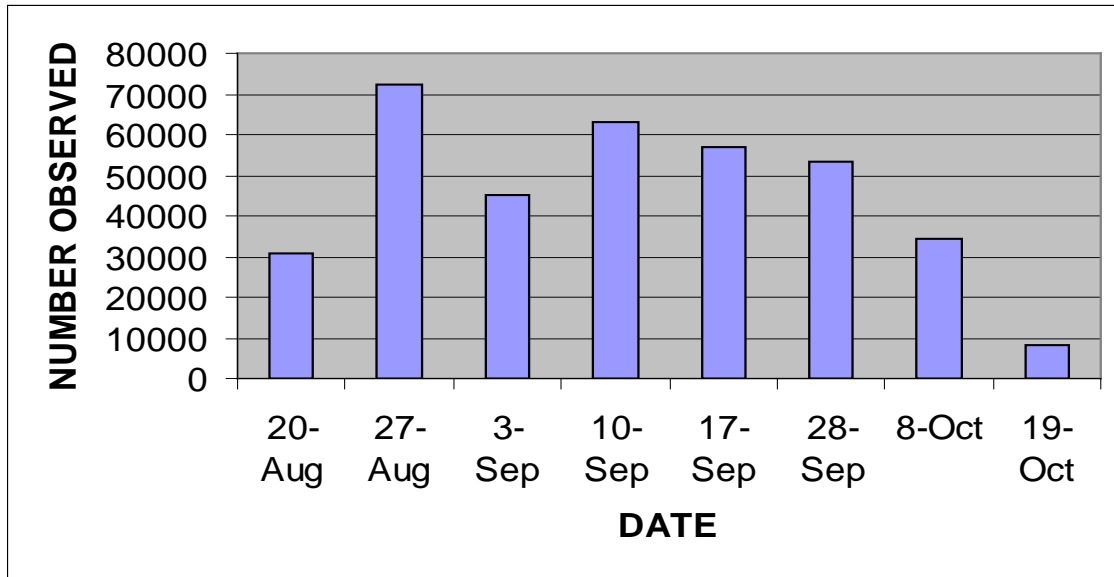


Figure 5. Numbers of ducks observed during fall migration, 1998

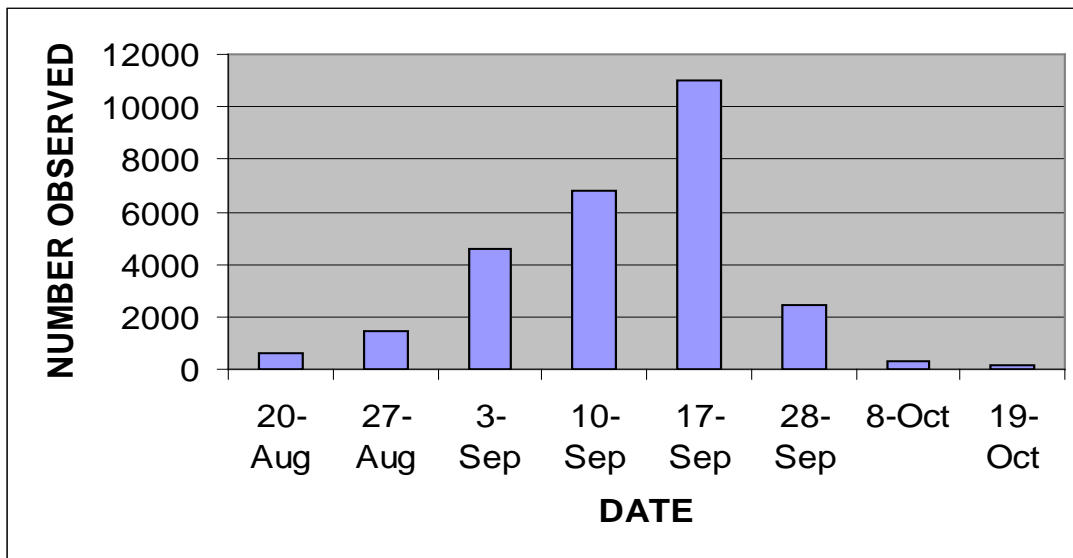


Figure 6. Numbers of geese observed during fall migration, 1998

Table 3. Date and number of geese observed during peak migration periods at Hay-Zama Lakes complex, 1978 to 1998

YEAR	SPRING MIGRATION		FALL MIGRATION	
	DATE OF PEAK	TOTAL GEESE	DATE OF PEAK	TOTAL GEESE
1978	28 April	5,588	27 Sep	13,688
1980	4 May	2,396	24 Sep	39,876
1981	6 May	6,278	20 Sep	8,417
1982	12 May	20,486	30 Aug	6,278
1983	5 May	22,064	10 Aug	7,604
1984	4 May	4,599	6 Sep	3,556
1985	8 May	3,529	20 Sep	5,445
1986	4 May	5,081	18 Sep	7,173
1987	5 May	8,588	31 Aug	3,692
1988	7 May	15,668	15 Sep	1,693
1989	29 April	6,398	2 Sep	1,317
1990	4 May	1,022	17 Sep	2,368
1991	2 May	817	10 Sep	4,062
1992	10 May	650	29 Sep	21,513
1993	7 May	1,068	24 Sep	4,724
1994	26 April	535	5 Oct	4,780
1995	3 May	9,082	8 Sep	7,122
1996	6 May	3,949	10 Sep	8,666
1997	7 May	3,973	2 Sep	222
1978 – 97 AVERAGE	4 May	6,409	12 Sep	8,010
1998	4 May	206	17 Sep	10,988

Calverley et al. (1993); Saxena et al. (1994); Schaffe and Wright.(1997); Wright (1997); Wright (1998)

### 3.2 Raptor Nesting Survey

The Hay-Zama Lakes complex supports a stable population of nesting bald eagles. Mature balsam poplar along the banks of the Hay River and shores of Sand Lake provide nesting habitat, and fish and waterfowl provide abundant prey. Recent surveys report from 4 to 6 active nesting pairs (Schaffe and Wright 1997; Wright 1997; Wright 1998).

Seven of the eight nests observed in the May 29, 1998 survey contained young or eggs and brooding adults (Table 4). Incidental observations of bald eagles were recorded on 11 of the 12 waterfowl surveys, with a maximum of 32 individual eagles observed October 19, 1998. Golden eagle (*Aquila chrysaetos*), short-eared owl (*Asio flammeus*) red-tailed hawk (*Buteo swainsoni*) and numerous northern harriers (*Circus cyaneus*) were observed as well during waterfowl surveys and other field activities.

Table 4. Summary of raptor nesting survey, May 29, 1998

SITE NO.	LOCATION (UTM)		STATUS	NO. OBSERVED			COMMENTS
	EASTING	NORTHING		ADULTS	EAGLETS	EGGS	
1	392845	6517293	empty	N/A	N/A	N/A	Canopy of sticks
2	388822	6517097	rearing	1	2	1	
3	388184	6516156	rearing	1	3	0	Abandoned nest within a few meters
4	383208	6513177	rearing	2	1	2	
5	376232	6506305	rearing	2	2	0	
6	376605	6521552	rearing	2	1	0	
7	388008	6507836	rearing	1	2	0	Duck carcass in nest
8	390603	6511321	rearing	2	0	2	Coot carcass in nest
TOTAL			7 active nests	11	11	5	



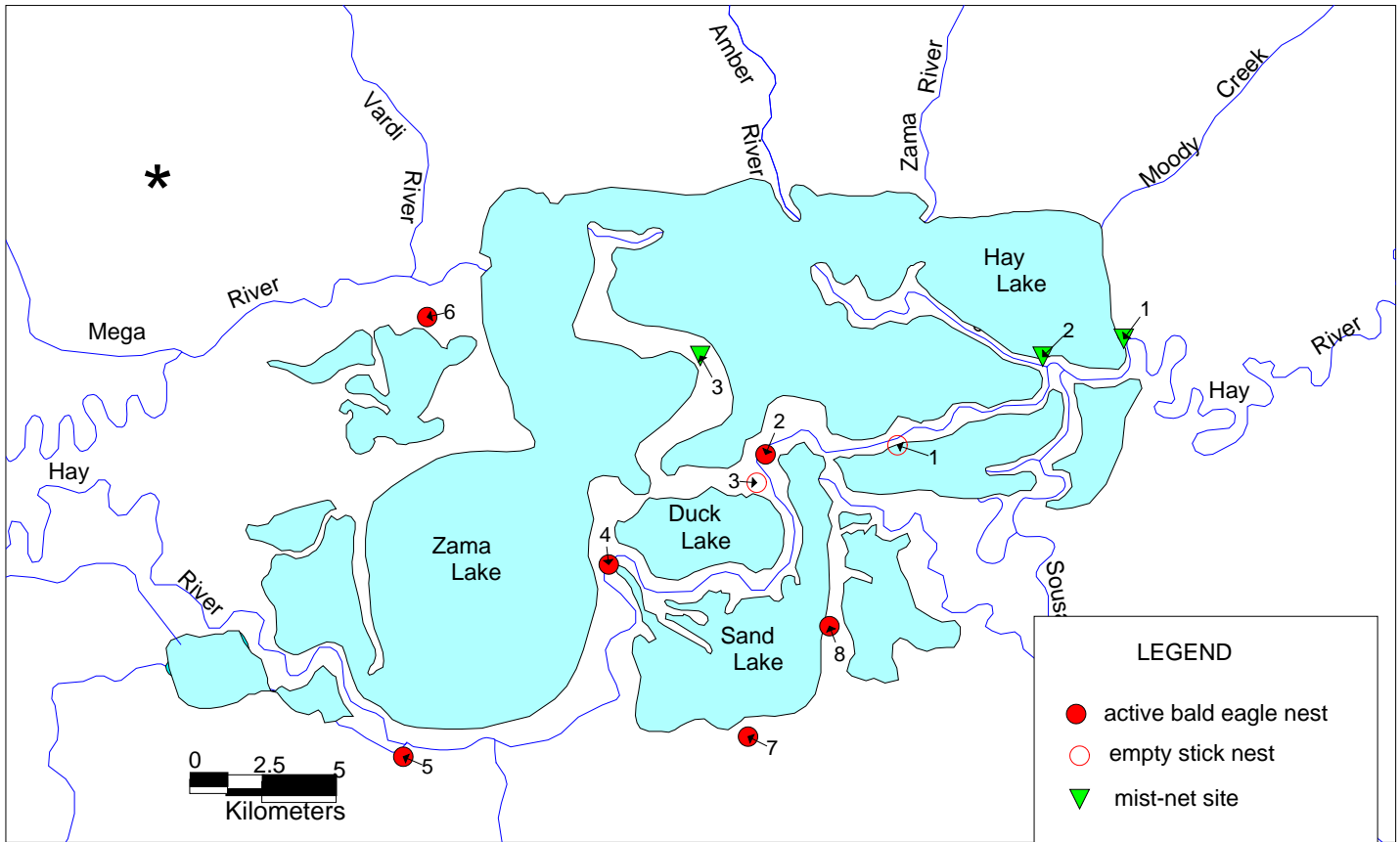


Figure 7. Locations of eagle nests and mist-netting sites at Hay-Zama Lakes complex, 1998

### 3.3 Neotropical Migrant Birds

Wildlife monitoring on the Hay-Zama complex has focused primarily on waterfowl, shorebirds and raptors. Information on the current status of other avian species in the area is minimal. The 1997 mist-netting program provided some of the preliminary information needed to determine the significance of the complex for migrating neotropical bird species.

Mist-netting efforts in 1998 produced a total of 298 individual birds, and 34 separate neotropical species (Table 5). The most common species captured was yellow warbler (*Dendroica petechia*). Clay-colored sparrow (*Spizella pallida*), savannah sparrow (*Passerculus sandwichensis*), white-throated sparrow (*Zonotrichia albicollis*) and American redstart (*Setophaga ruticilla*) were abundant as well.

Table 5. Avian species captured in mist-nets at Hay-Zama Lakes complex, May 21 to June 5, 1998

<u>SPECIES (common name)</u>	<u>ALPHA <sup>1</sup> CODE</u>	<u>NUMBER CAPTURED</u>
Yellow Warbler	YEWA	51
Clay-coloured Sparrow	CCSP	45
Savannah Sparrow	SASP	35
White-throated Sparrow	WTSP	26
American Redstart	AMRE	20
Red-winged Blackbird	RWBL	15
Alder Flycatcher	ALFL	14
American Robin	AMRO	14
Least Flycatcher	LEFL	8
Song Sparrow	SOSP	8
Swainson's Thrush	SWTH	8
Common Yellowthroat	COYE	6
Red-eyed Vireo	REVI	6
Yellow-rumped Warbler	YRWA	5
Black-and-white Warbler	BWWA	4
Wilson's Warbler	WIWA	4
Black-capped chickadee	BCCH	3
Blackpoll Warbler	BPWA	3
Canada Warbler	CAWA	2
Evening Grosbeak	EVGR	2
Gray Jay	GRJA	2
Magnolia Warbler	MAWA	2
Northern Flicker	NOFL	2
Northern Waterthrush	NOWA	2
White-crowned Sparrow	WCSP	2
Brown-headed Cowbird	BHCO	1
Blackburnian Warbler	BLWA	1
Chipping Sparrow	CHSP	1
Cape May Warbler	CMWA	1
Common Grackle	COGR	1
Eastern Kingbird	EAKI	1
Palm Warbler	PAWA	1
Solitary Vireo	SOVI	1
Yellow-bellied Sapsucker	YBSA	1
TOTAL	34 species	298

1 (Pyle, 1997)

#### 4.0 CONCLUSION

Waterfowl populations were stable for 1998, with the exception of spring geese. Goose populations for the spring migration period were the lowest recorded since monitoring began in 1978. Migrating waterfowl were well dispersed throughout the complex for the duration of both spring and fall migration periods allowing oil and gas wells to stay in production throughout the study period.

Hay-Zama Lakes complex continues to support a stable population of breeding bald eagles. Numbers of active breeding pairs and confirmed young were the highest recorded for the past 5 years. The complex also hosts a diversity of migrating and nesting neotropical songbirds. A total of 34 songbird species were recorded during the 1998 study period.

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