

Hay-Zama Lakes Complex Wildlife Monitoring, 2001



Alberta Conservation
Association

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

by:

Kenneth D. Wright
Senior Wildlife Technician

Alberta Conservation Association
Northwest Boreal Region
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Executive Summary

Results of the 2001 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). The oil and gas industry has proliferated on the complex, with numerous wells situated within the wetland boundaries. Monitoring of wildlife populations on the complex during critical waterfowl migration periods allows oil and gas production to continue with the provision that a well be shut-in in the event of presence of a large congregation of waterfowl. The alternative, as defined by Alberta Energy and Utilities Board, is a general shut-in of production for this same time period. In addition to waterfowl monitoring, a single, bald eagle nesting success survey was completed. 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 well dispersed throughout the complex allowing oil and gas wells to stay in production throughout the 2001 migration periods.

Acknowledgements

The following individuals, agencies, and corporations all contributed to the successful delivery of the 2001 Hay-Zama Lakes Complex Wildlife Monitoring Project. This manner of cooperation is characteristic of the Hay-Zama Committee, which was created in an environment of collaboration and teamwork.

- Funding for the project was provided through contributions from Ventus Energy and Crispin Energy, and administered by Alberta Conservation Association. Husky Oil Ltd. donated funds for the bald eagle nesting survey flight.
- Cameron Broatch (Alberta Conservation Association) completed the September 24th waterfowl monitoring survey.
- Committee members, Erin Stotschek (Ventus Energy) and Kim Morton and Elaine Nepstad (Alberta Environmental Protection) accompanied some of the monitoring flights as observers.
- Other observers assisting with monitoring flights include: Annette Baker (Alberta Conservation Association), Gerry Beyersbergen (Canadian Wildlife Service) and volunteers, Dennis Eckford and Marc McOuat.
- Warren Oates (Alberta Environmental Protection) assisted with the May 28th bald eagle nesting survey.

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1.0 INTRODUCTION

1.1 Project Background

The Hay-Zama Lakes Complex Wildlife Monitoring Program has been completed annually under the direction of the Hay-Zama Committee since the committee's revival in 1995. Records of waterfowl monitoring on the complex exist for most migration seasons since 1978, however methodologies and effort were varied and inconsistent. To impart a more constant, standardized monitoring effort, this task was delegated by the committee to Alberta Fish and Wildlife Services. Alberta Conservation Association assumed the role of monitoring with its inception in 1997, and continues to deliver the Hay-Zama Lakes Complex Wildlife Monitoring Program.

The Hay-Zama Committee was revived in 1995 in response to increased concerns about the impact of oil and gas activities in this environmentally sensitive area. Designed to direct industrial activities within the Hay-Zama Lakes complex, the committee includes members from the oil and gas industry, Dene Tha' First Nation, municipal, provincial and federal government agencies and environmental and conservation organizations.

Corresponding with the committees' revival, Alberta Energy and Utilities Board (EUB) revised existing guidelines for oil and gas operations within the complex, with the drafting of Interim Directive 96-1 (ID 96-1). One of the more significant amendments was the development of new boundaries for the complex based on hydrological and biological criteria. The new boundaries clearly define the areas most sensitive to industrial activity – the wetland area and surrounding vegetation. Wildlife monitoring within the new boundaries complies with the following clause, included in ID 96-1, as a general drilling and production requirement.

During a 5-week spring period (commencing mid-April) and an 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 Alberta Fish and Wildlife in 1992 as 600 ducks and/or geese at an active well site.

The Hay-Zama Lakes 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 in 1990, was nominated to the World Heritage Convention as a World Heritage Site. The province of Alberta designated the complex as a "Wetland for Tomorrow" and more recently as a "Wildland Park" under the Special Places Program.

The complex supports a great diversity of wildlife in addition to waterfowl. Fur-bearers, large carnivores, raptors, gulls, terns and numerous songbirds thrive in the area. 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). Walleye (*Stizostedion vitreum*), burbot (*Lota lota*) and several non-game fish species frequent the Hay River and tributaries.

1.2 Objective

The objective of this project was to minimize the effect of industrial activity on migrating waterfowl populations in the Hay-Zama Lakes complex. Monitoring waterfowl numbers on the wetland complex, and suspending well production in the event of a large concentration of birds on or near active wells, has been determined by all stakeholders to be the best method to alleviate the risk of environmental incident.

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). Comprised of over 50,000 hectares of open water, wet meadows, rivers and floodplain woodlands, the complex is characterized by severe seasonal and annual fluctuation of water level (Fearon and Larsen 1986).

The complex's major lotic system, Hay River, meanders through the complex, separated from lentic cells by high levees. Other lotic systems entering the complex include Sousa Creek, Mega River, Amber River, Zama River, Moody Creek as well as several unnamed creeks. Major lentic waters 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 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 lotic 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.

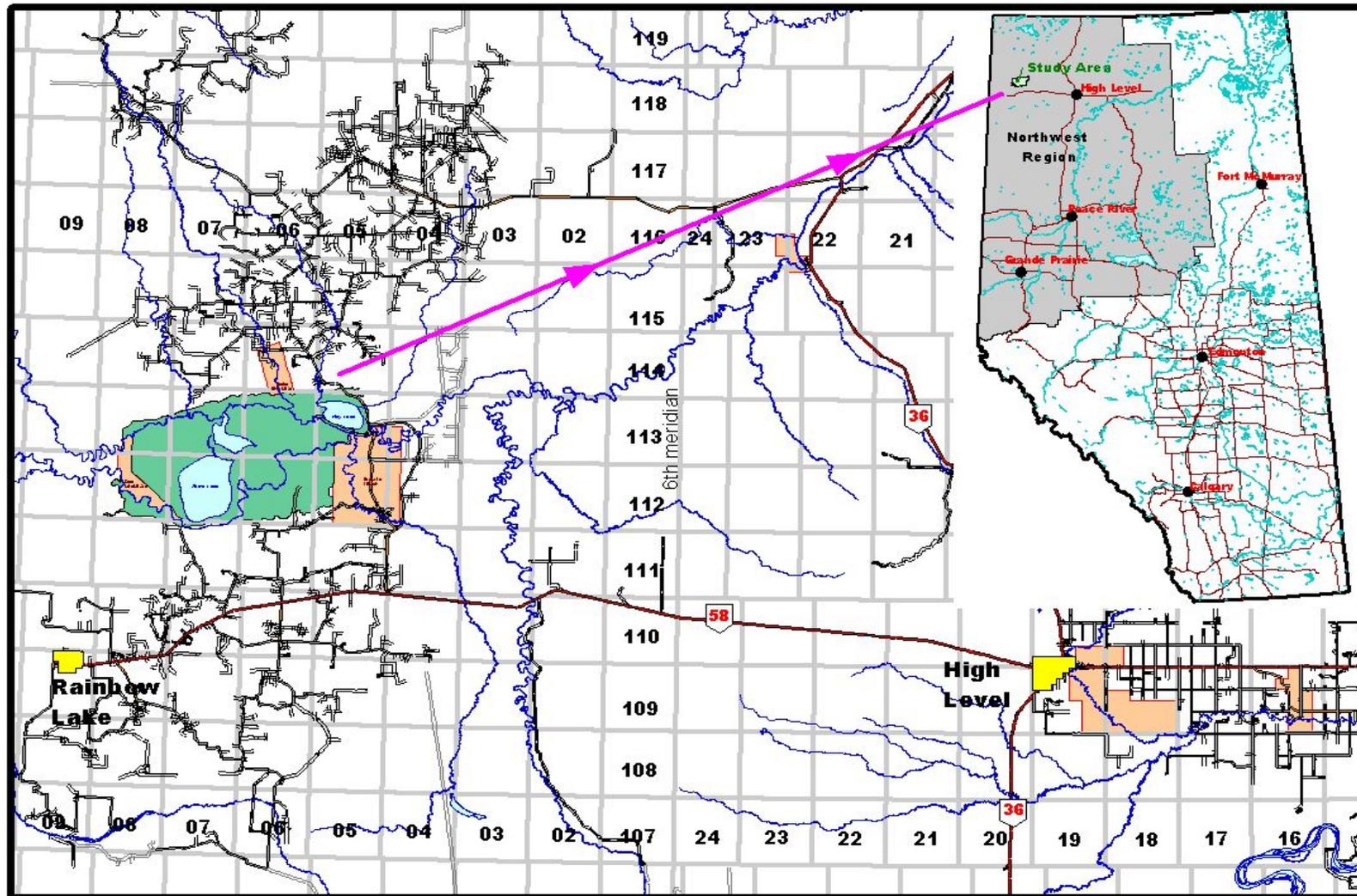


Figure 1 Location of Study Area

2.0 METHODS

2.1 Waterfowl Monitoring

Aerial surveys were completed at weekly intervals during spring and fall migration periods to monitor waterfowl numbers at or near active well sites, and to record migration progress. Five spring surveys were completed - April 30, May 7, 15, 22 and 28; and seven in the fall - August 27, September 4, 13, 18 and 24, and October 1 and 11. Surveys were flown in an R-44, rotary wing aircraft at approximately 30-meter altitude and 80 kilometer per hour ground speed. The survey route closely followed routes established in previous surveys and included flights over all active wells (Figure 2). All waterfowl observed within 200 meters of the survey route were recorded and, where practical, identified to species.

Provision for additional flights were allowed in the event of a well shut-in as a result of waterfowl congregating at or near an active well. Immediately upon observation of threshold waterfowl numbers at a well site, Alberta Energy and Utilities Board was to be contacted to initiate well suspension procedures. The suspended well must be patrolled again within 24 hours and put back into production as soon as waterfowl numbers fell below the threshold.

Due to a severe outbreak of avian botulism in 2000, observers looked for evidence of this disease during aerial surveys. Sightings of birds displaying symptoms of botulism were reported to Alberta Environment.

2.2 Bald Eagle Nesting Survey

Nesting sites of bald eagles (*Haliaeetus leucocephalus*) on the complex were monitored in a single aerial survey May 28, 2001. 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 2001). In addition to the May 28 nesting survey, sightings of bald eagles and other raptors were recorded on other field operations.

Nest site locations were geo-referenced using the helicopter's GPS system (Figure 6). Numbers of 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
- empty, if no evidence of nesting observed

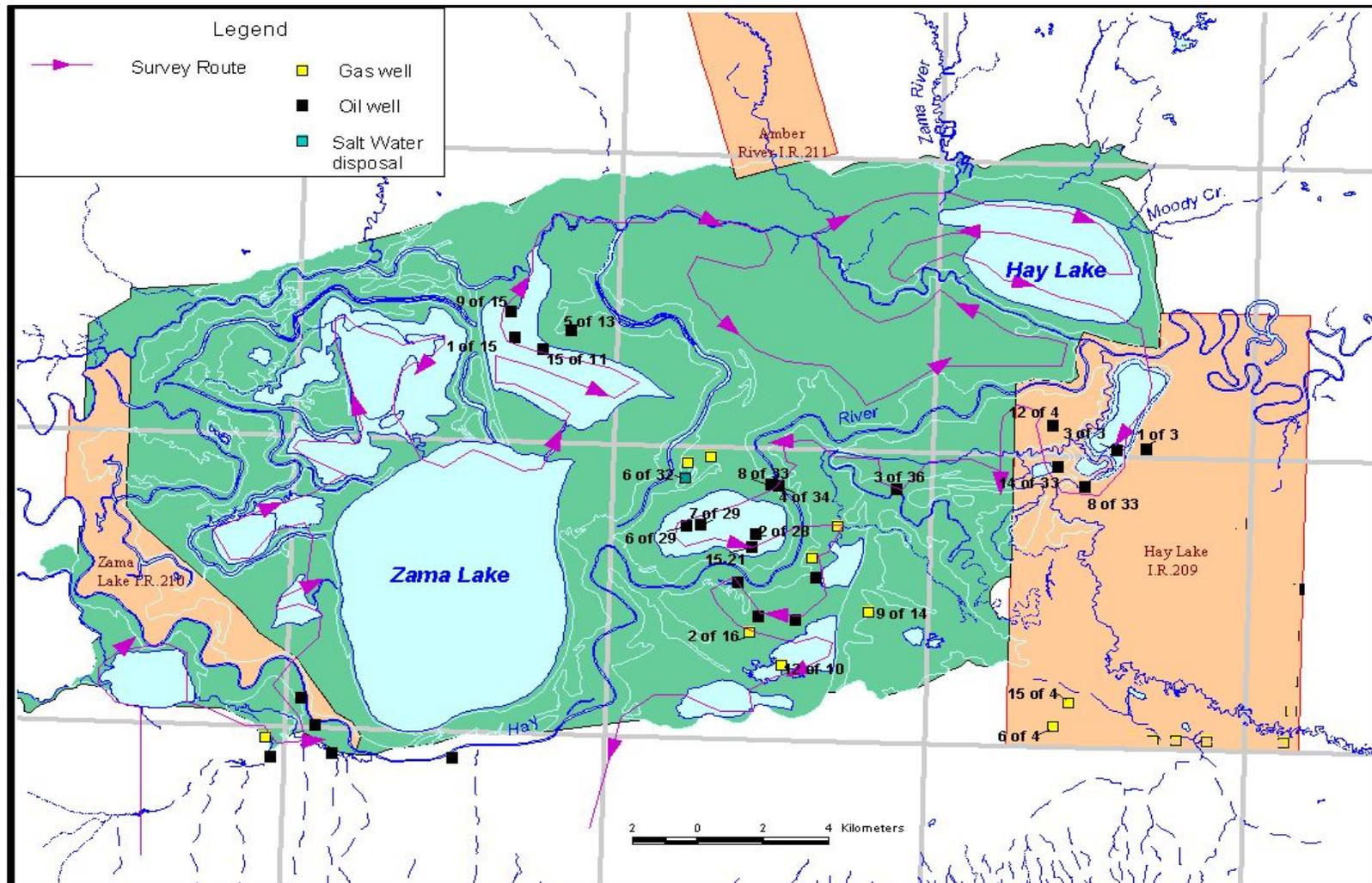


Figure 2. Aerial Survey route for waterfowl monitoring

3.0 RESULTS AND DISCUSSION

3.1 Waterfowl Monitoring

Relative abundance of waterfowl reported in this document represents observations on the survey route. Actual numbers present on the complex may be significantly higher. Peak goose migration data have been recorded since 1978, and may provide some insight into general migration trends, however caution is advised in interpreting these numbers as survey methods have varied over the years. Historical duck migration data is somewhat less comprehensive. Table 3 illustrates duck migration peaks from 1994 to present.

3.1.1 Spring Migration

There were no incidents of threshold waterfowl numbers at any of the well sites monitored for the spring migration period. The only significant sighting of a congregation of waterfowl approaching threshold number was one group of approximately 450 Canada geese and 22 swans near 12-04-113-5-W6, April 30. Otherwise, waterfowl were generally well dispersed and avoided congregating at active well sites.

Numbers of waterfowl observed during spring migration were highest on the earliest spring survey date, typical of migration trends observed over the past few years (Figure 3). Peak goose numbers were somewhat lower than the 20-year average (Table 4). Canada goose (*Branta canadensis*) was the most common species observed, although their numbers declined rapidly after the migration peak (Table 1). Greater white-fronts (*Anser albifrons*) were present through most of the survey period, with greatest abundance observed mid-May. Only a few snow geese (*Chen caerulescens*) were present mingling with the other goose species.

Swans were present on all survey dates. Whether they were trumpeters (*Cygnus buccinator*) or tundra's (*C. columbianus*) is unknown, as the similarities of these two species make accurate identification from the air difficult without undue harassment of the birds.

All duck species common to Alberta were represented on the complex (Figure 5). Northern pintail (*Anas acuta*) was by far the most abundant species observed, although present primarily for only the first two weeks of the spring survey. Mallard (*A. platyrhynchos*), northern shoveller (*A. clypeata*), green-wing teal (*A. crecca*), American widgeon (*A. americana*), canvasback (*Aythya valisineria*) and scaup (*A. marila* or *A. affinis*) were relatively abundant as well. Other duck species observed, in order of abundance, were redhead (*A. americana*), gadwall (*Anas strepera*), blue-wing teal (*A. discors*), ruddy duck (*Oxyura jamaicensis*), common goldeneye (*Bucephala clangula*), bufflehead (*B. albeola*), cinnamon teal (*Anas cyanoptera*), white-winged scoter (*Melanitta fusca*) and ring-necked duck (*Aythya collaris*). Additional species worth noting include sandhill crane (*Grus canadensis*), western grebe (*Aechmophorus occidentalis*), American bittern (*Botaurus lentiginosus*) and numerous shorebirds.

Table 1. Summary of spring, 2001 waterfowl survey.

DATE	DUCKS	CAGO ¹	GWFG ²	GSGO ³	SWANS
April 30	39,427	4,190	62	0	52
May 7	30,235	1,533	775	5	32
May 15	26,104	115	853	4	37
May 22	17,484	25	30	1	10
May 28	5,945	72	0	0	5
TOTAL	119,195	5,935	1,720	10	136

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

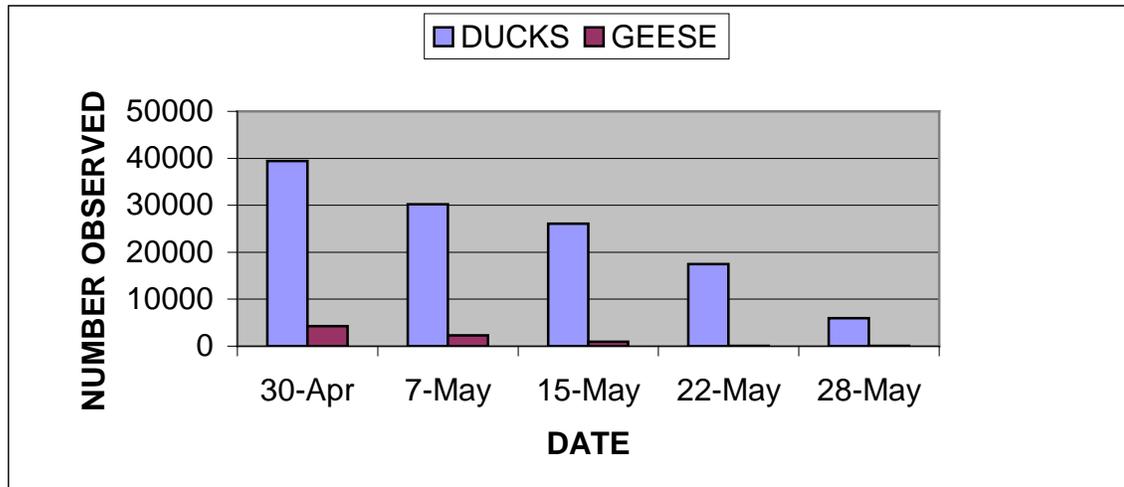


Figure 3. Numbers of waterfowl observed during spring migration, 2001

3.1.2 Fall Migration

Waterfowl numbers approached threshold on three occasions during fall monitoring. September 4th, 520 ducks and 35 geese were observed at well site 15-11-113-7-W6, and September 24, approximately 600 ducks were observed at the same site. Two hundred teal were on the actual well site, with an estimated 400 additional birds observed in the area immediately around the well. A substitute surveyor was conducting the survey on that date, and afforded the benefit of doubt to his estimate. Notification to EUB for shut-in procedures was delayed pending the next scheduled survey. By the next survey date, October 1, only 45 birds were observed at the 15-11 well. October 11, 506 mallards and gadwalls were counted at the 2-28 well in Duck Lake.

Fall goose migration peaked September 13, equivalent to the 20-year average, although the number of birds observed was somewhat lower than average (Table 4).

Canada goose was the most common goose species observed over the span of the entire fall monitoring period, however, at the migration peak Canada's and Greater white-fronts were present in equal numbers (Table 2). There were no observations of snow geese for the entire fall monitoring period. Migrating swans were present in all the fall surveys, with greatest numbers observed on the final survey date, typical of observations in past years. As in the spring surveys, swan species identification was not attempted.

Duck migration peaked September 18, one week later than geese. Mallard was the most common species present at 22.8 % of the total observed. Northern pintail, the predominant species observed during spring surveys, were outnumbered by mallard, gadwall, blue-wing teal and green-wing teal. Gadwall and the two teal species accounted for 13.2%, 12.8% and 12.3% respectively. Other duck species observed, in order of abundance, were American widgeon, northern shoveler, canvasback, goldeneye, bufflehead, scaup, redhead, cinnamon teal, ring-necked duck and ruddy duck.

Table 2. Summary of fall, 2001 waterfowl survey

DATE	DUCKS	CAGO ¹	GWFG ²	GSGO ³	SWANS
Aug 27	20,880	2,400	216	0	3
Sept 4	28,365	3,477	46	0	2
Sept 13	38,252	2,222	2,110	0	8
Sept 18	43,095	692	884	0	31
Sept 24	26,786	1,245	0	0	148
Oct 1	20,838	145	2	0	549
Oct 11	11,402	16	0	0	1,126
TOTAL	189,618	10,197	3,258	0	1,867

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

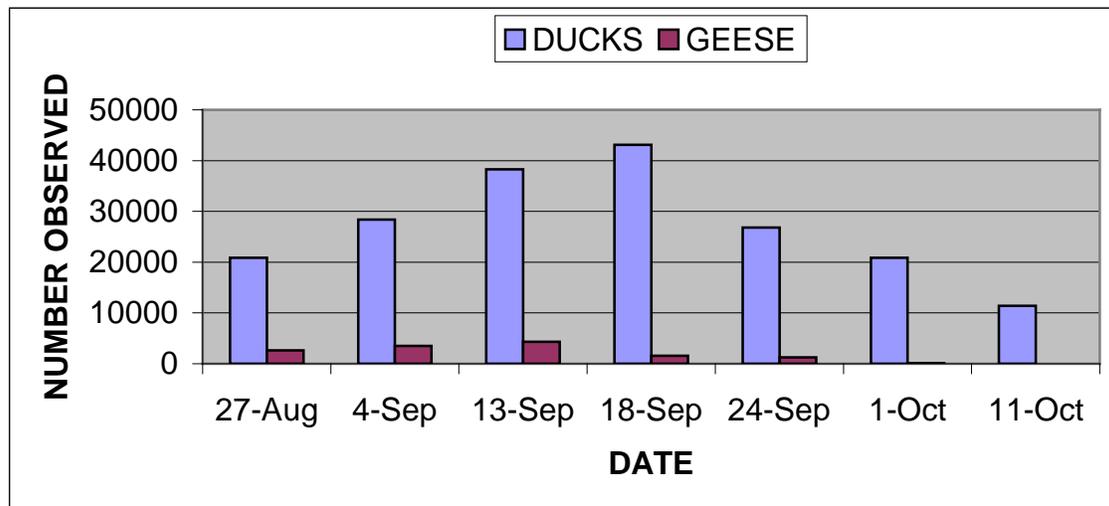


Figure 4. Numbers of waterfowl observed during fall migration, 2001

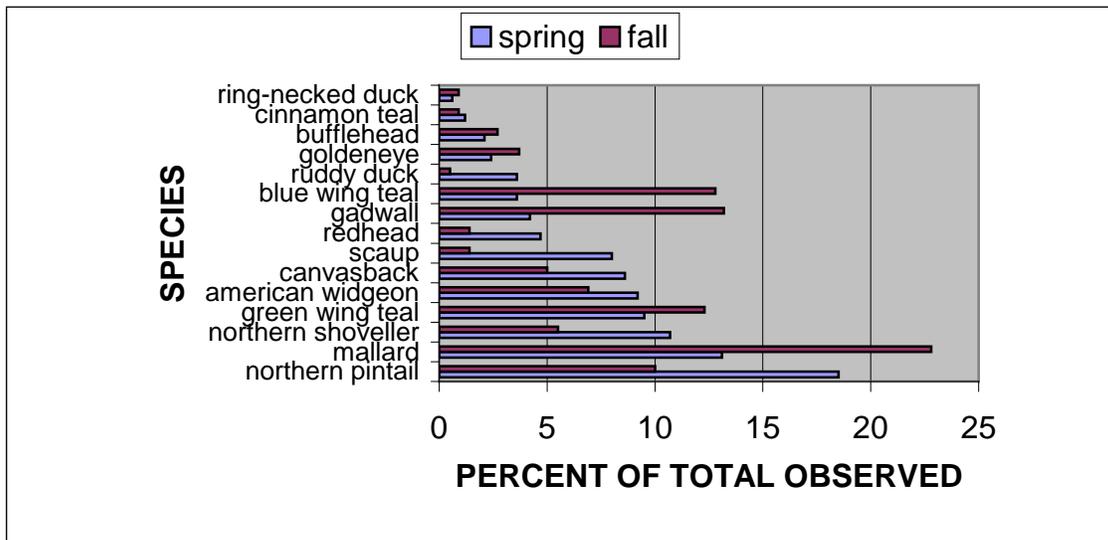


Figure 5. Relative abundance of duck species observed during waterfowl surveys, 2001

Table 3. Date and number of ducks observed during peak migration periods at Hay-Zama Lakes complex, 1994 to 2001

YEAR	SPRING MIGRATION		FALL MIGRATION	
	DATE OF PEAK	TOTAL DUCKS	DATE OF PEAK	TOTAL DUCKS
1994	24 May	18,417	8 Sep	35,525
1995	3 May	11,706	14 Sep	53,859
1996	6 May	19,810	16 Sep	28,255
1997	1 May	13,884	24 Sep	29,165
1998	8 May	32,676	10 Sep	62,941
1999	6 May	49,556	16 Sep	63,617
2000	1 May	29,307	2 Oct	32,902
1994 – 2000 AVERAGE	7 May	25,051	17 Sep	43,752
2001	30 Apr	39,427	18 Sep	43,095

Saxena et al. (1994); Schaffe and Wright.(1997); Wright (1997; 2001)

Table 4. Date and number of geese observed during peak migration periods at Hay-Zama Lakes complex, 1978 to 2001

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
1998	4 May	206	17 Sep	10,988
1999	29 Apr	6,975	9 Sep	7,570
2000	1 May	5,483	18 Sep	4,559
1978 – 2000 AVERAGE	4 May	6,136	13 Sep	7,969
2001	30 Apr	4,252	13 Sep	4,332

Calverley et al. (1993); Saxena et al. (1994); Schaffe and Wright.(1997); Wright (1997; 2001)

3.2 Bald Eagle Nesting Survey

Bald eagles are a common sight on the Hay-Zama Complex. Numerous adults and juveniles are present during migration periods and adult pairs can be found nesting in the mature balsam poplar along the banks of the Hay River and uplands around Sand Lake. Nesting bald eagles on the Hay-Zama Lakes complex have numbered from four to seven active nesting pairs over the past six years (Schaffe and Wright 1997; Wright 2001).

Three active nests were observed in the May 28, 2001 survey, the lowest number yet since 1994. An intense wildfire had burned through a good portion of the nesting habitat along the Hay River only two days prior to the survey (Figure 6). Fire fighting personnel witnessed at least one active eagle nest burning in the fire. Broods were observed in two of the active nests. A third active nest contained one brooding adult, however status of the brood was undetermined.

Incidental observations of bald eagles were greatest in the fall, with up to 54 individuals counted during fall migration monitoring. Golden eagle (*Aquila chrysaetos*), short-eared owl (*Asio flammeus*), red-tailed hawk (*Buteo swainsoni*), rough-legged hawk (*Buteo lagopus*) and numerous northern harriers (*Circus cyaneus*) were observed as well during waterfowl surveys and other field activities.

Table 5. Summary of Bald Eagle nesting survey, May 28, 2001

SITE NO.	LOCATION (UTM)		STATUS	NO. OBSERVED			COMMENTS
	EASTING	NORTHING		ADULTS	YOUNG	EGGS	
1	369918	6510319	empty	0	0	0	Nest in disrepair
2	358525	6514823	absent	0	0	0	Not found in this survey
3	376796	6521484	empty	0	0	0	Adult Bald Eagle flying nearby
4	393105	6517409	empty	0	0	0	Nest in disrepair
5	388872	6517157	absent	0	0	0	Very few standing trees remain in this area due to recent wildfire
6	387706	6511868	absent	0	0	0	Not found in this survey
7	383334	6513080	rearing	2	2	0	Bald Eagle
8	376306	6506117	rearing	1	1	0	Bald Eagle
9	388104	6507802	brooding	1	0	0	Brooding adult Bald Eagle in nest
10	390669	6511350	empty	0	0	0	Nest in good shape, but empty
TOTAL			3 active Eagle nests	4	3	0	

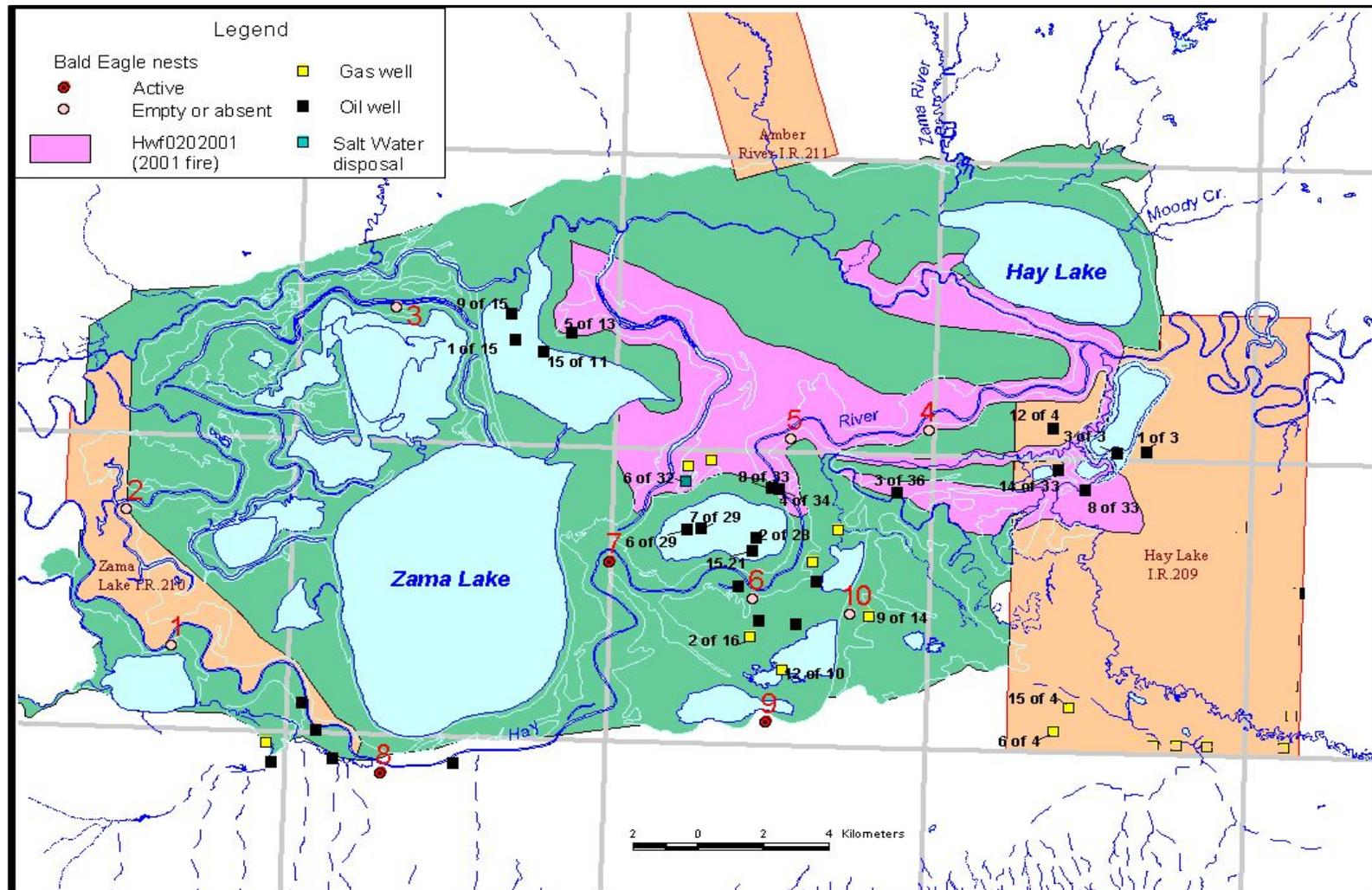


Figure 6. Locations of Bald Eagle nests in Hay-Zama Lakes Complex, May 28, 2001

4.0 CONCLUSION

Migrating waterfowl populations during this study period were well dispersed throughout the complex, with the exception of one incident of threshold waterfowl numbers at an active well site. Shut-in procedures were deferred pending results of the next scheduled survey, and by then, waterfowl at the well site had dispersed. Consequently, oil and gas production continued throughout the 2001 migration periods without interruption.

Recent migration trends illustrate a steady increase in Northern Pintail numbers for the spring migration period. Northern Pintail was the predominant duck species observed during this seasons spring surveys, outnumbering mallards, which were predominant in most past spring surveys. Species composition of fall ducks was comparable to past observations. Total duck numbers were higher than average this spring; while total geese were somewhat lower than average. Fall duck numbers were consistent with the average observed over the past seven years, while fall geese were significantly lower than average.

The local breeding bald eagle population was adversely affected by the May 26 wildfire. Number of active nests was the lowest observed since monitoring of bald eagle nesting success was standardized in 1994. Only three active nests were accounted for in the May 28 survey. Numerous non-breeding adults, as well as juvenile bald eagles were also present for the breeding season.

The Hay-Zama Lakes Complex Wildlife Monitoring Program continues to play a significant role in the mitigation of environmental concerns and economic interests on the complex. By committing to support wildlife monitoring in the future, members of the Hay-Zama Committee ensure that the integrity of this important wildlife habitat is maintained for the future.

5.0 LITERATURE CITED

- Calverly, A. J., D. A. Young, and B. T. Gray. 1993.** Hay-Zama Lakes complex waterfowl monitoring program – 1993. Prepared by Environmental Management Associates for Zama Holdings Ltd. Calgary.
- EUB. 1996.** Interim Directive ID96-1, Hay-Zama Lake Complex - special requirements. Alberta Energy and Utilities Board. Calgary.
- Fearon, P.W. and G. I. Larsen. 1986.** Hay-Zama Lakes survey report. Ducks Unlimited Canada. Edmonton.
- Moller, K. and J. Rosin. 1994.** Preliminary investigation of pike spawning potential on the Hay-Zama Wetland complex. Unpublished report. Alberta Environmental Protection. Peace River.
- Saxena, A. J. A. Bentz and D. O’Leary. 1994.** Wildlife monitoring program, 1994, Hay-Zama Lakes, Alberta. Geowest Environmental Consultants Ltd. Edmonton.
- Schaffe, C. M. and K. D. Wright. 1997.** Hay-Zama Lakes Biological Study. Alberta Environmental Protection. Unpublished report. Peace River.
- Wright, K. D. 1997.** Hay-Zama Lakes Complex fisheries and wildlife monitoring 1996 / 97. Alberta Environmental Protection. Unpublished report. Peace River.
- Wright, K. D. 1998.** Hay-Zama Lakes Complex fisheries and wildlife monitoring 1997 / 98. Alberta Conservation Association. Unpublished report. Peace River.
- Wright, K. D. 1999.** Hay-Zama Lakes Complex wildlife monitoring 1998 / 99. Alberta Conservation Association. Unpublished report. Peace River.
- Wright, K. D. 2000.** Hay-Zama Lakes Complex wildlife monitoring 1999 / 2000. Hay-Zama Lakes Committee. Unpublished report. Peace River.
- Wright, K. D. 2001.** Hay-Zama Lakes Complex wildlife monitoring 2000. Hay-Zama Lakes Committee. Unpublished report. Peace River.