1998 AISHIHIK RECOVERY AREA MOOSE POPULATION SUMMARY

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Fish and Wildlife Branch
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EXECUTIVE SUMMARY

- Moose counts have been conducted in portions of Aishihik Recovery area since 1981.
- Moose numbers declined by over 60 percent between 1981 and 1992.
- By 1992 there were only about 1600 moose in the area and densities were among the lowest recorded in southern Yukon.
- The area has been closed to moose hunting since 1993/1994 and wolf numbers were reduced between 1993 and 1997.
- Moose numbers have increased rapidly in response in recovery program.
- There are now approximately 3500 in recovery area and densities are near those seen in other portions of southwest Yukon.
- We expect moose population in the area to continue to grow for next few years in response to good calf and adult survival rates.

Aishihik Area Moose Survey Results Summary

We conducted moose surveys in two areas within the Aishihik Moose and Caribou Recovery Area during early December, 1998.

The Aishihik survey area encompassed approximately 2019 square kilometers (780 square miles) of habitable moose range east of Aishihik Lake. The area runs from the Mendenhall and Nordenskiold rivers west to the Aishihik road, and from the Alaska Highway to just north of Long Lake (see Map 1, attached). We conducted previous moose counts in this area in 1981, 1990 and 1992.

The Onion Creek survey area lies north of Kluane Lake and included approximately 3394 square kilometers (1310 square miles) of habitable moose range (see Map 2). It runs from the north end of Talbot Arm, north to the Nisling River and from Dwarf Birch Creek, west to Grayling Creek. Moose in this area were previously counted in November of 1992, just prior to the start of the recovery program.

These surveys were conducted, in part, to assess the effectiveness of the recovery program in rebuilding moose numbers in the area. As part of the program, licensed hunting was prohibited and First Nation hunters voluntarily reduced their hunting in the area. Wolf numbers in the area were also reduced and held below natural levels.

A description of how we do moose counts is presented in the Yukon Government publication entitled “Yukon Moose”. To receive a copy of this publication contact your local Department of Renewable Resources Field Services Office or the Department of Renewable Resources Moose Management Unit at 10 Burns Road, Whitehorse; or phone (867) 667-5787. We would like to thank the local community members, and the Champagne/Aishihik, Kluane and White River First Nation members who assisted with these surveys.

Summaries of the December 1998 and past survey results for the Aishihik and Onion Creek areas are presented separately in the following sections and tables.

Aishihik Survey Area

We estimate that there are now about 349 moose in the Aishihik survey area, or about 173 moose for every 1000 square kilometers (see Table 1, attached). This is significantly ($P<0.05$) more than the 126 estimated to be in the area in 1992 at the start of the recovery program and similar to the number of moose in the area in 1981.

The composition of the moose population in the Aishihik area is within the range normally associated with stable or increasing moose populations. We estimated that there were 51 calves and 30 yearlings for every 100 mature cows in the population in 1998. This is an increase from the estimated 11 calves and 14 yearlings for every 100 mature

cows in the area in 1992. We normally consider 30 calves for every 100 mature cows the minimum necessary to maintain a stable moose population.

The proportion of mature bulls in the survey area also increased significantly between 1992 and 1998. In 1992 there were about 61 mature bulls for every 100 mature cows. By 1998 there were 85 mature bulls for every 100 mature cows. We generally consider 30 mature bulls for every 100 mature cows the minimum needed to ensure that all cows are bred.

The rapid increase in moose abundance in the Aishihik area far exceeds our initial expectations. At the start of the recovery program, we predicted that moose numbers would increase by 60 to 100 percent over the six years between counts. In fact, estimated moose numbers increased by more than 175 percent over the six year period. This rapid growth is the result of a combination of increased calf survival and low adult mortality rates. Between 1981 and 1992 the proportion of calves and yearlings in the population showed a downward trend. By 1992, just prior to the start of the recovery program, calves made up only 6 percent of the population, far below what is normally required to maintain a stable moose population. Calf counts conducted annually between 1992 and 1998, however, showed that calf survival had increased. During these surveys, calves made up between 15 and 24 percent of the population during the recovery program.

In addition to the increase in calf survival rates, adult mortality rates must have been very low. Adult moose mortality rates generally range between 10 and 20 percent per year in northern ecosystems where wolves and bears occur at natural levels. In order for the moose population in the Aishihik area to grow at the rate observed, however, the average adult mortality rate must have been below 6 percent. This unusually low mortality rate was probably due to the reduction in wolf numbers and lack of hunting during the recovery program.

Several other species were also observed during the 1998 survey. Seventy-one Dall's sheep were seen on various mountain blocks throughout the survey area. Forty-four bison were recorded near Taye and Hutshi lakes. Wolf tracks from a pack of at least 6 individuals were seen near Malamute Mountain. Ten lynx, including a female with five young; and eight foxes, three coyotes, and a wolverine were also recorded in various parts of the survey area.

Onion Creek Survey Area

Similar to the Aishihik survey area, moose abundance in the Onion Creek area increased significantly ($P<0.05$) from 416 moose in 1992 to about 999 in 1998 (see Table 2). This represents an increase of about 140 percent in six years. The current average moose density in the Onion Creek area is about 294 moose per 1000 square kilometers.

As in the Aishihik area, the proportion of mature bulls in the Onion Creek moose population increased significantly between 1992 and 1998. In 1992 there were about 49 mature bulls for every 100 mature cows. By 1998 there were 67 mature bulls for every

100 mature cows. We generally consider 30 mature bulls for every 100 mature cows the minimum needed to ensure that all cows are bred.

Unlike the Aishihik area, however, the proportion of calves in the Onion Creek moose population was relatively low in 1998. We estimated only 18 calves for every 100 mature cows in the area. As previously discussed, we generally consider 30 calves for every 100 cows the minimum needed to maintain a stable moose population. In addition, only 7 per cent of cows with calves had twins in the Onion Creek area, well below the twinning rate observed in the Aishihik area. We do not know why calf survival was so much lower in the Onion creek area but we suspect that it was the result of unknown environmental factors. Further monitoring will be needed to determine if the poor calf survival was a single year phenomenon or a continuing trend.

The low calf numbers observed in the Onion Creek area during our 1998 survey are also in sharp contrast to the healthy calf numbers recorded during annual calf counts, which were conducted in the area during the recovery program. In any event, overall calf survival during the recovery program has clearly been sufficient for rapid population growth.

The moose population growth observed in the Onion Creek area indicates that adult mortality must have been below 8 percent per year. This is well below the 10 to 20 percent a annual adult mortality rate generally seen in northern moose populations living with normal numbers of wolves and bears. Again, this unusually low adult mortality rate is most likely due to the reduction in wolf numbers and lack of hunting during the recovery program.

Other species noted during the Onion Creek survey included a total of 499 caribou scattered throughout the survey area. Four Dall's sheep were observed in the eastern portion of the area, and a wolverine was seen in the Brooks Valley. Tracks from what may have been 3 separate wolf packs were noted in and adjacent to the survey area. Finally, a number of raptors including Gyrfalcons, eagles, owls and hawks were also recorded.

Although moose populations in both the Aishihik and Onion Creek areas increased rapidly between 1992 and 1998, our subjective assessment is that there is room for further population growth. Moose still appear to be at relatively low density in many areas of high quality habitat. We believe that the habitat in the Aishihik and Onion Creek areas could support moose densities of at least 1000 moose per 1000 square kilometers.

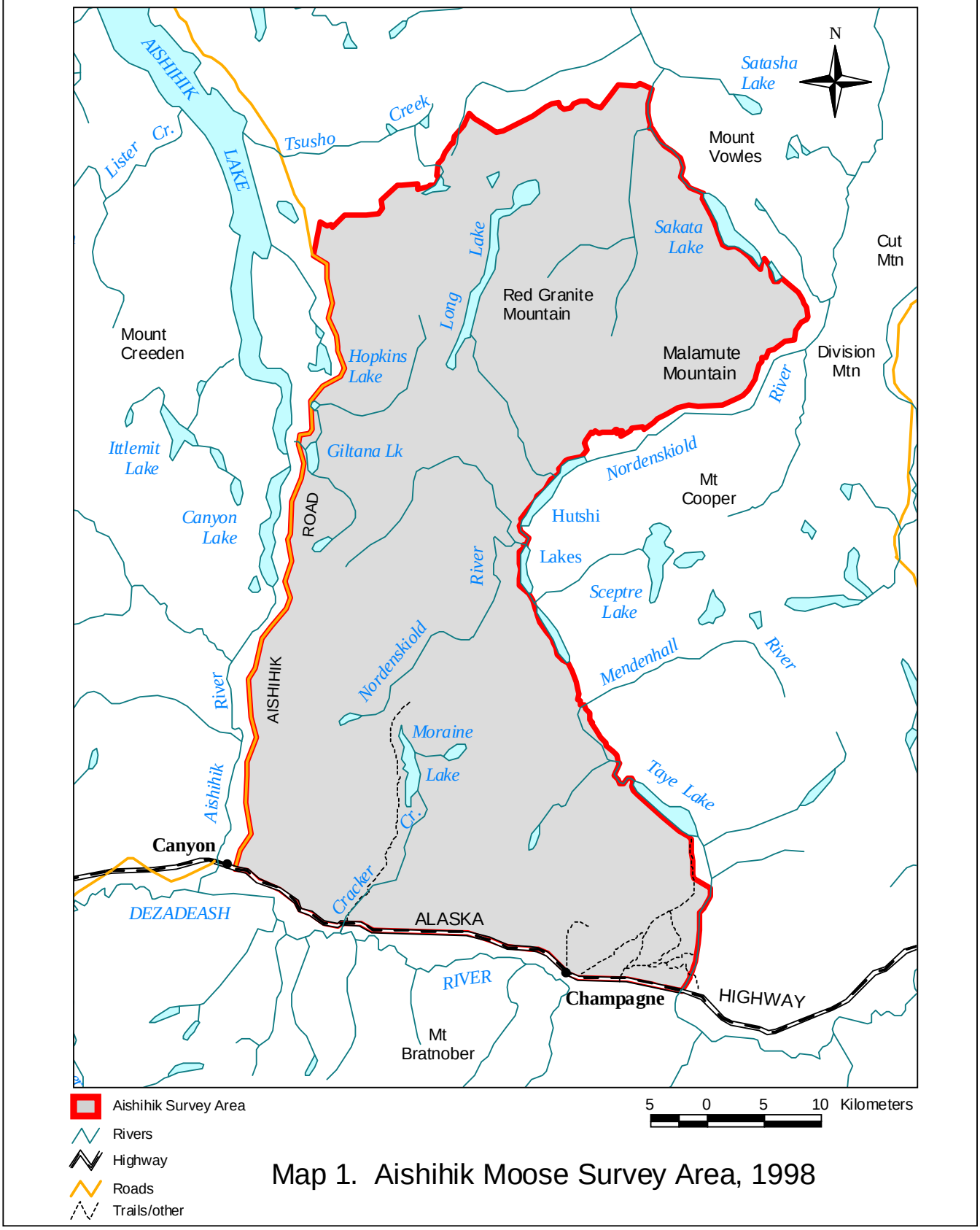
Table 1. Summary of 1998 and Previous Survey Results in the Aishihik Survey Area

Population Abundance	**1981**[1]	**1990**	**1992**	**1998**
Number of Moose Seen	237	131	91	207
Estimated Number of moose (90% CI)	332 (298-366)	247 (169-326)	126 (90-163)	349 (286-412)
Average Density (moose per 1000 sq. Km)	168	125	64	173
Population Composition (90% CI)				
Number of Adult Bulls ($\geq$ 30 mo.)	100 (61-139)	44 (21-68)	41 (26-56)	111 (84-138)
Number of Adult Cows ($\geq$ 30 mo.)	145 (119-171)	103 (67-138)	68 (46-90)	131 (104-159)
Number of Yearlings (approx.18 mo.)	53 (27-79)	41 (13-68)	10 (1-18)	39 (26-52)
Number of Calves (approx. 6 mo.)	35 (16-53)	60 (35-84)	8 (6-9)	67 (44-91)
Estimated Ratios				
Adults Bulls for every 100 Adult Cows	69	43	61	85
Yearlings for every 100 Adult Cows	36	40	14	30
Calves for every 100 Adult Cows	24	58	11	51
Adults Bulls (% of Total Population)	30%	18%	33%	32%
Adults Cows (% of Total Population)	44%	42%	54%	38%
Yearlings (% of Total Population)	16%	16%	8%	11%
Calves (% of Total Population)	10%	25%	6%	19%
Twinning Rate	16%	4%	17%	22%

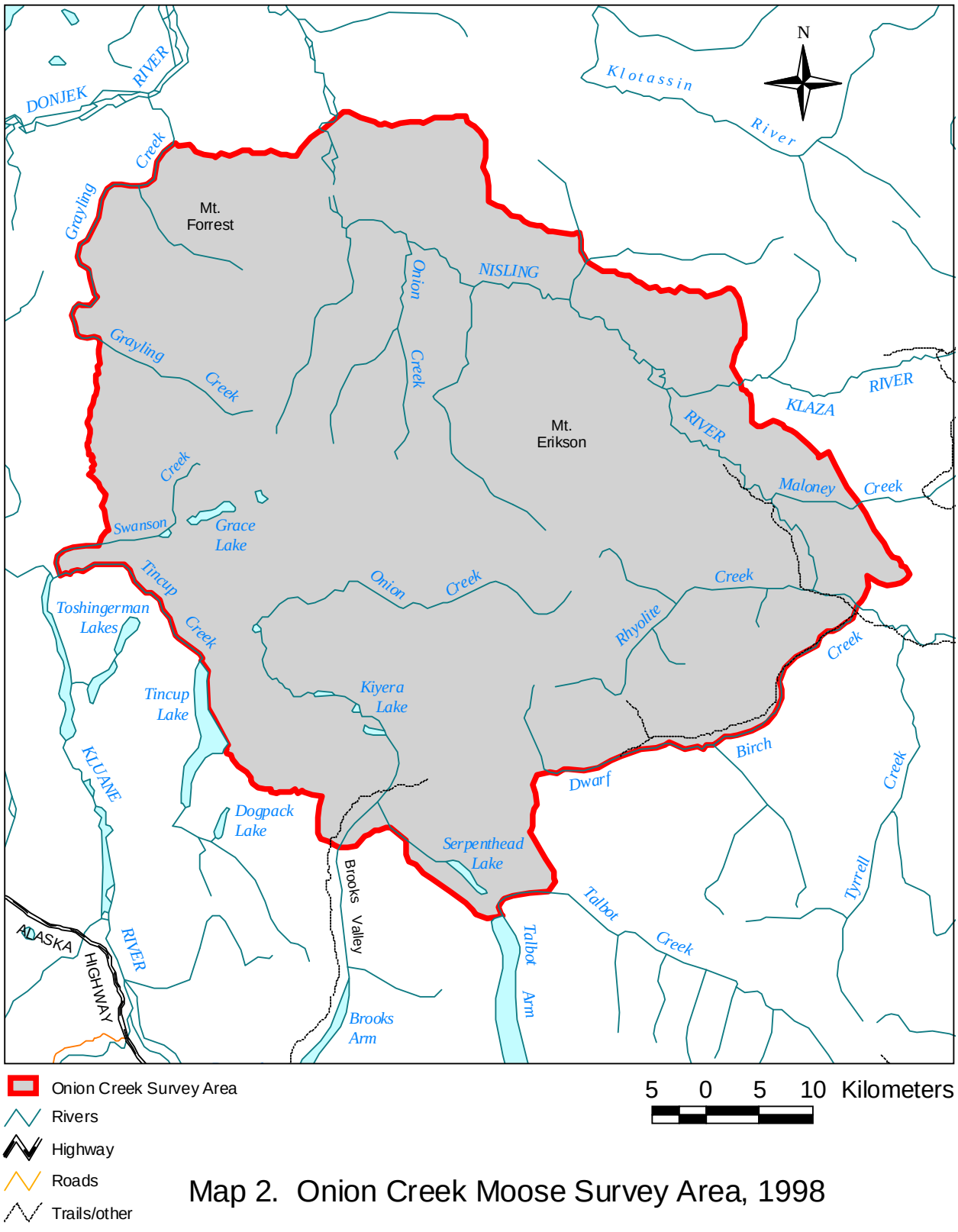
1 No sightability correction factor included

Table 2. Summary of 1998 and Previous Survey Results in the Onion Creek Survey Area

Population Abundance	**1992**	**1998**
Number of Moose Seen	266	358
Estimated Number of moose (90% CI)	416 (342-490)	999 (791-1207)
Average Density (moose per 1000 sq. Km)	122	294
Population Composition (90% CI)		
Number of Adult Bulls ($\geq$ 30 mo.)	112 (90-134)	321 (221-421)
Number of Adult Cows ($\geq$ 30 mo.)	229 (182-276)	479 (366-592)
Number of Yearlings (approx.18 mo.)	28 (14-42)	107 (72-141)
Number of Calves (approx. 6 mo.)	47(35-59)	88 (59-118)
Unknown age/sex	-	4 (0-11)
Estimated Ratios		
Adults Bulls for every 100 Adult Cows	49	67
Yearlings for every 100 Adult Cows	12	22
Calves for every 100 Adult Cows	21	18
Adults Bulls (% of Total Population)	27%	32%
Adults Cows (% of Total Population)	55%	48%
Yearlings (% of Total Population)	7%	11%
Calves (% of Total Population)	11%	9%
Twinning Rate	0%	7%



Map 1. Aishihik Moose Survey Area, 1998



Map 2. Onion Creek Moose Survey Area, 1998