

Furbearer Track Survey, Gates of The Arctic National Park and Preserve, Alaska

April 2008
John Burch



DATA SUMMARY:

Survey dates: March 25 – April 2, 2008 (9days).

Distance traveled: = 138 miles, (222 km)

Personnel: John Burch and Bob Mauer (volunteer)

Notable observations for 2008:

- No moose tracks or sightings in the Kollutarak or Anaktuvuk drainages.
- More than 4 fold increase in Lynx and snowshoe hare tracks from 2003
- Fox tracks more than double from 2003
- Lynx tracks were seen farther north (in the Kollutarak)
- Otter tracks seen in lower Hunt Fork
- No marten tracks seen despite high numbers near Bettles
- No human tracks in Hunt Fork or Publituk
- Route was abbreviated due to compliance concerns and perceived snowmachine trouble.
- Average snow depth = 20.8 inches (52.8 cm)

Introduction/Background

Three resource questions drive the need for this survey:

1. Are populations of harvested furbearers 'Natural and Healthy' in GAAR as mandated by ANILCA?
2. Is the distribution and abundance of moose in GAAR declining?

It will require several years of conducting these surveys before we can begin to answer the above questions.

The purposes of this study were numerous and encompass a variety of objectives:

- 1) Past proposals to liberalize bag limits on wolverine and wolves in GAAR (proposals #38 & #39 of the 2003-2004 Federal Subsistence Wildlife Proposals) sparked interest in population status of furbearers park wide in 2003. No studies or monitoring data exists for furbearers in GAAR since 1993 which was restricted primarily to carcass collections from localized areas near Anaktuvuk Pass and Wiseman (Swanson 1994, 1996). Earlier studies include Howard Golden's study using aerial track surveys in 1988 (Golden 1988), these surveys were restricted to the lower North Fork, Lower John River and Kobuk Preserve (Golden 1988).

A primary goal of this survey method was to develop an inexpensive index to relative abundance of furbearer populations throughout GAAR, inexpensive enough to be conducted annually on park base funds and not be reliant on short term 'soft money'. Utilizing snowmachines for traveling and conducting the surveys as apposed to aircraft is a key ingredient in achieving this goal.

- 2) In addition to the Furbearer monitoring, relative abundance and distribution of moose was also incorporated in the 2003 survey, but was limited to tracks and sightings in 2008. Past aerial moose surveys in the upper Kobuk and upper Koyukuk show a declining moose population with poor recruitment of calves (Glenn Stout 2000, Lawler et al 2003, Lawler et al 2006). This ground based study will eventually allow additional analysis of moose population trends based on track and sighting data, but would not be a replacement of aerial moose surveys. Furthermore, because of traveling on the ground, future evaluations of moose forage are possible (more thorough collections of evidence of old and new browsing, collection of browse specimens and fecal pellets all could be future expansions of this survey)
- 3) Because of the mode of travel it can be easy to make a series of snow and ice depth measurements (only 1 in 2008) or complete snow courses. Much more could be done here in the future as an alternative/addition to aerial snow markers. Snow depth and density can have significant impacts to wildlife populations. Snow and ice monitoring is a vital sign for both Arctic Network and Central Alaska Network.
- 4) Although not explicitly stated as an intended purpose at the outset of the study, a human dimension to the study evolved that is more difficult to describe. Interdivisional cooperation was involved by combining this study with a operations reconnaissance/patrol. A connection is made with local people by using the local method of travel, rather than aircraft. Tim Osborn (formerly of ADF&G, Galena) also used this technique successfully, routinely traveling by snowmachine to numerous villages for meetings and informal harvest reporting rather than flying. Tim reported that this was very instrumental in gaining the respect of local people and gave him a great deal more clout in convincing local people of unpopular changes to seasons and bag limits.

Methods

From March 25 – April 2, 2008 Bob Mauer and John Burch conducted furbearer track surveys by snowmachine based from Anaktuvuk Pass (AKP). Areas surveyed include Kollutarak and Agiak Lake, Anaktuvuk River, Hunt Fork, John and Publutuk Rivers. (Figure 1).

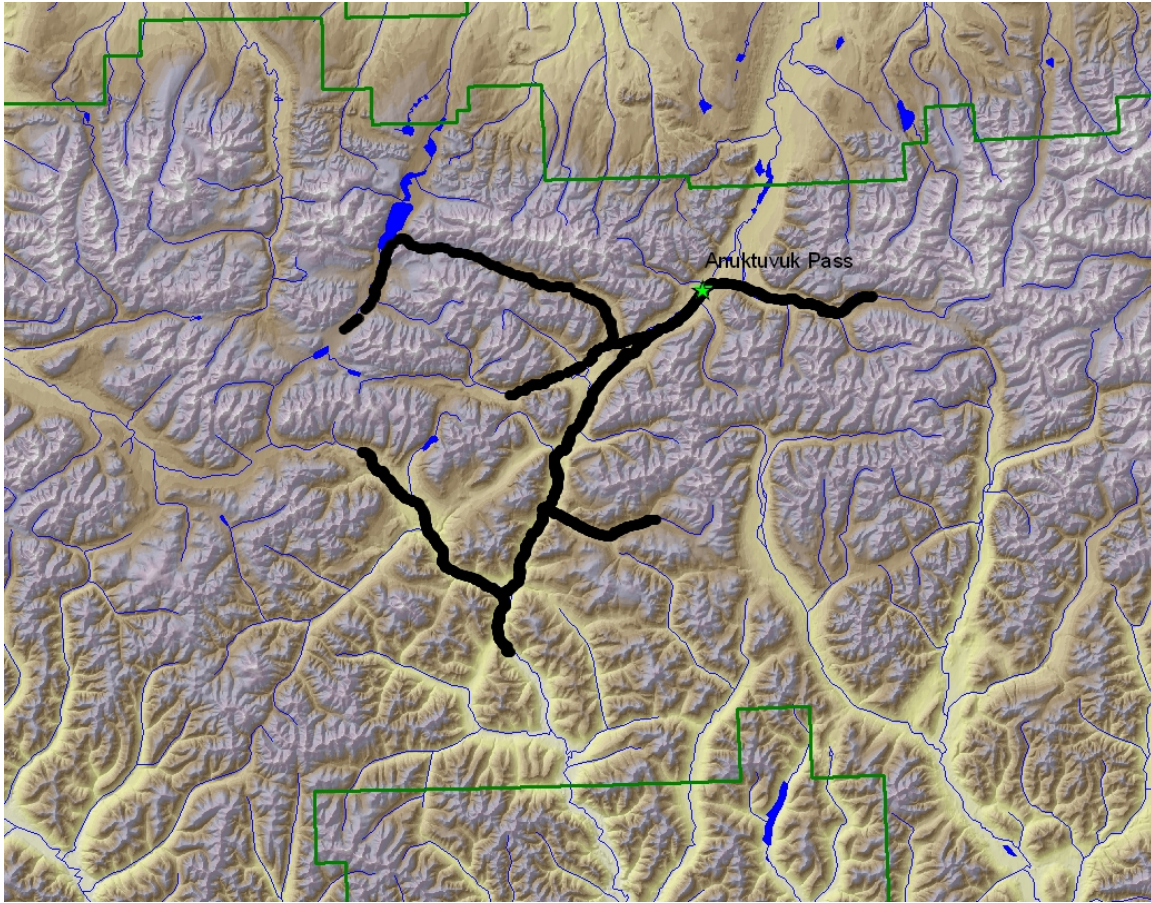


Figure 1. Routes traveled (black line) for the furbearer track survey via snowmachine 3/25/08 – 4/2/08. Route was abbreviated due to compliance concerns and snowmachine trouble.

Anytime a track or animal sighting was encountered, a description was logged in a notebook and a waypoint was stored in a GPS. A database was created from the GPS download of waypoints, it was edited, and the maps and tables contained in this report summarize the database. Travel distance was measured via GPS trip computer. Odometer readings were kept but are not as accurate or reliable.



Distinct outline of a wolverine track.

All tracks or sightings of wildlife were recorded when they were identifiable. Exceptions to this were with hares, caribou and ptarmigan (and occasionally moose) which were so numerous in places that documenting every track or sighting was not practical, but these concentrations were mapped and documented. The tracks and sightings encountered were tallied for each species and this number was divided by the total distance covered by the route (222 km in 2008) to give tracks/kilometer as the unit of measure to compare relative abundance of different species and begin to detect trends in abundance and distribution of the same species.

Results:

Notable highlights include a 4 fold increase in lynx and a near doubling of fox, both probably due to a large increase (much more than 4 fold) in snowshoe hare tracks, also, some of those lynx were seen in the Kollutarak River (nearing the northern extent of their range, although Bob Mauer had heard of a report of lynx being caught in the Anuktuvuk River several years ago), otter tracks were observed in the Hunt Fork when none were seen in 2003, still no marten tracks were seen at all even though very high numbers of marten and lynx tracks were seen during the moose capture work based out of Bettles earlier in March 2008. We really expected to see at least a few marten tracks in the Hunt Fork and possibly Publituk. Large numbers of caribou and caribou sign was seen throughout much of the route.



Figure 2. Wolverine tracks on top of Sulugiak Pass

The results of the furbearer and wildlife track data are found in Table 1 and Figures 3 –9. The fox tracks seen are most likely all red fox, but it is possible some of the tracks could have been arctic fox (Swanson 1994, 1996). Wolf tracks were more difficult to

summarize as we frequently encounter tracks of a pack of wolves traveling up or down the drainage we were traveling in. The result was encountering the same group of wolves (or in some cases what was presumed to be the same group) numerous times along a particular section of the route. Because of this, wolf tracks thought to be from the same pack were grouped together so as not to artificially inflate the count of wolves. A similar situation exists for some of the wolverine tracks where the same wolverine was responsible for more than 1 set of tracks (the same corrective action was taken when it was obviously the same wolverine). However, this problem is inherent in the technique and will occur with each species to varying degrees. It is assumed the problem is consistent from year to year, and trends in relative abundance should not be greatly affected. Wolves still stand out as a problem because they usually travel in groups, sometimes large groups of 15 to 20 and missing or mistakenly double counting the same pack of wolves can dramatically influence the relative abundance estimate.

Table 1. Number of tracks or sightings for each species encountered in 2008. Tracks/kilometer was calculated only for those species where individuals were discernable.

Species	Tracks	Sightings	Total	Tracks/Km 2008	Tracks/Km 2003
Fox	27	1	28	0.1261	0.057
Lynx	38	0	38	0.1712	0.041
Marten ²	0	0	0	0	0
Otter	5	0	5	0.0225	0
Weasel (ermine?)	7	0	7	0.0315	0
Snowshoe Hare ³	48 ³	0	48	many (0.2162) ³	0.072
Wolverine ¹	11	0	11	0.0495	0.072
Wolf ¹	12	0	12	0.0541	0.044
Moose	36	3	39	0.1757	N/A
Willow Ptarmigan ³	N/A	>300	N/A	N/A	N/A
WhiteTailed Ptarm	N/A	>40	N/A	N/A	N/A
Boreal owl	N/A	0	0	N/A	N/A
Golden eagle	N/A	2	2	N/A	N/A
Great horned owl	N/A	2	2	N/A	N/A
Gyr falcon	N/A	0	0	N/A	N/A

1 corrected to alleviate double counting of the same animals.

2 route was primarily north of their typical range, many tracks near Bettles

3 number counted where discernable – many seen throughout the route, track per kilometer is much higher.

Because this is the 2nd year of the study (first year was 2003) not much can be said about the trends in relative abundance of each species, it will require conducting the study annually for at least 2 or 3 more years before realistic comparisons can begin to be made, or the beginnings of any trend detectable. Five to 10 years (or more) of conducting the same survey in the same places is the primary goal of the project and only after this large number of repetitions (the more the better) will the real value of this work begin to show.

Howard Golden's aerial survey in 1988 (Golden 1988) produced tracks/kilometer for each species which were calculated from 83, 3km aerial transects, that data is summarized in Table 2. Caution should be used here as the methods were very different. However, some differences in track densities encountered are dramatic enough to indicate a significant change from 1988. Wolverines constitute the greatest noticeable change where in 1988 in the south eastern part of GAAR (Lower John, Wild, North Fork, Glacier, and Hammond rivers) not 1 wolverine track was seen on any of the 83 transects flown in that area. Where on the 2003 survey, tracks of at least 28 wolverine were encountered in 21 different places for a track density of 0.072 tracks/km in 2003 and in 2008 we saw tracks of at least 11 wolverine for a track index of 0.050 track/km (Table 1, Figure 4).

Table 2. A comparison of tracks/kilometer for furbearers from Howard Golden's Aerial Surveys in March of 1988. Methods were not the same.

Species	Tracks/kilometer (Golden 1988) Eastern Area	Tracks/kilometer (this study) 2003	Tracks/kilometer (this study) 2008	Tracks/kilometer YUCH videography
Red Fox	0.243	0.057	0.126	0.147
Marten	3.839	0.0	0.0	3.647
Wolverine	0.000	0.072	0.050	0
Lynx	0.082	0.041	0.171	0.324
Snowshoe Hare	3.584	0.072	0.216**	10.765

**number is much higher, tracks so numerous in many places they were impossible to count.

Fox tracks were seen in 28 locations along the survey route adding up to 0.0.126 tracks per kilometer, up considerably from 2003. Comparing this with Golden (1988) where he found 0.243 fox tracks/km from an airplane further south.

No Marten tracks were seen on this survey, but we were likely north of the primary range of Marten (Golden 1988). Future surveys should include drainages further south the lower John, Wild, North Fork, and Middle Fork Rivers to cover areas both in and out of GAAR known to have marten. This was the area covered by Golden (1988). During a moose capture operation based in Bettles very high numbers of both marten and lynx tracks were seen from the helicopter, which makes it even more significant that no marten tracks were seen in the Lower John, Hunt Fork, or Publituk. Future surveys need to be conducted further south to include marten habitat.

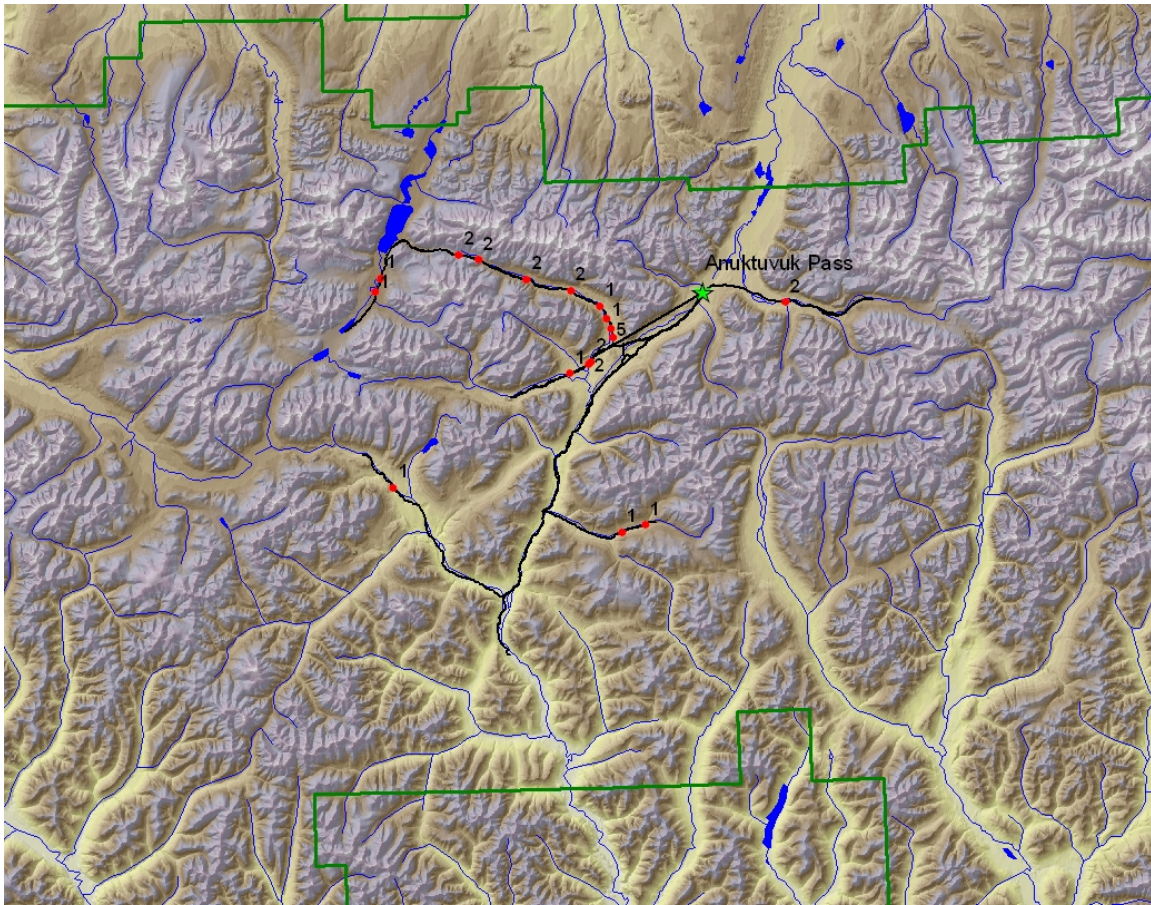


Figure 3. **FOX**. Locations where fox tracks were seen, $28 \text{ fox}/222\text{km} = 0.126$. Numbers indicate the number of individuals at the same location.

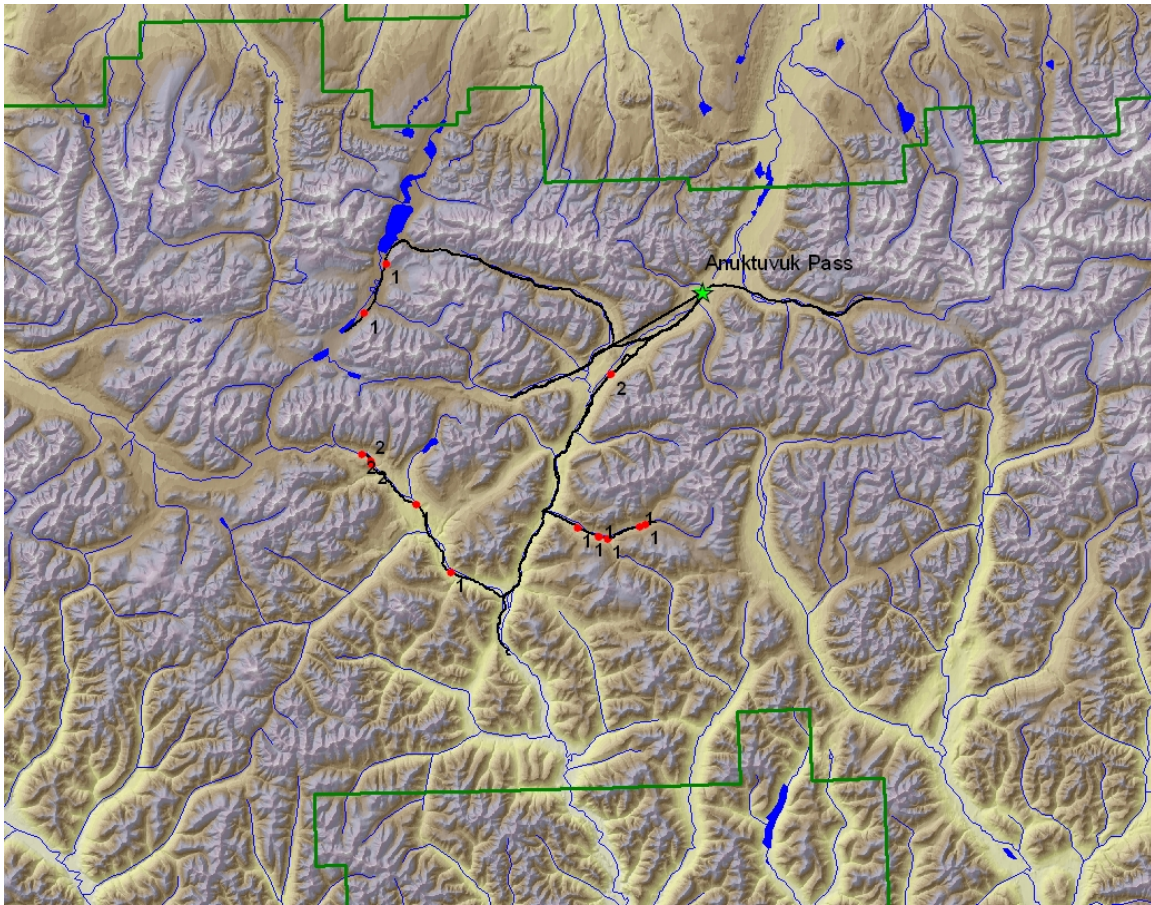


Figure 4. Locations where **wolverine** tracks were seen, $11 \text{ wolverine}/222\text{km} = 0.0495\text{tracks/km}$. Numbers indicate the number of individuals at the same location. Track count corrected to avoid counting the same animals multiple times.

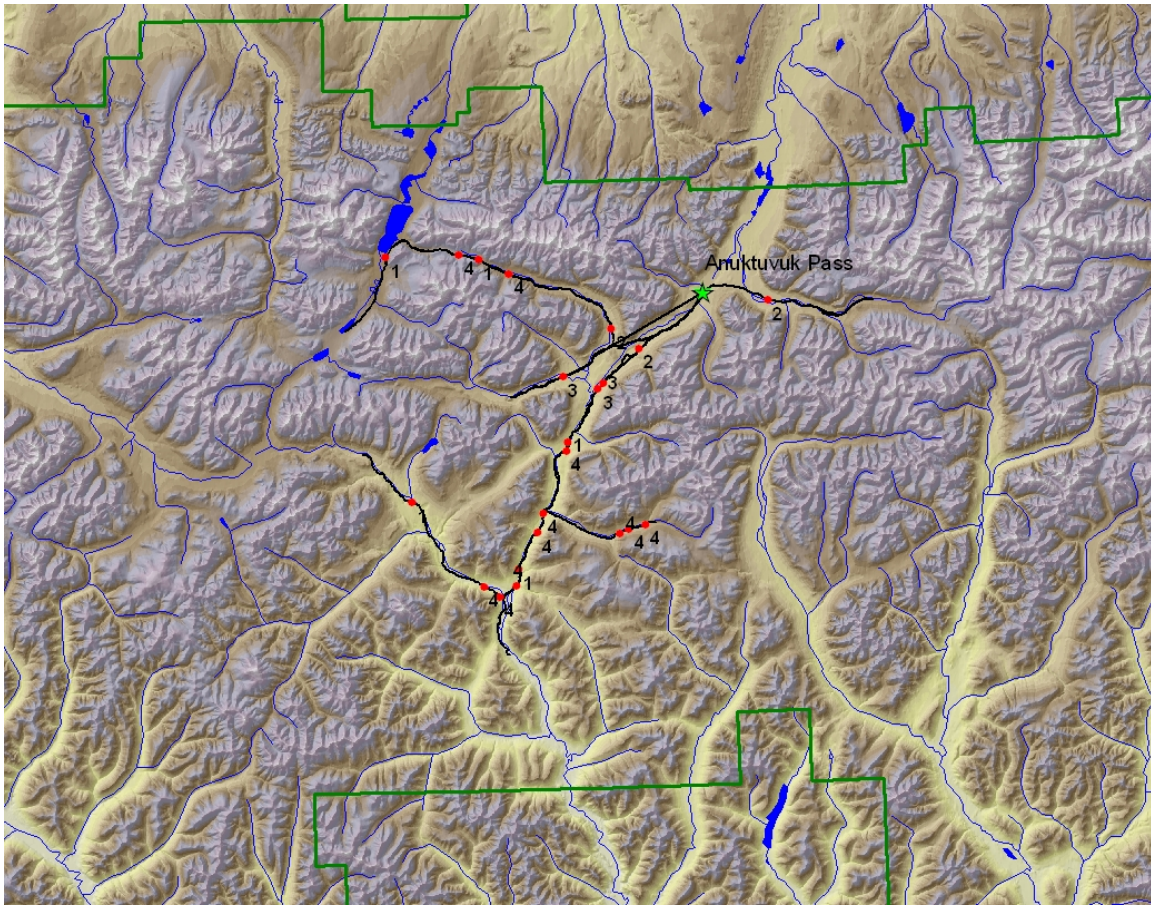


Figure 5. Locations where **wolf** tracks were seen, $12 \text{ wolves}/222\text{km} = 0.054 \text{ tracks/km}$. Numbers indicate the number of individuals at the same location. Track count corrected to avoid counting the same wolves multiple times.

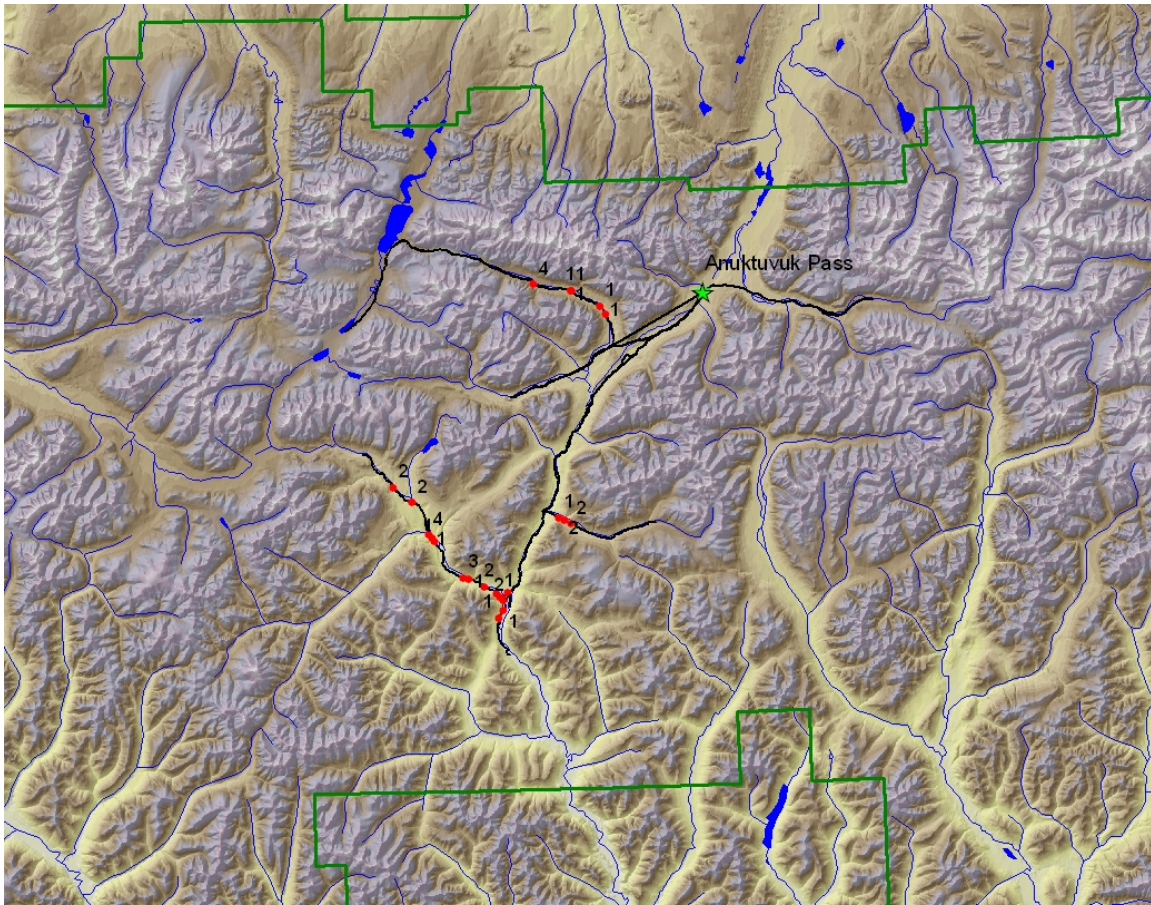


Figure 6. Locations where **lynx** tracks were seen, $38 \text{ lynx}/222\text{km} = 0.171 \text{ tracks/km}$. Numbers indicate the number of individuals at the same location.

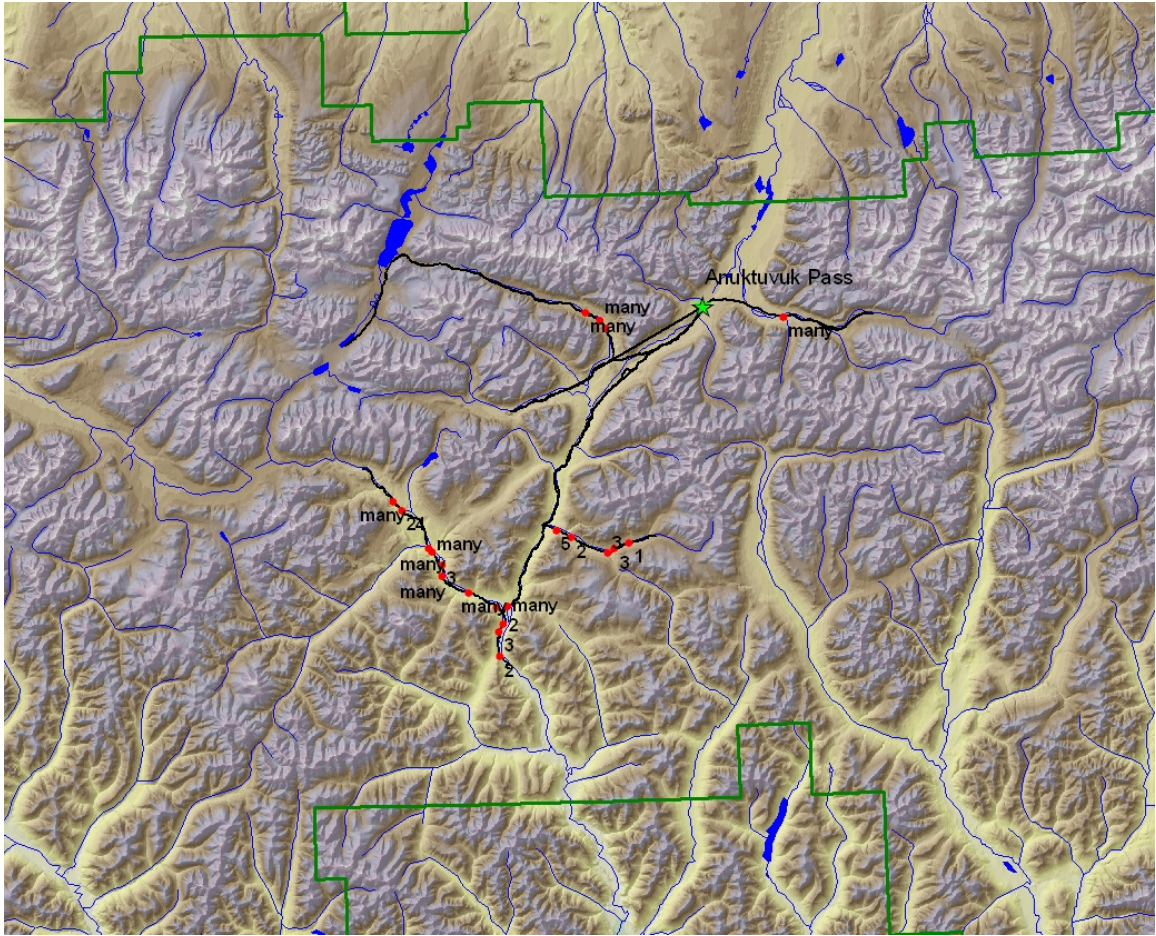


Figure 7. Locations where **hare** tracks were seen. Numbers indicate the number of individuals at the same location.

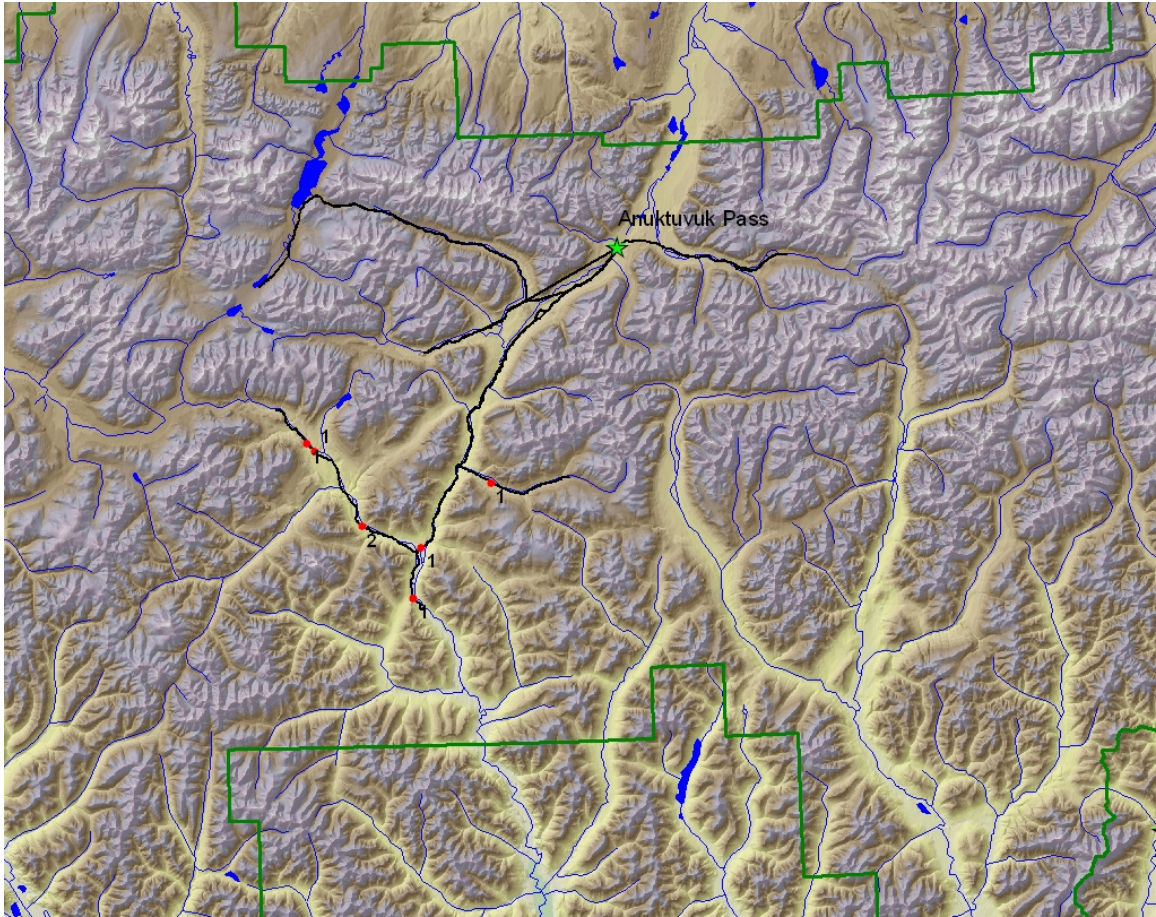


Figure 8. Locations where **weasel** tracks were seen. Numbers indicate the number of individuals at the same location.

Moose sightings, tracks, browse observations, browse collections

Sightings of moose are also summarized in Table 1 and Figure 9. Moose tracks in areas of concentrated use were not included because the numerous tracks in these areas were impossible to count consistently and were likely made by just a few individuals. Observations of isolated tracks were included.

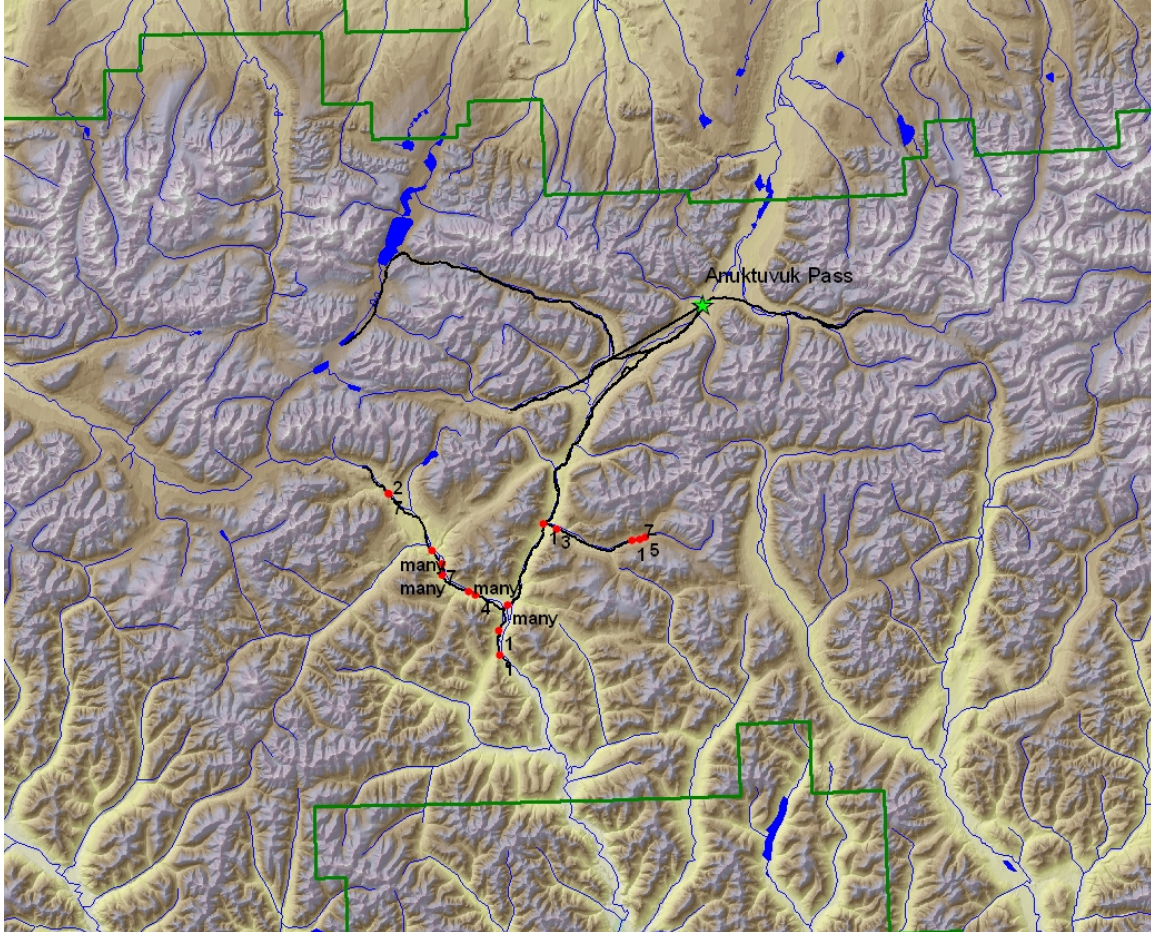


Figure 9. Locations of **moose** sightings and tracks, $39 \text{ moose}/222 \text{ km} = 0.176$ tracks/km. Areas labeled 'many' are areas of concentrated use where tracks were too numerous to count, numbers indicate number of moose tracks or animals seen when discernable.

Moose pellets and browse were not collected in 2008 as was done in 2003 due to time constraints for their analysis.

Birds observed along the survey route:

Willow ptarmigan were numerous throughout the survey route and their numbers appeared high, but not as high as in 2003. One observation of Golden Eagles was recorded and Great horned owls were heard in 1 place (Figure 13).

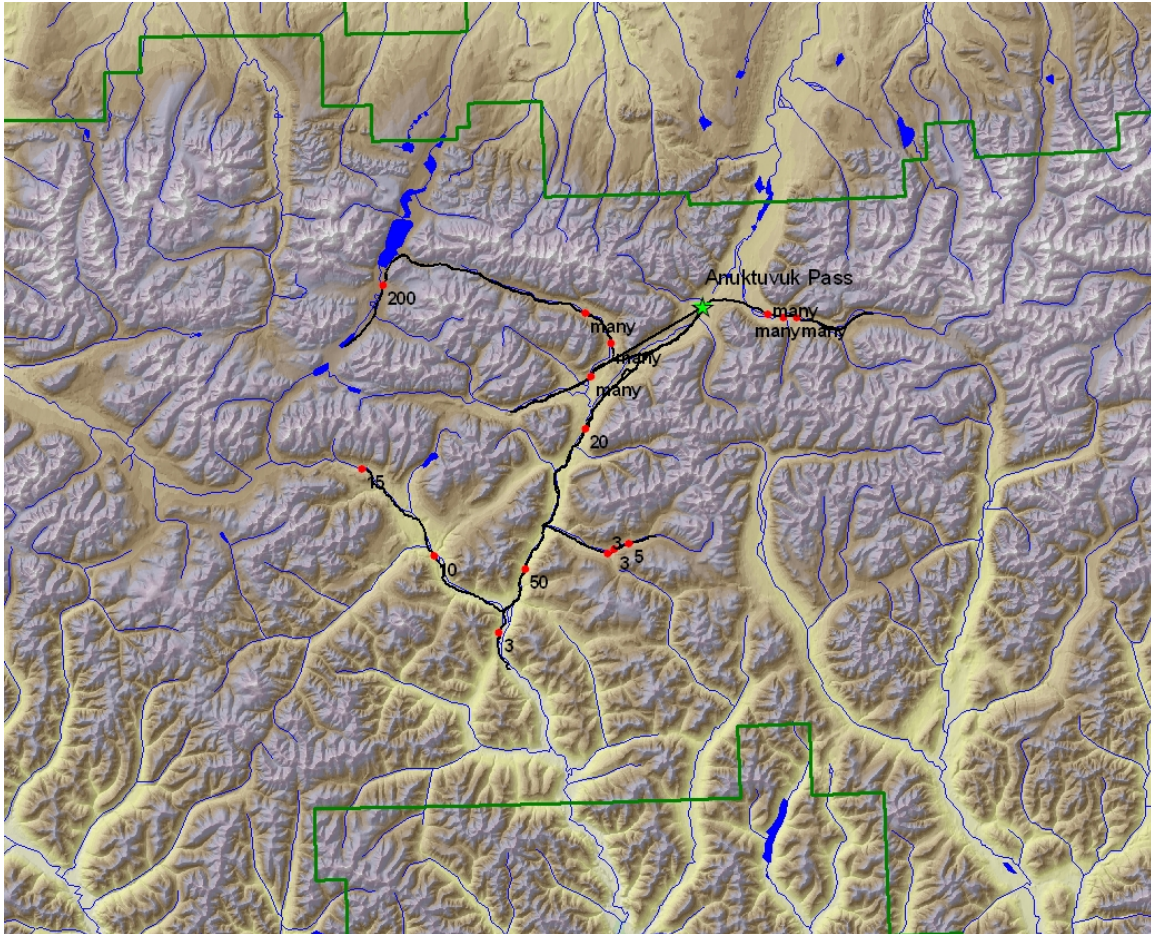


Figure 10. Locations where **willow ptarmigan** or tracks were seen. Numbers indicate an estimate of the number of individuals at the same location, most were too numerous to count.

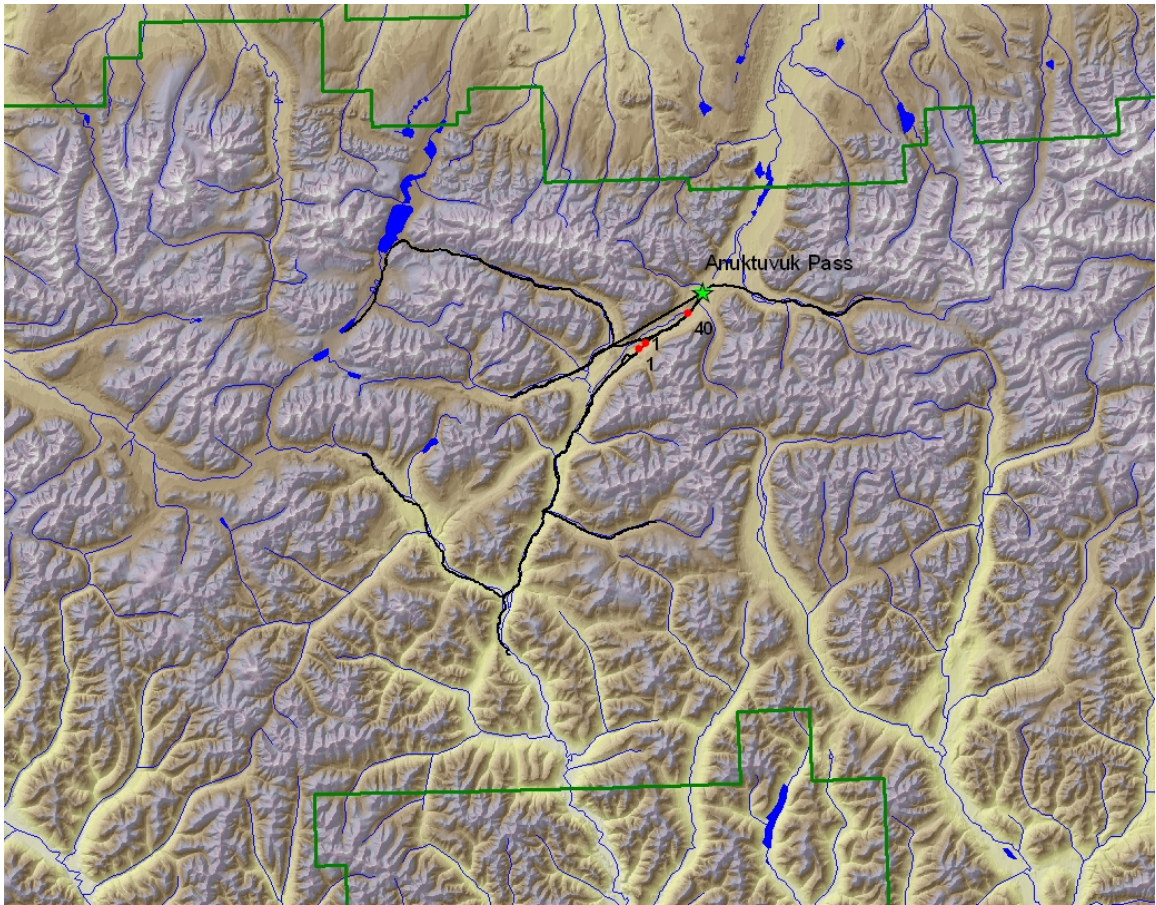


Figure 11. Locations where **white-tailed ptarmigan** were seen. Numbers indicate an estimate of the number of individuals at the same location.



Figure 12. Area full of ptarmigan tracks on the Anuktuvuk River (and a caribou or 2).

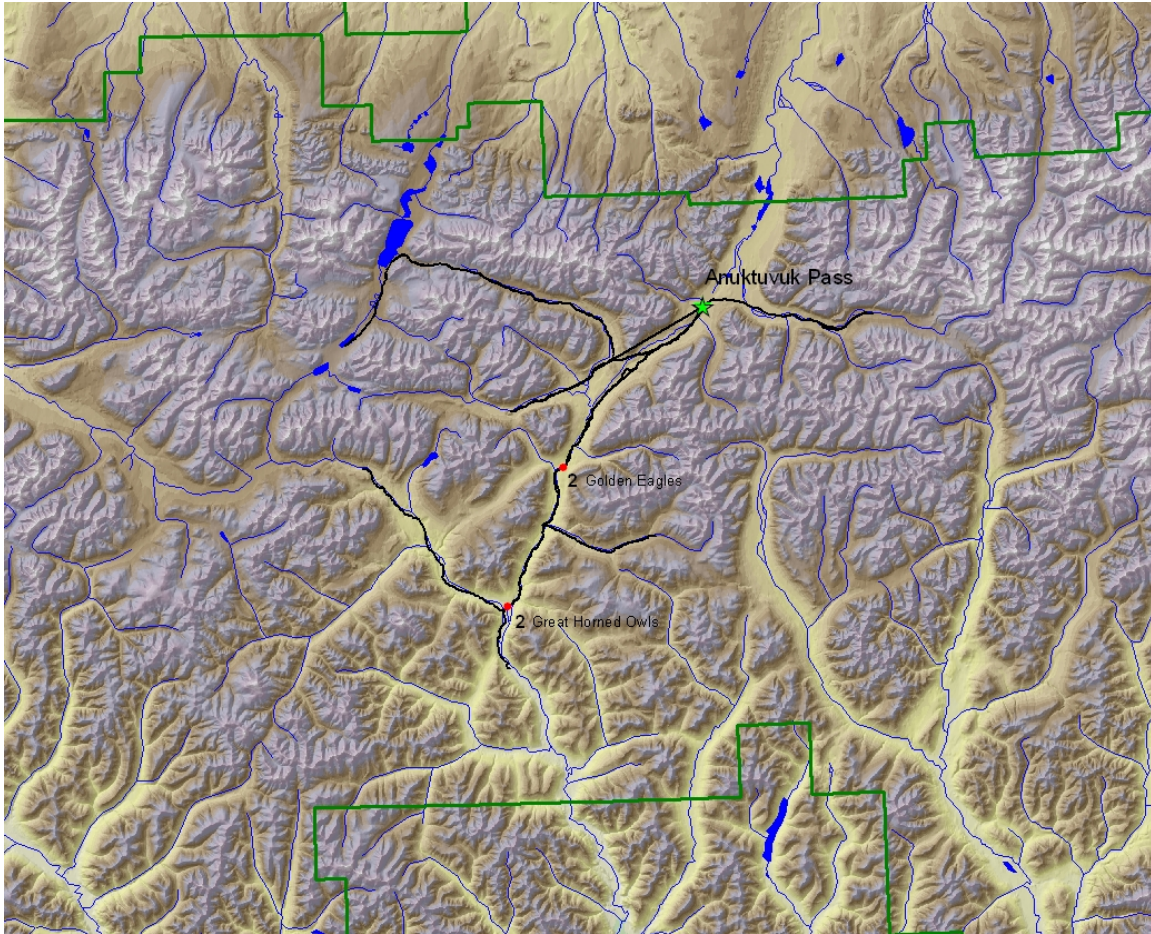


Figure 13. Locations where various raptors were seen or heard. Numbers indicate the number of individuals at the same location.

Snow

The 2 snow measurements were east of Hunt Fork Lake a few hundred meters in a sheltered, but open area within the trees (67.788351 x -152.383083, WGS-84).
The 3 measurements (22.0, 21.0, and 19.5 inches) averaged 20.8 inches (52.8cm) of snow.

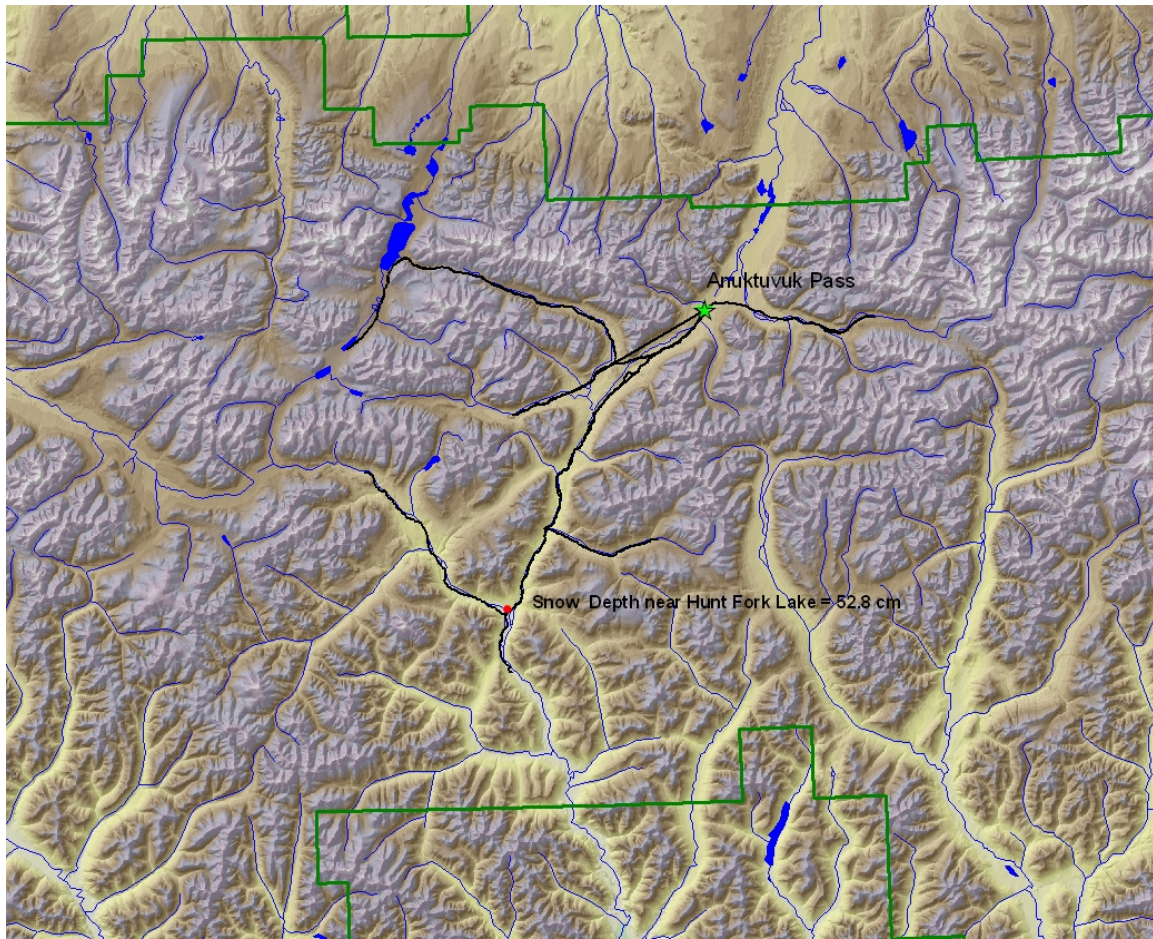


Figure 14. Location of the single snow depth measurement that was made in 2008.

Table 3. Snow depth measurements. Simple depth measurements, GAAR, March 2008.

DATE	Observation Type	Depth	Description	LATDD	LONDD
03/30/2008	depth	28.8cm (11.3 in)	Hunt Fork Lake, 12.5, 11.5, 10.0. average of 3 measurements = 11.3 inches snow at 2003 snow course site.	67.7877957	-152.3901183
03/30/2008	depth	19.1cm (20.8 in)	Hunt Fork Lake, 22, 21, 19.5. average of 3 measurements = 20.8 inches snow 200 meters north east of 2003 snow course site.	67.7897	-152.3787

Human Use

We saw 2 snowmachines off at a distance at Chandler Lake ice fishing. We saw fresh snowmachine tracks going beyond Agiak Lake and over the ridge into Agiagiak Creek.

A well used snowmachine trail ran from AKP down the John to Hunt Fork, but not beyond and none up the Hunt Fork, and up the Anuktuvuk River beyond where we turned around at Graylime Creek. We were told that Kenny Mekiana had been over Ernie pass and down the North Fork to at least Bombardment Creek several times.

No other people were seen throughout the trip except at Chandler Lake at a distance where we saw 2 snowmachines ice fishing. We visited Just and Angelise Jensen's tent camp in the upper Anuktuvuk River. Snowmachine tracks were seen throughout most of the route (Figure 15). There was 1 snowmachine track going up Publituk for less than 1 mile where it turned around.

Traps or trapping sets were only noticed in 4 places (Fig. 15 & 16), but the trapping season (fur quality) and interest in trapping was dwindling by late March.

No low flying aircraft were seen or heard

A few camps, cabins, and structures were encountered along the survey route (Figure 15 & 17). Lots of evidence of recent ice fishing activity on Chandler Lake

On our way to Ekokpuk we found evidence of a camp in Lower Masu Creek (used this fall?) with several meat racks probably used to make dry meat (Figure 17).

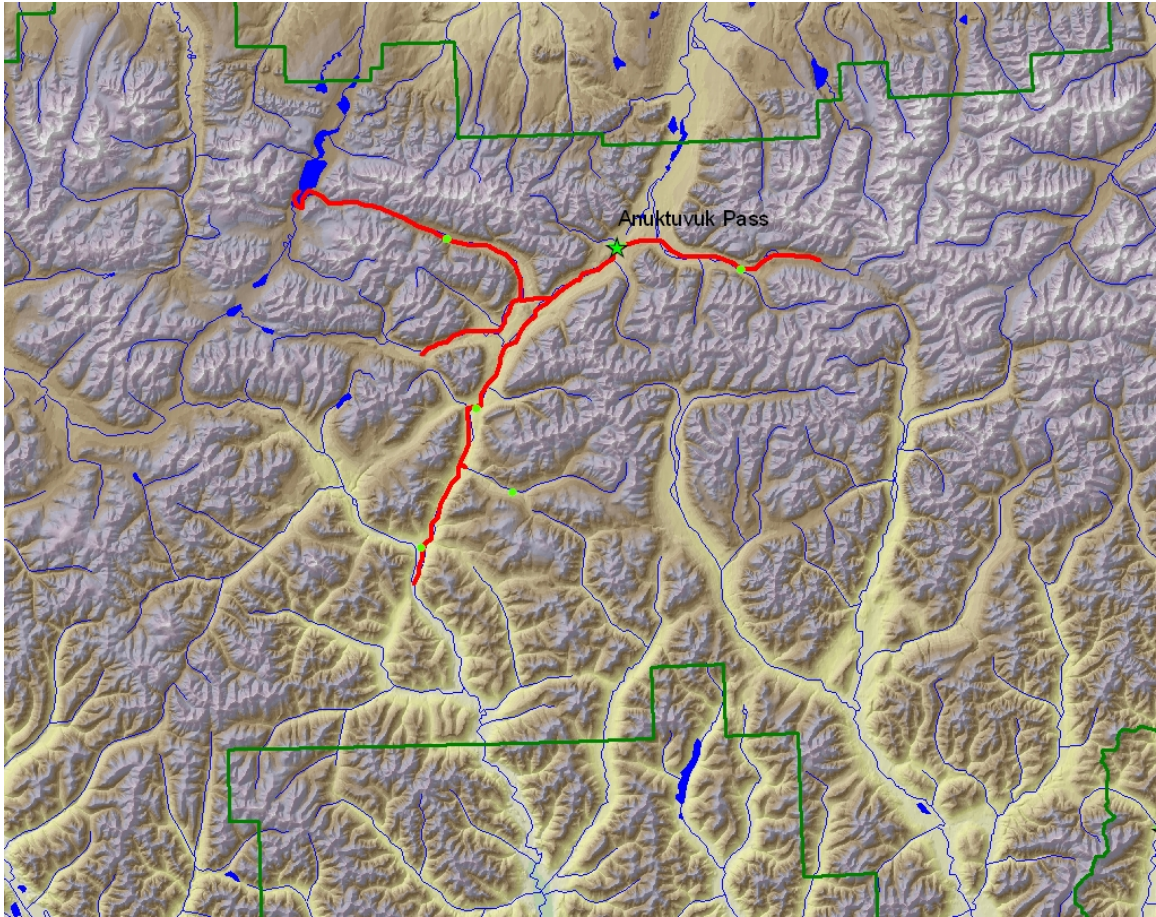


Figure 15. Locations where human tracks were seen (snowmachine tracks), trap sets cabins, tents etc..



Figure 16. Conibear cubby set for wolverine on the John just above Yenituk Creek.



Figure 17. Meat racks in lower Masu Creek.

Recommendations for future surveys:

1. Base some portion (or all) of the survey out of Bettles to cover marten habitat and conduct some of the survey routes outside the park to mitigate some Wilderness concerns. This would also help save some money by not needing to buy plane tickets or ship lots of gear, and we could haul in a substantial portion of the fuel from Fairbanks.
2. The route taken in both 2003 and 2008 covered only a small portion of GAAR. Future surveys should try and cover a wider area, possibly the Noatak drainage in the west, and the Hammond, Glacier and lower North Fork Rivers in the east to better survey the areas used by Wiseman and cover areas more likely to have marten. As with any population index the larger the area covered and the longer in time (years) these surveys are conducted the more valuable they will become. Furthermore, surveying areas lightly used (or not used) for trapping or hunting will be of great value to compare to areas of higher fur harvest. The specific route can be flexible during the first years of the survey until the best routes for meeting multiple objectives can be determined. These potential routes should be thoroughly discussed by all interested parties.
3. The evolution of this survey will likely be toward using the longer more sheltered drainages or routes that have more consistent snow cover conducive to seeing tracks. For example, the upper John, Killik and Lower Anuktuvuk Rivers might prove too windblown to be used for the track surveys, whereas the Alatna, Hunt Fork, Lower John, North Fork and Hammond drainages might have consistently better snow conditions for seeing furbearer tracks. However the less desirable drainages for seeing tracks may be very valuable to travel for other objectives of the study (moose distribution, human use, ice depth, ptarmigan/raptor sightings, other operational objectives, etc.) A part of designing this study will be determining the best routes to consistently get the most data. With this in mind the first years will need to be flexible until acceptable routes can be established.
4. Documentation of browsed and unbrowsed willows should be emphasized in the future if possible. This could be the only NPS data to document areas where moose have recently disappeared.
5. Survey routes should be chosen to maximize use of camps that could be left up and reused 2 or more nights in a row. This could be accomplished by planning survey loops allowing staff to return to the same camp, or running a long drainage or route one way to the end, then returning back to camp via the same trail. This will maximize fuel use and survey time by not pulling loaded sleds further than necessary, requiring taking down and setting up camps, packing and unpacking sleds, etc. Camps could also be chosen in places where snow courses, browse and fecal pellet collections, ice depths etc. could all be done in a day without the need to move the camp.

6. Shorter loops out of AKP worked well, and allowed for re-supply of food and fuel. A portion of the survey could be based from Bettles and surveys conducted on drainages not necessarily in the Park (Middle Fork, Wild, Lower Alatna, John, North Fork Rivers, route from Bettles to Iniakuk Lake to Kobuk would be another possibility) but encompassing parts of the same wildlife populations.
7. Additional data could be collected such as trapping voucher specimens for I&M inventories (ermine, marten, snowshoe hare, small mammals), or measuring ice depth on specific lakes, or any winter vegetation studies/photo points.
8. Propose that this survey method or something like it be incorporated into the Arctic Network I&M as a monitoring protocol.
9. This survey method is a way to integrate Traditional Ecological Knowledge, western science, cross program cooperation, winter travel preparedness and public relations to achieve management goals during winter, the longest season in the arctic. Also much valuable information may be gained from unanticipated encounters while conducting this type of survey, such as unusual wildlife or natural history observations or human use/contacts.

Potential problems with the study:

This survey method will not be without its problems. Under ideal conditions one can be diligent about seeing and recording tracks or other observations, however when weather conditions deteriorate, data collection will suffer. Snowfall or wind will quickly obliterate tracks, deep snow, overflow, flat light or whiteout conditions can at times require undivided attention to just safely travel, and observations will suffer as a result. Routes might need to be cut short due to changing weather and trail conditions, or unexpected high fuel consumption. Indexes to populations are not an exact science and this aspect of the study will need to be taken into consideration when the data are summarized, evaluated or used for management decisions, however, it will be much better than nothing at all.

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Appendix A. fuel consumption

Gas milage in 2008 was very similar to 2003 but detailed records were not kept as they were in 2003.

Gas milage table from 2003. .

AKP – Tulilik Lake – Agiak Lake – Hunt Fork – AKP loop totals, 1998 Skandik wide tracks, 500cc engines, tracks = 20X156 inches.

Date	Distance	Travel time	Fuel/machine (approx)	Total Fuel	Mileage
4/6/03	50 miles	8 hours	7 gal	14 gal	7 mi/gal
4/7/03	62 miles	8 hours	8 gal	16 gal	8 mi/gal
4/8/03	50 miles	6.5 hours	7.5 gal	15 gal	6.5 mi/gal
4/9/03	37 miles	3 hours	3.5 gal	7 gal	10 mi/gal
Total	199 mi	25.5 hrs	26 gal	52 gal	7.6 mi/gal

Injection oil consumption was about 100 miles/quart.