

1:30 - 2:00 PM	7	ርስዎች ለሚገኙት ስብሰባዎች (ጋራ)	5	የሚገኙት ስብሰባዎች የሚገኙት ስብሰባዎች	30 ሰከንድ
2:00 - 2:05 PM	8	የሚገኙት ስብሰባዎች RM004-2023 ስብሰባዎች		የሚገኙት ስብሰባዎች	

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Ekaluktutiak Hunters & Trappers Organization
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SUBMISSION TO THE NUNAVUT WILDLIFE MANAGEMENT BOARD

FOR

Information: X

Decision: X

Issue: Dolphin-Union caribou mortalities during collaring research

Background:

Inuit livelihood is deeply connected to and inseparable from the livelihood of caribou. Inuit in the Kitikmeot region have depended on and continue to rely on Dolphin-Union (DU) caribou for sustenance, learning and practicing Inuit Qaujimajatuqangit (IQ) and traditional knowledge, and sense of well-being and community. The Total Allowable Harvest (TAH) for DU caribou has deeply impacted opportunities for Inuit to continue to cultivate and maintain these relationships. Inuit populations in the north are continuing to grow and community members are facing significantly reduced access to caribou hunting.

The Ekaluktutiak Hunters and Trappers Organization (EHTO) understands that the Government of Nunavut Department of Environment (GN DOE) conducts scientific research to generate information on caribou population trends and make recommendations for TAH, as well as other management plans. For DU caribou, GN DOE completed abundance surveys in 2018 and 2020, and collaring took place in 2021. GN DOE is currently completing another abundance survey and EHTO was recently informed of their plans to deploy 35 more collars in March 2024. EHTO continues to receive and review map locations of already-collared DU caribou (with a 4 week delay) from GN DOE.

Specific to DU collaring, EHTO is concerned about the following:

- Four mortalities (out of 36 collared individuals) occurred during collar deployment in 2021 that resulted in a reduction of 4 tags from the closest community (Kugluktuk). These unexpected mortalities occurred due to physical and physiological injuries (GN DOE, 2021). EHTO understands that GN DOE staff devoted their best efforts to avoid these events by following Standard Operating Procedures (Northwest Territories Environment and Natural Resources Wildlife Care Committee, 2011) and animal care protocols (CARMA 2008; TAEM 1996) via GN DOE and Government of Northwest Territories [GNWT] permits and frequent communications with GNWT veterinarian staff. However, even with these efforts, unexpected mortalities did and can occur.*
- Mortalities also occurred during collar deployment prior to 2021, but these were fewer instances over time (2 mortalities out of 94 collars deployed from 2015 to 2018; GN DOE, 2018; GN DOE, personal communication). There was no TAH for DU caribou at that time.*
- Although meat from the 2021 collaring mortalities was distributed to the local community, lost hunting opportunities for each household are invaluable and irreplaceable. On hunting trips, Inuit hunters not only learn from and practice hunting, they also learn and continue to practice traveling on the land, survival and safety skills, properly butchering and sharing meat, and updating their experience and knowledge of all wildlife. This IQ and traditional knowledge is shared with other community members, especially young ones that get to travel with older hunters.*
- EHTO was not informed that caribou mortalities that occur during research would be considered part of the TAH. EHTO became aware of this response after the research mortality events in 2021 had occurred. In addition, HTOs were not consulted on the amount of compensation that could be provided for a caribou mortality during research.*
- Kugluktuk Angoniatit Association (KAA; Hunters and Trappers Organization [HTO]) was informed of the 2021 mortality events in real-time. This was possible because of local participant observers who took part in the field work. Local observers properly and promptly butchered the animal and brought all parts of the animal and meat back to the community without wastage. GN DOE staff in the field also provided immediate updates through telephone and met in-person with KAA upon return from the field. Standard Operating Procedures and research protocols do not guarantee these circumstances and efforts will occur with all projects.*

- The TAH for DU caribou that was initially set in 2018 did not take into account caribou mortalities that could occur during research. Tag deductions that account for GN DOE research mortalities are perceived as taking hunting opportunities away from Inuit.
- Any mortality that occurs during collaring research is not considered acceptable by EHTO. DU caribou population pressures, risks, and threats have been and continue to be acknowledged by co-management partners. This is reflected in their establishment and maintenance of a TAH. DU caribou is also currently assessed as Endangered by the Committee on the Status of Endangered Wildlife in Canada under the Species at Risk Act.
- Collar deployment involves pursuit by aircraft, capture by net gunning, and physical immobilization and handling to collect biological samples from reproducing females (Northwest Territories Environment and Natural Resources Wildlife Care Committee, 2011). These activities add remarkable pressure on a small population of caribou. Perception of predation risk can also affect reproduction in female animals, and is potentially heightened by repeat capture and handling (Cattet, 2018).
- The large population of Cambridge Bay relies heavily only on DU herds for caribou harvesting, under EHTO tag allocations (currently 50 per year). Community members occasionally harvest Beverly caribou.
- There is a lack of transparency in how collaring data could or would be used by GN DOE outside of a proposed research project, for example, in land use planning or Nunavut Impact Review Board processes under the Nunavut Planning and Project Assessment Act.

In addition, EHTO notes the following proactive efforts as they pertain to DU caribou:

- Kitikmeot communities are part of a User-to-User DU caribou group with the Inuvialuit Settlement Region as an interjurisdictional effort to continue monitoring DU population and distribution changes. This group is also a forum for exchanging traditional knowledge across the whole DU caribou range.
- EHTO acknowledges that collaring can provide important information on caribou distribution and guide abundance surveys. However, Inuit hunters are also already aware of this information through their shared IQ and traditional knowledge; GN DOE uses this information to design their abundance surveys. EHTO is particularly aware of how collaring information is comparable to Inuit knowledge when reviewing GN DOE collaring maps.
- EHTO is not in support of collaring research that affects Inuit harvesting. Collars that were previously deployed are still providing locational data. EHTO encourages the inclusion of and support for IQ, traditional knowledge, and Inuit hunters as alternatives to investing in collaring research. These alternatives should be considered especially in the years where DU caribou herds are in low numbers and already facing multiple disturbances. Any further reductions in Inuit harvesting opportunities limits Inuit ability to practice and build DU caribou traditional knowledge, although this knowledge can be gathered indirectly during other traditional harvesting and land use activities.

Consultation:

The below consultation record does not include all communications. This record is not meant to be exhaustive but instead, highlights key points that are relevant for this submission.

- On 16 September 2021, GN DOE provided information to KAA, EHTO, KRWB, Kitikmeot Inuit Association, Nunavut Tunngavik Inc., and Nunavut Wildlife Management Board representatives on DU collaring fieldwork that occurred in spring 2021. This in-person consultation took place in Kugluktuk. Discussions included the 4 mortality events and how GN DOE and KAA responded to them. It was noted by KRWB and KAA staff that no monetary compensation was offered or provided.
- On 10 November 2022, GN DOE indicated their intent (via email) to deploy 35 collars in spring 2023. GN DOE indicated this number was based on the vulnerable stage of the herd. GN DOE also proposed that collaring occur closer to Cambridge Bay since GNWT was also proposing to deploy collars in their jurisdiction on Victoria Island.
- On 9 December 2022, GN DOE provided draft research proposals (via email) indicating their intent for DU deployment to occur in April 2023. At this time, GN DOE indicated that letters of support were needed.
- On 30 August 2023, GN DOE hosted a meeting with EHTO and KRWB staff (via remote videoconferencing) that KAA was unable to attend. During this meeting, GN DOE initiated a discussion on how to approach DU caribou mortalities, and suggested options for EHTO and KRWB. EHTO voiced their concerns about mortalities occurring during collaring research, which are indicated in this submission. GN DOE proposed acceptable mortality rates and thresholds, where once a threshold is reached, research would no longer proceed and any remaining collars would be deployed the following year.

- *EHTO had a discussion on 31 August 2023 and did not want to support GN DOE on DU caribou collaring until the mortality issue is resolved. EHTO does not want to see their membership lose any DU tags.*
- *On 6 September 2023, GN DOE indicated to KRWB, EHTO, and KAA (via email) that “the GN supports the following two options for an NWMB submission: 1) keeping 4 additional tags in reserve for collar mortalities, or 2) seek approval from NWMB that any mortality from collaring will not be removed from the TAH.” GN DOE also recommended that the submission be made by HTOs and KRWB because of the lost opportunities for hunting when a mortality occurs, and that submissions should be made by the organizations requesting the change.*
- *On 20 September 2023, EHTO executives met with a KRWB staff member (via Microsoft Teams) to initiate a draft submission to NWMB.*
- *On 11 October 2023, EHTO executives met with a KRWB staff member (via Microsoft Teams) to discuss, review, and finalize a submission to NWMB.*
- *On 18 October 2023, GN DOE indicated (via email) that it is their “recommendation that animal mortalities during collaring operations not come of the TAH.” They also indicated that this recommendation would not create a conservation concern because collaring mortalities are usually a very low number.*

Recommendations:

- Inuit view animals not only as meat, but also opportunities and relationships that need to be respected, cultivated, and maintained over time. Co-management partners must keep this in mind when using tags to represent animals.
- A mortality that occurs during DU caribou research should not be considered part of a TAH. Animal mortalities during research should be considered rare events. A DU caribou mortality that occurs during research is an unintended event rather than a harvest.
- For every DU caribou mortality that does occur during a GN DOE research project, the animal must be promptly butchered by a local Inuit research participant and the meat must be brought back to the nearest HTO. GN DOE must also provide monetary compensation to the nearest HTO to acknowledge (rather than substitute) the lost hunting opportunity when a mortality occurs. This compensation should occur regardless of whether the mortality is counted as part of a TAH. The value of caribou is priceless and the appropriate amount of compensation needs to be determined in collaboration with the HTO.
- *For all mortalities, animals must be biologically sampled and, if possible, autopsied to confirm causes of death. Local observers are also knowledgeable about and able to verify causes of death.*
- IQ can inform the design of research projects to minimize mortality risk. EHTO can be consulted for their knowledge of when and where collars could be deployed to reduce mortality risk (e.g., at water crossings).
- DU caribou collaring research should not proceed without the explicit support of local HTOs, and the inclusion of at least 2 local participant observers recruited by the HTO for fieldwork. HTOs and their recruited observers should have the authority to pause or cancel research activities if they observe mortality risks, unusual mortality events, and/or research conditions that violate the conditions of their research support (e.g., as indicated via letters of support).
- During fieldwork, GN DOE must provide daily updates to local HTOs.
- All GN DOE staff and their contractors that conduct wildlife research should be mentally and physically capable, take their work seriously, and respect Inuit, wildlife and the land that they need to work with.
- When requesting Letters of Support, GN DOE should be requesting support not only for research activities but also when, where, and how collaring data will be used, shared, and published, for example, in collaboration with land use projects and proponents. GN DOE should also disclose what kinds of information might be collected from captured caribou when they are being collared (e.g., how long caribou are restrained for). HTOs cannot make informed decisions on whether or not to support research when they do not know all of the risks and how the resulting data might be used.
- Inuit hunters and elders collectively share and hold information on current caribou population distributions and trends. There is a need to improve support for and reliance on research that documents IQ and traditional knowledge in a way that is led, analyzed, and shared directly by HTOs or RWOs, in support of their responsibilities under the Nunavut Agreement. Most IQ research involves information that is extracted and reinterpreted by non-Inuit organizations to meet non-Inuit management objectives and priorities. Published IQ research also has a tendency to replace community consultations. When this happens, important aspects of IQ on how and when to use community-sourced information is lost.

- GN DOE must provide all wildlife handling and sampling protocols and research permits associated with a research project to the local HTOs and KRWB that they are requesting support from. For DU caribou, this includes permits that are acquired in the Northwest Territories and under the Species at Risk Act.

References:

CARMA. 2008. Rangifer Health and Body Condition Monitoring: Monitoring Protocols Level 2. CircumArctic Rangifer Monitoring and Assessment Network. 54 p.

GN DOE. 2021. Dolphin and Union caribou 2021 collaring, Kugluktuk — August 24–26. Field Report. Prepared by: A. Roberto-Charron.

GN DOE. 2018. Dolphin and Union caribou (Rangifer tarandus groenlandicus x pearyi) 2018 collaring (NWRT Project Number : #2-18-10). Nunavut Wildlife Management Board Final Project Report. Prepared by L.M. Leclerc.

Northwest Territories Environment and Natural Resources Wildlife Care Committee. 2011. Standard Operating Procedure. Capture, Handling & Release of Caribou. Version 2. Prepared by M. Cattet.

TAEM, 1996. 1995/1996 Year One Progress Report. Development and Application of Animal Borne GPS Technology on Woodland Caribou. A report of the Research and Development Committee of Manitoba Hydro.

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Submitted by:



Peter Evalik, Interim Chair
 Ekaluktutiak Hunters and Trappers Organization

Date: 3 November 2023

Wildlife Telemetry in Nunavut – Barren-Ground Caribou



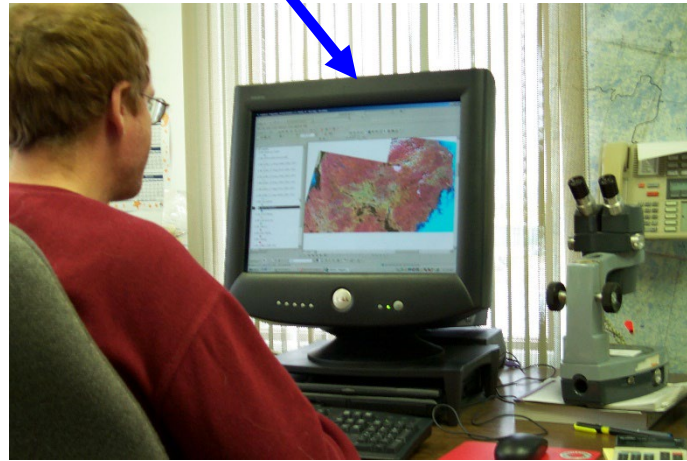
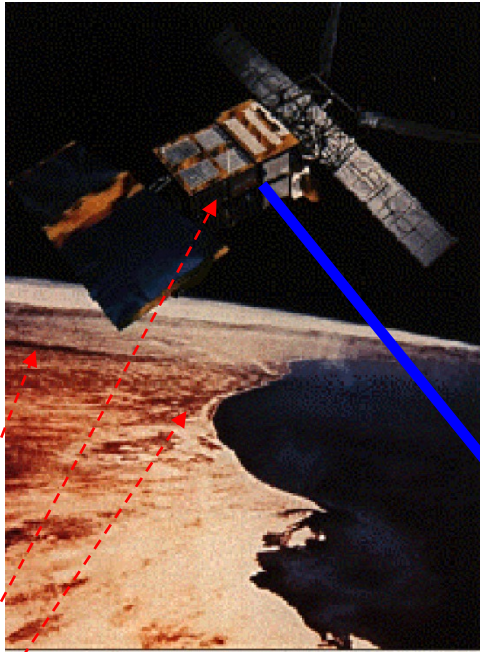
Prepared by: Mitch Campbell
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Ph: (867)857-3171

Some of the contents of this presentation contain draft results and are not to be cited, published or distributed without written permission of the GN ENV.

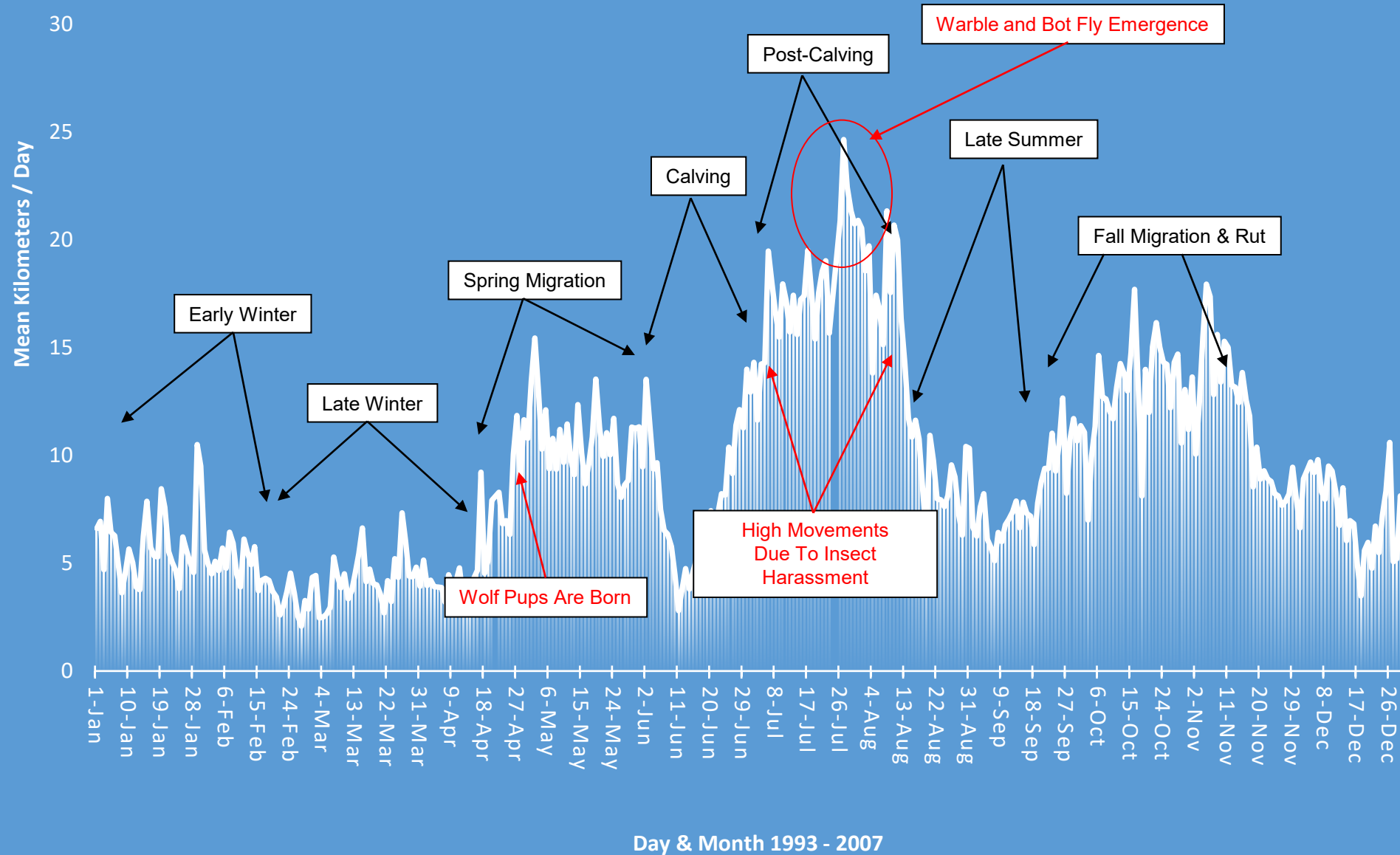
Telemetry Based Studies - Overview





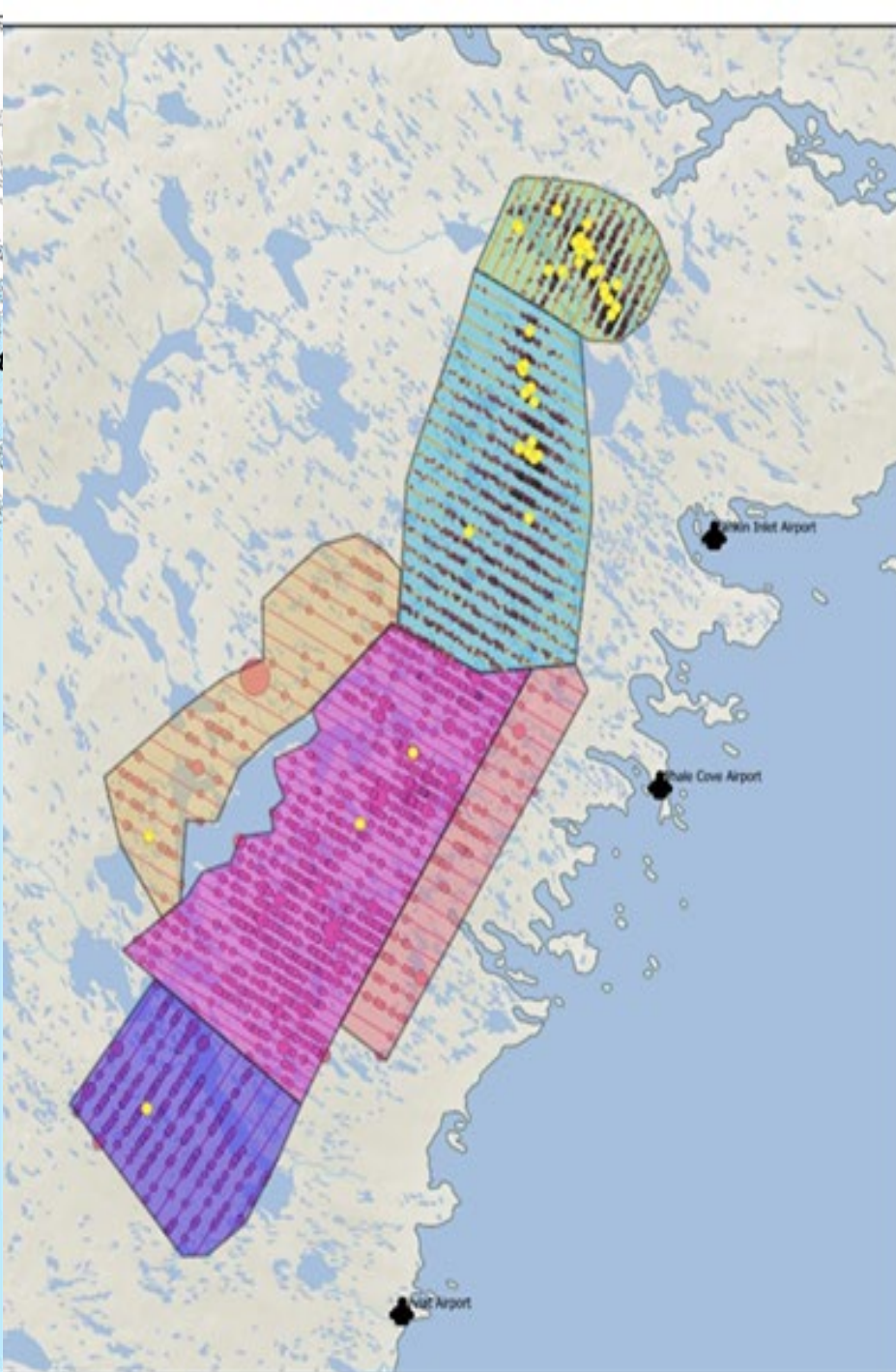
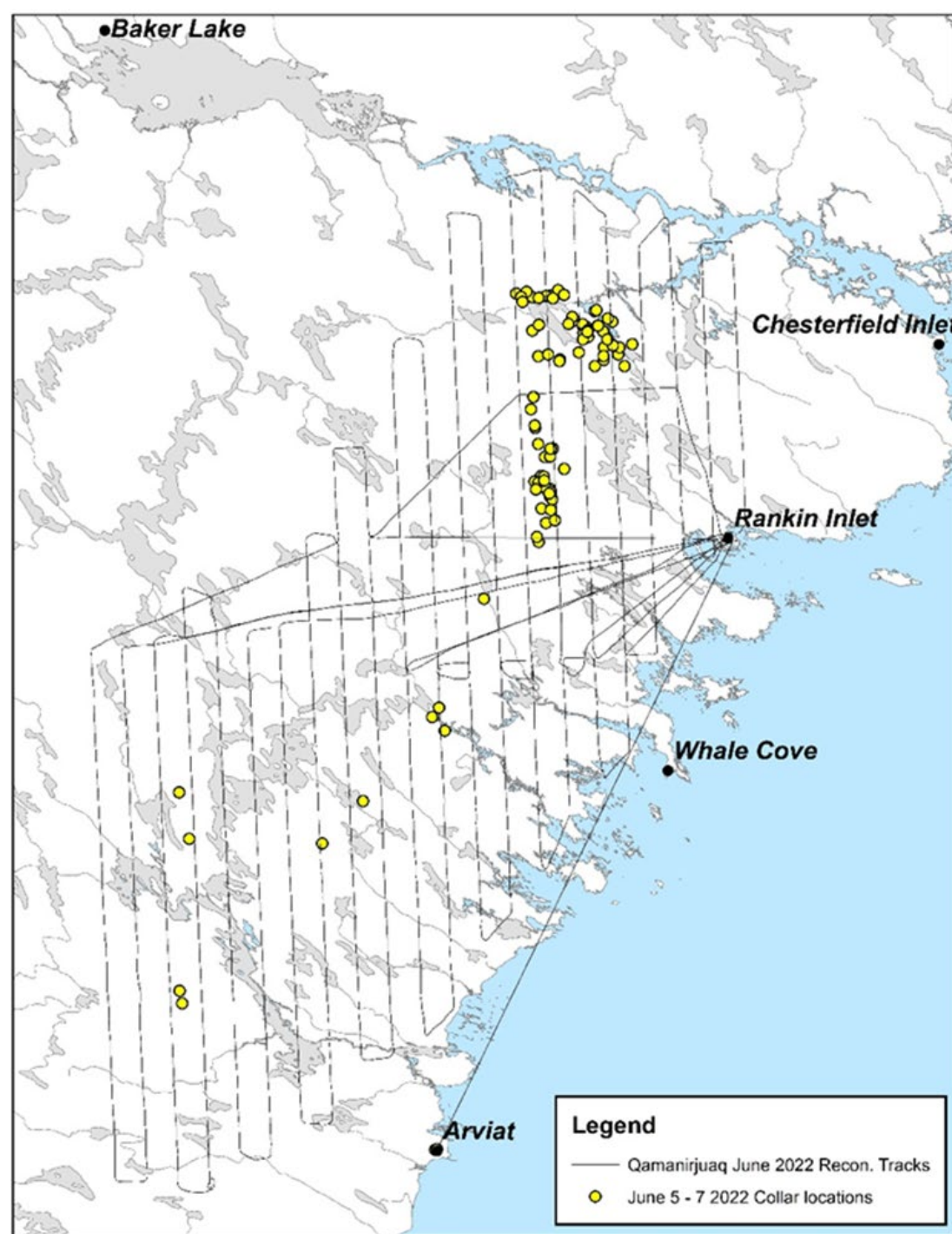


QAMANIRJUAQ CARIBOU MOVEMENTS (KM / DAY)



Caribou Research Programs





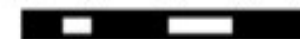
Legend

- Collars locations June 8, 2022
- caribou counted on photos

Visual transects (group size)

- 1 - 16
- 16 - 32
- 32 - 47
- 63 - 79

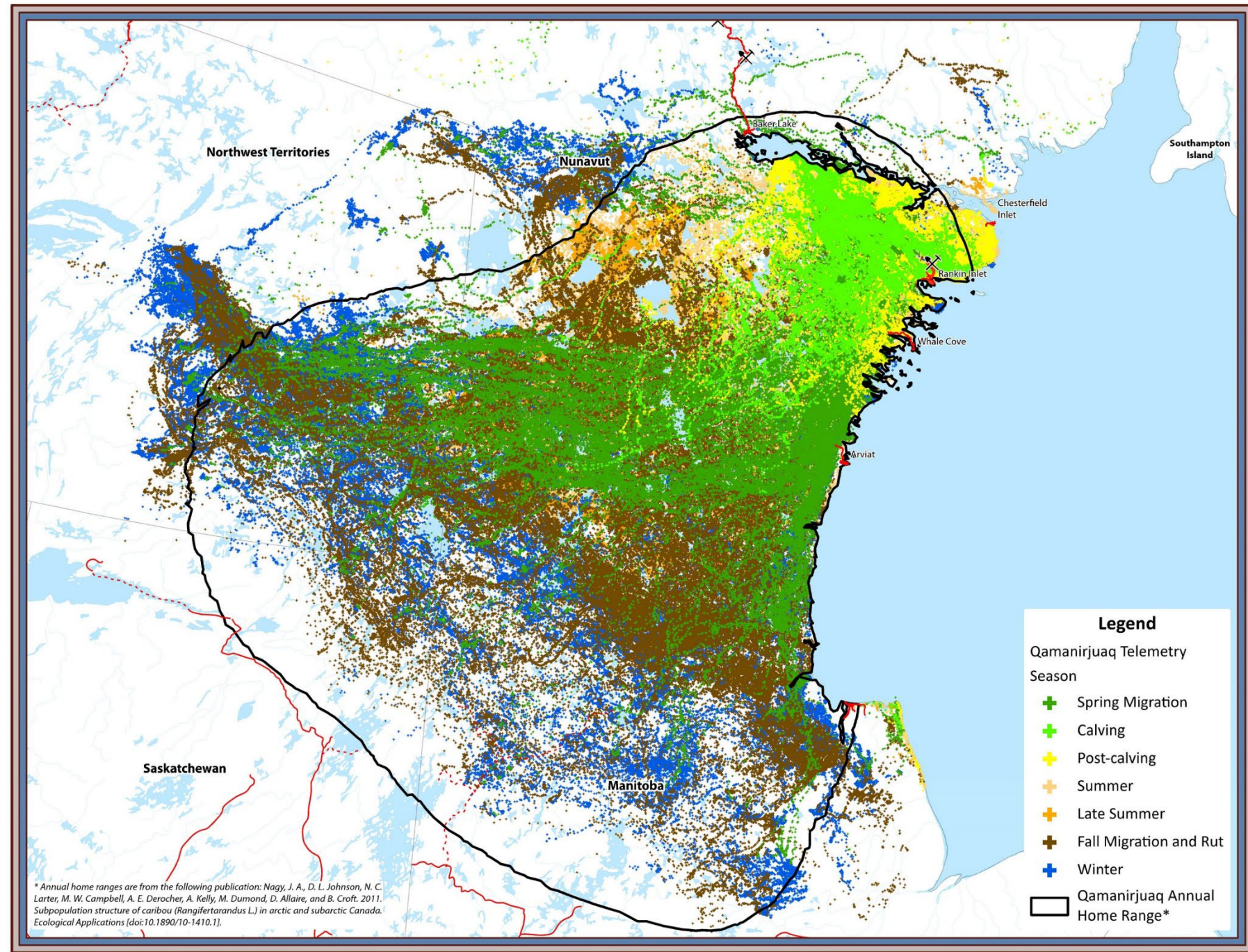
20 0 20 40 60 km



Caribou Range Studies

	Season	Date Range
	Spring migration	Apr 15 - Jun 8
	Calving	Jun 9 - 22
	Post-calving	Jun 23 - Jul 3
	Summer	Jul 4 - Aug 22
	Late Summer	Aug 23 - Sep 16
	Fall migration, pre-breeding	Sep 17 - Oct 18
	Rut/Breeding	Oct 19 - Nov 6
	Fall migration, post-breeding	Nov 7 - Dec 15
	Winter	Dec 16 - Apr 14

Qamanirjuaq Caribou Telemetry Based Annual Range



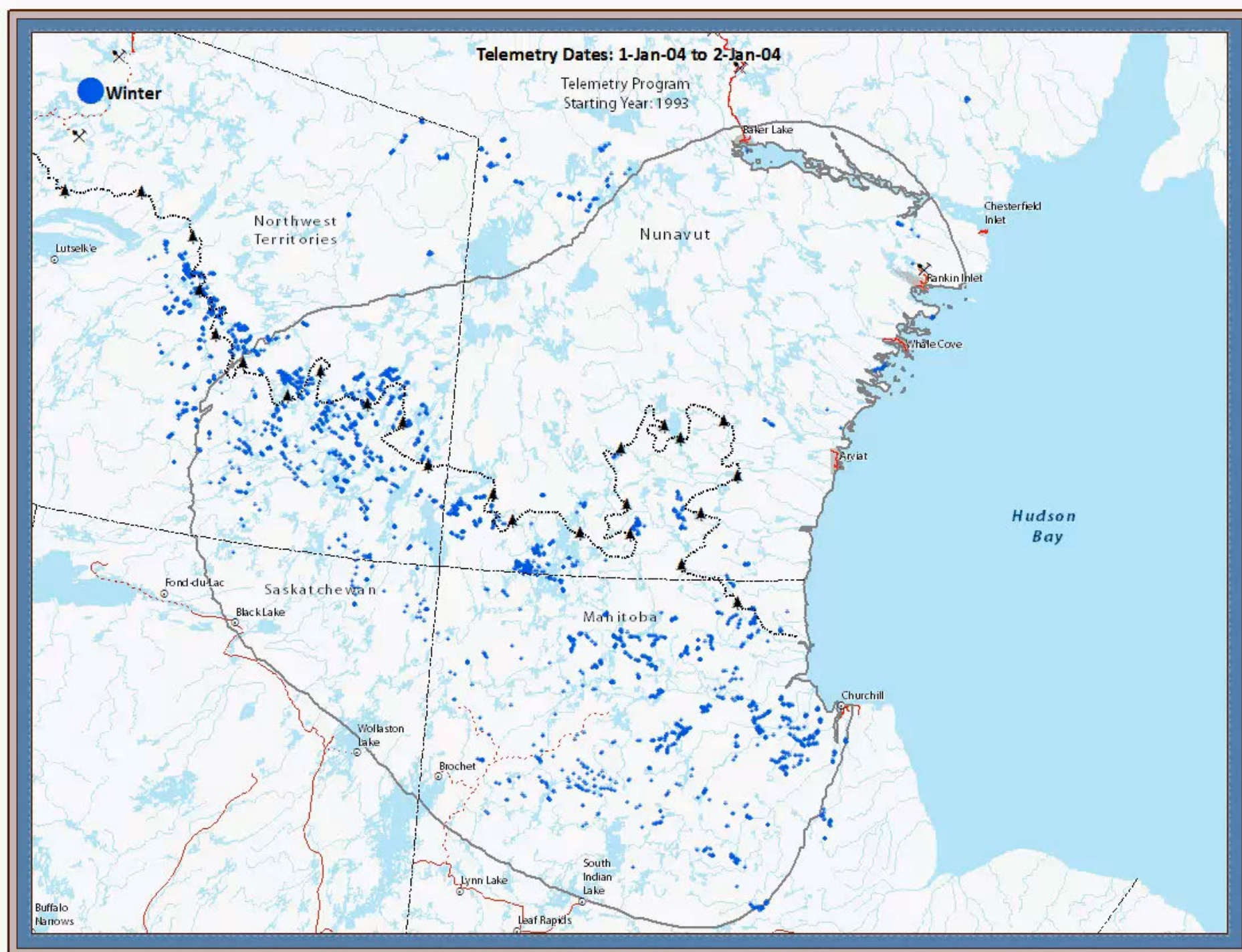
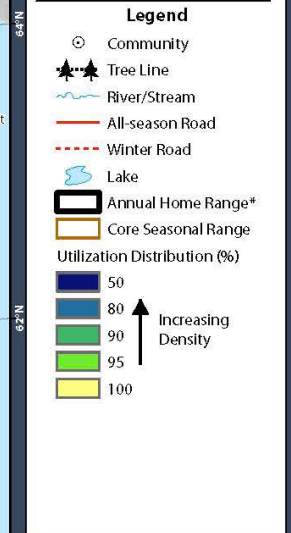
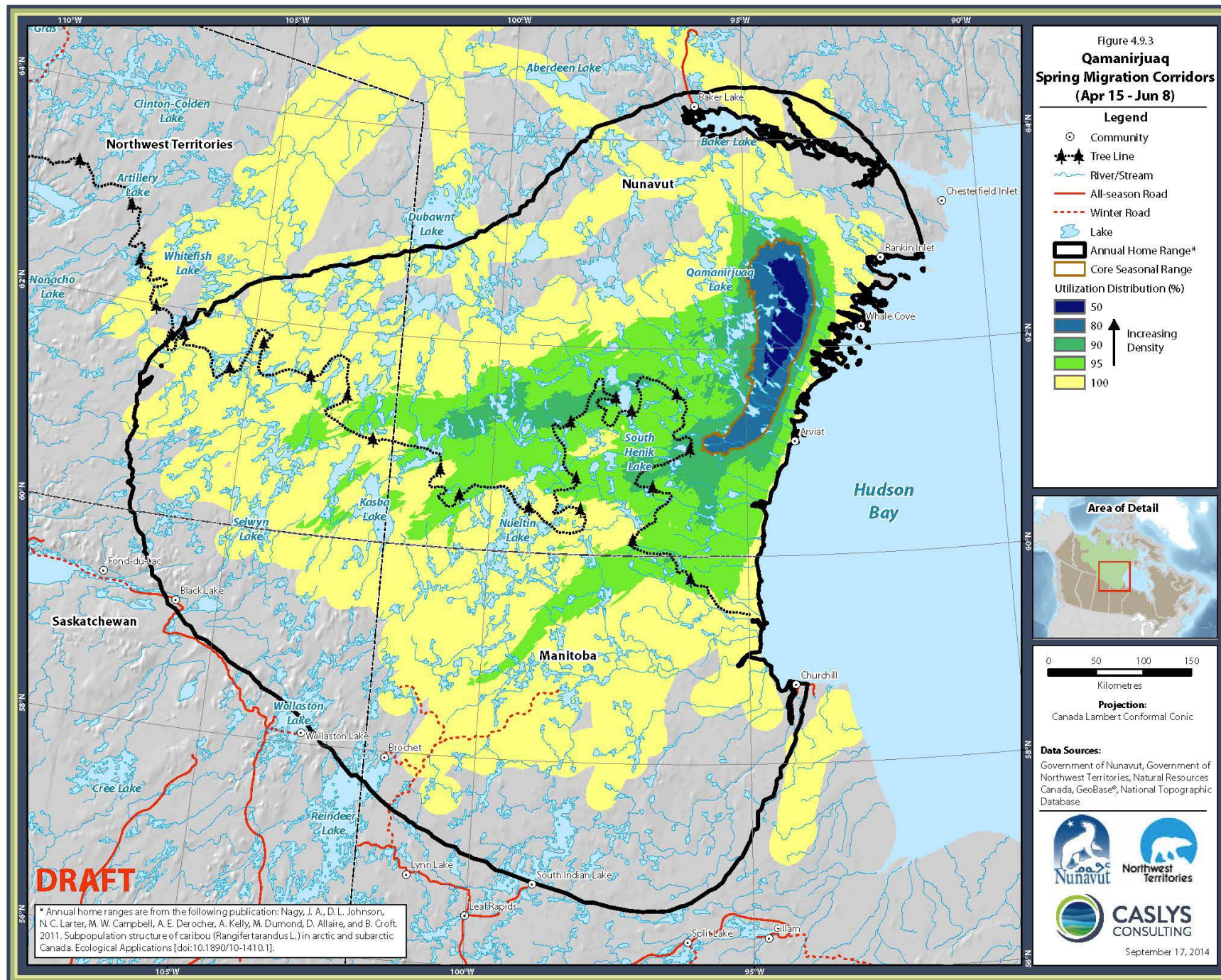


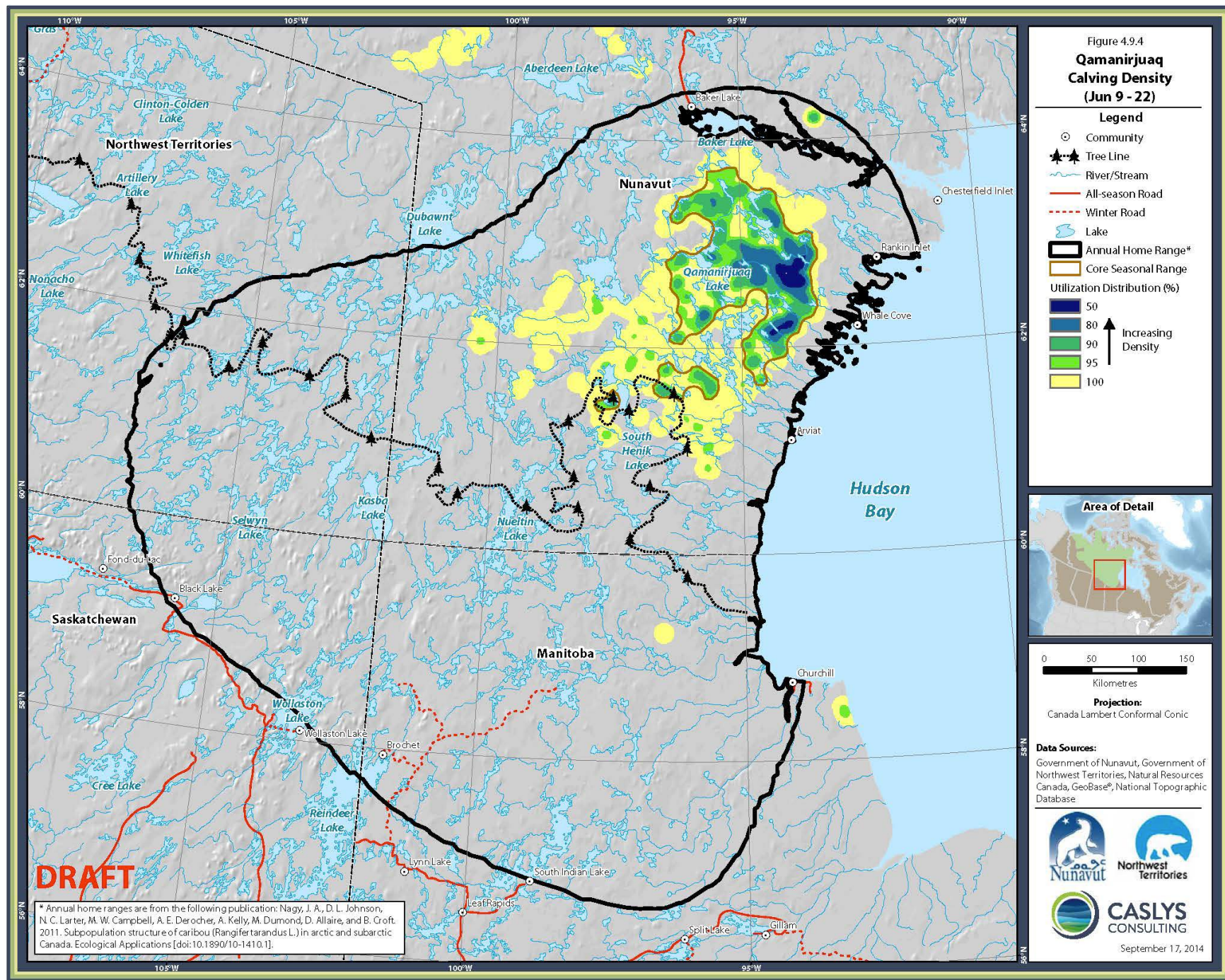
Figure 4.9.3
Qamanirjuaq
Spring Migration Corridors
(Apr 15 - Jun 8)



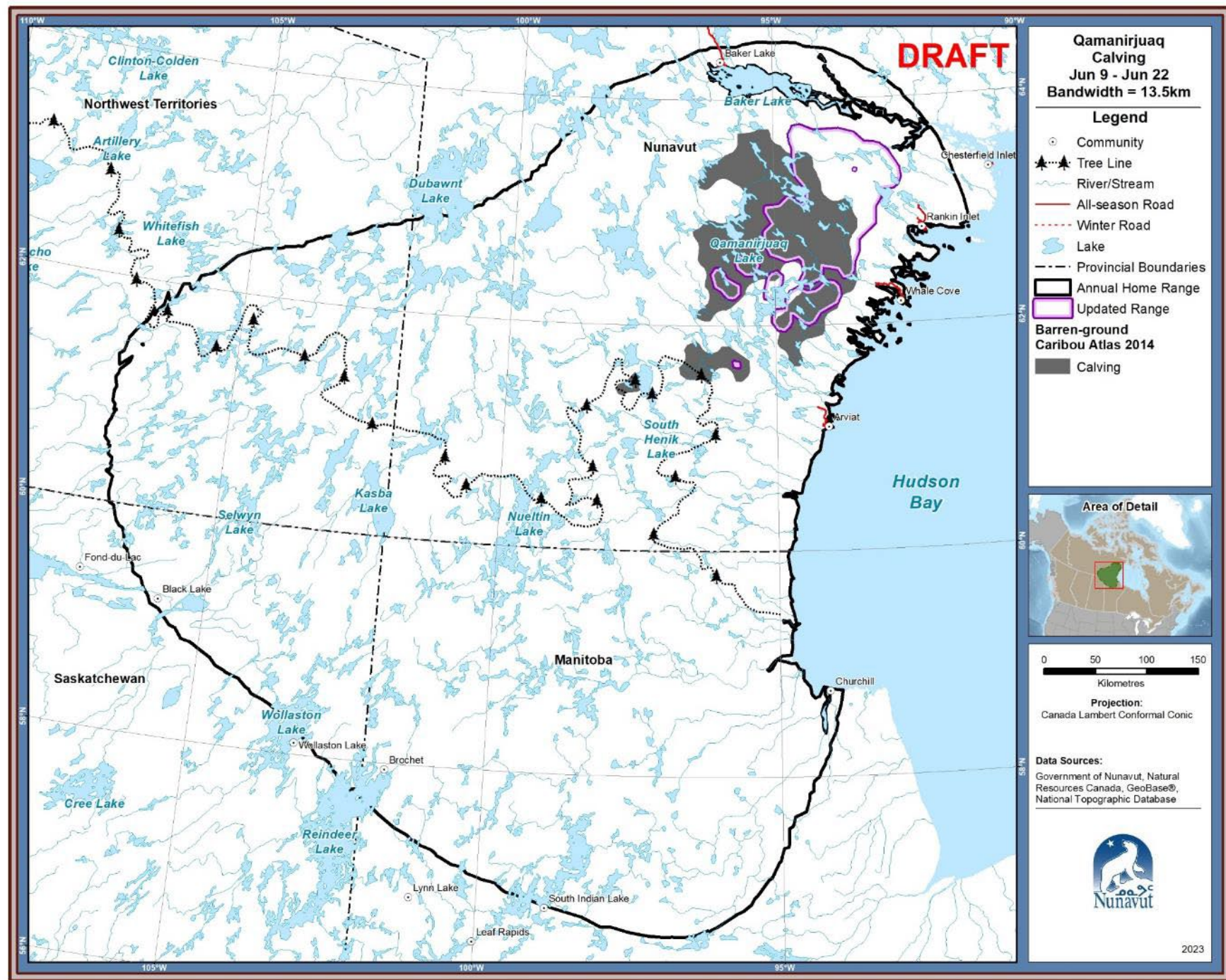
Data Sources:
 Government of Nunavut, Government of Northwest Territories, Natural Resources Canada, GeoBase®, National Topographic Database

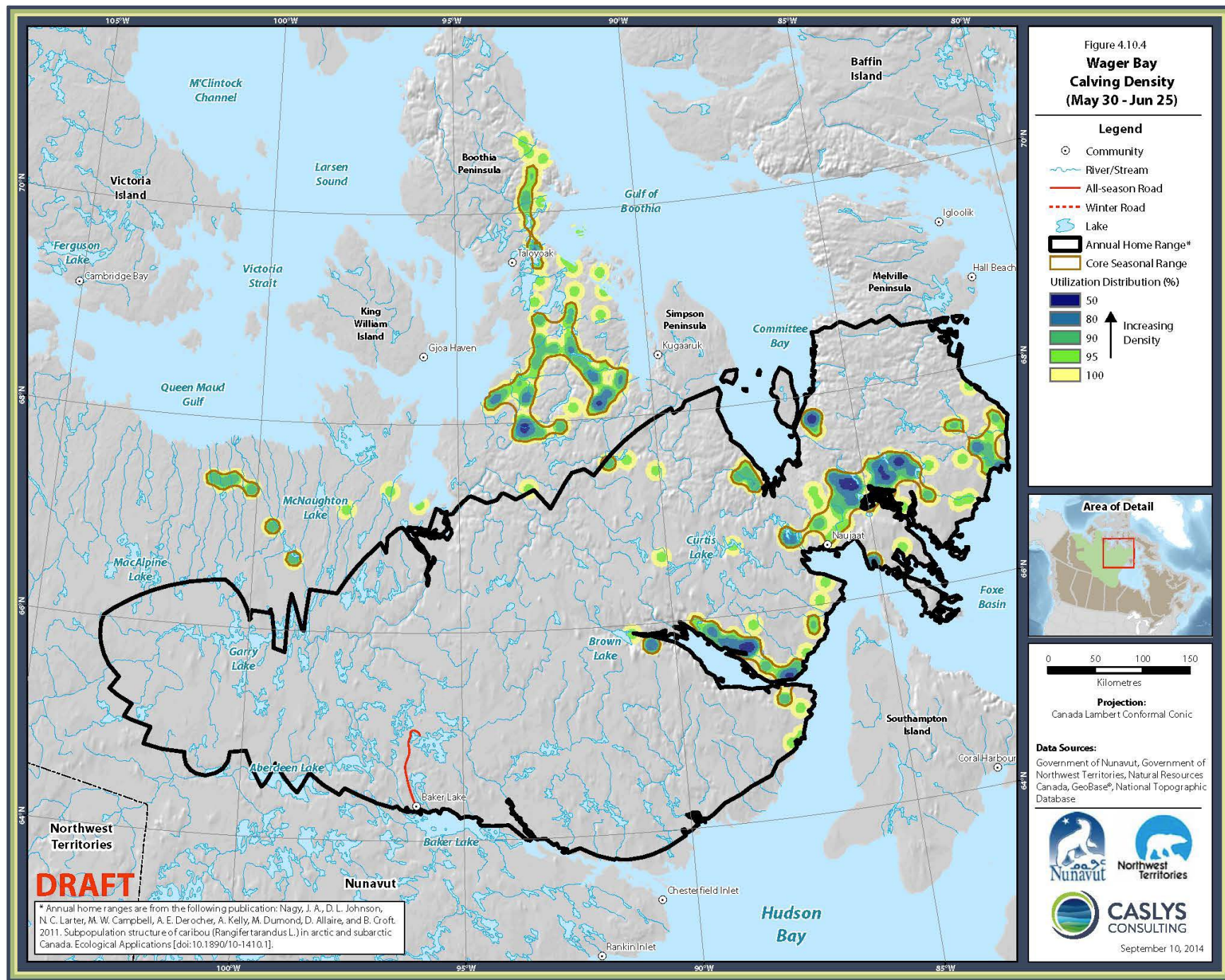


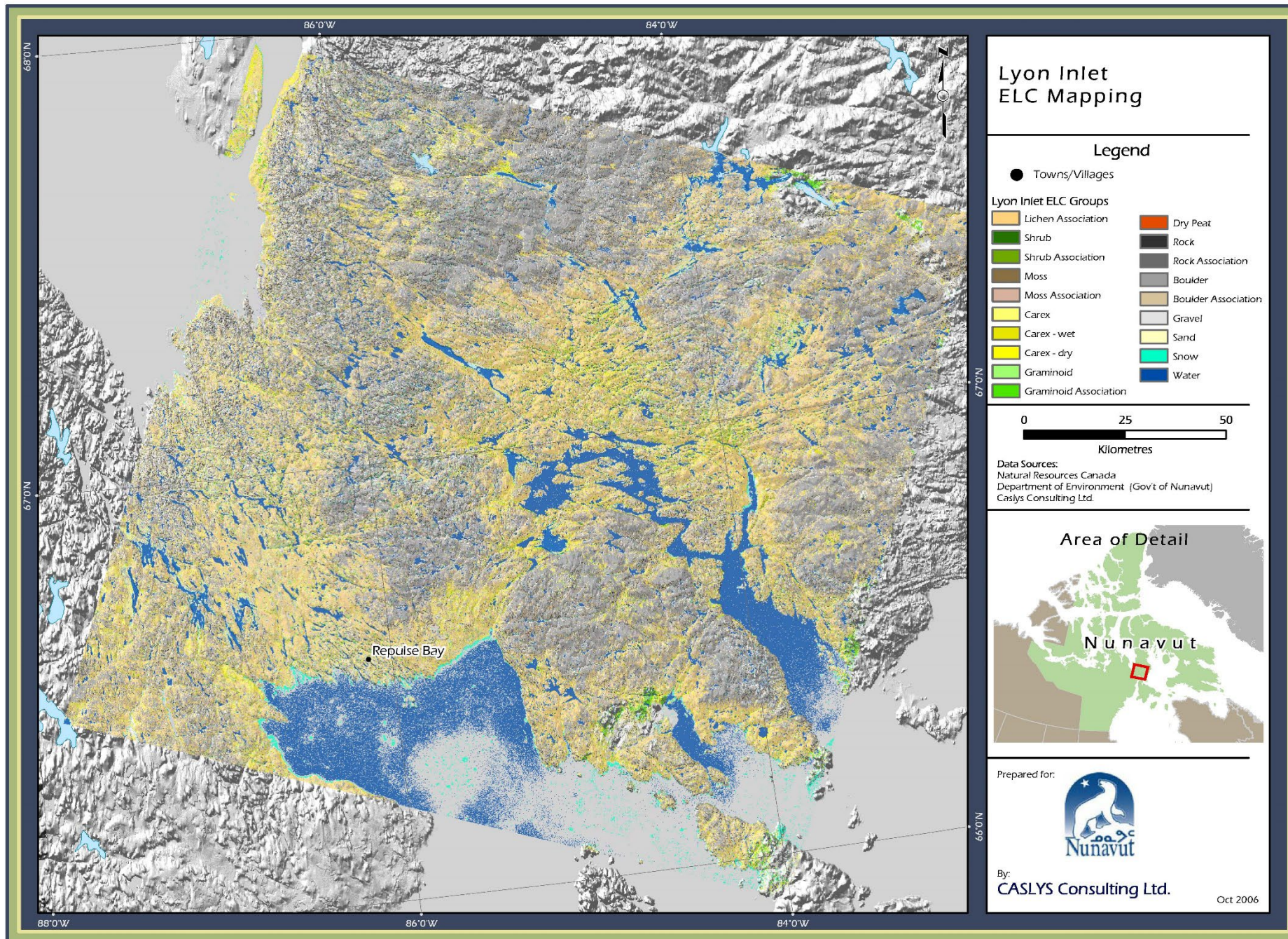
* Annual home ranges are from the following publication: Nagy, J. A., D. L. Johnson, N. C. Larter, M. W. Campbell, A. E. Derocher, A. Kelly, M. Dumond, D. Allaire, and B. Croft. 2011. Subpopulation structure of caribou (*Rangifer tarandus* L.) in arctic and subarctic Canada. *Ecological Applications* [doi:10.1890/10-1410.1].



Cal



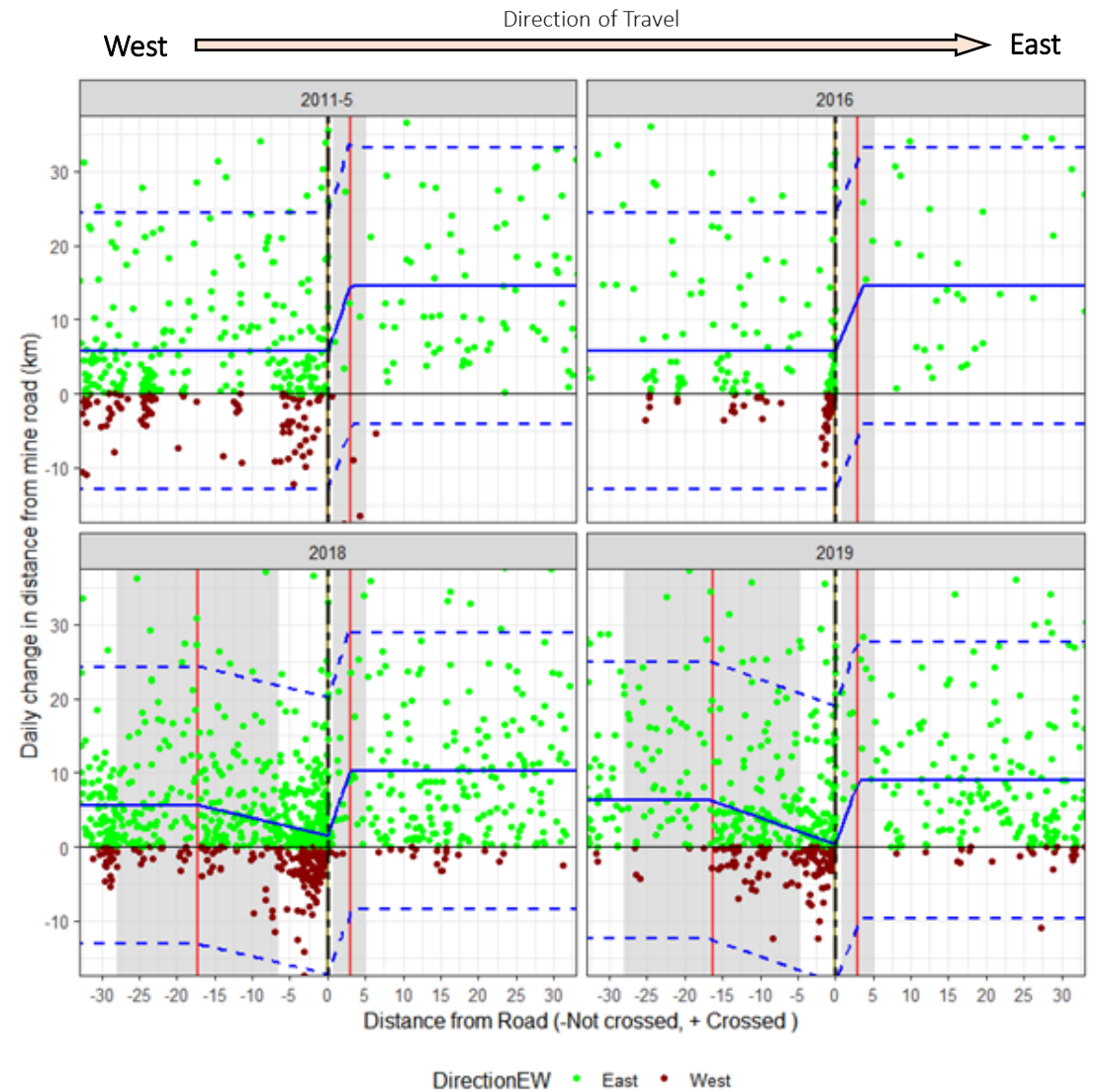
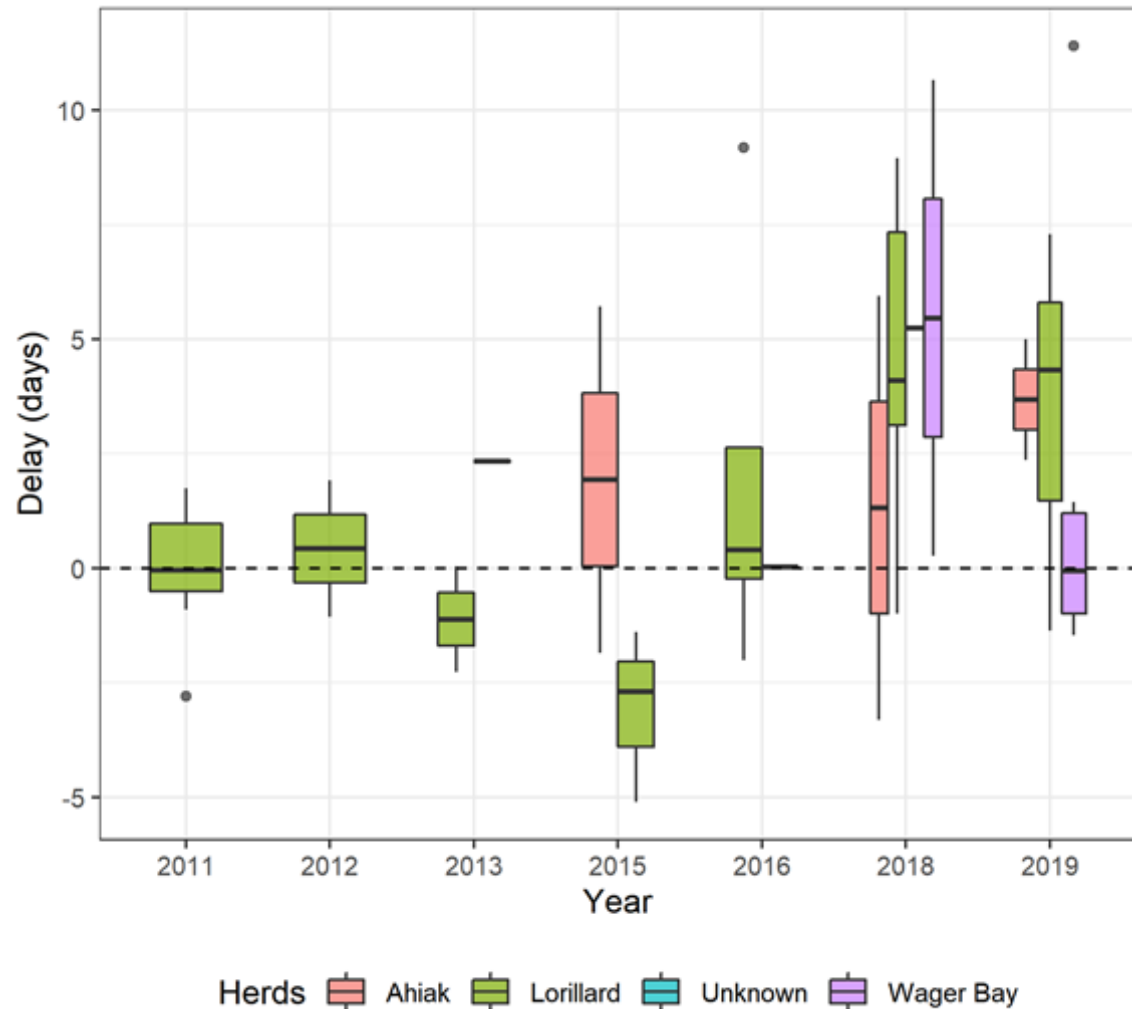




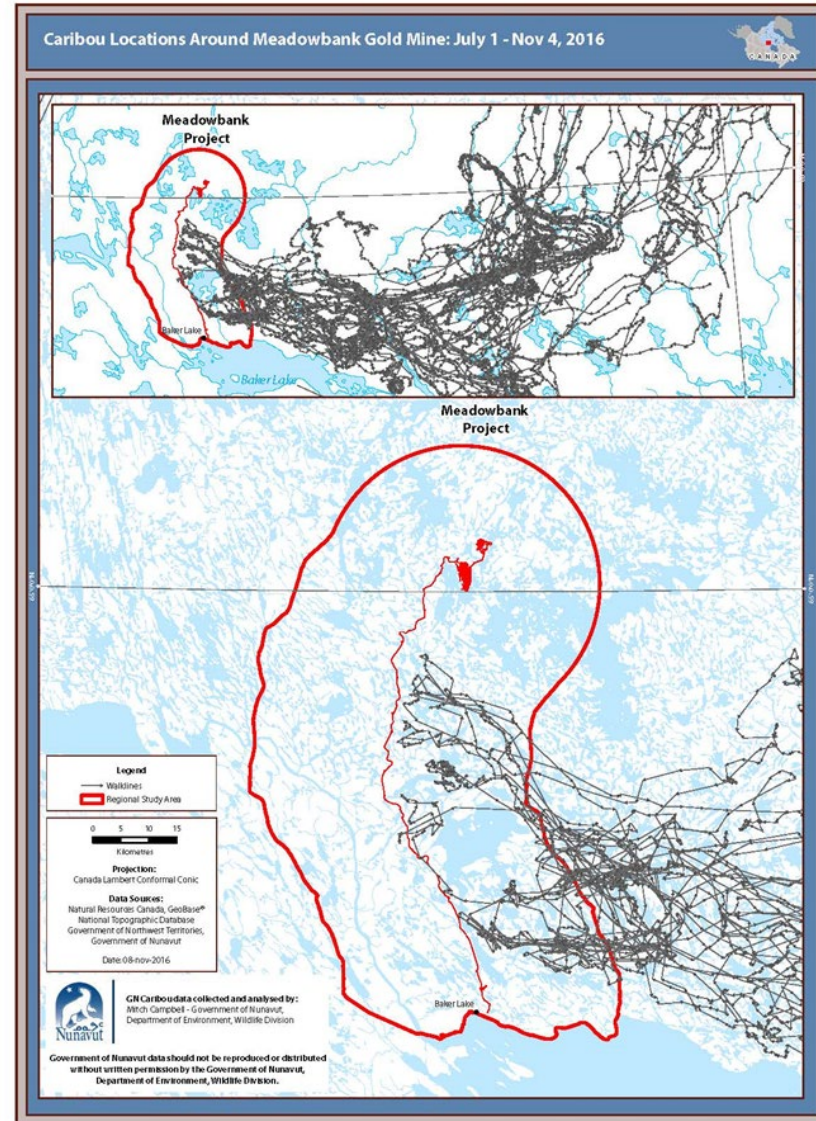
Land Use Planning

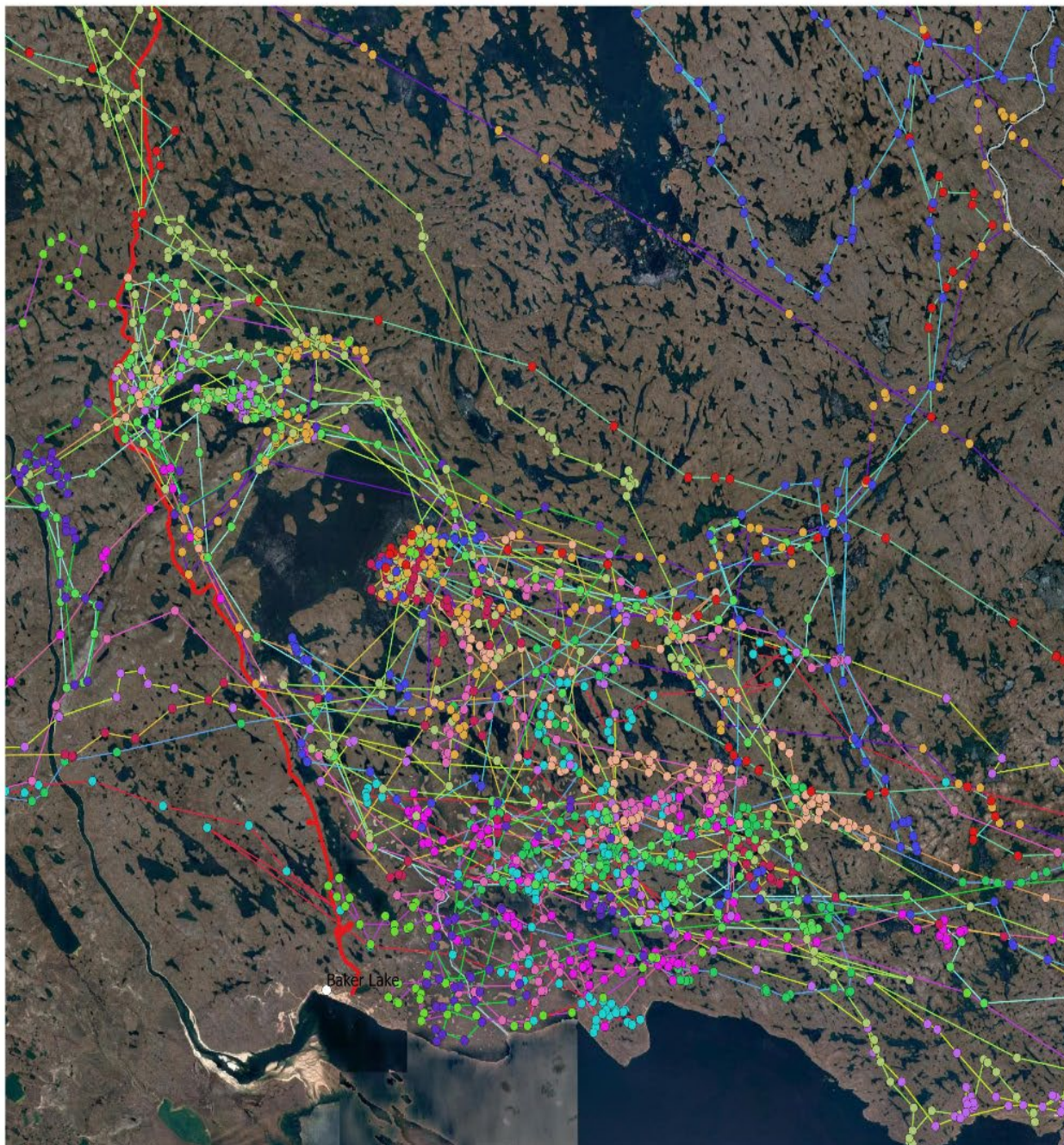


Significant Impacts Found



Impacts of Roads on Migration





Legend

Caribou collars

- BL0600415
- BL0640415
- BL0730416
- BL0750416
- BL0760416
- BL201733
- BL2018002
- BL2018003
- BL2018004
- BL2018005
- BL2018011
- BL2018013
- BL2018016
- BL2018017
- BL2018020
- BL2018024
- BL2018054

**August 15th through
November 17th,
2018**

10 0 10 km





Kugluktuk Angoniatit Association • Hunters' & Trappers' Organization

PO Box 309, Kugluktuk NU X0B 0E0 • Phone: (867) 982-4908 • Email: kugluktuk@krwb.ca

**TOGHIKTOTAT TATVUNGA NUNAVUMI ANGUTIGHALIKINIKUT MUNAGHIYIOVLOTIK
KATIMAYIITNUN
KATIMANIAKTITLUGIT RM-004-2023
NOVAIPA 29, 2023**

pitjutaoyok

TOHAKTITJUTIIT:

IHOMALIOKUTAT: X

PITJUTAoyok: Kugluktuk Angoniatit Katimayiit (Kugluktuk HTO-kut) toghiktatat talimanik illalioiyoghanik Aghaknik Aliahukhutik Anguniaktot Ataataghaitnik.

HIVUNIGHTJUTIIT TATVALO ATOGAoyOT:

Kangahaak ukkiut atoktitlogit, Kugluktukmiut Inuit takkuhimaliktot amigaikpalianinganik aghaitnik kaningani Kugluktup hillatani. Takkuyaokataghotik hapkua amiyuut aknaluit miggaiyakaktonik amihunik.

Aghait takkughaonginaktotli tuktuut nugiokviitni tatvalo nayogagiyaitni hapkua umingmaat.

Ukkua Nunavut Kavamatkut havagihimayaat aghait naunaiyaotaitnik kaningani Kugluktup 2008-09-mi taitai 2021-mi. Naunaiyaihimangmatjuk tatvani 2021-mi takkunaktot hapkua amigaikpalighimaliktot Aghait kaningani Kugluktup. Tatvani 2008-09-mi naunaipkutait imaitot talimaat avatkumayot aghait nahautait 5.6/1000 km² tatvalo 2021-mi tahama nahautait 6.6 aghait/1000 km². Naunaiyaotait takkunaktot hapkua aknaluit Aghait amigaikpalighimaliktot, and there is no significant increase in the male population. Una kangahanuak naonaiyaktaohimayot hapkuagok aghait annaomavalaakpaliktot amihunik ukkiunik. tatvani 2021-mi, 17-guyut aghait tigoyaoffaghimayot tatvanganin 2008-09-mi naunaiyaktaohimayogaluit.

Tatvani Kavamatokatkut Angutighat Umayoniklo Kayagiyaovaliyot Maligaatni, Aghait tiitigaktaohimaliktot Ihomalotaolalighotik. Hamna naonaipkutaongitok ikpigiyaitnik hapkua nunaliit takkukataktaitnik tahamani ukkiuktaktumi. Hamna kangahaak Nunavut Kavamatkut naonaiyaotaitni tatvalo nunaliitnin naonyaiyaghimayok hapkuagok aghait amigaitilangit amigaikpalianginaktot , tahamanivalaat Kugluktup kaningani.

tatvani 2020-mi, ukkua Nunavumi Angutighalikinikut Munaghiyiovlotik Katimayiit ikkayoghioingitait ukkua Kitikmeot Aviktoghimayomi Angutighalikiyiit Katimayiit toghiktatat huli illalioiyomavlogit hapkuninga talimanik alliahutaovlotik anguniakutighaitnik ataataghanik tatvagok tamaita hapkua 15-guyut ataataghat atoktaokatangitmata. tahamani Kitikmeoni hadja 15-nik aghaitnik alliahughutik anguniaktot ataataghaitnik avikgoghimayot imatot: Kugluktuk – 5; Ikaluktutiak – 5; Omingmaktok – 2 Kingaok – 3. Ukkua Kugluktuk Anguniaktiit Katimayiit piyagomangitot ataataghaitnik hapkunanga

HTO-kuniit tahamani Kitikmeot Aviktoghimayomi, pitjutigiloaghugo hapkua mamiliokutaongmata anguniaktot munaghihioyoniit tatvalo ahiagot havagiyaotitlogit.

Kugluktuk alliahughutik anguniaktiit anguhimayot kangahaak ukkiuni taimaitot:

2018-19	Malgok angutaohimayot
2019-20	0 anguniangitot; kallakjuaknik hiamaghimatiitlugo
2020-21	0 anguniangitot; kallakjuaknik hiamaghimatiitlugo
2021-22	hitamanik anguhimayot; ataohik ayughaotaoyok maahaknagiighimangmat
2022-23	malgok anguhimayot; ataohik angungitok; malgok taimaaktiktok anguniaghimaitomik
2023-24	talimat anguniakniaghimayot attilioghimaliktot upingaami tikkitiaktot

Una nunaliitni anguniaktioyonik nanminikaktok nigioktok tamakigomavlogit hapkua talimat ataataghat angotighakatoakat nakuniaknahogitait.

Inniktikutighat:

Tatvani Aktopa 24, 2022-mi, Ukkua Kugluktumi HTO-kut katimakatigihimayat ukkua Nunavut Kavamatkut anguhikiyiit naonaiyaiyoyok okaotigivlutjuk hapqua 2021-mi naonaiyaotaohimayot.

Uqqua Kugluktumi HTO-qut huli tohagaghaitniq hapqua angunahuaqtiit tatvalo Havaqviat Avatiliqiyiit havaqtiit Kugluktumi tatvalo una niqqainaqtuqtiniq anguhikiyiit naonaiyaiyoyuq.

ATOLIKUITJUTAIT:

Kugluktumi Anguniaqtiit Qatimayiit pitquiyugaluit uquninga Nunavumi Angutighaliqiniq Munaghiyiovlutiq Qatimayiit angiquvlutjuq hapqua talimat aghait ataataghait alliahughutiq anguniaqtiit atugaghaitniq.

Uqqua Kitikmeoni Aviqtuqhimayumi Angutighaliqiniq Qatimayiit iqqayughiotihimayaat hamna toghiqututigiavut.

Taitai huli talimaniq ataataghaniq alliahughutiq anguniaqtiit atugaghait huli manighiotaoniaqmata nunaptini; iqqayutauniaqmatlu iqqiqlimanahuaqlugit hapqua aghait amigaitilangit taimatotaug hapqua aghait tuqtuliquivalangitangita tuqtut nogioqviitni tatvalu tuqqutivalangitangita umingmaaqniq umingnait nayugaitni.

Hanaqihimaya umma:

Amanda Dumond

Ataniuyuq, Kugluktumi Angoniatit Qatimayiitni

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- [illegible]

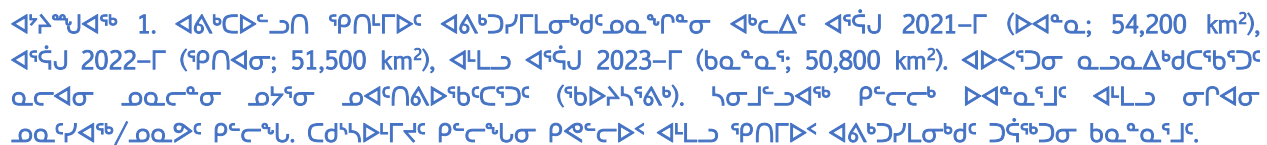
የዋናው ምርጫ ምክር ቤቅ ለጥቅምት 10 ቀን ውስጥ ምርጫውን ያካሂዳል።

- ሲሞላ፣ ሄክቶጋራዊና ሆሮ ለፍጥነት ደረጃውን ለማረጋገጥ ለሚያስፈልጉት ልዩ ምርመራዎች ሊደረጉ ይችላሉ።
- በባህሪያዊ ምርመራዎች ውስጥ ደረጃውን ለማረጋገጥ ለሚያስፈልጉት ልዩ ምርመራዎች ሊደረጉ ይችላሉ።

- 15 ዲፎርሞሽን ዲፕሎማ ባለቤት የሚሆኑትን የጥራት ማረጋገጫ ምርመራዎችን በጥራት ማረጋገጫ ስርተጥራት (KWRB) ይደረጋቸዋል፡
 - የፊኒሽን ስርተጥራት ባለቤት = 5
 - የፖሊሽን ስርተጥራት ባለቤት = 3
 - የፊኒሽን ስርተጥራት ባለቤት = 2
 - ልዩነት = 5

በጥራት ማረጋገጫ ዲፕሎማ ባለቤት የሚሆኑትን የጥራት ማረጋገጫ ምርመራዎችን በጥራት ማረጋገጫ ስርተጥራት (KWRB) ይደረጋቸዋል፡										
ድረጃ	2019		2020		2021		2022		2023	
	RH	SH	RH	SH	RH	SH	RH	SH	RH	SH
ፍጥነት	11	2	15	-	20	-	3	-	6	-
የፊኒሽን	11	-	12	-	2	-	4	1	3	1
የፖሊሽን	1	1	-	-	1	-	-	-	2	-
በጥራት ማረጋገጫ	1	-	-	-	-	1	-	-	-	-
ጥራት ማረጋገጫ	24	3	27	-	23	1	7	1	11	1
ልዩነት	6	4	7	-	9	-	9	5	5	4
ፊኒሽን				-			1		-	
ፖሊሽን				-					1	
ፍጥነት	7	1	9	-	23	-	5	4	9	2
ጥራት ማረጋገጫ	13	5	16	-	32	-	15	9	15	6

- ዲፎርሞሽን ዲፕሎማ ባለቤት የሚሆኑትን የጥራት ማረጋገጫ ምርመራዎችን በጥራት ማረጋገጫ ስርተጥራት (KWRB) ይደረጋቸዋል፡
- ዲፎርሞሽን ዲፕሎማ ባለቤት የሚሆኑትን የጥራት ማረጋገጫ ምርመራዎችን በጥራት ማረጋገጫ ስርተጥራት (KWRB) ይደረጋቸዋል፡
- የጥራት ማረጋገጫ ዲፕሎማ ባለቤት የሚሆኑትን የጥራት ማረጋገጫ ምርመራዎችን በጥራት ማረጋገጫ ስርተጥራት (KWRB) ይደረጋቸዋል፡

[illegible]

- [illegible]

[illegible][illegible][illegible]

- ሳይከሰቱም፣ ልዩነቶችን በሰነድ ማረጋገጥ ይቻላል። ለምሳሌ፣ ልዩነቶችን በሰነድ ማረጋገጥ ይቻላል።
- ጋራ ምርጫው ላይ ለሚገኙት ሁሉም ምክር ቤቶች ማረጋገጫ ማስገኘት ይቻላል። ለምሳሌ፣ ለምክር ቤቱ ማረጋገጫ ማስገኘት ይቻላል።
- ለምክር ቤቱ ማረጋገጫ ማስገኘት ይቻላል። ለምሳሌ፣ ለምክር ቤቱ ማረጋገጫ ማስገኘት ይቻላል።

- [illegible]

- [illegible]

ᐅᑦᓂᓴ: ᐱᑦᓂᐅ 25, 2023

[illegible]

[illegible]

[illegible]

3. የዎዎኔር ልዩ ስርዓት የጥራት ማረጋገጫ ስርዓት

- [illegible]

[illegible]

4. $\frac{1}{2} \Delta \sqrt{\Delta} \frac{1}{2} \Delta L^2 \leq \Delta L^2 \leq \Delta \sqrt{\Delta} \frac{1}{2} \Delta L^2$

- [illegible]

5. የምጥጥር ስርዓት ለፍጥነት ለሚገባበት

- [illegible]

ጋኅልኤፍጋር ልሊፍ ካግላፍጋረፍ ልፍጋረፍ ጋኅፍጋረፍ፣ ጋረፍጋረፍ 2023 ልሊ ጋረፍጋረፍ 2024.

- [illegible]

[illegible]

ᐅᑦᐅᑦᐅ: ᐅᐅᐱᐱ 11, 2023

