

DENALI NATIONAL PARK AND PRESERVE

CENTRAL ALASKA NETWORK

Vegetation Monitoring Program

Summary Trip Report: Middle Birch Mini-grid

28 July- 5 August, 2008



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Photos by B. Dykstra

August, 2008

PURPOSE:

The purpose of this trip was to install permanent plot monuments and to collect data for the CAKN Long Term Ecological Monitoring Program. We spent the day of July 28th travelling to the minigrid. Between July 29th and August 5th, 2008, we spent 8 days collecting field data.

PERSONNEL:

James Walton -- Crew leader, species composition data (non-vascular plants), soil data, transect cover, tree and sapling measurements.

Brian Dykstra -- Plot photos, quadrat variable estimates, species composition data (vascular plants), transect cover.

Kate Prengaman -- Grid point data, metaplot data, transect cover, tree and sapling measurements, trip/weather report records.

ACCESS TO MINIGRID AND CAMPING POSSIBILITIES:

When we left the office on the morning of July 28th, the weather conditions prevented the fixed wing aircraft from flying to Kantishna. We loaded up the suburban with all of the team's gear, as well as most of the gear for the green team. Wendy drove us, including Peter, out to Kantishna, while Carl and Rich flew in the helicopter directly to the Birch Bend Grid. We reached Kantishna in the early afternoon, and began the helicopter shuttle- it took two trips, 15 minute flight time each, to deliver our crew and gear to the minigrid.



Photo 1. A view of our camp from across this grassy seasonal wetland. Our cook tent was at the other end of this bar or open ground in front of the small, forested ridge.

The helicopter dropped us on a small bar of hard-pack ground along the edge of a small forested ridge between plots 13, 14, 18, and 19. On the map, the area appears as a wetland, but we were pleasantly surprised to find a dry, solid, open area between the grassy pond and the mixed forest on the ridge, and we made our camp along this narrow band. The nearly central location provided us with a reasonable hike to all of the plots in the minigrid.

Although this was a wet grid, most of the water close to our camp was standing still in grassy wetlands. We flew in with several 5 gallon jugs of drinking water so that we had a partial water supply in our camp. These four jugs provided most of our drinking water for the grid. We also pumped and filtered water from the pond between camp and plot 13 and used it for cooking and cleaning. It was not flowing, but the water was deep and reasonably clear. Small ponds and creeks are frequent across the landscape, so anyone with a pump/filter and the willingness to use standing water will not have trouble with water availability.

HIKING:



Photos 2 and 3. Most of the Middle Birch mini-grid looked like this: a landscape of stunted black spruce on moss and lichens with occasional ponds and wetlands throughout.

The Middle Birch minigrid is almost entirely black spruce forest on moss, lichen, and tussock tundra. The hiking was consistent, slow and steady, across this landscape. We had to make many creek and wetland crossings, in which we carefully watched the water level approach the top of our boots as we tested for footing on tussocks and downed vegetation. We also had to navigate around several small ponds, unable to hike directly from plot to plot. Thanks to our creek-cautious approach, we were able to reach every plot in the minigrid with overtopping our boots. Hiking across this grid was also an exercise in being disoriented on the landscape, especially with the low clouds shrouding the sun. It was totally flat, with black spruce as far as the eye could see, making it difficult to remember which direction we were headed and which we came from. On our first day, we took waypoint data for our camp on each GPS and gave one to each crew member, so that we would be able to navigate back to camp, even if we got separated or a device was lost or broken.

WEATHER AND ENVIRONMENTAL CONDITIONS:

The weather was cool and mostly rainy. We even had one morning of frost! The mosquitoes and other flies were still going strong (photo 4).

PHENOLOGY OBSERVATIONS:

It seemed that everything that could be fruiting in this mini-grid, was fruiting (photos 6, 7, 8, 9).

GENERAL NOTES ON PLOT-WORK AND PLOT OBSERVATIONS:

The overall landscape in this minigrid was very consistent. Almost all of our plots were in a stunted black spruce ecosystem, with an understory dominated by *Ledum decumbens*, *Vaccinium vitis-idaea*, and *Rubus chamaemorus* on *Eriophorum vaginatum* tussocks, lichens, and moss. We observed Larch trees in most of the plots, but only a few above breast high were still alive. *Vaccinium uliginosum*, *Betula nana*, *Empetrum nigrum*, *Chamedaphne calyculata*, *Oxycoccus microcarpus*, and *Drosaria rotundifolia* were also frequently observed. Small creeks, ponds, and depression wetlands occur throughout the grid, usually dominated by graminoids- *Calamagrostis canadensis*, *Eriophorum* spp and *Carex* spp. A few small ridges, perhaps formed from sand dunes, broke up the flat landscape- and along these micro-ridges, we observed a mixed tall forest of *Picea mariana* and *Betula neoalaskana*.

We also saw quite a few species in the minigrid which we never found in a plot, including *Iris setosa*, *Arctostaphylos uva-ursi*, *Rosa acicularis*, *Populus tremuloides*, *Cornus suecica*, *Ranunculus gmelini*, *Nuphar* sp., *Alnus viridis*, *Alnus tenuifolia*, *Ribes triste*, *Epilobium angustifolium*, *Carex* spp. and *Utricularia* sp.

Table 1. Collection series for the Middle Birch mini-grid.

Collector	Identifier	Series
Dykstra	Vascular plants	BD104-BD116
Dykstra	Digital Photos	
Walton	Nonvascular collections	JKW series

Table 2. Wildlife Observations.

Date:	Point:	Wildlife:
7/28/2008	Camp	Bear trail and scat observed along the ridge above our camp. Scat does not look extremely recent.
7/29/2008	6	Red squirrel midden at the center of the plot, nearby moose scat. Squirrels chattered at us from the surrounding area.
7/29/2008	1	During our crossing of the beaver-dammed creek, en route to plot 1, we saw an arctic greyling in the grass in the creek. Unfortunately, the fish was dead.
7/30/2008	11, 16	A family of voles lives in the plot. Several voles took turns emerging from holes and running around quadrat C while Brian and James were attempting to collect species composition data. More voles and vole holes were observed at plot 16.
8/1/2008	Camp	We spotted a small wood frog along the forest edge in camp. Luckily, it agreed to sit still for long enough for Brian to catch a picture.
8/3/2008	22	Vole holes in the plot. Large dragonfly flew around and ate mosquitoes :)
8/4/2008	20	James was threaten by a pair of sandhill cranes as he accidentally approached their territory to the south of the plot. They continued squawking at him, and us, for quite awhile.
8/5/2008	13	Fly-over by Canada Geese, honking at us.
8/5/2008	19	Very large squirrel midden just outside the plot. Red squirrels also observed running around on other trees in the plot.
All week	many	Throughout the grid, vole activity was frequently observed. We also hiked across several animal trails on the small ridges and around the edges of the larger ponds.

ACTIVITIES:**Monday, July 28**

Travel Day. We loaded up early at the office. Filling the Suburban with gear for both teams and space for 5 people required some precision packing. Wendy drove with us so that she could bring the Suburban back to HQ after we flew off from Kantishna. It was a long, rainy, muddy drive to Kantishna. We were the second crew to fly, so we finally arrived at our grid and began to set up camp around 3pm. By the time we had all arrived and set up tents, it was pretty late to start a plot. We had an early dinner and went to bed early, so that we could wake up feeling refreshed and ready to go the next morning.

Weather: The weather for our travel day was cold and rainy, but in the late afternoon, the sun came out as we set up camp.



Photo 4. Although we were hoping that the bugs would be dying off for this end-of-season field trip, both the mosquitoes and flies were still going strong at Middle Birch. Luckily, James was prepared—here he is eating lunch in his bug net.

Tuesday, July 29

Plot 6: The plot was on the SE-facing slope of a small, low ridge. The vegetation is tall black spruce forest with a few *Betula neoalaskana*. Several gaps in the tree cover were dominated by lichens. The open understory is mostly *Vaccinium vitis-idaea* on moss and lichens, with some *Geocaulon lividum* and *equarv* as well. A red squirrel midden is located in the exact center of the plot.

Plot 1: We had to cross a beaver dammed, deep and slow moving creek to get to the plot. It was difficult to find a good location to cross that would not have been deeper than our boots. We GPS'd the location of the crossing site we used successfully. The plot is flat, stunted black spruce on moss. The understory is *Ledum decumbens* and *Vaccinium vitis-idaea* with *Rubus chamaemorus* and *Eriophorum vaginatum*.

Plot 2, 7: We re-crossed the creek at the same location and then hiked west to plot 2. Both plots are very similar to plot 1, a flat plot with stunted *Picea mariana* and a few *Larix laricina* on moss and lichens. Understory is dominated by the *Ericaceae*, tussocks of *Eriophorum vaginatum* and *Carex bigelowii*, *Rubus chamaemorus*, and some *Betula nana*.

Weather: Cloudy, cool, buggy morning. By afternoon the clouds turned to a light rain

Wednesday, July 30

Plot 12: We started the day with another flat plot that is very similar to plots from the previous day- stunted *Picea mariana* on moss with an *ericaceous* understory. A few large *Larix* in the plot, only one is still alive.

Plot 11: Located on a very slight slope, facing west toward a small pond. The *Picea mariana* is more dense here, I estimated above 25% cover, including lots of seedlings. The understory seems very similar, however, *Ledum decumbens* and *Vaccinium vitus-idaea* on moss and lichens, with some *Betula nana*, *Vaccinium uliginosum*, *Rubus chamaemorus*, and *Equisetum sylvaticum*. Several voles running around in the quadrat frame in C gave us a good laugh.

Plot 16, 17: We spent our afternoon in two more similar plots, flat and dominated by stunted spruce. In plot 16, there is an increase in sedge cover, and a decrease in forbs. In plot 17, we saw the forbs return to levels more like most of the other plots. There were also a few tall, living *Larix* in the area. There seems to be a far greater number of dead *Larix* than alive, at least in terms of trees that reached breast high. The ratio of dead to alive is distinctly different from the spruce. They appear to be dying off more rapidly than the spruce, although both species do have a lot of saplings.

Weather: Cool, rainy morning after a long, rainy night. In the afternoon we had some breaks from rain, but it remained cloudy, chilly, and breezy.

Thursday, July 31

Plot 5: Located next to a pond, 20% of the western edge of the plot is in the pond. The pond vegetation is *Carex* and moss dominated with *Chamaedaphne calyculata* and *Eriophorum vaginatum* along the margins. Several dead trees were also recorded within the pond zone. The upland 80% of the plot is very similar to the stunted *Picea mariana* forest that we've been seeing in the rest of the grid.

Plots 4 and 3: Two more similar plots and we're really noticing a pattern now. Flat *Picea mariana* woodland with a few *Larix laricina*, on moss, lichen, and some *Eriophorum vaginatum* tussocks. *Ledum decumbens*, *Vaccinium vitus-idaea*, and *Rubus chamaemorus* dominate the understory. On the moss mats, there is *Oxycoccus microcarpus* and *Drosera rotundifolia*.

Plot 8: Not quite flat, this plot is on a very slight south facing slope towards a small depression wetland. The spruce here seem particularly stunted, only 41 reached breast high, and many of those were dead. The understory seems pretty typical however, a few *Eriophorum vaginatum* tussocks, the *Ericaceae*, *Rubus chamaemorus*, moss and lichen. It's been a long, rainy day, and now we're eager to get back to camp for dinner.

Weather: Another rainy night and cold, wet morning. Low clouds and wind. Rain picked up again in the afternoon.

Friday, August 1

We didn't do any plots today. James threw his back out early in the morning, and even carrying a light load, he pretty much collapsed about 200m from our camp. We slowly made our way back to camp, so that James could lie down and rest his back for awhile. Brian and I spent the day sitting in camp, entering data. With one person reading from the paper datasheets, and the other working on the Tablet PC, we entered all of the vascular plant quadrat data, collections, tree and sapling data for the first 12 plots. After a day of rest, James was feeling able to return to work, with a light load, the next day.



Photo 5. Wood frog we found at camp in Friday's sunshine.

Weather: Cool, cloudy morning warmed up throughout the day as the sun came out and dried everything out. Mosquitoes greatly increased however, with the new warmth and sunshine.

Saturday, August 2

Plot 9: Okay, we're back on track this morning. Plot 9 looks strangely similar to several plots we've seen previously. Black spruce on lots of *Eriophorum vaginatum* tussocks, *Ledum decumbens*, *Vaccinium vitis-idaea*, lichens and moss. It's flat, no signs of disturbance or succession, only a few living *Larix laricina*.

Plot 10: Here, on a gentle NNE slope the *Picea mariana* is quite dense, more than 200 trees. The understory remains consistent, but there's a few *Sprirea stevensii*, a new species for the grid, but not much of it. There's no *Larix* in this plot, and fewer dead spruce.

Plot 15: The rain has picked up again, and we've got another typical flat, stunted spruce plot. The understory is dominated by *Ledum decumbens*, *Vaccinium vitis-idaea*, and *Rubus chamaemorus* on moss and lichen, no *Eriophorum vaginatum* tussocks to speak of here. Lot of seedlings, *Picea mariana* and *Larix laricina*.



Photos 6, 7, 8, and 9. Almost everything that could be in fruit seemed to be in fruit this grid. Clockwise, from top left, *Empetrum nigrum*, *Rubus chamaemorus*, *Vaccinium uliginosum*, and *Vaccinium vitis-idaea*

Plot 14: This might have been our record-setting Wettest Plot of the Season. The plot fell in a wide, grassy creek, right along the forested margin, and the rain was pouring. The creek is dominated by tall *Calamagrostis canadensis*, with a few emergent shrubs- *Betula nana* and *Spiraea stevensii*, and struggling, water-logged trees. There are lots of dead *Picea mariana* saplings and a few dead ones large enough to qualify as trees. The north-east edge of the plot borders a small patch of tall, large trees, so we were able to core one *Picea mariana*. A large *Betula neoalaskana* is also leaning over the 6A transect from outside the plot. We caused quite a bit of disturbance to the grassy to the *Calamagrostis canadensis* in the plot when approaching and setting up the transects. In the areas where we had smashed the grass down, we were unable to take accurate cover data, so we had to skip a few damaged sections of our transects.

Weather: Morning started warm and sunny, but dark ominous clouds quickly arrived. The rain began around noon, and picked up steadily until we were drenched in the late afternoon.

Sunday, August 3

Plot 21 and 22: We woke up on a cold and clear morning to a light frost. Plot 21 is a flat plot with denser, healthier (eg fewer dead trees) population of *Picea mariana*, with a few living *Larix laricina* too. The understory was pretty much just our usual suspects-*Ledum decumbens*, *Vaccinium vitis-idaea*, *Rubus chamaemorus*, and *Equisetum sylvaticum* on *Eriophorum vaginatum* tussocks, lichen and moss. Plot 22 was almost identical, except 500m further west.

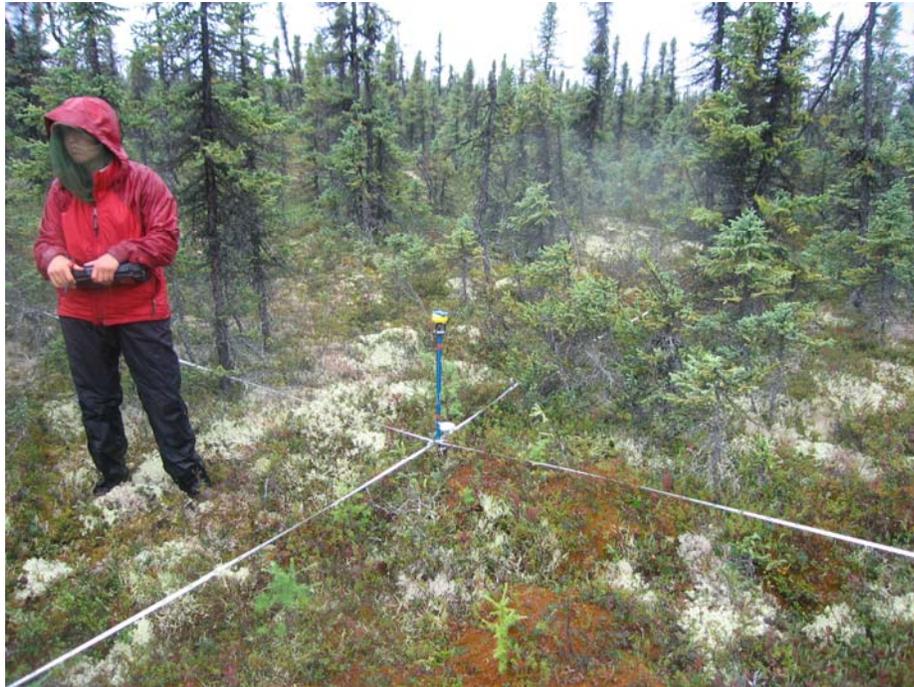


Photo 10. This is a pretty typical plot for the Middle Birch Minigrad. Open, stunted *Picea mariana*, on lichens and moss with lots of seedlings and Ericaceous shrubs.

Plot 23: This plot is a little bit weird. It is a flat, stunted black spruce plot, except that it has several little wetlands in and around it. Mostly, they are not large enough to merit their own Viereck types- just mossy areas with the usual *Ericaceae* and lots of *Chamaedaphne calyculata* with standing water. A slightly larger, sedge and *Chamaedaphne calyculata* dominated wetland winds around the outside edge of the plot, curving from the east around the north, and it received its own Viereck class, and another small patch in quadrant B was classified the same. The upland is open *Picea mariana* with a few *Larix laricina*, lots of *Vaccinium vitis-idaea*, *Ledum decumbens*, lichens and moss beneath, with *Chamaedaphne calyculata* climbing up from the wetter areas. In D, near the center, there is a large, dead area where it looks like many of the shrubs were recently killed. James' hypothesis is that an ice sheet, expanding from one of the nearby wetlands, may have formed here and caused the damage. So we clearly noted signs of disturbance, and possibly shifting ecotones along the tree to wetland border, but the processes in effect were not totally obvious.

Plot 18: Hiking back towards our camp, we returned to familiar territory. It's a mid-density stunted spruce plot on moss and *Eriophorum vaginatum* tussocks, *Ledum decumbens*,

Vaccinium vitus-idaea, and *Rubus chamaemorus* dominating beneath. No signs of disturbance or succession, but lots of swarming mosquitoes and flies taking advantage of the rare sunshine, but we finish this one quick and head back toward camp.

Weather: We woke up to frost- it was quite a cold, clear night. The cold, windy morning was sunny, however, and by the afternoon, everything that had been soaked from the previous day's downpour was drying out

Monday, August 4

Plot 20: This plot is in the center of a small, slow, creek/wetland. The E-W transect runs perpendicular to the creek almost exactly from bank to bank. The wetland is *Chamaedaphne calyculata* and sedge dominated, with a few *Betula nana* on lots and lots of wet moss. A few *Larix* saplings and dying *Picea mariana* are on the upland edge, where it quickly turns into our typical stunted spruce. The young *Larix* on the bank of D look very healthy, while the *Picea mariana* in A on the edge of the wetland are dead and dying. A pair of sandhill cranes are squawking at us to defend their territory just south of our plot.

Plot 25: We've returned to our typical stunted spruce woodland, with a small wetland just reaching the plot's south edge. There's one large clump of *Chamaedaphne calyculata* in B, but otherwise, it's the usual suspects, including rain and mosquitoes.

Plot 24: Located on a very gentle slope towards a small pond, plot 24 occurs in the center of what feels like a clearing. Although there are still a few tall saplings, the area is much more open than the typical black spruce woodland we are used to. There are just as many, if not more, *Larix laricina* than *Picea mariana*, just a few trees above breast high in each quad, and lots of seedlings. The understory is more dominated by sphagnum moss, with lots of andpol, *Oxycoccus microcarpus*, *Drosera rotundifolia*, *Rubus chamaemorus*, and empnig on top of it. The *Vaccinium vitus-idaea*, *Ledum decumbens*, *Vaccinium uliginosum*, and occasional *Betula nana* are all very low as well. Still raining pretty hard, we decided to call it a day early, and head back to camp. We only have 2 plots left to sample, and all day tomorrow, so we are feeling no need to rush.

Weather: The sun didn't last long. Morning drizzle turned into afternoon rain. And the mosquitoes still will not be deterred.

Tuesday, August 5

Plot 13: Suddenly, we're back to rushing. When James called in this morning, we heard from Dispatch that there was a possibility that we could get picked up this afternoon after all. Since we are eager to get out of this wet, buggy swamp, we told them we'd be ready. We've picked up speed and enthusiasm. Plot 13 is on the west side of a larger pond, along the ecotone from tall spruce forest (no sickly, stunted *Picea mariana* here) to the dense tall *Betula nana* and *Salix pulcra* scrub along the pond margin. We were able to core two black spruce trees. Beneath the shrubs, we found *Calamagrostis canadensis* and *Vaccinium uliginosum*. Underneath the tree canopy, it's ledgro and *Vaccinium vitus-idaea* on moss, with

some shorter *Betula nana*, *Salix pulcra*, and *Vaccinium uliginosum* as well. No signs of disturbance or succession.



Photo 11. Kate looking excited about our discovery of this large red squirrel midden.

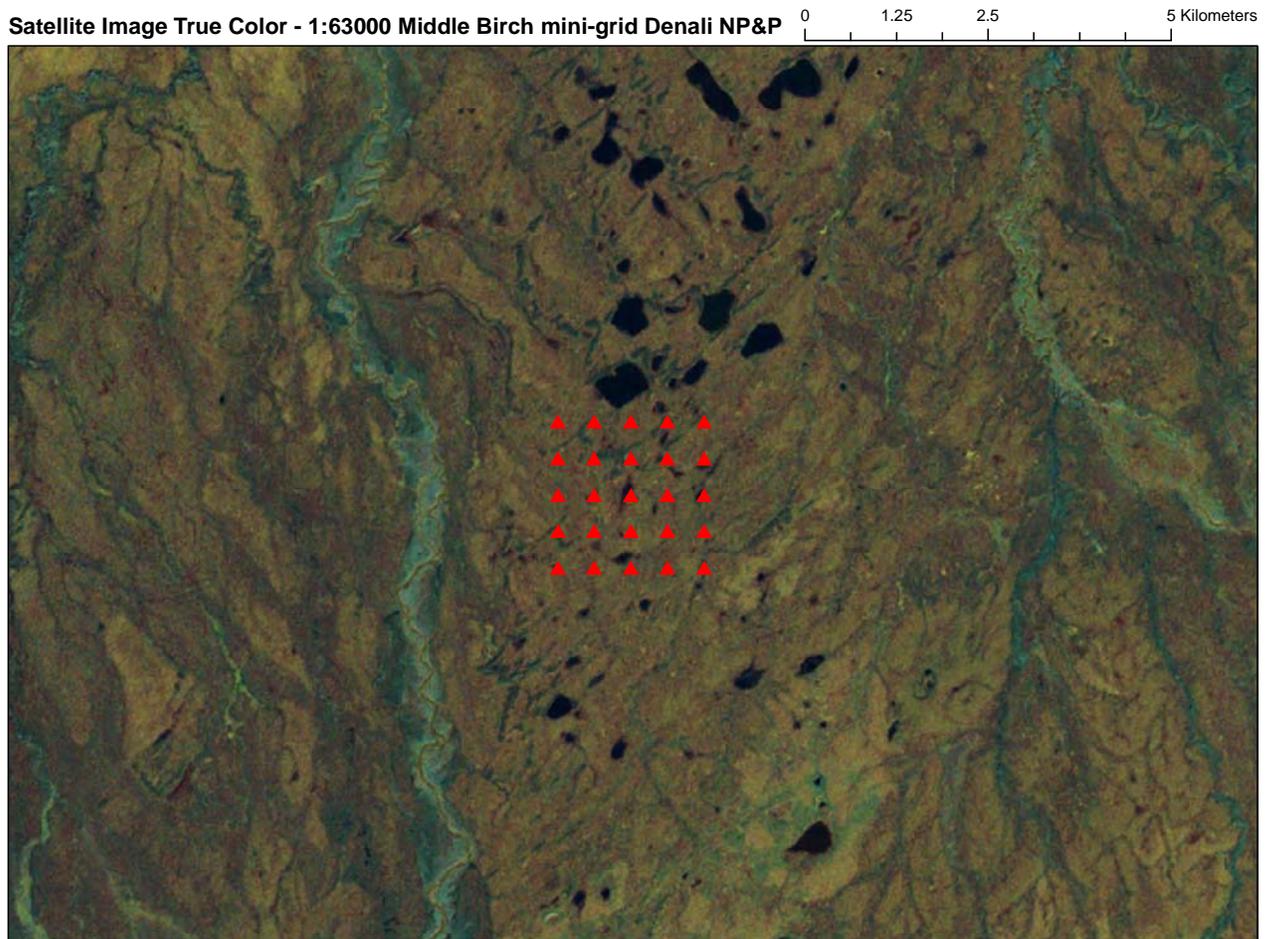
Plot 19: The sun decided to come out for our last plot. Still no word from Dispatch from Carl, so we're not sure if we'll get out this afternoon, but it's still nice to be doing our last plot. We're in a tall, open spruce forest at the base of one of the small ridges. The canopy is mostly large *Picea mariana*, but there are a few *Betula neolaskana* in C. This is probably the most diverse understory we have seen, at least in terms of vascular plants. Dominants include *Vaccinium uliginosum*, *Ledum decumbens*, *ledgro*, *Betula nana*, *Vaccinium vitis-idaea*, *Rubus chamaemorus*, *Geocaulon lividum*, *Eriophorum vaginatum*, *Carex bigelowii*, lichens and moss. We also discovered the largest squirrel midden EVER (okay, well maybe not ever, but it was nearly 4m across) just outside the plot on the east end. So that marks the end of our season!! 😊 😊 😊 (All three of us smiling)

During our final call to dispatch at 3pm, we were told that they had been unable to make the arrangements to fly out that afternoon. We hiked back to plot 25 to retrieve a piece of the quadrat frame which had been lost there. We organized gear for the morning flight, and settled in for an early dinner. As we were finishing James' specialty Annie Chun's we heard a helicopter in the distance. It wasn't until we saw Shane and 191 fly over our camp that we realized that we were going to get picked up that day after all. We packed up our camp in a record time, and began the shuttle back to Kantishna around 5:30pm. Larissa Yocum had driven out in the Suburban to meet us, and we loaded up. A little bit after 8, the third shuttle, with Rich and the green team's gear arrived at Kantishna, and after quickly loading that, we began the drive back to Headquarters. We arrived around midnight, unpacked only the necessities, and headed home for the night. We returned to the office to unpack the remaining gear the next day.

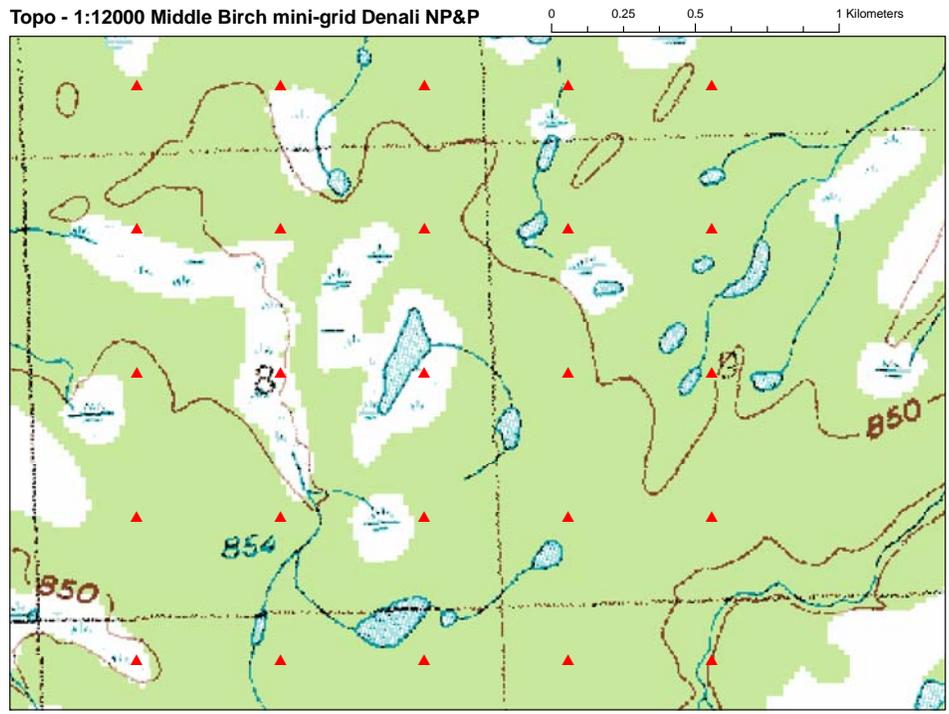
Weather: The day started out cool and cloudy. However, by mid morning the sun was breaking through the clouds. We had pleasant sunshine for our last plot of the grid :)

CONCLUSION AND FUTURE CONSIDERATIONS:

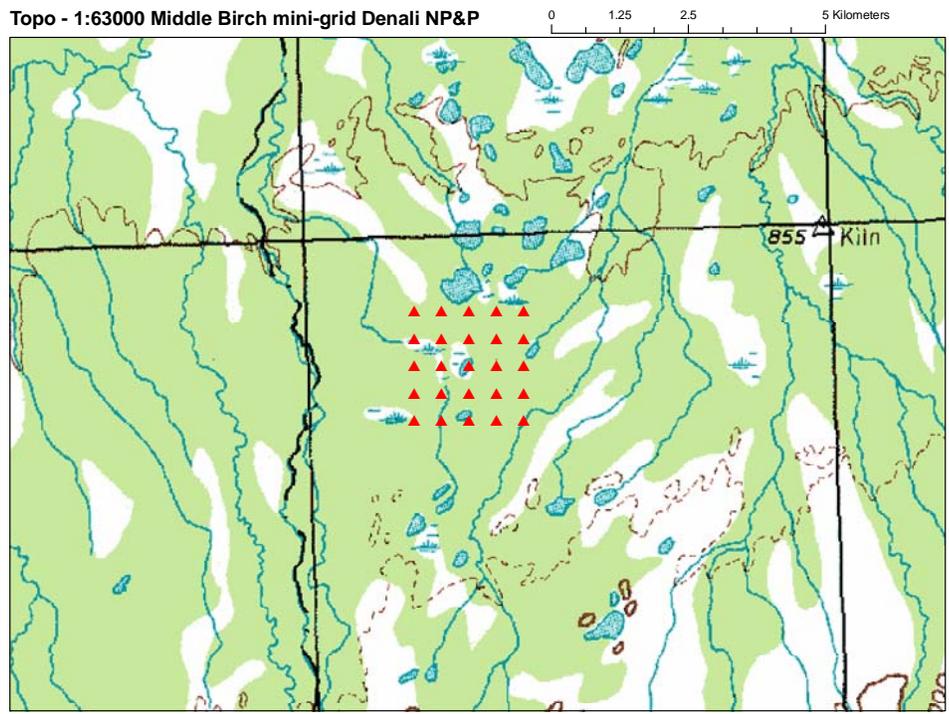
Knee-high waterproof boots were absolutely necessary in this grid. It was also very useful to have 3 GPS devices so that each crew member could have one to navigate back to camp if someone got lost or we had a need to split up. It was nice to fly in with several jugs of drinking water that tasted much better than the mossy pond water we had available throughout the grid, although the pond water was fine for cooking and dishes. We highly recommend our camp location- it was nice to work from a central location and also nice to have some open, solid ground to walk on at the end of the day. Also- it is important to note that contrary to popular belief, the mosquitoes do not die back everywhere at the end of July. They were definitely still going strong this grid, and we were glad to have our head-nets and bug shirts as well.



Map 1. Sattelite Image True Color 1:63000 of Middle Birch mini-grid.



Map 2. Topo map 1:12000 of Middle Birch mini-grid.



Map 3. Topo map 1:63000 of Middle Birch mini-grid.