



Reforestation / Harvest Results for the Kalskag Harvest Area 2018

Prepared by:

The Native Village of Napaimute Environmental
Director, Dan Gillikin PO Box 352, Aniak, AK 99557
(907) 545-0564

&

Director of Development and Operations, Mark Leary
PO Box 1301, Bethel, AK 99559
(907) 545-2877



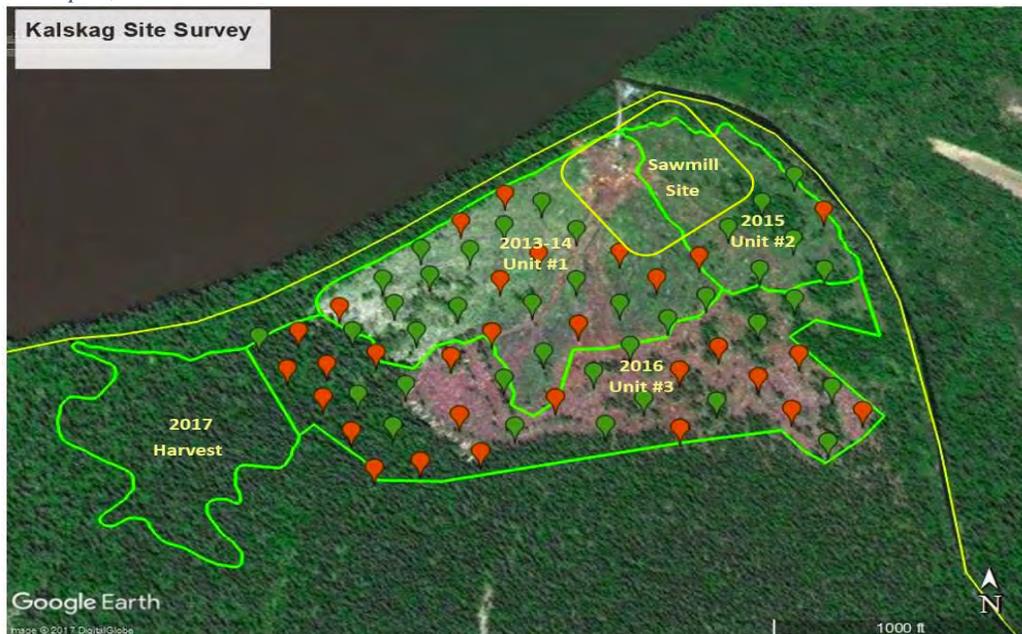
Introduction

This report is to document the reforestation work and timber harvest conducted by the Native Village of Napaimute in 2018. The reforestation work and reporting are requirements specified in the 2012 Timber Sale Agreement (as amended) between The Kuskokwim Corporation (TKC) and the Native Village of Napaimute, and to monitor progress toward meeting objectives identified in Napaimute's Reforestation Plan. Additionally, it is intended to demonstrate compliance with the Alaska Forest Practices Act (FRPA).

Alaska State FRPA reforestation requirements for Region III is that; the number of vigorous, undamaged, and well distributed seedlings of commercial tree species must average a minimum of 450 trees per acre, and must have survived on site for a minimum of two years, within seven years of harvest. At the Kalskag harvest site commercially viable trees include: white spruce (*Picea glauca*), paper birch (*Betula papyrifera*), and balsam poplar (*Populus balsamifera*).

In 2017 the Kalskag harvest site was surveyed by Napaimute staff to estimate the number of commercially viable species present in previously harvested units, see "*Reforestation Survey Results for the Kalskag Harvest Area 2017*" for additional detail. The survey indicated a patchy distribution of spruce and poplar trees, but a much more uniform distribution for birch throughout the harvest areas. Alaska's FRPA guidelines also requires that no more than 10 percent of the contiguous harvest area may be below the required stocking levels, none of the units surveyed in 2017 were currently meeting these requirements. Regeneration did however appear to be proceeding along a natural successional trajectory for an untreated harvest area, i.e. older units having more uniform distribution of countable species, which could possibly meet FRPA requirement within seven years of harvest without any treatment, see Figure 1.

Figure 1. Harvest units and survey plot locations 2017. Green colored balloons indicate at least one "countable" tree was observed in the plot, red balloons indicated no countable trees were observed.



In 2017 the Native Village of Napaimute applied for and received a USDA: NRCS/EQUIP contract agreement to subsidize reforestation cost for units harvested in 2015, 2016, and 2017. The total amount of reimbursement available under the contract for all three years for the acreage/treatment identified is \$12,121. Additionally, Donlin Gold donated \$5,000 to Napaimute for reforestation work. Project costs to date are not yet available, however estimated expenses in 2017 and 2018 include; seedling collection and procurement of 3,000 two year old seedlings (\$6,500), shipping and transport cost (\$600), Napaimute Staff /Crew time (720 hrs., \$14,400), and heavy equipment operation time (75 hrs., \$11,250) for a total estimated cost of \$32,750.

Methods

Reforestation – Three general reforestation treatments were identified under the NRCS contract and in the Napaimute Reforestation Plan with specific acreages identified for each harvest unit; tree/shrub site preparation (scarification), tree/shrub establishment (restocking of white spruce seedling), and natural regeneration. Tree/shrub establishment involved collecting seeds from white spruce trees at the harvest site (completed in 2017) and providing them to the Plant Materials Center located in Palmer for germination and growing to a minimum seedling size of six inches. It was decided that seedlings already available from the Plant Materials Center would be used in the 2018 planting since it would take an additional two years for the seeds collected at the site to be of sufficient size for planting, the 3,000 seedlings provided by the Plant Material Center came from trees in the Big Lake area.

The seedlings arrived in Aniak on August 5th and were transported to the harvest site the following week. Napaimute Staff, Harvest Crew members, and Summer Youth Workers planted seedlings over the next four weeks at specific locations in each harvest unit as identified by the Resources Director (Dan Gillikin) in accordance with the NRCS contract. Planting proceeded following the guidelines provided by NRCS. A variety of techniques were employed to set back the blue joint grass (*spp. calamagrostis*) that had extensively overgrown the harvest area to reduce competition for sunlight. Initially hand tools such as; weed whackers, machetes and brush hooks were used to clear an approximate 4-6 ft. parameter around each seedling planting location. After clearing a location a spot near the center was grubbed out down to mineral soil and either a shovel, gas powered auger or plugger tool was used to make a hole approximately 3-4 inches deep to accommodate the seedling root plug. Soil around the seedling was then lightly compacted and then the planting crews would move on to the next location and repeat the process. Seedlings were spaced approximately 10 – 12 feet apart along rows which were also spaced about the same distance, resulting in a density of approximately 450 seedlings per acre. Needless to say this was extremely labor intensive and time consuming; a more efficient method had to be found. After trying different techniques what was finally found to be most efficient was to use a bulldozer and back blade rows spaced space approximately 10-12 feet apart throughout the area to be planted. This effectively laid down the tall grass and allowed crews to then simply grub out a site and use the plugger tools to create a hole to accommodate the root plug. Using this technique crews were able to restock the entire harvest area as planned in a three week period. Using this technique also had the added benefit of partially scarifying the areas where restocking occurred.

Scarification also proved challenging throughout the harvest area given the amount of time that had elapsed between timber harvest and treatment, particularly in the older units. The first attempt at using an empty container flat drag behind a bulldozer as an improvised drag rake proved unsuccessful. What was found to be most effective was to use the bull dozer to “shear blade” the vegetation and overburden and then scatter the windrows of overburden outside the treated areas. While this method was effective, it was also very time consuming to treat a continuous area. After discussions with NRCS staff it was determined that the treated areas did not have to be continuous areas within the prescribed harvest unit. Known this, we preceded treating units in a “patch work” approach, selecting areas with less overburden and vegetation to be treated, significantly speeding up the process and minimizing windrows of overburden.

On August 24th NRCS and Napaimute Staff meet at the Kalskag Harvest site to conduct a site certification review. The group traversed all of the treated areas and documented the work that had been done. The seedling plantings were inspected and found to be satisfactory. Units that received a scarified treatment were inspected and the proportion of the unit treated was estimated, and agreed on by all parties. No inspection report from NRCS was available at the time of this report.

A recreational grade Garmin 60CSx GPS unit was used to log waypoints along the parameters of each of the treated areas. The GPS files were downloaded using the Garmin GPS utility and saved as KML files then uploaded into Google Earth where attributed polygons were created.

Harvest Area 2018 – Due to the convoluted nature of, and the presence of islands of “leave trees” in the 2018 harvest area ground mapping using GPS was not feasible. Fortunately, NRCS Staff provided Napaimute with a geo-registered hi-resolution satellite image taken in the summer of 2018 that covered the newly harvested area. The 2018 harvest area was heads up digitized from the imagery provided by NRCS using Google Earth. A total of six island areas where trees were left as a future seed source were measured and deducted from the total digitized area to arrive at the total area harvested in 2018.

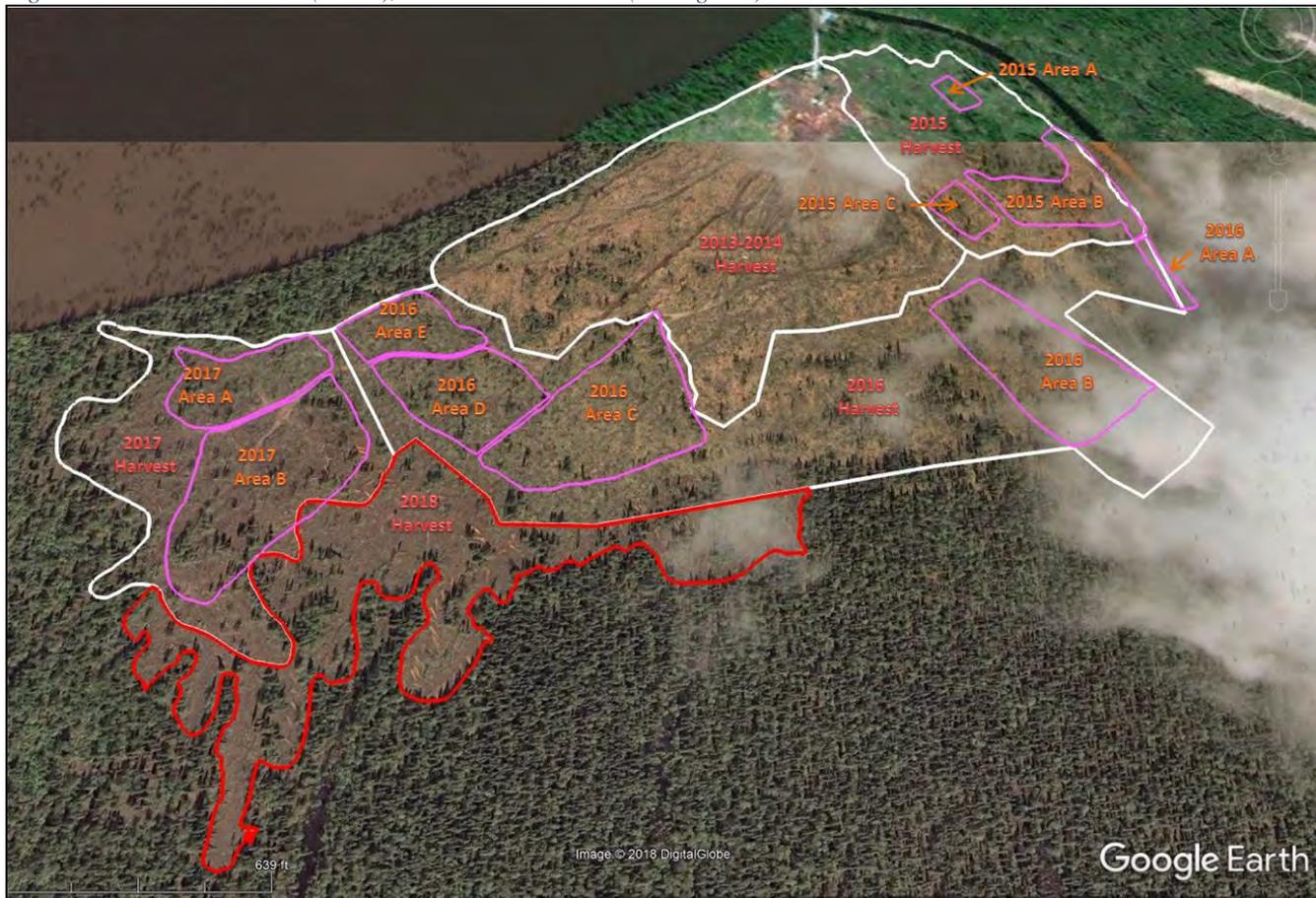
Results

Reforestation Work - To meet the conditions of the NRCS EQUIP contract Napaimute was required to complete reforestation work in units harvested in 2015 and 2016 this year. As previously mentioned two prescriptions were identified in the EQUIP contract; tree/shrub site preparation (scarification), and tree/shrub establishment (restocking). Work identified in the 2017 unit did not have to be completed until next season. Under the EQUIP contract the 2015 unit required 2.5 acres to be restocked, and 0.6 acres to be scarified; the 2016 unit identified 3.3 acres to be restocked, and 8.3 acres to be scarified; and in the 2017 unit 2.0 acres to be restocked, and 3.5 acres to be scarified. The table below summarizes what has been completed to date by unit and treatment, see Figure 2 for location of treatments. In summary restocking was completed at 156%, and scarification was completed at approximately 80%, relative to the EQUIP contractual requirements. All GIS files and data has been provided to NRCS who has indicated its willingness to provide full payment for restocking, and partial payment for scarification work completed to date with no breach of contract conditions.

Kalskag Harvest Site Reforestation Treatments						
Harvest Unit Yr.	Treatment Area Name	Percent Restocked	Percent Scarified	Treatment Total Acres	Restocked Area Acres	Scarified Area Acres
2015	2015 Area A	100%	10%	0.33	0.33	0.03
2015	2015 Area B	100%	10%	2.61	2.61	0.26
2015	2015 Area C	100%	100%	0.68	0.68	0.68
Total treatments for 2015 Area =					3.62	0.97
2016	2016 Area A	100%	0%	0.31	0.31	0
2016	2016 Area B	90%	25%	4.24	3.82	1.06
2016	2016 Area C	0%	25%	4.76	0.00	1.19
2016	2016 Area D	0%	70%	2.63	0.00	1.84
2016	2016 Area E	100%	30%	1.64	1.64	0.49
Total Treatment for 2016 Area =					5.77	4.58
2017	2017 Area A	100%	60%	2.27	2.27	1.36
2017	2017 Area B	10%	60%	5.17	0.52	3.10
Total Treatment for 2017 Area =					2.79	4.46
Total Treated Area in 2018 for Kalskag Harvest Site =					12.17	10.02

Harvest Area 2018 – The total area harvested in 2018 was determined to be 11.2 acres which included a reduction of 1.5 acres for six prominent leave areas, see Figure 2.

Figure 2. 2018 Harvest area (in red), and Treatment areas (in magenta).



Discussion & Recommendations

Discussion – Planting and seedling conditions remained good throughout the project. Weather conditions were mild, mostly overcast and moderately rainy during planting. Seedlings were stored under the Napaimute Office at the harvest site and regularly watered. All planting concluded by the end of August, and as of October 24th ground conditions have remained unfrozen, providing nearly two month for the seedlings to establish roots.

Recommendation – Future regeneration surveys should include an assessment of the survival of planted seedlings in each unit.

Discussion - Lack of proper equipment caused significant challenges and delays in the project. Initially crews did not have the proper planting tools and were forced to improvise. Additionally, the lack of a suitable blade, flail attachment for the bull dozer, or hydro-ax almost resulted in the scarification treatments not happening. Certainly the method that was employed worked, but only marginally and required a highly skilled operator to be effective, and minimize damage to equipment.

Recommendation – Napaimute needs to continue pursuing procurement of a suitable piece of equipment for applying scarification treatment, particularly if treatment is going to be postponed.

Discussion – Postponed treatment created additional difficulty in implementing the project, for both types of treatments. This is a result of years of growth of mostly blue joint grass in these areas creating a thick

vegetation mat (1-2 ft.) on top of the mineral soil. This root mat makes clearing areas down to mineral soil to create a suitable seed bed extremely difficult, and more expensive for both scarification and restocking efforts.

Recommendations – Treatment should be completed as soon after harvest as possible, at a minimum no more than a year post harvest.

Conclusion

Despite all the challenges discussed Napaimute considers the project a success having satisfactorily completing the NRCS EQUIP contract requirement for the 2015 and 2016 harvest units, and the 2017 unit ahead of schedule. More importantly the reforestation work follows what has been outlined in the Napaimute Reforestation plan, agreed to by TKC. Certainly lessons were learned in the process which we hope will reduce cost and make future work less of a challenge.

Finally, we wish to express our gratitude to Napaimute Staff, Harvest Crew, and Summer Youth Workers for their dedicated work on the project.

2018 Timber Harvest & Sawmill Report



A new generation of harvester operators – 23 year old Nickolai Savage is now the main operator of the only harvester in our region

Timber Harvest:

Like every year the 2018 timber harvest had its ups and downs. On the up side the majority of the harvesting occurred when it was supposed to: February to April. This is the time of the year when the trees have their lowest moisture content and they stay clean – two important qualities since the majority of the harvest still goes into producing firewood at this time.

The harvester ran well with very little down time except for minor repairs and routine maintenance. While the harvest was being conducted some of our employees were busy processing the wood into bags of split wood and bundles of round logs. Once a week or so as conditions permitted we would transport loads of 2017 firewood via the ice road to Lower Kuskokwim communities.



From Kalskag to Kasigluk: a load of wood is delivered 150 miles downstream from the harvest site



A good investment: a truck that can plow the road and haul wood at the same time

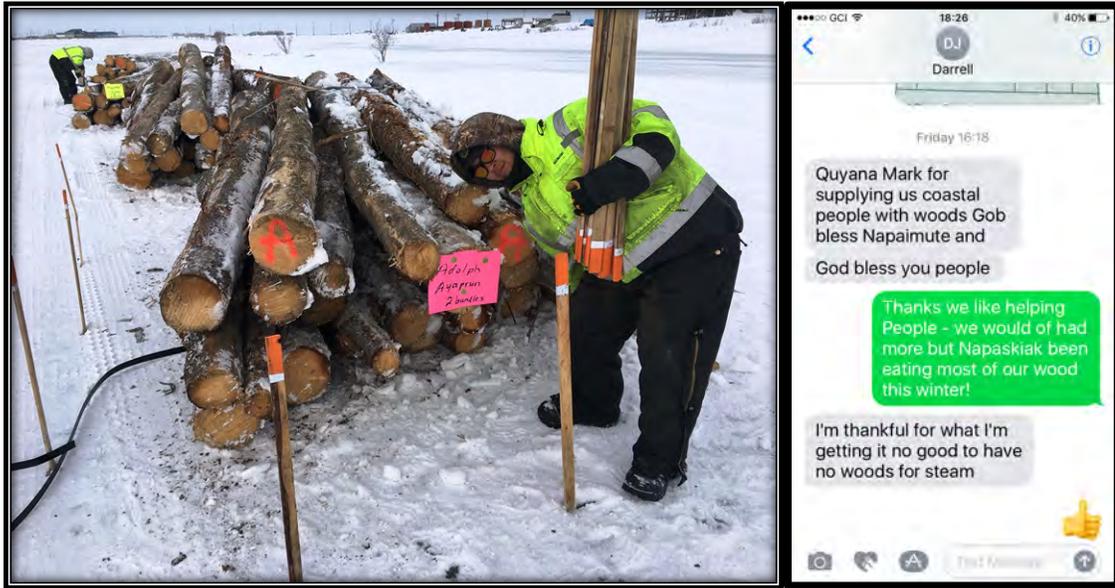


Wood convoy passes the sign marking the lower boundary of Kuskokwim Corporation land

On the down side we can't seem to increase our harvest volume to meet the ever increasing demand for firewood from the growing population of the Lower River and Coast. See KYUK news article:

<http://www.kyuk.org/post/y-k-delta-village-population-growth-outpacing-bethel-population-growth>

Even with some additional harvesting during the summer we seem to be stuck at around 300 cords maximum per year. Each spring we run out of firewood before we can completely satisfy the demand.



Bundles of logs dropped off at a prearranged spot for pick up by Coastal People

The other big downside to our harvesting season was the continual break down of our old skidder. It eventually had a serious break down that was beyond the capability of our crew to repair and we found ourselves with a great volume of harvested timber still lying back in the woods.



Large piles of harvested timber scattered all over the site with no efficient way to get it out to be processed

Until we could fix our old skidder or get a replacement machine our crew had to resort to using the harvester to load logs on metal skids that could then be dragged out with the dozer. This was slow and used up a lot of fuel but it was necessary to keep the processing crew supplied with wood.



Log bundles waiting to be trucked downriver this winter



Bags of chopped wood going by barge to the corporation store in Kipnuk

Over the course of the summer we looked for a replacement skidder and debated over the best way to finance it. We found what appeared to be a good used skidder at Kenny Lake and I made the trip to go inspect it. It checked out O.K. and in the end the Council approved financing its purchase through a conventional bank loan. It arrived in Bethel on the last barge and will be driven up the River on the ice road.



Napaimute's newly acquired log skidder



The machine gets a thorough steam cleaning & servicing before being sent to work

Overall the timber harvest went well but we need to find ways to increase our volume to meet the ever increasing demand for firewood compounded with the need to now supply saw logs to the mill.

Spring Break Up:

This year's spring break up proved to our crew what I've been telling them since we first moved there in 2013: *this area will flood.*

The past several years the Kuskokwim has been having low water break ups so our young crew hasn't seen what happens when we have a high water spring break up and they didn't follow my instructions for getting everything put up on the raised dirt pad we had built for the sawmill. They just didn't believe that the water could get that high. And in reality that was just a localized high water event – not a real flood like the ones we saw in the mid 1980's where the land in the Kalskag area was flooded for miles in every direction.

Due to unforeseen circumstances I was unable to visit the site to do my usual pre-break up inspection so was unaware that they had not moved everything up high.

We were fortunate that the water didn't get any higher. The water did reach some of our equipment and supplies but there was no loss or damage – just a lot of picking up. I inspected the site immediately after the River went down and walked the site with the crew. We were especially thankful there was no fuel/oil spilled and that our piles of harvested timber remained intact. The water would have had to come up 5 more vertical feet to reach the saw mill. If and when that happens, Lower Kalskag will be in serious trouble as well.

We were lucky and I believe our crew learned a valuable lesson about the River and the harvest site.

They won't let it happen again.

KLG HARVEST SITE, MAY 5, 2018



Small chunks of ice and wood debris scattered near the office-it was surprising how quickly the site dried up

The Long Road to Completion: Saw Mill Update



It was a long road to complete the reassembly of the saw mill. This was due a large part to having to build a raised earthen pad for it (this spring's break up proved the value of taking the time and expense to do this) and that we built a welded steel foundation for mill as opposed to the wooden one it was originally on. There were also a thousand other little details that had to be reconsidered, re-engineered, and re-evaluated. Perhaps one of the more significant modifications was the new conveyor system installed for saw dust removal. Throw in delays caused by bad weather, having to order parts, or absent personnel and everything took longer, but by mid-August the mill was complete and fully functional.

During the first week of August the Napaimute Traditional Council visited the site to observe the mill in operation and hold an employee appreciation luncheon. It was a good day. I forgot to mention that a large amount of the 2018 harvested timber was actually turned into lumber for the reassembly of the saw mill accounting for some of the lower than hoped volume of firewood.

Our crew was off for September hunting season and then spent the first half of October winterizing the site. We have been starting to get orders for lumber which we will begin filling early in 2019. We look forward to building the demand for middle Kuskokwim lumber and house packages as we did with firewood.

The following pictures document the progress of the saw mill reassembly over the summer.



Spring: working on the log infeed system



Getting the outfeed properly aligned and leveled



Starting to look like a saw mill



Test cuts



New catwalk from freshly milled lumber



Re-engineered saw dust conveyor



Sawdust falls into loader bucket for removal



Mill building goes up



Napaimute Traditional Council watches lumber being produced



New saw mill operator being trained by the former owner



Fully completed mill waiting for the 2019 production season



Council President Devron Hellings addresses the harvest site crew in front of the new office then....Moose's Tooth Pizza for lunch!

That's our report for the 2018 Season. If you have further questions or need additional information please feel free to contact us.

Thank you.

