20250914 Moller with Jessica Murray

Middle of a week of rain, averaging ~1.2 inches per day. Ben Gaglioti connected us with soil scientist Jessica Murray who's in town to take samples and download temp&moisture data from stations in yellow-cedar plots. C&I joined her for a walk up to the small patch about 250 yards downhill from new Dan Moller Cabin. Back home, based on what we quickly passed through, I estimated it at about one acre, if you include the halo of vigorous knee-to-head-high saplings surrounding fairly old ones.

Arc tipup from the new 2023 LiDAR DTM. *RCtrails* in red. Krapek cedar polygons in orange.

Eventually, I located John Krapek's shape-file for edge-walked cedar stands—orange on cover oblique and red outline next page. His polygon is 0.52 acres, mostly on west side of Cedar Ravine. By definition, Krapek-Buma stands end at the edge of "*mature*" trees. But definition appears to be a typo (1.4m dbh, & 30m tall!) At least, from *fig3*, it's apparent my surrounding doughnut of saplings would be outside his polygon. So our acreage estimates are not incompatible. *

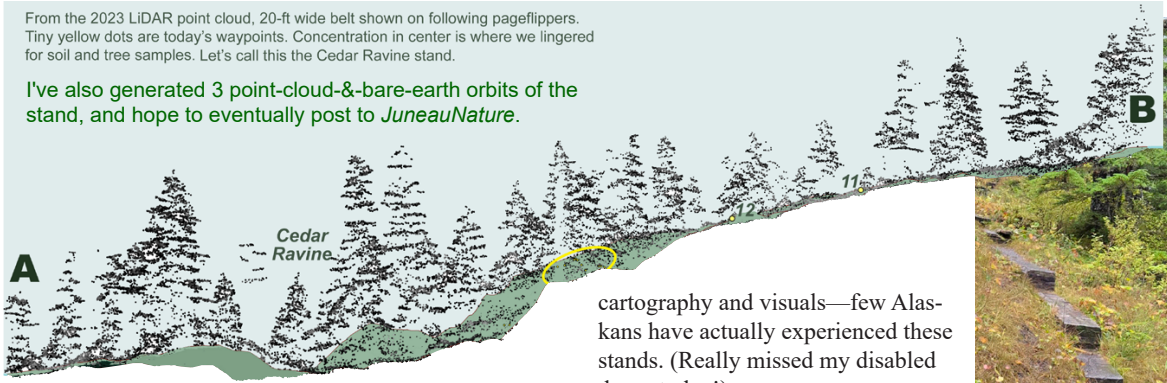
***Scirpus* pelage** Tufted clubsedge turns summer-**deer**-colored in autumn, as deer themselves turn grey—resemblance further heightened by bicolor blades and fur-like texture.

06

*Jessica will send me John's full GPS'd geodatabase for local stands. So far I have just the stand polygons and a "lone-tree" point file for outlying individuals

From the 2023 LiDAR point cloud, 20-ft wide belt shown on following pageflippers. Tiny yellow dots are today's waypoints. Concentration in center is where we lingered for soil and tree samples. Let's call this the Cedar Ravine stand.

I've also generated 3 point-cloud-&-bare-earth orbits of the stand, and hope to eventually post to *JuneauNature*.



Cedar decline has been heavily studied and reported, but I confess to inattention over the past decade. Red- and yellow-cedars are lovely trees, deserving of remedial lit-review and a hike or 2, so we were grateful for the chance to meet Jessica and hear about several new avenues of research. Seems like I could help with cartography and visuals—few Alaskans have actually experienced these stands. (Really missed my disabled drone today!)

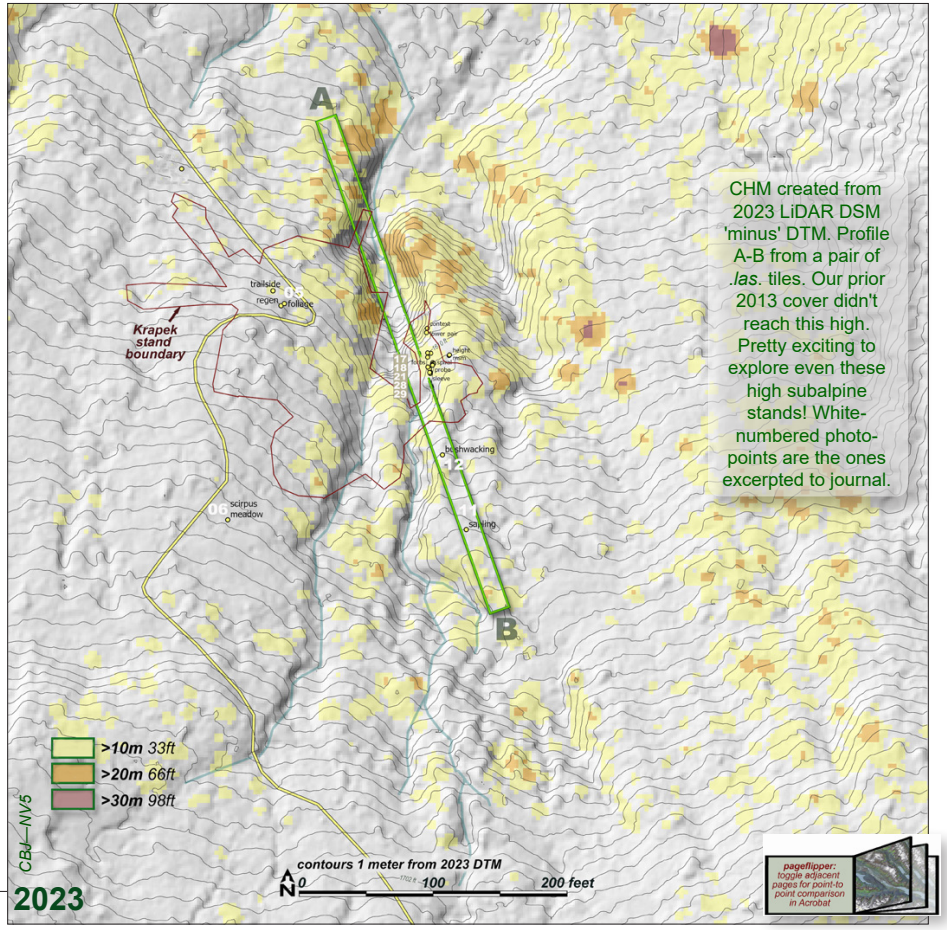
01 Aging planks Trail's getting pretty slippery—glad to have poles.

05 Healthy Okay, guess it's *Callitropsis nootkatensis* now; CANO.

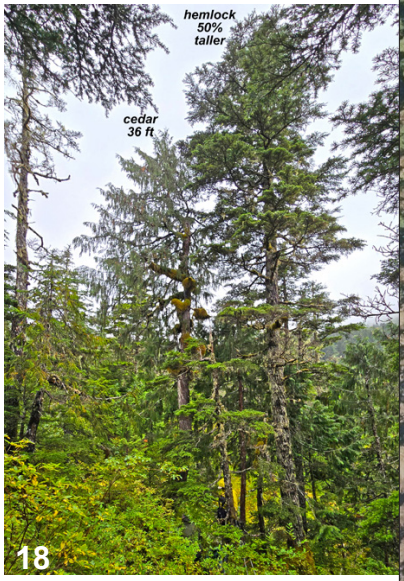
11 Sapling Abundant regen here. Unbrowsed & happy looking.

Entering John's polygon, you start to see young & old cedars from the trail at the 1,600-foot contour. Jessica's soil plot is on the far (east) side of Cedar Ravine, most prominent cleft in the upper valley. Surely this roughly dissected anomaly has something to do with establishment and persistence of locally rare cedar. But I can't guess what that might be. Rather that dive into the ravine, it's easier to climb to the new footbridge just off the bottom of this map, then drop through mostly open peatland

12 Lots in lower strata I'm baffled by the ability of cedar researchers to detect healthy stands from aerial surveys. Dieback is obvious, yeah, but I easily miss young & even old CANO walking right by it. I didn't take this photo to illustrate its abundance; only confirmed cedar zooming in, back home. Approaching, told J&C I was looking to ping both ends of a

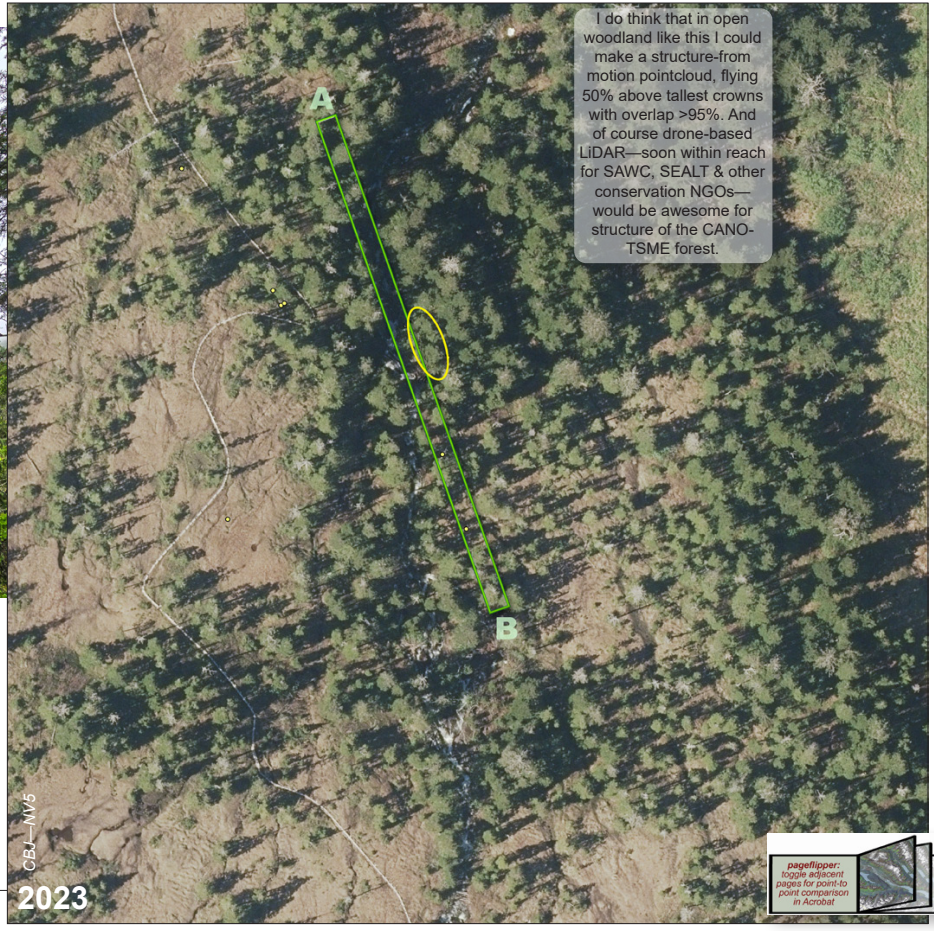


~50:50 CANO-&-TSME transect, so that I could later bring it up in the point cloud, to search for differences in canopy structure. But there weren't enough large CANO here. I later dragged 20-ft-wide boxes across & along the ravine dozens of times before settling on something pleasing—box A-B—nice for context but deflating to my hopes of a LiDAR cedar signature. [1]



18 Height measure Cross-slope view. Our biggest cedar was so short I only needed to back away a few paces to measure with hypsometer. Didn't take height of adjacent taller mountain hemlock, but pointcloud shows a 50-footer in about that position.

Shadows help with tree height estimates. Somewhere near point B, on descent to sample stand, Cathy pointed out a tall



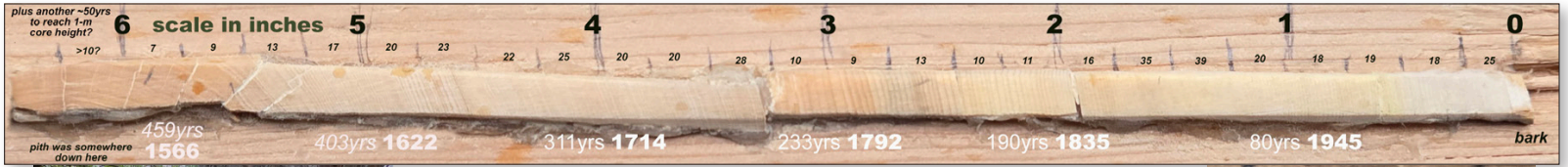
1 Cedars here too runty to show in pointcloud. Ideal would be a belt with half-dozen each of CANO & TSME, in a stand where CANO is at least 20m tall. Theoretically—maybe only with *.las* denser than 8 or 12 pts-per-m^2?—TSME should be full and dense, *vs* CANO wispier, maybe showing those drooping feathery fronds.

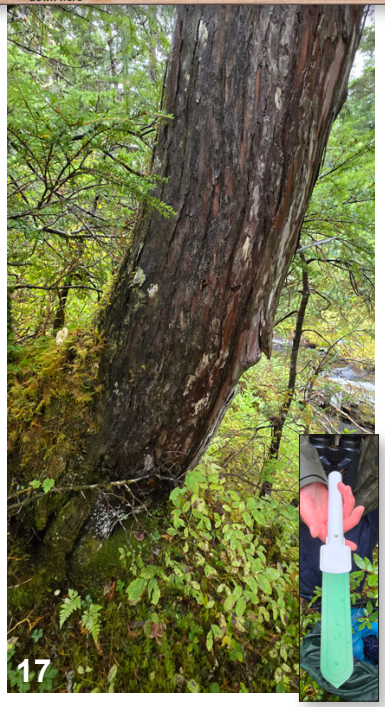
advanced-class-2 snag with whorls like a spruce—too skinny to pick up in the point cloud, but ~max height for CANO, 100-ft. Should've taken a picture. Pencil-thin top would've long since toppled from PISI or TSME of that decay stage.

21 Context Facing uphill from ravine edge beside a pair of smaller cedars (**C**), 5 'portrait' stitchers, assembled back home, give huge piece of terrain without fisheye distortion. [2] Good record of how open this forest is—almost qualifies as woodland.

At 1,600 feet, snow piles early & lasts long into spring. On top of that, extremely dissected terrain impedes movement by **deer.** Krapek notes late snowpack gives protection not just from spring coldsnaps but incisors. No saplings within their reach were touched, so I looked

2 First started doing this with Nikon DSLR in 2014 wetland assessents. Haven't tried it with phone but was delighted with results. Should do these routinely.





for browse sign on blueberries. Nada.

That's significant here on Sayéik, where, at least at lower elevations, shrubs are typically mowed down to knee height during high-pop winters.

17 Cored There's only one good-sized cedar near the soil station, immediately above it. Jessica didn't know if it'd been cored. *Fig 2* in Krapek *et al* (2017) gives germination time of oldest cedar in DM (Dan Moller) stand as late 1800s. [3] Above sample—mounted with pith on left & bark on right—extends that age considerably.

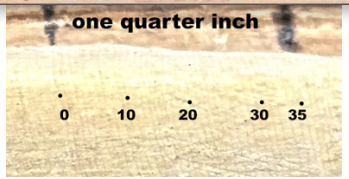
Diameter at core height ~1m above mineral soil (AMS) 37cm = 14.5 inches, *ie* ~7-inch radius.

Didn't have a proper sample receptical, and by the time we got it home things were pretty fragmented. Too sketchy to mark exact years, or even decades, so my count could be off by maybe 5%. Our dissecting scope is loaned out, so I did as well as I could with hand lens and enlargements from these 2x optic cell pics.

About 6.2 inches in (close to expected from a 7-inch radius), rings are thicker and curve strongly toward pith. Marked sampleboard every quarter inch & made a quick ring count. Thickness is always tight but varies about 4-fold: fattest-ringed quarter-inch had 9, and tightest had 39 rings. In this enlargement I dialed up contrast, from almost invisible to quite distinct.

With pith ~1560AD, 1m AMS, germination was probably in the mid-1500s.

29 Soil cylinder Carefully trimmed with knife, packaged and taped for transport. Inset on left is multisensor installed at base of this tree, recording moisture, and temp at 3 different levels.



3 Krapek & Buma (2018) cored "*largest yellow-cedar tree observed in 25 out of 27 interior subplots*" But maybe didn't get this one?

28 Deer forbs Typical density of untouched winter deer food in the cedar stand. COCA-RUPE-COAS, and a little baby *Vaccinium*. Considering that even shrubs are untouched, you'd expect these evergreen forbs—snow-covered long before woody browse becomes unavailable—to see even less use. That probably means sprouts of yellow-cedar have equally good odds of survival up here, at least in terms of herbivory.

30 New cabin Nobody was renting so we had lunch inside. I'd never seen the interior before. Huge beams—a masterpiece! Can't find out online where it came from, but looks like a Wes Tyler kit.

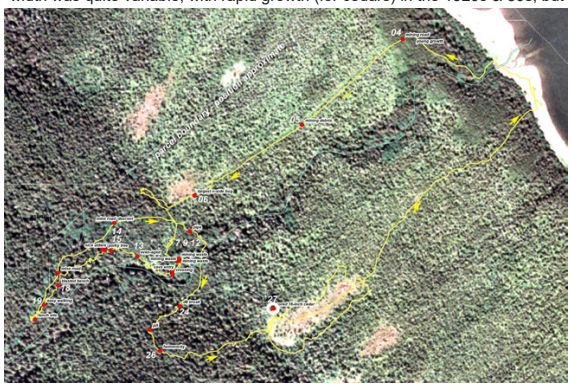
35 Bog fruits In flycatcher poor-fen, coming out, Cathy introduced Jessica to the array of peatland berry species, mostly past peak but a few still lingering for taste-samples.

Appendix: notes 20130509

Fig-2 in Krapek *et al* (2017) has oldest cedar at NC (Nevada Creek stand, shown on my front cover) as germinating about a third of the way thru the 1800s, if I read the chart correctly. For comparison here are my notes on photo 27 from a survey with Bosworth Botanical in 2013.

27 Didn't bring my d-tape, but comparing trunk to my 18-inch borer handle, I'd estimate 15 or 16 inches. That fits with distance to pith of 7.8 inches, which I hit exactly. Back home, glued sample to lath and sanded for counting under 10x stereo dissecting scope. Marked year 2010, then ticked off every prior decade with pencil.

Pith, at about a meter above ground, was formed in about 1735 AD. Ring width was quite variable, with rapid growth (for cedars) in the 1920s & 30s, but much slower growth in the mid 1700s. Probably that pattern extends back to year of germination, because this tree almost certainly came up in shade.



So it could well have taken 50 years for this tree to reach core height, giving us an estimated germination year of about 1685. I recall Paul Hennon saying that all Juneau area cedar stands are relatively young, apparently having colonized during colder conditions of the Little Ice Age, 2 to 3 centuries ago. This tree—I'm guessing one of the older ones in the Nevada Creek stand—fits that pattern. We should get a foliage sample to Paul for genetics, to see if our cedars are related to the others nearby

Back in the late 1990s, I think, Streveler and camped south of Lucky Me to do an environmental survey for Echo Bay mines. We found a few cedars at that time, although I don't recall anything like the numbers seen around Nevada Creek. What I do remember was finding a **bear-stripped tree**. This was remarkable because only brown bears had previously been known to bite the bases of yellow-cedars, on West Chichagof and Peril Strait. Douglas, of course, has only **black bears**. I told the other ELS crews to be on the lookout for bear-stripped cedars, but nobody saw evidence during our 2 days of surveys.

Our sidebar from 2016 *Supplement* describes the much larger and more extensive high elevation cedars on hill 970—at ~30 inches almost twice the diameter of NC tree #27, and potentially twice as old. This is Krapek's 14-acre stand CC (Cowee Cr), not included on *Fig-2,* so maybe trees weren't cored there?

We should return to Hill 970 and spend a day coring. Some of these could be contemporaries of the 1300s cedar on Steep Creek (Krapek EG stand)

From Moller cabin we watched a small flock of **sandhill cranes** climb over the island thru the fog on this horizon. Cool to see 'wetland' birds at alpine elevations!

References

I spent a day after our hike trying to get caught up on the yellow-cedar literature. A lot of these come from Brian Buma's publication list. Blue-highlights for downloadable pdfs.

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