Trip Report: Katmai Vegetation Study

15 – 19 June, 1987

Trip Members:
Gary Ahlstrand (Research Ecologist – principal investigator)
Susan Cantor (Biological Technician)
Dale Taylor (Wildlife Biologist)

Purpose of Expedition: To replicate Cahalane’s 1954 study of revegetation in Valley of 10,000 Smokes. To find as many of Cahalane’s (six) vegetation plots and initiate data collection on those plots.

15 JUNE 1987

1030 – 1130: Flew from Anchorage to King Salmon via Mark Air Flight 4031.

1200 – 1230: Carl (OAS Pilot) flew Gary and Susan from King Salmon to Katmai on Cessna 206. Pilot returned to King Salmon to pick up Dale. Spent several hours with logistics and orientation at Brooks Camp.

1600 – 1930: Charlie (helicopter pilot for Lake Clark Firepro crew) flew Gary, Susan, and Dale to Valley of 10,000 Smokes. Landed at base of Red Mountain to look for Plot B – Dale spotted all four poles with binoculars. Poles were bent but standing, with cairns intact. Susan returned to helicopter, and picked up Gary and Dale at the plot (which was 1/2 mile east of landing spot). Continued west up valley to look for Plot A, at the base of Fourth Glacier (near Katmai Mountain). No poles seen; vicinity of plot snowy. Flew north across Knife River to find Plot F; snowy. Continued East to Lethe Valley, then south along valley to find Plot C; no luck. Finally headed toward Mount Mageik to find Plot D. Head of valley still under snow. High winds (30+ mph) forced us to return to camp.

16 JUNE 1987

Weather day – easterly winds to 25 mph at Brooks Camp. Cloudy and rainy. Climbed Dumpling Mountain to overlook. No bears seen in or around camp. Calculated lat/long coordinates for all vegetation plots based on Cahalane’s 1954 descriptions (see Appendix A).
Trip Report - Katmai Vegetation Study (Page 2)

17 JUNE 1987

0800 - 0900: Charlie fueled helicopter up in King Salmon.

0900 - 1800: Dale, Gary, and Susan flew to Valley after Charlie plugged in plot coordinates on Loran-C. Flew to Plot A coordinates and spotted all four poles from the air, very close to their estimated position. Two poles bent completely over (by snow?) and laying flat on ground. Cairns intact. Repeated Cahalane's photo record. Plot fairly well vegetated with tiny plants.

Flew north across Knife Creek to Plot F coordinates. Initially confused by two cairns—landed and found 12" of rebar protruding next to one of the cairns. Discovered Cahalane's aluminum poles about 2/3 mile west of these cairns, using binoculars, compass sitings, and old photos. Two poles erect, one disappeared, and the fourth lying on the ground a few feet away.

Flew to Baked Mountain for Plot C. Landed near north spur of mountain on Leth Valley. Based on photos, Gary and Dale estimated the plot site to be about 1 mile north of Susan's estimate using compass sitings. However, photos were poor and sitings were ambiguous. No poles found - probably washed away in this wide, highly eroded valley. No vegetation in valley floor.

Continued south to vicinity of Plot D, at base of Mount Mageik. Despite ambiguous compass sitings and poor photos, we thought we found the approximate plot location. However, snow was over two feet deep and many landmarks unclear.

Helicopter picked us up (over a mile south of drop-off point), and landed at base of Novarupta to find Plot E. Both photos and compass sitings were excellent - but NOT in agreement. Gary and Dale felt they had lined up all three photos perfectly at a point about 1/2 mile southeast of Susan's estimate, which was based on six compass sitings. No poles present. Ground still had a foot or more snow, with bare patches showing scattered vegetation. Headed home - used 50 gallons fuel. (1.8 helicopter hours).
Trip Report - Katmai Vegetation Study (Page 3)

18 JUNE 1987

0800 - 0900: Charlie fueled up helicopter at King Salmon.

0900 - 1700: Gary, Dale, and Susan flew to Plot A. Dropped Gary and Susan off; Dale flew to Plots F and B to secure aluminum posts marking plot corners. Dale also calculated positions of missing posts on Plot F and replaced these with rebar. The two remaining posts were 117' apart. Plot B was free of snow (it was about 1/2 covered with snow on Monday) but very wet. Dale hammered posts about 3 feet into ground; however, they remained frozen in tilted position. Dale left at 1200 with helicopter (which went on to American Creek with Bill and Suzie).

Gary and Susan laid tapes out along borders of Plot A, then placed two more tapes 5' away and parallel to the north and east borders of the plot. Stretched cord across the two parallel N-S running tapes (the long edge) to form grids 5' square.

Began mapping each 5' square along the eastern boundary of Plot A. Mapping very difficult because of the small scale on the data sheets. Also could not resolve the problem of how to map clumps of plants - count individual stems even if they grow from a single rootstock? Examination of Cahalane's report seemed to indicate individual stems were counted in each clump - and that far fewer clumps had been encountered in 1934. Identification of very young plants was another obstacle. After mapping near exact position of each plant, on 18 squares (about 3 hours), we realized that a small plant we had mapped as Luzula was actually Sagina (found one in flower). Since Cahalane's work had been done in August, we decided to return to the site later in the summer to complete the plots. We had not expected the Valley to be as phenologically late as it was.

Returning in August would allow us to survey the other two plots (F and B) as well as A.

The 18 squares we had mapped coincided with one of two drainages in the plot. This explains the high density of plants in this section of the plot, averaging 52.7 vascular plants per 5 square foot grid (range 4 to 116). For mosses, an average of 12.6 plants were found per 5 foot square grid (range 0 to 57).
Trip Report - Katmai Vegetation Study (Page 4)

After discovering we had misidentified *Sagina intermedia*, stopped mapping vegetation and began collecting specimens from outside the plot. Six different species were collected, including *Luzula arcuata*, *Sagina intermedia*, *Poa sp.*, *Epilobium sp.*, *Agrostis scabra*, and *Oxyria digyna*. Soils were collected from both a drainage area and a non-drainage area outside the plot.

Decided to experiment with a different technique for data collection. Divided each 5-foot square grid into quarters and counted totals for each species within each quarter. This seemed much quicker (30 minutes for 10 5-foot square grids). This level of precision in mapping seemed comparable to Cahalane's 1954 work. Trampling of the plot was minimized when both investigators worked from the outer (or previously examined) edge of the grid.

The eleven grids examined in this way yielded the following averages: 9.54 vascular plants (range 2 to 30) and 11.54 mosses (range 0 to 61) per 5 square feet. These plots did not encompass any drainages; the overall density was therefore relatively low.

Weather was calm all day with sunshine in the late afternoon. Excellent view of Mt. Katmai on flight home.

19 JUNE 1987

0800 - 1400: Summarized our findings and cleaned camp. Gary talked with Jim Pepper (acting superintendent of Katmai NP) about the study.
1400 - 1430: Flew park service float plane (pilot Carl) from Brooks Camp to King Salmon.
1430 - 1800: Ate and waited for Mark Air Flight 4035 (delayed).
1830 - 2030: Flew King Salmon to Anchorage (via Dillingham) on Mark Air Flight 4035.
Trip Report - Katmai Vegetation Study (Page 5)

Conclusions

1. Three of the six vegetation plots set up in 1954 were located on this expedition (Plots A, B, and F). Of the remaining three, one was probably washed away (Plot C); the two others were under snow (Plots D and E). Plots C and E occur in areas subject to human traffic.

2. Latitude/Longitude coordinates were recorded from the helicopter Loran-C for all plots, although these are approximate for Plots C, D, and E. This will assist in future attempts to locate plots.

3. Plots need to be examined later in the summer (August/September). In June, there is still too much snow, and plants are too undeveloped, to conduct surveys.

4. For Plot A, plant density and diversity are much higher than in 1954. At least six species of plants were identified here.

5. Mapping should be done using 5-foot square grids by COUNTING the number of stems for each species in each quadrat. The exact location of each stem is probably not necessary.

6. Clumps of vegetation should be recorded by counting the number of stems per clump. This number can be circled to indicate that it does not refer to scattered individuals.

7. Data forms should include a mapping area at least 8" x 11".

8. Drainages from each plot should be mapped. These strongly affect the pattern of plant colonization.

9. Cover-frequency measurements should be taken from a random sample of "sub-plots" within each plot. Sub-plots should be smaller than the 5-foot square grids.

10. Corners of each plot should be marked with rebar sunk at least 3' into the substrate.

11. An equipment list for surveying plots was generated (see Appendix B).
Trip Report - Katmai Vegetation Study

APPENDIX A

Lat/Long Coordinates for Cahalane's 1954 Vegetation Plots

Plot A: 155°06.2' x 58°17.6' (4 poles found)
Plot B: 155°12.0' x 58°18.2' (4 poles found)
Plot C: 155°18.0' x 58°13.0' (approximate)
Plot D: 155°14.1' x 58°15.7' (approximate)
Plot E: 155°10.0' x 58°16.0' (approximate)
Plot F: 155°07.6' x 58°17.6' (2 poles found)

Brook's Camp: 155°48.0' x 58°32.4' (reference for calibrating Loran-C - superintendant's house)

Plot Dimensions: 104.5' x 52.5' - 5,486 square feet
(Plot C: 109.0' x 52.5' - 5,723 square feet)

Note: Corners of Plot F along northern boundary were 117.0' apart.
Axis of Plot A oriented using magnetic N-S

Magnetic Declination:
1954: 22°30'
1987: 20°56.7'

Compass sitings in Cahalane (1954) are not corrected for declination.
Trip Report - Katmai Vegetation Study

APPENDIX B

Equipment List for Surveying Cahalane's 1954 Vegetation Plots

** Helicopter with Loran-C
Surveyor's pins
2 100' tapes
2 50' tapes
Up to 10 104.5' cords marked at 5' intervals
Up to 20 52.5' cords marked at 5' intervals
1 folding plot frame, to divide each 5-foot square grid into quarters
Large-scale data forms
Hand lens
Hammer
Rebar
Clipboards
Soil sampling cans
Tape
Plant press
Plastic bags for collecting plants
Radios (hand-held)
USGS 1:63,360 topo maps (Mt. Katmai A-3, A-4, B-3, B-4)
Binoculars
Compass
Cahalane's 1954 report
Plant ID reference (Hulten)
Large backpack
Camera/Film
Folders with photos, sitings, etc. for each plot