



Lorna Raso

Two months of work in Alaska; "the last frontier".

Introduction

Looking back on the time I spent in the USA the thing that first comes to mind is scale. If there is a country of giants then surely it must be this one. Everything from the cars to the trees makes Europe seem like the land of Liliput. In the time spent there I worked one week in Idaho, one in Montana and five weeks in Southeast Alaska. I also had one weeks holiday in Fairbanks which I spent helping out in the University where I was warmly welcomed and shown as much as was possible in the time provided. In these weeks I was able to experience the feeling of the old growth forests in their true untouched grandeur, something which regrettably is practically impossible in Europe. I learnt a great amount from botanists, ecologists and foresters about the various ecosystems and the way they are managed.

Idaho and Montana

My first destination was Missoula (Montana) where I was met by Prof. Paul Alaback of Missoula University. He was my contact from Edinburgh and the plan was for me to stay with him for two weeks helping him out with his field work and familiarising myself with the flora before going on to work in Alaska.

The first week of work was in Idaho, in a small area of Aquarius in the Clearwater National Park where there had been a large area of wind throw which had to be monitored. Unfortunately we were unable to get to the proposed site due to an increase in the water level of one of the rivers so instead some clear-cut areas and some untouched areas were surveyed, to enable us to see the difference in ground vegetation. The forest in question was an old stand of primarily *Thuja plicata* D. Don (Western Redcedar) and some *Abies grandis* Lindl. (Grand Fir) and *Tsuga heterophylla* (Raf.) Sarg. (Western Hemlock) the latter found at lower altitudes and to a much smaller extent (an example of a perhumid forest). The other main tree that seemed to colonise the patches where there was no *Thuja* was *Alnus rubra* Bong. (Red Alder). The size of most of the *Thujas* was of 30 to 40 m in height and 60 to 110 cm in dbh. The main form of disturbance seemed to be wind and a series of trees had been overturned exposing patches of soil, which were generally colonised fairly quickly by shrubs. A few of the trees were cored to see the age of the stand, this proved to be quite hard as the *Thuja plicata* tends to hollow out as they get older. However in the end it was possible to estimate an age of the trees to be between 120 to 200 years.

The understory of the forest was just as impressive with a great variety of species of ferns, lichens and mosses as well as the many shrubs and herbs. The main species found in each of these groups were:

Shrubs	<i>Linnea borealis</i> (Twinflower) <i>Lonicera involucrata</i> (Bearberry honeysuckle) <i>Oplopanax horridus</i> (Devil's club) <i>Ribes laxifolium</i> (Trailing blackcurrant) <i>Rubus palviflorus</i> (Thimble berry) <i>Salix arctica</i> (Arctic willow) <i>Viburnum edule</i> (Moose berry)
Lower Ground Vegetation	<i>Actea rubra</i> (Bane berry) <i>Asarum canadatum</i> (Wild ginger) <i>Circaea alpina</i> (Enchanters nightshade)

	<i>Claytonia sibirica</i> (Siberian miners lettuce) <i>Claytonia perifolia</i> (Miners lettuce) <i>Coptis aspelenifolia</i> (Goldthread) <i>Cornus canadensis</i> (Bunchberry) <i>Heracleum canatum</i> (Cow parsnip) <i>Ranunculus uncinatus</i> (Small flowered buttercup) <i>Similacena stellata</i> (Star flower false salomons seal) <i>Trifolium wormskjoldil</i> (Springbank clover) <i>Viola sp.</i>
Ferns	<i>Adiantum pedatum</i> (Maidenhair fern) <i>Athyrium filix-femina</i> (Lady fern) <i>Dryopteris expansa</i> (Shield fern) <i>Polystichum munitum</i> (Sword fern) <i>Pteridium aquilinum</i> (Braken)

I was unable to even make an attempt at identifying most of the mosses and lichens in the area though the diversity was considerable.

When looking at the clear-cut area it was possible to notice a considerable change in the vegetation. The areas seemed to be dominantly covered by *Cirsium arvense* (Canadian thistle) and *Cirsium edule* (Edible thistle). *S. stellata* and *C. alpina* were also found quite abundantly in the area and there was an increase in the amount of shrubs with *Holodiscus discolor* (Oceanspray) and *Rubus idaeus* and *R. leucodermis* (Red and Black Raspberry) starting to appear. No regeneration was visible in the area and the only trees present were some small *Pinus contorta* Dougl. (Shore pine) and *Pinus monticola* Dougl. ex D. Don (Western white pine) which had been planted in the area and seemed to be finding it hard to compete with the weeds.

On returning to Missoula most of my time was spent helping one of Paul Alaback's students on a project to see the effect on the native flora of removing some of the introduced weed species which grow on Mt. Sentinel (Missoula's equivalent to Arthur's Seat). This was done by surveying a number of plots half of which were controls and the other half had had all the weed species removed. *Centaurea maculosa* (Knapweed) seemed to be the most problematic of the weeds, taking over large areas. In the short time I was there it was possible to note that the areas which had been weeded for one or two years seemed to have a much greater variety of native plant species.

I also had time to myself and this I used to look at an area just behind Mt. Sentinel that had been burnt down in 1992 by a provoked fire. The surrounding forest was mainly *Pseudotsuga menziesii* (Mirb.) Franco (Douglas fir) with the odd *Pinus contorta* (Shore pine) and *Tsuga heterophylla* (Western Hemlock). I was able to look at the whole burnt area and note the areas that had been burnt at different intensities. Those which had been in the hottest part of the fire had no signs of regenerating trees and seemed to be practically completely dominated by *Physocarpus capitatus* (Pacific Ninebark) a common shrub in the area. The areas in which there had been a lower intensity burn seemed to be fairing a bit better and though there was still a majority of shrub growth there were some small trees starting to appear, particularly *P. contorta*.

South East Alaska

The time I spent in Southeast Alaska I worked for Dr. Robert Deal in the Forest Research Lab in Juneau. The lab is the headquarters for the Forestry Service in Southeast Alaska and most of the research that takes place is done from here. What probably struck me most here was how ecologically inclined all the policies were. In actual fact, due to lots of public pressure the

government does not really do any cutting at all on its land at present. This is not to say that there is not still plenty of land that is being cleared, as most of the land owned by the indigenous people has been, or is being cut. Forests are generally *Picea sitchensis* (Bong.) Carr. (Sitka spruce), *T. plicata* and *P. menenzii* with occasional *Betula papyrifera* Marsh. (Paper-bark birch) at lower elevations.

Regeneration is not a problem in SE Alaska as the trees grow like weeds in any space available and clear cuts seem to resprout in no time. However, there is great concern for the old growth forests that are disappearing slowly but surely, with no possibility of recreating them. Another source of concern is the quality of these second growth forests that seem to be springing up everywhere, as they do not house as many species as their originators. For this reason a lot of the research in the lab was based on various tests to see how it was best to manage these forests so as to get as good an environment as possible. Most of these involved monitoring the forest after different thinning treatments.

My stay here can be separated into two stages; the time spent working in the actual lab offices in Juneau and the time spent doing fieldwork in the various islands in the area.

Lab work consisted mainly of entering the data collected by the different groups into the computers and preparing "cookies" (log transections) so that compression tests could be done on them (this being their main method of testing wood quality). As well as this I helped in collecting data for an experiment that had been ongoing on Douglas Island. This was an experiment to investigate various thinning treatments and their effect on the number of epicormic branches that grew on the trees, as these decrease the quality of the timber.

Field work was by far the most interesting as it meant flying in floatplanes (usually Beavers) and assessing the situation of various plots in different sites. This was done by counting the number of regenerating trees in the plots and doing eighteen vegetation plots to see the percentage cover of shrubs and vegetation. As many sites were done in each field trip it was interesting to be able to compare how various levels of thinning affect the regeneration and the vegetation that grows back. My experience is limited to a few weeks of work but it seemed evident that there was a very fine line between achieving the correct amount of thinning to get enough light for regeneration of trees without being over run by shrubs. This also varied with the topography and other physical variables in each site.

Fairbanks

In the week I spent in Fairbanks I was treated to the practically constant company of Prof. Glenn Juday and Dr. Phillis Adams. They both showed me around the university and tried to get me to see as many of the experimental sites as was possible in the limited amount of time. For this reason I helped out in various different projects. Interior Alaska was the most interesting for me. The two main types of forest I looked at were the *Picea mariana* (Mill.) Britten, Sterns and Poggenberg (Black spruce) forests found in the muskeg and the *Picea glauca* (Moench) Voss (White spruce) found on more elevated land.

One of the experiments I helped to collect data on was in a *P. glauca* / *B. papyrifera* stand. Here the trees had been wounded in different ways so as to simulate the attack of different forms of beetle and they were monitoring them to see how much more prone to disease they became. Insect attack seems to be quite an important form of disturbance within the *P. glauca* forests in Fairbanks. This makes them a lot more susceptible to disease and snow damage. During the visit was able to look at a 210-year-old stand of old growth *P. glauca*. The understory was very different from that in SE Alaska. It was mainly dominated by *Equisetum sylvaticum* (wood horsetail) and *Epilobium angustifolium* (fireweed) making it a lot more agreeable to walk through!! In areas where small openings had been formed there seemed to be some seedlings of *B. papyrifera* and the odd *Populus tremula* L. (aspen), however the species which seemed to dominate these areas was *Alnus sp.* (alder). It seemed as though the latter was not as grazed on by the moose as the other two species and so was able to take over a lot quicker. However in an

area which we looked at that had been burned down by a fire in 1983, previously *P. glauca* was completely dominated by the *B. papyrifera*.

The other stands I looked at were *P. mariana*. These thin spindly trees grow among thick layers of sphagnum. They are extremely well adapted to fire with a thick waxy cuticle covering the needles and cones. They are the only trees which are successful in these areas and they have to withstand the harsh conditions of growing on soils, which are in permafrost. This in itself makes it an exceptional tree as there appears to be no other that can grow in these permafrost conditions, *B. papyrifera* and *P. glauca* being slowly replaced by graminoid species in zones of permafrost.

The university had let a whole area to creating an experimental burning site and I was able to take a look at forests, which had been burnt only 2 weeks before my arrival. The fires had not been as intensive as expected and most of the trees were still standing and would probably sprout in the near future. The sphagnum layer had been reduced by an average of 10 cm.

The rest of the work I did was on sites on the Tanana River banks. Here there has been a lot of work done on succession patterns as it was possible to note a gradient of vegetation as you went along the river and much work has been done to see what pattern it follows.

Considering the diversity of the activities that I was able to get involved in and the range of forests I found myself in, I can be sure to say I learnt a great deal. This was possible due to the amount of help I received from many people both in Edinburgh as well as in the States, to whom I am very grateful.