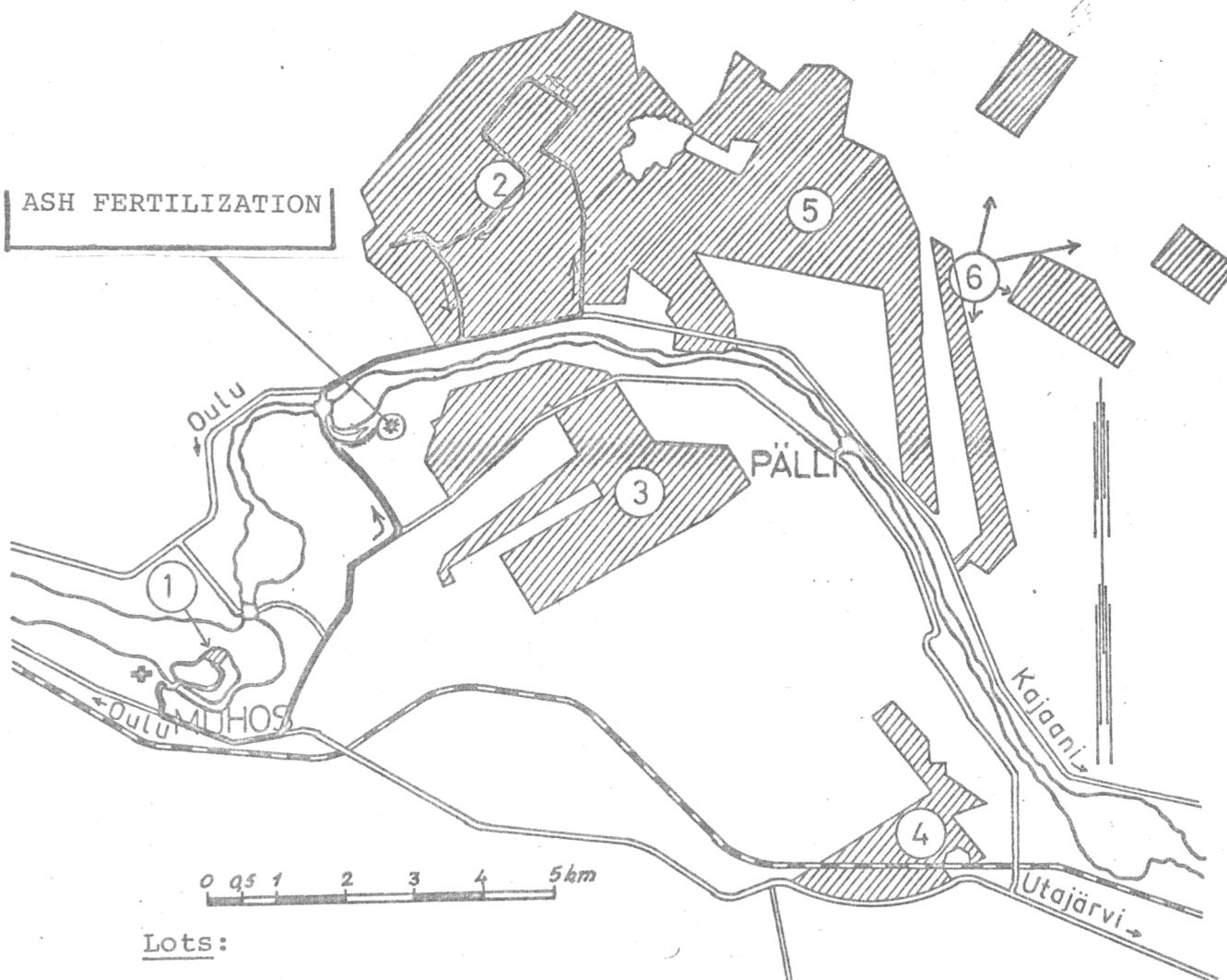


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PYHÄKOSKI EXPERIMENTAL FOREST

INDEX MAP OF PYHÄKOSKI EXPERIMENTAL FOREST

Detailed excursion route on lot 2 can be seen on page 4



Lots:

1. Research Station	4 ha
2. Northern lot	1 750 ha
3. Southern lot	630 ha
4. Kantosuö	280 ha
5. Tahvola and Häikiö	1 100 ha
6. Other lots	<u>900 ha</u>
Total about	4 700 ha

PYHÄKOSKI EXPERIMENTAL FOREST IN MUHOS

The total area of Pyhäkoski Experimental Forest, after some recent enlargements, is about 4700 hectares. From this, more than 90 % is peatland. In the case of peatlands, the altitude varies between 70-75 metres and in the case of mineral soils about 75-80 metres above sea level. This means that a comparatively even area is in question. The annual precipitation is about 550 mm, which is rather little. The average sum of daily mean temperature ($> + 5^{\circ}\text{C}$) is 1020 d.d., and the duration of the growing season ($\geq + 5^{\circ}\text{C}$) about 145 days.

The research activities in the station are characterized by problems urgent at a particular period of time. By presenting these periods, a clear picture of the development of the experimental activity as well as the changing of the problems within peatland forestry in the course of decades can be given.

In the 1930's, the emphasis was put upon investigations on peatland afforestation. Besides methods of natural regeneration, artificial seeding methods especially with pine were studied.

Yield investigations on peatlands were started in the 1930's, as the so-called permanent plot series were established. Among other things, the influence of different silvicultural treatments on yield has been studied on these plots.

The first fertilization experiments, using wood ash as a fertilizer, were established in the 1940's. The actual basic research on the fundamentals of fertilization did not start until the beginning of the 1950's, as the use of commercial fertilizers in forests increased.

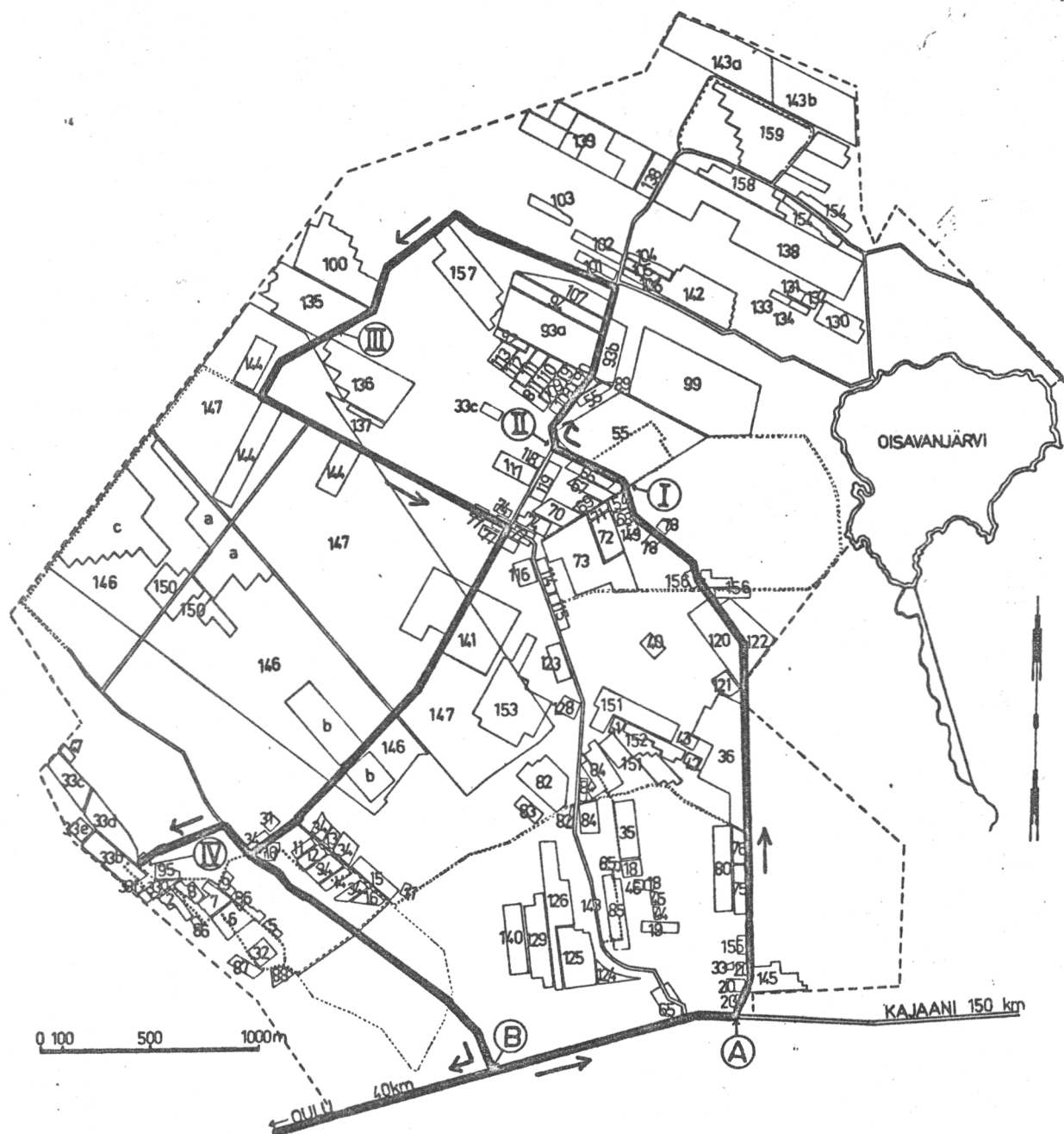
Investigations on new ditching methods started in the 1950's after mechanized ditching had become a common practice. At that time, the first field experiments on the use of plastic pipes in forest drainage were established in the experimental forest. Later, this work has been continued by investigations on rotary ditching and work output.

Investigations on different fertilizer forms became actual at the beginning of the 1960's. At this time, it was already known which nutrients and how much of each should be applied when fertilizing peatlands. Since nutrients are applicable in various chemical forms, extensive experiments with different nitrogen and phosphorus fertilizers were set up to find out the most profitable form for common use.

In the 1960's, the development of seeding and planting methods started again. Simultaneously, the value of different ditch types in afforestation was studied. It was found out that a good planting result and an effective drainage are achieved at the same time if the furrowing method is used. Mechanized afforestation with soil preparation has been studied, too.

Good facilities for studying the need for repeated fertilization and supplementary ditching were provided by old fertilization experiments established some 20 years ago in the experimental forest. Soon after the activity of the research station started, old plots were divided into smaller units by ditches. The possibilities for intensive forestry by using effective ditching and frequently repeated fertilizations have been the main object of research at the beginning of the 1970's.

SURVEY MAP OF LOT 2



Excursion route on lot 2

Points:

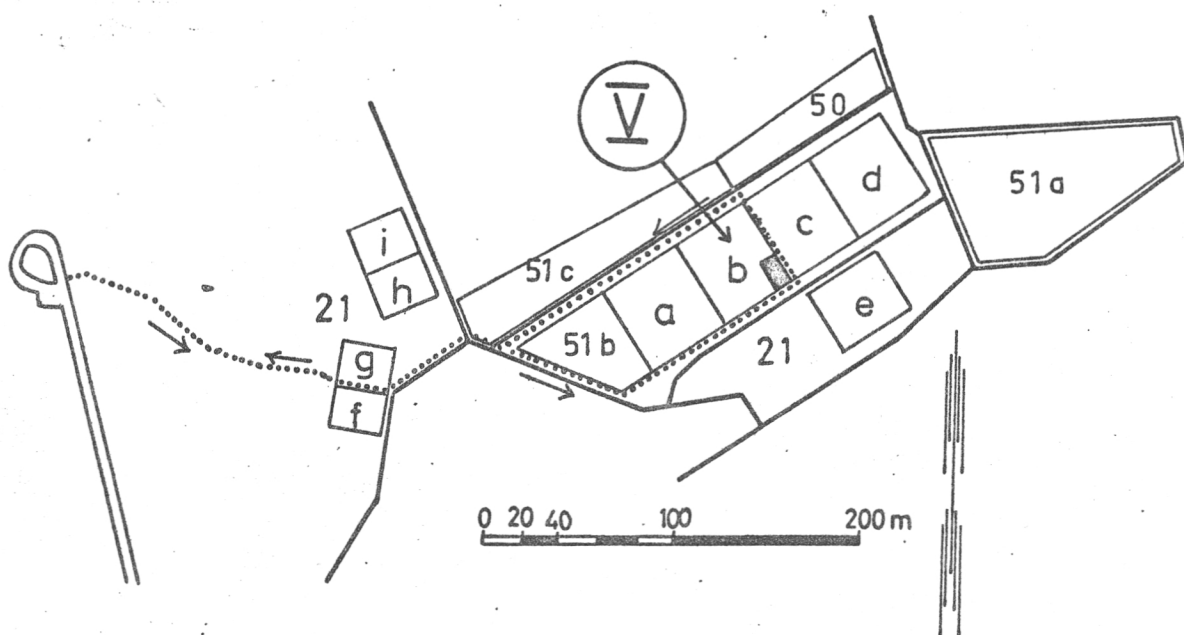
- I Fertilization experiments 66, 55 a and b, 55 c
- II Jylkký cottage
- III Experiments on afforestation of open peatlands
- IV Various fertilization experiments on an old drainage area

POINT V

The last excursion point is not on land owned by the Forest Research Institute. When the power station on the river Oulu was being built, the required land on both sides of the river was given to the Oulujoki Company. Efforts have been made to preserve all the established experiments.

The name of the Experimental forest derives from the famous Pyhäkoski rapids, which before the building of the power station was an excellent place for salmon fishing and a beautiful tourist attraction. The official residence of the forest technician (of the Research Institute) was in the middle of the present dam basin on a high cape which is now covered with 12 m deep water.

In the 1930's experiments dealing with the afforestation of drained peatlands and soil improvement were established in this area which previously belonged to the Forest Research Institute. Sand with varying amounts, calcium and later wood ash were used for soil improvement. The sand was from mineral soil of *calluna vulgaris* type. The area was drained in 1933 and afforested in 1934 and 1937.



POINT V. ASH FERTILIZATION EXPERIMENT ESTABLISHED 1947

An experiment investigating the effect of wood ash was set up on this originally treeless open swamp, whose nutritional status resembles cottongrass - sedge type. In 1932-34 the area was drained using 60 m wide drain spacings and afforested partly by seeding and partly by planting in 1934-36. The afforestation failed so that in 1947 there was an uneven, less than 0,5 m tall young stand.

Including the wood lost in thinnings the total wood production (inc. 1975) on the plot b was 190 solid m³ without bark/ha and on the plot c about 220 solid m³/ha (on the zero-plot only 10 solid m³/ha). The yield surpasses that obtained on the best mineral soils (the Oxalis-Myrtillus type) in southern Finland in the same period of time.

With the aid of these experimental plots, serving mainly as demonstration plots, the following things may be observed:

- The amount of radiation energy from the sun is not, in these latitudes (65°), the main growth limiting factor. By soil improvement measures it is possible to reach a very high production level per hectare.

- The present results do not yet represent the maximum possible level, since the employed drain spacing, 60 m, is too wide. This is demonstrated by a distinct decrease in the total height of trees when moving towards the middle of the strip. The experimental plots do not touch the ditch side, which would be the best site.