DISCUSSION OUTLINE

FOR

MENOMINEE FOREST MANAGEMENT CONFERENCE

NEOPIT, WISCONSIN

JANUARY 23 - 25, 1951

MODERATOR - GEORGE S. KEPHART

U. S. INDIAN SERVICE - BRANCH OF FOREST AND RANGE

WASHINGTON, D. C.

JANUARY 23, 1951
8:30 A.M.

A. Introduction and Statement of the problem
W.J. Ridlington - Forest Supervisor - Menominee

B. Forest Survey Methods

1. Present Status of Menominee Survey
W.J. Ridlington - Forest Supervisor,
Menominee Discussion.
2. Red Lake Forest Survey
T.M. Holt - Asst. Area Forester.

DISCUSSION

3. Objectives and use of ten percent cruise at Menominee with Growth Plot Controls.
W.P. Arthur - Mill Manager,
Redby, Minn.

DISCUSSION

RECESS

4. Management of Forest Property based on Statistically Set Value and Growth Plots.
C.B. Slott, Coop. Ind. Forester
U.S. Forest Service, Milwaukee, Wis.

DISCUSSION

LUNCH PERIOD

5. Advantages, Costs and Application of Aerial Surveys.
C.D. Chase - Lake States For. Exp. Sta.
(To be adjusted to Mr. Chases arrival at meeting)

DISCUSSION

6. Other Survey Methods in Use in the Lake States.

OPEN DISCUSSION

C. The Forest Management Plan

1. Objectives and Requirements of a Practical Forest Management Plan.

Lee B. Winner - Forester - Menominee

Discussion

RECESS

2. Indian Service Policy as it affects Forest Management Planning.

George S. Kephart - Br. of Forest and Range, Washington, D.C.

DISCUSSION

D. Summary of Survey Procedure

Discussion Leader - T.M. Holt

1. Minimum basic data to be obtained.
2. Desirable data to be gathered.
3. Application of data:

A. Cutting Budget

B. Long range management planning
C. Maintaining continuous inventory
D. Determination of values

January 24, 1951
8:30 A.M.

E. Growth and Mortality Determination and Their Application in Sustained Yield Management.

S.r. Gevorkiantz - Lake States For. Exp. Sta.

DISCUSSION

(A re-statement of the conference problem
is desirable at this point)

F. Plan of Action

Discussion Leader - G.S. Kephart

1. Justifiable Expenditure
2. Future use and action on 10% cruise.
3. Utilization of plot information on hand.
4. Unit of area for Volume Determination
5. Means of recording and maintaining current inventory figures.
6. Course of Action:

Step by step procedure to be outlined and agreed to by the group.

January 25, 1951
8:30 A.M.

G. Questions for which specific answers are sought:

Discussion Leader:-

1. Should 10 % cruise with growth plots controls be undertaken as logging progresses in uncruised blocks?
2. How can we salvage much of our present 10% cruise data? Where must we hold the line on any further breakdown of gathered 10% data:- by 40, 1/4 section, section, or block? Much of the data already has become victim of "book-keeping breakdown", when scattered salvage operations became necessary.
3. What use should we now be making of gathered and computed 10% cruise data? As of the end of calendar year 1950, $26,940 has been spent on cruising 50,334 acres, at a cost of $.53 per acre.
4. How can we best use details of plot information now on hand? (Computing complexity is extreme).
5. Are plot cruise and 10% data compatable?
6. Should we plot cruise entire Reservation as a unit in order to give the management plan a basis in fact?

7. What is groups' attitude toward an aerial survey to cover the Reservation with a cover-type, condition and size class map and plot cruising each condition class from permanent growth plots?
8. How can we develope a management plan for production of forest products? How can we best determine what proportion of annual cut the aspen and cedar stands must take in order to carry a fair share of annual cut?
9. Are growth figures, as presented, from blocks 2, 2A and 3 indicative of over cutting?
10. At present, sales and production (Mill) departments dictate species and proportion of each t o total volume cut. What is responsibility of Forestry Department toward such a policy?
11. Should an estimate of mortality not salvaged be made each year and deducted from allowable annual cut? How else can production departments be sparked with sufficient incentive to devise methods and means for gathering smaller volume of salvage?

ADJOURN

The discussions at the meeting centered around a list of questions pertaining to surveys and management problems. The answers to these questions as obtained from the discussions are listed here as a summary to the meeting.

1. How can we salvage much of our 10% Cruise data? Where must we hold the line on any further breakdown of this data?

   There is no need to keep the 10% cruise data current by means of a detailed bookkeeping system. The data has its value in being a historical base. Corrections, as shown by plot remeasurements, when applied to the base data, will serve to bring the base up to date. Changes occurring in the forest will be reflected in the established plots.

2. How can we best use the details of plot information now on hand?

   The plots serve to establish volumes, indicate growth rates, and in general, answer any questions that may be in the Forest Manager's mind, concerning happenings in the woods. When used to answer a specific question that involves anything less than the total plot volumes, the data may not be correct within desireable statistical limits; however, it will provide valuable information as to trends.

3. What use should we now be making of gathered and computed 10% cruise data?

There is really no need to be concerned about the use of 10% cruise data beyond that which has been made of it. The value of this data is primarily historical. Actually, volumes were used to develope the second cycle cutting budget, and the field maps have been and will continue to be widely used.

4. Should 10% cruise with growth plot controls be undertaken as logging progresses in uncruised blocks?
No, this will not be necessary. The uncruised blocks will be plot cruised to 15% accuracy. This will be sufficient for management purposes.

5. Are plot cruise and 10% cruise compatable?
Yes, since they both serve to furnish management with volume answers for those acres covered.

6. Are the growth figures as presented from Blocks 2, 2A and 3 indicative of overcutting?
Not necessarily, the data covers a limited area of the Reservation and may not be representative of the entire area. Any cutting that has occurred in those blocks, since plot establishment, was necessary to prevent loss of mortality. Too, the period is a relatively short one from which to draw sweeping conclusions. If it should later be determined that overcutting has occurred, adjustment of cut in that area must be made in years to follow in order to bring back proper level of growing stock. The present annual cut limitation is also a very weak figure. The primary job at present is to either prove or disprove it.

7. Should we plot cruise the entire Reservation as a unit to give the management plan a basis in fact?
Yes, an additional 225 plots established in uncruised areas, when combined with 200 of those already established in cruised areas, will provide per acre volumes of saw log timber for the entire Reservation, correct to 10% statistical limits. The 225 new plots will be randomly placed, along mechanically selected strips, in such manner as to permit of their being used to cruise individual blocks to within 15% limits.

8. What is the groups attitude toward an aerial survey to be followed up by making a condition class map?
Upon completion of P. & M. A. Aerial survey, the panchromatic prints will be purchased. These will be used to fullest extent possible, to obtain a condition class map of the Reservation. This map will give area figures against which per acre volumes of the Reservation wide plot cruise will be applied.

9. How can we develop a management plan for Forest Products?
Survey of forest products will be delayed until such time as a condition class map has been completed. This will facilitate locating those areas that must be sampled.

10. Should an estimate of mortality not salvaged be made each year and deducted from allowable cut? How else can production department be sparked with sufficient incentive to devise means of gathering small volumes of salvage?
The answer is primarily administrative. A practical

limit of salvageable volume should be determined, and where that volume is located, a logging area should be designated. It then becomes a part of the annual cut. The suggestion was made that the Reservation be divided into salvage units, with gyppo loggers maintaining their areas clean. Where salvage material alone will not support the individual, he then could log standing timber to contribute his share to the annual cut.

11. What is responsibility of Forestry in supplying specific species, etc. (question #10 of outline).
Answer to this question purely administrative and could not be answered by the group.

Menominee Forest Management Conference

Neopit, Wisconsin

Jan. 23, 24 and 25 1951

PRESENT WERE:

George Gevorkiantz, Lake States Exp. Station

C. D. Chase, Lake States Exp. Station

W. Parker Arthur, Ind. Service Red Lake Mills

C. B. Stott, U. S. Forest Service

T. M. Holt, Ind. Service Aris Office

W. J. Ridlington, Ind. Service Menominee

Lee B. Winner, Ind. Service Menominee

RIDLINGTON

This meeting was originally planned as a round table discussion of our survey problems as a means to some decision on what to do about our 10% cruising. We expected Cal Stott to be on the reservation sometime in January and had hoped to get Parker Arthur to sit in with us. As things have developed, the planned gathering has grown into quite a formidable conference.

Now, as for the matter of the forest survey of the Menominee forest, where are we going with the 10% cruise? When will we get there? Will it be worth anything when we do get there? Will the tribe receive full value for the money spent? All these questions should be answered now! Are we in a position to say that all this material we have gathered is fine but there is a new and better way to do this job? Can we afford to put aside what we have and start over? New methods and techniques are being developed constantly, and before we can arrive at a set of answers from one method we are forced to consider another. In the

closing paragraph of their textbook "Forest Mensuration", Bruce and Schumaker say, "The technique for mensuration is constantly changing. There have been many important additions to the tools made available to the Mensurationist in the past decade alone, and these tools have led to new methods which are great improvements on anything that went before. There is no reason to think that the end has been reached."

There are probably in this group as many answers to the questions that we raise as there are of us. It is our purpose to bring together these ideas and come up with what seems to be the most logical course. We want to arrive at an agreement on all the questions of survey. The results will be the policy that guides us through the next cutting cycle.

Our problems then line themselves into three distinct categories:

1. Surveys
2. Growth estimates.
3. Application of our findings and stand management.

(Refer to Data sheet for status of survey.)

A summary of our cruising to date is as follows:

1. 10% Cruise
   (a) 65,096 acres completed.
   (b) Estimated volume 624,958 M.B.F.
   (c) Total cost of this cruise $37,218.00

2. Plot cruise (temporary in Block 8).
   (a) 16,415 acres.
   (b) Est. volume 224,025 M.B.F.
   (c) Total cost $500.00. Estimated

3. Plot cruise (Permanent plots) Blocks 1 & 12
   (a) 16,140 acres.
   (b) Est. volume 81,930 M.B.F.
   (c) Total cost. $1,218.00 Estimated.

There remains to be covered 77,364 acres on which there is an estimated volume of 180,087,000 board feet. If the plot cruise is a satisfactory method, the additional cost to cover this area is about three or four thousand dollars. If the plot cruise is not satisfactory and it should become necessary to 10% cruise this area and recovery blocks 1-5 and 12 which are plot cruised, the additional cost would be about $58,000.

There are now 656 plots for growth study and inventory control on 85,491 acres at a cost of about $6.00 a plot, or $3,936. To establish control plots on the remainder of the

Reservation would cost three or four thousand dollars.

Now let's see what this program would cost.

Cost of Cruise to date (10%)	$34,500
Already spent on Perm. Plots	2,936
To complete 10% cruise	40,949
To establish additional plots	3,000
Total	$82,385
Total..	

These figures are startling, to say the least, but we have already spent $34,500 on 10% cruise that has resulted in but little material gain for the operation. The principal use has been of the field maps. These maps have proven themselves to be very valuable to all concerned with woods operations. They alone then might have to carry the entire cost of cruising (53¢ per acre). Perhaps we should look for a cheaper way of getting our maps.

As for the unused part of the cruise data, much of it has lost any semblance of its original accuracy during the past eight years. The reason? Repeated scattered salvage operations as a result of dying hemlock, birch, and blowdown, have changed the original volumes. The data was collected and computed by forties. Salvage occurred wherever and when-

ever, as fast as possible. Much of the time these were never marked and the only record of the cutting was by blocks.

Out of this meeting we hope to get answers to such questions as: How can we make the best use of our 10% cruise data? Should we continue to set our growth plots in the uncruised areas? If we do we will have 1,500 or 2,000 plots before we finish the job. The job remeasuring and maintaining that number of plots will be terrific.

We also would like to know just how best to use the data we are collecting? As yet the marking crew goes out to mark without consulting any cruise data. It is true, however, that they do mark by grade and risk without calling it such.

We have made two remeasurements on plots to give us growth data. The net growth is so low as to frighten us. Our annual cut is based on a growth rate of 2% on one bil-

lion board feet. How long can we continue to cut at a 2% rate if we are growing at 1% or less? We recognize that our growth data is limited and may not reflect a true condition. But perhaps that is wishful thinking. We feel that it is time to re-evaluate the whole forest management plan and reset our course.

IIDLINGTON: We are very fortunate in having Mr. Cal Stott and Mr. Ted Holt with us today. Tomorrow Mr. S.R. Gevorkiantz and Mr. C.D. Chase of the Lake States Experimental Station will be here. We had hoped to have Mr. Kephart sit in to report on Indian Service policy and to act as "Moderator", but he will be unable to attend. Bill Heritage wrote this letter giving hi a summary of what has happened on the Menominee Reservation. If I read part of this letter, it will let us know how Bill feels about the problems in question: "In considering forest management plans at Menominee, it appears to the foresters of this office, careful thought must be given to the following history of the Menominee forest and to the

effect these changes have made in the forest.

The Menominee Indians were moved to their present location in 1853 and the reservation was established by the treaty of May 12, 1854. The original reservation contained 12 townships but was reduced to 10 townships by the treaty of February 11, 1856, and they were paid $.60 per acre for the ceded land. Early logging, which began about 1860-65 and continued to 1908 removed the timber standing near driving streams, and it is surprising how small some of the streams, running into the Wolf and South Branch of the Oconto Rivers were that were utilized to carry logs to market. An act of June 18, 1890, set the maximum volume that could be removed in any one season at 20,000 M.B.F. A total of approximately 400,000 M.B.F. was cut and removed by river driving.

The act of March 28, 1908 provided for the operation of sawmills and continued the maximum cut at 20,000 M.B.F. per annum, except for timber in certain areas, as outlined in the act of March 3, 1911. The act of May 31, 1949 provided

for cutting additional timber not to exceed 5 M.B.F. yearly during the fiscal years 1949, 1950 and 1951 in order to remove dead, diseased and/or blown-down timber. The total dut,qbased on the records available, to June 30, 1950, has been 1,283,830 M.B.F. from this reservation of 234,000 acres Over the years various estimates have been made of the volume of timber on this reservation. When the cost records for the Mills were set up in 1910 an estimate of 1,750,000 M.B.F. of timber was shown. In 1914-15 a cruise was made of the timber by experienced timber cruisers and forestry trained compassmen, who reported a total volume of 1,146,608 M.B.F. of which 242,544 M. feet was reported as poles, posts cordwood and ties. The "Cutting Budget" for the second cutting cycle, Menominee Indian Forest 1951-1965," by John W. Libby, dated February 17, 1950 show an estimated total volume of 1,080,801 M.B.F.

Over the past century, fires ran over much of this reservation and great damage was done to both mature and

young timber. The loss during certain years, especially 1910, 1925, 1932 and 1934, was tremendous. Since 1936, except for one fire of 1,000 acres the area burned over has been quite normal.

When the reservation lands were surveyed in 1852 the surveyor's report showed many areas of recent and old blow-downs. Many of these had been caused by southwesterly winds. A blow-down in July 1905 was reported to have thrown some 30,000 M.B.F. This salvage cut reached a total of 40,000 M.B.F. In June 1933 several million board feet were blown down, and widely scattered over the reservation. In August 1934 more than 30,000 M.B.F. were blown-down and again in 1936 some additional 20,000 were blown-down. In 1949 several areas of timber were wind-thrown, while in 1950 the loss from wind has amounted to some 10,000 to 12,000 M.B.F. scattered over an area of five townships. These losses, scattered as they are over large areas, do great damage, It has been impossible to salvage all the blown-

down timber and many of the better quality logs were greatly reduced in volume and quality by damage from the wind.

Woodsmen and foresters have noted and reported, for the past century and a half the fact that hemlock timber, when disturbed by the building of roads through the stands, light logging, or other disturbance by man, often dies and, therefore, when the hemlock trees began to fade out of the stands in 1930-33 little concern was felt as it was believed to be the normal thing in these old hemlock stands which covered about 50,000 acres. Later it was learned that the "hemlock borer" always present in a hemlock forest, and probably assisted by the drouth of that time and the age of the timber, was the cause of this loss. A report of 1938 by Regional Forester William Heritage showed a loss of some 135,000 M.B.F. only part of which it was possible to salvage, and the Menominee forest is still dotted with the skeletons of these old trees through much of the hemlock stands. It has been necessary to return as many as three times to certain

hemlock stands to salvage the dead and dying trees within a period of 10 years.

In 1918 White Pine Blister Rust was first found near Keshena Agency and today it is spread over most of the reservation. The fight to control it goes on, and more than $250,000, including funds from CCC-ID, has been spent in trying to control the disease. While the actual loss to mature timber has been very small, the damage to reproduction has been quite extensive and there are areas up to 80 acres in size, so badly infected that the chances of control are questionable.

For the past 10 years "Walking stick" infestations have occurred at two year periods. It was believed that nature would eliminate these insects before they reached an epidemic stage. However, with the defoliation of 1949 covering some 7,500 acres, it now appears necessary to take control steps and while the actual damage so far has been to trees below merchantable size, there is a possibility that here may be a

serious threat to hardwoods of several species.

Throughout the mature and near mature birch, a disease has occurred which is probably "birch die back" which has made it necessary to return to cut-over areas within two-year periods in order to remove the dead and dying trees of this very valuable specie.

Two years ago a "blight" which was thought to be a virus disease occurred on many of the young yellow birch. To date limited damage has been noted, but the threat is present.

In the planted stands of Norway pine, it was necessary this past season, to spray from a plane certain areas in the hope of controlling "spittel bugs" which were doing considerable damage.

Of the 234,000 acres comprising this reservation, it is reported that 222,000 acres have some tree growth, and that 175,000 acres contain timber of merchantable size and quality. In a discussion this past week with Forest Supervisor

Ridlington, it was brought out that today there is only about 20 of the 360 legal sections comprising the reservation that can be said to contain "virgin timber." In every other legal section some cutting has been done at some time within the past 90 years, or fire, disease, or wind has in some way injured the original stand. So in these "Round Table" discussions, it will be necessary to remember that while this forest averages today more than 4½ M. feet per acre, based on the total timbered area, almost all of it has been "culled" to some extent, either by logging, fire, insects, or disease, and is not a virgin forest.

It appears it is time we should carefully consider all factors in order that timber fit for lumber manufacture may continue to be available in the next third, fourth, and fifth cutting cycle. Lumber can only be made from trees 12 inches D.B.H. and quality lumber can be secured only from trees 16 inches D.B.H. and above."

LINGTON: Now we have our cutting map up to date. It might be well

just to see how much of the reservation has been covered by some cut or other. (Ridlington shows maps). This was cutting from 1908 to 1929. Most of the timbered areas were covered and the map got so full we had to make a new one. We started the second cutting cycle. This much has been cut over.

WINNER Has anybody any comments on this data sheet? There may be some question as to how this volume for the uncruised area was arrived at. John Libby scanned over the 1938 panchromatic pictures for areas and applied what he thought was a good average.

HOLT At least there is some basis for the figure; it is not a complete guess.

LINGTON The area should be fairly close. About the money that was charged to 463-2, the cruise account. Some of it may or may not have justifiably belonged there, but by making the division it follows through at about .53¢ an acre. The cost of the temporary block cruise was about $5.00 per plot for a

hundred plots.

WINNER Let's find out what happened at Red Lake.

HOLT The first cruise at Red Lake dates back to 1910 at the time the Forest Service was directing the forestry work of the Indian Service. In that cruise they covered all of the pine land, which amounts to little over 100 acres located on south shore of Lower Lake. Incidentally, it was rather an economical cruise for $4,000.00, run only once through a section. It did, however, give some idea of what the total volume was. In 1916 and 1917 a cruise was run on the South side of the Lower Lake. I don't know how many times through a forty that was, but it did set 40x40 base estimates. The International Lumber company cut 105 million board feet, and according to figures that I have seen, considering cedar products and other items that were taken out, the overrun was about 78%. Of course the cutting wasn't completed until 1927 and that would help to account for the over-run, since it would

include about 10 years of growth.

WINNER

Was any silvicultural treatment carried out in that area?

HOLT

No. Only thing that was taken out before then was when dead and down became scarce, it was necessary to burn some over in order to have material to log. Then, of course, there were other fires coming through at regular intervals and consequently a good part of the volume was sold. The fires of 1930 destroyed a large volume, and windstorms have raised plenty of cain at Red Lake, as well as Menominee. Ponemah Point was cruised in 1922 and that was on twice through a forty basis. They had a very good map as a result, but again, from lack of records, there was no assurance as to how close the estimate was. During CCC days there was much work to get the cruise data up to date, and much of it was questionable. Walt, you probably know better than I do at present time with the type maps that were made, it was almost impossible to identify your location, particularly in more or less open areas. If you

were to take the type map and go looking for a certain type you would likely look all day. In those days when we were pressed for getting work done we used what men we had. Much of the cruise was gathered by CCC men. In 1936 Heritage and Kephardt drew up what is called the preliminary management plan for Red Lake. It is an excellent source of material as to early history of Red Lake as well as laws and Treaties that affect the reservation, and they followed on through estimating their volumes, utilizing the best available information, but it was not like a new cruise. A good bit of it was based upon the judgement of Heritage, Kephardt and Frisby, and maybe even some of Ridlington. Continued cutting over the years and lack of funds and personnel to maintain a cut-over cruise just simply blew lots of holes in any volume work at Red Lake. There was another cruise some years ago. It is probable too that under cutting practices at that time it may be that a lot of the stuff was not considered as economically available. I have never found any specifications concerning

that work. It is certainly tough to follow behind when the whole thing is a matter of word of mouth. From 1936, when the preliminary plan was made, it was felt necessary to accomplish another cruise. Each and every year no money was available for it. Finally, in 1949 the Tribe agreed to put up the money for this aerial survey. The contract for the photographs was let in March, 1949. The scale was 4" to the mile. The flying was all done during the summer of 1949 and the reflights accomplished by November 15. Flying was completed late in September, which actually was a little bit later than they consider as ideal time. To me some of the later flying looks better and is easier to read than early flying. Flying was done on 650 sq. mi. for $2400 or $3.69 sq. mile which figures out to about .6¢ per acre. They provided two copies of the prints and the negatives, which are the property of the Agency. We have had some occasion to have more prints made of those negatives. The instructions that we used are based on the survey instructions for Lake

States and State and Iron Range. We attempted to utilize portions of those instructions which best fitted our needs and set them up in detail form.

WINNER Did you try to have the Forest Service do the interpretation for you?

HOLT No. Leaf had worked about two years on aerial photography and then came over with us. He did all the area outside of Red Lake forest. Hamilton did the work inside the forest. Leaf worked with Hamilton the better part of a month for training. Paul Gillick of the Lake States was also up there from time to time. Then there would be maybe a day a week, after the initial month, that Leaf would spend with us, and Hamilton carried through on that. I felt, and still do, that we gave him every opportunity in the world as far as assistance was concerned, but on his ground checking he fell down in some areas. The results were that the area on the south side of the Lake had to be rechecked. In fiscal year 1950, type mapping had been accomplished on 407,000

acres, and about 200 sample plots had been taken. Our total costs are just little over $7,000.00 for 400,000 acres.

WINNER You didn't figure any breakdowns on actual costs?

HOLT I am sorry to say that we were all set up to do it and we had the figures, but I don't know where they went to. When I made up the original estimate of cost of survey it was based on all information obtained from the Forest Service. The estimate was about $10,303.00 for the total job or $.025 per acre. There are factors that make difficult the application of Red Lake costs to another area. These are: reflying because of poor overlap, and the 100,000 acres of marsh on which no work was done. Between the two they probably balanced one another off. Comparing cost at Red Lake with the cost on the Chippewa. They have accepted the aerial surveys on a gross area of 1,312,870 acres, and I have the cost broken down by photos, mapping and field checking. The photos cost a little more than $.006 per acre. The mapping and plot estimating was about .0148 per acre or total cost of about .0212 per acre.

Now, that doesn't include the cost of the maps which in our case are made at the Mills office.

Cal, do you know what the map costs are on that? The estimate I got from Cass Lake was a total per acre of about $.05.

STOTT I think I used about .045 about a year ago.

HOLT The better part of a month for training, Paul Gillick of the Lake States was also up there from time to time. Then there would be maybe a day a week, after the initial month, that Leaf would spend with us, and Hamilton carried through on that. I felt and still do that we gave him every opportunity in the world as far as assistance was concerned, but on his ground checking he fell down in some areas. The results were that the area on the south side of the Lake had to be rechecked. In fiscal year 1950, type mapping had been accomplished on 407,000 acres, and about 200 sample plots had been taken. Our total costs are just little over $7,000.00 for 400,000 acres.

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WINNER How were you figuring on using that map data in your plot plan? Are they all temporary? Did you attempt to grade anything at all, or did you just take diameters for volumes?

RIDLINGTON: Is that pretty much standard procedure?

HOLT Yes, but they are to do some grading that they thought couldn't be done at first.

RIDLINGTON: What use do you intend to make from the data you have worked up?

HOLT Basically, to prepare a revised management plan. We

took aerial photos so that we could pick out acreages of open areas and condition classes in timber stands. I don't know how we could afford to do that otherwise.

NNER Are you satisfied with the results? How about the plots and volumes?

LT We are about one-fifth done. The only plots that we have are the ones which Hamilton had taken.

LT Whether or not they have 6,000 cords or whether there are a million cords, everybody has been pulling figures out of the air. No one agrees.

NNER: If it wasn't for the fact that you didn't have reliable type maps, would you have spent the money on the aerial photos?

LT We must realize the limitations of the thing, I don't think it is particularly well adapted to sales, for example. Of course, there are a lot of variations to aerial surveys, how much ground work you want to do, etc. You could swing it over to a straight 10% cruise after you have your type and classification done. Anybody who does photo interpretation

has to be completely honest with himself and admit there are things he cannot see.

NNER In that management plan, what is the specific purpose of condition classing the forest? Isn't it to divide the area into uniform conditions in order to reduce the number of plots necessary?

LT We should know where we can expect to go, how much volume we are going to have, and one has to have some kind of classification system. Wouldn't that serve the same purpose that Winner mentioned, Cal?

OTT: I don't think so.

NNER: If you were just to designate the area as merchantable or non-merchantable, wouldn't you have accomplished your purpose? It would give the necessary breakdown.

OLT How would you allocate your plots then? Wouldn't you need more plots then you otherwise would? You probably would do that to give uniform conditions as far as your type is concerned within reason of course. You can attempt to get too

fine on that.

WINNER First, you had the type line, where would you go from tthere?

HOLT We used the Lake States standerd.

STOTT Some of this classification has historical value. Some day you will have much more intensive forestry with better records and maps. I think I have got to admit, I am very prone to refer to maps.

HOLT Your statement, Cal, brings us out further about the historical value.

ARTHUR I think I wouldn't be too far wrong in saying that the bulk of the area considered and covered by survey is not saw log timber.

HOLT Pulpwood is what is looking Red Lake in the face.

IDLINGTON In managing pulpwood you wouldn't care about this fine line.

HOLT To me, at least, your photos would seem suited to get saw log size and density.

ARTHUR Ted, what was your experience with the reflights of the

area that blew down?

HOLT Just this. On Ponemah Point they had flown the area and taken pictures under this contract just a week before and I was so certain that all we would need was a reflight on the area, and we would have the whole picture. In actuallity, all we got was reduced density in the stands.

RIDLINGTON We had about the same experience here. When John looked for blowdown from a plane.

HOLT I think the helicopter would be ideally suited, as far as seeing stuff on the ground goes.

WINNER: Assuming that some day this reservation were to be flown, would you think it would be possible to find a thoroughly experienced man and have him do the interpreting?

HOLT It would hardly call for outside experience here. It would mean they would have to do a lot more ground checking. I don't know of any outfit in the Lake States. I am not so sure a fellow fresh out of school wouldn't be better. Maybe you don't feel confident at present time, but any average

individual could learn to read photos.

WINNER How about some of these local consulting outfits? Some of the interpretation aids look like pretty high-priced . Con't some of these consulting firms have this modern equipment?

HOLT The only equipment we used at Red Lake and the basic thing you need for aerial work is your eight dollar stereoscope.

STOTT Now cost about $15.00.

HOLT: Frankly, I am very suspicious, the Indian Service let a contract for an aerial survey on a million acres to be within 5 percent accuracy. Who is going to know whether that part of contract will be fulfilled? As far as I am concerned, I would rather have a good set of photographs and I would much rather have somebody work right under my eye, rather than have a contractor take that job. You can check yourself from common knowledge. Walt, you have enough knowledge of these areas, say you hired a completely green man. Browsing through his work, you could check from memory much of his interpretation.

INGTON From our experience I don't have much faith in photos.

HOLT Realize the limitations to the thing. In your picture that exact boundary is there, but not so on a field mapping project.

STOTT You can't have a perfect thing. You have to admit flaws. How many errors you can accept depends on what you are going to use the information for.

HOLT Isn't any estimate based upon averages? As far as this aerial survey or any kind of survey is concerned, if you have got the job to do, do it yourself rather than contract the thing. We had very little trouble at Red Lake. Just one thing more. On the NW angle at the time of the cruise there was no foliage on the 39-40 photos of the AAA. In some places I have never been able to see anything in those spring photos. When we got on the area, we found changes, yes, but the entire area was type mapped before anyone put foot on the ground. New photos were flown this fall at four inch to the mile. It seems that these contractors are a little more in demand. Red Lake should have cost about $500. When it came time to deal with

him he wanted $850 to start. Finally settled for $550 to avoid reflying.

WINNER Park, will you tell us about your plans for the survey? What would have been the next step had you remained here.

ARTHUR I think that one of the things I am going to say wasn't grasped fully. When I took over the cruise I was told that this was the way it was to be done. I have gathered that we were interested in determining how much volume there was on the reservation. The tribe was continually asking for this figure and no doubt had a good reason to ask. Our annual report of the Mills shows the standing timber as a capital account. Each year's annual cut was deducted from the capital account, but no credits were given to growth. It must have been about three or four years ago the tribe actually had no maple left. I point that out for two reasons: 1. Thinking the tribe has a logical question, how much timber do we have on the reservation, the forest department is responsible for the answer. 2. It is rather ridiculous to turn in a financial

report showing that no maple is left when everyone knows there are millions of feet of maple. The tribe more or less put the heat on the Forestry Department to get an answer to the question. Are we actually saving the forest in cutting a certain amount of timber a year. They would have been willing, I believe anxious in fact, in some years to have allotted enough money to have completed a cruise of the reservation to find out how much timber they had. Now it seems lacking a logical approach. When I came here there was no established inventory figure, and in all probability it would seem more likely that the capital, in order to continue to earn the tribe its income, must have growth added. As for the cruise, we would add to it as we cut timber. As work progressed, we would obtain this information of volume. As I said before, and I think it is the most important thing, I can't see any great need for correcting the volume figure to what we had at that time. The cruise data certainly is not worthless. Getting up to the point, I am not passing the buck to anybody. I didn't disapprove the plan when

it was handed to me. There are some statements in this that are basic, probably, to the idea Delaney had as to how the answer should be obtained: " In line with the past policy, it is planned to make a 10% cruise of the area logged during the past ten months. To select areas as time and money will permit with the view to eventually building up a complete inventory of the entire operating unit. The immediate objectives will be to secure data on:

1. An accurate record of volumes.

2. A comprehensive type map to show distribution of species by volume.

3. Prediction of growth increments."

I read that to give you a little slant on what was wanted.

I don't know, probably I am not following very closely to the meeting outline. Well now, as near as I can recall, the growth plot control idea came along probably in 1945-46. I went over to the Lake States Experiment Station, talked to experts over there, gathered ideas, talked to Gevorkiantz. Then I talked to Cal. The most concrete information I got

came from Cal. Frankly, I didn't get much satisfaction from anybody else. I spent some time with professors and got a wide range of ideas that ran the whole range. One professor's idea was to one extreme and in the same building I ran across one with the other extreme. What we were looking for at the time was a system that we could apply that would do what apparently some have feared couldn't be done. The plots in our cruise area were placed so that stand conditions would be representative. We would have basic data on which we could put our fingers, so to speak, and keep the pulse of the entire area of the whole body. Cal was more instrumental in giving his ideas. We decided then to proceed on that basis. We tried to limit plots to, as far as possible, a number that would be a reasonable operation, using two foresters as the number of men to maintain the plots along with other routine work. Inasmuch as we had a type map, we established our plots according to the interest that we had in the types. We also thought that those plots were not purely growth plots. I have always thought of them as little windows through which we could look

at our forest to observe forest behavior. By applying an original acreage by types, by timber classes, and various diameter classes, I felt and still feel we could very accurately determine what is happening to a large area by observing these smaller units.

All original plot work was started by Grapp, with metal tags, etc. It was interesting to note from the record that was available what his prediction was, on what net volume the 70% cut was going to produce. When plots didn't tell stories bearing that out they abandoned them, assuming something was wrong with the plots. We believe that the plots did tell the story. Getting back to the point, I will mention it is my idea that the original basic data, in so far as type lines is concerned, probably, as Walt has indicated is worth the entire effort. Winds and bugs have changed the picture some since then, but it wouldn't make a bit of difference if type lines did change. The plots in M.H. type would record behavior for the entire area of that type in the block. Assuming that the

data was accurate, the story those plots originally told is complete. Changes in the type can be obtained for that block by recording the plot behavior. You could actually say that after remeasurement of your plots we could shift volumes by species. All we have to do is rewrite it, instead of carrying the cruise data up to date, so that eventually we are going to have the same thing. Why are we interested in getting back to this old idea of what have we got today? What good is any cruise of the entire reservation all at once? Getting back to that question you raised, Lee, I could answer it this way. Here's the point, I don't believe should be overlooked. I am certainly cost conscious. I have had to acquire it in the last two years. I am just mentioning it because I was interested in your cruising costs for that time. In 1943 I helped to establish a cost accounting system for forestry, but it is mentioned to prove the point that I am interested in cost. Here's another question: Why the sudden desire to keep our costs to the minimum? We had a terrific back log of cruising data prior to 1946 and it is now up to date.

It has been quite a strain on the budget to catch up, so to speak. It certainly was a wonderful thing it was done. The job has been done and at a cost comparable to cruise costs in textbooks.

RIDLINGTON The job has been done and I don't think the money wasted. From our own standpoint, what can be done about the area remaining to be covered? We aren't particularly interested in considering another 10% cruise.

WINNER Block 5 is certainly a primary area, we have now got figures for 5 on a block basis. Do you think that the volume figure is sufficient for management purposes?

ARTHUR This is a small area on which to keep 500 people employed indefinitely, and Block 5 is relatively important. I think that a few dollars spent on base maps is money well spent. In view of the detail with which the other timbered blocks have been covered, I would say that the temporary plots didn't get the full picture. While I was here, any employment given in a place like this is of value if it is steady. As time

goes on you will be able to 10% cruise for the development of these maps, which are going to be the basis forever, with seasonal fire guard help when danger is low, or with regular crew during slack time.

RIDLINGTON In this matter of keeping men employed, on this second cycle marking we covered the same amount of territory to get about half the volume as we got on the final cut. I don't doubt that I'll have to run another marking crew just to keep up. So you see, we have full time work for our employees now. I don't want to do anything just to make work.

WINNER As you said Park, the basic importance of the 10% cruise is its historical value. The growth plots are what bring that to date. Would it then be necessary to balance our 10% data by deducting the amount of cut per forty and adding growth in order to keep it current? Are sub-division lines essential? They would be needed to keep the map to date.

RIDLINGTON We want to continue to mark by forties. Winner hasn't convinced me that any other subdivision has to come into the

picture. When we get out in the woods to mark a forty, we know where to start and stop. How do you work at Red Lake? Do you use the forty?

HOLT No. I am not so sure but what you might in your final cleanup be wrong in choosing a 40 rather than a larger area, but from the marking that I have done I much prefer the shorter strip than the long one.

About the reliability of plots. You spoke of hemlock mortality. Now if I understand Cal's method of figuring, that is just how you can't apply them to definite plans. For instance, you used them in block 3 to find out how much mortality occurred, but he says the accuracy of those answers is poor.

STOTT The thing is that the answer for all species combined is correct within predetermined percentages. Any one species is not that accurate by itself. It would be nice if we could do that, and in your case it came out fairly close.

WINNER Getting back to 10% data, I would like to know this.

With 20 plots in a forty acre tract, as a unit, computed by itself, what kind of statistical accuracy could we expect? What kind of accuracy can we expect for a section when sixteen individually computed forties are added?

STOTT Very poor, and each breakdown becomes increasingly poorer.

ARTHUR I don't think it is so poor where we figure out averages.

WINNER Here's the point. The answers on all plots, in a block, handled as an aggregate make a wonderful estimate, but not so where each forty is computed separately and where board feet per type in each forty is accumulated to give volumes for sections, and sections added to give volumes by block.

HOLT Your accuracy for the individual forty increases in direct propertion to uniformity of the stand within that forty. Wouldn't the accuracy average out to a decent figure?

WINNER Walt is being bothered by the fact that this plot cruise data does not inform him of exactly where to go for what the cruising crew called high priority material. They must range over the entire block to find the estimated cut volume.

HOLT You could use the data from individual plots for a guide.

WINNER I went through block 1 and graded trees on the plots with my eyes. Now the marking crew is going to mark with their eyes while they mentally grade trees for quality, vigor and risk. The question is, are they grading with the same standards that I used. If they do, will they mark the amount of volume that I had called high priority cutting stock. I didn't go through and look at every tree, but the answer should, 95 times out of 100, be within the predetermined limits. After they have completed work on entire block they should come out with a volume about the same as I had.

STOTT How small an area must the estimate be for within 10% or 15%. You wouldn't know what was on any one 40, still you would know your woods on the reservation and in considerable detail. I would like to ask a question. Do you recall what growth was on the plots that Grapp established that you measured?

RIDLINGTON They would have to grow fifty years before they could

make up what was cut. I am sure it was about 50 ft. per acre per year. The hardwood plots brought it up. You said that the plots you established, Park, were growth plots. What was your plan for determining the growth?

ARTHUR — You can use them for that but they are more than that. Your growth was one factor.

HOLT — Just a point now. Talking costs from what I remember a statement that Al Sump made in regard to old timber cruise. He spoke in terms of 35¢ an acre. Then certainly $.53 per acre is not out of line.

STOTT — I had a job once that cost 35¢ an acre and sure got the devil for it. It could depend on what group of years that it was taken from just like arguing CCC costs. It is not out of line.

ARTHUR — Plots would serve more than that; they would serve as a look at that part of the Reservation that none of us had seen before.

RIDLINGTON — Now we are going into the plot cruised block 1 with our

marking. It doesn't appear to me that I can use that data there. If you are to take that million feet of/vigor trees, you are going to have a guide, and what is the basis for applying it? We are working hardwood now; it runs 12,500 feet per acre, 175,000 per 40.

RIDLINGTON: I am wondering what you could use as a guide. If you had a particular condition that you were concerned about, couldn't you as a last resort 10% cruise on a 40 to see where you are definitely going? It wouldn't take long of course. It would give you a specific case. I think that Lee hit on the answer when he said the marking crews must range the entire area, and will have to mark the same as he graded to come out with the same volume that he classified.

WINNER: It shouldn't take too long to find out whether they are approaching that more and more closely as marking progresses.

RIDLINGTON: You begin to roam some forties in that area, and you don't know then in some instances whether there is enough volume to mark. It will take two or three hours to cover them. It further impresses upon me the advantage of a specific type map.

The sooner you get over the area, the sooner you see the results.

STOTT I think the fundamental concept should be, the cruises out in the woods, to prepare you for the job of taking out 50 million feet in 10 years against which to check your result.

RIDLINGTON When we are finished with this meeting, we would like to have you use Cal Stott's method of marking on a forty just to see how you would go about it.

WINNER Cal Stott will now tell us a few things about managing a forest from growth, volume plots.

STOTT: For one thing, Park said a good many things, even to the words that I have said and written down in my reports. But we talked this over a good many years ago and maybe we still talk the same language. I wanted to tell you about the last few jobs I had. I like to make my plots permanent because I got so much information in a short time by remeasuring to prove point. Here's a job in Ohio. Three years ago they were convinced they ought to make an estimate, and the man finished the job this summer. He cruised about 130,000 acres of land

and he found four hundred million board feet of timber. I went down there last fall to work with them. I had difficulty convincing them of the truth of my figures because they thought the estimates were too high, although they never have had any figures before. I guess they are now convinced because they increased allowable cut from two million feet to six million. In Indiana they have half cruised the state lands and their timber is far in excess of what was expected. I had another similar case. In Michigan we cruised a 130,000 acre block. I am interested in an estimate on the Menominee reservation of the whole darn thing fresh and current of, say, one year. The 1950 census figures show population increased. Now I wonder what the whole thing is here. We don't know within 10% to 15% the answer on the mortality problems. If we get a volume figure of about 5% growth on your billion feet of timber, I still am not sure of what percent is lost. I believe by adding new plots in the areas where there are none now, and at the same time got some measure of the current loss and the losses what happened a few years ago, we could make it a continuous

inventory. With that job I would like to do it on a permanent plot basis. I would do it up for the use of IBM computing. We had trouble with the Michigan computing job, but once they are finished they have really got a record to add to and subtract from. You ought to have an estimate for the whole forest of that kind. These guesses are all too varying.

RIDLINGTON Cal, I was wondering. In carrying out a plan, we already have 656 plots. Couldn't some of those be used? Do you think 300 plots would cover the area remaining?

STOTT I would actually need only 200 additional plots for 10% accuracy on the entire Reservation. You would probably need several hundred more plots before the block volumes are finished.

I would sample the popple areas too, but not now. Mortality is becoming increasingly important. I was thinking of how it would be if you threw out the logging camp and established little logging villages. If each little village had its share to contribute to the mill in collecting mortality, I believe you would get it done better. Standing mortality

should not go over to the mill until you have cleaned out current and back mortality. A bonus should be given to the operator for taking it in. This old forest is going to have a lot of it until, I don't know how many years it will take to get over the hump, but it will be plenty. Seems to me something ought to be done. There must be ten million feet on the ground right now. It is possible that logging was changed enough when you threw out the railroad system, but more adjustments should be made and more thought given to this.

RIDLINGTON In your system of proposing salvage villages, the matter of roads gets to be such a terrific thing. Right now it would be snow plowing. It's hard to find anyone to clean up these areas of scattered volume.

I think we are making some progress. Up to this time we salvaged seven million feet or just about half of our cut.

ARTHUR In those areas that are culled through the most, plots have already been established. We have in the neighborhood of 600 plots out. I would be willing to gamble on the stories

they tell if our mortality figures out to be .7% of the volume that we have on the reservation, I would be willing to gamble on applying these percentages to the remaining timber area rather than to go over the entire reservation.

STOTT Timber type is a pretty standard thing but the amount of mortality is not nearly that much. There are too few trees lost and you don't get a very reliable figure. Accuracy is dependent upon the volume occurring in the specific category for which one attempts to present an answer. To sample mortality reliably, you need more samples.

WINNER I would like to read a few words that I have set down on, The Objectives and Requirements of a Management Plan:

What exactly is the purpose of management? Is it to gather detailed information and then proceed to shape the condition of the forest? Or is it rather to simulate Mother Nature and allow a loose and flexible plan to itself be shaped by the condition of the forest. I believe that at the present stage of forest development here, it is well to gather data concerning the physical make-up of the stand if that data has or will have a clear use in practical application.

It would seem that every problem, in order to be a problem at all, must have two or more lines of thought leading to

solution. In this problem of the objectives and requirements of management planning, there seems to be two distinct concepts. First, there is the "mechanical approach", with its determination of rotation ages, cutting cycles, distribution of age classes and yields to be expected in each of these classes. With such tools in hand, there next follows, the determination and establishment of silvicultural treatments for individual working areas that should bend the timber to conform to the ideal. All of this in the expectation that once attained, this ideal will be maintained through the application of a cutting budget. Donald M. Mathews was one of the foremost exponents of this approach in this country. In his book "Management of American Forests" he lists what, in his opinion are the basic questions that a management plan must answer. They are:

1. What is the approximate actual growing stock for the forest under consideration.
2. What is the probable annual growth of rotation age timber.
3. What is the rotation age that should be arrived at?
4. What is safe annual cutting budget that will insure continuous production and regularity of growing stock?
5. What is normal growing stock for the forest and when can normality be attained?

He also claims that age is the most important single factor for determining ripeness of members in a forest stand when he writes, "Management must accomplish the cut so that an ap-

proximately even distribution of age classes will result as soon as possible under the economic conditions that obtain."

The opposite school of thought is concerned with what Cal Stott likes to call management based on "Natural selection" or management of individual trees of a stand rather than the averages of the stand itself. In 1897 a Swedish Forester named Uno Walmo wrote a book. He called his book "Rational Forest Management" and in defense of his philosophies he later writes "The gentlemen of the clear cutting school have not wished to hear about individual tree management supposedly because I have introduced the term". His purpose is noble even though his attitude is belligerent. His contention is that such management would "strengthen and intensify the care of the stand, which obviously is wholly in accordance with good stand management." Mr. Walmo goes on to say "It is not age but rather the four controlling factors, stand space, growth ability, quality, and size which in my opinion are and ought to be the criteria or ripeness." Lets look at these factors more closely. Stand space, which is defined by Mr. Walmo as tree space, plus growth ability seem to be nothing more than a designation of vigor. Quality of course admits a realization of the fact that comparative economic values play a part in determining cutting priority. Size seems to play two roles: first in delineating a minimum merchantable size for the product being manufactured, second as a criterion of relative risk. Which of these concepts is the correct one? This meeting is meant to answer that question. If we can determine the

best answer for that question here, the others will come quite easily.

Here are some more quotations that might have a bearing on the outcome. Zon and Scholz in 1929 (Research Bulletin 28, "How fast do Northern Hardwoods Grow") found that barring attacks of insect, fungus or extreme wind, the forest can maintain itself indefinitely, therefore; "Under ordinary circumstances there is no urgency of cutting old virgin forest for fear of deterioration through over-maturity." They go on to say "It is evident that while trees that have lived through the last 20 years have actually grown at the rate of 213 board feet per acre per year, a number of large trees have gone down with the result that the total merchantable stand today is no greater than that 20 years ago. The total net increment in a virgin forest is large, but the net growth is nil." The figure of 213 board feet per acre per year is an interesting one. In 1929 and '30, Lloyd Crapp found virgin timber on the Reservation to be growing at the rate of 213 board feet per acre per year. He also estimated mean annual increment for selectively cut areas to be about 244 board feet per acre per year. This winter we just completed measurement of 230 four year old plots and found that if all mortality had been salvaged, the area would have realized a gross growth of 254 feet per acre per year. Actually, discounting mortality not salvaged, the area yielded a growth of 69 feet per acre per year.

It seems that until such time as we are geared to catch mortality as it falls out, prospective mortality before it

falls over, and those over ripe individuals no longer producing net growth before they graduate to the almost mortality class, to what use can we put carefully made management plans calling for adjustment of diameter class distribution and regulation of basal area? What is the object of a rotation cutting budget when after its very first year of operation we must start juggling the figures? The problem almost seems to be exclusively based on the location of high risk timber by relative quality delineations. We need a plan written so that a practical salvage and pre-salvage scheme can be gotten into high gear. If we could realize the mortality exclusive of the amount of accelerated growth due to stand thinning, we have guaranteed over half of the annual cut. Sanitation cutting, since it must supply most of the allowable cut, should be planned for in accordance with a particular area's urgency or priority of need for treatment. Risk, quality, and vigor all being considered.

Forestry, as a natural science, had for many years been missing a relatively important point. In attempting to analyze a forest working unit for management purposes, artificial boundaries were and are used to break any particular management circle into smaller subdivisions. At the start of thinking in forest management, there were two alternatives available for this process of subdivision. One choice was to accept Geodetic Survey unit delineations of Township, section, quarter section, and forty as the sole scheme of forest land break down. This is the system that was accepted and put into

practice for many decades. Another choice might have been subdivision by natural boundaries. That is accept the timber type, wherever it might be on the Reservation or however pocketed with other types and give its aggregate area the equivalent importance of the township. Then, within a type make further subdivisions to age class (a particular area within a type might be found to lie in one of three recognized classes). This would correspond to the present section in usage. Finally, subdivide each age class within the forest cover type into one of three density classes, and that would correspond to the present quarter section subdivision. Now, consider each pocket of "condition classed" timber as being on par with the forty. To manage a forest subdivided in such a manner, all pockets of the same density class within a particular age group of one type on a forest would receive the same silvicultural treatment. This treatment would be indicated by the result of a plot survey showing answers of volumes by grade, vigor, and risk combined to give a weighted priority classification. There, is forest management shaped by the condition of the forest? Much time, effort and money has been spent in attempting to operate a plan that is almost the direct antithesis of the above scheme. A survey that provides data in order for forest management to attempt to shape the condition of the forest is not in accord with continuous forest industry. A condition class map should be made and like conditions treated as a continuous area, to receive relatively uniform silvicultural treatment.

The procurement of a condition class map is not as dif-

ficult as might first seem to be the case. Actually, its accomplishment is faster and less expensive than ground development of a simple type map. Aerial photography making use of all newest developments in lenses, films and filters, when interpreted by experienced aerial photograph mappers has proven itself to be a permanent fixture in the house of forest management. The silvicultural methods, briefly described above, are being put into use on our national forests with increasing success. Why should we not make use of these tools of forest mensuration?

The costs of completing an aerial survey on the Menominee are estimated, based on factual sources:

Cost of flying Infra red,	$3.75 per sq. mi. or	$1350
Cost of mapping (includes field check)	$3.60 per sq. mi. or	1296
Plots (incl. supplies equip., labor and computing)	6.00 per plot or	$6000
	TOTAL	$8646

STOTT: An extensive area under one stand classification might be too large to handle.

HOLT: I don't know where you are going to find your various cutting classes in that system, or are plots on the ground when you finish with the map job?

WINNER It would have to come from the ground work. You are breaking map classifications all down from aerial photographs at Red Lake.

ARTHUR Say it takes so many years to get this map, maybe that same year after flying we have several blowdowns? Then, where is all the careful mapping?

WINNER Cal, what have you found out in relating vigor to risk? If a particular area shows large volume of high cut priority, isn't that where damage most likely will occur?

STOTT High risk is more susceptible to loss.

WINNER But what happens to your present map, Park? This place has been type mapped and we have the same possibility to contend with.

STOTT Looking in all your little windows with the permanent plots you would have the same thing.

WINNER You have got to apply your formula for plot number. This would help standardize and uniformize and reduce the plots necessary, to a minimum.

STOTT I don't like to throw cold water on that idea but the number of plots is standard on an area of over a thousand acres anyway. As long as you fix your need at a certain desired accuracy. The number of plots is just so many. You

are going to have to admit you're going to get better sampling in a certain age group in setting your plots wherever the condition class may occur on the reservation.

HOLT For my own information, would 300 plots give you the information of volume for the whole Reservation?

RIDLINGTON The main job is cruising 77,000 acres. Actually, we would have no large amount of work there. Any time we could use a limited number of plots.

STOTT There will be times when you would have to add plots in order to sample stands coming into merchantability and drop plots they are cut out.

HOLT Wouldn't 300 plots reflect that change?

STOTT There is a little weakness there. It should never be out of proportion. Your type map would show that, once you get one. Basically, you will still have those plots. You made the statement earlier in the day that these plots could likewise reflect or give us an idea what the mortality is on the reservation as well as growth.

HOLT Now when you start adding and subtracting what basis for

area are you going to have to play on?

STOTT — I don't think you can fix those 300 plots but you can try it.

RIDLINGTON — Isn't it true, as these poles grow into merchantable trees we are going to want more information on these stands?

ARTHUR — On the matter of 10% cruise costs, Cal, the stand density variations made for different costs. In block 1, $.53 per acre is not a fair figure to compare against $.05 per acre plot cruise cost. We might have averaged six forties per day and perhaps even eight in some places.

RIDLINGTON — What does an aerial photo give us that is permanent?

HOLT — You get absolute swamp timber separated from highlands. You get all villages, dwellings, fields that are practically fixed and permanent. What else would you want that you wouldn't be able to get from the photos? As far as type boundaries go, they would be permanent in a way.

RIDLINGTON — What do you think about it Park?

ARTHUR Do you really need a type map?

RIDLINGTON I think eventually. From my past experience I say definitely.

ARTHUR I think that is a pretty important point. I don't think you need it. You've got too much salvaging to do to think of how much we are losing in block 2 and 2A. I see no reason why there can't be aerial type maps from the 1938 pictures. With adequate ground checking, you would have a good aerial type map and establish good area figures.

WINNER The Forest Service thinks it necessary to refly and remark every 10 years, and I believe they plan to do that.

ARTHUR I don't see why it should be necessary to refly in 10 years.

WINNER If we were to buy aerial photographs even just for those areas that haven't been cruised, the cost of flying would be only $1300. As long as we would consider spending the money to make maps from the 1938 pictures, perhaps we would be better off to get proper photography that shows all areas up

to date. To completely map the entire Reservation, counting ground check, would cost about $1300 more according to available figures.

What do you think of contracting the entire works to the producing of printed map. When it is through, we would put in additional necessary plots.

RIDLINGTON We have 180 million ft. on the outside of the cruised area and we still don't even know where the popple is. I wonder if these aren't the same growing pains the Forest Service went through. Wonder if they didn't go through the same thing then decide it wasn't sensible to founder around betwixt and between, but rather undertake a relatively inexpensive scheme to settle such problems once and for all in aerials.

ARTHUR I can't feel too concerned about it. I don't think it is so urgent.

RIDLINGTON Did you ever have a feeling when you were here Park that John might be over-estimating the volume of popple?

ARTHUR I had that suspicion. Walt, if you could get the mortality rate on the areas we have already covered, I think it would help a lot. Of what urgency is the figure of 380 million feet or 360 million feet? It seems to me, certainly in attempting to increase the rate of salvage, a few years of remeasurement will get that answer. I don't see how we can determine volume that accurately unless you get some personal knowledge there. Do you think there has been enough change in block 5 since those 1938 pictures were taken to prevent their use for a map there?

RIDLINGTON When this cruise was first started in 1941, you brought up this question of how permanent a type map is. If we have to fly the Reservation every ten years, as small as it is, I don't think we want to. If plots give us the answer in the area that has been cruised, why won't it give us the answer in the rest of the Reservation.

STOTT I would like to get an estimate for the whole reservation, current as of one year. Finding out whether I could cut thirty-

five million or 19 million B.F. a year. You don't even know what the allowable cut is yet!

ARTHUR I think we can come close to it by using the plots now established.

HOLT Is your mortality the result of over-maturing of the timber, or is it the case of wind throw action?

ARTHUR Everything. The forest is forever going to be wagging us. Cal, can you rely on the figures and say it will give you a better answer than you had before and also know it is correct only within the 30 or 40 percent?

STOTT I would plan for better accuracy than that. About 10-15%. You don't need to take a re-measurement every year, although your answer would be a little better. You can't expect to cure mortality all at once

ARTHUR I can interpret Cal's words as saying Amen to the urgency.

January 24, 1951

PRESENT:

Mr. C. B. Stott, _____
Mr. Ted Holt, _____
Mr. Clarence Chase, _____
Mr. George Gervorkiantz, _____
Mr. Walter Ridlington, _____
Mr. Lee Winner, _____

IDLINGTON In 1941 we started cruising operations; this map shows the 10% strip cruise where the area is colored in. Cal Stott came along and demonstrated plot cruises and they were placed mechanically in these areas. Last year we continued with that plot cruising in block 1 (16000 acres). Permanent plots were placed in strips and tally was done on IBM cards. This is how the figures on the data sheet came into being. 180 million B.F. is based on difference between volumes from various cruises, which covered about 60% of the merchantable volume and one billion B.F. estimate.

We have reached this stage in our cruise and we came up with problems that kind of befuddled us. We are in doubt about the value of 10% cruise in that area. Block 5 was temporary plot cruised, and we didn't get enough information from the data that was collected. We found that our 10%

cruise data was going to pieces on us. What can we do to hold that stuff together, or is it worth holding? Have we already gotten our money's worth out of it? Out of this 10% cruise we did get a very good cover type map, showing roads, timber type, and swamps. We use them a good deal. When we send loggers out in that area we can pretty near do it from that map.

Block 13 was clear cut, burned and reburned. We don't even have a good crop of popple in that block. (Riddlington shows cutting maps). Over a billion feet of timber has been removed from the Reservation since 1908, according to Heritage's letter.

We just completed our first cutting cycle, and we're just ready to start over there when the blow down came. In block 1 we are starting our second cut, but we didn't want to cut this all at once. We didn't want to choke the mill up with so many logs.

GEVORKIANTZ What is your annual cut?

RIDLINGTON Twenty million feet.

Our discussion yesterday was centered on our surveys, and of course covered the 10% cruise. Considerable discussion came up on type maps, as to the actual value and use they had. I realize that it isn't giving the rest of you credit for having said much yesterday. Unless you want to add something, I think we will go on and hear from Chase. Some have been trying to sell us on the idea that we need a new set of photos. We have a set of 1938 AAA pictures. I haven't been quite convinced that the new photos will give us enough extra information to justify the expense when you consider that we have these type maps of all our principal stands of timber. It wouldn't be much of a job to complete our survey on the rest of the 77,000 acres. It was brought out yesterday that aerial photos should be taken every ten years. Is that right?

CHASE If there is much cutting, I think that is right. I would say that I think it is best to look at the aerial photo as a tool to get your areas and to help line up areas in need of cutting. Personally, I don't think a long term

program would have to have maps every ten years. Maybe you are far enough along with this program so that you don't need other pictures now. You still have 77,000 acres to be surveyed yet? What about your other areas?

WINNER — Even 10% cruising an area doesn't show any condition classification.

CHASE — What does your type map include? Does it give size classification?

WINNER — No, just standing timber type in merchantable areas. Non-merchantable areas are designated by size class.

RIDLINGTON — There are no condition classes at all other than merchantable timber types.

CHASE — I like to see density. I think it has real value.

RIDLINGTON — That cruise to date has cost us about .53 an acre and there is some question as to that. We feel that we have this data very carefully worked up, but must we figure the maps alone cost .53, since they are all that we've been able to use? It seems as though we are stretching it a little by saying that.

GEVORKIANTZ: Just a matter of suggestion, it seems to me that if we assumed two things: One of them, of course, all this work, regardless of what method, is done. What is the primary purpose of it? Is the purpose of the orientation on cruising a question of whether it should be used for today and tomorrow?

HOLT Isn't it true for selling purposes you are interested in more specific and detailed data, and for management purposes you can deal in blocks?

GEVORKIANTZ That should be crystallized. Let us assume that whether it is for sale purposes or both, and whether that management should be interpreted in blocks or what ever else is the most fitting. I think we ought to make up the point there.

HOLT There is no reason why the point can't be settled at this time.

GEVORKIANTZ What do you plan to manage and get your information on -block basis, type basis, or condition type basis?

RIDLINGTON It seems as though we are going to have to be satisfied

BY managing blocks and type within blocks. We still use the 40 line for our unit of work.

WINNER In block 1 and 12 what we are trying to do is to take the types and manage those types by priority classes based on vigor, risk, and quality grading. If we got photographs and condition class maps we could try to manage the priority of condition classes within types within the block.

GEVORKIANTZ Your priority within the type then would be in reality nothing less than condition class priority?

WINNER Yes. Condition classes that would be managed with some weighted priority scheme that we will later want your opinion on.

GEVORKIANTZ I feel that your type could include one or more of these condition classes. Therefore, I felt his priority would compare reasonably close with condition class. None of your data is now gathered really by priority?

WINNER Not from our 10% strip cruise.

HOLT Your accuracy is based upon the type rather than the total combined types.

GEVORKIANTZ Just for percentage purposes, apparently there is nothing wrong with the 10% cruise. That is a good cruise. Is it the feeling of you people that regardless of how good it is, that is a little bit too much to bite?

HOLT I think the point towards the 10% cruise is not really the cost of the thing but the fact that recurrent blow downs we have had and will have, have reduced the value of it.

GEVORKIANTZ Generally speaking, isn't it the feeling that it is a little bit too expensive?

RIDLINGTON Yes, especially since we have quite a large area yet to complete.

GEVORKIANTZ Is it the feeling of the administration that the cruise is not just simply to find out what volume is today but if any system is established, regardless of what, it was established for continuity? Something that you would like to

have instead of guessing, depending on a certain set up. The set up should answer relatively accurately what goes on today, what takes place in the stand, and what is to be expected in the future, placing special emphasis on allowable cut, and how the growth capacity of the forest is functioning. Certainly the annual growth must govern as to what your cut is going to be so you can always refer to some basis.

ARTHUR The important thing at Menominee is to maintain an even line with production because of the sawmill enterprise. I think Walt's position in that respect is perhaps not fully grasped by any of us. He answered both of your questions himself. We use type maps and eliminated an administration problem. Instead of taking the logger out to a particular area, we can point it out on the map. Recently you asked about 40. The marking crew never will forget about the 40. We can say we are going to manage forests by condition classes, but 40 has to continue to go into it. The 40 is the unit we have to use, merely from physical standpoint.

It is always going to be unit of measure but it shouldn't be confused with the overall management plan what type of treatment management is going to give. After cutting you could designate and look at condition class mapping to see if it still exists. It is just a convenience to the administrator to say that he must mark the forty. If he has a good type map he will have to recognize the type and at the same time keep track of what was taken out of that area. At the same time as you go on with your management of the forests your map begins to change. After a blowdown you have to look at the map to see if that condition changed. I mentioned that because I didn't want you to think that Walt planned on managing it on anything other than 40 basis.

RIDLINGTON You might give George a quick coverage of what has been done on the permanent plots in this cruised area.

HOLT Our 40 then is only descriptive as to location, but you would still manage the type. The only thing it serves if for location.

WINNER During the last summer's salvage we ignored the 40 and marked by roads where the roads went through mixed hemlock hardwood stands. That salvage exists all over the reservation, and in order to get the best pick up we had to desert the 40.

ARTHUR There is no conflict there, but one point should be kept clear. You would not really be taking care of 40 in this plan; it would be altogether too expensive.

RIDLINGTON We all talk in terms of 40's. It is going to be quite hard to throw it out the window. The first plots set out were put out on permanent basis, primarily as a means of keeping current inventory on these 10% cruised blocks. I think Park probably realizes that the 10% cruise has its limitations and had intended to keep it current through remeasurement of plots.

How about relative accuracy of the 10% cruise? Remember that was mentioned. Your 10% accuracy should be much better than accuracy by plots.

GEVORKIANTZ It is not a question of accuracy but use. Regardless of accuracy you want to fit one into the other.

RIDLINGTON In one instance we had lot of blow down. We went over those plots to count amount of mortality. Surprisingly enough we logged very close to that figure.

HOLT That was certainly much better than just taking a hike out through the brush and back to the road again.

ARTHUR If you were satisfied with that record, doesn't that mean you would be able to determine all kinds of things? If you have a reliable map, and plots scattered over the reservation, then every five years or any time you felt it to be necessary you just go around and observe changes on the basis of the plots. Those don't have to come exactly on certain dates. But when it comes you would know exactly what you take out in your logging operation. I think I can visualize a good management plan where you don't know the volume and yet you might have a good idea of what should be taken out.

HOLT In re-establishing plots, what is going to tell you when to put some more in?

ARTHUR If you establish quite a number in the beginning, even if you do have fires or any other catastrophe, you can rely on the same number, until about twenty or thirty years later just by using common sense.

GEVORKIANTZ Whatever the premises or whatever the requirements of the plan that should be followed, common sense should be used. Not by specific iron clad rules. You should use your plots and not just forget about them.

CHASE How many plots do you have?

RIDLINGTON 656 plots, that is quite a nice investment right there.

HOLT Did we settle as to whether we are going to operate on a type map?

RIDLINGTON I think we are going to operate with type within blocks.

CHASE During this present period you are having to go all over for logging material, but in time you are going to

wish you could get a little better information, so you can go out here or there and it won't be spread all over. I have a feeling that since you can take care of that sort of program, you will want to be thinking more in terms of individual books.

CHASE The countys did try to keep data by 40's, now they are trying sections.

RIDLINGTON My point is that types are scattered all over in the block. My feeling is that in the future we are going to want to become more and more intensified.

STOTT I am going to vote against managing sections since these men know the reservation so well. I was thinking as a means of locating units. You are still going to keep the 40's as a marking unit?

RIDLINGTON Yes, we are. My point would be not to keep record by 40's but to keep record by types. I think that priority classifying the type has possibilities.

HOLT Can we state then as a conclusion that the unit will

be the type within the block. Only kept by 40's because they mark that way?

RIDLINGTON When Libby tried marking by sections he thought that the marking crew could mark more than one 40 a day. When he left I suggested they go back to 40's because it worked out a little better.

HOLT Chase, would you give us the advantages of your experience and knowledge on your Lake States photos?

CHASE We have used aerial survey as a means of getting the maps. It is well to think of aerial surveys just as a tool for getting a map. I thought maybe you had enough data from areas already covered to preclude the necessity for getting information for those remaining blocks. It seems to me now that in the interest of the more intensified management that you are doing and closer stratification since your maps are ten years old, maybe the aerial photos would be of value. Certainly the use of the aerial photo is a method of getting maps relatively cheaply. If

you were to get pictures by this summer you could get your map completed by next winter. The pictures that we would recommend are on a scale of four inches to the mile. We found that there is considerable advantage to that. Second thing we recommend are infra-red modified photography. In Menominee, I was rather disgusted with their pictures. I think the main difficulty was developing and printing. True, some difficulties in the strips as well as flying changes delayed the surveys. Sometime the infra-red are good and sometimes poor. I think you will have to have infra-red if you want good maps without too much field checking though.

GEVORKIANTZ Chase thinks pictures can be obtained at very little cost, if any, because Shawano County is going to be flown. When do you suppose Shawano County would be covered as far as field cruise is concerned?

CHASE I think it is scheduled to be done within two years. They may fall behind because of delay in getting photos. However, Shawano County is a kind of high priority with

them. If they get pictures next fall, they would probably like to swing in to the field next fall.

RIDLINGTON Would those prints be acceptable to us?

HOLT You could buy them at any time after completion. After they are turned over to the Department of Agriculture.

CHASE There is a pretty good possibility that picture would be available by September or October.

GEVORKIANTZ If you are interested in cooperating, contact Stan Welsh. I suppose you would have to correspond with Fred Wilson of Madison first.

RIDLINGTON I am pretty happy. The way we stand right now, we'll probably sail along pretty well. Are you satisfied Cal?

STOTT I would like to see you get them. If you spend $140 to get these, you might get more expensive ones later.

WINNER Where is all this experience for interpretation obtained?

CHASE We found that the "stereographs" that the Chippewa Reservation made up were a big help.

WINNER We could certainly build up some work like this.

(MR. HOLT AND WINNER HAVE REBUTTAL ON PLOTS).

WINNER I am beginning to wonder, inasmuch as we are getting pictures, and we can almost count on it, whether our plot program should stop until we have condition class maps and consider things all over again. Use what plots are already established and take those areas where no plots are now and put additional plots in them where needed to sample condition classes.

STOTT I have never believed in waiting around for those photographic answers. I would get out and put more in. With the knowledge that you fellows have of, say, Block 5, you can still lay out your plots and you won't have to have too many.

HOLT Lee, would you offer the information that you gathered on your surveys?

WINNER On the strip cruise, we used a forty acre unit to get our data. We took tree tally by diameter class and kept the

tally sheets separated by types. The rule we have been using is that 60% or more of the volume in a major species takes the type of that species. If it is hemlock or hardwood, neither one comprising 60% or more, then it takes the name hemlock-hardwood.

RIDLINGTON We might be going through a stand of poles, and there may be pine but not in merchantable volume. We type it as merchantable and won't mention the pine.

WINNER For our plots we take one-fifth acre circular samples. Plot centers are located by means of bearing trees, and then we paint number all merchantable trees clockwise on the plot. We then measure with diameter tape and paint DBH. The tree is graded as to vigor, risk, and quality. We make an estimate of defect on each tree based on a system pretty close to Zillgate's except it isn't, or is it Cal?

STOTT Yes, it comes from Zillgate.

WINNER The first tree on the plot of each species is our

sample for usable length measurement. Use this as our basis for adjusting table heights. We average out heights for all these species by vigor classes and then determine percent deviation per foot difference in height from our table.

GEVORKIANTZ What determines the type of table?

(STOTT AND WINNER EXPLAIN ALL SPECIES VOLUME TABLE USED).

GEVORKIANTZ When you take information on grade and vigor, what is the purpose there?

WINNER Trying to correlate this vigor risk and grade to give us 27 combination possibilities. We lined them up in order of priority and tried to bunch them into three priority groups.

GEVORKIANTZ Are you putting totals by DBH classes?

WINNER We are using IBM cards so that we can combine those things in any shape, color and form.

GEVORKIANTZ I don't think you will be able to guarantee enough accuracy on your priority grade with all those break downs.

WINNER We are using the combined Priority form to prevent the breakdowns otherwise required, if we were to compute grades within risk classes, with vigor classes.

RIDLINGTON Does any one have any questions on the survey? If not, we will listen to George on growth and mortality. Winner, tell about those remeasurements first. In block 3 we went back over and remeasured after four years of growth. These are the results on 140 plots.

GEVORKIANTZ What kind of timber in block 3?

RIDLINGTON All saw timber. It runs heavy to hemlock type, plus hemlock and hardwood mixture. Those are about equal.

WINNER We found since 1946 there was a total net gain of 55.3 board feet per acre. That is, gross growth but mortality has been removed. 241.8 would have been the gain if all mortality had been picked up.

GEVORKIANTZ What is the mortality loss then?

RIDLINGTON 186.5 board feet per acre (year). Normally, that would have been much less. We had a couple of things go

wrong. We couldn't catch up at first. Had too many blow-downs. It's like our popple which becomes so old that we have to get it salvaged. Shouldn't be wasted, regardless of what should be cut annually.

WINNER — Using plot data as cruise volumes, it showed 15,500 ft. per acre gross.

STOTT — 20% should be knocked off from that figure for defect.

ARTHUR — There was timber taken out of there, so we can't really say that all the mortality was lost.

GEVORKIANTZ — What volume table was used?

RIDLINGTON — Same volume table was used.

GEVORKIANTZ — There must be some cutting that came into that. Since 1945 there was seven million feet cut on an area of approximately 17,570 acres?

STOTT — This was not done on 5% accuracy, it was done on 15%. If you cut seven million feet on 17,000 acres, that is a lot of cutting. That is over 4,000 ft. per acre. I think that the big item is that the figures show .3 of 1% gain per year after lost mortality has been deducted as lost.

It would have been 1½% gain if it had been salvaged.

RIDLINGTON What was your mortality in blocks 2 and 2A, Lee?

WINNER 177 board feet. Zohn's bulletin of "Hardwoods Growing" in 1929 shows that if you could pick up every piece of mortality you could get 213 board feet per acre per year.

GEVORKIANTZ You have to break the back of that by salvage cutting. Eventually you are going to come out with net growth.

RIDLINGTON It is almost impossible to say what trees are going to stand up.

GEVORKIANTZ In block 2 and 2A, has there been any salvage of mortality?

RIDLINGTON Yes, the fellows pick up about one million feet a year in those blocks. Some more of it might get picked up this coming spring. 267 is total gross growth possible. This 80 board feet is actual gross gain.

GEVORKIANTZ Well then there is 187 which you said was mortality which was lost, whereas that mortality wasn't all lost.

CHASE If you hadn't picked it up you wouldn't have gained, you would have lost.

RIDLINGTON Assuming that we have a billion board feet on the Reservation, our 20 million allowable cut appears to be 2% of the total. From the information on these plots, if every stick of mortality has been picked up, does that indicate overcutting? The total possible growth is only 1.5%.

GEVORKIANTZ It is hard to say, because it is not a sample of the whole reservation. The allowable cut should be the growth on the whole reservation. If you assume that the allowable cut was computed from a certain standard level, and if those areas were typical of the reservation and you wanted to keep logs coming into the mill you should be holding down to fifteen million board feet on that basis.

RIDLINGTON Here is something that is bothering me. If we keep on cutting 20 million, are we going to reach a time when there is going to be nothing to cut.

GEVORKIANTZ If you figure from tally forms, you might be right. I think what to cut should be figured in the woods with the aid of some system like your V.R.Q. I think you should keep a concept of proper growing stock level over a period of years. If you are cutting too much today because of dying birch and hemlock, later you might re-appraise and adjust. You should be thinking of concentrative cutting, instead of cutting reservation-wise, with the exception of blow down.

WINNER That fluctuating cut might be allright on private forests, but here the law says not over twenty million, and actually that obligates us to cut just that much.

GEVORKIANTZ I would say if you prove that the cut should be seventeen million you should adjust the cut accordingly.

ARTHUR We know that hemlock is not reproducing itself, and we've got about 50,000 acres of hemlock. Our hemlock has decreased from four hundred million to two hundred million board feet.

GEVORKIANTZ This is a very good forest. I tried to explain that

the overcut is simply because hemlock is dying out so rapidly.

RIDLINGTON — When we get hemlock picked up, then will we get some net growth?

ARTHUR — I would like to suggest that a permanent record of plot use be maintained as to the results you find from the plot data. On the one side of the page put how they prove their worth value and merit, and on the other side, how they have proven to have weaknesses as management indicators. As time goes on, I think opinions are going to be formed as to how our use of plots for certain things either fit or don't fit the purpose.

GEVORKIANTZ — Mortality is not a thing you can predict. It goes like a zigzag proposition, but I think the balance sheet is a good idea so as to see what information you are getting out of plots, but of course you can't look just until you get the answers you want. You have to examine the plots you establish with some unbiased procedure. Too, they must be reliable for whatever they are put in for. The thing that

I would suggest instead of this plus or minus sheet, is to put in the history notes a record of the data and see how far those plots would serve to satisfy all the management needs, no matter how often those needs arise. As time goes on, management will become more intensified and more plots will be established. If you are going to think in terms of long periods of time, I think you have to get the areas and the conditions of those timbered areas along with restocking areas and determine about when they will be producing. Some of them will probably become merchantable right along.

WINNER — Are you thinking in terms of standing green timber only, when you mentioned a fluctuating allowable cut, or are you including salvage and forest products?

GEVORKIANTZ — Yes, I am thinking of everything.

RIDLINGTON — Aspen doesn't come into our management plan now. We intend to push the popple and see if the mill will put some popple through.

HOLT — What is the acreage of your pine type?

In block 5 you indicated a growth for white pine of 513 board feet per acre, and with other species a total of 624 board feet. With any acreage at all in that site, you are certainly going to offset other areas of break even or loss. As long as we have trees of merchantable size in the stand areas, as long as they stand there and are producing, they are tending to carry through the critical period.

RIDLINGTON We can only present the logging department with timber. I am concerned on this point. Assuming that twenty million is our growth. Then we find that we have got a small patch of salvage timber that the logging department doesn't pick up. Should we scale it and deduct it from our annual cut, or should we let them cut right on to the twenty million regardless?

GEVORKIANTZ If you have the vested right, forestry should not allow cutting of any more timber than designated. But now just because somebody didn't pick it up, you can't penalize them. You must realize a practical limit to salvage. Cuts

should not only be figured but located.

RIDLINGTON — As manager, you have to insist that he goes out there. He should go there and get what we have to offer. Your forest is going to be better and you still get the legal amount.

GEVORKIANTZ — I can't see a figure like twenty million. Can't you remove that limitation on twenty million feet per year? If it is twenty million or die, where does the management come in? You can't start out with the rule before you find out what it ought to be. Now you have to go and find out what it ought to be. I personally am quite sure that ify you have good statistics and good dope, somebody will put pressure on and it will have to be revised.

ARTHUR — Up until now, you know George in your experience here the problem has been primarily getting as much over-mature stock as possible. Walt is faced with the second cutting cycle. Now we are trying to get these statistics that couldn't be refuted.

RIDLINGTON — You brought it right up to date.

GEVORKIANTZ When was that particular twenty million law passed?

HOLT In 1908.

GEVORKIANTZ Well the forest was chuck full of timber. Twenty million wasn't much of a cut at that time. I don't think that has any bearing whatsoever on your woods any more. Well, I don't think there would be much difficulty in breaking down that which dates back to 1908. Whoever suggested that then was perfectly allright, but it was not the same as it is today. I can't see why anybody has to specify any particular amount. I can see why they did want it at that time.

CHASE That was a very good figure to set then. I think you probably had a much easier time getting it before than you do now. Hemlock stood up pretty well.

GEVORKIANTZ Point is, I was thinking about the possibility of mortality salvage. Growth should be determined on the basis of this permanent set up of plots regardless of what method is being used. In the long run that process

is most easy because it is nothing more than subtraction. Growth should be gotten on some periodical measurement. Shouldn't be needed very often nor delayed too long. Maybe every five years will be found satisfactory. If reliance is made on growth plots we should establish the base data today. If you resort to increment core method just as soon as you have a set up you could set the cut. Five years from now you will have growth figures which you will then have to use. On the assumption the plots will be distributed by your condition classes means there will be quite a number of plots and these would be simply a stepping stone for determination of allowable cut. The main emphasis would be, therefore, to periodically estimate growth, adjust allowable cut and use those facts as your real basic plan for your management. If you have a map todsy, how long will that last and how much of the Reservation must you cover to keep the map up to date? You know where cutting operations take place; therefore, you will also have to map the area

out and make map changes, but that will be expensive and perhaps something you won't have to do except every twenty years. In view of the fact that you might have the possibility of cooperating with the Wisconsin crew, they are going to establish forty acre blocks that will be scattered in your territory regardless of what you are going to do in your own plan. When they have scattered 40's all over this map, and imagine they will have a lot of 40's that you can use which will be mapped by their crew and which will practically correspond with the map you have today. You can proceed then, going to these 40's every three or five years and re-map them, using same standards as carefully as you can. In most cases you don't have to map small changes, but if you do, that will be your labor for keeping track of change in condition classes on a statistical basis. You will not be able to have that kind of map and revise it completely very often. It will still give an idea of lot of things. If you assume that particular set up, of course,

it is very good, but you also have plots where you can go from time to time and learn what changes are taking place. I think a good intensive map would be good, but chief emphasis should be on the alloweble cut. As time goes on, the intensity of forestry will increase. You will find that perhaps quite a large percentage of your cut will come from your improvement cuttings. Now it might not look so big today, but eventually it will be quite a big item. Now, how to go about it in the field. Although there is a lot of dispute pro and con concerning allowable cuts. Assume you have operating areas and an experienced forester who says he can take out so much here and there. I would use all these methods. You will be surprised how much high risk material you can get out of the forest in that way. The only thing you can calculate on paper would be the general plan of control. Now you fix up Delaney's list of requirements and see that your distribution of DBH classes is in proper distribution. 1. Adjust area figure. 2. Adjust volume figures of growing stock in that

area. All of that could come out from those plots properly distributed or those control blocks which might be established at the same time the map is made. An allowable cut will not be different. You are now cutting your forest so that nothing will be taken out if benefit will not be accrued. You remove everything because it has got to be cut. I think it is about time that we as foresters started to lean away from stereotyped management plans. They pay too little attention to fact that your difficulty is so much high risk material that has to be cut regardless. With this concept, if you do want to use rotation periods you can, as a guide, but it is a period such that the youngest and the oldest in the range of that rotation period should be subject to cutting. You know from your experience that you can keep a plan only so long as you would not sacrifice large volumes of mortality. Like in the case of your hemlock. With the concept that you can estimate your other cuts, you will have a very realistic picture. Allowable

cut used to be calculated in the office by someone, and the fellows tried to fulfill bill in the woods. There were lots of disputes.

I personally think this allowable cut should be mostly to know how much the woods are growing and everything should lead toward meeting that. I think you could make a setup with that idea in mind, and if possible try to strive toward a good map. I think that is possible now with cooperation. Also try to establish those plots as unbiased as possible within condition class. We can see the type, size class, and density class. That breakdown is a nice breakdown because it is a manageable one. Then if you have plots established in condition classes, I would rather start out with a basic minimum rather than start out with too much and find out you can't handle it. If you wish, use this block area control system where you can keep track of changes in condition classes. If you take your map record and put it on a statistical basis, striving

for an average and say such a percentage is here, I will guarantee you that even if you don't have a better map on a 100% basis you will come out pretty close. Any change that takes place throughout the territory will be shown by the 40 or 50 control blocks. You will have steady source of employment for labor established, and will be self-sufficient. Every time you measure you'll know where you stand. If you have any trouble, it will show up and can be corrected in the next 10-year period. That is my concept, in a general way, of possibilities here. It wouldn't take long to establish it. Incidentally, although you have got a certain number of plots, you can use in this territory, you don't have anything. You must also think of priorities too. On block 13 you might say, "I would like to know what is there." Just establish a minimum number of plots there, enough to know what is going on, but not too accurately. You should still cover that area. I think it is a matter of decision on how

far you want to go. You might have to change that type of information but basically the plots are still there. I think, personally, you would not have too much to handle, but you know how much you could afford to spend. Another thing, in their establishment you should schedule the plan to suit your convenience or work schedule. Suppose generally you want to first measure after five years, next time six years, but for some reason you couldn't do it. It is kind of a flexible thing. In certain areas you say "I am not going there for the next ten years." I think that the whole secret of management is to translate all you know into allowable cut and use the information coming directly from the woods. We have a pretty good aerial methods if you need that. Another thing to use is a scheme like this and with some periodical measurements over a period of time make corrections. This system has definite advantages in that it is a self-correct ing scheme. Nobody should feel awful about it if he found

that he made a mistake in his management. He should correct himself over a period of time because later measurements will be made and management will always be corrected. It gives a systematic set up. If you figure up how much money was spent on different ways of cruising it might run into quite a bit of money. I am actually challenging anyone to give me an answer on why those plots won't work. Those extremely detailed methods cost too much money.

I can't see anything that a set of plots won't answer for you. If you start out with scheme A. ten to 20 years later it will be more apt to be intensified rather than go the other way.

HOLT — Do you mean these 40-acre blocks for area control.

GEVORKIANTZ — Yes, they don't have to be forty acres, but that is a nice size.

ARTHUR — If you have an adequate number of plots, how important then is your type map which, as far as your best map is concerned, a temporary thing.

GEVORKIANTZ Purely statistically you don't need to bother too much. That map originally will serve as base for statistical change. Later on I assumed that the map is going to be improved and improved so it will show condition classes and where cutting took place.

HOLT As far as areas for volume is concerned, your blocks might give that.

GEVORKIANTZ Also the check blocks would be an awfully good check on your map, particularly in reference to the fact that the Wisconsin crew is coming to your forest. They can establish a lot of blocks for you at their own expense and you might as well take advantage of them. Now you also find out that you want a statistically better figure. You will take a few more blocks and it will be at your own expense. The question is, could you possible revise the map every five years? It is quite a job.

STOTT I have a question. There are six hundred plots already in here. If condition class was assigned each

plot depending on the area surrounding the plot, and if we had a thousand plots on this forest, couldn't we go over those plots periodically and re-define the condition class? Wouldn't that also give a correction for area, the same as these area control blocks might give it?

GEVORKIANTZ — On the assumption that when they are established, first, how much area was surrounding it?

STOTT — My condition class statistics would be based purely on number of plots that fell in that particular condition class.

GEVORKIANTZ — The 40 block map is more accurate. If it were only a question of bare statistics the advantages of these blocks is not quite so sharp, if you don't find enough excuse for them. If you are map conscious though, and can see all advantages of a good map you will have to use them.

WINNER — You seem to think that condition class is a pretty important thing.

GEVORKIANTZ — Yes, particularly so in the case where you have even

aged hemlock stands. That becomes less important in other hemlock stands. Whenever you have got rotation age timber you must have those classes. I don't know how many plots you need really, maybe all you need is 500 for the whole works. The plot statistics would tell you that.

VENEER

RIDLINGTON The question has come up several times as to the possibility of the production of veneer. Mr. Dickenson would like us to give him an estimate as to how much veneer we could produce each year from the seven or eight million feet of hardwood and pine logs we bring in. He had in mind the installing of a veneer plant in connection with the sawmill, but as yet we haven't arrived at any figure as to how much we could produce. We have been shipping out about half million feet a year to the veneer mills in Shawano. He told me he is going ahead on the assumption that we can at least produce one and a half million feet a year.

HOLT Is the object for greater profits or for greater employment? Would you like to tell them about your experience during the last war, George?

GEVORKIANTZ My experience is very limited, of course. I think

that estimate of one and a half million feet is probably very conservative, considering the quality of timber here. I think it will be very easy to produce. The question arises, what type of veneer are you thinking about? For what particular use? That will determine the amount. If it is, for example, specifically marketing for airplane veneer the percentage will drop considerably. For furniture manufacture, that is another thing. One and half million is not unreasonable. Another thing, of course, the way I understand it you are already selling veneer logs without particular effect to the sawmill. Does that mean that the Menominee veneer produce as it is today without effecting the sawmill will be continued under the new set up while you are producing lumber? The point of consideration will be how the two things will blend together. If you would continue on the same basis as before and adjust the production of veneer in the same proportion as you sell the logs to Shawano now, there will be no conflict. But if the

veneer will overtake and encroach upon the sawmill the mill grades will drop. That is something to consider. It doesn't mean it makes it less desirable. It will bear watching the relationship and adjusting size of veneer plant. Also as much as I know and gather from the talk of others there seems to be particular attention being paid to the production of veneer. It was quite valuable during the Second War. The Government is making an effort in encouraging the production of plywood and veneer. Apparently the assumption is that veneer will be important and ought to be expedited. That also means that it is very desirable to start something in the direction of veneer. It is moving in the right direction, and if all the practical and engineer things are well adjusted, it seems it would be a definite increase in profit for the reservation. I don't think the establishment of a sawmill is ever a final word. At one time that is all there was. Seems to me additional effort in this veneer direction

would be a very profitable move. Now that is just a general picture, I don't know what could be added.

RIDLINGTON In the normal marking procedures, you know, we don't mark for quality. We mark on the basis of the risk principle. It has been said that our second cut was going to produce timber of higher quality. So we can assume that our second cut will produce at least the same number of veneer logs.

GEVORKIANTZ If we consider the general run of timber, the Reservation is unique in that we have inherited timber of particularly high quality to begin with. If you are talking about volume of veneer based on the quality of logs, there have been a lot of studies made. It was found that the old growth timber is of high quality. It is hard to say that what you are going to have tomorrow will be better. Populability of veneer might slide down a little, but not very much. On this matter of grades, I suppose you have

considered that for some time. What do you think that the cleaning up of the best logs will do to your mill? How will it affect the lumber grades?

DICKENSON It will reduce your volume of better grades, but I think the difference in prices will offset it. The veneer logs we sell today bring more than finished lumber. We won't sell it unless we can double our margin.

RIDLINGTON The point there is not so much that profit part, but don't you think it would affect the employment of men at the sawmill? If we put one and a half million feet to the veneer plant to provide additional source for labor, we wouldn't intend to go into a big scale operation. As production went up, we could add a plywood plant, but not to start with.

RIDLINGTON The place to start the marking of the peeler logs is right in the woods. That is what your assumption was when you arrived at that figure, wasn't it?

GEVORKIANTZ Aircraft veneer proposition is very low now. In

order to increase it all you have to cut for it in the woods, but if it is general veneer, specifications are not so severe.

DICKENSON — It is also important in order to get maximum grade in the saw logs. We certainly can lose a lot by not sawing for grade in the woods.

RIDLINGTON — What is the minimum length chunk you would take?

DICKENSON — Eight foot when you think of veneer.

GEVORKIANTZ — Does that command a better price?

DICKENSON — Yes. I remember when everybody was very much concerned about mineral stain in veneer hardwood. We don't have too much of that.

RIDLINGTON — There has been some talk of using popple for peelers. Do you know anything about that? Is it a profitable field to go into?

GEVORKIANTZ — That is a hard question to answer, because in that case if you talk about hardwood veneer or pine, you talk about a limited market and therefore, what governs there

would not be true in another field. Where are you going to sell it? It is a more or less new idea of popple for veneer, and came with the idea of a more specific use for it. If you can find companies that will take it and there is nothing other than freight costs to add, you are strategically able to compete in that field. My proposition would be to follow through to a plywood plant. It seems to me, as time goes on, diversification in manufacture of any species is practically the answer for continuity of income. In bad times you possibly can make something on one if you don't make it on another. Income stabilizes and the industry is more continuous. Probably it is not so much whether it is desirable or not, it is purely good business figuring.

HOLT This might give an indication. You mention what might give a relative value. Popple value might be correlated with cottonwood.

DICKENSON In popple there is no discoloration, and it might be

used in food containers too -it doesn't stain. The cost of production of your smaller popple logs is going to be higher so that the margin from the producer's angle is less than the price on board car of other species.

CHASE We sold some to the Crandon Plywood and Veneer Company, and most of it went into tea boxes.

HOLT Thinking of the employment angle, and to me the answer on a log scale basis would be more easily comparable, it certainly could give more employment. The prime thing would be an additional margin in your selling price. In that same light, popple is becoming more abundant all the time. We are going to have to figure out some way to utilize it.

DICKENSON I don't think for jobs alone it is justifiable to set up a veneer mill.

GEVORKIANTZ You are strategically located, not only as to a source of wood supply, assuming you are producing veneer, but also from the point of competition with other establishments.

I don't think there would be any trouble. As far as engineering problems are concerned, there are things a person has to figure out.

ARTHUR — I heard one veneer man say that they are not interested in Menominee maple. Would you consider maple as one of the species that you would produce. They don't care for the the white wood. The heart is being used.

GEVORKIANTZ — Think that was more important five or six years ago when they all wanted the white; now they don't care for it.

WINNER — When we set plots we estimated butt log grades. Cal has some figures on a method for converting volumes by grades, to available veneer.

STOTT — We had to estimate timber for Wisconsin Realty Company and we estimated birch veneer separately. The idea, even then, was not only for ordinary veneer, but also for airplanes and stuff that took the best, so we went down to 5" and sometime 44" lengths. Log figures show that

for #1 birch, 58% was suitable for veneer; and #2 trees trees 39%, and #3 -14%, down to that shorter length. It is given by diameter classes. You can convert your estimate from this plot data or on the kind of trees you bring to the mill. It figures that if you have all #3 logs that you could still get two million feet a year in veneer logs.

RIDLINGTON Out or eight million feet of hardwood logs?

STOTT You could only get about a million then. That is, assuming all #3 logs.

WINNER The production of veneer then shouldn't affect the working procedure but would create a need for training sawyers.

RIDLINGTON It can't help but reflect on the marking. I really agree, it would be a good thing to go into this veneer plant, but there will be more pressure if they get one and a half million then decide to step up to two. There is always the trend to increase the production.

HOLT Since labor is such an important point, as well as your margin of profit, it would be favorable in that direction to expand.

GEVORKIANTZ Veneer doesn't require too many men. With time, employment problems will drop. I still think that if we make this assumption; here is the allowable cut and you must get the most out of it. Have you had any undue squeeze for quality in mill production? In the sawmill you need a buffer, but in the case of veneer you just don't bother with it.

RIDLINGTON There is something that bothers me. We watch out for excessive butting now. Very often that butt will not be suitable for veneer, but we have to reach up into the veneer section to make a log. Is it economical to throw the butt section away just to bring in an additional veneer cut?

DICKENSON You have got to leave some meat on that log. There should be some #1, #2, or 3 on it that will pay its way

through the mill.

WINNER — It would take a large amount of education for the men in the woods.

GEVORKIANTZ — Think that would be adjusted to certain rules and certain specifications for cutting. There is some waste in long butting in regular sawlog operations too. You can be looking for veneer but don't try to spoil the other log too. You might have some waste of sawlog material unless you compromise the two operations. I think that experience will eventually work out an answer.

KESHENA — I would like to know how much production a veneer plant should have in order to write off the initial investment within a reasonable time.

GEVORKIANTZ — The best answer would be to see how the other veneer establishments are working out. That is, what they consider life of the plant, in order to liquidate the initial investment.

KESHENA — There is one factor that enters into this. The

Menominee Tribe now gets 4% in the Treasury of the United States. They are not taking any risk with it. This 4% has to be taken into consideration. From that standpoint I was interested in how much production would be needed to write off your initial investment.

WINNER Joe, have you any idea of what you consider a fair profit, over and above the 4% guaranteed?

KEESHENA No, I don't. We know that we are tied to a limited production. Our whole economy is based on that twenty million. We are reaching a point now where it is necessary to furnish more employment. An oversupply of labor is seriously threatening the profits of the one industry we have. The world situation might relieve it temporarily because the boys are leaving the reservation every day for employment on the outside. In normal times the industry is not sufficient to take care of employment needs.

HOLT Joe, is the object of the Tribe to furnish employment for all the employables on the Reservation?

That does not follow normal community happenings, but we do have a unique situation here. From an economic standpoint, we have to provide for the welfare of the tribe. We try to keep the people right here, instead of making them drift. We also have other trends, which will probably change the situation, where that goal won't be desirable. There is a very definite trend to turn the reservation out from under the Federal Government, and of course the situation is going to change eventually.

HOLT Don't believe we should have used the word "drift" but rather migrate.

KESHENA During war time we had a large shift, due to the fact that the lumber industry was behind other defense production in wages. People got out and became welders, etc. and got twice as much as they could get here.

GEVORKIANTZ If you assume that you have a veneer plant and that it is established on an efficient basis and that it is capable of competing with established industries, that

means that a veneer business would generally be operated on the 15% profit and risk assumption. That assumes that since it is an efficient organization, on a par with other industries; no leakages, etc. That gives you an idea there is a margin of 15%. Discounting the 4% you must have for profit, you have a spread of 11% to cover risk; therefore, it doesn't look like the enterprise is very unsafe. I mean you are not assuming you are going to be in a very bad situation where a change of 1 or 2% in net return would determine it was risky. The assumption is again made that the established plant will be able to compete with others, and so efficiently that no extra cost is involved. I am sure that 4% would not be attractive to other operations, and they would have to operate on a higher level. Without much calculation, you can assume that profit will be more than 4%. It is not too risky. Diversification is the only answer. I would venture to say it is one of the unique things that

the reservation has existed on the sawmill alone this long. Most of the sawmills never made enough to support a stable economy.

KESHENA — Is there enough veneer here?

HOLT — I think we have answered it. Seems to be the general concensus there is a good supply.

P L O T S

GEVORKIANTZ — You have covered the saw timber stands already. Now why not get that other area as you go along? There are two things the Wisconsin Survey people will want, and one of them is data on the small stuff as soon as possible. If you are going to take management's viewpoint and look ahead for 40 to 50 years, a lot of areas will be in production in 30 or 40 years. If you go strictly on a systematic basis, it is going to take a lot of plots and that may be more than you need. It is going to be fairly time consuming. You can reduce the number of plots considerably. You can give the Wisconsin people dope they

want, and one of them is data on the small stuff as soon as possible. If you are going to take management's viewpoint and look ahead for 40 to 50 years, a lot of areas will be in production in 30 or 40 years. If you go strictly on a systematic basis it is going to take a lot of plots, and that may be more than you need. It is going to be fairly time consuming. You can reduce the number of plots considerably. You can give the Wisconsin people dope they want and they could give you what you want.

HOLT — Isn't our next step, following the establishment of these additional plots, a matter of condition class mapping from the photos?

GEVORKIANTZ — Wisconsin county survey is faced with the same thing you are. They have new surveys ahead of them. Yet they go out and take in plots as they go along.

CHASE — In some early surveys, plots were originally taken at intervals of 10 miles apart and the data was classified by the same condition classes we have today. We go back to

that data and we figure the percentage in different condition classes in that particular county. So now we say we know the proportions have changed somewhat and then we go ahead and take our plots on that new allocation plan. Then we take additional plots where we don't have enough. It is a fair guide. If you don't know exactly what you have, where you have a good idea of your area, you can make a proportionate table.

GEVORKIANTZ They don't have to rely on that old survey here; they have enough knowledge now. That is why I am always bringing this cooperation business in because I am not thinking about all this uncruised area in which you don't have an immediate interest.

WINNER Should we then hold off any new cruising until we contact these State people? This question is based upon Chase's statement as to what cooperation we might be expected to give the State field crews. It may be necessary to adjust the type of information we would gather. I

think it should go on record as a specific item rather than be left dangling in the air.

HOLT — Those personnel are not being represented here, and I don't think we can get down to too fine a point.

GEVORKIANTZ — I know you are all interested in those colored blocks, and I am even more interested in this cooperation. They want to finish the whole job here in three years. After they size up what they get and you see what you are going to get, the rest might be done by some system so that it will be mutually beneficial. It is not pressing you anyway. Of course this other figure on uncruised areas is important too. I would suggest to keep on going in block 5 with permanent plots.

HOLT — Do we have a type map for block 5?

STOTT — No, type acreage. It is just as good for establishing plots for that area.

RIDLINGTON — I would like a 10% map. Why don't you say that first we 10% map. As far as 10% plot taking is concerned, that

may not be needed in block 5. But we are going to cruise in 5 eventually. We will establish more plots here to fit into management.

WINNER — What are we going to do as far as block 5 mapping is concerned? Is it essential to map or isn't it? Should it be mapped 10% or shouldn't it? Should we type map or condition class?

EVORKIANTZ — Don't mention 10% any more if you are going to use photos. Use 100%.

HOLT — We will establish permanent sample plots in Block 5, following 100% mapping from aerials. Is this the first step?

EVORKIANTZ — As far as Conservation Department is concerned, I think the area figure you have will be allright. I really think you will need 100% map for management. I would suggest regardless of that, that for analysis of this particular plot cruise, why don't you break down these things by proper condition classes? When it comes to salvaging and your answers fall down because it won't keep in

balance with growth, don't think you overcut. If the overcut is because of salvage, that is not overcut. What you get out of it in forest improvements, that would govern. How much was removed in block 3?

WINNER 27,700 plot volume board feet were removed.

GEVORKIANTZ Here's the way to look at that. You start out with 1.5% net growth. After salvaging you have still gained 64 board ft. per acre. What is your idea of a cutting cycle? How often do you expect to go back and cut there? 15 years? Usually you would consider that you would cut about how much per acre?

RIDLINGTON Say 2,000 feet.

GEVORKIANTZ If you assume that this is rppresentative then you gain 64 ft. per acre per year and assume that you are going to continue to gain it. In other words if that is a representative area and you are going to assume you will go back there and get 20,000 feet of standing timber, plus salvage, from that point of view you overcut. If that is salvage only, I think it would not be bad. There might be

a slight overcut if you start peering into figures closely. I think it is going to pay dividends, without question, as soon as you get rid of your poorest hemlock that doesn't stand up.

HOLT — George's statement to me certainly is encouraging.

RIDLINGTON — Yes, we can look at it in a little brighter light now.

GEVORKIANTZ — You might assume that as far as hemlock is concerned you don't want to bank on it. It is better not to count on it at all. Out of 15,900 per acre volume in block 3, what proportion is hemlock?

RIDLINGTON — 40 or 50 percent.

GEVORKIANTZ — If hemlock is so heavy in the picture and is dying out, I don't think you should be so alarmed because apparently you have to get rid of hemlock. This is all you can do is to leave the best growing stock, since hemlock refuses to stand up.

RIDLINGTON — The Sales department sells on certain proportion of what we are going to produce. We try to go through our

stands and cut what we have to. What is the answer you give to question 11, Ted?

HOLT — I would say it is an administrative problem. Too, one can't predict market conditions.

GEVORKIANTZ — As a general policy what that means is that the Sales Department controls the Forestry Department.

RIDLINGTON — It isn't quite that domineering, but it is facing us.

ARTHUR — I think maybe Forestry has to do a better selling job.

RIDLINGTON — Red, for the record will you give a statement as to what salvage has been running at Red Lake?

HOLT — With logs that ran 17 to 20 per thousand we salvaged surprisingly less per acre than it had been on stands that ran 8 to the thousand.

RIDLINGTON — Did you pick up on contract basis?

PARKER — Piece basis. Sawing was done by piece, also skidding and loading.

RIDLINGTON — Did you have a permanent force of loggers that you

could depend on or did you have to look around continually?

PARKER — About 12 or 15 fairly good gyppo loggers that put in from one-half to a million feet.

RIDLINGTON — It is strange, when I suspected there was 242 feet per acre salvaged, actually 186 feet was lost in block 3. It seems to me quite a bit should have been picked up.

GEVORKIANTZ — That means that regular full-fledged loggers might have to consider salvage a regular thing.

RIDLINGTON — The loggers that we have now will grown, but they might go and get it.

I think we have all our questions answered. I can just say thank you gentlemen. We were very glad to have you come and help us here. Now we can go about our business a little better. Maybe before too much water goes over the dam, we might have another such meeting.

HOLT — Especially I want to thank the fellows from the non-Indian group.

RIDLINGTON — Yes, it has been a pleasure to meet with a group like this.

GEVORKIANTZ The National Service is interested in what you do here too. It gives statistics to us because we have to do a job here also. It is not only what we gave you, we expect to take something too. It has been a pleasure to meet with you. You always learn something every day. I hope you will be successful in establishing a nice set up. I think you will gain pretty much from it. That uncolored area is not much today, but it will be worth something in a few years. I think you will find that that area there has a lot of man-hours involved, if there is a need for employment. I think that area will someday offer you just as much employment as the big timber would. There is a lot of forestry there. There is also a lot of little jobs which if pursued will mean quite a number of man hours in the aggregate.