

N.Z. INSTITUTE OF FORESTERS' SUBMISSION TO THE MANAPOURI COMMISSION OF ENQUIRY

The Council of the Institute appointed a subcommittee to prepare a report, after seeking members' views, for submission to the Commission of Inquiry. Chairman was D. A. Franklin, and members J. W. Levy, A. G. D. Whyte; later supplemented by J. J. K. Spiers, G. J. Molloy, C. G. R. Chavassee and B. D. McConchie, with assistance from P. J. McKelvie and J. Y. Morris. Messrs. Franklin, Spiers and McConchie appeared before the Commission for questioning.

Over 200 members replied to the original questionnaire and of these 60% had read the Report of the Cabinet Committee on Lake Manapouri. Opinions were divided as to whether the lake should be raised or not, but there was a strong expression of opinion that, should the lake be raised, clearing of the vegetation must be to a high standard.

The written submission of the Institute follows.

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The N.Z. Institute of Foresters represents a body of opinion competent to comment on the management of forest areas, forest ecology and associated wildlife, scientific and other values of vegetation. clearing of forest areas and resource economics, all of which are pertinent to the issues before the Commission of Inquiry.

After the report of the Cabinet Committee on Lake Manapouri was released, all members of the Institute were surveyed for their opinions. The majority was opposed to the raising of the level of Lake Manapouri above its natural high level because they felt that many of the consequences of such action could not be adequately assessed until after the lake had been raised, and that some of the possible consequences could outweigh the economic benefits gained.

Nevertheless, from the report of the Cabinet Committee on Lake Manapouri, it appeared to the Council of the N.Z. Institute of Foresters that there may be financial and legal requirements which commit the Government to raising the levels of the lakes. Therefore the Institute has restricted its comments to those aspects relating to the raising of the lakes upon which it is competent to judge. To better acquaint the Council with relevant facts, a subcommittee of six visited Lakes Te Anau, Manapouri and Monowai, and their findings are set out below.

The Institute deplores the fact that the Manapouri power scheme was negotiated in contravention of the spirit of the National Parks Act of 1952 and that validating legislation was completed without prior and formal reference to the National Parks Authority, and is most disturbed at the precedent that this has created. It is also concerned that it appears that an integral part of the Manapouri power scheme is a proposal to

establish a maximum operating level of Lake Te Anau at 670 ft compared with the present natural mean level of 663 ft. This could profoundly affect the shoreline and remedial action may be required. The consequences of raising Lake Te Anau are not mentioned in the report of the Cabinet Committee on Lake Manapouri, and there appears to be no financial provision for remedial work to be carried out.

While as a body the Institute would prefer that the levels of Lakes Manapouri and Te Anau should not be raised, if a decision is made to raise them the Institute is adamant that shoreline clearing of Lake Manapouri must be carried out to the following standards:

A. On steep shorelines all trees and stumps should be removed and sunk below present low-water level, and all such work should be completed before the level of the lake is raised except for those precipitous areas where the National Parks Authority agrees that clearing may be deferred until the lake level is such that it may be done safely.

B. On the remaining shoreline, all woody vegetation including stumps must be removed and disposed of by way of sale of logs, burning, sinking in the lake, or burying provided that such burying ensures that debris will not be exposed by subsequent wave action.

The Institute is also adamant that definite and adequate finance must be made available to carry out remedial action around the shores of both Lakes Manapouri and Te Anau for at least ten years after the levels of these lakes have been raised, and that such remedial action should be to the satisfaction of the National Parks Authority.

Time is obviously limiting and adequate clearing trials have not been carried out. If a decision is made to raise the levels of the lakes, an immediate start should be made on such trials, these to be in accordance with a properly prepared plan with well-defined objectives. Furthermore, a comprehensive plan of operations setting out time schedules for the completion of the various clearing operations should be compiled as soon as sufficient information is available.

The Institute would also like to draw the attention of the Commission of Inquiry to the following:

(1) It is not altogether clear from the report of the Cabinet Committee on Lake Manapouri whether or not there is an agreement to raise the levels of either Lake Manapouri or Lake Te Anau, or to what levels the lakes should be raised. No indication is given of the normal and extreme fluctuations of lake levels that can be expected. It appears that very wide freedom of action is given in the legislation.

(2) It is also not clear from the report what the proposed minimum operating level of Lake Manapouri will be. This could have a very significant effect on the standards and costs of shoreline clearing. We have assumed that minimum operating level will be at or below the present forest edge.

(3) It is stated in the report (paragraph 60) that "if the lake is raised to 610 ft present plans envisage clearing the forest to 613 ft". This figure of 3 ft above maximum operating level is entirely arbitrary and not related to the present lower level of forest around the shores of Lake Manapouri. The present level of forest around the shores of both Lakes Manapouri and Te Anau is related to shoreline topography and aspect, and for this reason the line of clearing must be related to the present level of forest and not to a fixed contour.

(4) It is essential that the levels to which it is intended to remove shoreline vegetation be defined on the ground on flat and rolling areas as soon as possible. Only by this means will it be possible to determine areas, costs, quantities of merchantable timber, etc., with any degree of accuracy.

(5) It is stated in the report (paragraph 48) that "Ministry of Works envisage considerable flexibility in treatment". This in our view is entirely wrong. In view of the very considerable resources that will have to be deployed for shoreline clearing, it is essential that initial clearing (including the timing of operations) be to very precise standards to ensure that corrective work after the lake is raised is kept to a minimum.

(6) It is inevitable that there will be some unforeseen damage to lake edges once the levels of the lakes are raised. Deaths of trees may be expected from windblow along the newly exposed forest edge and also possibly from drowning and slipping. The Ministry of Works proposals in the report make no allowance for the cost of any remedial action but we consider that definite financial provision should be made for any such remedial action and that finance should be available for at least ten years after the levels of the lakes have been raised.

(7) The Institute has made a broad economic analysis based on the figures given in the report and finds that, if the cost of raising the level of Lake Manapouri is \$8.8 million, the rate of return on capital invested would be about 14%. We consider it highly significant that, after allowing for a rate of return of 8% (the opportunity cost of capital to the economy quoted in the report), a total of \$15 million could be spent on raising the level of the lake. An investment on this scale could ensure very high standards of shoreline clearing.

(8) In our view, the consequences of leaving stumps in the zone between fluctuating water levels will, in most cases, be the progressive removal of soil by wave action and the complete exposure of stumps and root systems. With prolonged periods of submersion, the rate of decomposition of these stumps is likely to be very slow and they will remain an eyesore whenever they are exposed. There is ample evidence of this at Lake Monowai. We therefore consider it essential that all stumps and root systems be removed prior to the raising of lake levels.

(9) The pilot clearing trial.

(i) The results of the pilot clearing trials at South Arm indicate that, if stumps, surface roots and humus layers are not removed, woody vegetation will quickly become established. Thus, in areas cleared well before raising the lake levels, regrowth will be a serious problem if surface layers are not removed.

(ii) We consider that the trial was quite inadequate in respect of acreage, topographical types, forest types and methods of clearing. This, together with the lack of detailed analysis of costs by type of operation means that very little can be gleaned from the Cabinet report.

(iii) On the steeper areas, apparently no attempt was made to test the feasibility of pulling whole trees off the slopes. If this can be done, trees could be pulled clear of any wave platform and sunk in deep water, most of the humus would be removed thus minimizing regrowth, and the resulting landscape would be more aesthetically appealing than would be achieved by felling.

(iv) On the flatter areas, it appears that no attempt was made to pull or push over large standing trees. This was a serious omission, as this technique is probably the easiest way of removing most stumps.

(10) We consider that most of the flat to gently rolling areas can be satisfactorily worked by tractor, but there are some swampy areas where winching would be required. We consider that the standard of clearing aimed at on flat areas should be similar to that attained on the South Arm camp site itself.

(11) There are four methods of disposal of vegetation from the flatter areas:

(i) Sale of timber. This is discussed in greater detail below.

(ii) Burning. This could be safely carried out on the flatter areas, but some form of heaping by rake blade will be required to get a clean burn. There should be no problem in burning heads and small material provided that reasonable burning conditions are obtained. We believe that such conditions will occur with sufficient frequency. Large logs may be burned under good conditions but no attempt should be made to burn tree stumps as their presence in a pile of slash could adversely affect the chances of obtaining a good burn in the rest of the pile. Any debris resulting from incomplete burning will have to be buried as it will not sink in water.

(iii) Burying. This should be carried out in such a manner that debris will not be exposed by wave action once the level of the lake is raised. The surface of areas where debris is buried need not necessarily be below the ultimate level of the lake as it is considered that areas above ultimate high-water level would be recolonized by vegetation fairly readily, but of course provision will have to be made for navigation channels.

(iv) Sinking in the lake. This would probably not be a suitable method of disposal for small material or heads unless these were still attached to logs, because of the problems involved in transporting such material. However, it would be a suitable method for logs and stumps, particularly for those close to the present shoreline. All material should be sunk below ultimate low water level, and the job should be completed before the lake is raised at all.

(12) We recommend the following methods of disposal: sale of all merchantable timber; burning of all smallwood and heads after heaping (an attempt could also be made to burn logs if good conditions are obtained); burying or sinking of all other logs and stumps. Different techniques may be needed for different types of forest, and distance to and type of lake shore will affect disposal into water.

(13) Merchantable timber.

(i) The report of the Cabinet Committee states that the volume of merchantable timber presently existing below EL 613 is 545,000 cu. ft, most of which is situated at the head of Hope Arm on flat or gently sloping terrain. We consider that this volume is insufficient to warrant construction of a bridge and road from Manapouri township and therefore removal must be by water. We support the view that the cost of felling, extraction and loading on to barges should be charged against the clearing operation to facilitate the sale of logs at ruling market rates.

(ii) If the level of Lake Manapouri were raised to EL 620, it appears that the volume of merchantable timber to be cleared would be several times the figure quoted above (and the areas on which it occurs would be correspondingly greater), but it is still likely to be insufficient to require modification of the above view. However, as the volume involved would be of the order of the annual indigenous cut in Southland, the time required to handle and dispose of the timber merits careful consideration.

(iii) In view of the current investigations into the availability of beech for export from Southland, the merchantability of these species should be further considered. A sale of beech logs for chipwood could considerably reduce the magnitude of the problem of disposal in clearing certain areas. If costs are allocated as in (i) above, the proposal could be economically viable.

(14) Pollution. At Lake Monowai there has evidently been very little decomposition of stumps, logs and even small branches where these have remained completely submerged. Thus, if the debris from shoreline clearing is submerged, it would probably not lead to significant pollution of the water. Furthermore, we are not aware of any disadvantageous effect of such pollution on water fowl, which appear to be very numerous on Lake Monowai, particularly on those areas that have been drowned.

(15) Slips. There is no evidence that raising the level of Lake Monowai has induced lake-side slipping. Because of the resistant nature of the country rock and the effectiveness of the dense protection forest, we consider that, if slipping is induced by raising the levels of Lakes Manapouri and Te Anau, it will be on a minor scale and will not detract significantly from scenic values. Evidence from all over Fiordland shows that slips revegetate rapidly in this climate, and the shores of Lakes Manapouri and Te Anau are no exception.

(16) Beaches. On most of the flatter areas around Lake Manapouri it appears that the subsoil is sandy alluvium and the creation of beaches from this material should be possible. However, where this is improbable or likely to take a long time, we consider that it should not be difficult to stockpile sand from existing beaches and spread it where new beaches are desired.

(17) The Institute has access to a substantial amount of data and expertise related to the ecology of forests. We are not aware of any forest types around the shores of Lake Manapouri below EL 613 which are not represented elsewhere in Fiordland National Park; *i.e.*, if the level of Lake Manapouri is raised to EL 610, no unique forest types will be destroyed.

(18) As the podocarp element of the beech podocarp forests around Lakes Manapouri and Te Anau extends to well beyond the limits of any proposed levels for these lakes, we consider that any bird species dependent upon podocarp seed as a food source will not be greatly affected.

(19) Finally, we wish to point out that ten years have elapsed since the first public announcement of the intention to raise the level of Lake Manapouri and seven years have elapsed since validating legislation was enacted. In that time, however, no reliable information has been gathered on such important aspects as the acreage liable to be submerged, suitable methods of shoreline clearing, realistic costs of such clearing and the amount of merchantable timber involved, nor have sufficient data been published on frequency and range of fluctuations in lake level, and the effects of these on shoreline vegetation, despite the fact that it is intended to spend relatively large sums of public money on raising the level of the lake. We can see no justification for such inaction on the part of the Government and its departments, and this Institute considers that any public works having an impact on any aspect of our environment should be exhaustively examined by all interested parties before commitments affecting the environment are made.

On Thursday, 6 August 1970, J. J. K. Spiers, D. A. Franklin and D. B. McConchie appeared before the Commission of Enquiry, and were questioned on the N.Z.I.F. submission for about 2½ hours.