APPLICATION OF ENVIRONMENTAL WEIGHTING SYSTEM FOR QUANTIFICATION OF MINIMUM FLOW IN WHANGANUI RIVER

by

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A Thesis
Submitted in Partial Fulfilment
of the requirements for a degree in
Master of Philosophy in Resource and
Environmental Planning

Planning Department
Massey University
1994

ABSTRACT

Environmental weighting system is a technique for measuring the environmental sensitivity of reduced river flows. A points system with seven environmental categories was used to arrive at scores indicative of a location's sensitivity and commensurate with the maximum permissible volume of abstraction. The same score is used to estimate the environmentally prescribed flow or minimum flow.

This study deals with the applicability of an environmental weighting system to the quantification of a prescribed minimum flow using the Whanganui River as a case study. The minimum flows in Whanganui River have been subject to considerable debate since the construction of a series of intakes on several headwater streams in the early seventies for the purpose of increasing water volumes for the ECNZ power generation at Tokaanu and nine hydroelectric power plant stations on the Waikato River. In 1977, the NZ Canoeing Association requested that a minimum flow be fixed which in 1983, culminated in a recommendation of 22 $m^{-3}s^{-1}$ minimum flow at Te Maire in December and January. A review of these flows was carried out in 1987 and the minimum flow was increased to 29 $m^{-3}s^{-1}$ from December to May following a Planning Tribunal Hearing in 1989-90.

The results showed that one of the flow allocation methods was very restrictive to ECNZ operations while strongly favouring the requirements of fisheries and other instream uses. Two other options were examined under the demand conditions in the Whanganui River. They provided for an environmentally prescribed flow which was similar to that proposed by the Planning Tribunal Determination (1990), but each had slightly different abstraction proposals to meet suggested flows.

Under New Zealand conditions the technique was found to be useful in identifying the environmental constraints of competing demands for river water. However, in an already regulated flow regime the outcomes were hypothetical but still meaningful.

ACKNOWLEDGEMENTS

This exercise proved to be a worthy learning experience to the author not only in the field of study but more importantly in the rudiments of researching. In this pursuit, the contribution of Richard Heerdegen as thesis supervisor, is particularly acknowledged. Likewise, the assistance of the Staff of Department of Conservation in Wanganui, specifically Murray Mc Lea, who furnished the necessary information and lent their expertise to the Study making the completion of this work possible.

Massey University is also acknowledged for providing the research grant. Special thanks is due to the Staff of Massey University Planning Department for all their support material or otherwise.

The New Zealand Government, through the Ministry of Foreign Affairs and Trade, is recognized for making the ODA scholarship available.

The author is appreciative of the assistance from Mon Gelera during the preparation of the final copy.

I am grateful to my wife Yvette for her forbearance and to our children, Francis and Jessica, for having unknowingly relinquished some of their comforts to give way to my selfish ambition. To my family, my endless gratitude for the encouragement they have extended during trying moments.

To the Almighty GOD for having nurtured me with His wisdom and providing for all my needs, my infinite gratitude.

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