

Development of a Non-Destructive Method to Assess Vegetation Structure and Structural Diversity of Tussock Grasslands at a Landscape Scale

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ABSTRACT

Measurements of vegetation structure (the three dimensional placement of the vegetation biomass) and structural diversity (the number of vegetation layers present and the abundance of vegetation within them) are required for numerous ecological questions. Several methods exist, but few are time & resource efficient, appropriate for measuring grasslands at a landscape scale and are non-destructive to the vegetation. Furthermore, the lack of studies evaluating such methods makes it difficult for ecologists to choose which is most appropriate.

A novel, non-destructive method for measuring both vegetation structure and structural diversity at a landscape scale (using aerial photographs) is being developed. The results attained will be compared with those yielded by two established methods employed for estimating vegetation structure and structural diversity (“Height Frequency Method” (Dickinson 1992) and “MacArthur Method” (MacArthur 1961)) as well as a presence/absence data which is considered as a baseline; representing the vegetative community with no information about structure or structural diversity.

The limitations of the existing methods will be presented followed by an overview of the developments to date with the “novel aerial-photo method”. A request for advice and suggestions will be made.

Keywords and phrases: vegetation structure, structural diversity, tussock grassland, aerial photography.

1.0 INTRODUCTION

This work has been derived from doctoral work that is aiming to find opportunities for increasing the native biodiversity in farmed high-country tussock grasslands. The relationships between past land management and the

diversity of the flora and fauna are being investigated. Surveys of the plant, reptile and invertebrate communities were carried out within 10 high-country paddocks where the vegetation ranged from highly modified (exotic pasture grass) to low modification (dense tussock grassland). An index of vegetation structure and structural diversity is used as a proxy measure for historic land management, and consequently, it was imperative that reliable measurements of these variables were taken.

The lack of a satisfactory method appropriate for measuring grasslands at a landscape scale led to the consideration of developing a novel method based on aerial photography. If a satisfactory method can be developed, it will have the advantage of being applicable to both present and historic research. Historic photos of the study area will be analysed to measure changes in vegetation structure over time. This data coupled with the results from the reptile and invertebrate surveys will be used to infer changes that have occurred within the faunal communities over time.

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