ECOLOGY OF FREE-RANGING HORSES IN NORTHERN GUY FAWKES RIVER NATIONAL PARK NSW, AUSTRALIA

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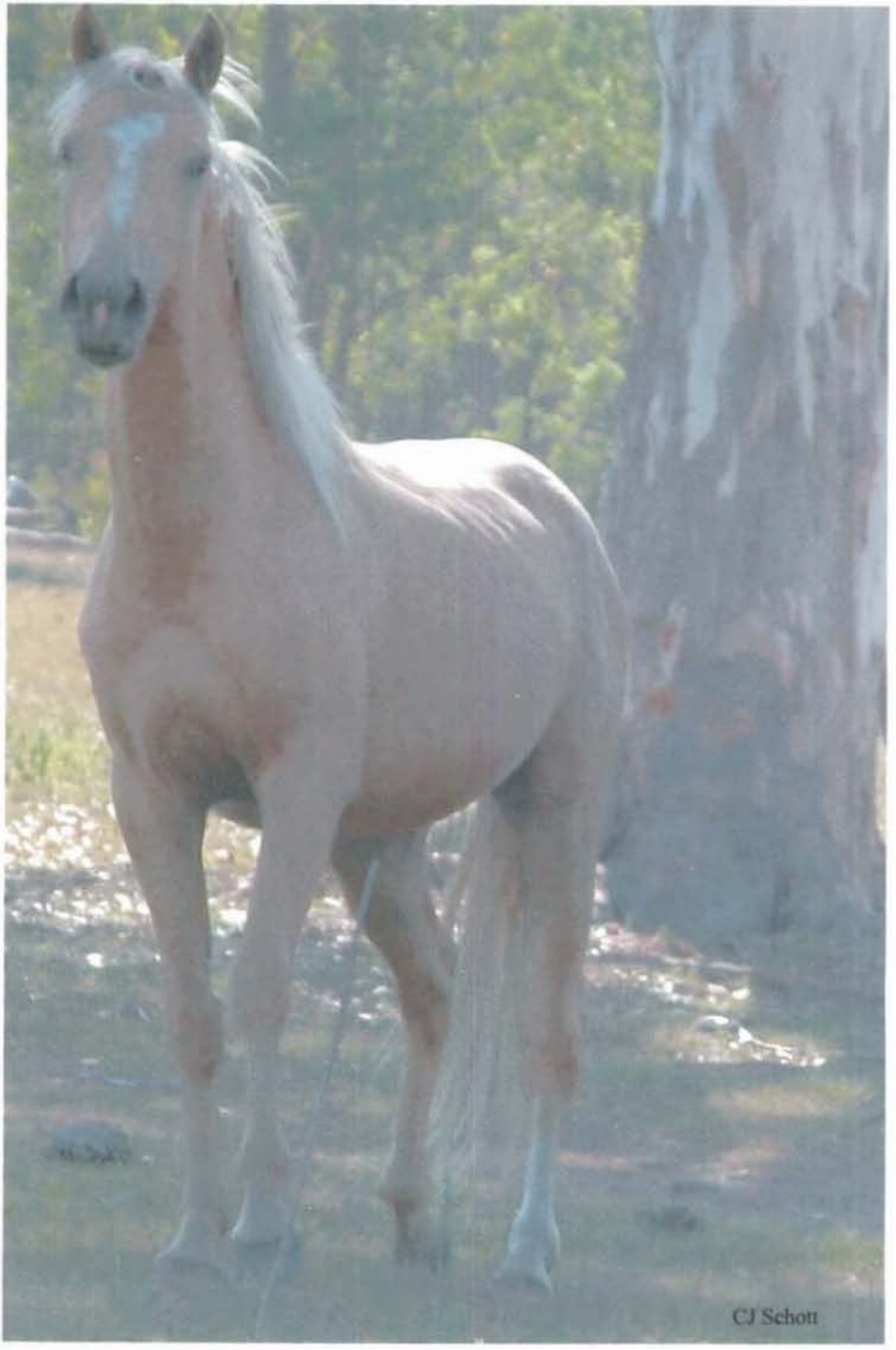

Frontispiece: Free-Ranging horse with damaged *Eucalyptus amplifolia* in background

I certify that the substance of this thesis is my original work, and has not already been submitted for any degree and is not being currently submitted for any other degree or diploma. I certify that, to the best of my knowledge, any help received in preparing this thesis, and all sources used, have been acknowledged in the thesis.

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ABSTRACT

This study examines spatial and temporal aspects of free-ranging horses on approximately 40 km^2 of Paddy's Land plateau in northern Guy Fawkes River National Park (GFRNP). Free-ranging horse ecology within GFRNP holds particular scientific interest as, in October 2000, prolonged drought and bush fires prompted the NSW National Parks and Wildlife Service to perform a free-ranging horse control operation, in which 606 horses were culled. A scattered population remains and highest densities are thought to occur in the northern sector of the Park. Investigations into the current population and their impacts are needed to increase our understanding of the relationship free-ranging horses have with the woodland plateau.

Baseline information on the densities and distribution of the horse population is presented along with the first examination of bark-chewing damage to eucalypt trees by horses. Density, habitat-use and distribution was systematically sampled by means of repeated transect surveys, implementing horse-band-counts as well as dung-counts, and by passive observational surveys. Results are consistent with anecdotal reports of a seasonal migration, of a portion of the horse population, from the gorge system to the plateau. Free-ranging horses occupied Paddy's Land plateau over all seasons reaching highest densities during the extremely dry summer of 2002-2003. They were dispersed across plateau and showed significant tendency to occupy drainage-lines, which are associated with abandoned stock ponds.

Impact assessments revealed that bark-chewing damage is clustered with severity of damage along drainage-lines and in close proximity of other water sources. Investigations using transect and quadrat techniques revealed that free-ranging horses chew bark, intensely during summer demonstrating preferences for *Eucalyptus amplifolia, E. saligna, and E. moluccana*. Damage is correlated with poor biological health of trees, which indicates that horses directly affect ecosystem health on Paddy's Land plateau. Replicated exclosures were pilot-tested in Bob's Creek to measure the effects of grazing on herbaceous vegetation. Difficulties experienced resulted in recommendations for a future design.

It has been recommended by the National Parks and Wildlife Service that all free-ranging horses be removed from GFRNP, and by the Heritage Working Party that some of the horses be relocated and managed off National Park estate to retain their bloodlines. This study offers detail to support this process including, recommendations for ecosystem rehabilitation on Paddy's Land plateau. Restoring abandoned stock ponds to reconnect the seasonal drainage-lines would be a logical step, and perhaps reduce the advantage these ponds offer the free-ranging horses and other exotic ungulates. Further study of this restoration opportunity would support better management of Park resources while offering a better understanding of horse ecology in Guy Fawkes River National Park.

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Last but certainly not least, a tribute to both the horses of Guy Fawkes River National Park and to the eucalypt trees of Paddy's Land plateau. May the future bring a balance…

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES