Title: Increased abundance and stability of threatened mammals due to both positive and negative fire responses under managed regimes of decreased annual variation in regional fire extent

Author: Ian J. Radford, Kenneth H. Pollock, Ben Corey, Richard Fairman, Karin Carnes, Tony Start, Ed Hatherley, Tom Vigilante, Wunambal Gaambera Aboriginal Corporation

Institutions: Department of Biodiversity, Conservation and Attractions, North Carolina State University, Bush Heritage Australia, Wunambal Gaambera Aboriginal Corporation

Benefits of fire management programs for fauna are rarely demonstrated. This is the case also for fire management programs in northern Australia where recent collapses of small and medium sized mammal assemblages have occurred in some regions and fire regimes have been implicated in declines. This study presents the first data on threatened mammal responses to prescribed fire management programs recently established in the north Kimberley to test for benefits to this group. This was done by comparing mammal survey data before and after fire management regimes were applied. Results show that fire regimes were changed through increased application of broad-scale patchy early dry season burning resulting in decreased extent of high intensity late dry season wildfires and decreased inter-annual variation in total fire extent. A number of threatened mammal species benefited directly from these changes. In addition, two of the four mammal functional groups represented in the region increased in mean abundance (trap success). Species specific responses to fire extent and to LDS fire extent were both positive and negative, indicating diverse and opposing responses to fire among small and medium sized mammals. Improvements in mammal assemblage condition under increased fire management may therefore be attributable to combined benefits both for positive and negative responding species under a regime with more consistent annual fire extent. Possible reasons for failure of other fire management programs in northern Australia to facilitate increases in mammal abundance are discussed.