LESSONS LEARNT FROM A 45 YEARS-LONG FERAL DONKEY MANAGEMENT PROGRAM IN THE KIMBERLEY, WESTERN AUSTRALIA

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Abstract

In the Kimberley region of northern Western Australia (WA), feral donkeys (*Equus asinus*) have been the focus of intensive control over 45 years, which has significantly reduced their population densities. After an initial population reduction of approx. 500,000 animals from 1978 – 1994 by aerial culling, the implementation of the 'Judas' technique has been an important tool to control feral donkey populations at low densities and as a monitoring tool to facilitate localised eradication. Aerial control is costly (approx. $10,000/day) and absorbs a considerable proportion of landholder's and state budgets, which forces land managers to seek more cost-effective ways of feral donkey management.

Keywords: feral donkey management, 'Judas' technique, localised eradication, Kimberley.

Introduction

Feral donkeys impose substantial grazing pressure in the WA rangelands and can reduce productivity of affected cattle stations and impact biodiversity. Managing feral donkeys and other large feral herbivores (LFH) is a continuing challenge in the rangelands due to well-established and widespread populations, moderately high reproductive capacity, and lack of native predators.

The Kimberley region has historically supported high concentrations of feral donkeys. By the 1950's feral donkeys established large and dense populations across the entire region, and concerns were being raised about overgrazing, soil erosion, damage to station infrastructure, and the impacts on native flora and fauna that donkeys were causing (Watkins 2012). On some pastoral stations, population density in the late 1970's ranged from 1 – 3.5 donkeys/km^{-2} (Johnson 2000). Individual landholders, recreational shooters, and pet meat operators controlled feral donkeys by ground shooting and trapping, but the methods were not effective in reducing high population numbers (Watkins 2012).

Methods

In the 1970's, helicopters become available for aerial mustering of livestock in WA, and in 1978, aerial shooting was recognised as the most efficient and

humane method of controlling large and widespread populations of LFH in WA. As a result, from 1978 - 1994, aerial control become the primary tool to remove large populations of feral donkeys in the Kimberley region. Control operations were conducted annually over 3 – 4 weeks (approx. 200 hrs flying time) during the later part of the dry season, when the animals concentrated near water points. To reduce animal' search time and increase cost-effectiveness of operations, fixed wing aircrafts were often used to assist in locating the animals, and prior to each control, the operators closely liaised with pastoralists to identify areas of high population numbers.

When the number of donkeys was reduced to a point where aerial culls became uneconomic (e.g., when the number of donkeys shot was less than 20 animals per hour), the program introduced a 'Judas' technique in 1994 to further reduce the population (Watkins 2012). The 'Judas' technique had proven very effective in the eradication of cattle infected with tuberculin during the national brucellosis and tuberculosis eradication campaign (BTEC) in the Kimberley (O'Dwyer 1988).

The 'Judas' technique progressively created a 'Judas network' by collaring donkeys with a VHF transmitter, which were released back to the environment. Being gregarious, 'Judas' animals searched out and associated with other donkeys, leading operational staff to the locations of donkey groups which were then controlled. Initially, 'tracking runs' were conducted every 1 – 2 months, but with time, the frequency of runs decreased to about three per year. Similarly, the length of each run decreased from about five days at the beginning of the program to three days at present. Distribution (spacing) of 'Judas' animals depended on terrain and aimed to cover the anticipated animal's home range estimated at the time at about 45 km^{-2} (Watkins 2012).

Results and Discussion

Aerial culling considerably reduced population density of feral donkeys in the region by removing approx. 500,000 animals from 1978 – 1994. The 'Judas' technique further reduced the population to a very low level by removing approx. 90,000 animals from 1994 – 2022 (Figure 1), and lead to a localised eradication of donkeys within targeted areas, i.e., within the 'Judas' animal's home range (Zabek *et al.* 2019).

In the absence of information regarding the initial and current population size, the effectiveness of the program has been based on an annual harvest rate, which decreased from 0.74 to 0.01 donkeys/km^{-2} within the managed areas over 45 years. Observations of aerial operators and individual landholders indicate the number of feral donkeys in the managed areas have decreased considerably and aerial operators find it difficult to locate donkeys for collaring and culling. According to the Kimberley Biosecurity Survey, feral donkeys stopped being considered by pastoralists as a major threat to pastoral industry in the Kimberley region (KRBA 2017).

However, as the decrease of the harvest rate corresponded with the gradual decline in the effort invested into the 'Judas' program (expressed as the annual number and duration of tracking runs; Figure 1), more recently, the program has been adopting new approaches and technological tools to

increase animal detection and harvest effort to further suppress the population and ultimately improve efficiency and cost-effectiveness of the program.

These tools include deployment of GPS tracking devices on 'Judas' animals, as more location data will assist with more rapid detection of 'Judas' animals and their social cohorts, which in turn will decrease expensive helicopter search time. In addition, the program is aiming to maintain uniform survey effort by applying even frequency and duration of tracking runs each year. Finally, the program partners are undertaking a genetic investigation into the feral donkey population to determine genetic dispersal, re-colonisation ability, and the connectivity of feral donkeys across and between the regions in WA. These investigations will permit better definition of the size of management areas in feral donkey control programs.

Conclusion

For established pest species, such as feral donkeys, effective management aims to reduce the damage they cause, thereby preventing further impact to agriculture and biodiversity. Effective management also includes monitoring the density and distribution of established populations to delineate their extent and monitor effectiveness of control activities. In the remote rangelands, aerial control is the only method able to reduce LFH population numbers, but with a cost of $10,000/day, which absorbs a considerable proportion of landholder's and state budgets. This high cost of control forces land managers to seek more cost-effective ways of management. The feral donkey management program in the Kimberley region has evolved over the last four-and-a-half decades from an intensive, broad-scale control to a highly specialised operation, targeting specific management areas. The success of the program is a result of the strong, effective, and continuing commitment from all program partners.

Conflicts of Interest

The authors declare no conflict of interest.

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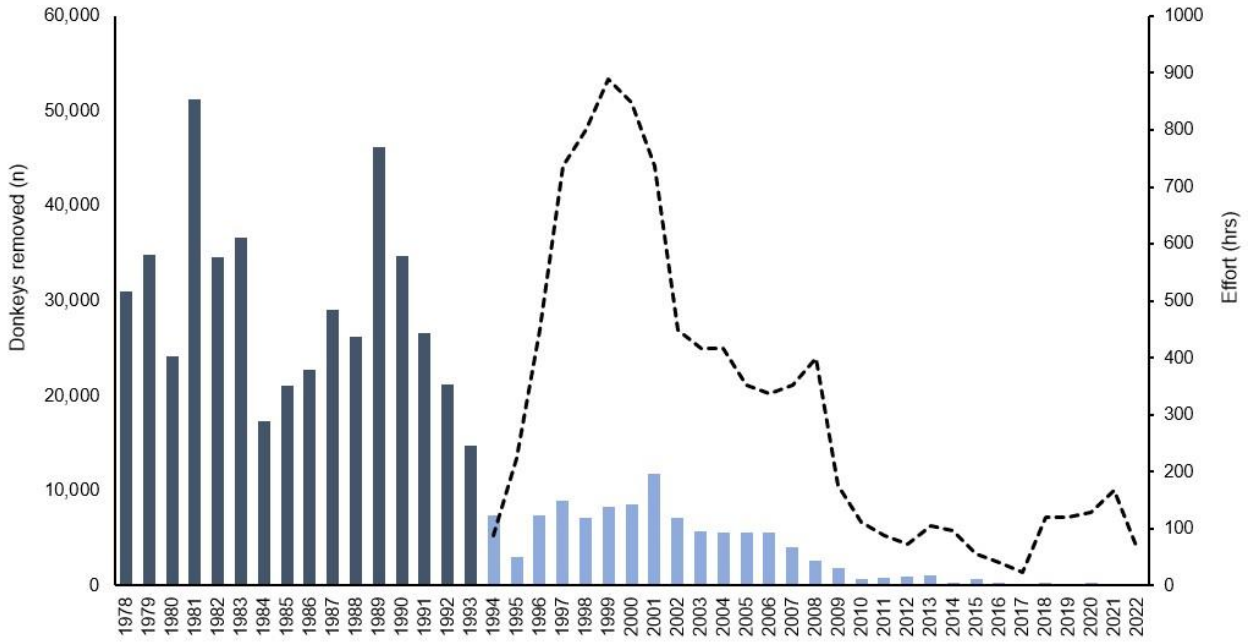

Figure 1: Number of feral donkeys controlled annually in the Kimberley region by the feral donkey management program from 1978 - 2022; grey bars – donkeys controlled by aerial shooting (1978 – 1994), blue bars – donkeys controlled by the Judas technique (1994 – 2022), and dashed line – approximate control effort (hours) of the Judas technique. Control effort of aerial shooting (1978 – 1994) was approximately 200 hours/year.