



Macropod Management

MARIA ISLAND NATIONAL PARK



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Introduction

In 2010 a comprehensive review (the Macropod Review) was initiated by the Tasmanian Parks and Wildlife Service (PWS) through consultant wildlife ecologist, Janeane Ingram (Forest Contracting Services (Tas) Pty Ltd). The Macropod Review recommendations are intended to assist with future decision making for the management of Forester kangaroo, Bennetts wallaby and Tasmanian pademelon populations on Maria Island National Park (NP) in response to concerns raised about the animal welfare aspects of the macropod control program. Recommendations from the review have been summarised below and form the basis for the future directions for macropod management at Maria Island National Park (Maria Island NP).

The Macropod Review provides four main areas of recommendation. These are:

1. key recommendations to improve the management of the Maria Island NP macropod populations (Pp. 2) and directions for future research;
2. the development of a comprehensive Maria Island National Park Macropod Strategy (Pp. 2)(Pp. 61);
3. endorsement of the “Maria Island National Park Monitoring Strategy 2010” (Appendix 1) and the “Macropod Control Management Principles (Draft)” (Appendix 2) ; and,
4. recommendations for the short, medium and long term population control of macropods at Maria Island NP (pp. 27-31).

The PWS supports and endorses:

- the implementation and adoption of the methodologies as proposed by Ingram & McCallum (2011) in order to protect the natural values of Maria Island NP and, to maintain a viable and healthy population of each macropod species for observation by tourists and visitors to the island;
- the recommendation as described in Ingram and McCallum (2011) to continue to undertake spotlight shooting as the preferred method of population control (pp.. 31 – the Macropod Review). Population control action will be undertaken when warranted as evidenced by ongoing monitoring; and

- the annual review of indicators that trigger the need for a proactive population control option including the potential changes and amendments necessary given the status of new research, information, or any updates of the *Maria Island National Park and Ile Des Phoques Management Plan 1998*.

Background

Macropod Introduction and Population Management

Forester kangaroo (*Macropus giganteus*) were introduced on Maria Island NP from the late 1960s as part of a fauna reserve strategy and to enhance the visitor experience of a nature reserve (Tasmania Parks and Wildlife Service, 2010; Ingram & McCallum, 2011). Bennetts wallaby (*M. rufogriseus rufogriseus*) and Tasmanian Pademelon (*Thylogale billardierii*) were also brought to the island despite already being established, as cited in Wakefield (1962) and Guiler (1999) (Ingram & McCallum, 2011). Rapid increases to the macropod populations occurred following the removal of sheep in 1981, particularly the dominant grazing species, Forester kangaroo.

Problems from overgrazing on the island were evident as early as the mid 1980s due to drought, with juvenile Forester kangaroo dying from high parasite loads and reduced pasture quality. Seasonal fluctuations in pasture levels and the availability of water have also resulted in negative impacts on animal welfare. A lack of natural regulation from predation or dispersal, and the potential for a high population rate of increase when pasture conditions improve resulted in poor animal health and extremely low food availability in the following season (Tasmania Parks and Wildlife Service, 2010; Ingram & McCallum, 2011).

Due to concerns for animal welfare, a decision was made in 1987 to reduce the population in the short term by shooting any animals that appeared sick and emaciated. There was a longer term goal to actively manage impacts from overgrazing. As a result, population control by shooting of all three species has occurred annually since 1994 (with the exception of 2001 and 2009) (Tasmania Parks and Wildlife Service, 2010; Ingram & McCallum, 2011) in an effort to reduce the macropod populations to a sustainable level, as cited by Coulson (2001) and Tanner & Hocking (2001) (Ingram & McCallum 2011). An initial control effort in 1994

of 3,300 animals resulted in improved body condition and assisted in the regeneration of woodland understorey vegetation (Tasmania Parks and Wildlife Service, 2010).

Summary of the Macropod Review

The Macropod Review briefly documents the historical background of macropod management and examines the methods employed for the population control of Forester kangaroo, Bennetts wallaby and Tasmanian pademelon at Maria Island NP. The review makes recommendations which are based on a synthesis of past control programs (using the results from biological samples and population data collected in most years), and a critique of the options currently available or being considered for the population control of all three macropod species.

Specifically, the Macropod Review was undertaken in order to:

- detail monitoring procedures that are appropriate for macropod management on Maria Island NP;
- detail the current options for macropod population control in Australia that may be suitable for Forester kangaroo, Bennetts wallaby and Tasmanian pademelon on Maria Island NP;
- detail the population dynamics of all three species from past control years including body condition and the effect of rainfall.

The resulting document has been reviewed by the senior consultant for the project, Professor Hamish McCallum, Griffith University (Qld). Greg Hocking, Principal Wildlife Officer at DPIPWE has also contributed to the review with historical information and population data.

The Macropod Review also identifies three key areas which will be improved through the use of new methods and strategies (pp. 2):

1. Increased and standardised spotlight surveys that form the basis for macropod population estimation;
2. Establishment of procedures for assessing animal health, particularly body condition and fecundity; and,

3. Further research into the impacts of marsupial grazing on pasture condition and the regeneration of native plants.

New Procedures Established

The principle author (J. Ingram) has undertaken comprehensive research of peer reviewed literature and extensive field surveys to establish the new procedures recommended by the Macropod Review. Most of these procedures, such as pasture monitoring and population monitoring, have already been initiated and implemented with the support and involvement of PWS Rangers and field staff on Maria Island NP.

Biological monitoring to determine animal health has also been implemented and this has involved staff from the PWS, Wildlife Operations, Animal Health and Welfare, and Mt Pleasant laboratories, Department of Primary Industries Parks Water and Environment (DPIPWE).

The new procedures for annual spotlight survey counts of all species of grazing marsupials on the island consists of a modified line transect survey incorporating distance sampling techniques. The implementation of these monitoring procedures has resulted in the establishment of a much improved scientific monitoring (survey) program to provide a relative population index.

Analysis was completed last year by the principle author (J. Ingram) using the DISTANCE program. The results were further validated with additional spotlight surveys in winter. Biological sampling procedures that typically occur in winter have also been intensified to enhance scientific rigour and increase the level of data for improved confidence in the decision-making process. Field sampling includes the participation of a veterinarian, with follow up laboratory analysis consisting of clinical pathology, microbiology, serology and parasitology reports.

Proposed Macropod Management Directions

Summary

The main goals for macropod management at Maria Island NP are to protect the natural values of the park, and to maintain viable and healthy populations of each macropod species for observation by tourists and visitors to the island. The Review recommends the following objectives for the development of a Macropod Management Strategy. These, in tandem with the long term monitoring of the three Management Action Indicators will enable a proactive and integrated approach to the achievement of the main goals for macropod management.

Maria Island Management Strategy Objectives

The Macropod Review proposes the following management objectives:

- Address animal welfare issues such as nutritional induced stress in the macropod populations during periods of low rainfall.
- Prevent degradation of remnant pasture areas that are essential for macropod grazing and are a focal point of the historic landscape.
- Minimise the loss of native vegetation cover and plant diversity, particularly if macropod browsing is causing a lack of regeneration.
- Increase public awareness of the issues related to macropod management which include impacts on the island ecosystem.
- Implement a monitoring, evaluation and reporting framework that can be assessed against expected strategy outcomes.
- Contribute to the research of non-lethal population control methods that can be applied to free-ranging populations.

Management Action Indicators

Management decision making will be guided by the three main indicators for population control with the intent of meeting the strategy objectives, and in addition, to achieve compliance with the principle objectives within the Macropod Management Program of the *Maria Island National Park and Ile Des Phoques Nature Reserve Management Plan (1998)* as recommended in the Macropod Review

(Ingram & McCallum 2011). The decision to conduct a population control program (or not) in any one year will be made on the basis of scientific monitoring and assessment of the indicators as outlined below to meet the defined objectives for macropod management on Maria Island NP.

The indicators are:

- the results from pasture, biological, and population monitoring;
- current and predicted seasonal rainfall (and hence available food); and,
- the predicted population rate of increase (ROI¹) based on fecundity (the number of females with pouch young), and rainfall the previous season.

Population Control Recommendations

Continuation of Selective Reduction Culls

The Macropod Review supports population control of macropods on Maria Island NP by continuing selective reduction culls through spotlight shooting as the most humane option available. For the immediate future, the PWS will continue to monitor the Management Action Indicators including population and pasture indices, assessment of animal health, and seasonal rainfall in a yearly cycle (see Figure 1).



Figure 1. The annual cycle of population, biological, and pasture monitoring on Maria Island NP that will facilitate data analysis, reporting and review.

The monitoring data and its follow-up analysis will be summarised in a “Maria Macropod Annual Monitoring Report” to be produced in early winter of each year. The report will include recommendation of the need, or not, for pro-active population intervention through spotlight shooting for that year, based on the flow of information through the decision tree (see Figure 2). Should population control be indicated, the macropod control program will be guided by the “*Macropod Control Management Principles (Draft)*” (pp. 50 the Macropod Review). This will ensure the humane treatment of animals by using best practise methods and will include supervision by an experienced veterinarian. Lethal population control will occur only if management intervention is warranted following a comprehensive evaluation of animal welfare issues (Ingram & McCallum, 2011).

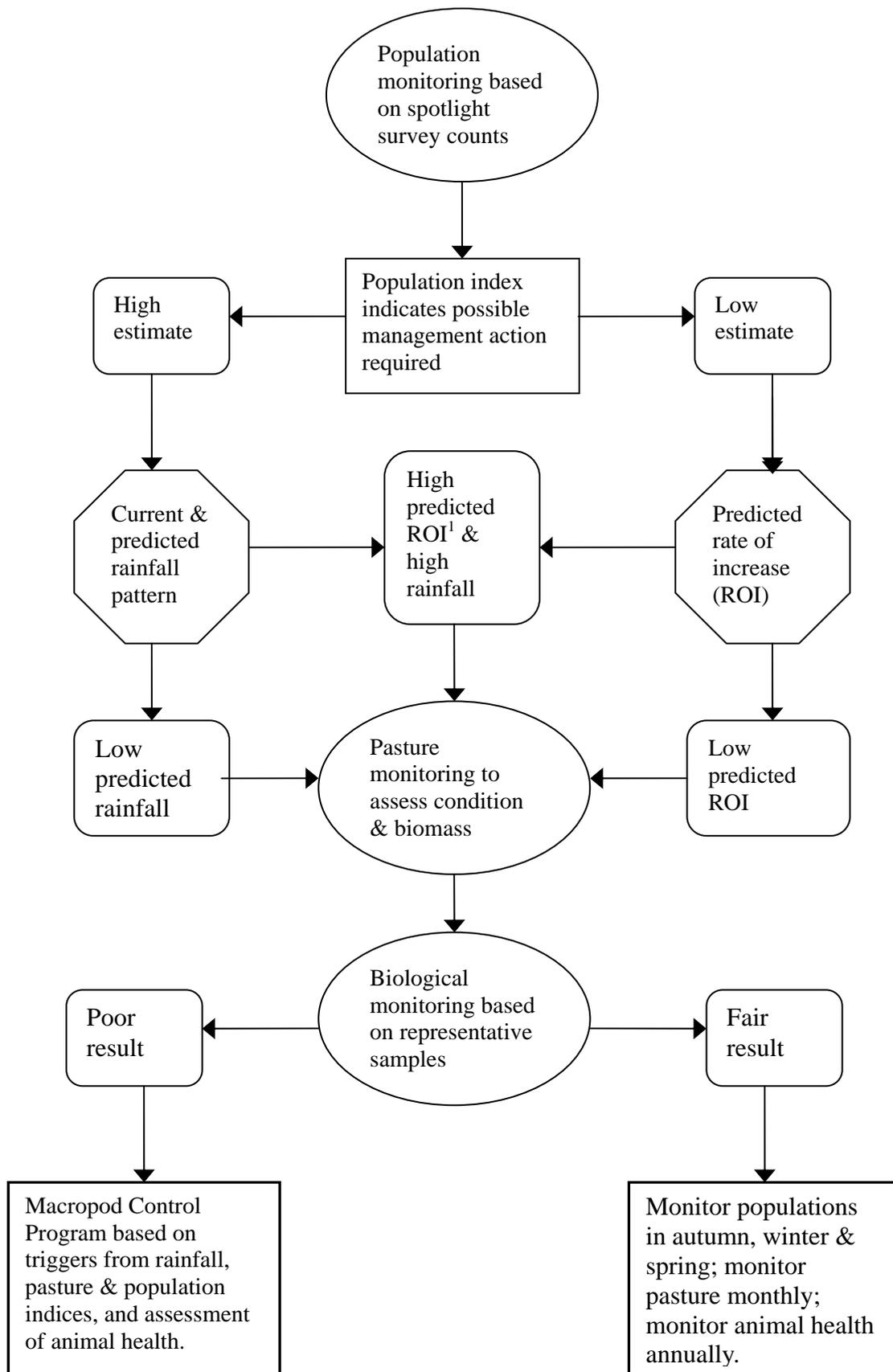


Figure 2. Decision tree for macropod population control on Maria Island NP to be based on an evidence-based, adaptive management strategy of informed decision making.

¹ROI is calculated as described in Indicators list on pp. 10 above.

Population Control - Future Directions

Introduction of a Major Predator

The Macropod Review recommends the introduction of a major predator, the Tasmanian devil (*Sarcophilus harrisi*) to promote natural regulation as a potential method of population control on Maria Island NP. As a separate issue, a proposal is currently being drafted by DPIPWE raising the possibility of using Maria Island NP as a site for the introduction of Tasmanian devils as a wild insurance population that is isolated from the impacts of the Devil Facial Tumour Disease (DFTD). There is therefore, a potential dual benefit from the introduction of Tasmanian devils to Maria Island NP (Ingram & McCallum, 2011).

The Tasmanian devil translocation proposal is being reviewed with the relevant DPIPWE specialists and assessed as per internal approval processes. Following any approval by DPIPWE, an assessment of the introduction to the national park under PWS Environmental Impact and Assessment Policy (Reserve Activity Assessment) must be undertaken. Assessment of this proposal will be substantial given the level of detail required, the need for public consultation, and any potential for referral to the Commonwealth Government under the *Environment Protection and Biodiversity Conservation Act, 1999*.

Captive Management of Forester Kangaroos

In the absence of a major predator, captive management of Forester kangaroo within a fenced enclosure may limit the impact of this introduced dominant grazing species on the island ecosystem. Bennetts wallaby and Tasmanian pademelon as generalist browsers have the potential to reach equilibrium with ecological processes over time. The enclosure option also presents some issues for wider reserve management including the potential need for increased fire management to protect heritage, assets and visitor safety due to reduced fire abatement with less grazing.

Future Direction

Both of the medium to long-term population control recommendations, the devil introduction or the enclosure fencing, will require significant commitments in staff resourcing; the potential for new infrastructure; and, additional operational changes for PWS staff. These issues will need to be considered when developing the

medium and longer term options for the comprehensive macropod population management strategy. The PWS will undertake ongoing research into the long term objectives and options for wildlife management on the island.

Conclusion

The Macropod Review has provided the PWS with specific recommendations and directions for consistent macropod monitoring, population management, and further research. Management of native and introduced macropods on Maria Island NP will be guided by the two main goals: that is, to maintain a viable and healthy animal population and to protect the natural values of the island. Ongoing future management will be guided through the identification of key desired outcomes in the development of a Macropod Management Strategy as recommended by the review. The development of this strategy will be based on an evidence-based, adaptive management approach (Jones, 2009). The development of this strategy will be undertaken in light of associated management decisions such as the potential introduction of a major predator to the island, a review of the *Maria Island National Park and Ile Des Phoques Nature Reserve Management Plan, 1998*, the need for any additional research, and the resources available for such research and strategy development.

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Appendices

Appendix 1

Maria Island National Park Monitoring Strategy 2010

Current Situation	Desired Outcomes	Strategies	Priority
<p>Population Monitoring</p> <p>Standardised spotlight surveys incorporating distance sampling techniques have been completed for five grazing species.</p> <p>Monitoring of Forester kangaroo, Bennett's wallaby & Tasmanian pademelon provides information for potential population control.</p>	<p>Reliable population estimates based on data analyses from the Distance program, modelled from detection probabilities & numbers observed.</p> <p>Ensure a balance between animal welfare for introduced & native fauna, while maintaining the conservation values of the island ecosystem.</p>	<p>Undertake repeated spotlight counts over three nights with surveys replicated in May, July & September in each year.</p> <p>Research the potential carrying capacity for grazing & browsing marsupials for use in estimating viable macropod population sizes.</p>	<p>High</p> <p>Medium</p>
<p>Biological Monitoring</p> <p>Intensive biological sampling of the three macropod species to assess animal health, including parasite loads & reproductive rate.</p> <p>Monitoring of animal health provides data to inform decision making across various agencies within the department.</p>	<p>Comprehensive pathology reports that provide a framework for estimating population dynamics including rate of increase & body condition.</p> <p>Contribute to the development of a wildlife data base, including identification keys for endemic macropod parasites & potential disease threats.</p>	<p>Coordinate sampling of biological material that includes all three species, both sexes & a range of age classes from multiple sites.</p> <p>Research the prevalence of wildlife disease & the presence of pathogenic parasites at Tasmanian mainland National Parks.</p>	<p>High</p> <p>Medium</p>
<p>Pasture Monitoring</p> <p>Establishment of temporary exclosures to measure grazing offtake, estimate % of vegetation cover & an index of biomass.</p> <p>Monitoring of pasture condition has the potential to act as a trigger for intervention in future grazing & wildlife management.</p>	<p>Measurable scientific data on grazing offtake that can be compared with % of cover to better inform management prior to population control.</p> <p>Provide a standardised index of pasture biomass for calculating carrying capacity, in conjunction with rainfall forecasts & impacts on animal health.</p>	<p>Record measurements of vegetation height, % of cover & estimate pasture quality each month, with replicate plots at three sites.</p> <p>Research the impacts of overgrazing & the potential for regeneration in the absence of grazing at key sites on the island.</p>	<p>High</p> <p>Medium</p>

Appendix 2

Macropod Control Management Principles (Draft)

- 1. Lethal population control is to occur only if management intervention is warranted, following a comprehensive evaluation of animal welfare issues;*
- 2. The priority is to make informed management decisions, based on triggers using population estimates, assessment of animal health and pasture condition;*
- 3. Target levels of culling for each species are to be determined from winter, spring and summer rainfall predictions and the expected population rate of increase (ROI);*
- 4. The final decision on culling levels within each management site should be based on veterinary advice during the Macropod Control Program;*
- 5. Culling is to be timed to minimise the potential for mature females to be carrying large pouch young and restricted to winter months only;*
- 6. Best practice methods for the humane shooting of macropods are to be actioned by experienced wildlife rangers, and supervised by a veterinarian at all times;*
- 7. The Macropod Control Program should involve input from a wildlife biologist to coordinate the collection and interpretation of relevant biological data;*
- 8. No animal carcass or animal product resulting from a culling program in a National Park is to be used for human consumption or commercial purposes;*
- 9. Alternative population control options should be considered, as they become available and trialled for use on all three macropod species on Maria Island NP.*



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