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Controlling feral pigs in tropical rainforest

The rainforests of Queensland's Wet Tropics World Heritage Area (WTWHA) support a large component of Australia's biodiversity, including numerous endangered plant and animal species. Rainforest-related tourism in the WTWHA is also worth several hundred million dollars annually. Feral pigs are regarded as one of the most important vertebrate pests of the WTWHA. They have, substantial deleterious impacts on a range of important environmental, economic, human health and social values in the WTWHA. Frequently cited environmental impacts include: predation of native plant and animal species; disruption of trophic webs; weed and pathogen transmission, and erosion and water quality deterioration.

Economic impacts are largely incurred by primary producers and include damage to produce and infrastructure; lost production potential, and the cost of control. The successful introduction of a serious exotic veterinary disease, such as foot and mouth disease, to the local feral pig population would be an economic catastrophe. Feral pigs may also serve as amplifiers and vectors for important human diseases such as Japanese Encephalitis and leptospirosis.

Feral pigs are currently widespread in the WTWHA. Methods used to mitigate the impacts of feral pigs in Australia are largely based on reducing pig abundance by increasing mortality, and include poison baiting, trapping and shooting. Poison baiting is generally regarded as the most effective and efficient method of producing the population reduction required to significantly reduce the impacts of pigs on the environment. However, trapping remains the preferred pig control method within the WTWHA due to the potential for poison baiting programs to impact non-target species, particularly species of conservation significance such as the Cassowary and Spotted-tailed Quoll. Trapping alone is unlikely to provide the level of popu-

lation control required to prevent rapid recovery to pre-control levels.

This demonstration site aims to assess the impacts of feral pigs on the conservation value of the Wet Tropics Natural Heritage Area and develop acceptable means of enhancing pig control in the WTWHA while minimising non-target impacts. The project also seeks to understand the process of uptake and investigate new models to reduce resistance to pig control techniques. An economic analysis of the marginal benefits and costs of pig management is also being undertaken.

The project has developed a strong relationship with the Wet Tropics Management Authority (WTMA), Queensland Parks & Wildlife Service (QPWS), the Douglas Shire Council and local aboriginal elders. Douglas Shire Council has a pig trapping program in place and Andrew Bengsen is working with the trapper to improved data gathering, management and analysis. The Council is also renting office space to the project. The local newspapers have also been extremely interested in the project with a number of articles produced in the Cairns and Townsville newspapers.



A feral pig consuming a non-toxic banana-flavoured version of the PIGOUT bait, manufactured by Animal Control Technologies Australia, at an exotic fruit orchard on the rainforest edge.

Impacts of Feral Pigs on Rainforest Ecosystems



Feral pig enclosure built to monitor rainforest recovery over the next two years. Source: Amanda Elledge 2007. Fencers are Andrew Bengsen and David Solomon (traditional owner).

For the last 14 years, Qld Parks and Wildlife Service (QPWS) have been monitoring numbers of tree seedlings and percentage of soil surface area affected by pigs in 10m x 10m enclosures, and

matched unfenced sites at three locations in the World Heritage Area: Oliver Creek, Em-magen Creek and Donovan Creek.

Preliminary data on the environmental impacts of feral pigs in lowland rainforests of the Wet Tropics was collected and analysed by University of Queensland honours student, Dominique Taylor. Dominique compared unfenced plots with fenced plots that have excluded feral pigs for 12 years. She found that pigs significantly reduced leaf litter cover, seedling density, and the diversity and density of invertebrates.

Amanda Elledge will further progress this research by (1) quantifying the response of plants, soil, leaf litter and macro-invertebrates to feral pig rooting; (2) assessing interactions between feral pig impacts and environmental variables; and (3) investigating spatiotemporal variations in the use of lowland rainforests for foraging by feral pigs.

The first two objectives will be achieved by comparing unfenced plots with fenced plots that have excluded feral pigs for a short- (2 year) and long- (14 year) period of time. Although the long-term plots are the same used by Dominique, more detailed measurements will be collected once in the wet season and once in the dry season. Enclosures for assessing the short-term recovery of rainforest were built in August 2007. Sampling of these plots commenced in August 2007 and will continue bimonthly for two-years, excluding the mid-wet season in February. Transects for investigating spatio-temporal variations in the use of lowland rainforests for foraging by feral pigs will be established in October 2007. Data from these plots will be collected bimonthly for one-year, excluding the mid-wet season in February.



Recovery of rainforest habitat with the 12 year exclusion of feral pigs (right side of fence). Note the greater proportion of young plants when pigs are excluded. Source: Dominique Taylor 2006.

Meet the Team

CSIRO: Iain Gordon

University of Queensland: Andrew Bengsen, Carla Meurk, Amanda Elledge (IACRC PhD Students); Luke Leung, Ian Russell

James Cook University: Brian Roberts, Miriam Goosem,

IACRC: Steve Lapidge

Wet tropics Management Authority: Ellen Weber

Aust. Wildlife Conservancy: Mick Blackman

Qld Parks & Wildlife Service: Tina Alderson

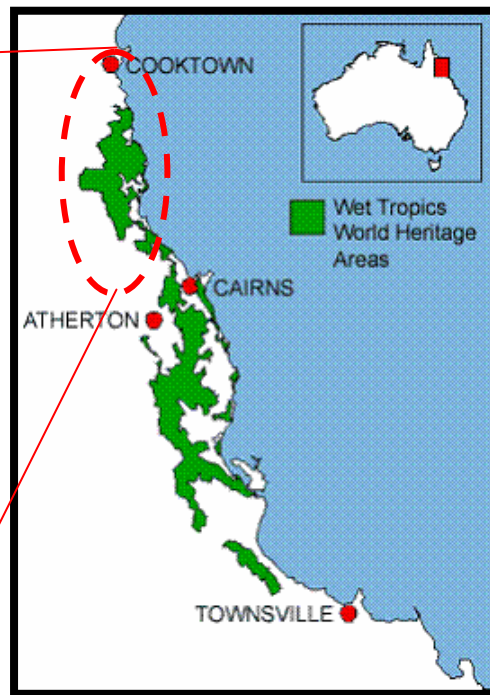
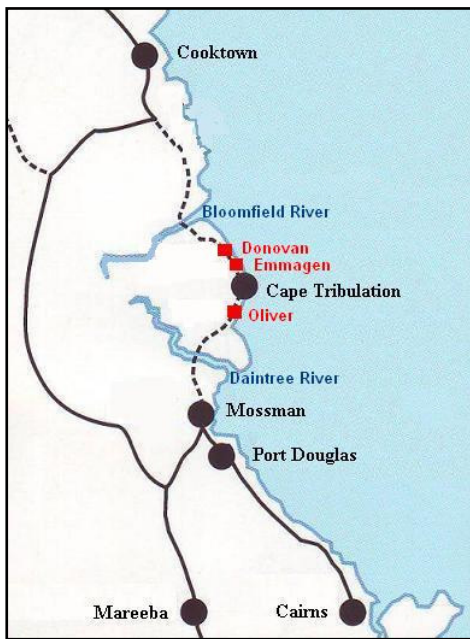
Douglas Shire Council: Peter Logan



Project Leader:
Iain Gordon

PhD students: Amanda Elledge, Carla Meurk & Andrew Bengsen





Left: Map showing the WTWHA and field locations for the project

Feral pig control—products & strategies

The rainforests of the WTWHA support a diverse vertebrate fauna, including many species which share similarities with feral pigs with respect to foraging behaviour and food selection. These species may thus be exposed to varying degrees of risk from traditional feral pig control methods such as poison baiting, which is not generally supported by the Wet Tropics Management Authority. Trapping is promoted as best practice management in this area. However, trapping can only achieve short term, localised control of pig damage not the rapid, large-scale reductions in pig population size required to reduce population growth rates and provide proactive pig control.

The main aim of this project is to overcome the limitations imposed on feral pig control programs in the Wet Tropics by the potential for accidental poisoning of non-target species, while optimising the efficacy of feral pig control products and strategies.

To date, a theoretical framework has been produced to guide the process of developing pig-specific pest control programs in complex faunal communities, in which feral pigs are difficult to isolate from non-target species. The framework breaks the process of interaction between animals and pest control activities into a number of components, providing a structure to aid the identification of exploitable differences between pigs and non-target species. Evaluation of the outcomes of this procedure is underway.

Fieldwork testing the ability of different bait compositions and presentation methods to reduce bait consumption by non-target species, which had been classified based on their food selection and foraging behaviour, has been completed. Preliminary results suggest that the classification process was largely successful in identifying methods to prevent or reduce bait consumption by a large proportion of resident non-target species. Future work will focus on reducing bait consumption by a smaller number of species which share a substantial degree of functional overlap with the feral pig, as well as identifying the most useful seasonal conditions in which to conduct effective and target-specific pig control activities.



Andrew Bengsen setting a camera to monitor animal activity at a bait station

Socio-economics of feral pig management

The focus of this research will be on the development and assessment of successful resource/conservation management strategies for the control of feral pigs in the Daintree rainforest, through an analysis of the social, economic and ecological processes which exist in this area.

Social issues: Carla Meurk (PhD, UQ St Lucia) is focusing on social aspects of the relationship between people and pigs in the Wet Tropics, and the consequences for management.

Social research driven by conservation managers is dominated by approaches that focus on improving understanding and/or adoption of management strategies. This is in spite of the continued failure of top down approaches to achieve successful long-term management outcomes. The ongoing debate over “best practice” feral pig management is just one example of this.

A critical analysis of “uptake” in conservation management discourse is being undertaken. This will focus on conflict between groups, particularly the resistance to current management by feral pig hunters. By examining current management structures and the multiple values of feral pigs, future management planning can begin to meaningfully incorporate social values alongside ecological imperatives and thus reduce resistance.

Economics: A contract with James Cook University will undertake economic analysis of the marginal benefits and costs of pig man-

agement.

The post is yet to be filled, however the study will focus on assessing the economic costs of pig damage to agriculture and conservation natural capital in the Wet Tropics, and then determine the economic costs of controlling pig numbers to ‘acceptable’ levels by different methods (e.g. trapping, baiting, hunting).



Invasive Animals Cooperative Research Centre

Together, create and apply solutions

www.invasiveanimals.com

Uptake of Products and Strategies

The Invasive Animals Cooperative Research Centre (IA CRC) was funded by the Commonwealth Government in the 2004 CRC Selection Round. The centre aims to counteract the impact of invasive animals through the development and application of new technologies and by integrating approaches across agencies and jurisdictions. The CRC is headquartered at the university of Canberra.

The Uptake of Products and Strategies Program facilitates national and international registrations, commercialisation, market research and delivery of IA CRC market ready products to industry partners. Demonstration sites also showcase new ways of looking at cross-tenure and cross-discipline pest animal control techniques. The Program Leader is Steve Lapidge and the Uptake office is based in Adelaide.