Frank Gigliotti

The Executive Officer
Environment, Natural Resources and Regional Development Committee
Parliament House, Spring Street,
EAST MELBOURNE VIC 3002

Dear Sir/Madam,

INQUIRY INTO THE CONTROL OF INVASIVE ANIMALS ON CROWN LAND

This submission addresses one of the key considerations highlighted within the Committee’s Terms of Reference - 3. assessment of the relative costs and benefits, financial or otherwise, of other forms of pest control in national parks.

The damage caused by invasive species to the natural environment and agricultural industry is a major continuing problem, and current control measures have limited impact. I am writing to inform you that there is a more cost-effective, target-specific and potent alternative that is in the final stages of development.

The Multi-dose Ejector is a poison delivery system capable of delivering multiple lethal doses in the field for several months without human intervention and can be deployed as permanent sentinel sites providing long term continuous protection against predator pests.

I would like to take this opportunity to introduce myself and provide some background information to my credentials.

As outlined in the attached curriculum vitae, my career has centred predominantly around vertebrate pest research in both the public and private sectors. As Senior Technical Officer with the Vertebrate Pest Research Unit (VPRU), Victorian Department of Primary Industries, I was directly involved in the development of PAPP (para-aminopropiophenone) as an alternative toxin for the control of European red fox and wild dogs. I was also instrumental in initiating research and development of the M-44 ejector, now marketed as the Canid Pest Ejector (CPE) by Animal Control Technologies (Australia) Pty. Ltd.

Having first-hand experience of the shortcomings of the CPE, and being aware of the needs of farmers and land managers across Australia, I continued the R&D into a Multi-dose Ejector (MDE) upon leaving the Department in 2006.

Issues with current best practise baiting include:

1. As highlighted by farmer, Robert Belcher in the recent ABC Landline story on the continuing impact of wild dogs on the sheep industry, “it is difficult to attract a dog to a small buried bait when there are lambs on the ground”. This is also relevant to fox control. The issue with current baiting practices is that it is more often than not carried out as a reaction and/or when resources, climatic conditions and money are available rather than targeting the animal’s behaviour and breeding cycle.

2. Current baits and the CPE are a single opportunity, requiring constant manpower to reset. The ‘attractant’ (a manufactured, reconstituted meat product or piece of meat) deteriorates in the environment reducing their longevity and effectiveness.
3. While aerial baiting deep within public land is considered by some to be the answer to the wild dog problem, I believe this strategy further exacerbates the problem and poses an increased risk to native non-target species. Dingoes naturally run in packs composed of an alpha male and female. As a pack they are able to hunt larger prey such as kangaroos and wallabies. Public land managers see this as a natural means of reducing overabundant macropod populations, thus the rationale of protecting ‘dingoes’ in National Parks. By aerial baiting these areas there is a high risk of killing the dominant alpha animals thus fragmenting the pack structure resulting in individual animals having to hunt independently and being forced to seek easier prey.

The R&D into a MDE was initiated in order to mitigate these issues and provide land managers with a tool, which would reduce resource costs and remain field active for prolonged periods of time without the need to re-bait. Due to its innovative design, once deployed the MDE is capable of delivering multiple doses of poison while the new polymer attractant bait remains viable. In addition, through the incorporation of the ‘pull force’ technology the MDE retains greater target specificity by limiting the number of species capable of triggering the device due to the physical strength required.

Their innovative design allows MDE’s to be deployed as permanent sentinel sites, capable of remaining field-active for several months. In light of this, it would then be possible to establish buffer zones, a corridor between public land and private land, to provide a permanent control line, preventing animals movement across public/private land. This approach would reduce the likelihood of destroying the pack structure, thereby allowing the pack to hunt larger prey within the park boundary, while providing a line of protection to control individual or juvenile animals from dispersing onto private land. Similarly it would reduce the movement of domestic dogs gone wild into national parks and thereby reducing hybridisation.

This project has progressed significantly since funding from Caring for our Country that demonstrated proof of concept, and has the support of Meat and Livestock Australia, which funded the project up until 2014. Unfortunately due to funding restraints and an internal restructure further funding for the project was not available. I have attached an information sheet below further explaining the components of the MDE.

Due to the on-going problem with predatory pests, I am writing to seek support for completing this innovative project, which would provide a significant advancement to current ‘best practice’ poison baiting techniques. An operational prototype of the MDE has been manufactured. Some further refinement of the polymer bait is required and industry partners need to be sought for the manufacture of the aerosol canisters required for the delivery system. With the support from industry, a field-ready unit could be available for field assessment within twelve months.

I would welcome an opportunity to discuss the benefits of the MDE technique while demonstrating the MDE device to you and your colleagues.

Kind regards,

FRANK GIGLIOTTI
Research Summary

The objective of the research being undertaken in Australia is to achieve a significant advancement in current ‘best practice’ poison baiting techniques for the control of predator species. The Chemical Dosage Dispenser, also referred to as the Multi-Dose Ejector (MDE), was conceived as a means of controlling predator pests in remote and regional areas where resources and accessibility are limited.

The MDE builds on previous research and technology, such as the USA M-44 Ejector, incorporating innovative new developments such as polymer engineering technologies, aerosol toxin delivery, target specific pull force and exclusion collars to protect non-target species, for the protection of both conservation and agricultural values.

The MDE provides:

- **Multi-dose capability:** The aerosol delivery system allows for > 20 metered doses of the chosen chemical without the need to ‘reload’ or interfere with the site for prolonged periods (> 2months). The delivery system allows the chemical to be delivered directly into the animals’ mouth in a more concentrated form, keeping the required dose mass to a minimum, increasing bioavailability, and protecting the chemical from environmental degradation.

- **A long-life polymer bait:** Polymer technologies have been used to provide a durable bait matrix able to accommodate multiple visitations by target animals. Impregnation of the polymer with a lure ensures the ‘bait’ retains an attractive scent for periods of up to 2 months without the continual need for bait replacement.

- **Greater target specificity:** The ‘exclusion’ collar, derived from (Nicholson and Gigliotti 2005) allows the device to be **deployed exclusively for fox control**. The collar excludes access to the ‘bait’ by larger species such as dingoes and native carnivores due to its morphologic design, while the ‘pull force’ requirement precludes activation of the MDE by smaller species able to ‘enter’ the collar. By using an alternate ‘open’ collar the MDE allows both foxes and wild dogs to access the bait, while still retaining greater target specificity through the incorporation of the pull force technology (Marks and Wilson 2005).

- **Low risk to non-target species:** Marks and Wilson (2005) found a statistically significant relationship exists between an animal’s body mass and the applied pull force it can exert. By exploiting the size difference between the target species and 31 identified bait consuming Australian native mammals, it was determined that 26 of the 31 mammals could be excluded from taking a bait if doing so required a specified minimum pull force.

The design of the MDE is such that, once the target animal is attracted to the bait and exerts a sufficient upward pulling force to trigger the delivery system, a metered dose of chemical is released directly into the mouth of the animal. The collar prevents the animal from grasping the bait with its carnassial teeth thereby ensuring that the line of trajectory is directly into the animal’s mouth. This mode of action ensures a lethal dose of toxin is delivered thereby potentially eliminating sub-lethal dosing and learnt aversion behaviour that occurs with current baiting practices. Having a fixed bait station precludes bait caching or removal. By establishing permanent baiting sites using the MDE, continual baiting activities can occur in otherwise seasonally inaccessible and/or remote areas. The use of a series of MDE stations can be used to provide buffer zones between public and private land. Bait stations remain active for periods of 1-2 months without any need for bait or chemical replacement. These MDE sentinel sites would provide long-term protection to livestock by reducing the dispersal of predators from public to private land.

The potential application of the ‘chemical dosage dispenser’ technology extends beyond the current focus of predator pest control in Australia. The unit has the potential to deliver a variety of chemicals. Around the world potential applications include rabies vaccine delivery, anti-fertility drug administration for population management of exotic and nuisance animals, and the delivery of sedatives to assist in relocation programs (i.e. such as with the reintroduction of the grey wolf), and monitoring the health of...
individuals/populations.

Components of the chemical dosage dispenser:
(from left to right)
1) Exclusion collar
2) Delivery mechanism with polymer bait
3) Ground deployment system / housing

Animal at bait station.

REFERENCES


Frank Gigliotti – Curriculum Vitae

Career Overview

I have spent the majority of my working career in wildlife research for both state and federal government agencies. Starting in 1979 with CSIRO Division of Wildlife Research in the Northern Territory and culminating in 13 years as Senior Technical Officer with the Department of Primary Industries Victoria (DPI), Vertebrate Pest Research Unit (VPRU). In 2006 I established my own consulting/contract business, General Dogs Body (GDB) – R&D Technical Services (ABN 35 643 705 189). This was initiated through an invitation from the Invasive Animal - Cooperative Research Centre (CRC) to continue the development of a carbon monoxide (CO) rabbit warren fumigation technique. This project has since been successfully completed and is currently awaiting final manufacturing implementation and registration through the Australian Pesticides and Veterinary Medicines Authority (APVMA). In 2008, the Federal Department of Agriculture, Fisheries and Forestry (DAFF) through Caring for our Country Landcare Open Grant, awarded GDB two funding grants for the:

i) Development of a multi-dose ejector for the control of wild dogs and foxes, and
ii) Improving the efficacy of hydrogen phosphide (PH3) fumigation for rabbit control.

Proof of concept in both projects was successfully achieved and in 2010 Meat and Livestock Australia Limited (MLA) agreed to further fund the Multi-dose Ejector Project. This project successfully produced a field efficacious prototype, however, in 2014 due to the economic climate and restructuring within MLA, further funding was not made available.

During my time as Senior Technical Officer with the VPRU I gained considerable hands-on experience in all facets of project management, from planning through to implementation, including securing funding, budget accounting, staff supervision, training and communications. Having had the privilege of working in a multidisciplinary research facility (the Keith Turnbull Research Institute, DPI), I also had the opportunity to develop skills and experience in a variety of other environmental disciplines such as invertebrate pest biological control, soil conservation and land management. In doing so, I have contributed to a number of peer-reviewed scientific papers and technical reports on a variety of environmental issues. A notable career highlight was in 2004 when I had the privilege of working in a collaborative, multinational research team undertaking toxin susceptibility trials at Kuopio University in Finland. This innovative project developed an alternative toxin for fox control, known as para-aminopropiophenone (PAPP).
Key personal achievements of particular note include:

- Achieving a level of biological control of *Sirex* wood wasp (*Sirex noctilio*) throughout south-eastern Australian soft wood plantations to allow plantation vigour to be maintained by integrated management practices.

- Research and development of the carbon monoxide rabbit warren fumigation technique as a humane alternative to chloropicrin.

- Research and development of a chemical dose dispenser (Multi-dose Ejector) for wildlife management.

**Capabilities**

- Project management including securing funding, budgeting, initiation, and delivery, with particular expertise in the technical development and assessment of animal control techniques.
- Team leadership, staff supervision and training.
- Understanding of the requirements and procedures involved with animal ethics and related codes of practice.
- Animal husbandry experience in care, handling, trapping and laboratory procedures, including the use of sedative drugs and euthanasia techniques.
- Land management activities including revegetation works, weed control and habitat enrichment as part of environmental rehabilitation for threatened species.
- Well-developed interpersonal skills and ability to effectively communicate both orally and in writing.
- Able to work independently or within a multidisciplinary team with strong OH&S ethics.
- Practical problem solving skills associated with project implementation and execution.
- Day to day use of computer packages – Microsoft Window applications.

**Education and Accreditations**

- Diploma of Environmental Biology from Darwin Institute of Technology (now Charles Darwin University).
- Monash University - Laboratory Animal Care and Use.
- Northern Melbourne Institute of TAFE – Cert. II Conservation land Management.
- Department of Environment and Primary Industries – Agricultural Chemical Users Permit-1080 and PAPP endorsed, Scientific Procedures Fieldwork Licence, Commercial Operators Licence.
- Department of Justice – Working with Children Permit.
- Department of Health – Drugs and Poisons Permit.
- Victorian Firearms Licence – Category A/B Longarms.
- Kangan Institute – Operate ride-on vehicles Certificate.
- Defensive driving course - Vehicle control.
- Intermediate 4 wheel drive awareness program.
- Level 2 Chainsaw operator certificate.
Interests

• Volunteer: Woodleigh School - Friends of Brian Henderson Wildlife Reserve
• Volunteer: Ellamead Dorper Sheep Stud (farm maintenance – fencing, building construction, general farmhand)
• Travel, experiencing different cultures
• Landscape design and construction/gardening

Referees

• Mr Michael Johnston (Ex VPRU colleague), Senior Project Officer
  Department of Parks and Wildlife - Western Australia
  Woodvale and Dirk Hartog Island

• Raelene M. Kwong, Biological Control of Weeds
  Invertebrate Sciences, Biosciences Research Division
  Department of Environment and Primary Industries
  Centre for AgriBioscience, La Trobe University, Victoria

• Dr Gary Simpson, Head of Science Faculty
  Director of the Brian Henderson Wildlife Reserve
  Woodleigh School – Woodleigh Campus

• Mr Mark Fenby, OUTFOXED Pest Control Aust.
Employment History

2006 – 2016
GDB R&D Technical Services

Major projects undertaken:

• **SUEZ Environmental (2008-ongoing).**
  Principal Investigator undertaking research and management projects –
  i) Control of silver gulls using Alphachloralose (Rentokil),
  ii) Management of a feral goat herd
  iii) Management of European red foxes and feral cats (in collaboration with OUTFOXED Pty Ltd), and
  iv) Rodent and nuisance birds control program

• **Meat and Livestock Australia Limited (2010 – 2013).**
  *Development of a Multi-dose Ejector (MDE) for Control of Predator Pests.* This project has been an extension of the work initiated under the Caring for our Country grant and has involved co-ordinating and collaborating with a range of organisations in order to develop and assess the various components, which go to make the MDE. The MDE incorporates innovative new developments such as polymer technologies, aerosol toxin delivery and, target specific pull force and exclusion collar designs for the protection of non-target species.

• **Department of Agriculture, Fisheries and Forestry (DAFF) Caring for our Country Landcare Open Grants (2008 – 2009).**
  i) *Development of multi-dose ejector for the control of foxes.* The objective of the research was to achieve a significant advance in current ‘best practice’ poison baiting techniques for the control of invasive predator species in remote and regional Australia through innovative design, for the protection of both conservation and agricultural values.
  ii) *Improving the efficacy of hydrogen phosphide (PH$_3$) fumigation for rabbit control.* The project investigated alternative methods of activating the PH$_3$ tablets to increase gas production and reduce the time to achieve lethal concentration.

For each of the projects above GDB was the Principal Investigator, responsible for all aspects of project management including funding, liaising and co-ordinating industry collaboration, subcontracting required expertise, and managing and conducting all experimental trials involved in achieving the project outcomes.

• **Invasive Animal Cooperative Research Centre (IA CRC) involvement in a number of research projects (2006 – 2016).**
  i) *Development of a carbon monoxide (CO) fumigation technique for the control of rabbit* (Project Consultant – responsible for efficacy trials, operator manual and training, 2006-2013). I have had ongoing involvement in the development of the CO fumigation technique since its conception by the Vertebrate Pest Research Unit and the lead up to commercialisation by the IA CRC.
  The Central Science Laboratory’s (CSL), Wildlife Management and Animal Welfare Team in York, England expressed an interest in the prototype and in
July 2006 I was invited to York to demonstrate and conduct efficacy trials for the control of burrowing mammals.

ii) Control of feral pigs using bait delivered sodium nitrate (Associate Investigator - conducting efficacy trials, 2007 - 2008). GDBs’ role was project coordination and operation of an OSM-3 Hemoximeter for measuring blood methaemoglobin concentrations in-order to establish the minimum lethal dose of sodium nitrite (SN) required within manufactured HOG-GONE® baits to effectively and humanely control feral pigs in wild populations.

iii) Development of bait delivered PAPP for the control of foxes (Associate Investigator - efficacy pen trials, 2008). GDB responsibilities included applications for experimental permits and the coordination and undertaking of lethal dose trials, including supply of experimental animals and staffing requirements.

iv) Assessment of the ‘grooming traps’ for fox and feral cat control (Principal Investigator-conducting efficacy pen trials, 2011-2013). This study investigates the efficacy of a novel automated devices, referred to as ‘grooming traps’ designed to deliver a lethal dose of PAPP or 1080 paste onto the fur of the target animal. The device relies on the animal’s fastidious grooming nature to facilitate intake of the toxin. GDB responsibilities included applications for experimental permits, the coordination and undertaking of lethal dose trials (including supply of experimental animals and staffing) and assessment of the utilisation of traps by foxes and cats, including the likely hood of self-dosing.

• Department of Sustainability and Environment, Victoria (2008-2013). ‘Development of the Curiosity® feral cat bait’ (Principal Investigator - efficacy pen trials with cats and foxes, and non-target susceptibility and field efficacy trials). GDB has had a continued association with the project as a member of the field research team and was responsible for the coordination and undertaking of various specific non-target trials.

• Nocturnal Wildlife Research Pty Ltd (2006). Compilation of an Adoption Strategy for the integration of lethal trap devices (LTD) (Principal Investigator) This involved a review of current State and Territory legislation regarding the use of foot hold traps, and the coordination of a national survey into the integration of LTD into government trapping programs in order to improve the humaneness of the practice. This required extensive communication with all levels of State and Federal Government, welfare organisations, commercial stakeholders and private and public land managers.

1993 – 2006
Senior Technical Officer, Vertebrate Pest Research Unit, Department of Primary Industries, Victoria.

The Unit aimed to develop innovative, humane, safe and effective techniques for the management of exotic and native vertebrate pests.

Duties:
• Project Leader, provide technical expertise and staff supervision including training of field staff and clients in the use of control technique.
• Project management, including preparation of funding applications to state and federal government agencies, undertaking and analysing field and pen trials and communicating results to department staff and project stakeholders including private and government agencies nationally and overseas.
• Firearms Coordinator for DPI-Frankston campus, responsible for maintenance of firearms and compliance with licensing and permits.
• Responsible for compliance with government agencies in regards to experimental permits (i.e. Animal Ethics Committee, Human Services, and APVMA).
• Safety Officer responsible for facilities and equipment maintenance with strong emphasis on OH&S.

Key Achievements
• Acting Head of the Vertebrate Pest Research Unit from July 2002 to November 2003 and from 2004 to 2005.
• Research and development of the carbon monoxide rabbit warren fumigation technique as a humane alternative to chloropicrin.
• Collaboration in multinational team investigating a potential alternative canid toxicant including experimental work at Kuopio University, Finland.
• Research, assessment and development of the mechanical ejector as an additional target specific baiting tool.

1989 – 1993
Technical Officer, Biological Control
Department of Conservation and Environment, Victoria.

Duties
• Responsible for rearing and distribution of biological control agents for the control of Sirex wood wasp (*Sirex noctilio*) to soft wood plantation managers throughout south-eastern Australia and Tasmania.
• Operation and maintenance of an insectary and quarantine facility.
• Development of rearing techniques and analysis of research data.
• Coordination of field operations including training and supervision of field based staff.
• Provide technical expertise to the National Sirex Coordination Sub-Committee

Key Achievements
• Achieving a level of control in Victorian plantation to allow plantation vigour to be maintained by integrated management practices.
• Developing the operations worksheets for incorporation into the National Sirex Control Strategy.

1985 – 1989
Technical Officer, Land Protection Division,
Department of Conservation Forests and Lands, Victoria.

Duties
• Data analysis using microBrian Remote Sensing Analysis System and preparation of maps and written reports.
• Field collection of ‘ground truthing’ data and liaison with Department staff and stakeholders to coordinate ground activities and maintain data base.
• Undertook land unit mapping including aerial photo interpretation and soil profile descriptions as part of a land capability survey team under the National Soil Conservation Program.
• Supervision of technical staff.

Key Achievement
• Contribution to published reports and responsible for the design, artwork and formatting of publications.

1980 – 1985
Technical Assistant/Officer,
Conservation Commission of the Northern Territory.

Duties
Land Resource Survey Section, Technical Officer
• Land unit mapping including aerial photo interpretation, and soil profile descriptions.
Alligator Rivers Region, Heavy Metal Monitoring team, Technical Assistant
• Technical support to the establishment and implementation of a monitoring program in the uranium province of the NT.
Soil Conservation Unit, Technical Assistant
• Provided response to public requests for soil conservation and rehabilitation works including construction of contour banks, stabilisation of slopes and erosion prevention.

Key Achievement
• Contribution to published reports and responsible for the design, artwork and formatting of publications.

1979
Technical Assistant, Division of Wildlife Research
CSIRO Darwin Branch, Northern Territory.

Duties
• Collection of biomass material on the sub-coastal flood plains of the South Alligator River as part of research team looking at the effects of water buffalo on the environment.
• Maintenance of field camp and laboratory equipment.
Publications

Peer Reviewed Papers


Marks, C.A., Gigliotti, F. and Busana, F. (2009) Assuring that 1080 toxicosis in the red fox (Vulpes vulpes) is humane. II. Analgesic drugs produce better welfare outcomes. Wildlife Research, 36, 98–105


**Technical reports**


Fisher, P.M., (1998) Rhodamine B as a marker for the assessment of non-toxic bait uptake by animals. *Vertebrate Pest Research Department, Report Series No. 4, Department of Natural Resources and Environment, 70pp. ISBN No. 0 7311 3192 4 (Frank Gigliotti contribution Sections 6.4 and 8.4)*


Reconnaissance Survey of the Middle Reaches of the Goulburn River Catchment. 


