FOX AND CAT CONTROL AND

THE ART OF WAR

R. Armstrong, Environmental Protection Branch

Introduction

Feral animal control is often perceived as a simple, straight forward task. There is a feral on a reserve, the feral is causing damage to reserve values, the objective is to stop the damage, the feral is controlled, damage stops, end of story. In small scale operations where a single species is controlled on a relatively small area that is owned or managed by one individual, this skirmishing approach is appropriate

However, feral animal control operations become far more complex when the target animal is to be controlled over very large areas (650,000ha for Operation Foxglove or 5.5 million ha for Western Shield) that are owned and managed by a variety of people. It is even more critical that the operation is executed professionally when the target area has thousands of concerned neighbours and is used every day by thousands of people for a multitude or purposes. In these situations, the feral animal control operation becomes a full scale war.

The art of warfare has been developed and refined since the dawn of humanity. One of its earliest commentators was General Sun Tzu of China in 400 BC.

Sun Tzu was a General of the Chinese Emperor's army. He made a study of the Art of War and recorded his philosophy on 13 chapters. His philosophy has been translated and studied by some of the greatest military minds in history including Napoleon and Mao Tse-tung. The principles of Sun Tzu have been applied to conflicts in war, business and politics over the intervening 2,400 years. These principles are equally applicable to the war against feral animals currently being waged in Western Australia.

"War is a matter of vital importance to the State; the province of life and death; the road to survival or ruin. It is mandatory that it be thoroughly studied."

Sun Tzu believed that the skilled strategist should be able to subdue the enemy's army without engaging it, to take his cities without laying siege to them and to overthrow his State without bloodying swords. The application to feral animal control is to be able control feral animals on the public estate without opposition from groups within the community or the political spectrum. In this perspective the enemy is not the fox or cat, but those voices in the community that would inhibit the implementation of control strategies.

In this situation, the primary objectives of control operations is not only to reduce the feral population but to:

- Win the hearts and minds of Governments, neighbours, users, managers and other interested parties before control operations begin. Constituents must be convinced and become overtly supportive of the need for the control operation,

- Get the best possible control result for every dollar invested in the operation,

- Achieve specified reduction in feral animal populations and/or an increase in native fauna populations as soon as possible. This achievement must be communicated to all the constituents affected by the operation.

To achieve feral animal control and before committing to the war it is necessary to appraise the campaign in terms of five fundamental elements:

- *The morality of the cause* and the confidence of the people in it.

- *The appropriateness of nature's season.* In relation to feral animal control this deals with the foreseeable problems of implementation.

- *The difficulties of the terrain.* Engage the enemy on favourable ground. Determine the size and difficulty of the task combined with the chance of success and the risk of failure.

- *Command.* Appoint a General with the managerial skills capable of carrying the day. Support him with a 'general staff' of appropriate specialists.

- *Doctrine.* Set the guidelines, decision pathways and responsibilities to execute the campaign. Once determined let the General do his job without interference.

Bureaucracy

"Those skilled in war cultivate the Tao and preserve the laws and are therefore able to formulate victorious policies".

The Tao is the way of humanity and justice. 'Laws' are regulations and institutions. Those who are successful in war are themselves humane and just and maintain the laws and institutions of their State. By these means they make their government invincible.

There are many laws and institutions associated with feral animal control. Primarily concerned with the responsible use of toxic substances such as 1080 and the safety of the public and those using it. There are also rules and institutions associated with the organisation undertaking the control work that have to be complied with.

Humanity is a very important component of success in feral animal control. The method of control must be demonstrably the most effective and humane means of achieving the control objective. It must also be safe for non-target organisms. Inflicting unnecessary pain and injury on feral or non-target animals will not be tolerated by Australian citizens. Any hint of a callous attitude to the welfare of target or non-target animals will be rightfully condemned.

External

Pesticide Regulations under the Health Act are the primary legislative requirements that have to be conformed with. Under these regulations all personnel handling 1080 bait products require training and certification by Agriculture WA. All bait formulations used must be registered by the National Registration Authority and be approved for use in WA by the Health Department on the advice of the Pesticides Advisory Committee. Notification of neighbours is also required by these regulations.

Because feral animal control operations cover such vast areas that are abutted by literally tens of thousands of neighbours, notification has been achieved by advertisement in the print media. This form of notification is a dispensation granted by the Executive Director of Public Health and has been granted pending the honouring of certain commitments made by CALM. Small scale baiting operations where the individual notification of each neighbour is possible are required to notify each neighbour in writing. In addition to notification of neighbours, the baited areas must be sign posted with warning signs to notify the public that toxic baits have been layed.

Agriculture WA (formerly the Agriculture Protection Board) are responsible for ensuring that these regulations are complied with. AgWA has formulated procedures that must be complied with in any baiting operation. These requirements are set out in '1080 Operational Procedures Manual for Staff' that is presented to all personnel completing the 1080 training course.

show APB 1080 Manual

Internal

CALM has formulated a Fox Control Manual which sets out procedures that must be complied with when undertaking fox baiting operations on CALM managed estate. As a minimum, this manual incorporates the requirements of AgWA. These procedures include the preparation of baiting proposals for approval, the need for fauna surveys, operational guidelines and job prescriptions, requirements for bait free buffers around private property, public access and recreation sites, specifications for signage and advertising and financial management of operations.

show CALM fox Manual

Conforming to the requirements set out in this manual will ensure that fox control operations are professionally executed and that the Department and its fauna conservation objectives are protected from criticism.

Public relations

Current technology for the broadscale control of foxes and cats is limited to the use of toxins delivered to the target animal in some form of bait. In Western Australia the toxin of choice is sodium fluoroacetate (1080). It is colourless, odourless and very difficult to detect by the target animals. It is water soluble and is quickly detoxified by micro-organisms. The evolutionary tolerance of many of Western Australia's native animals to this toxin makes it very target specific. Because 1080 occurs naturally in the Western Australia genus of *Gastrolobium*, it is more acceptable to the public than alternative manufactured toxins that are less target specific and more persistent. Unfortunately 1080 has been used widely in other countries, particularly the USA and New Zealand, where non-target animals lack tolerance and its use has resulted in significant controversy and opposition from the public.

Any baiting program on public land must accept the very real risk of domestic dog mortality. Domestic or working dogs from neighbouring properties that are allowed to stray or dogs taken into the baited area by the public incur a very high risk of fatal bait ingestion.

Cognisant of this risk, it is essential that public relations programs build a broad base of support in the community for the nature conservation objectives of the program. This support is necessary to offset the inevitable negative response resulting from dog deaths. Community support must be in place before the program is initiated and maintained throughout the life of the operation.

"For to win one hundred victories in one hundred battles is not the acme of skill. To subdue the enemy without fighting is the acme of skill".

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"Thus a victorious army wins its victories before seeking battle; an army destined to defeat fights in the hope of winning".

There are several critical steps in building public awareness and support for feral animal control programs:

- **Identify the audiences:** There will be a variety of audiences to be addressed. These audiences may consist of (but not limited to) industry or recreational groups that regularly use the target area, immediate neighbours, conservation groups, local Government (councillors and staff), State Government politicians - particularly local members, groups concerned with animal ethics, veterinarians, the travelling public and personnel within your own organisation.

o/H - 5 headings)

- **What is the message/s:** Each target audience will require a slightly different message depending on their perceptions of the values that may be affected. It is important that their concerns are met with appropriate information. Identify the issues that are most likely to cause concern to each audience group and ensure they are addressed.

  Emphasise that there is a broad base of community support for the operation and that many positive results will accrue as a result of the program such as fauna recovery, ecotourism opportunities and increased agricultural production.

However, it is essential that the messages put out to the public do not conflict, that they are honest and unambiguous. People get nervous and "anti" when they are uncertain or think that something is being hidden.

The message should concentrate on the positive outcomes of the control program such as fauna conservation etc and not on the means of achieving it (poisoning animals or the toxin to be used).

- **How do I deliver the message/s to each audience:** There are many different tactics that can be used to relate the message. Ensure the most appropriate vector/s is applied to each audience. Examples of message vectors are radio and TV exposure, popular press articles, advertisements in the print media (local and State), a note in the school newsletter, a letter box drop, an information pamphlet in the shire rates notice, pamphlets at CALM offices, signage in the field, public meetings, Land Conservation District meetings and newsletters, personal contacts etc. The most appropriate tactic or combination of tactics will depend on the target audience.

  It is also very useful to cultivate local spokespersons that are not aligned with the organisation undertaking the control program. Prominent community leaders, independent of CALM, are very powerful and effective lobbyists in their local communities.

- **How do I know if they heard me?:** Because the success or failure of the program will depend on a positive public perception it is essential to determine the effectiveness of the public relations exercise. This can be achieved in several ways.

  Records should be kept of public enquiries about the program and the tone and tenor of the inquiry (for or against and reasons why). A variety of survey techniques can be applied to target audiences ranging from professional marketing surveys and poles to semi-formal questionnaires of user groups. Simple statistics on the number, timing and location of dog deaths is a basic and simple indication of the effectiveness of the public relations exercise in changing the behaviour of people visiting the target area.

Operation Foxglove is centred on a public relations strategy that utilises advertising in local and State newspapers before each baiting, facilitating print and electronic media contacts on a regular basis to keep the public informed of progress, sign posting the boundary of the baited area and popular use areas within the target area and supplying information pamphlets and maps of the target areas in CALM offices. Operations that are on a much smaller scale should inform neighbours by mail that baiting is taking place in addition to the measures stated previously.

Dealing with the media for popular press articles and advertising is best done by a professional with media liaison skills. Corporate Relations Division is the CALM repository for this expertise. However, personal contacts by local officers with local media should be cultivated as a very effective means of communicating with local communities.

Planning

"Now if the estimates made in the temple before hostilities indicate victory it is because calculations show one's strength to be superior to that of his enemy; if they indicate defeat, it is because calculations show that one is inferior. With many calculations, one can win; with few one cannot. How much less chance has one who makes none at all! By this means I examine the situation and the outcome will be clearly apparent".

The need for detailed planning for the execution of large scale feral animal control programs cannot be understated. The huge areas involved, the intricate logistics and timing, the number of constituencies affected by the operations and the resources that need to be allocated demand that the chance of failure be eliminated.

Where to bait

One of the most fundamental questions to feral animal control is "where do I expend my limited resources to ensure the maximum gain?" The nature conservation objectives of CALM address the protection of existing fauna and the re-introduction of fauna that has become locally extinct. This forms the basis for prioritising fox and cat control operations.

Western Shield critically reviewed the known distribution of extant fauna that is under threat from feral predators. These areas were given first priority for funds for predator control. Second priority was given to those areas that did not have known populations of threatened fauna but were considered to be suitable for reintroduction of native fauna if feral predators could be controlled. These two categories of land were further divided by identifying those areas where cats were likely to be a problem if foxes were controlled. This correlates roughly with areas receiving less than 350mm of rainfall. Feral predators in these areas will not be controlled until a feasible means of broadscale cat control is developed.

The effectiveness of baiting operations, particularly on smaller reserves can be vastly increased if community fox baiting on adjacent agricultural land takes place in sympathy with baiting undertaken by CALM. To date there are several instances where this type of activity is taking place eg Boyanup, Corackerup Boddington and Stirling Range. These community based operations will be actively encouraged by CALM.

Aircraft

Because of the scale of operations most fox control operations are undertaken by delivering baits from aircraft. Baiting targets greater than 20,000 ha are more efficiently baited from the air. Smaller reserves or reserves with complex boundaries are more efficiently baited by ground application from a vehicle using existing access.

Baiting operations require low level flying at between 500 - 1000ft at airspeeds between 100 - 180 knots. Engine failure at these altitudes can only result in severe

damage, injury and probably death to the flight crew. For this reason all aerial baiting operations undertaken by CALM utilise a twin engine aircraft.

Flight lines are one kilometre apart and a bait is dropped at 200m intervals along the flight line. This equates to 5 baits to the square kilometre or one bait every 20 ha. Because of the poor aerodynamics of dried meat baits they flutter to the ground when exiting the plane with very little forward carry. The maximum foreword carry observed in trials of a bait dropped from 500 ft at 100 knots in almost windless conditions ranged between 2m and 77m with no bait being more than 25m from the centre of the flight line.

Navigation is controlled by a Global Positioning System (GPS) utilising satellite navigational technology. The system is able to determine and record the location of the aircraft and every bait that leaves the plane. The specification of the GPS allow the GPS coordinate to be within 200 metres of the true position of the plane in 99% of instances. This information led to the application of bait free buffers of a nominal 1 km against private property and 500m surrounding established recreation sites and 200m from major public roads.

Co-ordinates for baiting target boundaries and flight lines are loaded into the navigation system before taking to the air. The pilot is guided along the flight line by a deviation indicator mounted on the plane's dashboard in front of him.. The indicator consists of a line of light emitting diodes (LED) lights. When the pilot is on track the LED lights in the middle of the bar. Every ten metres deviated from the line left or right lights up an additional LED in the direction of the deviation (left or right). As long as the pilot keeps the LED indicator centred the plane will be on track.

The GPS calculates the position of the plane in flight and indicates to the bombardier when 200m has been travelled since the last bait was dropped. The interval calculation is independent of airspeed. Aircraft position and bait drop location are recorded and can be down loaded into a GIS data base for plotting after flight missions.

Flight time endurance of the aircraft usually exceeds the endurance of the bombardier. Five hours per baiting sortie is the maximum that should be attempted due to bombardier fatigue.

The cargo capacity of the plane is approximately 2,500 baits which is enough to cover 50,000 ha and can be distributed in about 4 hours.

Before an aircraft can be utilised for baiting it requires a hole in the floor of the aircraft with a chute attached capable of delivering a bait. Any modification to an aircraft requires engineering drawings to be produced and approved by the Civil Aviation Safety Authority (CASA). In addition, the pilot of the plane requires a low level endorsement on his licence and a dispensation from CASA to drop objects from the aircraft in flight.

Aircraft costs are determined by flying hours, hiring with or without fuel and a component for pilot accommodation and other expenses. Minimising costs is achieved by flying as fast as possible whilst baiting and minimising ferry times

between targets. This requires efficient sequencing of targets and strategically located airstrips. It also requires a close communication between the aviation contractor, the program coordinator, the pilot and the aircrew. Pre-operational training of all involved is essential to the smooth running of the operation.

Baits

Baits used in WA for fox control are dried meat baits injected with 4.5 mg of 1080. Baits can be produced in the field but quality control is difficult and bacterial contamination, blowfly strike and uneven drying can cause baits to be less effective and more noxious to handle. AgWA produces a very high quality meat bait in it's bait factory under sterile conditions using kangaroo meat dried in dehumidified kilns. These baits can be stored for extended periods when frozen.

Experimentation is currently under way with a bait designed for cat control. The bait is a small kangaroo meat sausage injected with 4.5 mg of 1080. This bait is still in the experimental stage and is currently registered under a trial permit with the NRA. The conditions of the trial permit do not allow for its wide scale use.

Baits are laid in the field at a rate of 5/km^2. This intensity of baiting has proven effective on large scale baiting operations. Smaller reserves that are surrounded by unbaited agricultural land may require as many as 10/km^2 to be effective against the large number of foxes impacting on the reserve. Ground baiting should place a bait every 200m along the baiting transect. This minimises the chance of one fox taking several baits by following the bait transect. Dragging a lure along the bait transect is counter productive as it increases the chance of one fox taking several baits and denying those baits to other foxes in the area.

The total quantity of baits required each year should be determined and an order placed as early as possible. This allows the bait factory to schedule its production throughout the year to meet seasonal bait demands.

CALM's annual bait demand is currently in the order of 180,000 baits per annum. The production capacity of the bait factory is currently 240,00 baits per annum. Western Shield will increase the CALM bait demand to 680,000 baits per annum. Bait production capacity in WA will have to be increased by nearly 300% to meet this demand alone. The demand for baits from the agricultural sector is also increasing. CALM is investigating the feasibility of producing it's own bait requirements to address this imbalance.

Bait transport and storage is also a critical logistical concern. Baits must be transported and stored in appropriated sign posted and secure containers under the Pesticide Regulations and CALM procedural guidelines. The current practice is to transport baits in insulated bait boxes capable of carrying 5,000 baits. Baits are stored at strategic centres in 7m^3 freezers capable of holding 5,000 baits each.

With increasing quantities of baits being required, transport and storage capacity will be increased. It is proposed to store baits centrally in a bulk freezer and deliver them to operational centres as required at the time of baiting. Transport of greater than

1000kg of bait will require the vehicle and driver to be licensed under the Dangerous Goods Act.

The Pesticides Regulations require that every bait manufactured and distributed be accounted for. This requires keeping detailed records of bait movements and a written record of the chain of custody of all bait products. Baits coming into the possession of a certified bait handler become his personal responsibility. Delivery of baits must be recorded through 1080 Bait Registers held by operational centres involved in baiting. Transfers between centres is recorded in the Bait Register and supported by a 1080 Issue and Receipt Voucher.

Only personnel that have successfully completed the AgWA 1080 training course and have been field certified for a particular bait product can take custody and use that product. The availability of skilled and trained operators at operational centres is fundamental to the success of feral animal control programs.

On ground management

"Generally, management of many is the same as management of few. It is a matter of organisation".

Management of a large feral animal control program is best managed by a central hub of command supported by specialists and sub-commanders responsible for specialist functions or areas of operation. Each must know his responsibility, the tasks to be undertaken and the limitations to his authority.

Organisational philosophy and structure for fox control operations under Operation Foxglove is based on a central command and coordination function allocated to Environmental Protection Branch. This hub is supported by:

- Personnel from Districts and Regions that are responsible for executing the control operations such as aerial and ground baiting, bait collection ,transport and storage; sign erection and maintenance, community and neighbour liaison and data collection for fauna population monitoring
- Ecologists from Science and Information Division that supply information on baiting strategies, fox and cat biology and fauna population dynamics,
- Media and community liaison specialist from Corporate Relations Division,
- Specialist mapping products from Land Information Branch
- CALM*fire* specialists with knowledge on aircraft operations and logistics
- Specialists from Agriculture WA that supply advice on non-target toxin tolerances and bait delivery, make bait products and investigate new bait manufacturing processes and formulations,.

Western Shield will become the umbrella organisation for all operational predator control carried out on the CALM estate. A Western Shield feral predator control unit will be set up and tasked with the execution of operational predator control and associated fauna monitoring. The unit will be overseen by a Steering committee consisting of the Executive Director and the Directors of Nature Conservation, Science and Information and Regional Services. The unit will consist of Roger Armstrong from Environmental Protection Branch and Peter Mawson from Wildlife Branch supported by a zoologist. The unit will be centrally funded and function as a "business unit" to coordinate feral predator control. Logistic and specialist support will be contracted from Districts, Regions and SID to ensure effective operations are undertaken and that CALM's objectives are met in the long term.

"To control many is the same as to control few. This is a matter of formations and signals". o/H 8

To ensure that the spokes of the organisation support the hub and vice versa depends on clear and unambiguous communications between all involved in the program.

This is only achieved by clearly defined roles and responsibilities and effective reporting and communication channels. Communications must necessarily be formal and informal. Formal communication to record instructions and reports of activities and progress and informal communication to respond quickly to changes in circumstance throughout the execution of operations.

The communication structures and operational responsibilities will be clarified over the next few months to enable coordinated, large scale predator control programs to become operational in the 1996/97 financial year.

By the turn of the century (4 years) CALM is endeavouring to be well on the way to turning back the clock by 60 years. To those times when native fauna were a common sight in the reserves and forests of WA. With the enthusiasm and dedication of people right across CALM and the community that supports us, we will succeed.

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- ***The appropriateness of nature's season***
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- ***Command.***
- ***Doctrine.***

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