Title of Proposal - Field efficacy trail of the Hisstory bait for feral cats, at Yampi Sound Defence Training Area, Kimberley

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Science and Research

1.2 Provide a detailed description of the proposed action, including all proposed activities.

Field efficacy testing of the Hisstory bait; a 1080 (sodium monofluoroacetate) variant on Curiosity bait on feral cats in the Kimberley, Western Australia, including both the assessment of efficacy on feral cats and of non-target species impacts. In particular, the project will monitor Dasyurus hallucatus (northern quoll) to ensure that the finding from captive studies of minimal risk to the northern quoll from Hisstory baiting is applicable in a field situation. The development of a humane, target-specific broad-scale control technique for feral cats is identified as necessary in the Threat Abatement Plan for Predation by Feral Cats. The Hisstory bait is intended to provide an effective, target-specific, broad-scale bait for feral cats to be used in northern Australia. In addition, this work has been recognised as a potential way of minimising risk to northern quoll by the Australian Pesticides and Veterinary Medicines Authority from Eradicat baiting by the Western Australian Department of Parks and Wildlife.
Background
Feral cats are widespread across Australia and threaten the survival of many small to medium sized native species at low population densities. They have been identified as a major obstacle to the reconstruction of faunal communities and the successful re-introduction of native species to parts of their former range. While feral cat densities are often low (i.e. 1 cat every 1-4 square kilometres), individual cats can make significant impacts on prey populations. For example, an adult male cat must consume 5% to 8% of its body weight in prey per day, while females raising kittens require 20%. An estimate of the 375 feral cats on Macquarie Island prior to their eradication estimated they consumed 56,000 rabbits and 58,000 sea-birds per year. A review of papers on feral cat diets across Australia found 400 vertebrate species that feral cats feed on or kill in Australia (Doherty et al 2015). The Threat abatement plan (2015) has two actions of ensuring toxic baits targeting feral cats are registered and available for use across all of Australia, and have a broad-scale toxic bait available for northern Australia to complement other toxic baits. The Australian, Victorian and Western Australian governments have collaborated to develop the humane poison bait, called Curiosity Feral Cat bait, a bait that is suitable for use in southern and central Australia. A modification of this bait – using the 1080 toxin - has been developed that we believe will be suitable for use in northern Australia. This is called Hisstory.

At present there are no effective options for broad-scale control of feral cats for north, central and eastern Australia. In Western Australia the Eradicat bait has been registered for the broad-scale control of feral cats use but the Department of Parks and Wildlife holds a concern about

the use of this bait in areas where northern quoll (Dasyurus hallucatus) are present. This bait is directly injected with the toxin 1080 which could be accessed by the northern quolls.

An alternative is a variation on the Curiosity bait developed by the Department of the Environment. The Curiosity bait is a small meat sausage containing a plastic pellet that encapsulates a toxin. The pellet is reliably rejected as a 'stone' by native animals, including northern quoll, northern brown bandicoot and black-footed tree rat, but not by cats (Gigliotti, 2011).

The Curiosity bait contains the toxin para-aminopropiophenone (PAPP), to which many native species are tolerant. However, there are certain wildlife species that are highly susceptible to PAPP toxin, such as varanids. This potential hazard is managed in southern Australia by baiting in cooler months when reptiles are in torpor. This practice is not transferable to the tropics where reptiles are typically active all year round. A simple modification to the Curiosity bait (a changed toxin) should allow land managers to undertake large-scale baiting programs without impacting native species populations in these northern regions. This proposal seeks to undertake a field trial in the Kimberley of the Hisstory bait, i.e. Curiosity containing the toxin sodium monofluoroacetate (1080) rather than PAPP as the toxin. It is expected that the combination of the encapsulated toxicant delivery and the 1080 poison will prove to be an effective control technique for feral cats while protecting northern quolls, reptiles and other non-target species. Appropriate testing has been conducted in captive situations (Robinson, 2010) and now field efficacy testing is required.

Methodology
Research conducted by the Department of Parks and Wildlife WA (DPaW) (e.g. Algar and Burrows (2004)) has shown that it is possible to effectively control feral cats in Western Australia when the abundance and activity of prey for feral cats is at its lowest, and bait degradation due to rainfall, ants and hot, dry weather is significantly reduced. Hence it is proposed to undertake the field drop of the Hisstory bait towards the end of the dry season in the Kimberley in September 2017. Baiting with the Hisstory bait will be conducted under an Australian Pesticides and Veterinary Medicines Authority (APVMA) permit to allow research use and supply of an unregistered agricultural and veterinary chemical product. The baiting will be conducted from a dedicated baiting aircraft which will deploy the baits at previously designated bait drop points. A baiting intensity of 50 baits per km2 will be used over an area of up to 200km2. It is proposed to use the baiting aircraft contracted by DPaW and follow the DPaW Protocol for Deployment of Cat Baits. The baiting will be overseen by 1080-toxin accredited DPaW staff and this will include transportation, on-site preparation and baiting operation. Two baiting cells will be used, one with toxic baits and one with non-toxic baits over an area where dingoes (a non-target species that could be affected by toxic baiting) are likely to be present.

Surveys will be conducted to assess the effect of baiting on the feral cat population and non-target species potentially at risk from consuming baits. Feral cats will be trapped in the non-toxic bait cell using soft-catch leg-hold traps approximately 3-4 weeks post-baiting and whisker samples taken for analysis of bait consumption. The potential efficacy of the product will be determined through measuring bait consumption by feral cats. The baits will contain a marker dye that indicates bait consumption by the presence of fluorescence in the feral cat’s whiskers. Dingos may also be captured with the leg-hold traps and those that do will also be sampled for

bait consumption.

Northern quolls: Prior to baiting, in August 2017, up to twenty quolls will be trapped the toxic baiting cell and fitted with either GPS data-logger radio collars or VHF radio collars depending on the size of the animal and collars available. The quolls will be tracked before and after the baiting. If any quoll is found dead, the cause of mortality will be determined if possible through the marker dye and other indicators. Additional monitoring for northern quoll will be done employing remote cameras set up with a lure to attract animals close. Up to 60 cameras will be used in the site that will monitor northern quoll and other species attracted by the lures. Monitoring will take place prior to baiting and following baiting in September 2017 to obtain a relative change in occupancy.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Area	Point	Latitude	Longitude
YSDTA	1	-16.446042647305	123.69345292411
YSDTA	2	-16.449993922843	123.87472733818
YSDTA	3	-16.517153283347	123.87884721122
YSDTA	4	-16.513203377879	123.92553910575
YSDTA	5	-16.449993922843	123.92279252372
YSDTA	6	-16.45131099681	124.05874833427
YSDTA	7	-16.41311222464	124.05188187919
YSDTA	8	-16.409160199014	124.20981034599
YSDTA	9	-16.41311222464	124.32654008232
YSDTA	10	-16.439457009332	124.33065995536
YSDTA	11	-16.448676839935	124.24551591239
YSDTA	12	-16.467115186915	124.24139603935
YSDTA	13	-16.449993922843	124.39108476005
YSDTA	14	-16.50793671168	124.41168412529
YSDTA	15	-16.534268607083	124.36224564872
YSDTA	16	-16.592186125882	124.39383134208
YSDTA	17	-16.589553889317	124.44052323661
YSDTA	18	-16.535585107604	124.4830952581
YSDTA	19	-16.50793671168	124.48034867607
YSDTA	20	-16.501353177168	124.69046220146
YSDTA	21	-16.901221707888	124.70007523857
YSDTA	22	-16.897279741731	124.19195756279
YSDTA	23	-16.957714159247	124.18234452568
YSDTA	24	-16.949832509788	123.96536454521
YSDTA	25	-16.838140372421	123.96948441825
YSDTA	26	-16.828939252617	123.9118061956
YSDTA	27	-16.861798340935	123.83215531669
YSDTA	28	-16.64613902771	123.58221635185
YSDTA	29	-16.446042647305	123.69345292411

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).

Yampi Sound Training Area consists of 566,000ha, 35km south of Koolan Island on Yampi Sound, and 65 km north north east of Derby (130 km northwest of Derby by road), Western Australia. Formerly comprising Kimbolton and Oobagooma Stations, it was acquired by Defence in 1978 for use as a training area.

The Yampi Sound Defence Training Area represents an area of transition from the sandstone plateau of the north-west Kimberley, to the broad plains and pindan scrub of the south-west Kimberley (SKM, 2009). The geomorphology of the area is highly variable, with the area that will be subject to the proposed action being dominated by broken quartzite hills, plains and hills of red clay rich soils, red pindan sands and blacksoil plains (Barrett et al 2001 in SKM, 2009).

A survey of the area in 2008 (SKM, 2009) identified 191 indigenous vertebrate species, comprising 9 amphibians, 49 reptiles, 109 birds, and 25 mammals including 6 bat species. Five introduced vertebrate species were also recorded.

SKM (2009) provide vegetation summaries for eight different vegetation types generally ranging from open woodland with Corymbia and Eucalyptus species to sparse shrubland and low open woodland dominated by Bauhinia, Eucalyptus and Heteropgon species. There are also patches of closed forest/vine thickets.

Rainfall statistics at Deby (~70 km south) has a mean of 690 mm per year with a summer rainfall pattern peaking between December and March.

1.6 What is the size of the development footprint or work area?

20,000 ha

1.7 Is the proposed action a street address or lot?

Street Address

Yampi Sound Defence Training Are
Derby WA 6728
Australia

1.8 Primary Jurisdiction.

Western Australia

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

Yes

1.9.1 Please provide details.

Trialling a new feral cat bait in the Kimberley—WA

A new hybrid feral cat bait, Curiosity® 1080, has been developed to reduce impacts on northern quolls and will be trialled in the Kimberley region. The trial will determine how effective the hybrid bait is in controlling feral cats and check for any impacts on non-target species. It will use remote cameras as well as collared feral cats and northern quolls to monitor results. Local Indigenous rangers will also be trained in feral cat management and monitoring techniques. The project will help the endangered woylie and the vulnerable black-flanked rock-wallaby, western ringtail possum and numbat.

Funding

$250 000

Partner

WA Government

1.10 Is the proposed action subject to local government planning approval?

No

1.11 Provide an estimated start and estimated end date for the proposed action.

Start date 08/2017

End date 09/2017

1.12 Provide details of the context, planning framework and State and/or Local government requirements.

Policy framework:

The Commonwealth Threat Abatement Plan for Predation by Feral Cats (2015) identifies the action to ‘have a broad-scale toxic bait available for northern Australia to complement other toxic baits’. A project has been run by the Commonwealth Department of the Environment since 1996 to undertake this action. As described in Action 2.1, the Department in association with Western Australia has developed the Hisstory bait that we believe will be suitable for use in northern Australia.

Commonwealth registration of the product: In order to register the bait with the Australian Pesticides and Veterinary Medicines Authority pen and field efficacy trials on feral cats and any possible non-target species are required. Pen data has been obtained. This proposed action is to gather field efficacy data.

Policy framework:

The Commonwealth Threat Abatement Plan for Predation by Feral Cats (2015) identifies the action to 'have a broad-scale toxic bait available for northern Australia to complement other toxic baits'. A project has been run by the Commonwealth Department of the Environment since 1996 to undertake this action. As described in Action 2.1, the Department in association with Western Australia has developed the Hisstory bait that we believe will be suitable for use in northern Australia.

Commonwealth registration of the product: In order to register the bait with the Australian Pesticides and Veterinary Medicines Authority pen and field efficacy trials on feral cats and any possible non-target species are required. Pen data has been obtained. This proposed action is to gather field efficacy data.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders.

Neighbouring landholders will be notified of the project as per conventional procedures for aerial baiting with 1080 dosed baits.

Signs will be placed at the boundaries of the baited area as required for 1080 baiting to alert the public.

The Dambimangari Aboriginal Corporation are being consulted.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

The application for a research permit with the Australian Pesticides and Veterinary Medicines Authority requires the submission of a dossier on the potential environmental impacts. In brief, this requires for an adequate assessment to be made about the potential environmental impact of the active constituent and related products: the expected volume of use; the expected exposure, behaviour and fate of the active constituent(s) when the agricultural chemical product is used as proposed; and the potential harmful effects on birds, mammals, aquatic life (fish, invertebrates, algae and higher plants), terrestrial invertebrates (honeybees and other non-

target arthropods, earthworms), soil microbial processes, and non-target terrestrial plants. This information is important in establishing whether the risk to any of these organisms posed by the proposed use of the product may be considered unacceptable or whether there are other concerns due to the behaviour of the substance in the environment.

Further detail on data requirements is available on the APVMA website at: https://apvma.gov.au/node/805.

A decision on this application is anticipated in early July 2017.

1.15 Is this action part of a staged development (or a component of a larger project)?

No

1.16 Is the proposed action related to other actions or proposals in the region?

No

Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

2.1 Is the proposed action likely to impact on the values of any World Heritage properties?

No

2.2 Is the proposed action likely to impact on the values of any National Heritage places?

No

2.3 Is the proposed action likely to impact on the ecological character of a Ramsar wetland?

No

2.4 Is the proposed action likely to impact on the members of any listed threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat?

No

2.5 Is the proposed action likely to impact on the members of any listed migratory species, or their habitat?

No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

No

2.7 Is the proposed action likely to impact on any part of the environment in the Commonwealth land?

No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No

2.9 Will there be any impact on a water resource related to coal / gas / mining?

No

2.10 Is the proposed action a nuclear action?

No

2.11 Is the proposed action to be taken by the Commonwealth agency?

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No

2.13 Is the proposed action likely to impact on any part of the environment in the Commonwealth marine area?

No

Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

Yampi Sound Defence Training Area has a number of habitat types. A flora and fauna survey in the dry season of 2008 (SKM, 2009 - attached) surveyed eight sites to represent a variety of land systems across the area. These habitat types selected were rainforest pockets; grasslands, littoral zones, blacksoil plains, sandstone woodland communities, granite outcrops, fire protected sandstone communities, and isolated topographic high points on King Leopold Range. The fauna survey identified a total of 191 indigenous vertebrate species, including 16 incidental species records observed whilst travelling between sites. This comprised 9 Amphibians, 49 Reptiles, 109 Birds and 25 Mammals including 6 bat species. An additional five introduced fauna species were recorded at YSTA including cattle, donkey, horse, pig and dingo. A total of 8 species of national conservation significance were identified, each of which are listed under the Commonwealth Environmental Protection and Biodiversity Conservation (EPBC) Act 1999. These species are the Northern Quoll Dasyurus hallucatus, Golden-backed Tree-rat Mesembriomys macrurus, Golden Bandicoot Isoodon auratus, Freshwater Crocodile Crocodylus johnstoni, Saltwater Crocodile Crocodylus porosus, Oriental Plover Charadrius veredus, White-bellied Sea Eagle Haliaeetus leucogaster, and the Rainbow Bee-eater Merops ornatus. Flora investigations were limited to observations of dominant species and communities present. This included species of note, such as weed species and those with conservation status. No species of conservation significance were recorded during the investigation.

The toxic baiting cell is likely to include granite outcrops and fire protected sandstone communities. Non-toxic baiting cells will be over grassland areas.

3.2 Describe the hydrology relevant to the project area (including water flows).

Not relevant.

While the Robinson River and other waterways are present in the area, the smaller waterways should be dry in September. Permit conditions from the APVMA for use of 1080 do not permit the laying of baits near waterways so any places with water must be avoided.

3.3 Describe the soil and vegetation characteristics relevant to the project area.

The toxic baiting cell has open woodland and some tussock grass woodland.

SKM (2009) describe these areas as: Rocky Hills: A number of variants of this habitat are present. The most common is a quartzite dominated series of hills and ranges, such as the Kimbolton Range and McLarty Range. Low, open woodland dominates the vegetation, with spinifex ground cover on the plateaux. This habitat type occurs across the northern and eastern sections of the property. In the west of the property, extensive granite boulder ranges are present, including outliers such as Boulder Hill, where large round granite boulders produce cave and crevice habitat. In the Secure Bay area, extensive black granite boulder outcrops and hillsides are present near the coast. The only vegetation on these hills are occasional shrubs and vine thickets.

The non-toxic baiting cell has Astrebla grassland communities and woodland plains.

SKM (2009) describe these as: Woodland Plains: Areas of Eucalyptus spp. and Acacia spp. dominated plains occur across the lowlands particularly in the south and central regions of the YSTA. Tropical woodlands dominated by Eucalyptus spp. grow on the foothills and plains in the northern part of the property, while the sand plain country south of the Robinson River, is generally dominated by Acacia spp., and is known as pindan country.

Grasslands: Treeless plains dominated by grass to approximately one metre high and generally occurring near coastal situations, such as floodplains of the major rivers.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area.

The area supports high floral and faunal diversity because it has a number of different biogeographic regions and has not been disturbed.

3.5 Describe the status of native vegetation relevant to the project area.

Intact.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

Not applicable.

3.7 Describe the current condition of the environment relevant to the project area.

Good. The area contains a number of invasive species, notably feral cats, that are impacting on native flora and fauna including threatened species.

3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.

The West Kimberley

Nature and extent of likely impact

Extracts from the Australian Heritage Database Nominators Summary Statement of Significance:

The biological significance of the west Kimberley
Biodiversity analysis using the Australian Government's Australian Natural Heritage Assessment Tool (ANHAT), supported by the Australian Heritage Council's expert opinion, has shown the northern Kimberley coast and islands, the Kimberley Plateau and the west Kimberley Devonian reefs are nationally significant for species richness and endemism for many plant, mammal, reptile, frog and invertebrate groups. Island populations of critical weight range species such as the northern quoll (*Dasyurus hallucatus*), the golden bandicoot (*Isoodon auratus*), the scaly-tailed possum (*Wyulda squamicaudata*) and the golden–backed tree–rat (*Mesembriomys macrurus*) are of particular importance due to their decline on the mainland caused by an array of human–induced threatening processes.
The northern Kimberley coast and islands, the Kimberley Plateau and the west Kimberley Devonian reefs have outstanding heritage value to the nation under criterion (a) for plant, mammal, reptile, frog and invertebrate species richness and endemism; and as refugia protecting against human-induced environmental changes.

This extract mentions the value of the northern quoll, however, it is in reference to island populations off the Kimberley coast so is not considered to be relevant.

3.9 Describe any Indigenous heritage values relevant to the project area.

Indigenous foundations of the Kimberley
The Dreaming (full extract not included). There are likely to be dreamings for different peoples related to the northern quoll in the Kimberley.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.

Commonwealth Department of Defence property

3.11 Describe any existing or any proposed uses relevant to the project area.

The Department of Defence use the property for their operations.

The Australian Wildlife Conservancy commenced environmental management of the property in 2016 under contract to the Department of Defence.

Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action.

The intent of the project is to test the newly developed Hisstory bait for feral cats, which will enable the effective management of feral cat populations in northern Australian environment without causing additional declines of non-target native species. This objective is being met by a number of methods:

Delivery of the 1080 toxicant in a very hard pellet, known as the Hard Shell Delivery Vehicle (HSDV). The toxic compound is totally encased in purpose designed polymer that provides a very tough outer surface. The polymer dissolves when in an acidic environment such as the stomach. We have demonstrated that the HSDV device is an effective way of minimising the exposure of a wide range of native wildlife species that may also eat the bait by exploiting their different feeding behaviours. Essentially, feral cats simply shear food items into a size that can be manageably swallowed without actively ‘chewing’ them. This feeding behaviour is different from many native mammal species that actively masticate items more thoroughly in the mouth before swallowing. Unpalatable items such as stones are rejected. Pen and field trials have demonstrated that many small-medium native mammal species will reliably reject the HSDV if they consume the bait. Birds that have been tested, such as Australian ravens, have also reliably rejected the pellet when they were provided with baits. Conversely, feral cats are known to reliably consume the HSDV.

Captive northern quolls have been found to reliably reject the HSDV during pen trials (Gigliotti 2011). Similarly, the captive and free-ranging eastern quolls, which are larger than northern quolls, have also been found to have reliably rejected the HSDV (Robinson 2010 in Johnston 2010). Therefore, we expect northern quolls to consume some baits but no deaths from consuming the toxin.

Greater bilby have been tested and they will reliably reject the HSDV. Greater bilby are also tolerant to a cat-sized dose of 1080 toxin.

Golden bandicoots are expected to behave in a similar fashion to the larger southern brown bandicoot and, while not generally consuming carrion, we have made the assumption that the golden bandicoot could eat a bait. However, we are confident, based on the 100% rejection of

the HSDV by the southern brown bandicoot (Hetherington et al 2007) that the golden bandicoot will also reject the HSDVs. It is also noted that the 1080 LD50 for *Isoodon gunii* (779 g (728-830) is about 5.37 mg/kg (McIlroy, 1983). It is a bit larger than the golden bandicoot at 300-850 g but provides an indication that the larger golden bandicoots may be tolerant to a 4.5 mg dose of 1080 in the unlikely case that a HSDV was consumed.

Northern brush-tailed phascogales are expected to behave in a similar fashion to the southern brush-tailed phascogale that was tested by Hetherington et al. (2007). The southern brush-tailed phascogale will consume baits, and on average consume 2.9 ±2.11 g of bait of a ~16-20 g bait. In this situation, the phascogales would need to consume the right part of the bait to encounter the HSDV. Hetherington et al's (2007) testing showed one animal took a ball bearing (analogue for a HSDV at that time). We believe, that the low bait consumption, together with the low level of HSDV consumption suggests the *P. pirata* will not be impacted by Hisstory baiting, particularly at a population level. In addition, we have been provided with some records of where *P. pirata* has been detected and baiting will be located away from these sites.

The application of baits is timed to occur during the time of year when the prey resource for feral cats is at its lowest, which in the case of the Kimberley is towards the end of the dry season. Optimal baiting success for feral cats will occur when cats are food stressed. Bait lay rates are based on work conducted by DPaW (Algar and Burrows 2004). Baits will not be laid in or near water.

Access to the site is limited by the Department of Defence. Signage will be placed as required by bait labels and 1080 toxin regulatory requirements.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved.

The intent of the project is to test the newly developed Hisstory bait for feral cats, which will enable the effective management of feral cat populations in northern Australian environment without causing additional declines of non-target native species. The effective management of feral cats will assist with the recovery of threatened species (MNES).

Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action.

Listed threatened species.

A list of threatened species has been taken from the EPBC Act Protected Matters Report. Each species is individually assessed below. Note that most references contained in this section are from the SPRAT database references and have not been individually checked for accuracy or attached to this referral. The exceptions being Anon 2002, Algar 2006, Robinson 2010, Johnston 2010, Gigliotti 2011, Menkhorst et al 2017.

Listed species at <u>no</u> risk from the proposed project

The species below have been assessed as not being put at risk by Hisstory baiting.

<u>Birds</u>

Calidris canutua (red knot, knot) is listed as Endangered under the EPBC Act. The red knot's habitat includes sheltered coasts on mudflats and sandbars of estuaries, harbours, lagoons; occasionally on beaches, reefs. Hisstory baits will not be laid on mudflats, sandbars and beaches.

Calidris ferruginea (curlew sandpiper) is listed as Critically Endangered under the EPBC Act. The curlew sandpiper's usual habitat is the inter-tidal mudflats of estuaries, lagoons, mangrove channels, around lakes, dams, flood waters, flooded saltbush surrounds of inland lakes. Hisstory baits will not be laid on mudflats and near waterways.

Erythrotrirchis radiates (Red goshawk) is listed as Vulnerable under the EPBC Act. The Red Goshawk's diet is 95% birds and is taken as live prey. The red goshawk is unlikely to identify a cat bait as food. We do not consider the Hisstory baiting to be a risk to the red goshawk.

Erythrura gouldiae (Gouldian finch) is listed as Endangered under the EPBC Act. The Gouldian finch feeds almost entirely on grass seeds. In addition, the size of the pellet containing the toxin (approx 6-8 mm) is too large for this finch to consume. We do not consider the Hisstory baiting

to be a risk to the Gouldian finch.

Falcunculus frontatus whitei (crested shrite-tit (northern)) is listed as Vulnerable under the EPBC Act. Prey eaten by the northern crested shrike-tit includes insect larvae (probably beetle), beetles, katydids, tree crickets, spiders and cicadas. Whilst, these are relatively large invertebrates, smaller invertebrates are likely to also be eaten (Ward 2008). The northern subspecies of the crested shrike-tit forages in trees, especially in eucalypts. Because of these feeding habits we do not consider the Hisstory baiting to be a risk to the northern crested shrike-tit.

Geophaps smithii blaauwi (partridge pigeon (western)) is listed as Vulnerable under the EPBC Act. The partridge pigeon (western) mostly feeds on seeds but also takes some insects and small snails. The small size of the food taken suggests that the Hisstory baiting would not be a risk to the partridge pigeon.

Limosa lapponica baueri (bar-tailed godwit (bauera), western Alaskan bar-tailed godwit) is listed as Vulnerable under the EPBC Act. The bar-tailed godwit's habitat includes coastal mudflats, sandbars, shores of estuaries, salt marsh and sewage ponds. Hisstory baits will not be laid on mudflats and near waterways.

Limosa lappoinca menzbieri (northern Siberian bar-tailed godwit, bar-tailed godwit) is listed as Critically Endangered under the EPBC Act. The bar-tailed godwit's habitat includes coastal mudflats, sandbars, shores of estuaries, salt marsh and sewage ponds. Hisstory baits will not be laid on mudflats and near waterways.

Numenius madagascarensis (eastern curlew, far eastern curlew) is listed as Critically Endangered under the EPBC Act. The eastern curlew's habitat is tidal mudflats, sandspits of estuaries, mangroves, lake shores, ocean beaches. Feeds by probing deeply into mud or sand. Hisstory baits will not be laid on mudflats and near waterways.

Papsula abbotti (Abbott's booby) is listed as Endangered under the EPBC Act. The Abbott's booby is a marine feeder and will not consume a Hisstory bait.

Pezoporus occidentalis (Night Parrot) is listed as Endangered under the EPBC Act. The night parrot is a granivorous feeder so is unlikely to identify a Hisstory bait as food or consume a Hisstory bait.

Polytelis alexandrae (Princess parrot, Alexandra's parrot) is listed as Vulnerable under the EPBC Act. The princess parrot is a granivorous feeder so is unlikely to identify a Hisstory bait as food or consume a Hisstory bait.

Rostratula australis (Australian Painted Snipe) is listed as Endangered under the EPBC Act. The Australian Painted Snipe eats vegetation, seeds, insects, worms and molluscs, crustaceans and other invertebrates (Marchant & Higgins 1993) in the surrounds and shallows of wetlands. Because of this diet preference, it is not expected that an Australian Painted Snipe would consume a bait and pellet. In addition, Hisstory baits will not be laid near waterways and wetlands. As such, we do not consider the Hisstory baiting to be a risk to the Australian Painted

Snipe.

Tyto novaehollandiae kimberli (masked owl (northern)) is listed as Vulnerable under the EPBC Act. The masked owl (northern) feeds in open woodland on small to medium-sized terrestrial mammals (Garnett & Crowley 2000). As the masked owl takes live prey we do not consider the Hisstory baiting to be a risk to the masked owl.

The Australian Wildlife Conservancy surveyed the Yampi Sound Training Area in October 2016 and also found *Erythrura gouldiae* (Gouldian finch), which is listed as endangered. The Gouldian finch feeds almost entirely on grass seeds. In addition, the size of the pellet containing the toxin (approx 6-8mm) is too large for this finch to consume. We do not consider the Hisstory baiting to be a risk to the Gouldian finch.

Mammals

Isoodon auratus auratus (golden bandicoot (mainland)) is listed as Vulnerable under the EPBC Act. The golden bandicoot consumes insects, small reptiles and mammals, sea turtle eggs, roots and tubers. It is expected that the golden bandicoot could consume the bait (attractant or sausage part) if encountered. However, we do not expect the golden bandicoot to consume a hard shell delivery vehicle or pellet. Bait and pellet consumption trials on the similar, but larger, *Isoodon* species, the southern brown bandicoot (*Isoodon obesulus*) demonstrated 100% pellet rejection (Hetherington et al 2007). The southern brown bandicoot is approximately 1 kg whereas the golden bandicoot is approximately 650 g. A broad assumption would be for a smaller animal to consume smaller food items so be more likely to reject the hard shell delivery vehicle.

Macroderma gigas (ghost bat) is listed as Vulnerable under the EPBC Act. The ghost bat is carnivorous consuming small mammals including bats, birds, reptiles, frogs and large insects. They have two foraging modes; perched in vegetation to ambush passing prey and gleaning surfaces such as the ground while in flight. As the ghost bat is cued on movement, it is unlikely to detect and recognise a Hisstory bait as food. As such, we do not consider the Hisstory baiting to be a risk to the ghost bat.

Macrotis Lagotis (greater bilby) is listed as Vulnerable under the EPBC Act. The greater bilby is omnivorous with many of its food resources changing between seasons and geography. Key plant foods include seed from grasses (such as *Yakirra australiense*) and sedges, plant roots, vegetative parts and bulbs from Bush Onion (*Cyperus bulbosus*) and *Wurmbea deserticola*. The Greater Bilby also feeds on invertebrates including ants, beetles, termites, insect larvae and spiders (Southgate & Carthew 2006). The greater bilby excavates much of its food from the ground, creating holes up to 250 mm in depth. They dig to access termite mounds, expose bulbs, and expose the roots of *Acacia spp*. shrubs that have root-dwelling larvae (Pavey 2006). The greater bilby is likely to consume a bait (attractant or sausage part) if encountered. However, we do not expect the greater bilby to consume a hard shell delivery vehicle or pellet. Bait and pellet consumption trials have been undertaken and the results of this demonstrated bait acceptance, but with 92% of pellets rejected and 9% not found after the trial (10/11 animals). If the greater bilby was to consume the pellet containing 4 mg of 1080, this is not enough to cause the greater bilby to die. The LD50 (LD50 is the amount of toxin to theoretically

kill 50% of the tested animals) for the greater bilby is approximately 14.1 mg/kg with an approximate lethal dose ranging from 7.52 to 23.5 mg (Anon (2002) as quoted in Algar (2006)). As such we do not consider the Hisstory baiting to be a risk to the greater bilby, especially at a population level.

Mesembriomys macrurus (golden-backed tree-rat, koorrawal) is listed as Vulnerable under the EPBC Act. The golden-backed tree-rat is herbivorous consuming seeds, fruits, invertebrates, grass and leaves. As such, it is unlikely to consume a Hisstory bait. A bait acceptance trial run by Algar (unpub.) showed no bait consumed by golden-backed tree-rats.

Petrogale concinna monastria (nabarlek (Kimberley)) is listed as Endangered under the EPBC Act. The narbarlek is herbivorous and is unlikely to consume a Hisstory bait.

Saccolaimus saccolamus nudicluniatus (bare-rumped sheath-tailed bat) is listed as Vulnerable under the EPBC Act. The bare-rumped sheath-tailed bat is an insectivorous bat and is unlikely to detect or recognise a Hisstory bait as food.

Xeromys myoides (water mouse, false water rat, yirrkoo) is listed as Vulnerable under the EPBC Act. The water mouse is carnivorous and takes species including a variety of crustaceans, marine polyclads, marine pulmonates and marine bivalves. The Water Mouse appears to utilise both intertidal and freshwater habitats. Most records have been from mangrove forests, saltmarsh, sedgelands, clay pans and freshwater melaleuca wetlands. Hisstory baits will not be laid on mudflats or near waterways.

There is one additional threatened species listed in Sinclair Knight Merz 2009 Yampi Sound Training Area Fauna and Flora Survey Report, Dry Season 2008 Regional Biodiversity Monitoring and Remediation Program (NT1651) (SKm, 2009). This species does not appear in the Protected Matters Search Tool Report. This is the *Phascogale pirata* (northern brush-tailed phascogale), which is listed as Vulnerable under the EPBC Act. The brush tailed phascogale (*Phascoglae tapoatafa)* was tested by Hetherington et al. (2007) to determine the number of animals that would consume a bait (in that case an Eradicat bait which is comparable in palatability) and a ball bearing (as a surrogate for a HSDV). Most of the animals (83%) did not consume the whole bait, and only one animal consumed the ball bearing. On average 2.9 ±2.11 g of bait was consumed. This low bait consumption, together with the low level of HSDV consumption suggests the *P. Tapoatafa* and the sub-species *P. Tapoatafa pirata* (Atlas of Living Australia)/species *P. pirata* (SPRAT) will not be impacted by Hisstory baiting, particularly at a population level.

The Australian Wildlife Conservancy surveyed the Yampi Sound Training Area in October 2016 and also found *Mesembriomys gouldii* (black-footed tree-rat), which is listed as endangered, and *Trichosurus vulpecula arnhemensis* (northern brushtail possum), which is listed as vulnerable.

The black-footed tree-rat is predominantly herbivorous but the diet also includes some invertebrates. It is unlikely to recognise a Hisstory bait as food. The smaller golden-backed tree rat (same genus) did not consume any bait in a non-target bait acceptance trial by Algar (unpub.).

The northern brushtail possum's diet consists of leaves, flowers and fruit (Kearle 1985; Kearle 1998). They occur mainly in sites that have large hollow-bearing trees, particularly where the understorey includes some shrubs that bear fleshy fruits (Woinarski et al 2014). The Australian Wildlife Conservancy survey recorded the northern brushtail possum in the lowland savannas and woodlands at Yampi Sound Defence Training Area (see http://www.australianwildlife.org/sanctuaries/yampi.aspx). The proposed toxic baiting will not be taking place in the lowland savannas and woodlands, but in the rocky ranges, so the northern brushtail possum should not be affected by the Hisstory trial.

Reptiles

Caretta caretta (loggerhead turtle); *Chelonia mydas* (green turtle); *Dermochelys coriacea* (leatherback turtle); *Lepidochelys olivacea* (olive ridley turtle); *Natador depressus* (flatback turtle) are listed as Endangered or Vulnerable under the EPBC Act. These turtles use the beach and other coastal areas that will not be baited with Hisstory baits.

Target species for trial

Dasyurus hallucatus (northern quoll) is listed as Endangered under the EPBC Act. Pen studies have demonstrated that the northern quoll will consume a bait (attractant or sausage part) but reliably reject the hard shell delivery vehicle or pellet containing the toxin. Bait and pellet consumption trials have been undertaken in the Northern Territory at the Territory Wildlife Park (Gigliotti, 2011). This study tested nine adult and 12 juvenile northern quolls with non-toxic baits containing a pellet with a marker dye instead of toxin.

All baits were consumed. Of the nine adult quolls which consumed a bait, six pellets were found intact indicating no exposure to the core (in this case a marker dye) while the remaining 3 were found fractured. In each fractured case, it was only the polymer encapsulation that had fractured as the core material, i.e. the marker dye, was

intact meaning these quolls were not exposed to the core material. The juvenile quolls damaged a greater proportion of the pellets (two intact, nine damaged) but once again the cores were recovered and no quolls were exposed to the marker dye. In addition to recovering the pellet cores, no scats were found in the pens that were stained with the marker dye that would also indicate consumption. In summary, the northern quolls all consumed baits but none consumed the hard shell delivery vehicle or pellet.

These results are indicative of the expected field behaviour of the northern quoll and suggest that the use of toxic Curiosity® baits within the study area should not lead to population decline in the quoll population. Similar results have been achieved with captive and wild eastern quolls (*Dasyurus viverrinus*) in Tasmania (Robertson 2010 in Johnston 2010).

Nature and extent of likely impact

The trial of the Hisstory bait in the Kimberley should not cause any impact on listed threatened species or their habitat or any ecological community. As identified above, the four species that have been identified as potentially consuming a bait will be protected from toxin consumption by

the design of the Hisstory bait. The design of encapsulating the 1080 toxin in a hard plastic pellet (Hard Shell Delivery Vehicle) is intended that animals that nibble and chew food will reliably reject the hard plastic pellet. Testing in captive situations for the greater bilby and the northern quoll have demonstrated rejection of the hard plastic pellet. In addition, it is noted that the formulation of the hard plastic pellet and toxin is slightly modified from that tested on the northern quoll to make the pellet slightly harder – so we anticipate an even lower level of damage to the hard plastic pellets. The greater bilby should not be affected, and it is tolerant to a cat-sized dose of the toxin. Testing of similar species to the golden bandicoot and northern brush-tailed phascogale are expected to reject the hard plastic pellet.

The trial is designed to provide a field-based demonstration that the northern quoll is unaffected by the Hisstory bait as one of the project aims. This will be done by placing GPS/VHF tracking collars on a number of northern quolls for the duration of the project to determine their movements and, in the case of mortality by any cause, the cause of the mortality.

Listed migratory species

A list of migratory species has been taken from the EPBC Act Protected Matters Report. Note that most references contained in this section are from the SPRAT database references and have not been individually checked for accuracy or attached to this referral.

We do not expect there to be any likely impact on a migratory species using the specified restrictions for the Hisstory bait. Hisstory baits will also have conditions placed on where and how they can be laid. These label conditions (as submitted to the Australian Pesticides and Veterinary Medicines Authority in the application for a research permit) state: PROTECTION OF WILDLIFE, FISH, CRUSTACEA AND ENVIRONMENT. Do not contaminate ponds, waterways or drains with baits or used containers. There are also restrictions of no baiting with 1080 within 100 m of waterways in Western Australia. Below are the listed marine species and our assessment for each about their habitat, feeding characteristics and potential risk from Hisstory baiting. None of the listed species have been identified as being at risk.

Description

<u>Birds</u>

Anous stolidus (common noddy) The common noddy is generally a marine feeder, foraging by dipping; gleaning items from the surface or just below the surface of the water. Hisstory baits will not be laid in marine areas.

Apus pacificus (fork-tailed swift) The fork-tailed swift is an aerial eater, flying anywhere from 1 m to 300 m above the ground to forage. As such we do not consider the Hisstory baiting to be a risk to the fork-tailed swift.

Fregata ariel (lesser frigatebird, least frigatebird) The lesser frigatebird is a marine feeder. Hisstory baits will not be laid in marine areas.

Fregatra minor (great Frigatebird, greater frigatebird) The great frigatebird is a marine feeder.

Hisstory baits will not be laid in marine areas.

Sternula albifrons (little tern) Little terns are shallow marine feeders. Hisstory baits will not be laid in marine areas.

Cecropis daurica (red-rumped swallow) Red-rumped swallows are aerial feeders and would not recognise a bait as food.

Cuculus optatus (oriental cuckoo, Horsfield's cuckoo) The oriental cuckoo eats insects, favouring caterpillers (Menkhorst et al 2017), so is unlikely to recognise a bait as food.

Motacilla cinerea (grey wagtail) The grey wagtail is an insectivorous bird that is too small to consume HSDV (bill 15.7-17.0mm – 14-22 g) (Menkhorst et al 2017). It is unlikely to recognise a bait as food. As such we do not consider the Hisstory baiting to be a risk to the grey wagtail.

Motacilla flava (yellow wagtail) Probably should be Motacilla tschutschensis eastern yellow wagtail (has a Kimberley distribution). The yellow wagtail is an insectivorous bird that is too small to consume HSDV (Menkhorst et al 2017). It is unlikely to recognise a bait as food. As such we do not consider the Hisstory baiting to be a risk to the yellow wagtail.

Acrocephalus orientalis (oriental reed-warbler) Typical habitat of the oriental reed-warbler is reeds, cane grass, cumbungi, sedges and mangroves.

Actitis hypoleucos (common sandpiper) The common sandpiper's preferred habitat is narrow and often steep shorelines, often in sheltered setting used by few or no other shorebirds: largest numbers probably along mangrove-lined creeks, but varied wetland habitats also include areas of mud with outcropping rocks, steep sided sewage ponds and dams; avoids open mudflats (Menkhorst et al 2017). Hisstory baits will not be laid near waterways.

Calidris acuminate (sharp-tailed sandpiper) Fresh to saline inland wetlands; also forages in nearby damp grasslands, and coastal populations routinely use tidal flats. Like all shorebirds, will feed on invertebrates and is unlikely to recognise a bait as food. At the time of baiting there will not be any damp grasslands (end of dry season) so birds will be concentrated on wetlands or tidal flats. Hisstory baits will not be laid on tidal flats or near waterways so we do not consider the Hisstory baiting to be a risk to the sharp-tailed sandpiper.

Calidris canutus (red knot) The red knot's habitat includes sheltered coasts on mudflats and sandbars of estuaries, harbours, lagoons; occasionally on beaches, reefs (Menkhorst et al 2017). Hisstory baits will not be laid on mudflats, sandbars and beaches.

Calidris ferruginea (curlew sandpiper) The curlew sandpiper's usual habitat is the inter-tidal mudflats of estuaries, lagoons, mangrove channels, around lakes, dams, flood waters, flooded saltbush surrounds of inland lakes (Menkhorst et al 2017). Hisstory baits will not be laid on mudflats or near waterways.

Calidris melanotos (pectoral sandpiper) The pectoral sandpiper's habitat is in shallows or grassy edges of freshwater wetlands; also use brackish wetlands with short saltmarsh fringes

when no fresh water is available. Seldom forages on tidal flats. (Menkhorst et al 2017). Hisstory baits will not be laid on mudflats or near waterways.

Charadrius veredus (oriental plover, oriental dotterel) Little is known of the oriental plover's diet. It has only been recorded eating insects, including termites, beetles, grasshoppers, crickets and bugs (Berney 1907; van Tets et al. 1969). It is possible that an oriental plover may consume a Hisstory bait but this risk is probably minimal as it probably only feeds on invertebrates.

Glareola maldivarum (oriental pratincole) During the non-breeding season, Oriental Pratincoles eat insects, including dragonflies, cicadas, beetles, moths, ants, termites, locusts, grasshoppers, flies, bees and wasps (Barker & Vestjens 1989; Boekel 1980; Kilgour 1904; Johnstone 1983; Mathews 1909, 1910; Pierce 1978; van Tets et al. 1969). During the breeding season, they also eat flying insects (Ali & Ripley 1969; Maclean 1996). The species usually feeds aerially, at heights varying from just above the ground up to 300 m (Campbell 1920; Corben 1972b; Garnett 1986; Liddy 1959). As such we do not consider the Hisstory baiting to be a risk to the oriental pratincole.

Limosa lapponica (bar-tailed godwit) The bar-tailed godwit's habitat includes coastal mudflats, sandbars, shores of estuaries, salt marsh and sewage ponds. Hisstory baits will not be laid on mudflats and near waterways.

Numenius madagascariensis (eastern curlew, far eastern curlew) The eastern curlew's habitat is tidal mudflats, sandspits of estuaries, mangroves, lake shores, ocean beaches. Feeds by probing deeply into mud or sand. Hisstory baits will not be laid on mudflats or near waterways.

Pandion haliaetus (osprey) In Australia, Eastern Ospreys mainly feed on fish, especially mullet where available, and rarely take molluscs, crustaceans, insects, reptiles, birds and mammals (Clancy 1989, 2005a; Johnstone & Storr 1998; Kennard & Kennard 2006; Marchant & Higgins 1993; Olsen 1995; Rose 2000c; Saunders & de Rebeira 1985; Smith 1985). Eastern Ospreys usually forage diurnally, but have also been observed hunting prey at night (Hollands 2003). They generally search for prey by soaring, quartering or circling above a body of water and scanning below for fish. As such we do not consider the Hisstory baiting to be a risk to the eastern osprey.

Tringa nebularia (common greenshank) The common greenshank is found in a variety of coastal to freshwater habitats with open mudflats or still shallow water. Often wading in shallow water to lunge for fish, also probing for polychaetes or running to pick up prey from surface. (Menkhorst et al 2017). Hisstory baits will not be laid on mudflats or near waterways.

Migratory marine species

Blaenoptera edeni (Bryde's whale): solely marine, where baiting will not occur.

Carcharodon carcharias (white shark, great white shark): solely marine, where baiting will not occur.

Dugong dugong (dugong): solely marine, where baiting will not occur.

Chelonia mydas (green turtle); *Dermochelys coriacea* (Leatherback turtle, leathery turtle); *Eretmochelys imbricata* (hawksbill turtle); *Lepidochelys olivacea* (olive ridley turtle, Pacific ridley turtle); Natator depressus. These turtles use the beach and other coastal areas that will not be baited with Hisstory baits.

Crocodylus porosus (salt-water crocodile): Salt-water crocodiles tend to feed in or close to waterways. Hisstory baits will not be placed close to waterways so we believe there is little risk to salt-water crocodiles.

Manta alfredi (reef manta ray); *Manta birostris* (giant manta ray): solely marine, where baiting will not occur.

Megaptera novaeangliae (humpback whale): solely marine, where baiting will not occur.

Orcaella brevirostris (Irrawaddy dolphin): solely marine, where baiting will not occur.

Orcinus orca (orca): solely marine, where baiting will not occur.

Pristis clavata (dwarf sawfish); *Pristis zijsron* (green sawfish): solely marine and estuarine, where baiting will not occur.

Pristis pristis (freshwater sawfish): solely an aquatic species, where baiting will not occur.

Rhincodon typus (whale shark): solely marine, where baiting will not occur.

Sousa chinensis (Indo-Pacific humpback dolphin): solely marine, where baiting will not occur.

Tursiops aduncus (spotted bottlenose dolphin (Arafura/Timor Sea populations): solely marine, where baiting will not occur.

Nature and extent of likely impact

We do not expect there to be any likely impact on a migratory species using the specified restrictions for the Hisstory bait.

Hisstory baits will also have conditions placed on where and how they can be laid. These label conditions (as submitted to the Australian Pesticides and Veterinary Medicines Authority in the application for a research permit) state: PROTECTION OF WILDLIFE, FISH, CRUSTACEA AND ENVIRONMENT. Do not contaminate ponds, waterways or drains with baits or used containers. There are also restrictions of no baiting with 1080 within 100 m of waterways in Western Australia.

Below are the listed marine species identified by the Protected Matters Search Tool and our assessment for each about their habitat, feeding characteristics and potential risk from Hisstory baiting. None of the listed species have been identified as being at risk.

Listed marine species

Birds

Acrocephalus orientalis (oriental reed-warbler) Typical habitat of the oriental reed-warbler is reeds, cane grass, cumbungi, sedges and mangroves.

Actitis hypoleucos (common sandpiper) The common sandpiper's preferred habitat is narrow and often steep shorelines, often in sheltered setting used by few or no other shorebirds: largest numbers probably along mangrove-lined creeks, but varied wetland habitats also include areas of mud with outcropping rocks, steep sided sewage ponds and dams; avoids open mudflats (Menkhorst et al 2017). Hisstory baits will not be laid near waterways.

Anous stolidus (common noddy) The common noddy is generally a marine feeder, foraging by dipping; gleaning items from the surface or just below the surface of the water. Hisstory baits will not be laid in marine areas.

Anseranas semipalmata (magpie goose) The magpie goose feeds in freshwater swamps, inundated grassland and dry grassland. Grubs for roots and tubers using strongly hooked bill. Also grazes and strips grass seeds. (Menkhorst et al 2017). Being a herbivore, the magpie goose is unlikely to consider a bait as food. We believe the Hisstory baiting to be a low risk.

Apus pacificus (fork-tailed swift) The fork-tailed swift is an aerial feeder and would not recognise a bait as food.

Ardea alba (great egret) The Eastern Great Egret has a diverse diet that includes fish, insects, crustaceans, molluscs, frogs, lizards, snakes and small birds and mammals (Kushlan & Hancock 2005; Marchant & Higgins 1990; McKilligan 2005; Vestjens 1977c). It is possible that a great egret may consider a Hisstory bait to be a food source, but because it feeds on live prey and generally in or near waterways we believe the Hisstory baiting to be a low risk. Hisstory baits will not be laid near waterways.

Calidris acuminate (sharp-tailed sandpiper) Fresh to saline inland wetlands; also forages in nearby damp grasslands, and coastal populations routinely use tidal flats. Like all shorebirds, will feed on invertebrates and is unlikely to recognise a bait as food. At the time of baiting there will not be any damp grasslands (end of dry season) so birds will be concentrated on wetlands or tidal flats. Hisstory baits will not be laid on tidal flats or near waterways so we do not consider the Hisstory baiting to be a risk to the sharp-tailed sandpiper.

Calidris canutua (red knot, knot) is listed as Endangered under the EPBC Act. The red knot's habitat includes sheltered coasts on mudflats and sandbars of estuaries, harbours, lagoons; occasionally on beaches, reefs. Hisstory baits will not be laid on mudflats, sandbars and beaches.

Calidris ferruginea (curlew sandpiper) The curlew sandpiper's usual habitat is the inter-tidal mudflats of estuaries, lagoons, mangrove channels, around lakes, dams, flood waters, flooded saltbush surrounds of inland lakes. Hisstory baits will not be laid on mudflats and near waterways.

Calidris melanotos (pectoral sandpiper) The pectoral sandpiper's habitat is in shallows or grassy edges of freshwater wetlands; also use brackish wetlands with short saltmarsh fringes when no fresh water is available. Seldom forages on tidal flats. (Menkhorst et al 2017). Hisstory baits will not be laid on mudflats or near waterways.

Charadrius veredus (oriental plover, oriental dotterel) Little is known of the oriental plover's diet. It has only been recorded eating insects, including termites, beetles, grasshoppers, crickets and bugs (Berney 1907; van Tets et al. 1969). It is possible that an oriental plover may consume a Hisstory bait but this risk is probably minimal as it probably only feeds on invertebrates.

Cuculus optatus (oriental cuckoo, Horsfield's cuckoo) The oriental cuckoo eats insects, favouring caterpillers (Menkhorst et al 2017), so is unlikely to recognise a bait as food.

Fregata ariel (lesser fridgatebird, least frigatebird) The lesser frigatebird is a marine feeder. Hisstory baits will not be laid in marine areas.

Fregatra minor (great Frigatebird, greater frigatebird) The great frigatebird is a marine feeder. Hisstory baits will not be laid in marine areas.

Glareola maldivarum (oriental pratincole) During the non-breeding season, Oriental Pratincoles eat insects, including dragonflies, cicadas, beetles, moths, ants, termites, locusts, grasshoppers, flies, bees and wasps (Barker & Vestjens 1989; Boekel 1980; Kilgour 1904; Johnstone 1983; Mathews 1909, 1910; Pierce 1978; van Tets et al. 1969). During the breeding season, they also eat flying insects (Ali & Ripley 1969; Maclean 1996). The species usually feeds aerially, at heights varying from just above the ground up to 300 m (Campbell 1920; Corben 1972b; Garnett 1986; Liddy 1959). As such we do not consider the Hisstory baiting to be a risk to the oriental pratincole.

Hirundo daurica (red-rumped swallow) Also known as *Cecropis daurica.* Red-rumped swallows are aerial feeders and would not recognise a bait as food. As such we do not consider the Hisstory baiting to be a risk to the red-rumped swallow.

Hirundo rustica (barn swallow) The barn swallow is almost entirely insectivorous, consuming mainly flying insects (Cramp 1988). As such we do not consider the Hisstory baiting to be a risk to the barn swallow.

Limosa lapponica (bar-tailed godwit) The bar-tailed godwit's habitat includes coastal mudflats, sandbars, shores of estuaries, salt marsh and sewage ponds. Hisstory baits will not be laid on mudflats and near waterways.

Merops ornatus (rainbow bee-eater) The Rainbow Bee-eater mainly feeds on insects (Barker & Vestjens, 1989; Calver et al. 1987; Fry 1984; Higgins 1999; Lea & Gray 1935; Serventy & Whittell 1976), and will occasionally take other animal items including earthworms (Cleland et al. 1918), spiders (Lea & Gray 1935) and tadpoles (Wheeler 1973). The Rainbow Bee-eater usually forages from open perches, from which it may scan for prey (typically flying insects). When a flying prey item is sighted, the Rainbow Bee-eater launches into a swift pursuit flight, which may include a series of rapid twists and turns, and snaps up its prey (Fry 1984; Pywell 1990). As

such we do not consider the Hisstory baiting to be a risk to the rainbow bee-eater.

Motacilla cinerea (grey wagtail) The grey wagtail is an insectivorous bird that is too small to consume HSDV (bill 15.7-17.0mm – 14-22 g) (Menkhorst et al 2017). It is unlikely to recognise a bait as food. As such we do not consider the Hisstory baiting to be a risk to the grey wagtail.

Motacilla flava (yellow wagtail) Probably should be Motacilla tschutschensis eastern yellow wagtail (has a Kimberley distribution). The yellow wagtail is an insectivorous bird that is too small to consume HSDV (Menkhorst et al 2017). It is unlikely to recognise a bait as food. As such we do not consider the Hisstory baiting to be a risk to the yellow wagtail.

Numenius madagascarensis (eastern curlew, far eastern curlew) is listed as Critically Endangered under the EPBC Act. The eastern curlew's habitat is tidal mudflats, sandspits of estuaries, mangroves, lake shores, ocean beaches. Feeds by probing deeply into mud or sand. Hisstory baits will not be laid on mudflats and near waterways.

Pandion haliaetus (osprey) In Australia, Eastern Ospreys mainly feed on fish, especially mullet where available, and rarely take molluscs, crustaceans, insects, reptiles, birds and mammals (Clancy 1989, 2005a; Johnstone & Storr 1998; Kennard & Kennard 2006; Marchant & Higgins 1993; Olsen 1995; Rose 2000c; Saunders & de Rebeira 1985; Smith 1985). Eastern Ospreys usually forage diurnally, but have also been observed hunting prey at night (Hollands 2003). They generally search for prey by soaring, quartering or circling above a body of water and scanning below for fish. As such we do not consider the Hisstory baiting to be a risk to the eastern osprey.

Papsula abbotti (Abbott's booby) is listed as Endangered under the EPBC Act. The Abbott's booby is a marine feeder and will not consume a Hisstory bait.

Rostratula benghalensis (sensu lato) (painted snipe) The Australian Painted Snipe eats vegetation, seeds, insects, worms and molluscs, crustaceans and other invertebrates (Marchant & Higgins 1993). The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum *Muehlenbeckia* or canegrass or sometimes tea-tree (*Melaleuca*). The Australian Painted Snipe sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (Marchant & Higgins 1993). As such we do not consider the Hisstory baiting to be a risk to the Australian painted snipe.

Sternula albifrons (little tern) The little tern is a marine feeder. Hisstory baits will not be laid in marine areas.

Tringa nebularia (common greenshank) The common greenshank is found in a variety of coastal to freshwater habitats with open mudflats or still shallow water. Often wading in shallow water to lunge for fish, also probing for polychaetes or running to pick up prey from surface. (Menkhorst et al 2017). Hisstory baits will not be laid on mudflats or near waterways.

Not listed in the Protected Matters Search Tool, but listed in Sinclair Knight Merz 2009 Yampi Sound Training Area Fauna and Flora Survey Report, Dry Season 2008 Regional Biodiversity Monitoring and Remediation Program (NT1651): *Haliaeetus leucogaster* (white-bellied sea-eagle)

The White-bellied Sea-Eagle feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans, and on carrion and offal (del Hoyo et al. 1994; Ferguson-Lees & Christie 2001; Marchant & Higgins 1993; Rose 2001a). As such, they could potentially take a Hisstory bait as carrion, however, only some birds (including some adults) may travel inland along major rivers (del Hoyo et al. 1994; Marchant & Higgins 1993). Birds also occasionally visit inland lakes, rivers or reservoirs that occur outside of the usual distribution of the species (Marchant & Higgins 1993). We do not consider the Hisstory baiting to be a risk to the white-bellied sea-eagle as no major rivers, inland lakes etc are present in the proposed study area.

Fish

Hisstory baits will not be laid over water so no marine fish will be impacted.

Mammals

Dugong dugong (dugong): solely marine, where baiting will not occur.

Reptiles

Hisstory baits will not be laid over water so no marine seasnakes (*Acalyptophis peronei, Aipysurus apraefrontalis, Aipysrurus duboisii, Aipysurus eydouxii, Aipysurus laevis, Astrotia stokesii; Disteira kingie; Disteria major; Emydocephalus annulatus; Enhydrina schistose; Hydrelaps darwiniensis; Hydrophis elegans; Hydrophis mcdowelli; Hydrophis ornatus; Lapemis hardwickii; Pelamis platurus*) will be impacted.

Caretta caretta (loggerhead turtle); Chelonia mydas (green turtle); *Dermochelys coriacea* (Leatherback turtle, leathery turtle); *Eretmochelys imbricata* (hawksbill turtle); *Lepidochelys olivacea* (olive ridley turtle, Pacific ridley turtle); *Natator depressus* (flatback turtle). These turtles use the beach and other coastal areas that will not be baited with Hisstory baits.

Crocodylus johnstoni (freshwater crocodile) Freshwater crocodiles tend to feed in or close to waterways. Hisstory baits will not be placed close to waterways so we believe there is little risk to freshwater crocodiles.

Crocodylus porosus (salt-water crocodile) Salt-water crocodiles tend to feed in or close to waterways. Hisstory baits will not be placed close to waterways so we believe there is little risk to salt-water crocodiles.

Whales and other cetaceans. Hisstory baits will not be laid over water so no whales or other cetaceans will be affected.

Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail.

The Commonwealth Department of the Environment and Western Australian Department of Parks and Wildlife are undertaking the proposed action. All previous work by the parties related to feral cats has been in accordance with environmental and ethical permits.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application.

Not related to any feral cat work.

6.3 Will the action be taken in accordance with the corporation's environmental policy and planning framework?

No

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Yes

6.4.1 EPBC Act No and/or Name of Proposal.

Baiting efficacy trial of feral cat bait and 1080 toxicant (EPBC No. 2015/7503). Kimberley region. Determination was Approval not required.

Baiting efficacy trial of feral cat bait and PAPP toxicant (Curiosity® Feral Cat bait) in the Pilbara (EPBC No. 2012/6381). Determined to be Not a Controlled Action.

Baiting efficacy trial of feral cat bait and PAPP toxicant (Curiosity® Feral Cat bait) at a tropical site (EPBC No 2008/4383). This trial was undertaken on Christmas Island where it was

identified that robber crabs and other crabs may be at risk from consumption of the Curiosity® Feral Cat bait and hard shell delivery vehicle. In this situation, a gantry system was set up to individually suspend baits above the ground to prevent access by crabs. Hence, no further action was required under the EPBC Act referral.

Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

Reference Source	Reliability	Uncertainties
Algar, D 2006 A summary of the research undertaken to identify non-target risks in the use of the feral cat bait, Eradicat, and encapsulation of the toxin. Science Division, Department of Environment and Conservation, Perth, WA.	High. WA Government document.	None.
Algar, D and Burrows, ND 2004. A review of Western Shield: feral cat control research. Conservation Science Western Australia 5(2), pp131-163.	High. Prepared by WA Government scientists and published in a peer-reviewed journal.	None.
Ali, S. & S.D. Ripley (1969). Handbook of the Birds of India and Pakistan. Volume 3. Bombay: Oxford Unversity Press.	High. Referenced in SPRAT.	None.
Anon. 2002 1080 Summary Information. Miscellaneous Publication No. 011/2002, ISSN1326-4168. Government of Western Australia. Copy available on request.	High. WA Government document.	None.
Barker, R.D. & W.J.M. Vestjens (1989). The Food of Australian Birds. 1 Non-Passerines. Lyneham, ACT: CSIRO	High. Referenced in SPRAT.	None.
Berney, F.L. (1907). Field notes on birds of the Richmond District, north Queensland. Emu. 6:106-115	High. Peer reviewed journal article referenced in SPRAT.	None.
Boekel, C. (1980). Birds of Victoria River Downs Station	High. Referenced in SPRAT.	None.

Reference Source	Reliability	Uncertainties
and of Yarralin, Northern Territory. Part 1. Australian Bird Watcher. 8:171-193		
Calver, M.C., D.A. Saunders & B.D. Porter (1987). The diet of nestling Rainbow Bee-eaters, Merops ornatus, on Rottnest Island, Western Australia, and observations on a non-destructive method of diet analysis. Australian Wildlife Research. 14:541-550	High. Peer reviewed journal article referenced in SPRAT.	None.
Campbell, A.J. (1920). Notes on additions to the "H.L. White Collection". Emu. 20:50-66	High. Peer reviewed journal article referenced in SPRAT.	None.
Clancy, G.P. (1989). A survey of breeding Osprey Pandion haliaetus in north-eastern coastal New South Wales, 1980 to 1982. Corella. 13:9 to 14	High. Peer reviewed journal article referenced in SPRAT.	None.
Clancy, G.P. (2005a). The diet of the Osprey (Pandion haliaetus) on the north coast of New South Wales. Emu. 105:87-91	High. Peer reviewed journal article referenced in SPRAT.	None.
Cleland, J.B., J.H. Maiden, W.W Frogatt, E.W. Ferguson & C.T. Musson (1918). The food of Australian birds. Scientific Bulletin of Department of Agriculture, NSW. 15:1--112	High. NSW Government document.	None.
Corben, C. (1972b). Oriental Pratincoles in South-east Queensland. Sunbird. 3:6-8.	High. Referenced in SPRAT.	None.
Department of the Environment 2015 Threat abatement plan for predation by feral cats. Australian Government Department of the Environment, Canberra	High. Australian Government document.	None.
del Hoyo, J., A. Elliott & J. Sargatal, eds. (1994). Handbook of Birds of the World. In: Volume 2: New World Vultures to Guineafowl. Barcelona: Lynx Edicions	High. Referenced in SPRAT.	None.

Reference Source	Reliability	Uncertainties
Ferguson-Lees, J. & D.A. Christie (2001). Raptors of the World. London: Christopher Helm	High. Referenced in SPRAT.	None.
Fry, C.H. (1984). The Bee-eaters. In: Book. Poyser, Calton, England	High. Referenced in SPRAT.	None.
Garnett, S.T. (1986). Seasonal changes in the wader population in the south-east of the Gulf of Carpentaria. Stilt. 8:9--13.	High. Referenced in SPRAT.	None.
Garnett, S.T. & G.M. Crowley (2000). The Action Plan for Australian Birds 2000. Canberra, ACT: Environment Australia and Birds Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/action/birds2000/index.html	High. Referenced in SPRAT.	None.
Gigliotti, F. 2011 Response of northern Australian wildlife species to non-toxic Curiosity® baits. Project report for the Department of Sustainability and Environment, Heidelburg. Commercial in confidence document - available on request.	High. Sound methodology and careful work completed under contract for the Australian Government.	None.
Hetherington C. A., Algar D., Mills H. and Bencini R. 2007. Increasing the target-specificity of ERADICAT® for feral cat (Felis catus) control by encapsulating a toxicant Wildlife Research, 2007, 34, 467–471	High. Peer reviewed journal article referenced in SPRAT	None.
Higgins, P.J. (ed.) (1999). Handbook of Australian, New Zealand and Antarctic Birds. Volume Four - Parrots to Dollarbird. Melbourne: Oxford University Press	High. The definitive series on Australian birds. Referenced in SPRAT.	None.
Hollands, D. (2003). Eagles, Hawks and Falcons of	High. Referenced in SPRAT.	None.

Reference Source	Reliability	Uncertainties
Australia. Second Edition. Melbourne: Bloomings Books		
Johnston, M. 2010 The development of a humane felid-specific toxin and bait delivery system for feral cat control – final report 2008-10. Arthur Rylah Institute for Environmental Research Client Report. Department of Sustainability and Environment, Heidelberg, Victoria. Commercial in confidence document - available on request.	High. Project report for the Australian Government by Victorian Government scientists.	None.
Johnstone, R.E. (1983). Wildlife of the Dampier Peninsula, south-west Kimberley, Western Australia. Part IV Birds. Wildlife Research Bulletin Western Australia. 11:54-69.	High. Referenced in SPRAT.	None.
Johnstone, R.E. & G.M. Storr (1998). Handbook of Western Australian Birds. Vol. 1: Non-passerines (Emu to Dollarbird). Perth, Western Australia: West Australian Museum	High. The definitive series on Australian birds. Referenced in SPRAT.	None.
Kearle, JA. 1985. Habitat preference and diet of the northern brushtail possum Trichosurus vulpecula arnhemensis in the Alligator Rivers region, Northern Territory. Proceedings of the Ecological Society of Australia 13, pp161-176.	High. Peer reviewed journal referenced in the National Mammal Action Plan.	None.
Kearle, JA. 1998. The population dynamics of a tropical possum, Trichosurus vulpecula arnhemensis Collett. Wildlife Research 25, pp171-181.	High. Peer reviewed journal referenced in the National Mammal Action Plan.	None.
Kennard, S. & D. Kennard (2006). The breeding cycle of a pair of Ospreys Pandion haliaetus in northern coastal	High. Peer reviewed journal referenced in SPRAT.	None.

Reference Source	Reliability	Uncertainties
New South Wales. Australian Field Ornithology. 23:165-176		
Kilgour, J.F. (1904). A trip to the Ord River (north-western Australia). Emu. 4:37-43	High. Referenced in SPRAT.	None.
Kushlan, J.A. & J. Hancock (2005). Herons. Oxford, United Kingdom: Oxford University Press	High. Referenced in SPRAT.	None.
Lea, A.M. & J.T. Gray (1935). The food of Australian birds: an analysis of the stomach contents. Part 2. Emu. 35:63-98	High. Referenced in SPRAT.	None.
Liddy, J. (1959). The Australian Pratincole in north-west Queensland. Emu. 59:136-140	High. Referenced in SPRAT.	None.
Marchant, S. & P.J.Higgins, eds. (1990). The Handbook of Australian, New Zealand and Antarctic Birds, Volume 1 Part a - Rattites to Petrels. Melbourne, Victoria: Oxford University Press	High. The definitive series on Australian birds. Referenced in SPRAT.	None.
Marchant, S. & P.J. Higgins, eds. (1993). Handbook of Australian, New Zealand and Antarctic Birds. Volume 2 - Raptors to Lapwings. Melbourne, Victoria: Oxford University Press	High. The definitive series on Australian birds. Referenced in SPRAT.	None.
Mathews, G.M. (1909). On the birds of north-west Australia. Part I. Birds from Wyndham. (With field notes by collector J.P. Rogers). Emu. 9:53-69	High. Referenced in SPRAT.	None.
McIlroy, JC. 1983. The sensitivity of Australian animals to 1080 poison VI. Bandicoots. Australian Journal of Wildlife Research 10, pp507-12.	High. Peer reviewed journal. Accepted as key work on 1080 sensitivity.	None.
McKilligan, N. (2005). Herons, Egrets and Bitterns: Their Biology and Conservation in Australia. Melbourne: CSIRO Publishing	High. Referenced in SPRAT.	None.
Maclean, G.L. (1996).	High. Referenced in SPRAT.	None.

Reference Source	Reliability	Uncertainties
Glareolidae (coursers and pratincoles) species accounts. In: del Hoyo, J., A Elliott & J. Sargatal, eds. Handbook of the Birds of the World. Volume 3. Hoatzin to Auks. Page(s) 377-383. Barcelona: Lynx Edicions	Key reference for birds.	
Menkhorst, P; Rogers, D; Clarke, R; Davies, J; Marsack, P; and Franklin, K. 2017. The Australian Bird Guide. Bloomsbury Publishing, London.	High. New publication by highly regarded ornithologists.	None.
Olsen, P. (1995). Australian Birds of Prey. Sydney: University of NSW Press	High. Referenced in SPRAT.	None.
Pavey, C. (2006). National Recovery Plan for the Greater Bilby Macrotis lagotis. Northern Territory Department of Natural Resources, Environment and the Arts.	High. Australian Government Recovery Plan.	None.
Pierce, R.J. (1978). Feeding methods of an Oriental Pratincole. Notornis. 25:290	High. Peer reviewed journal referenced in SPRAT.	None.
Pywell, S.R. (1990). The Behavioural Energetics of foraging in the Rainbow Bird (Merops ornatus). Unpubl. BSc(Hons) thesis. Hons. Thesis. Monash Univ., Melb	High. Referenced in SPRAT.	None.
Queensland Department of Agriculture and Fisheries Factsheet Feral cat ecology and control, 2007 Available at https://www.daf.qld.gov.au/__data/assets/pdf_file/0004/61987/IPA-Feral-Cat-Ecology-PA26.pdf	High. Queensland Government publication.	None.
Robinson, S. 2010 Report on non-target species testing of Tasmanian devil, eastern quoll and spotted tailed quoll. Appendix to Johnston 2010. Commercial in confidence document - available on	High. Contracted work under a report prepared for the Australian Government. Sound methodology.	None.

Reference Source	Reliability	Uncertainties
request.		
Rose, A.B. (2000c). Observations on Ospreys Pandion haliaetus breeding on the lower north coast of New South Wales. Australian Bird Watcher. 18:274-279	High. Referenced in SPRAT.	None.
Rose, A.B. (2001a). Supplementary records of the food of some terrestrial non-passerines in New South Wales. Australian Bird Watcher. 19:60-68	High. Referenced in SPRAT.	None.
Saunders, D. & P. de Rebeira (1985). The Birdlife of Rottnest Island. Guildford: the authors	High. Referenced in SPRAT.	None.
Serventy, D.L. & H.M. Whittell (1976). Birds of Western Australia. Perth: University of Western Australia Press	High. Referenced in SPRAT.	None.
SKM 2009. Yampi Sound Training Area Fauna and Flora Survey Report, Dry season 2008. Regional biodiversity monitoring and remediation program (NT1651).	High. Report prepared for Australian Government Department of Defence.	None.
Smith, G.C. (1985). Analysis of prey remnants from Osprey Pandion haliaetus and White-bellied Sea-eagle Pandion leucogaster feeding roosts. Emu. 85:198-200	High. Referenced in SPRAT.	None.
van Tets, G.F., W.J.M. Vestjens & E.C. Slater (1969). Orange runway lighting as a method for reducing bird strike damage to aircraft. CSIRO Wildlife Research. 14:129-151	High. Peer reviewed journal referenced in SPRAT.	None.
Vestjens, W.J.M. (1977c). Status, habitats and food of vertebrates at Lake Cowal. CSIRO Division of Wildlife Research Technical Memorandum. 12	High. CSIRO report.	None.
Ward, S.J (2008). Habitat-use, foraging and breeding ecology	High. Report published by the Northern Territory Government.	None.

Reference Source	Reliability	Uncertainties
of the northern shrike-tit Falcunculus frontatus whitei. Darwin, N.T: Department of Natural Resources, Environment, the Arts & Sport.		
Wheeler, R. (1973). Rainbowbirds taking tadpoles. Australian Bird Watcher. 5:48	High. Referenced in SPRAT.	None.
Woinarski J., Burbidge A. and Harrison P. 2014. The Action Plan for Australian Mammals. CSIRO Publishing.	High. Accepted as a definitive work for Australian mammals.	None.

Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.0 Provide a description of the feasible alternative?

No. The intention of this action is to determine whether there is any risk to broad-scale action using the Hisstory bait in the future.

8.1 Select the relevant alternatives related to your proposed action.

8.27 Do you have another alternative?

Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

Organisation

9.2 Organisation

9.2.1 Job Title

Assistant Director

9.2.2 First Name

Julie

9.2.3 Last Name

Quinn

9.2.4 E-mail

julie.quinn@environment.gov.au

9.2.5 Postal Address

GPO Box 787
Canberra ACT 2601
Australia

9.2.6 ABN/ACN

ABN

34190894983 - DEPARTMENT OF THE ENVIRONMENT AND ENERGY

9.2.7 Organisation Telephone

02 6274 1294

9.2.8 Organisation E-mail

julie.quinn@environment.gov.au

9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

Not applicable

Small Business Declaration

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

Signature:..... Date: .....

9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

Yes

9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made

The primary objective of the proposed action is to protect or conserve the environment consistent with the objectives of the EPBC Act.
The primary objective of the proposed action - the field efficacy testing of a new feral cat bait - is to determine the suitability of this product for use in northern Australia. The bait has been developed for the specific purpose of reducing feral cat numbers in conservation areas of northern Australia and Tasmania (note that a similar product - Curiosity - has been developed for the rest of Australia) to benefit species listed as threatened under the EPBC Act and other native fauna. The development of a bait for feral cats addresses the highest priority action under the EPBC Act's Threat abatement plan for predation by feral cats (20), being "ensure broad-scale toxic baits targeting feral cats are developed, registered and available for use across all of Australia, including northern Australia" (Action 4.1).

Person proposing the action - Declaration

I, JULIE QUINN, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature:..... Date: 21/6/2017

I, JULIE QUINN, the person proposing the action, consent to the designation of ASSISTANT DIRECTOR as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature:..... Date: 21/6/2017

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

Assistant Director

9.5.2 First Name

Julie

9.5.3 Last Name

Quinn

9.5.4 E-mail

julie.quinn@environment.gov.au

9.5.5 Postal Address

GPO Box 787
Canberra ACT 2601
Australia

9.5.6 ABN/ACN

ABN

34190894983 - DEPARTMENT OF THE ENVIRONMENT AND ENERGY

9.5.7 Organisation Telephone

02 6274 1294

9.5.8 Organisation E-mail

julie.quinn@environment.gov.au

Proposed designated proponent - Declaration

I, JULIE QUINN, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature:..... Date: 21/6/2017

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

Assistant Director

9.8.2 First Name

Julie

9.8.3 Last Name

Quinn

9.8.4 E-mail

julie.quinn@environment.gov.au

9.8.5 Postal Address

GPO Box 787
Canberra ACT 2601
Australia

9.8.6 ABN/ACN

ABN

34190894983 - DEPARTMENT OF THE ENVIRONMENT AND ENERGY

9.8.7 Organisation Telephone

02 6274 1294

9.8.8 Organisation E-mail

julie.quinn@environment.gov.au

Referring Party - Declaration

I, JULIE QUINN, I declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature:..... Date: 21/6/2016

Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. skm_2009_yampi_sound_defence_training_area_fauna_and_flora_survey.pdf
2. ysta_tracks_map.pdf