



Barbed Wire Action Plan

Carol Booth



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1. Introduction

Barbed wire is a major killer of wildlife in Australia: thousands of bats, birds, gliders and macropods become entangled and die each year. Barbed wire is both a conservation and welfare problem. Entanglements are considered a threatening process for a number of threatened species, including Spectacled flying-foxes, Grey-headed flying-foxes, Mahogany gliders and Ghost bats. It causes considerable suffering for entangled animals.

The deaths on barbed wire are largely preventable. In many cases, barbed wire does not perform an essential function, or else it could be replaced by other types of fencing and, where it is essential, relatively simple measures could reduce its impact. However, because there is so much barbed wire in the Australian landscape – in both rural and urban environments – and very little awareness of the issue, it is will be a demanding (but achievable) task to reduce the wildlife toll.

1.1 Purpose of the plan

The initial purpose of this plan is to engender support for combined action on the barbed wire problem by providing information about its impacts and outlining potential solutions. The intended audiences are individuals, groups and agencies interested in the welfare and conservation of wildlife affected by barbed wire. By developing a coordinated approach across species and interests, and pooling resources and information, we can ensure that proposed solutions maximise outcomes and are effective for all species affected.

1.2 Contacts for feedback or project participation

If you have feedback on this plan, please email Carol Booth (Queensland Conservation) at carol.booth@gmail.com (phone 0402 701 276). If you are interested in participating in barbed wire projects, please email Jenny McLean (Tolga Bat Hospital) at jenny@tolgabathospital.org (phone 07 4091 2683).

2. Scale of the problem

Because most barbed wire entanglements go unobserved or unreported, and most animals dying either on the fence or later from injuries or infections are scavenged, there is little information about the numbers of animals affected. More than 60 Australian species have been recorded entangled, including those listed in Tables 1 and 2. Species thought to have the highest rates of entanglement are indicated by an asterisk. Bats, gliders, cranes and nocturnal birds appear to be the most susceptible groups. Some of the affected species are listed as threatened under state and/or federal legislation. In some cases, barbed wire entanglements are regarded as threatening processes for threatened species, in particular for Spectacled flying-foxes, Grey-headed flying-foxes, Ghost bats and Mahogany gliders.

Animals rescued from barbed wire, particularly bats, have injuries that are generally extensive and horrific. The extent of damage from constriction of blood flow to wing membranes and other parts of the bat body rarely becomes obvious until four or five days later. If animals are released from fences, without first putting them into rehabilitative care, most would eventually die from starvation.

Table 1. Records of mammal entanglements in barbed wire

Group	Species	Comments
Bats	Little red flying-fox** <i>Pteropus scapulatus</i>	<i>P. scapulatus</i> is particularly prone to entanglements. In the Millaa/Ravenshoe area (Qld) in Sept-Oct 1994 during a particularly windy period, 442 little red flying foxes were entangled, most along one 10 km stretch of barbed wire. Of those caught, 147 were unreleasable, and 30 were dead when found. ¹ Approx. 200 carcasses were observed dead on another stretch of barbed wire in western Queensland. ² The Tolga Bat Hospital on the Atherton Tablelands (Qld) receives into care c. 100 flying foxes rescued from barbed wire fences each year. ³
	Spectacled flying-fox** <i>Pteropus conspicillatus</i>	Listed as Vulnerable (EPBC Act). Barbed wire is considered a threatening process.
	Grey-headed flying-fox** <i>Pteropus poliocephalus</i>	Listed as Vulnerable (EPBC Act, Vic FFG Act, NSW TSC Act). Barbed wire is considered a threatening process.
	Black flying-fox** <i>Pteropus alecto</i>	Listed as Vulnerable (NSW TSC Act). van der Ree (1999) noted 124 records of entanglement.
	Eastern tube-nosed bat** <i>Nyctimene robinsoni</i>	Listed as Vulnerable (NSW TSC Act). van der Ree (1999) noted 41 records of entanglement. After Cyclone Larry in March 2006, 16 tube-nosed bats were rescued from barbed wire fences on the Atherton Tablelands (Qld). ⁴
	Ghost bat** <i>Macroderma gigas</i>	Listed as Vulnerable (Qld NC Act). Barbed wire entanglements have been recognised as a significant threatening process in the Pilbara, WA. ⁵
	Yellow-bellied sheath-tailed bat** <i>Saccolaimus flaviventris</i>	Listed as Vulnerable (NSW TSC Act). On a barbed wire fence around Forty Mile Scrub National Park (Qld), 12 carcasses were observed. ⁶
	Diadem leaf-nosed bat <i>Hipposideros diadema</i>	On a barbed wire fence around the Department of Defence's Tully Land Command Battle School, at least six Diadem leaf-nosed bat carcasses were recovered. ⁷
	White-striped free-tailed bat <i>Tadarida australis</i>	
	Eastern long-eared bat <i>Nyctophilus timoriensis</i> .	Listed as Vulnerable (EPBC Act, NSW TSC Act) (south-eastern form).

¹ Jenny McLean (pers. comm.) January 2006. See also <<http://www.jeffress.net/ffnff/barbwire.htm>>

² Reported in van der Ree (1999).

³ Jenny McLean, <<http://www.athertontablelands.com/bats/barbedwire.html>>

⁴ Jenny McLean (pers. comm.) April 2006.

⁵ Armstrong & Anstee S (2000); Norm McKenzie, CALM, WA (pers. comm.).

⁶ Observed by Martin Schulz (pers. comm. Feb 2006).

⁷ Scott Burnett, WPSQ (pers. comm. Feb 2006).

Table 1. *Continued.*

Group	Species	Comments
Gliders	Squirrel glider** <i>Petaurus norfolcensis</i>	Listed as Vulnerable (NSW TC Act, Vic FFG Act). van der Ree (1999) recorded 15 entangled in his study area in Victoria from 1994-1998 (systematic searches were not conducted) and noted 41 other records. In NSW barbed wire is recognised as one of the threats. ⁸
	Sugar glider** <i>Petaurus breviceps</i>	van der Ree (1999) noted 78 records of entanglement, with 44 in Queensland.
	Mahogany glider** <i>Petaurus gracilis</i>	Listed as endangered (EPBC Act, Qld NC Act). The CRC for Tropical Rainforest Ecology & Management found that barbed wire is a significant cause of mortality for these gliders. ⁹ Since rediscovery of the species, 9 entanglements have been reported to QPWS, 6 fatal. ¹⁰ Injuries have been so bad that no releases have been possible. ¹¹ These typically occur in summer.
	Yellow-bellied glider** <i>Petaurus australis</i>	Listed as Vulnerable (EPBC Act, Qld NC Act, NSW TSC Act). van der Ree (1999) noted 14 records of entanglement.
	Greater glider** <i>Petauroides volans</i>	van der Ree (1999) noted eight records of entanglement
Macropods ¹²	Brush-tailed bettong <i>Bettongia penicillata</i>	
	Tasmanian pademelon <i>Thylogale billardierii</i>	Listed as Vulnerable (Vic FFG Act)
	Common wallaroo <i>Macropus robustus</i>	
Other	Koala <i>Phascolarctos cinereus</i>	Listed as Vulnerable (Qld NC Act in SEQ, NSW TSC Act). van der Ree (1999) noted six records of entanglement.
	Platypus** <i>Ornithorhynchus anatinus</i>	In a study in the Wimmera catchment by the Platypus Conservancy, a high rate of scarring on the bill, head, front feet and tail was observed – thought to be from encounters with barbed wire fencing in the water. ¹³
	Grassland melomys <i>Melomys burtoni</i>	

⁸ See <<http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10604>>.

⁹ Information at <<http://www.rainforest-crc.jcu.edu.au/publications/infosheets/mahoganyGlider.pdf>>

¹⁰ Mark Parsons, QPWS (pers. comm. Feb 2006).

¹¹ Daryl Dickson (pers. comm. Feb 2006).

¹² Van der Ree (1999) reported that many of his respondents reported numerous entangled macropods in fences, including Grey and Red kangaroos. He did not include them in his list because macropod entanglement is not specific to barbed wire fences – they also become entangled in plain wire fences.

¹³ Information at <http://www.platypus.asn.au/platypus_in_country_areas.html> and <http://www.platypus.asn.au/helping_platypus_in_rural_areas.html>

Table 2. List of bird entanglements in barbed wire.¹⁴

Common name	Genus species
Sarus crane** ¹⁵	<i>Grus antigone</i>
Brolga** ¹⁶	<i>Grus rubicundus</i>
Black-necked stork	<i>Ephippiorhynchus asiaticus</i>
Buff-banded rail	<i>Gallirallus philippensis</i>
Bush thick knee	<i>Esacus neglectus</i>
Emu	<i>Dromaius novaehollandiae</i>
Southern Cassowary ¹⁶	<i>Casuarius casuarius</i>
King quail	<i>Coturnix chinensis</i>
Wood duck ¹⁷	<i>Chenonetta jubata</i>
Pacific black duck	<i>Anas superciliosa</i>
Hoary-headed grebe	<i>Poliiocephalus poliocephalus</i>
Pelican	<i>Pelecanus conspicillatus</i>
White-faced heron	<i>Egretta novaehollandiae</i>
Pacific heron	<i>Ardea pacifica</i>
Nankeen night heron	<i>Nycticorax caledonicus</i>
Royal spoonbill	<i>Platalea regia</i>
Wedge-tailed eagle	<i>Aquila audax</i>
Brown falcon	<i>Falco berigora</i>
Australian hobby	<i>Falco longipennis</i>
Peregrine falcon	<i>Falco peregrinus</i>
Little button-quail	<i>Turnix velox</i>
Red-chested button-quail	<i>Turnix pyrrhothorax</i>

Common name	Genus species
Latham's snipe	<i>Gallinago hardwickii</i>
Black-fronted dotteral	<i>Elsayornis melanops</i>
Masked lapwing	<i>Vanellus miles</i>
Silver gull	<i>Larus novaehollandiae</i>
Little corella	<i>Cacatua sanguinea</i>
Sulphur-crested cockatoo	<i>Cacatua galerita</i>
Galah	<i>Cacatua roseicapilla</i>
Red-rumped parrot	<i>Psephotus haematonotus</i>
Southern boobook	<i>Ninox novaeseelandiae</i>
Masked owl	<i>Tyto novaehollandiae</i>
Barn owl	<i>Tyto alba</i>
Grass owl	<i>Tyto capensis</i>
Tawny frogmouth** ¹⁸	<i>Podargus strigoides</i>
Owlet nightjar	<i>Aegotheles cristatus</i>
Laughing Kookaburra	<i>Dacelo novaeguineae</i>
Blue-winged Kookaburra	<i>Dacelo leachii</i>
Dollarbird	<i>Eurystomus orientalis</i>
Eastern spinebill	<i>Acanthorhynchus tenuirostris</i>
Magpie-lark	<i>Grallina cyanloeuca</i>
Willy wagtail	<i>Rhipidura leucophrys</i>
Magpie	<i>Gymnorhina tibicen</i>
Silvereye	<i>Zosterops lateralis</i>

¹⁴ Primarily from van der Ree (1999); also K.N. Armstrong (pers. comm. March 2006).

¹⁵ The Australian Crane Network focuses on barbed wire as particular problem for sarus cranes and brolgas, and provides extensive information on the issue on their website. Further information at <<http://ozcranes.net/>>

¹⁶ Listed as endangered (EPBC ACT; Qld NC Act).

¹⁷ In a review of the problems of fences across waterways, Allen and Ramirez (1989) documented entanglement of 47 different bird species internationally. They “suspect that the hazards of barbed-wire fences over water are greatest for birds that move long distances across the water to take flight or for birds that fly close to the water after taking flight.”

Legislation referred to in Tables 1 & 2:

EPBC Act: *Environment Protection & Biodiversity Conservation Act 1999*

Qld NC Act: *Nature Conservation Act 1992*

NSW TSC Act: *Threatened Species Conservation Act 1995*

Vic FFG Act: *Victorian Flora and Fauna Guarantee Act 1988*

¹⁸ Cheryl Cochran (Northern Rivers Wildlife Care) reports that they regularly encounter frogmouths entangled on barbed wire in northern NSW (pers. comm. Feb 2006).

3. Predisposing factors

Any barbed wire presents a risk of entanglement, but the risks seem to be greatest in the following circumstances:

- *During the night*: Most entanglements are of nocturnal creatures that probably do not see wire in the dark. Flying back to roost directly into the early morning sun may also blind animals to fences. It has also been suggested that microbats may mistake barbs for insect prey.¹⁹
- *Fences across flight/glide paths*: Larger birds and bats such as flying foxes and ghost bats save energy if they fly close to the ground, so are vulnerable to fences in their flight path. Ghost bats also forage in low trees and capture prey on the ground, which brings them into contact with fences. In habitats where trees are widely spaced, e.g. in marginal or cleared areas, gliders have further to glide and thus their landing approach may not be high enough to clear a fence.
- *Windy weather*: In windy weather, bats and birds, particularly juveniles whose flight is weak, have problems gaining enough height above a fence or are blown onto a fence. Bats and birds may fly low in a head-wind just above the vegetation to reduce energy costs.
- *Fences on ridge lines* or where they are higher than surrounding vegetation (eg. around new plantings): Flying foxes and birds, particularly those flying at night, may not see a strand of wire above the highest point of land or vegetation. For example, flying foxes regularly get entangled in fences on the rim of a large gently sloping basin of land on the Atherton Tablelands which has a lake/swamp at the bottom.²⁰
- *Fences near food trees*: As a flying animal leaves or is chased from a food tree it may dip and become entangled in a nearby fence.
- *Fences around water*: Flying foxes and water birds get entangled on their flight to and from sewage ponds, wetlands and waterholes. Crane wingspan is up to 2.5 metres, and their long legs hang down for landing and take-off, so they need enough space around a wetland to take off.
- *Fences across watercourses* or barbed wire submerged in water: Platypus and water birds become entangled on barbed wire in and across water.
- *New fences*: Newly erected fences, where there were none previously, often have particularly high rates of entanglements (e.g. ghost bats in the Pilbara).
- *Fences on forest/cleared land ecotones*: Fences in these areas cause problems especially for microbats.

Animals may also simply not recognise a fence as a threat or as an object that is relatively immovable.²¹

¹⁹ Chris Corben (pers. comm., Mar 2006): "This is based on the fact that echolocation cannot tell that a smooth surface is more than a point, and that much of the fence will not be "seen" by the bat, which will quite likely perceive the fence as an insect flying along beside the bat and will see the barbs as wingbeats."

²⁰ Jenny McLean, Tolga Bat Hospital (pers. comm. Jan 2006).

²¹ Armstrong & Anstee (2000).

4. Legal considerations

In some states, landholders with barbed wire fences that entangle protected wildlife may be legally liable for the deaths, harm or suffering caused; however, it has never been tested in court.²²

Queensland: Under the *Nature Conservation Act 1992*, people have an obligation to avoid the killing, injuring or harming (including ‘snagging’) of wildlife unless they have a permit to do so or satisfy the defence in s 88(3), which states that “it is a defence to a charge of taking a protected animal in contravention of subsection (1) to prove that (a) the taking happened in the course of a lawful activity that was not directed towards the taking; and (b) the taking could not have been reasonably avoided.” Therefore, in some circumstances, people may be liable for the entanglements of wildlife, particularly if it is a regular occurrence. There are third party rights under the NCA, which allow individuals or groups to take legal action to prevent breaches of the Act. There are no provisions under the *Animal Care and Protection Act 2001* relevant to barbed wire entanglements.

New South Wales: All Australian native animals are protected under the *National Parks and Wildlife Act 1974* and it is an offence to harm protected animals without a licence. It is an offence to harm a threatened species without a licence issued under the *Threatened Species Conservation Act 1995*. A landowner may be liable for wildlife harmed on a barbed wire fence on their property unless they can show that they have a licence or some other authorisation specified in the legislation. Anyone can commence proceedings in the Land and Environment Court to ensure that the requirements of the legislation are enforced.

Victoria: Part VII of the *Wildlife Act 1975* provides for offences in relation to wildlife. The Act prohibits taking or destroying wildlife without a licence or authorisation, (sections 41 to 43) “Take” or “destroy” are not defined under the Act, and have not been the subject of judicial interpretation in Victoria. The *Flora and Fauna Guarantee Act 1988* does not provide an offence for taking fauna.

South Australia: Section 51(1) of the *National Parks and Wildlife Act* states that “a person must not take a protected animal or the eggs of a protected animal,” which includes “indigenous, migratory and protected animals” (section 5). The Act does not define the term ‘taking’ so it is unclear whether barbed wire takings would be included. However, s52(2) provides that it is a defence to a charge of ‘taking’ to show that the taking was not wilful or negligent. The *Prevention of Cruelty to Animals Act* may require an owner who is aware of an animal caught in a fence to prevent any further unnecessary pain. Section 13(2)(a) defines an offender as a someone who “unreasonably” causes an animal unnecessary pain. Furthermore, 13(2)(f) describes an offender as someone who having [already] injured the animal (not being an animal of which that person is the owner), fails to take reasonable steps to alleviate any pain suffered by the animal.

Western Australia: Under the *Wildlife Conservation Act 1950* all native fauna is protected at all times, unless otherwise declared by the Minister. Under the Act, landholders could potentially be liable for the harming of wildlife on barbed wire fences by the ‘taking’ of protected fauna. However it is not clear whether ‘take’ would extend to “indirect taking” from a barbed wire fence. In addition, the Criminal Code may provide protection from liability in some circumstances, if, for example, the taking occurred by accident. This defence may be difficult to prove if animals

²² Environmental Defenders Offices in various states have provided information for this section.

were killed on the landholder's fence on numerous occasions, however. Under the *Animal Welfare Act 2002* landholders could be subject to liability if the person in any way "causes the animal unnecessary harm". If the animal "suffers harm which could be alleviated by the taking of reasonable steps" the person can also be subject to liability. The scope of what is "unnecessary" or "reasonable" has not been considered by the courts in this context, but most landholders would likely be able to address these requirements. Again, it is a defence to the criminal provisions in the *Animal Welfare Act* if the act occurred by accident.

Northern Territory: The Territory *Parks and Wildlife Conservation Act* at section 66 makes it an offence to "take or interfere with protected wildlife unless the person is authorised to do so." However, the elements of both mens rea and actus reus of the offence would have to be proven. In short the unintended consequent harm caused to wildlife of erecting a barbed wire fence would not meet the mens rea test for the offence to be proved. Section 67 makes it an offence to take or interfere with unprotected wildlife for commercial purposes, unless authorised to do so. Once again, there is no relationship with injuries to wildlife caused by barbed wire fences. *The Animal Welfare Act* at section 6 provides: (1) A person must not neglect or commit an act of cruelty on an animal. However this protection suffers from the same difficulty outlined above.

Tasmania: Under the *Threatened Species Protection Act 1995* and *Wildlife Regulations 1999*, people must not *knowingly* take a listed animal without a permit. This includes killing, injuring, catching or damaging an animal. A permit can be issued authorising a landowner to 'take' a protected species under the *Wildlife Regulations 1999* if the taking is necessary to prevent the destruction of stock or crops by the wildlife.

Other legal issues: It is often difficult to rescue entangled wildlife without cutting fence wire. Damage caused to private property by those who attempt to free animals may face a common law charge of nuisance. At Common Law physical damage to property is always regarded as unreasonable and therefore actionable in private nuisance. It should be noted that it is no defence to argue that the activities complained of benefit the public, or that the benefit to the public outweighs the detriment suffered by the plaintiff.

5. Options to prevent or reduce the barbed wire toll

5.1 Removal / replacement / alternative fencing materials

Use plain wire or other fencing material: The best option is for barbed wire not to be used at all in fences. Replacing the top one or two strands with plain wire will resolve most problems.²³ Other fencing options include the use of 'borderline' or 'nightline', which are solid high tension nylon sighter 'wires' (no steel), used mainly for horse fencing. Nightline glows in the dark. They are significantly more expensive than plain wire, but would be useful in high-risk areas.

Remove fences: In some particularly entanglement-prone situations, such as along ridgelines or around wetlands, the best option is to remove the fence altogether and

²³ Ballina Shire has recently replaced the barbed wire on the two top strands of a fence around four sewage treatment ponds (Cheryl Cochran, FFICN, 2005). In Townsville, the 10th Terminal Regiment of the Australian Army installed plain wire on all their fences to avoid entanglements of juvenile bats which are released on its land and other bats at the Ross River colony (Dominique Thiriet, pers. comm. 2006).

erect it elsewhere if need be. In many cases, fencing does not serve an essential purpose.

Cover the barbs on existing fences: Barbs can be covered with tubing, particularly in entanglement hot spots. Gadgets have been designed for splitting poly pipe quickly and for applying the pipe to the fence (Fig. 1, see next page).²⁴ In entanglement hotspots, another option is to install an ‘apron’ of chicken mesh or similar over the fence.



Fig. 1 The polypipe splitter device that simultaneously splits and installs the pipe over barbs.

Use electric fences: To control stock access, electric fences may be effective, although the vegetation management required to maintain electric fences can be costly and time consuming, particularly in northern Australia,²⁵ and may not restrain cattle effectively since cattle are sometimes prepared to suffer electric shocks. Electric fences may also kill and injure some native wildlife.²⁶

5.2 Improved visibility

Barbed wire can be made more visible to animals by adding visible (and often audible) objects to the fence, such as tape, plastic flags, metal tags, and empty aluminium cans. Considerations include the introduction of waste to the environment, the effort required for installation and maintenance, and the cost.

Electric tape: Used electric fence tape can be strung above the top strand of barbed wire, secured to fencing posts with fencing staples.²⁷ The tape offers good visibility, as it is white and shimmies in the wind; it also acts as a physical barrier. It is cheap, quick and easy to put up, especially over long distances.

²⁴ The gadget has been developed by a member of the Northern Rivers Wildlife (Cheryl Cochran, Northern Rivers Wildlife Carers pers. comm., Feb 2006).

²⁵ As discussed at <<http://ozcranes.net/consv/elec.html>>.

²⁶ For example, some animals respond to electric shocks in ways which make them particularly vulnerable to death on electric fences, e.g. snakes often curl around a wire after being shocked, sugar gliders may wrap their tails around the wire and echidnas curl up in a ball (Lund & De Silva 1994, cited by Long & Robley 2004).

²⁷ A landholder on the Atherton Tablelands, who considers it necessary to retain barbed wire for cattle, has developed this approach (Jenny McLean, pers. comm. July 2005). He has placed the tape about 100mm above the top strand of barbed wire.

Plastic signals: Plastic bunting²⁸, flagging made from surveyors tape, or plastic warning tags such as are used on roadworks, can be added to barbed wire to provide a visual and aural warning to animals. Bunting needs to be replaced about annually because of deterioration. Second-hand bunting can be obtained from caryard dealers. Plastic flags made from tape are cheap, but need to be regularly replaced due to deterioration. Flags need to be quite closely placed, at least every 30 cm or so.²⁹ Plastic should not be used on stock fences as cattle eat plastic, suffer digestive problems and may die.³⁰

Metal signals: Metal tags³¹ or other shiny objects, such as metal plates³² or beer cans, can also act to make barbed wire more visible.³³

Others: Brightly-coloured plastic balls (like airstrip powerline markers) have been used to prevent powerline strike by cranes in Europe and the US and may also be useful for fences.³⁴ These would be a relatively expensive option for extensive lengths of fencing.

5.3 Other options

Remove food trees: Food trees close to barbed wire could be removed if this is the reason flying-foxes are getting caught. Unless the tree is a weed, however, this is not a good option for wildlife, and can be expensive.

Manage vegetation: In some cases, managing the height of vegetation may prevent entanglements. Birds and bats tend not to be caught on surrounding barb wire once closely-planted trees grow to fence height. Where fenceline grass is long, bat deaths may be reduced. Furthermore, hedges of vegetation can be planted to replace barbed wire fences – prickly vegetation may inhibit access as well as barbed wire. Regular vegetation management is probably not feasible on relatively large properties.

Check fences: Improved surveillance of fences and timely rescues would save some entangled creatures, however this will not address the causes of entanglement. While it may not be realistic to expect farmers with many kilometres of fences to regularly check them this could reasonably be asked of landholders with short fences, such as those in industrial areas or rural residential areas. It should be requested in addition to other measures.

²⁸ Bunting has apparently been successful at preventing flying-fox entanglements for >10 years at the Rockhampton rubbish tip (Nigel Tuckwood, Waste Coordinator, Rockhampton City Council, pers. comm. April 2005) and also at the Amberley airforce base (Rebecca Worrill, Civilian Environment Officer, Amberley Airforce Base, pers. comm.. April 2005).

²⁹ A flying-fox has been entangled on barbed wire less than 40cm from flagging (Dominique Thiriet pers. comm.. Feb 2006).

³⁰ See <<http://ozcranes.net/>>

³¹ Metal tags have been used on a DPI facility in Cleveland with no bat deaths recorded since (as at April 2005) (Louise Saunders, Brisbane Bat Rescue, pers. comm. April 2005).

³² Aluminium one-person pie dishes are simply bent and clamped by hand over the barbed wire (Meredith Ryan, pers. comm. April 2005). Metal plates have been installed between the top two barbed strands atop a cyclone mesh fence around a power substation in the Pilbara. In this case, barbed wire was required since substations should meet Australian Standards regarding the Restriction of Entry (point 10.4; AS 2067-1984) and plates were considered to be the best alternative (Kyle Armstrong, pers. comm. March 2006).

³³ Beer cans have been used on camel fences at Newhaven, Birds Australia's property in the Northern Territory, and by iron ore mining companies in the Pilbara (Kyle Armstrong, pers. comm. March 2006).

³⁴ <<http://ozcranes.net/>>

5.4 Approaches taken elsewhere

Barbed wire fencing is a welfare problem in Europe, particularly for deer and raptors. In Europe several councils in Italy, Austria and Germany have banned the use of barbed wire fencing.³⁵ The Norwegian Animal Welfare Act forbids the use of barbed wire unattached to other fencing material which is easy to see and makes explicit provision for local councils to ban its use for fencing.³⁶ The European Union Parliamentary Special Interest Group on Animal Welfare agreed in a March 2006 meeting to progress a proposal to ban the use of barbed wire fencing in agriculture and forestry, particularly as there exist cheaper and better alternatives, such as electric fencing.

Barbed wire fencing is also a problem in the United States. One regional NGO, the Jackson Hole Wildlife Foundation, has developed a campaign to remove barbed wire fences.³⁷ They provide information about safe fencing, organize groups of volunteers to take down old fences, and work with governments and landowners to either remove or alter problem fences. By 2005 they had removed about 132 km of fencing.

6. Economic and other issues

6.1 Relative fencing costs

There is a widespread perception that plain wire costs more than barbed wire (and it may have in the past). However, currently, plain wire is cheaper than barbed wire. Furthermore, it takes longer to run out barbed wire than plain wire.³⁸ The disadvantage of hi-tensile plain wire is that it is hard to tie off and hard to strain using old-style strainers (although twitchers and wire joiners make it easy).³⁹ As an indication of relative cost, the following prices were advertised recently:

1500m hi-tensile plain wire \$115	\$77/km
750m 3.15mm plain soft \$98 (10 Gauge wire in the old terms)	\$131/km
500m 4.0mm plain soft \$98 (8 Gauge wire in the old terms)	\$196/km
400m Barbed wire \$66	\$165/km

The relative costs of various forms of fencing and mitigation measures need to be investigated.

6.2 Stock and fencing

There are different opinions about how necessary barbed wire fencing is for stock containment. Some graziers have found it is unnecessary and that high tensile plain wire is effective.⁴⁰ However, this may not work to contain stock in areas with lush

³⁵ Dr Ebner in a presentation to the Eurogroup for Animal Welfare, Brussels, 15 March 2006, as reported by the Secretariat.

³⁶ See <<http://www.animallaw.info/nonus/statutes/stnoapa1995.htm>>.

³⁷ See <<http://www.jhwildlife.org/fencing.html>>.

³⁸ Peter Richards (pers. comm. Feb 2006).

³⁹ Ibid.

⁴⁰ One grazier on 100,000 acres west of Charleville has found that high tensile plain wire with wooden posts every 0.5km and star pickets in between contains his scrub cattle very well (Peter Richards [not the grazier in question] pers. comm. February 2006).

pastures.⁴¹ Barbed wire has the advantage of deterring stock from fence rubbing, which damages fences.⁴² Much barbed wire is used out of habit from previous times when soft wire was not as strong and labour was cheap. Also, some farmers find high tensile wire difficult to work with. The relative merits of different types of fencing for containing stock in different situations need to be investigated.

6.3 Fencing for conservation

Many barbed wire fences are erected in the name of conservation, e.g. to protect wetlands or vegetation, including those funded by the Natural Heritage Trust (NHT). Ideally, this means that the conservation motivation behind the fences will also extend to protecting wildlife from barbed wire. It should be a condition of NHT and other government funding that barbed wire not be used for fencing on the grounds that it undermines conservation of other species.

6.4 Human health

Wildlife entanglements can also be a human health risk. For example, members of the public often try to free flying foxes from barbed wire and suffer scratches or bites, which can expose them to Australian Bat Lyssavirus. For this reason, Queensland Public Health recently funded the vaccination of five rescuers in barbed wire hotspots on the Atherton Tablelands after Tolga Bat Hospital presented records showing that 26 of 60 rescues were performed by unvaccinated members of the public, of whom four were bitten.⁴³ (The cost of fence remediation may be cheaper than vaccination of several people, and removes the source of the health hazard.)

Unfortunately, the threat of disease is likely to inhibit barbed wire rescues. This is a particular problem for flying foxes with the threat of Australian Bat Lyssavirus. For example, in the Northern Territory, there was a media campaign with the main message of “do not touch or try to rescue bats” and no corresponding messages promoting compassion for entangled bats and encouraging people to call a rescuer.⁴⁴ Some rescuers have noted an increased callousness in people towards entangled bats since the risk of diseases has been emphasised.⁴⁵

6.5 Insurance and liability

Barbed wire may be an insurance requirement in some situations. Wildlife rescuers have been informed by some landholders that a barbed wire fence was a condition of their insurance.⁴⁶ In some states, farmers may be liable for damage caused by stock escaping from their property and are either required to have barbed wire fences for public liability insurance or have the perception that barbed wire fences are the safest form of enclosure. The insurance situation needs investigation and liaison with companies to determine if some alternative designs would be covered.

⁴¹ Meredith Ryan, grazier and flying fox carer (pers. comm.. March 2006): “When cattle are used to relatively ‘lush’ pastures they get very spoiled and as soon as they perceive that their current paddock is somewhat “grazed” they look over the fence and say “that’s greener pasture where I want to be and through they go if there is not the deterrent barbed wire.”

⁴² Metalcorp Steel,

<<http://www.metalcorpsteel.com.au/products/category.cfm?GroupID=3&ProductLineID=30>>

⁴³ Jenny McLean, Tolga Bat Hospital (pers. comm. Feb 2006).

⁴⁴ Centre for Disease Control Bulletin Vol. 10, No. 4, December 2003.

<http://www.nt.gov.au/health/cdc/bulletin/dec_2003.pdf>

⁴⁵ Louise Saunders, Bat Rescue Brisbane (pers. comm.. April 2006).

⁴⁶ Helen Gormley, ONARR (pers. comm. Mar 2005)

7. Recommended actions

7.1 Coordination

Establish a barbed wire coordination group to promote actions to reduce the wildlife toll from barbed wire. Ideally, this group will involve people focused on each of the variety of species affected. It would primarily function electronically.

Seek funding for 2 years for a part-time coordinator/secretariat of the coordination group.

7.2 Research

At present, we have very limited and mostly anecdotal information about the extent, causes and impacts of entanglements and options for prevention.

Entanglements database: Set up a central database to record entanglements and other information such as species affected and site information. Request wildlife and rescue groups, government wildlife agencies, landholders and beekeepers to record and pass on information about entanglements. Analyse data to determine extent and patterns of entanglement. Data concerning mortality on electric and other types of fencing could also be collected, particularly if promoted as an alternative to barbed wire fencing.

Causes of entanglements: Investigate causes of entanglement and assess whether proposed fencing alternatives are safe for all affected species.

Other fencing options: Explore options for making existing barbed wire fences safe for wildlife. Develop other options, preferably cheap, easy and lasting. Assess alternative fencing options for different situations: security, stock control, vegetation protection.

Economics: Investigate the relative economics of different fencing options.

Monitoring: Assess the effectiveness of approaches with monitoring of sites with different treatments.

Insurance: Investigate insurance requirements with respect to fencing.

Research promotion: Promote research projects to universities and research centres, including the development of potential Honours, Masters and PhD projects.

7.3 Manufacture innovation

Approach manufacturers of barbed wire to propose the development of new forms of wire which are both functional and wildlife-safe. For example, perhaps a special top strand wire which has bright anodised aluminium tags already attached could be developed.

7.4 Education

Educational material: Develop educational material about barbed wire, including websites and pamphlets, and request that governments, RSPCA and other organisations put the material on their websites or distribute pamphlets.

Government: Many barbed wire fences are government-owned, e.g. fences around national parks and government facilities. Provide information to federal, state and local governments about the problems of barbed wire. Request governments to set a good example by (a) conducting an audit of their barbed wire fences, (b) undertaking a risk assessment and (c) replacing or rendering safe any barbed wire considered to be a problem. Request local governments to provide information

(perhaps through rates notices and on their websites) to residents, particularly new residents who are unaware of the issues with barbed wire.

NRM groups: Natural Resource Management (NRM) activities are responsible for many new fences in the landscape, often using barbed wire, for protection of vegetation, wetlands and riparian areas. Raise awareness about the problems of barbed wire and promote alternative approaches to fencing by writing to NRM groups, publishing articles in their newsletters and requesting that they develop guidelines to minimise the entanglement of wildlife in fences in NRM projects.

Farmers: Contact farming representative groups, such as National Farmers Federation, Agforce and Landcare, seeking cooperation on promoting alternative fencing options to farmers. Publish articles in their newsletters. Promote stories about barbed wire problems and solutions in rural media.

Industry: Contact industry representative groups seeking cooperation on educating their members about entanglements, and promoting alternative fencing options and improved surveillance and rescue procedures.

Wildlife care groups: Request wildlife care groups to promote barbed wire awareness in their local areas. Promote awareness and care protocols at conferences, such as the annual National Wildlife Rehabilitators Conference.

Landholders whose fences entangle wildlife: Provide information to land managers whose fences have entangled wildlife or pose a risk. The most effective approach will require case-by-case judgement as landholders who feel antagonised may refuse to report future entanglements. Assess assistance options for entanglement hotspots. Also see below in 7.5 – 7.6.

Sellers of fencing material: Seek to have labels attached to barbed wire for sale, warning purchasers about the hazards of barbed wire for wildlife and detailing people's obligations for wildlife conservation and welfare.

Media: Promote the issue and best practice fencing via the media. Use entanglement events (when it will not antagonise the landholder) to develop community awareness and sympathy. Promote mitigation actions taken by landholders in local media. Consider holding a barbed wire awareness day each year with a coordinated media campaign.

7.5 Incentives and assistance

Investigate the costs of mitigation in various circumstances and identify potential forms of assistance and incentives available to encourage mitigation. Assistance could take the form of contributions towards costs of re-fencing or labour to assist re-fencing or mitigation.

7.6 Legal reform and enforcement

In some regions, land managers who erect and retain fences causing the death, injury or harm of wildlife are potentially liable under wildlife legislation or local government laws; however, most people are unaware of such obligations. Education will motivate many landholders to take remedial actions. For recalcitrant land managers there may be legal options to force their compliance.⁴⁷ Legal reforms are needed to provide better protection for wildlife against barbed wire.

Develop awareness about legal obligations: Obtain legal advice about people's obligations to avoid the death, injury or harm of wildlife by entanglement in

⁴⁷ This would be justified in cases such as an urban golf course whose managers refused to remove unnecessary barbed wire that was killing dozens of bats - despite the offer of a rescuer to do the work to replace the barbed wire strands.

each state. Where people do have legal obligations to avoid harm to wildlife, place this advice and other information on websites, e.g. government and NGO websites, for public access. Seek to have this information displayed also on barbed wire for sale.

Inform landholders of their options & obligations: Each time a rescue is performed or entangled wildlife is observed, provide information to the landholder about the entanglement, the outcomes, problems with their fencing and their options for addressing the problems (including website addresses and organisations from which they can obtain further information). They may also be informed in a friendly way of their legal obligations and requested to take corrective action. Judgement will be required about what approach to a particular landholder is best. A legalistic approach may antagonise landholders and result in worse outcomes for wildlife. Develop template letters and pamphlets for landholders that can be used by wildlife care organisations.

Persuade recalcitrant landholders: If landholders do not take corrective action, legal warnings may assist. As a last resort in some states, third party applications can be made to the court to order that the landholder take action to prevent further entanglements.

Persuade governments to take responsibility: Seek education and enforcement actions from state governments and local governments.

Investigate legal reforms: Investigate ways to improve legislation. For example, propose reforms to welfare legislation, such as the Queensland *Animal Care and Protection Act 2001*, to recognise barbed wire as an avoidable welfare problem. Investigate reform under legislation regulating development to limit the use of barbed wire fences, for example, in codes for various types of development under the Queensland *Integrated Planning Act 1997*. Draft appropriate local laws for local governments and request governments to develop policies and laws on barbed wire use.

7.7 Rehabilitating entangled wildlife

Promote best-practice rescues and care of wildlife entangled in barbed wire.

Publicise rescue options: Publicise contact details for wildlife rescue groups in each region and ensure that local and state governments have correct information to give to people about rescuing entangled wildlife. Where feasible, request property managers with problem fences to conduct daily searches and report entanglements.

Develop rescue & care protocols: Develop rescue and care guidelines for different species entanglements and promote to wildlife care groups.

Collect rescue information: Request all rescuers to record and share information about entanglements, including site of entanglement, species, condition, likely causal factors, and outcome of the wildlife involved. Pictures will be a useful resource. This information can be used to inform the landholder and be added to the entanglements database. For flying-foxes, it would also be useful to record the vaccination status of the rescuer.

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