# Macropod fence injuries

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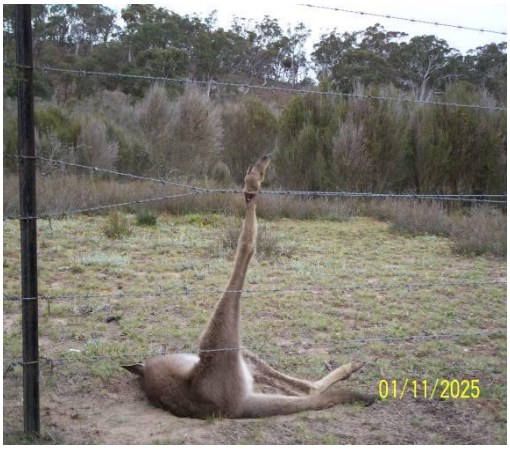
## 1. Introduction:

Increasing urban development, rural subdivision and the continued use of fencing that is unfriendly to wildlife has made it more difficult for macropods to traverse the landscape unhindered. The result is that macropod fence injuries are becoming more commonplace. As this paper demonstrates however, fence injuries may not always be life threatening if the animal is rescued with care, diagnosed and treated properly and given a sufficiently long period for rehabilitation before release back to the wild.

This paper reports on the injuries, diagnosis, treatment and outcomes for 50 consecutive fence injured macropods whose rescue we have been involved with over a five year period. Consecutive animals are reported and analysed to avoid bias in relation to severity of injuries and outcomes.

This paper takes the relational ethical view that all injured wildlife species rescued deserve the same high level treatment and care. Our experience is that rehabilitation of macropods from injury is most successful when there is a relational ethic approaching the 'being-for' ideal (Bauman 1995, Garlick et al 2008) between carer and animal. Questions of animal welfare are not determined by perceptions of numbers, rather they are about being *actively* concerned for another's 'well-being'. Well-being concerns about animals remain whether they are few or many. In the case of animals this well-being is not judged from an anthropocentric or anthropomorphic view or from a casual or episodic encounter, but via a 'being-for' relation based on kindness, respect, understanding and sensitivity – particularly in relation to what is understood by the yardstick of 'suffering' (Derrida, 2008).

**Plate 1: Typical macropod fence entrapment** (Photo: Bill Waterhouse)



The outcomes reported suggest fence injured macropods can have very good outcomes and do not need to be euthanased without accurate assessment

## 2. Outcomes

The 50 consecutive cases used for this paper are categorised by weight and gender in figure one to demonstrate the range of macropod that become injured through being caught in wire fencing. The data relate to some of the rescues we have been involved with here in south-eastern New South Wales and show the range from the small 'at-heel' to the large adult macropod. As might be expected, smaller macropods are the most frequently represented. Perhaps unexpectedly, males are more represented in the larger macropods being caught. Forty nine of the 50 animals reported in this paper are Eastern Grey Kangaroos. One adult 20 kg male Wallaroo was rescued from a fence and is recovering in care.

**Figure 1: Demographic characteristics of fence injured macropods**

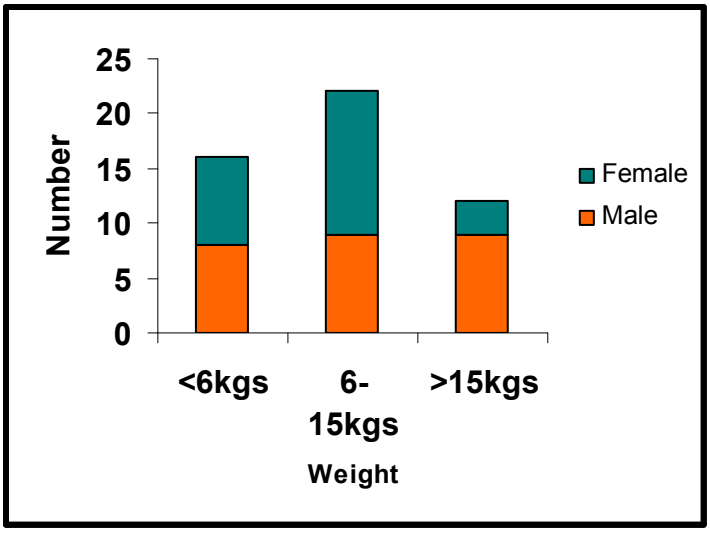



Figure two shows the outcomes from the initial rescue. It shows the number of animals that were brought into care for treatment against those that died or were euthanased within the first 24 hours. The major causes of death or euthanasia were myopathy and hip dislocation accounting for 10 of the 13 deceased animals. Fractures and very severe laceration accounted for the other three animals.

**Figure 2: Rescue outcomes**

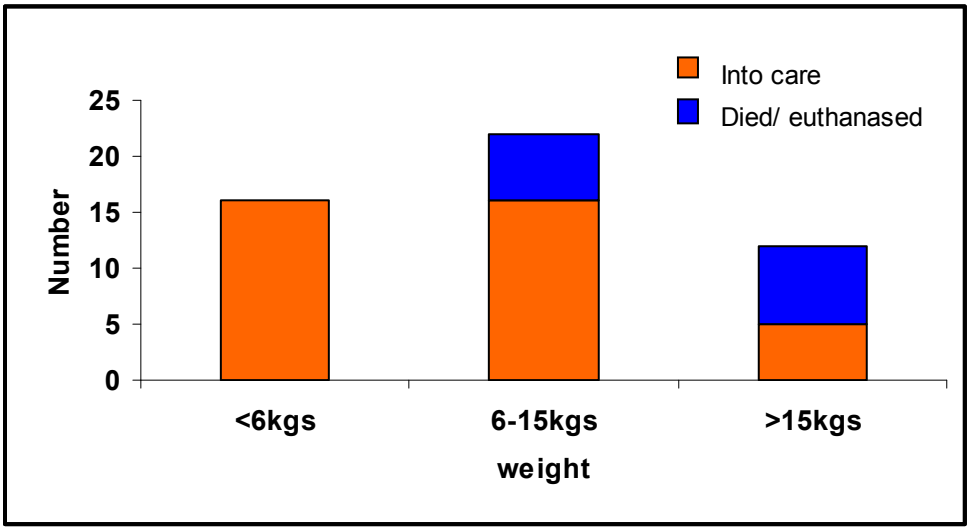



Figure three shows the range of injuries present in the treated animals. The data excludes animals which died or were euthanased soon after rescue. The data show the percentage of cases with lacerations, neurological, tendon injuries, ischaemic injuries, myopathy, fractures and dislocations. All of these injuries are discussed in detail later.

The data show lacerations of varying severity were present in more than 90 percent of all treated fence injured animals. Very severe damage is caused by barbed wire. Neurological injury is also common. Hip dislocation is more common in the fence injured macropod than fractures and tendon damage. Severe ischaemic injury and myopathy are also less frequent but important problems encountered.

**Figure 3: Macropod fence injuries in treated animals**

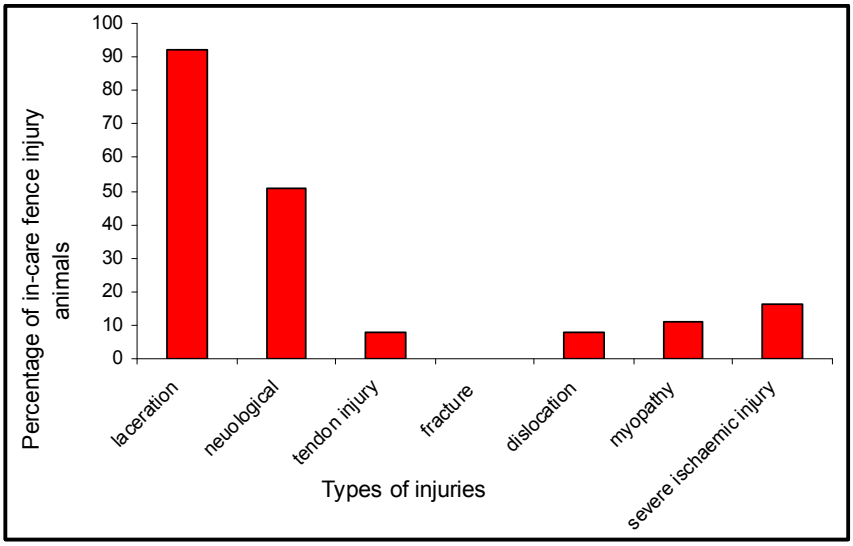
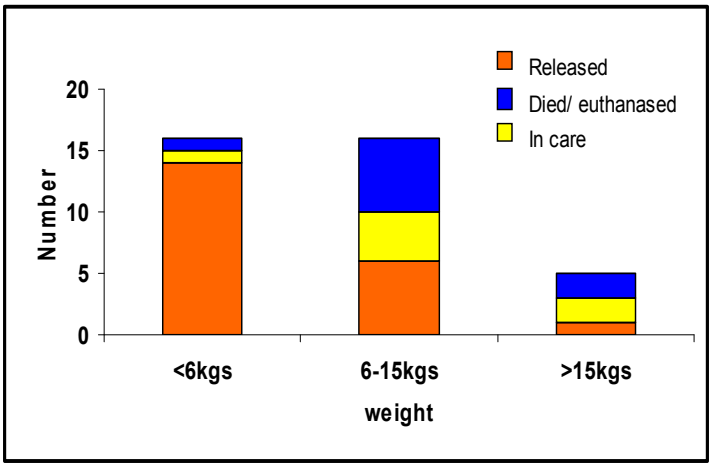


Figure four shows the final outcomes for the animals that survived the first 24 hours after rescue. It indicates a very high success rate for macropods less than six kilograms. All cases in this category survived the fence injury and 14 of the 16 animals in this category have already been released and one is to be released in September.

**Figure 4: Outcomes for treated animals**




* The indicated death in the <6kgs category was unrelated to its initial fence injury

The small macropod are easier to treat because they can be immobilised in their bags and myopathy is less of a problem. Larger joeys and juveniles have a much greater incidence of the life threatening injuries, particularly myopathy and hip dislocation. Five of the six animals in the six to 15kilogram group which were euthanased after coming into care had recurrent hip dislocation and one had myopathy. The two large macropods which died or were euthanased had myopathy.

## 3. The injuries and their treatment

### 3.1 Husbandry

Most fence injured animals are immobile for a considerable time after coming into care. The exceptions are those that have been caught for a brief period and these animals are usually mobile and lacerations are their only injuries.

Housing, nutrition, analgesia and sedation are important considerations. Because these animals are immobile you can very quickly gain their trust. Many of the six to 15 kilogram animals have spent their first weeks of rehabilitation on our living room floor. They are not troubled by domestic noises which they do not interpret as a threat, but as soon as they are taken outside and hear a bird screech they panic. Larger animals have been housed on straw on the garage floor or

in constructed straw bale shelters in an enclosure, which are cool in summer and warm in winter. Bottles of Wombaroo milk and Nutrigel are used as a food supplement.

You can imagine how you would feel if you had been hanging by one leg for hours. Analgesia would be appreciated. Meloxicam (Metacam) is not used because of the high risk of myopathy and consequent renal damage. Paracetamol and codeine (Painstop or Panadine) are useful.

When first rescued, Diazepam (Pamlin) is used for sedation. Recently I have been able to use Fluphenazine (Modecate) to reduce stress in larger macropods (effective three weeks). Wild macropods up to around 12 kilograms enjoy being in a large pouch. Smaller injured macropods only need a bag and bottles of warm milk for stress reduction.

### 3.2 Lacerations

If the fence wire is loose around the leg or foot, the lacerations can be more extensive and ragged. These lacerations do well with good cleaning and suturing to achieve the best closure possible and therefore fasten the healing process. Most fence injury wounds are dirty and therefore a lot of attention needs to be given to cleaning the wound (Plate two). Extensive flushing with saline, lifting of skin flaps and further flushing and removal of debris with tweezers is usually required. Antibiotics, namely Betamox or Baytril (if maggots are present), are used to prevent infection. A significant problem is pressure and ischaemic damage caused by very tight wire (Plate three). Most wounds develop extensive necrotic tissue which needs to be removed and the wounds often take many weeks to heal completely. Betadine and Manuka honey with non-adherent dressings are good wound treatments.

**Plate 2: Lacerations**

Pints at rescue

Typical lacerations caused by fencing

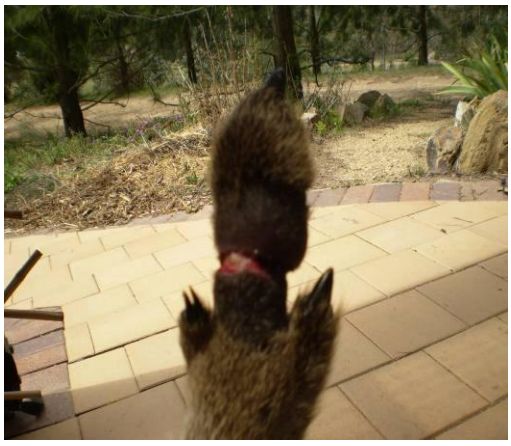
Pints at release

### 3.3 Ischaemic injury

Ischaemic and crush injury are problematic in fence injured macropods. A simple laceration would normally heal quickly and well. However, the tissue which is caught tightly by wire, and sometimes tissue distal to the entrapment site, become necrotic due to ischaemia or crush damage. Most lacerations cannot and should not be sutured as the wounds will literally fall apart as the tissue dies. Regular wound debridement and cleaning is necessary.

Two animals (Reckless and Mirri) we have rescued from fences have lost the main claw and toe after fence entrapment due to ischaemia. I have observed them anxiously after release for several months as their foot became very swollen and then the tissue slowly healed without antibiotics or other intervention. Reckless has now had her first joey and Mirri I suspect will have her first joey next year.

**Plate 3: Ischaemic injury**



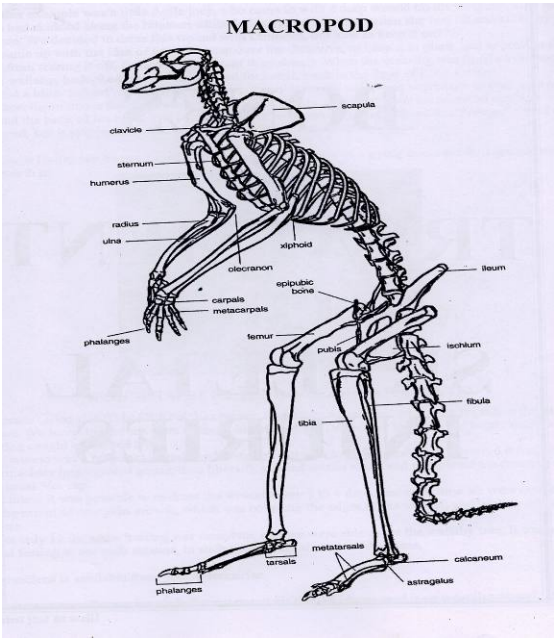
Roy recovered from ischaemic injury, released

### 3.4 Dislocation

Dislocation of the hip is a common occurrence in macropods caught in fences. The hip ball and socket joint in macropods is very shallow and after reduction recurrent dislocation is a major problem. Small macropods which can be contained in pouches do well after reduction. It is important to reduce the dislocation as soon as possible after rescue.

Hip dislocation diagnosis can be difficult. I have found that identifying the three bony prominences as shown in Plate 4 below is an accurate and quick assessment. When the middle bony prominence sits higher towards the back of the animal then it is likely that the hip is dislocated. If in doubt I always get a second opinion from one of our helpful vets. Plate 5 shows three different hip dislocation outcomes.

**Plate 4: Hip dislocation**




Bony prominences in pelvis hip. Hip in position

**Plate 5: Hip dislocation cases**

Ben – euthanased due to re-current dislocation

Lizzie – released

Bingle - released

3.5 Myopathy

Hanging from a fence causes significant muscle trauma and stress. A major cause of death in the larger macropods caught in fences is myopathy. I give Vitamin E/ Selenium injections to all macropods caught in fences. Small macropods get three days of 1 ml per 40kg (0.025ml/ kg). If the animal already appears to have myopathy the dose given is 1ml per 20kgs for five days. Pamlin is used for its anxiolytic, sedative and muscle relaxant properties.

A good indicator of survival is whether a rescued animal will drink water. I have found that animals that will drink after being sedated do well. The consequence of stress is muscle damage

(myopathy). The muscle protein myoglobin is excreted by the kidneys and can cause kidney damage. Fluid is very important in myopathy treatment. Subcutaneous fluids are easy, quick and safe to administer. Using an administration set and an 18 gauge needle several hundred mls can be given quickly without much discomfort. I check the urine with a reagent strip for myoglobin. The combination of daily subcutaneous fluids (normal saline, not Hartmann's), Vitamin E/ Selenium, Pamlin and Modecate and Wombaroo milk has saved a number of macropods with myopathy. They often will not eat, but it is easy to get them to drink a bottle of formula. The animal shown in Plate 6 had just been rescued from being impaled on a barbed wire fence and died about six hours later, likely from myopathy.

**Plate 6: Myopathy**

Large male impaled on barbed wire.
Died soon after rescue from myopathy

3.6 Neurological injuries

Knuckling (Plate 7), does not always indicate tendon laceration. The commonest cause of both 'knuckling' and 'foot drop' is sciatic nerve injury. The other common problem is inability to adduct the leg (bring the leg inwards towards the body). This is caused by obturator nerve injury (Plate 8). Combined with the nerve injury is the muscle weakness caused by muscle trauma and myopathy. Tendons and ligaments are also likely to have been stretched. Consequently progress can be slow and variable.

The usual sequence for recovery from neurological damage is as follows:

- For the first three weeks, the animal rests and eats.
- If injuries are relatively minor, the animal will be determined to hop and a thick bandage or splint is required to protect joints until there is full neurological recovery.
- If the injuries are more severe it can take three to five weeks before the animal can weight bear. It cannot get to a standing position at this stage and will need the support of your hand or a harness to stabilise. Sometimes the animal cannot get the foot flat on

the ground, so standing behind it and putting pressure on the femur is useful physiotherapy.

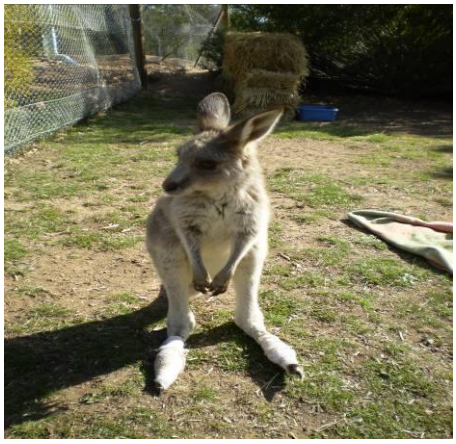
- The next milestone is hopping and falling, progressing to hopping, stopping and maintaining balance.
- The next milestone towards full recovery is getting to the standing position.
- Punting is extremely difficult for the fence injured macropod with nerve damage. This may take several months before it is mastered.

Physiotherapy and splinting to protect joints and bandaging to prevent skin injury are all extremely important in this rehabilitation process (Plate 9). Patience, attention to nutrition, and offering water regularly are vital to good outcomes. Muscle and weight loss are common due to disuse atrophy and the high energy requirements of efforts to get up and hop.

If an animal cannot move the hind legs or tail, please have your vet examine it as soon as possible and note well that urine retention and bladder rupture can occur with spinal injury. A fence injured macropod should be checked by a vet to exclude fracture, dislocation or spinal injury prior to treatment of other injuries and rehabilitation.

**Plate 7: Knuckling**

Slim – knuckling after rescue



Slim – thick bandage to protect joint and skin. Released

Lilly - released

**Plate 8: Adduction difficulty**

Andy – Adduction difficulty. Released

**Plate 9: Splinting**

Smuggles and Muffie – sciatic nerve injury causing foot drop. Both in care

3.7 Fractures

Only two of the 50 cases had fractures (one femur and one metatarsal) and both were euthanased. The foot fracture was in a large adult male with severe lacerations. Because of the high success rate we have had in treating foot fractures in MVA macropods, I would treat foot fractures in small fence injured macropods.

3.8 Tendon injuries

Tendons can be lacerated by the wire itself or in some cases rupture subsequently due to ischaemic and crush damage. The tendon injury is often associated with sciatic nerve palsy. The knuckling improves with time and the metatarsophalangeal joint and dorsum of the foot are protected by a splint or thick crepe bandage and vetwrap during the healing process. An excellent and versatile splint material is the SAM splint available from St Johns Ambulance. This is a light metal splint encased in a soft foam material and can be cut to the appropriate size. Soffban is always used under splints and splints and bandages always checked for appropriate tightness.. Vetwrap can be an especially dangerous material if wrapped too tightly causing poor blood supply (ischaemia) to distal tissues that have already been compromised by poor blood supply during fence entrapment.

Animals with tendon injuries have a lot of difficulty with punting but by the time they are released are able to hop extremely well.

## 4 Conclusions

Many fence injured macropods are euthanased unnecessarily. Accurate diagnosis, the correct treatment and time to fully recover give good outcomes. In the 50 consecutive cases reported in this paper, 100 percent of the less than 6 kgs joeys recovered from their fence injuries. Myopathy, hip dislocation and long bone fractures carry a poor prognosis. If the animal survives myopathy in the first 24 hours then treatment can be successful.

At the current slaughter rate Eastern Grey Kangaroos are predicted to reach zero population by 2010. In the future, every success with an injured macropod could help the species survive the damage being done to them by unthinking and cruel human action. Hopefully they will not go the way of the Passenger Pigeon.

## 5 Acknowledgements

Thank you to kind and excellent veterinarians Dr Hamish Cameron, Dr Brett Jones and Dr Howard Ralph who have treated animals for me and taught me many aspects of diagnosis and treatment. Thank you to physiotherapist Glenda Ralph for her advice on animal rehabilitation. Thanks also to carers Glennis Koorsman and Robyn Kibblewhite. Most of all thanks to my husband Steve who is an equal partner in every aspect of our work with native animals. Slim (Steve's Little Miracle) is testimony to his knowledge.

This paper is dedicated to the 514 kangaroos which were slaughtered brutally and unnecessarily at Belconnen in the ACT and to the kind people who tried to help them.

## 6 References

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