
Challenges in making an accurate assessment of burnt wildlife

By Dr Anne Fowler BSc(Vet)(Hons) BVSc MACVSc (Avian Health)

Introduction

There is a strong desire to be able to perform an accurate assessment of burnt wildlife. This will permit triage so that the animal obtains appropriate treatment. It permits the compassionate euthanasia of wildlife that has been burnt too severely to survive. It allows the estimation of the time that an animal may take in the rehabilitation process.

However, there are difficulties with assessment that can involve the challenge of being familiar with the normal behavior of a diverse variety of species, and the challenges of determining the depth of the burn.

Difficulties with performing an accurate assessment

There are a number of difficulties with being able to accurately assess a burn throughout its course:

- **Lack of knowledge of the normal behavior of the animal** can make assessment difficult. However, wild animals are just that – wild. Any animal that permits a human to approach is an animal that requires assessment. The rescuer needs to remember that they are perceived as a potential predator by the animal.
- **Different animal shapes.** This makes the calculation of the extent of the burn difficult as surface area calculations have not been made for all species. Fur or quills hide the extent and depth of the burn.
- **Lack of experience with burns and wounds.** It does take time to become familiar with the landmarks of the different levels of burns in the skin layers. Veterinary assistance is warranted to help in the assessment of burns. As a consolation, even medical staff working in burns units do not get it right all of the time!
- **Contamination of the burn** by debris making fire-ground assessment difficult. Burnt animals need to be removed from the fireground and taken for a thorough initial assessment where the soot, burnt hair, dirt and leaves are removed.

- **Depth of the burn** may take several days to become apparent. The central zone of necrosis where the burn is at its deepest is often most easily visible. But consideration for how far the burn extends beyond this zone can take some time to appreciate. It may require further cleaning and clipping hair to find the edges of the burn.
- **Compassion fatigue.** Fires are a traumatic time for rescuers. The fireground can be a depressing place where many bodies are found. There is a strong human desire to then save whatever is found to still be alive. Objectivity is lost. However, the primary aim of good assessment is to find the very few animals that can be saved. For the majority, assessment will reveal that a compassionate euthanasia to end pain and suffering is the best choice for the individual. Many animals will be assessed on the fire-ground or at the staging area as having burns that are too severe. Others will enter care only to be euthanased in the first fortnight as the true extent of the burns become apparent.
- **Time.** The greater the time between the fire and the animal being assessed may mean that secondary infections or other systemic problems will have altered the appearance of the burn or the animal.
- **Numbers of animals.** In some situations, where there are a large number of animals, the stress to feel that there are more animals to examine can lead to a perfunctory examination. However, each individual needs an accurate assessment of the burn at its initial assessment.
- **Difficult in ‘making the call’.** For a variety of reasons, an animal may pass its initial assessment. Subsequent re-evaluations may make it clear that the burns are worse than originally thought. It can be challenging to be the person who gets to decide the fate of an animal. Whenever there is doubt, veterinary opinion should be sought.

Assessment at a distance

The key concept with assessment at a distance is to have a knowledge of the normal behavior of the animal species. This has been a challenge as often the cadet of rescuers on fire-grounds have had limited background in observing both healthy normal and sick animals of the variety of species expected to be seen.

Equipment that will assist in the distant assessment include binoculars to permit a close examination of the animal without approaching within its natural flight distance.

Table 1: Normal and abnormal behavior of wildlife in response to human approach

Species	Normal behaviour	Abnormal behaviour
Koala	Climbs tree when approached Walks quickly across open ground	Sits at bottom of tree Does not climb up tree when approached Walks tentatively or not at all
Kangaroo, red-neck wallaby	Hops quickly away when approached within 50m Will stop and look back after hopping a short distance	Unable to move away when approached. Gait is slow, uneven Altered weight bearing by limbs
Swamp wallaby	High level of vigilance Will move into denser bush upon approach	Able to be approached, reluctant to move
Wombat	Heads quickly for burrow when approached Grazing in at dusk/dawn and active at night	Found grazing during the daytime Gait may be slow
Echidna	Digs down quickly when approached and should be able to be partly submerged and difficult to lift out of soil	Reluctant to dig, unable to dig down, altered gait.

Assessment of the entire animal

Fire brings out all age classes of animals. This is unlike the typical scenario for injured wildlife that are commonly dealt with by wildlife carers, where most of the animals are young: orphaned joeys, birds or young animals having accidental injury during their dispersal.

The animal must be assessed on:

- **Age:** advanced old age requires euthanasia. For possums and koalas, tooth wear gives a good indication of the age of the animal. Elderly animals with advanced tooth wear will be unable to gain sufficient nutrition to accommodate the several times increase in metabolic rate that is imposed on the body by burns. These animals will lose weight and slowly starve in care if permitted to start the rehabilitation process, which a concerns for their welfare.
- **Concurrent injury.** Wildlife may be injured in the act of being caught for assessment. Wild animals will seek fresh grass and water in drains next to roads during dry summers and fires. This places them at higher risk of vehicle injury. The animal needs to be assessed on a individual basis in light of the severity of the injury. Blindness, broken jaws, broken spines and open leg fractures may all preclude the treatment of burns on that individual.

- **Presence of disease.** In the example of koalas, an assessment of the presence of underlying disease, such as Chlamydiosis must be made. This may involve female koalas undergoing an abdominal ultrasound under anaesthesia with a veterinarian to determine if paraovarian cysts are present. Chlamydiosis places an increased metabolic demand on the individual and is likely to flare up in the stress of captivity. An infected animal may easily spread the disease in the situation where many debilitated koalas are housed in close proximity.
- **Degree of shock.** As shock leads to the reduction of blood to the skin where the burn is situated, determining the severity of the shock is important. This may have implications for initial triage, and may delay the assessment of burns under anaesthesia until the shock has been addressed with warmth and fluids. Shocky animals may be weak, have cool extremities, and be poorly responsive to handling.
- **Level of dehydration.** This will provide an idea of how much fluid the animal requires, and possibly how long additional rehydration is required. The skin of the animal is pinched between the forefinger and thumb to determine the degree of dehydration.

Table 2: Different levels of dehydration

Degree of dehydration	Appearance	Treatment
5%	Dry tacky mouth when touched with finger, No skin tenting	Warmed oral electrolytes Free access to water
8%	Tented skin returns to normal over 1-2 seconds. Pinch the skin over the head of a koala, Pinch the skin in groin of wombat, and; Pinch over the shoulder blade for possums and kangaroos.	Free access to water Warmed oral electrolytes Subcutaneous fluids
10-12%	Skin tents for greater than 2 seconds, cold limbs, heart rate is slowing down This stage is very hard to reverse, even with intravenous fluids	Intravenous fluids given by a veterinarian Warmed oral electrolytes if swallowing Subcutaneous fluids
15%	Skin remains tented for longer than 3 seconds. Slow heart, low body temperature The animal is very close to death	Euthanasia

Assessment of burns

The depth of the burn

This has been described as first, second and third degree burns. This has led to confusion amongst lay-people. However, the terminology below is more descriptive and able to be understood by people without training in burns.

Superficial burns: (first degree burns) involves the outermost layer of the skin (epidermis).

- This is very painful.
- The skin is red, but not blistered.
- The skin blanches when pressed
- A pin prick will result in bleeding and sensation

The best example of this burn is when you burn yourself on a hotplate. It is uncommon that this burn is seen in wildlife. It tends to be seen in flying foxes with electrocution burns to their wing membranes. Bird skin does not blister as prominently as mammalian skin as it lacks collagen, so superficial burns are missed.

Partial thickness burns: (second degree) involve the deeper levels of the skin.

There are two levels of partial thickness burns:

Superficial partial thickness:

- Extends from the epidermis into the mid-dermis
- The skin blisters but will heal within two weeks without scarring.
- The skin may be red, swollen, and the surface may be dry
- Hair regrowth is likely as the skin follicle is spared
- Very painful
- There is brisk bleeding on a pin prick

Deep partial thickness:

- Involve the epidermis and a varying amount of dermis.
- The skin is blotchy with red or white areas.
- Hair follicle is lost
- Blisters may be present but are often not seen in wildlife due to the time taken between the burn and rescue causing the blisters to rupture with movement.
- Oedema of the skin and severe inflammation are seen.
- Nerves have been destroyed, so it is not painful.
- There is slow bleeding on a pin prick.
- There is no blanching to applied pressure.
- This burn heals by migration of skin from the edges

- This burn will take 2 – 4 weeks to heal with possible scarring.

Full thickness burn:

The full depth of skin is destroyed by the burn. There are no hair, nerves, or blood vessels left. The burn may extend to the tissues below. So fat, muscle and fascia may be affected by the burn.

- Dark brown, insensitive, leathery covering (eschar) on the burn
- The fur in adjacent areas appears scorched
- There is no blanch to pressure applied to the area
- There is no pain to a pin prick, and possibly no bleeding.

This depth of burn will take at least 2 – 4 weeks to heal

Escharotomy which involves cutting away the dead skin and suturing fresh edges together may be required for areas of skin with full thickness burns. This can be done around the 5th day. It requires general anaesthesia and is performed by a veterinarian.

Euthanasia

The assessment of burnt wildlife will lead to the realization that some individuals will have sustained damage that is unable to respond to rehabilitation and treatment. Thus euthanasia is required.

Some of these conditions include:

- Rupture of eyes due to thermal injury;
- Burns to more than 20% of the body;
- Smoke inhalation that does not respond to treatment;
- Burns to the mouth and throat;
- Deep burns where loss of digits or feet occurs;
- Burns to the tail where amputation is required for arboreal animals;
- Animals with moderate burns with secondary problems that preclude successful rehabilitation;
- Burns to the face such that eyes or mouth cannot close;
- Burns to genitalia and cloaca where urination, defaecation or mating will be affected.

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References

- Fowler A. Assessment and Treatment of Burnt Wildlife, 2008

- Devgan et al. Modalities for the assessment of burn wound depth. *Journal of burns and wounds*, 2006
- Garvey et al. Survival behaviour of swamp wallabies during prescribed burning and wildfire. *Wild Res*, 2010, 37, 1-12