


Dealing with livestock affected by the 2014 bushfires in South Australia: decision-making and recovery

Dr Jeremy Rogers, Trent Scholz and Amelia Gillen, Primary Industries and Regions, share the findings of recent treatments to save livestock after bushfires. 

ABSTRACT

Primary Industries and Regions South Australia (PIRSA) staff are called on to assist in assessment and management of livestock affected by bushfires in South Australia. Methods and circumstances of euthanasia or treatments and decision-making at times of high stress can be complex with many variables. Some surviving animals will require monitoring and treatment. This paper describes the success rates and treatments in four cases in South Australia. It is helpful to advise producers of previous experience and results and give a qualified prognosis, especially when there is a temptation to destroy large numbers of livestock where some could be saved. There are significant psychological benefits for producers and communities when animals can be saved from being destroyed and some hope for recovery is given. Decisions involving euthanasia or management and treatment are made from day one through the weeks following a fire, but there are opportunities between days seven and ten for very effective medical and management intervention.

Background

Serious fires involving large livestock casualties occur approximately every ten years in South Australia. Internal reports following these fires address operational aspects but rarely decision-making processes, assessments and prognosis after treatment.

There are some Australian papers published on this subject, and some state agriculture websites that give information to producers and advisors, but the published information on Australian conditions is limited. Since large bushfire events only occur infrequently, lessons from the past may be forgotten. McAuliffe, Hucker and Marshall (1980), Carroll (1979),

and Hart (1986) published papers that reflect similar observations and are useful historical references.

In the summer of January–February 2014 there were five major fire events in South Australia and a number of livestock were affected, particularly at Eden Valley and Bangor. The majority of losses occurred when managed fires suddenly turned after an unpredicted change of wind direction, catching out producers who had believed that their stock were in protected locations. Case studies from these events show that medical treatments such as injectable and topical analgesics and antibiotics are available at moderate cost and these should be included in the assessment and prognosis mixture, where possible. Gee (1986) noted that long-acting antibiotics improved recovery and success rates in some sheep when given on a second follow-up visit to hospital mobs.

Method

This paper discusses some of the factors involved in decision-making by owners and advisors, and how decisions may be weighted in various situations. The lists and discussion are the conclusions of the authors and as a result of experience as firefighters and veterinarians, and following extensive debriefings with colleagues.

Fire response arrangements in South Australia

In South Australia the bushfire season is between November and April, with occasional serious fires outside of these times. Major bushfires tend to occur in January and February and property owners are advised to develop plans for livestock and property.

After and during a large fire event there is often confusion about who may be responsible or available to assist landowners in the assessment, treatment or euthanasia of animals. Concurrently there is often an outpouring of offers for assistance from professionals and concerned public. This situation can lead to confusion and sometimes inappropriate actions by well-meaning, but untrained or inexperienced people (Australian Veterinary Association).

PIRSA has the lead role in assisting and co-ordinating activities for livestock on properties affected by emergency events, including bushfire. Wildlife, pets and horses may also be included, and these animals may be assisted by other agencies. At times there is an overlap of roles and this requires managing, particularly in peri-urban areas (RSPCA Victoria). Decisions made by property owners about their livestock depend on a number of factors that may be unique to the owner, property and area. PIRSA has a key role in assisting property owners in the decision-making process and providing competent professional and timely advice. PIRSA also manages initial recovery activities such as emergency fencing, fodder and water supplies, and the collection and reporting of data on agricultural losses.

Psychological aspects

In the aftermath of a serious fire event the psychological health benefits to producers and their families of receiving some assistance, and some hope of survival for their animals, is greatly appreciated. This factor has been noted by earlier authors (e.g. Willson 1966, and Jenner 2007) who have been veterinary practitioners in rural communities. About seven to ten days after the fire event landowners may discover livestock they had overlooked, or may find damage to hooves and teats that was not previously obvious. By this time most firefighting efforts have stopped, people are exhausted, and the magnitude of loss can have a severe impact.

Dianne Phillips, Department of Environment and Primary Industries, Victoria states,

‘Another part of this equation is the transition in the owner’s mental state from the initial impact, where they really feel that they don’t have the time, energy or resources to deal with injured livestock; to that period a week or two later when they feel like they are getting a handle on it.’ (personal communication, Dianne Phillips DEPI Victoria 2014).

In contrast Gee (1986) noted that producers dealing with hospital mobs, where they had to continually revisit and destroy some animals over a prolonged period, found the process mentally very hard, and he reported he would have been ‘less lenient’ in some of his decisions to retain stock in hindsight.

Although not on the scale of the Victorian Black Saturday bushfires in 2009 where up to one million animal deaths may have occurred (RSPCA Victoria), the series of fires in South Australia from January to March 2014 was significant. Table 1 shows the livestock losses and Figure 1 shows the location of the large fires.

How decisions are made

Each property, person, event and situation will have a number of determinants about how decisions are made. Although the primary objective in the first stages of response is to deal with animal welfare considerations, other factors such as safety on a fire ground, owner psychological health and wellbeing, and

Table 1: Livestock losses in South Australia fires, January–March 2014.

Fire location/ name	Dates	Cattle and other	Sheep
Bangor	Feb–Mar 2014	80	1 800
Eden Valley	Feb 2014		2 700 ^a
Kiana (Eyre Peninsula)	Feb 2014	20	600
Rockleigh	Jan–Feb 2014		340
Clare	Jan–Feb 2014		40
Totals		100	5 480

a Including sheep salvaged by slaughter.

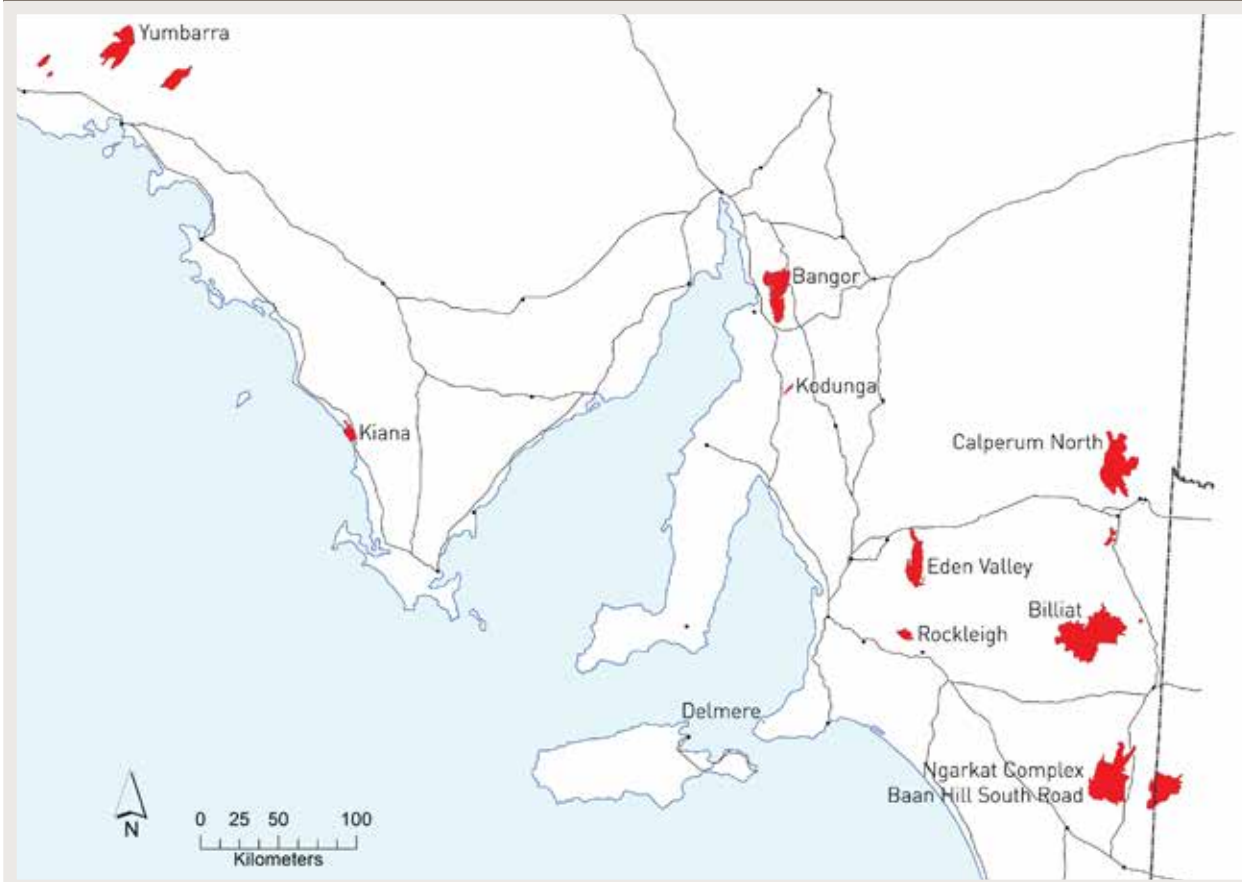
disposal options for dead or destroyed stock may be significant considerations.

Generally there are ten factors that influence decisions for treatment or destruction of fire-affected livestock immediately after a fire (one to ten days). These are:

1. scale of the event; is it unknown, large, medium, small
2. availability of PIRSA and other assisting resources such as experienced staff, vehicles, access, equipment, communications (also consider distances involved and time delays)
3. availability of owner or farmer resources such as holding yards, paddocks, feedlots, fences, sheds, water and food, shelter, time and labour, interest and ability, finances, medications and treatments
4. value of the stock, including the type (species), genetics, sex, age, emotional value¹, number involved, insurance cover²
5. ability and opportunity to examine stock, particularly where stock may be burnt in parts of the body that are difficult to see without close individual inspection
6. timing of decision-making; is it immediately after the event, within a few days, one week, two weeks
7. weather and forecasted weather
8. animal prognosis with or without treatment, which includes treatment or inspection frequency and the long-term prognosis
9. other options such as salvage slaughter and agistment
10. disposal options such as a need to wait for a short period until some livestock are destroyed. Badly injured animals must be destroyed immediately, but less severely damaged animals may need to be retained until suitable disposal options are available.

1 The emotional value of animals to their owners can be hard to quantify. Pets for example maybe dealt with in a very different way to commercial animals, and most livestock producers have empathy for their livestock. In addition, delaying a decision to destroy animals can have either a negative or positive value depending on the circumstances.

2 If livestock are insured this may affect the owner’s decision-making. Careful records of conversations and numbers of animals destroyed should be kept in these circumstances.

Figure 1: Map of South Australia's southern coastline where major fires occurred January–February 2014.

What decisions to make

Making decisions will be highly variable depending on the individuals and the factors listed. Most PIRSA inspectors attempt to categorise affected animals into 'unaffected', 'mildly affected', 'severely affected', and 'very severely affected' groups and deal with these groups accordingly. Much will depend on the first three factors in the previous list but some producers following large fires simply do not have the time or resources to care for even slightly affected animals.

There are excellent resources available to guide the initial assessment following a fire, for example 'Assessing sheep after a fire'³ on the Department of Primary Industries website and similar documents on other Australian state government websites. PIRSA has a brief assessment checklist as part of its *Bushfire Plan for Sheep* and Braddon (2015) has a summary table offering more detail. Breeding animals (e.g. rams and ewes) should be assessed with respect to their ability to breed and damage to genitalia. These guides are useful particularly immediately following a fire, but they become less useful as time goes by, particularly if food, water, shelter and appropriate pasture are available. By day ten after a fire a different matrix should be developed that includes some treatments. By this time

most severely affected animals will have died or been destroyed and producers need assistance to evaluate stock survivors. At this point the list of factors might include:

- the scale of the event
- available facilities such as food, shelter, and yards
- medical treatments available and likely prognosis
- labour availability
- weather conditions
- psychological considerations for producers.

Who makes the decisions

An automatic response to this might be: 'the producer', but often this is not the case. People in high-stress situations are guided by advice from a trusted source and may not act wisely, and the source may not have appropriate knowledge or experience or awareness of all factors. Decisions taken by untrained people may result in needless destruction on one hand and unnecessary suffering on the other (Willson 1966) Animal welfare can be open to differing interpretation and can be ameliorated by treatment options and some experience is required to find the right balance between clear and quick decisions, and postponing decisions to a later time.

³ Assessing sheep after a fire. At: www.depi.vic.gov.au/fire-and-emergencies/recovery-after-an-emergency/livestock-after-an-emergency/assessing-sheep-after-a-bushfire.

Case studies

No resources for hospital mob

A producer with a large number of sheep had the entire grazing property burnt and most yards and fences were destroyed. Sheep were mustered and confined to temporary yards and drafted according to visual signs of fire damage. All affected sheep were destroyed (over 100) as the owner did not have the time, willingness, or resources to establish a hospital mob. Some affected sheep had mild lesions. In this case, although much could have been done to treat and salvage some sheep, conditions, resources and economics did not allow this. This process is more common in rural areas that involve large numbers of sheep, where extensive amounts of land are burnt, and there are fewer options for transport and agistment.

Treatment saves injured sheep

A producer in the Murray Bridge area with approximately 200 surviving, young, pregnant merino ewes was able to move them to an unaffected area where food, water and shelter was available. A number of injured sheep had been destroyed by the producer and he had drafted 60 affected sheep out of the main mob one week after the fire believing that most would require destruction. The producer was quite despondent as these were valuable young sheep and would have a major impact on his livelihood. No insurance was available. An inspector looked at 60 sheep and although many had severe burns to their legs, inguinal areas and perineum, only 16 were selected for treatment using analgesics, antibiotics and topical treatments of emollient cream, disinfectant and fly repellent. The remaining 44 sheep were released with instructions for the owner to closely monitor them. The owner reported that the treated sheep appeared much improved within 24 hours of the treatment. Retreatment of other animals occurred in decreasing numbers over the following two weeks with only two sheep being destroyed while the rest recovered fully.

At shearing time the owner reported that sheep that had been burnt were difficult to distinguish from those not burnt, and most had produced and were rearing lambs.

Small minority may survive even without treatment

A producer with 200 young ewes was absent from an agistment property at the time of the fires. PIRSA staff attended after notification by the Country Fire Service and members of the public. They found 68 badly affected sheep that were destroyed immediately. Only 16 of the original 200 sheep survived without any attention even though affected by the fire, although they were provided with food and water. The sheep could not be mustered for treatment as no facilities were available. This demonstrates that some sheep will survive with minimal attention. However, survivors should be closely observed and sheep that are not recovering should be humanely destroyed.

Nursing calves protect heifers' teats

A farm had 15 pregnant Santa Gertrudis stud heifers suffer mild to severe burns to teats and udders after standing on burnt ground that was still hot, although not hot enough to damage their hooves. Cows with calves-at-foot in the same group did not suffer damaged teats and the owner attributed this to the fact that nursing calves protected the teats. The heifers were moved to an agistment property and inspected ten days after the fire. Topical cream was applied liberally to affected areas. The owner originally thought that all the animals would need to be slaughtered as the teat damage appeared too severe. However, after two weeks and two topical treatments, all the heifers had improved. Later, seven of the 15 heifers successfully calved and were able to rear their calves. These reflect the results previously described in the literature (Morton *et al.* 1987).

What kills livestock in fires

Animals and humans are damaged in fires from three main sources:

- radiant heat producing death or significant burns
- smoke and heated gas inhalation
- shock, pain, tissue necrosis, dehydration and multi organ failure.

There is often a combination of these factors and each can occur to different extents or severity. Smoke inhalation can kill or severely injure without much apparent burn injury and may affect some species (such as equines) more than others (Madigan 2011).

Most severely affected animals will die or need to be destroyed within the first 12 to 72 hours after the fire. This would be due to severe burns to the head and limbs, animals being recumbent (unable to stand), and those that are reluctant to move or unable to access feed and water.

Conclusion

The four case studies illustrate that there is no simple formula for making decisions about individual animals or groups of animals in the period seven to ten days after a fire. Decisions and advice should be given carefully after an inspection of the livestock. This can be problematic depending on facilities available. Simple

decision-making matrices may be helpful immediately after a fire event, but should be interpreted with care. Some decisions about euthanasia need to be made quickly and without the benefit of complete examinations as animals may be unrestrained. Other euthanasia decisions are obvious for animals that are moribund, recumbent, or have damage that is unlikely to be treated. At other times even mildly damaged livestock may need to be destroyed when the owners do not have the capacity to care for or treat them. Often the farm infrastructure will be damaged to the extent of making care in the short-term very difficult.

Whenever PIRSA staff are involved in the euthanasia of animals in fire events, careful records of the conversations with producers and the numbers of animals involved are kept. Since euthanasia is an irreversible decision, it may be wiser to postpone this decision at times when animal welfare and circumstances permit, at least for a proportion of the animals involved. In the immediate aftermath of a serious fire there is sometimes a tendency to destroy even mildly affected livestock, without close examination, or consideration of other options. Obviously these decisions rest on the premise that there will be responsible management of these animals, and appropriate care in a safe location.

New topical analgesics are becoming available at a modest price, and pain relief for burnt livestock appears to be an area that has been underserved in the past, and has the potential for great benefits and improvements in survival rates.

Treating animals need not be costly or complex but this option does require appropriate feed, water, shelter and facilities to be available and a proportion of livestock that do survive may be unsuitable for breeding. However, there are good benefits to producers and their families from offering some hope for some animals after a traumatic event when so much damage has been sustained. When producers see animals recovering from injuries with relatively minor treatments, it gives them great encouragement.

References

- Braddon E 2015, *Response to bushfires: NSW perspective. Proceedings of the Combined Australian Cattle Veterinarians & Australian Sheep Veterinarians Annual Conference, Hobart 2015*, pp. 66-69.
- Carroll SN 1979, *Some observations on the destruction or treatment of burnt stock in the wake of bushfires. Veterinary Inspectors of NSW 1979 Conference Proceedings. 62nd Annual conference pp. 85-89. At: www.flockandherd.net.au/archive/1986%20Proceedings/pages/image93.html*.
- Dianne Phillips, Regional Veterinary Officer, Bairnsdale. Department of Primary Industries and Environment, Victoria, editorial comments and advice.
- Gee CD 1986, *Involvement of veterinary inspectors in bushfire situations. Veterinary Inspectors of NSW 1986 Conference Proceedings. 69th Annual conference pp. 259-271. At: www.flockandherd.net.au/archive/1986%20Proceedings/pages/image261.html*.
- Hart KG 1986, *Bushfires – Administration and Lessons. Veterinary Inspectors of NSW 1986 Conference Proceedings. 69th Annual conference pp. 259-271. At: www.flockandherd.net.au/archive/1986%20Proceedings/pages/image273.html*.
- Jenner, M 2007, *The psychological impact of responding to agricultural emergencies. Australian Journal of Emergency Management vol. 22, no. 2, May.*
- McAuliffe PR, Hucker, DA & Marshall, AN 1980, *Establishing a prognosis for fire damaged sheep. Australian Veterinary Journal vol 56, March.*
- Madigan J. *Wildland fire and livestock-Preparedness and response-including approach to mass casualty scenarios. Proceedings of the AVA Annual Conference, Adelaide 2011.*
- Morton JM, Fitzpatrick DH, Morris DC, & White MB 1987, *Teat burns in dairy cattle – the prognosis and effect of treatment. Australian Veterinary Journal vol. 64, no. 3, March, 1987.*
- Willson RL 1966, *Assessment of bush fire damage to stock. Australian Veterinary Journal vol. 42, April.*
- NSW Department of Primary Industries 2013, *Assessing bushfire burns in livestock. January 2013 Primefact 399 second edition. At: www.dpi.nsw.gov.au/agriculture/emergency/bushfire/animals/assess-bushfire-burns-livestock*.
- RSPCA Victoria 2009, *Submission to the 2009 Victorian Bushfires Royal Commission. At: www.royalcommission.vic.gov.au/Submissions/SubmissionDocuments/SUBM-002-021-0245_R.pdf*.

About the authors

Dr Jeremy Rogers is a Senior Veterinary Officer with PIRSA. His role includes managing the Bovine Johne's Disease Program, disease surveillance and emergency management training and responses. Jeremy has been a Country Fire Service volunteer for 20 years.

Trent Scholz is an Animal Health Officer with PIRSA, based at Port Augusta. He has attended the aftermath of a number of large bushfires in Victoria and South Australia. He works on various animal health and disease surveillance programs in regional and remote SA and is a member of the Country Fire Service.

Amelia Gillen is an Animal Health Officer with PIRSA based at Murray Bridge. Amelia's work involves disease surveillance, regulatory activity at saleyards, and emergency animal disease preparedness and training. Amelia has been a member of the National Rapid Response Team for two years, and is a member of the South Australia First Response Team.