

## Fireworks and animal welfare

Fireworks are used by people throughout the year to mark different events, e.g. Bonfire Night, New Year, Chinese New Year, Diwali, etc, and at private events such as weddings. While they can bring much enjoyment to some people, they can cause significant injury, problems and fear for other people and animals. The RSPCA therefore supports measures which will help ensure people can enjoy fireworks responsibly while mitigating potentially significant animal welfare problems for pets, horses, farm animals and wildlife.

Fireworks can be a source of fear and distress for many animals. In particular the sudden, loud noises that many fireworks make can cause fear. For example, it is estimated that 45% of dogs show signs of fear when they hear fireworks<sup>1</sup>, and a New Zealand survey recorded 79% of horses as either anxious or very anxious around fireworks or over the Guy Fawkes period<sup>2</sup>. Animals affected not only suffer psychological distress but can also cause themselves injuries, sometimes very serious ones, as they attempt to run or hide from the noise.

Although most reports of welfare problems caused by fireworks relate to domestic pets, other animals can also experience fear, distress and/or injury as a result of them. Horses and farm livestock are easily frightened by loud noises and sudden bright lights and can be at risk of injuring themselves on fencing, farm equipment or fixtures and fittings within their housing if startled.

Furthermore, the location of a fireworks display should be selected carefully to avoid setting off fireworks near any known group of wild animals, such as lakes with waterfowl or known nesting sites in the spring and summer. Debris produced by fireworks can also pose a hazard to horses and farm livestock if found on the land and also cause disturbances to wildlife.

There is widespread public concern about the effect that fireworks can have on animals and the RSPCA receives hundreds of calls about them every year. The peak months for calls (in order of numbers of complaints) are November, October, January and December. For example in 2018 we received 411 calls from people concerned about fireworks. The total number of calls in 2018 represents an increase of 12% from in 2013. We acknowledge the figure fluctuates from year to year, but on average the RSPCA receives around 400 calls a year on fireworks in England and Wales.

Table 1: Total number of calls received by RSPCA each year concerning fireworks

	2018	2017	2016	2015	2014	2013
All calls	411	501	434	514	425	367
England	362	474	388	452	381	339
Wales	37	24	37	38	27	26

In addition to this a number of animal welfare charities have noted they see an increase in public and supporter concerns about fireworks. For example the Blue Cross has said they see a marked rise in the number of pets brought to their clinics requiring medication during periods when

<sup>1</sup> Blackwell, E., Casey, R., & Bradshaw, J. (2005). Firework Fears and Phobias in the Domestic Dog. Scientific Report for the RSPCA, University of Bristol, UK

<sup>2</sup> Gronqvist, G, Rogers, C. & Gee, E. (2016). The Management of Horses during Fireworks in New Zealand. *Animals* 6(20).

fireworks are being detonated<sup>3</sup>. The PDSA did research on this issue through their annual Wellbeing report<sup>4</sup>, finding that 51% of veterinary professionals had seen an increase in pets with phobias (e.g. of fireworks, etc) in the last two years, 40% of dog owners said their pet is afraid of fireworks and 83% of veterinary professionals agree that fireworks should be regulated to allow use only for licensed events or on certain dates.

Aversive stimuli, such as loud noises, that are unpredictable and out of an animal's control - as is the case with fireworks - are particularly stressful for them<sup>5</sup>. Being unpredictable, as well as intermittent and relatively infrequent, also makes it unlikely that animals will acclimatise to firework noise<sup>6</sup>.

Some research has been carried out looking at the impact of noise on animals, in particular farm animals. We understand that unexpected loud or novel noises can be highly stressful to livestock<sup>7</sup> and that animals are more sensitive to high frequency noise than humans<sup>8</sup> <sup>9</sup>. It is generally accepted that intermittent noises can cause more welfare problems than general background noise, for example it has been found that novel noises ranging from 80-89 dB increased the heart rate in pigs<sup>10</sup> and prolonged exposure to noise levels above 100 dB increased the respiration rate in lambs<sup>11</sup>. As such the Welfare of Farmed Animals Regulations state - in both England and Wales - that pigs must not be exposed to constant or sudden noise and noise levels above 85 dB must be avoided where pigs are kept<sup>12</sup>.

Horses in particular take flight when scared and can collide with fences, the interior of buildings, and other harmful objects as they flee. In a survey on the management of horses during fireworks in New Zealand, running was the most frequent response to fireworks reported, and 35% of respondents reported horses breaking through fences. 26% of respondents reported their horses had received injuries due to fireworks, ranging from lacerations, strains and sprains to most serious of all, broken limbs (7%), an injury which most usually results in euthanasia<sup>13</sup>. The British Horse Society reports 20 deaths, 10 severe injuries, and 88 mild to moderate injuries in horses in firework incidents since 2010. In addition, many horse owners will be in close proximity to or riding their animals when fireworks startle them; indeed many will attend their animals during periods of firework detonation and attempt to calm and safeguard them. There is therefore

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<sup>3</sup> <https://www.bluecross.org.uk/pet-advice/fireworks-and-pets>

<sup>4</sup> <https://www.pdsa.org.uk/media/4371/paw-2018-full-web-ready.pdf>

<sup>5</sup> Bassett L & Buchanan-Smith HM (2007) Effects of predictability on the welfare of captive animals. *Applied Animal Behaviour Science* 102: 223-245

<sup>6</sup> Wright AJ, Soto NA, Baldwin AL, Bateson M, Beale CM, Clark C, Deak T, Edwards EF, Fernandez A, Godinho A, Hatch LT, Kakuschke A, Lusseau D, Martineau D, Romero LM, Weilgart LS, Wintle BA, Notarbartolo-di-Sciara G & Martin V (2007) Anthropogenic noise as a stressor in animals: a multidisciplinary perspective. *International Journal of Comparative Psychology* 20: 250-273

<sup>7</sup> Grandin, T. *Behavioural Principles of Livestock Handling*, p. 2, American Registry of Professional Animal Scientists, 1989.

<sup>8</sup> <http://www.grandin.com/behaviour/principles/noise.html>

<sup>9</sup> Brouček J (2014) Effect of noise on performance, stress, and behaviour of animals. *Slovak Journal of Animal Science* 47(2): 111-123

<sup>10</sup> Temple Grandin, "Livestock handling and transport" Pg 65, pg 415

<sup>11</sup> Ames DR and Arehart LA 1972 Physiological responses of lambs to auditory stimuli. *Journal of Animal Science* 34: 994-998

<sup>12</sup> Welfare of Farmed Animals (England) Regulations 2007 (Schedule 8, part 2), Welfare of Farmed Animals (Wales) Regulations 2007 (Schedule 8, Part 2)

<sup>13</sup> Gronqvist, G, Rogers, C. & Gee, E. (2016). The Management of Horses during Fireworks in New Zealand. *Animals* 6(20).

potential for people riding and looking after horses during firework detonation to be seriously hurt by panicking, fleeing animals<sup>14</sup>.

It should also be noted that in contrast to advice for pet animals, in the case of horses, ponies or donkeys, the strategy of moving animals to an area away from detonation of fireworks (e.g. indoors), shutting curtains/blinds and distraction with music etc, are often not suitable or achievable<sup>15</sup>. This also applies to free-living wildlife as well as captive wild animals, such as those kept in zoos, where it may not always be possible to move them to an alternative area. The effects of sudden loud noises on wild animals are difficult to assess; the impacts will vary depending on the biology of each species, and physiological effects are often harder to measure than behavioural effects in animals in the wild. However there is evidence that unpredictable loud noises do disturb wild animals, both free living and captive<sup>16,17</sup>. For example, one study in the Netherlands showed that birds were disturbed by New Year's Eve fireworks in three consecutive years, and thousands of birds were observed to take flight in response to the fireworks<sup>15</sup>. Indeed, fireworks are classed as highly disturbing to some bird species<sup>18</sup>, and have been associated with the abandonment of nests or even whole colonies<sup>19</sup>.

Wild animals in captivity are usually not able to perform the same escape behaviours as they would in the wild. While little research has been carried out into the effects of fireworks on captive wild animals, there is some evidence that firework events can cause stress in zoo animals<sup>20,21</sup>. As with free-living wildlife, more research is needed to fully understand the effects of fireworks on captive wild animals; in the meantime, we advocate adopting the precautionary principle<sup>22</sup> to avoid the potential of causing harm.

Studies have found fireworks to be the most common cause for fear responses in dogs<sup>23</sup>, and it is estimated that 45% of dogs show signs of fear when they hear fireworks<sup>24</sup>. A New Zealand survey found that 6% of cats and dogs suffered from physical injuries as a result of fireworks, for example being involved in road traffic accidents whilst trying to escape<sup>25</sup>. Amongst the injuries there were

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<sup>14</sup> McGreevy, P.D., Henshall, C., Starling, M.J., McLean, A.N. & Boakes, R.A. (2014). The importance of safety signals in animal handling and training. *Journal of Veterinary Behavior* 9, 382-387.

<sup>15</sup> Gronqvist, G, Rogers, C. & Gee, E. (2016). The Management of Horses during Fireworks in New Zealand. *Animals* 6(20).

<sup>16</sup> Shamoun-Baranes J, Dokter A M, van Gasteren H, van Loon E, Leijnse H & Bouten W (2011). Birds flee en mass from New Year's Eve Fireworks. *Behavioural Ecology* 22(6): 1173-1177

<sup>17</sup> Pedreros-Echevarria E, Sepúlveda M, Gutierrez J, Carrasco P & Quiñones RA (2016) Observations of the effect of a New Year's fireworks display on the behavior of the South American sea lion (*Otaria flavescens*) in a colony of central-south Chile. *Marine and Freshwater Behaviour and Physiology* 49(2): 127-131

<sup>18</sup> U.S. Fish & Wildlife Service (1997) Guidelines for managing fireworks in the vicinity of piping plovers and seabeach amaranth on the U.S. Atlantic Coast, February 4, 1997.

<sup>19</sup> Weigland JF & McChesney GJ (2008) Seabird and marine mammal monitoring and response to a fireworks display at Gualala Point Island, Sonoma County, California, May to August 2007. United States Bureau of Land Management and Fish and Wildlife Service. 12 February 2008.

<sup>20</sup> Rodewald A, Gansloßer U & Kölpin T (2014) Influence of fireworks on zoo animals: studying different species at the Zoopark Erfurt during the classic nights. *International Zoo News* 61(4): 264-271

<sup>21</sup> Schell CJ, Young JK, Lonsdorf EV & Santymire RM (2013) Anthropogenic and physiologically induced stress responses in captive coyotes. *Journal Of Mammalogy* 94(5): 1131-1140.

<sup>22</sup> When human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. UNESCO and World Commission on the Ethics of Scientific Knowledge and Technology (2005). *The Precautionary Principle*. UNESCO

<sup>23</sup> Blackwell, E., Bradshaw, J., & Casey, R. (2013). Fear responses to noises in domestic dogs: Prevalence, risk factors and co-occurrence with other fear related behaviour. *Applied Animal Behaviour Science* 145, 15-25.

<sup>24</sup> Blackwell, E., Casey, R., & Bradshaw, J. (2005). *Firework Fears and Phobias in the Domestic Dog*. Scientific Report for the RSPCA, University of Bristol, UK

<sup>25</sup> Dale, A.R., Walker, J.K., Farnworth, M.J., Morrissey, S.V., & Waran. N.K. (2010). A survey of owners' perceptions of fear of fireworks in a sample of dogs and cats in New Zealand. *New Zealand Veterinary Journal* 58(6), 286-291.

sadly, several fatalities. In addition to the short-term distress caused, it's thought that dogs will often generalise their fear of one loud noise, such as fireworks, to other similar, explosive noises such as thunder<sup>26</sup>. This could cause significant long-term impacts throughout the animals' lives.

The impact of fireworks on cats is less understood than in dogs, although the PDSA Animal Wellbeing Report 2018<sup>27</sup> found that 34% of owners reported that their cat is afraid of fireworks. It is likely that many owners are unaware that their cats are fearful, or of the severity of the fear because cats are more likely to display passive responses such as hiding (compared to more active responses such as vocalisations in dogs).

It is clear that more research on the impact of firework noise on all species, including wild animals, horses and pet animals, is required but we feel there is sufficient evidence to support the view that fireworks have a negative impact on animals and that legislative steps should be taken to reduce this impact.

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<sup>26</sup> Blackwell, E., Bradshaw, J., & Casey, R. (2013). Fear responses to noises in domestic dogs: Prevalence, risk factors and co-occurrence with other fear related behaviour. *Applied Animal Behaviour Science* 145, 15-25.

<sup>27</sup> PDSA Animal Wellbeing Report 2018 <https://www.pdsa.org.uk/media/4371/paw-2018-full-web-ready.pdf> accessed 03/04/19