

The birds and the bins – sound power and the rural soundscape

Have you noticed that there is a sound power label on your wheelie bin and wondered why? Mark Dowie, Physical Test Applications Specialist at HBK has the answer.

By Mark Dowie, Physical Test Applications Specialist at HBK



Left:
Figure 1: Sound power label on recycling bin

Below:
Wheelie bins at dawn

Sound power measurements are more commonly used for power tools and heavy machinery, and not for items that spend most of their working life producing no noise.

After a brief internet search, I learned that the sound power label on a recycling bin requirement comes from the European Outdoor Noise Directive 2000/14/EC (OND);

the objective of which is to improve the control of emission in the environment by equipment for use outdoors.

Additionally, the directive seeks to ensure the smooth functioning of the European Economic Community while protecting human health and wellbeing. This all seems very sensible but, as I'd never felt disturbed by my neighbours putting out their bins, I was interested



to understand what was being measured and why. Without extensive research I noted that there are two main sources of noise from a wheelie bin:

- the lid being dropped; and
- the bin being dragged along a bumpy pavement.

To understand which noise is loudest I set up a simple sound power measurement. The wheelie bin was empty as the rubbish bags have a damping effect. The measurement was performed with a sound level meter and a 1mstick to make four measurements around the bin. For the bin lid, I did three drops per 10 second measurement. This gave a result of approximately 86 dB LWA. For the rolling noise I vigorously dragged the bin past the meter three times within a 10 second period and dropped it back on its base. Despite my best efforts to be loud, this measured 74 dB LWA. Both results were below the 89 dB stamped on the bin but, at least the investigation shows that the bin lid being dropped produces the higher level.

Widening the research

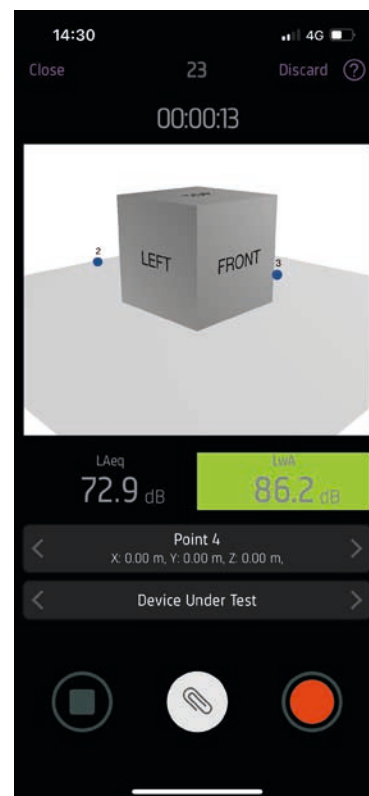
This led me to wonder whether any of my neighbours had ever been irritated by the bins being put out.

I live in a rural area and during the pandemic residents of the local villages started using WhatsApp to support each other; these groups are still going and are a popular way for the communities to stay in touch and discuss village issues. I posed a question via these local WhatsApp groups, 'What sounds do you enjoy and what sounds to you dislike when you are outside your house, in your garden or going for a walk?' I also met with people at the local sports centre and asked the same question. I also asked more freely what sounds they noticed and how they felt about them.

The people I asked live within a five mile radius of a town with a population of about 20,000. The surrounding area is mostly farmland with a few small villages. For me, with my acoustic hat on, there are a number of obvious noise sources including an active MoD base, dog kennels and some industrial sites. There are also two fairly busy single carriageway A-roads that intersect in the town. There is a busy motorway about three miles north of this five mile radius, which



Above & above right: Figure 2: Bin lid drop test



Above & above right: Figure 3: Rolling bin test



is audible in the villages to the north of this area if the wind is blowing from the north.

The area is also on a flight path for flights coming from Heathrow, Gatwick and further afield and these flights were noticeably absent during the first Covid lockdown.

The wider area is home to RAF and

Army training facilities; low level fly-pasts of Hercules aircraft and Chinook helicopters are common, and occasionally you can hear very low frequency booms from Salisbury Plain 25 miles away. There can be some motorsport noise from off-roading events as well as the nearby MoD base



Left: Some people were very specific about the birdsong they liked, such as blackbirds

being used to film motor racing shows infrequently. Despite all of these sound sources, it can be noticeably quiet with night time LA90 levels dropping below 30dB.

What my neighbours think about their local soundscape

I've tried to give an overview and some specific examples, so let's start with the negatives:-

- neighbours shouting;
- neighbours' music;
- cars, motorbikes, and quad bikes – horns, alarms and unnecessary revving and screeching;
- Low-flying aircraft;
- garden machinery such as chainsaws and leaf blowers; and
- dogs barking, either from next door, passing by or from the local kennels.

'Next door's Smartspeaker being shouted at and then being played too loud'

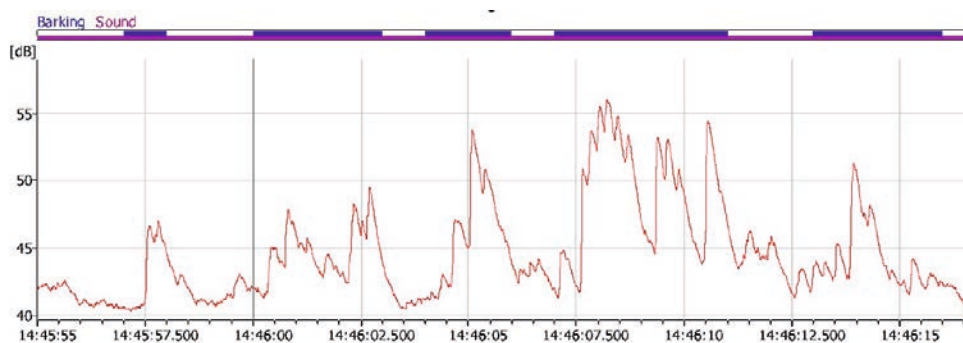
'Next door's boiler turning on'

'Slamming of metal footpath gates'

'Lawn-mowing at silly times of day'

'Foxes at night'

As a side note, I did some measurements in a resident's garden about 250m from the local dog kennels. If it was assessed as an industrial premises to BS 4142:2014 then it would have an impulsivity penalty of 9 dB based on the 10ms data. Individual barks can be seen on Figure 4 on the left. ^{P44}



Above: Figure 4: Barking from dogs in kennels is highly impulsive

The positive and most liked sounds by neighbours included:

- birdsong;
- church bells;
- tractors;
- nearby stream/running water;
- grazing sheep and cows; and
- lawn mowers.

'Nice children playing'

'Willow on leather (cricket)'

'Horse hooves on tarmac'

'Autumn leaves in the wind'

'Silence near the lake'

'Bees buzzing around the flowers'

'Falling of ripe apples'

'A good thunderstorm'

'The soft clucks of chickens'

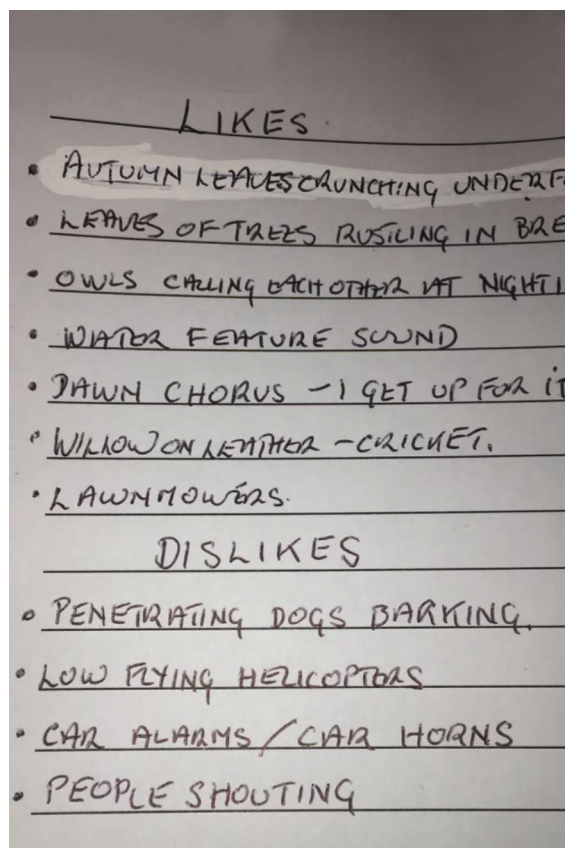
'Rain on the conservatory roof'

There was one thing that everybody, without fail, said that they liked —birds. Some people were very specific with different people highlighting skylarks, blackbirds, woodpeckers, and owls but, everyone I asked said they enjoying hearing birdsong. Pigeons, however, are a little like Marmite and are not universally popular.

Notably, out of the 30 or so people that responded, no-one had an issue with wheelie bins. It could certainly be argued that in this case outdoor noise directive has achieved its goal. However, as a rubbish bag being thrown into a bin is only an occasional and brief noise, it was never going to be a major contributor to noise pollution within the rural soundscape.

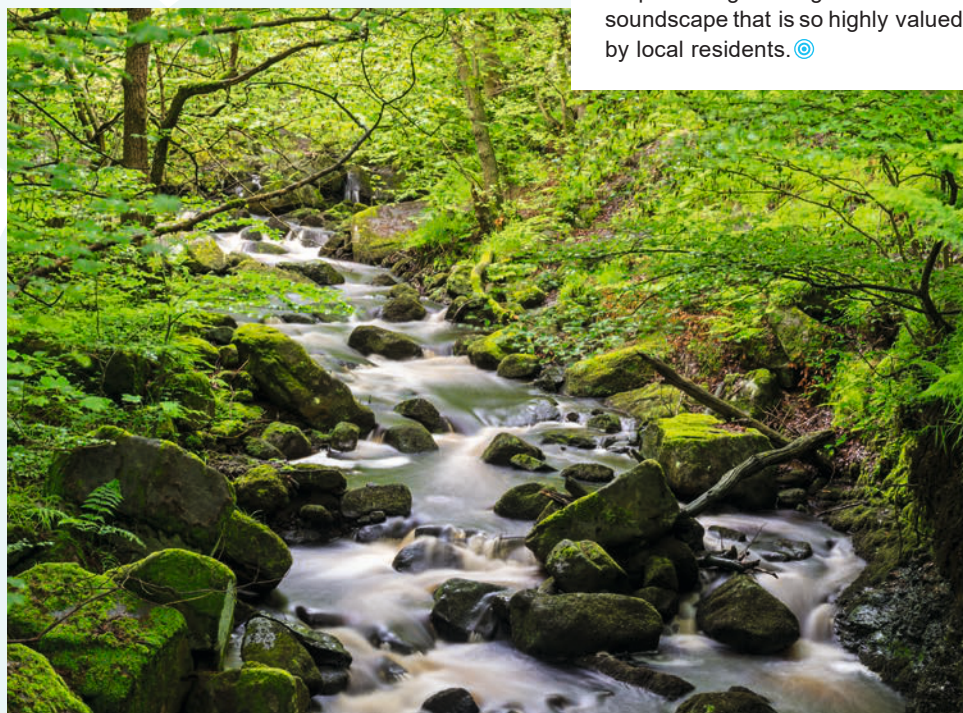
Protecting the fragile rural soundscape

On a more serious note, birdsong (with the exception of the dawn chorus) is a low level sound and, as these local residents have alluded to, great pleasure can often come



Above: Figure 5: An individual response

Below: Delicate sounds are easily drowned out by the less natural sounds that have been slowly encroaching on the rural soundscape



from a single blackbird, owl, or lark. These delicate sounds are easily drowned out (or possibly stopped) by the less natural sounds that have been slowly encroaching on the rural soundscape. Even distant dog barking can be more dominant than a bird three metres away.

Most of the 'negative' noises listed by local residents are regulated in some way individually. The Defra statutory guidance for dog kennels requires them to have a noise management plan but there doesn't appear to be any level limit to protect the nearest residents. Motor sport has vehicle noise limits for track racing, however, it's unclear if these restrictions apply to ad-hoc events on airfields and farmer's fields. Noisy neighbours can be reported to the local authority for investigation and, as previously mentioned, garden tools will be subject to sound power tests and noise limits. However, there is not a way to universally manage the cumulative effect of all these sources. As noise monitoring options reduce in price and software learns to identify source types maybe instrumentation could provide a simple method for protecting the fragile rural soundscape that is so highly valued by local residents. ☺

From this article, you should note that:

- The sound power label on a recycling bin requirement comes from the European Outdoor Noise Directive 2000/14/EC
- The Defra statutory guidance for dog kennels requires them to have a noise management plan but there doesn't appear to be any level limit to protect the nearest residents
- Instrumentation could provide a simple method for protecting the fragile rural soundscape