

Assessing the Impacts of Boat Engines on the Noise Pollution Incurred on UK Inland Waterways

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Abstract:

Noise pollution is an emerging issue of the modern world, however, one area which received less attention is the noise pollution caused by boats engines. This is of particular relevance to UK inland waterways, where boat traffic is still common, despite being mostly from leisure craft. Using different techniques this project highlighted the possible negative impacts caused by boats to human and wildlife in rural areas of the UK. Despite biases in the current research landscape and sparse information available to inform some aspects of this project, we conclude that the peak noise levels produced by inland waterways boats are comparable to that produced by road vehicles and therefore are likely to result in similar negative impacts (Jonasson, 2000; ISO/FDIS 5130, 2007; Schreurs, Brown and Tomerini, 2021).

Methods:

Sound Level Measurements:

Above water (calibrated NTi XL2 sound meter and NTi Audio M4260 measurement microphone)
Below water (uncalibrated hydrophone and Zoom H4N, spectrograms of audio generated in GoldWave digital audio editing software)

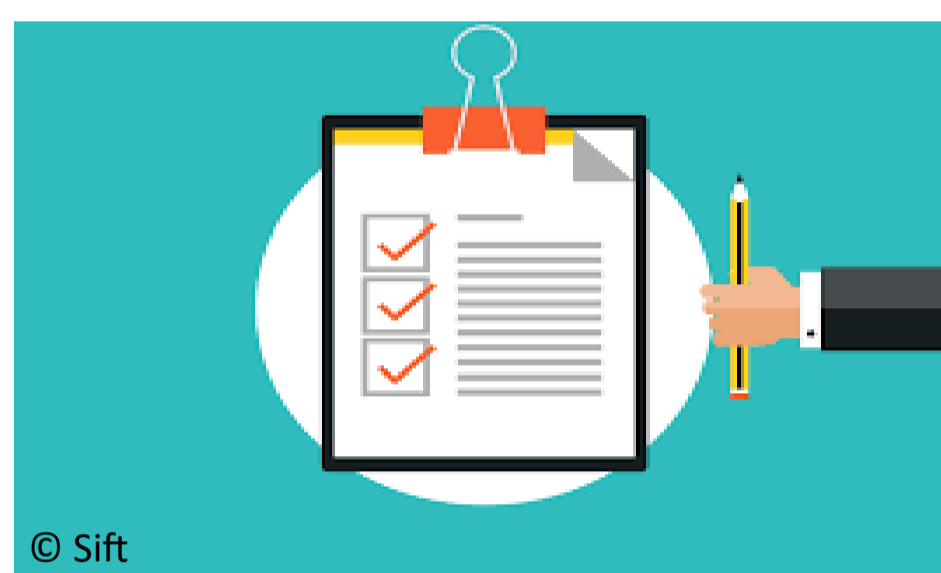


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Survey of 74 respondents



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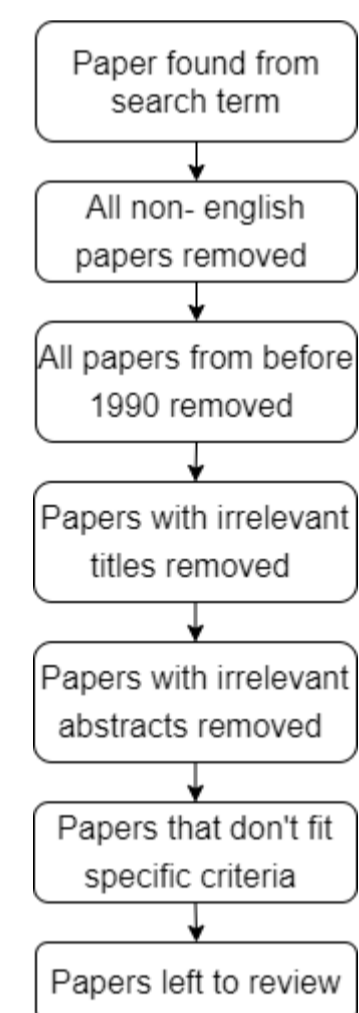


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Two systematic literature reviews:

Asking:

What is the Documented Signature and Sound Level of Small Boats?
What is the Impact of Boat Engine Noise Pollution on wildlife?



Results:

Survey:

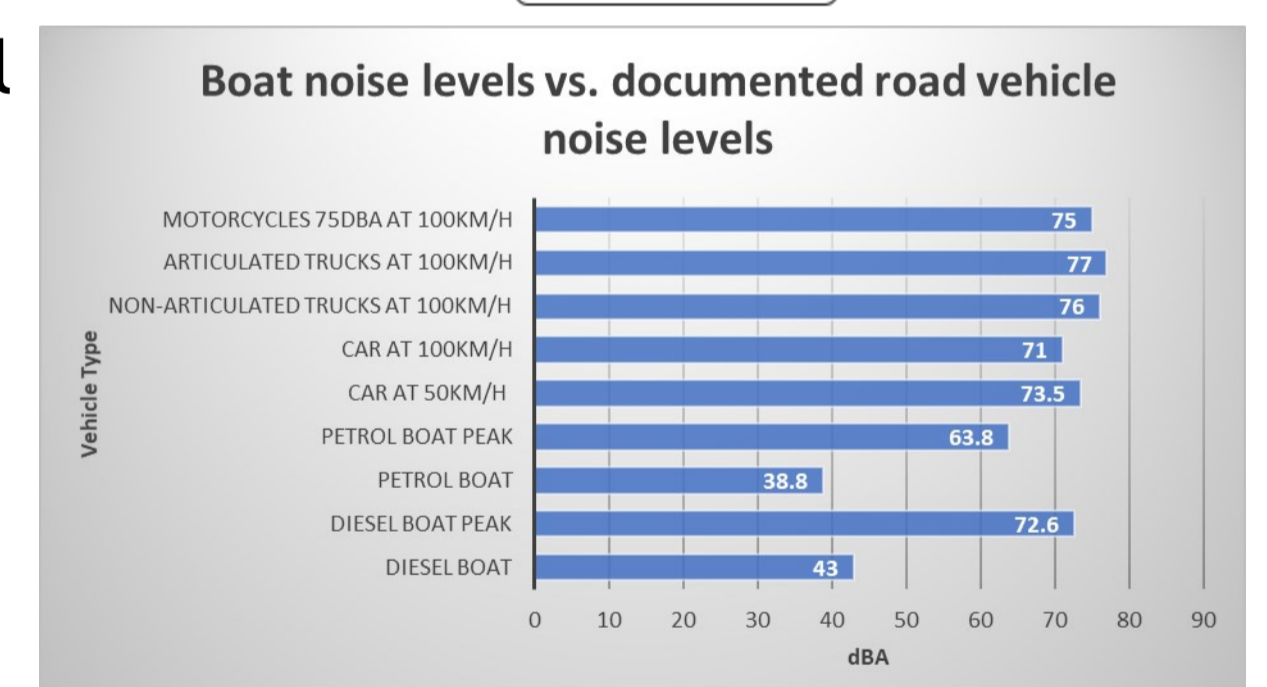
Only 11.4% answered with noise pollution when asked what the primary environmental issue of boats is.

73.33% of respondents said the noise from boats lasted from 0-14 minutes.

Sound levels:

Above water:

	Diesel boats:	Petrol boats:
Pilot Study Measurements:	mean LAeq of 43.0dBA	mean LAeq of 38.8dBA
Literature review one:	Mean level of 85.96dBA	



Underwater:

From literature review one the average underwater level documented was: 151.745dB re1 µPa.

Diesel boats produce higher dB levels at lower frequencies, but still produce levels 24dB+ above the background noise level for mid-to-high frequencies.

Petrol boats produce higher dB levels in the mid-level frequencies, but still produce levels 26dB+ above the background noise level for low frequencies.

Other dBA levels from vehicles sourced from Jonasson, 2000; ISO/FDIS 5130, 2007; Schreurs, Brown and Tomerini, 2021

Literature review two:

97% of the papers documented negative impacts with the other 3% documenting a neutral response to boat noise. 12% of the reviewed papers were about fresh-water species, indicating there is a research bias in favour of marine life.

Conclusions :

1. Boat noise is comparable to road traffic noise
2. People are somewhat exposed to it in terrestrial environments but there is little research on this
3. Impacts on animals are likely to be negative but the current research is biased in a number of ways
4. The potential negative impacts of BENP make it a good candidate for further research

Acknowledgments and Citations:

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