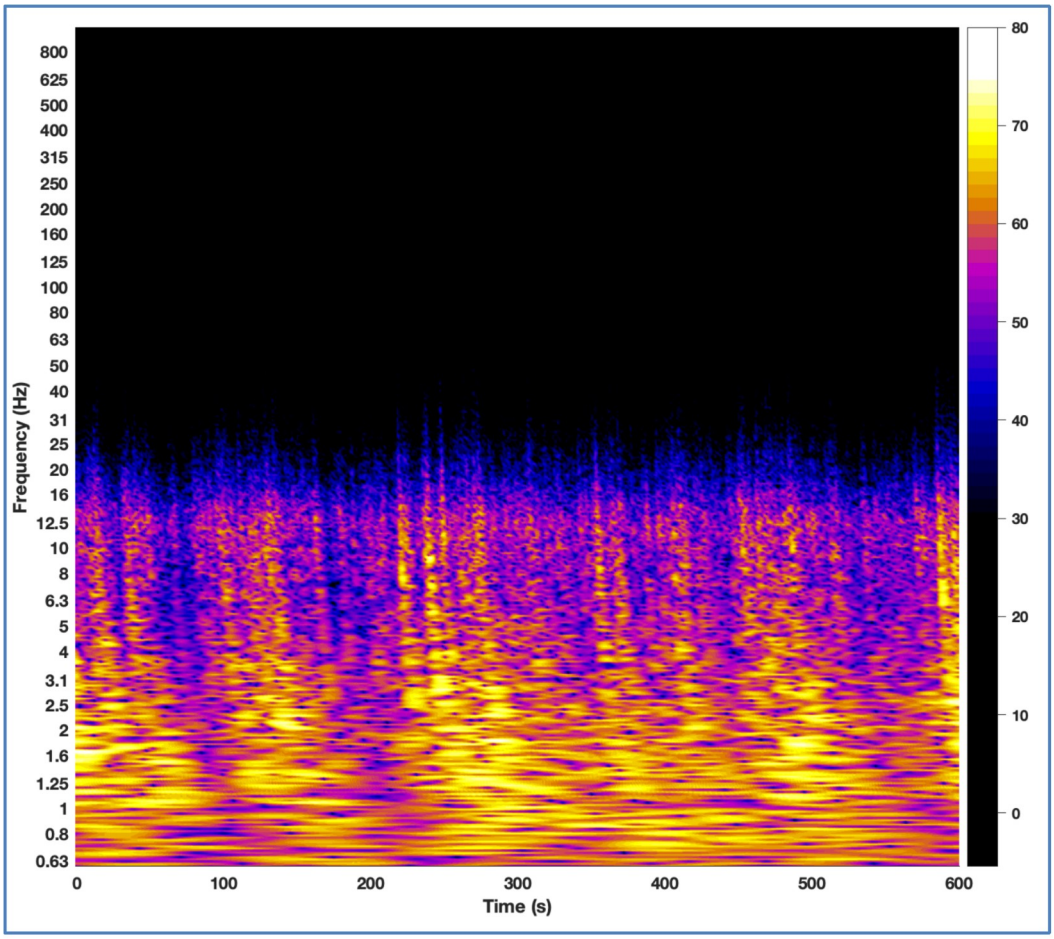
Wind Turbine Acoustic Signature Found in proximity to Blackcraig Industrial Wind Turbines

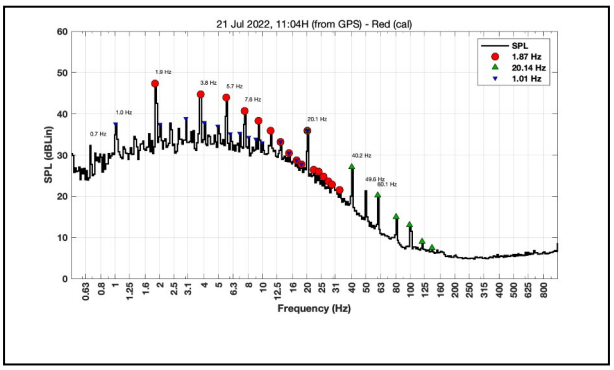
Sound is created by a series of troughs and peaks in air pressure. The frequency or pitch of the sound is measured by the number of peaks that arrive in each time interval. For audible noise the peaks arrive closer together than in infrasound, which is why we can hear it. The distance between peaks, the wavelength, is in the order of centimetres. Humans hear well at 3000Hz (3000 peaks per second). Babies cry at 3500Hz.

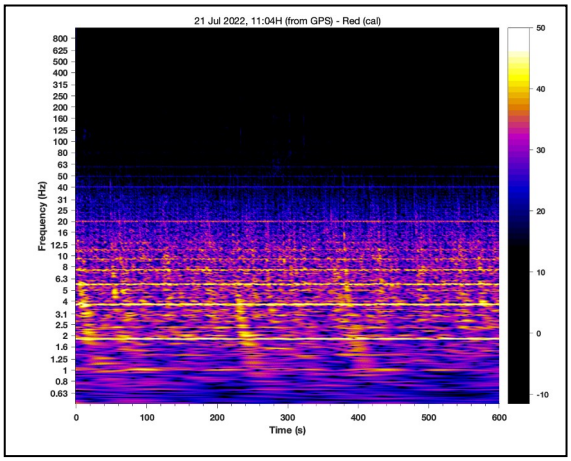
To protect against a noise the thickness of a barrier must be at least in the same order as the wavelength. This would be centimetres for audible noise, which is achievable. But at 20 Hz the wavelength is 17 metres, so we do not have the means of creating a barrier of sufficient thickness to protect from the lower frequencies. Consequently, low frequency sound will travel through objects and may cause them to resonate in response to the sound stimulation as well.

It is often asserted by the wind industry that infrasound generated by IWT is no different to that found in urban or natural environments.

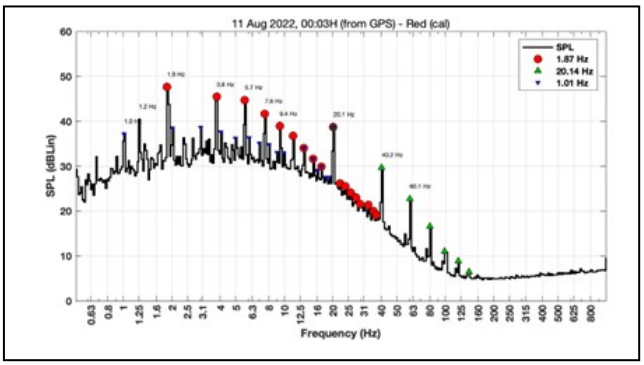


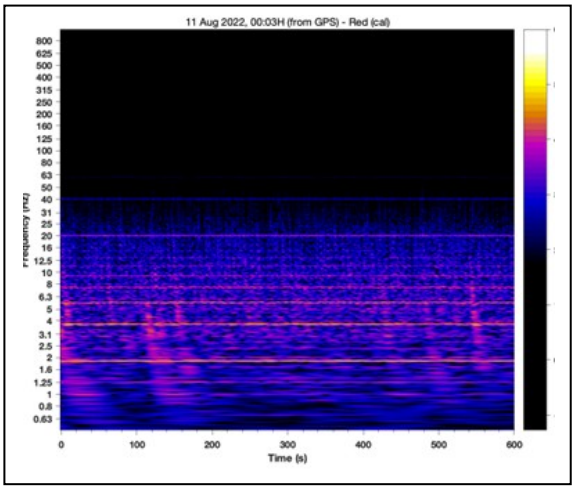
There is a clear difference when comparing the natural acoustic environment of the ocean, (Sonogram of Romo Beach, Denmark on 13th December 2016 seen above) with the other 3 pairs of figures (indicated as Residence 2,4 & 5), where the acoustical output of operational IWT is captured.



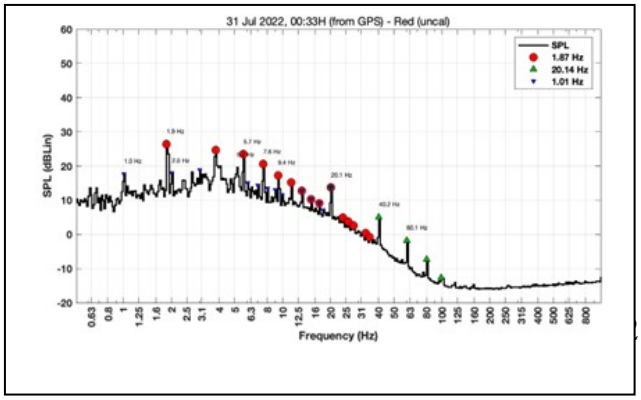


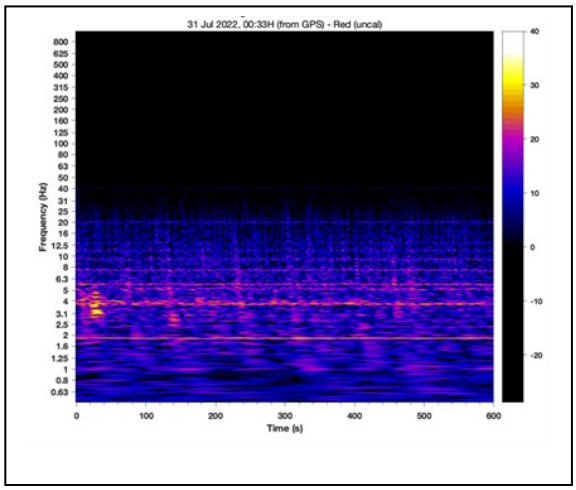
Residence west of Blackcraig





Residence East of Blackcraig

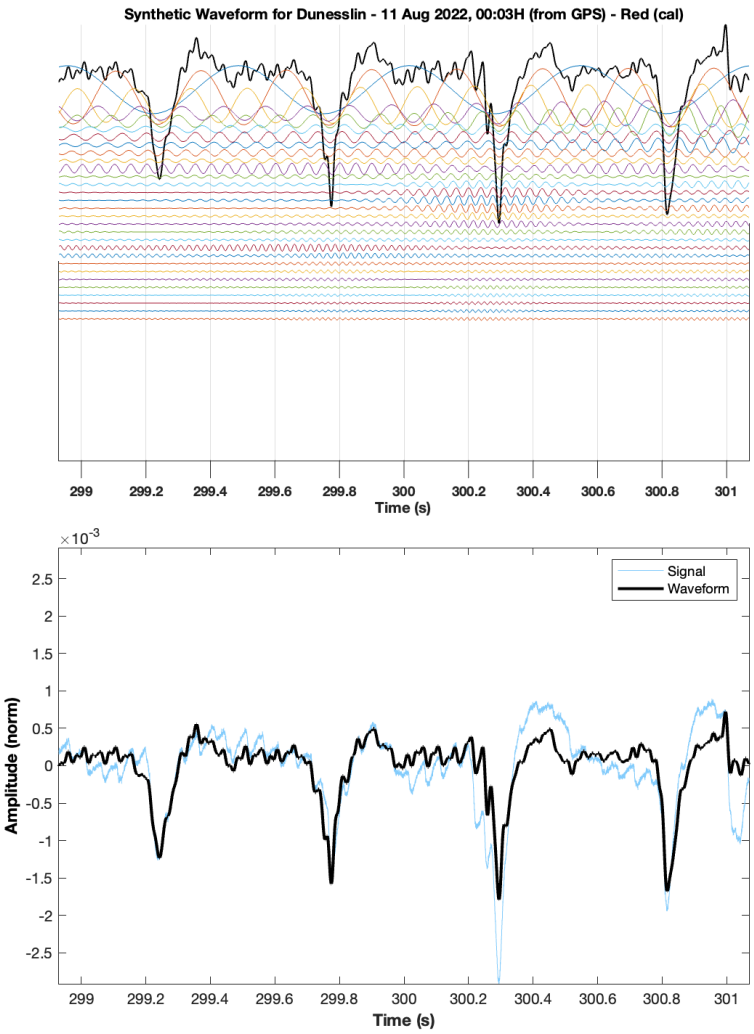




The time scale of the peaks associated with the IWT acoustic signature are of a different time scale than the peaks associated with natural phenomena.

A harmonic series with a fundamental frequency at 1.87 Hz in all the above residences dominates the harmonic analysis (peaks with red dots) and the horizontal lines in the sonograms.

The fact the peaks associated with the IWT acoustic signature occur in a mathematical sequence with a blade pass frequency of 1.87 Hz indicates that this can only be originating from a human-made machine, and not Nature. This is confirmed by looking at the shape of the sound waves, which shows a train of pulses (dips) at the blade-pass frequency, shown in the following figure.



This pulsed nature of the acoustic phenomena associated with WTs, with its particular time profile, has a particularly deleterious effect on biological systems.

Sound monitoring done at locations in the region around Blackcraig at varying distances have recorded the same wind turbine signature (WTS) demonstrating the danger in assuming that more distant properties will be safe from ILFN acoustic pollution.