

# Acoustic communication of the Golden-haired bark beetle (*Hylurgus ligniperda*)

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Biological invasions potentially causing major environmental and economic impacts are an unwanted by-product of international trade. Although New Zealand is at the forefront of implementing measures to reduce such invasions, the detection of cryptic organisms such as wood borers and bark beetles infesting timber and wooden materials remains difficult. We used a widespread and common non-native pine bark beetle, *Hylurgus ligniperda*, as a model system to develop acoustic detection tools. The development of such tools for detecting insect infestations of imports where visual inspection is not possible is currently a big challenge for national plant protection authorities.

*Hylurgus ligniperda* strongly relies on acoustic communication for a variety of behaviours. The sounds it produces may be useful for acoustic detection in imports of commodities such as timber and wooden items. However, to date, all aspects related to the acoustic communication of this beetle remain unknown. In this project we describe the different sounds produced by *H. ligniperda* and the behavioural context associated with them. Additionally, we analyse the effects of size and proximity of conspecifics in the sound production. As *H. ligniperda* can be found in all continents, except Antarctica, we show the potential of this species as a model organism for the development of acoustic-based methods with border biosecurity purposes.