

GOVERNEMENT

Liberté
Égalité
Fraternité

UNDERWATER NOISE POLLUTION

AT A GLANCE

dB

Sound level is the perceived intensity of a sound. Expressed in **decibels**, it indicates the impact felt when hearing a sound.

Hz

Frequency is the number of sound waves per second at any given point. Expressed in **Hertz**, it corresponds to the "pitch" of a sound: the higher the frequency, the sharper the sound.

AMBIENT NOISE

AMBIENT

Primarily background noise, generally of **average intensity** and propagates in all directions.

IMPULSIVE NOISE

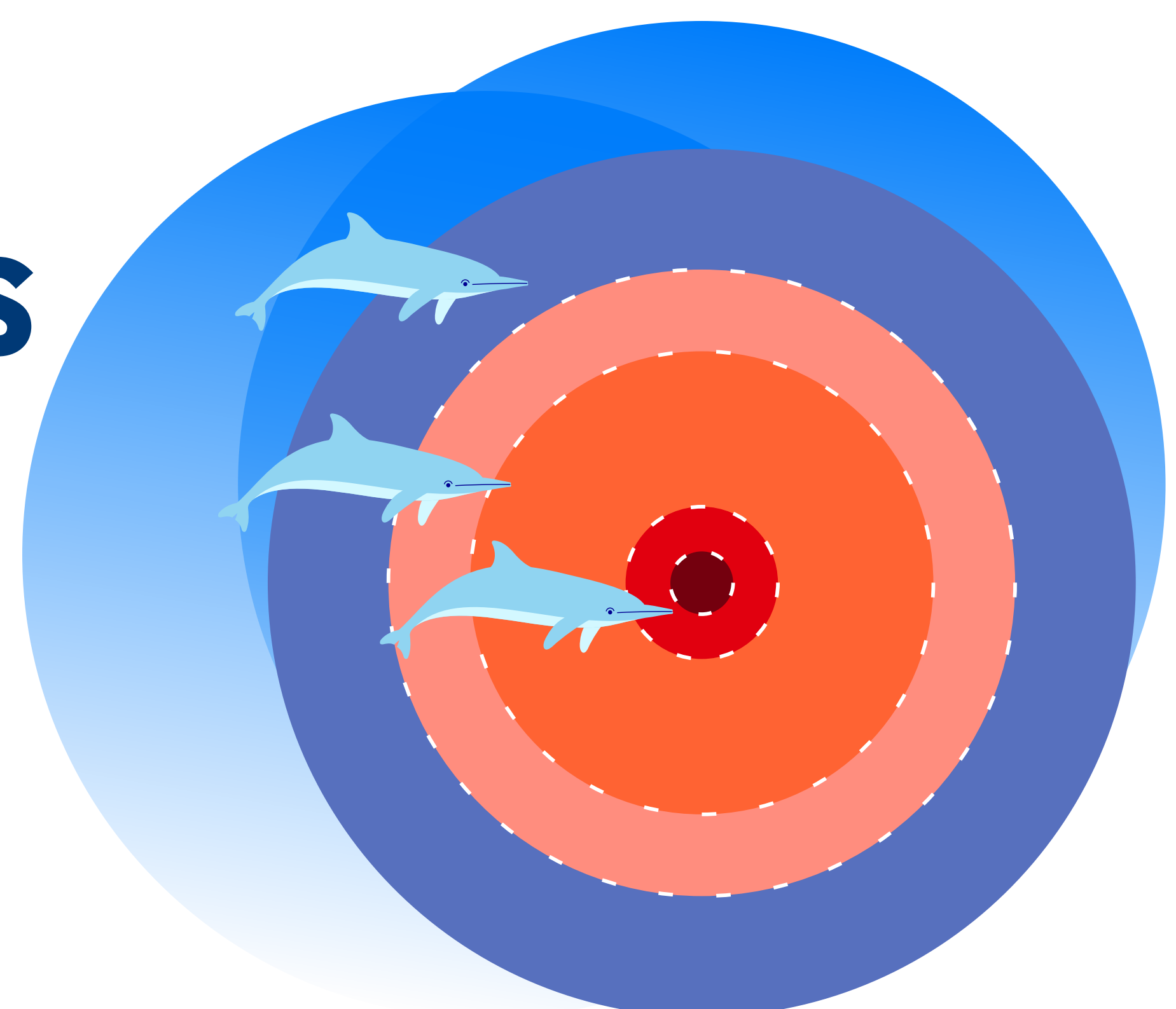
IMPULSIVE

Relatively **short** and of **high-intensity**. It may propagate in all directions (e.g. explosions) or be more directional (e.g. sonar).

IMPACTS OF NOISE ON MARINE ANIMALS

The reactions of marine animals to noise emissions **vary greatly** and depend on the **species concerned**, the **intensity of the noise** and the **emission duration**. The following impacts have been found, in increasing order of severity:

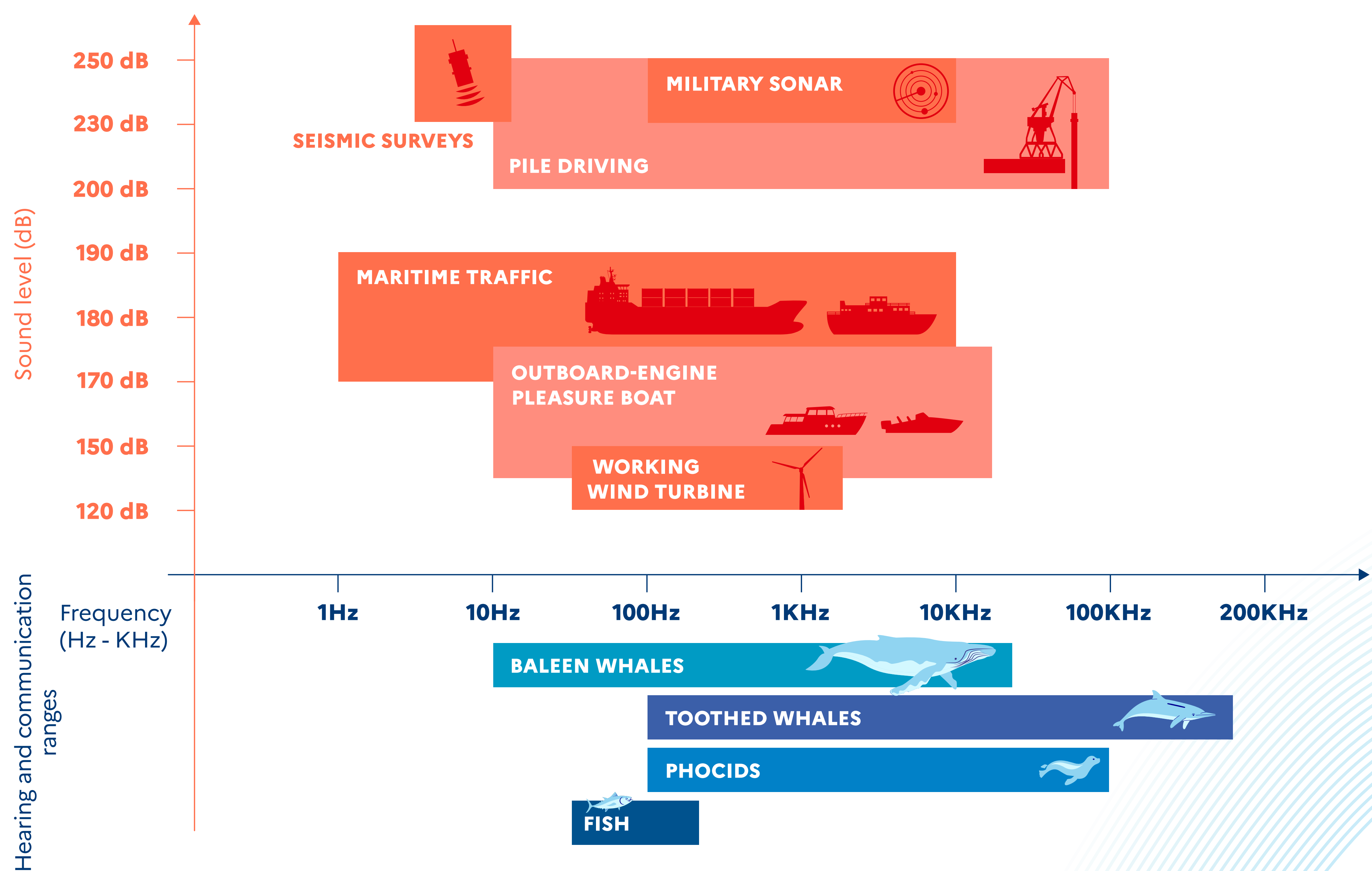
- **Physiological reactions:** lower growth rates, stress, faster breathing rate.
- **Acoustic masking:** communication between individuals is hindered, making the location of group members or prey more difficult.
- **Behavioural reactions:** flight or interruption of critical activities, changes in migration routes.
- **Temporary physiological damage:** loss of hearing level or decreased auditory sensitivity.
- **Permanent physiological damage:** lesions to organs generally leading to the death of the animal (hearing organs, lungs, swim bladder ...).



Zones of influence of noise emissions

- Noise source
- Hearing loss zone
- Behaviour modification zone
- Masking zone
- Audible zone

Impacts of human-made noise on marine wildlife



REGULATIONS

Although human-made underwater noise is recognised by the United Nations as a source of pollution and a threat to marine ecosystems, **there is currently no binding international regulation framework concerning the emission of noise in the oceans.**

In 2014, the **International Maritime Organization (IMO)** published (non-binding) guidelines aimed at reducing underwater noise.

In Europe, the **2008 Marine Strategy Framework Directive (Directive 2008/56/CE)** aimed at achieving good environmental status in European waters by 2020 set an objective for the reduction of underwater noise impacting marine animal populations.

The definition of noise thresholds required to ensure this objective is currently being discussed by the various European working groups.

Current efforts



An **Underwater Noise Community** was created in France in 2019 at the initiative of the directorates concerned within the **Ecological Transition Ministry (MTE), the Ministries of the Sea and Foreign Affairs and the French Biodiversity Agency (OFB)**; it brings together scientists, researchers, NGOs and members of the industrial sector involved in the issue, in order to **update scientific and regulatory knowledge** and to **share solutions** to reduce underwater noise and its impacts.



A **guide of recommendations for limiting the impact of sound emissions on marine wildlife** was published by the MTE in July 2020 aimed at state services and professionals in various maritime sectors. This methodological guide is intended to serve as a **reference document** on available knowledge, methods, technical devices and good practices.