

Attachment 5.1.2.4

THE EFFECTS OF VESSEL UNDERWATER NOISE ON WHALES AND WHAT MARINERS CAN DO ABOUT IT

SOURCES OF NOISE

While there are plenty of naturally occurring sounds in the ocean, an increase in commercial vessel traffic is the main reason for increased underwater noise¹.

In the North Pacific Ocean, underwater noise has been **DOUBLING** in intensity **EVERY DECADE** for the past **60 YEARS**².



Sound travels **4.5 TIMES** **FASTER** in water than in air.

WHERE VESSEL NOISE COMES FROM

- ENGINE AND ONBOARD MACHINERY
- DRAW FROM POOR HULL MAINTENANCE
- BOW/STERN THRUSTERS
- PROPELLER
- CAVITATION

Most underwater noise from large vessels is caused by propeller cavitation³.

NOISE INCREASES WITH SPEED⁴

IMPACTS

Underwater noise interferes with the ability of marine animals to transmit and receive acoustic information.

VESSEL NOISE CAN AFFECT THE ABILITY OF MARINE ANIMALS TO...

AVOID DANGER

COMMUNICATE

LISTEN NOW⁶

FIND PREY

REST

MATE AND REPRODUCE

NAVIGATE

In some areas, vessel noise has reduced the area some whales can communicate by **90%**⁵.

WHAT YOU CAN DO

In 2014, the International Maritime Organization (IMO) recognized that underwater noise associated with shipping is something that can be mitigated.

Options to reduce ship noise underwater already exist!

READ THE GUIDELINES

WWW.IMO.ORG



SLOW DOWN

MAINTAIN

OPTIMIZE

DESIGN

REROUTE



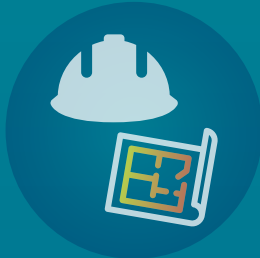
Operate below cavitation inception speed and avoid rapid acceleration.



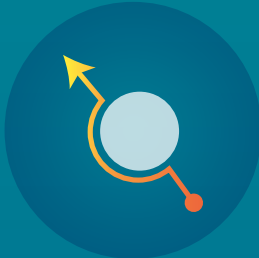
Clean hull and maintain propeller.



Insulate ship engine and use resilient mountings for onboard machinery. Modify propeller to minimize cavitation.



Incorporate vessel quieting considerations during re-fits and new vessel construction.



Modify route to avoid whales in immediate vicinity and known sensitive marine areas.