

From science to operations: How research is used to manage acoustic E&P industry risks to marine mammal populations

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Introduction

The IOGP Sound and Marine Life Joint Industry Programme (SML JIP or JIP) examined a generic Source-Pathway-Receiver risk assessment process to:

- Identify data needs for various elements of the process
- Assess how outcomes from the SML JIP research informs the various aspects of a typical risk assessment

We also considered how the population consequence of disturbance (PCoD/PCAD) methodology could be integrated within the overall risk assessment process.



Method

A commonly adopted method of risk assessment is to use a matrix to map likelihood (or probability) and consequence (or severity) for a particular event. Figure 1 shows the relationship between a generic source -pathway-receptor impact assessment framework and risk. Early in the planning stages for an activity, a first step is to conduct a screening risk assessment. Depending upon the level of risk identified through screening, the complexity of assessment could range from: desk-top comparison (low risk) → basic sound exposure assessment (medium risk) → complex sound disturbance assessment (high risk).

For each of the 6 elements detailed in Figure 1, a flow block diagram was prepared identifying key data needs required for each element of the risk assessment process (see Figure 2, for example). Outcomes of the JIP supported studies were then mapped against the data needs identified in the block diagram. Note: JIP Phase II projects are largely completed while Phase III projects are underway or in planning.

The PCoD/PCAD methodology using a top-down approach was considered a useful tool for informing consequence and likelihood.

Project Scoping

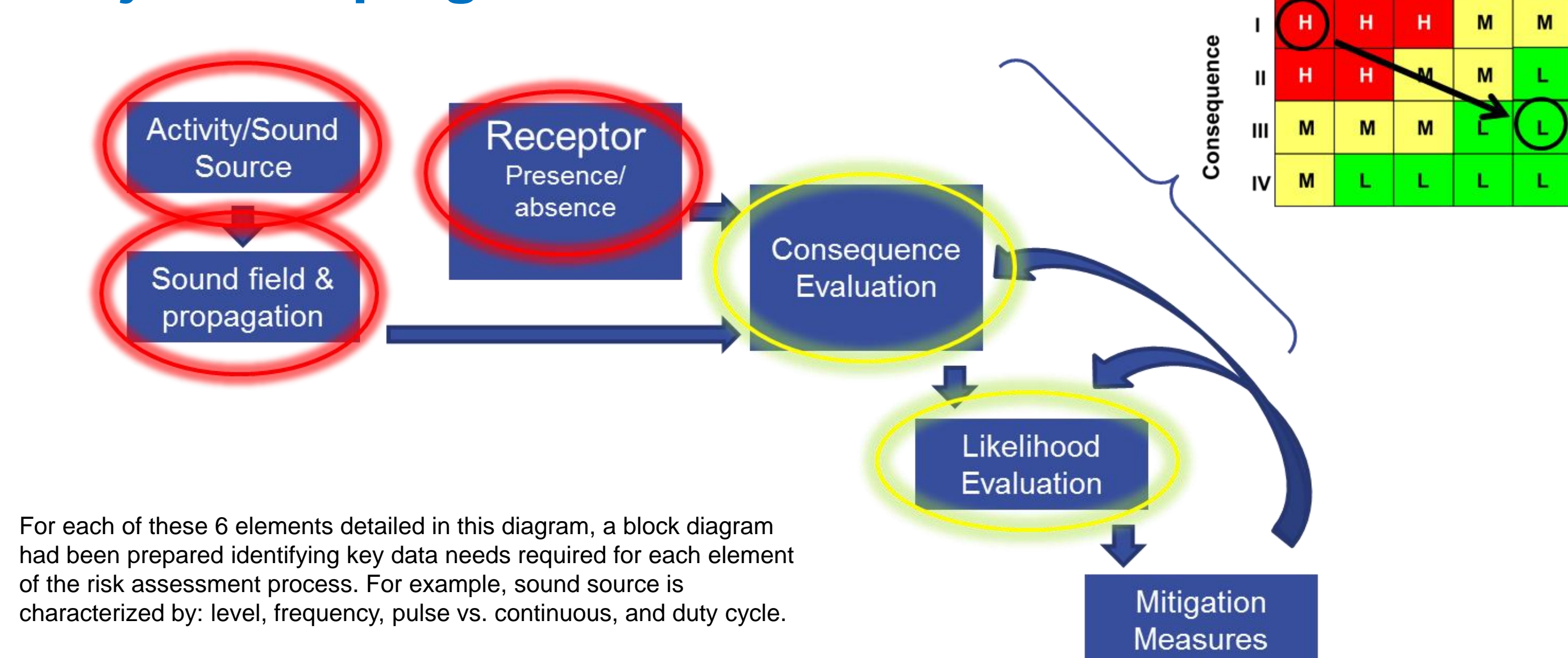


Figure 1. The relationship between source pathway, receptor and risk.

Consequence Evaluation

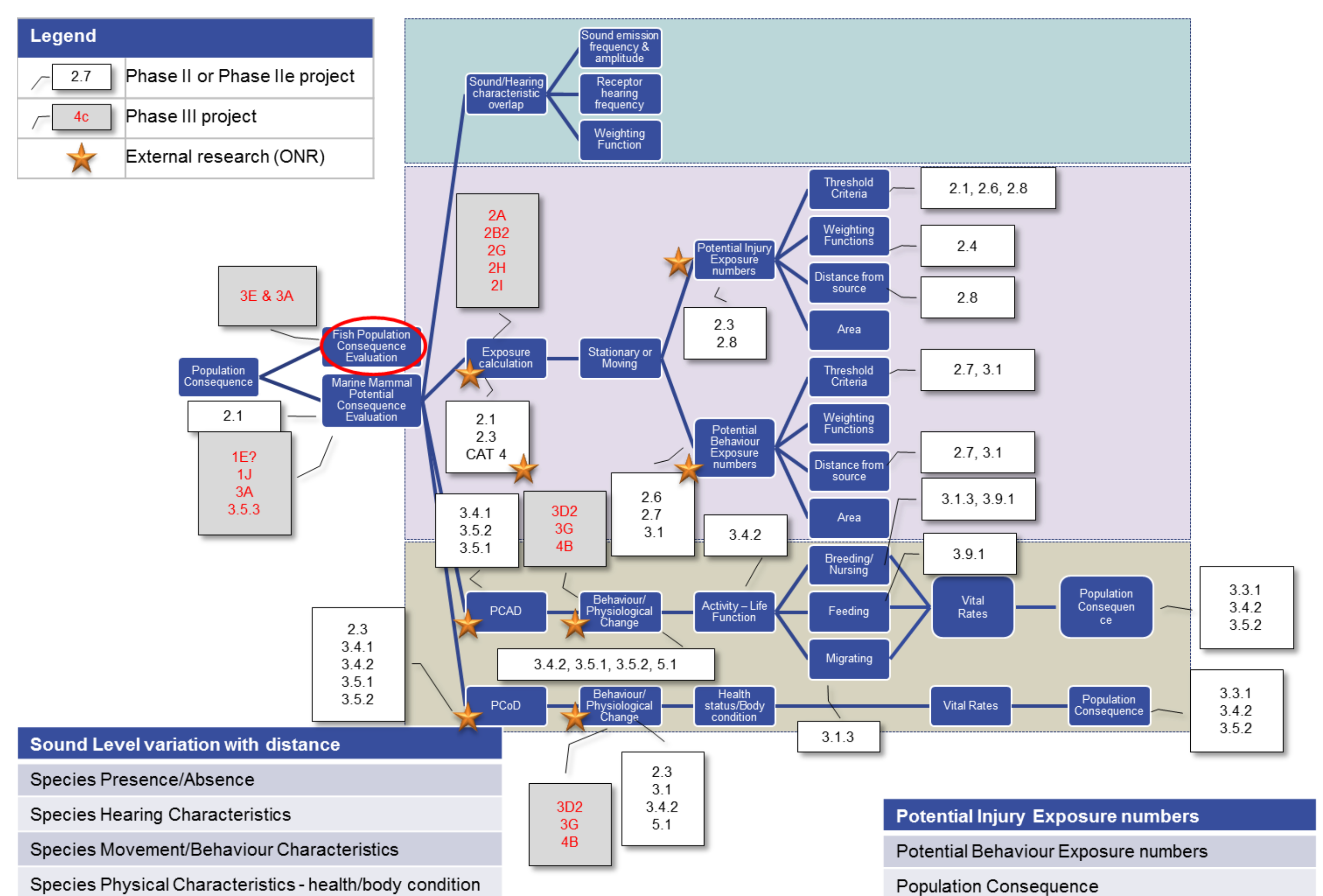


Figure 2. The data map for consequence evaluation. The three shaded areas are indicative of the three distinct levels of assessment complexity depending on risk. From top to bottom is low to high risk.

Conclusions

- Outcomes from every JIP supported project address the data needs identified, which demonstrates the value of research outcomes to help inform risk assessments.
- The majority of JIP supported projects have multiple outcomes which relate to data needs across multiple risk assessment stages.

Potential Next Steps Could Include:

- Identifying and mapping outcomes from research activities that have been supported by other industries or research programs as well as individual companies relative to those supported by the SML JIP.
- Formulation of new questions for possible consideration for future research efforts.
- Outcomes from future projects may be added following publication of results.