

## Underwater Noise Management Procedure

Underwater noise generated from piling works and vessel operations during construction will be managed by BCI in accordance with the following underwater noise management procedure described below and presented in **Figure 1**. Target marine fauna for underwater noise management includes whales, dugong, dolphins and turtles.

To mitigate and manage noise impacts generated from piling works on the target marine fauna, noise impacts from piling will be managed according to the depth of water which piling will be conducted i.e. shallow water (<3m Depth - Low Tide) and deeper water (> 3m Depth - Mid & High Tide). Within each depth corresponding management zones will be applied. A suitable trained marine fauna observer will conduct visual observations for both shallow and deep-water zones. A marine fauna observer will conduct visual observations on the piling platform during shallow water piling. During deep water piling a marine fauna observer will conduct visual observations from a roaming vessel.

### Management Zones

The marine fauna observer will perform visual observations within a 500m Observation zone (distance from piling works) for all target marine fauna during shallow water piling. Within the observation zone is a 100 m exclusion zone for all target marine fauna ().

During Deep water piling the marine fauna observer will perform visual observations within a 2 km observation zone for all target marine fauna. Due to the extent of this zone, roaming vessel observations will be conducted. Within the observation zone is a 1 km exclusion zone which applies to whales and dugongs, and a 500 m exclusion zone which applies to turtles ().

### Management Procedure

#### **1. Commence Marine Fauna Visual Observation Prior to Commencement of Piling**

Prior to piling works each day the marine fauna observer will commence visual observations for 30 minutes within the management zones (i.e. if shallow water piling, only management zones corresponding to this depth zone).

- > If target marine fauna are observed within the management zone, piling operations shall delay until target marine fauna have exited the management zones or have not been seen for 20 minutes.
- > If target marine fauna are not observed within the management zone, piling operations may commence with soft-start procedures.
- > Daily records of all target marine fauna observations within 500 m of piling operations;
  - Record observed cetaceans in a format consistent with the National Cetacean Sighting and Stranding's Database;
  - Other target marine fauna observations within 500 m of piling operations;
  - Fauna behaviors, in particular any behaviors that could be attributed to piling activities;
  - Management responses in relation to dead and injured wildlife, including suspension of piling activities; and
  - Observation effort in relation to piling activities.

## 2. Soft-Start Piling

Soft-start procedures involve gradually increasing the piling impact energy over a 30-minute period. The soft-start procedure may alert marine mammals to the presence of the piling activity and enable animals to move away to distances where injury is unlikely. The marine fauna observer will continually monitor the management zones during soft-start procedure.

### *Observation Zones*

- > Where target marine fauna are observed within the observation zone then following procedure shall be applied:
  - If it is evident that the marine fauna are in distress then piling operations shall cease until marine fauna have exited the management zones or have not been seen for 20 minutes. Once target marine fauna have exited the management zone, soft start piling may recommence.
  - If target marine fauna are not showing signs of distress, soft start procedures will continue and the marine fauna observer will continue to monitor the marine fauna.
- > Where target marine fauna are not observed within the management zones for the duration of the soft-start procedure then normal piling operations may commence.

### *Exclusion Zones*

- > Where target marine fauna are observed within the exclusion zone then soft-start piling operations shall cease until target marine fauna have exited the management zones or have not been seen for 20 minutes. Once target marine fauna have exited the management zone, soft start piling may recommence.
- > Where target marine fauna are not observed within the management zones for the duration of the soft-start procedure then normal piling operations may commence.

## 3. Normal Piling

Where target marine fauna are not observed in management zones during soft start procedures then normal piling can commence. Normal piling involves commencement of full impact piling. The marine fauna observer will continually monitor the management zones during normal piling.

### *Observation Zones*

- > Where target marine fauna are observed within the observation zone then following procedure shall be applied:
  - If it is evident that the marine fauna are in distress then piling operations shall cease until marine fauna have exited the management zones or have not been seen for 20 minutes. Once marine fauna have exited the management zone, soft-start piling may recommence.
  - If target marine fauna are not showing signs of distress, piling operations will continue and the marine fauna observer will continue to monitor the marine fauna.

### *Exclusion Zones*

- > Where target marine fauna are observed within the exclusion zone then piling operations shall cease until target marine fauna have exited the management zones or have not been seen for 20 minutes. Once target marine fauna have exited the management zone, soft-start piling may recommence.
- > Where target marine fauna are not observed within the management zones then normal piling operations may continue.

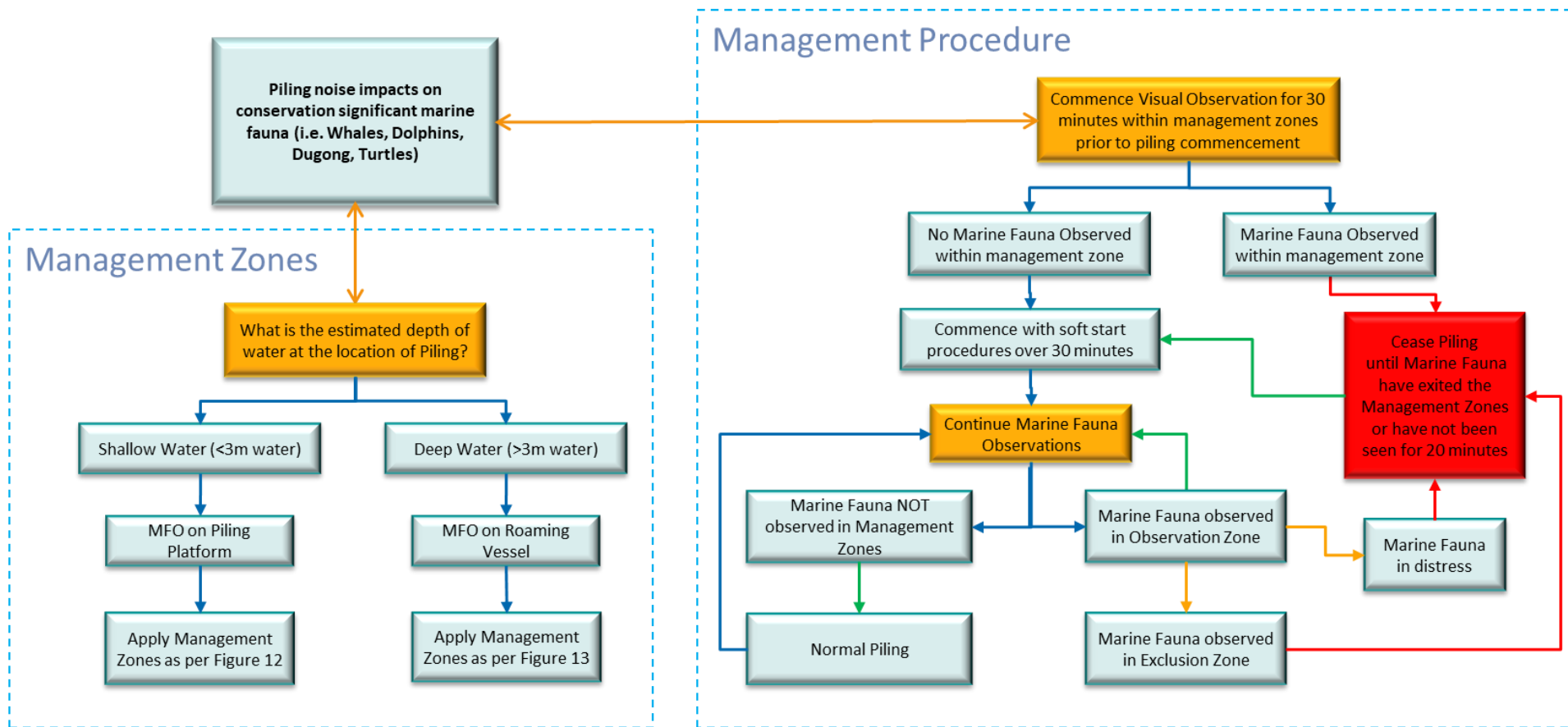
#### **4. Low-Visibility Conditions**

During periods of low visibility (i.e. where a distance of 500 m cannot be clearly viewed), then piling operations may commence with soft-start procedures provided that during the preceding 24-hour period:

- > There have not been three or more circumstances where marine fauna have been observed which resulted in ceasing of piling operations;
- > A 2-hour period of continual observations was undertaken in good visibility within the 24-hour period prior to proposed piling and no marine fauna sighted; and
- > Piling should occur during daylight hours unless in the case of a safety/emergency; at such times it will not extend beyond 10pm.

#### **5. Additional Considerations**

- > Piling should be undertaken in shallow (i.e. < 3m depth) waters whenever possible;
- > Deep-water (i.e. > 3m depth) piling should not occur between July and September when Humpback Whales are migrating throughout the Kimberley region;
- > Piling should only be undertaken during daily hours when marine fauna observations can occur; and
- > The management procedure must be repeated from the beginning for all piles.



1.

2. Figure 1 Underwater Noise Management Process

INSERT MANAGEMENT ZONE FIGURES AND UPDATE REFERENCES ABOVE.

3.