

Introduction

This module provides details of the 360° survey (5 metre radius circle) section of the Rapid Monitoring form, including percentage estimation of benthos categories.


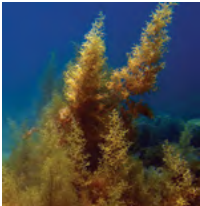



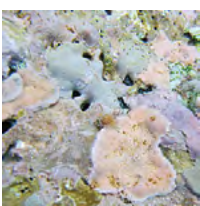
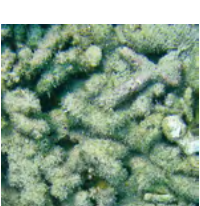



Key points

The key points explored in this module include:

- » Choosing a survey area
- » Estimating percent cover
- » Recognising benthos
- » Common benthos mistakes

360° survey (One 5 metre radius circle) → See over page for information guide and survey methodology

BENTHOS			
Insert % for each benthos type to total 100%			
Macroalgae		← MACROALGAE →	
Live coral			
Recently dead coral (white)		← LIVE CORAL →	
Live coral rock			
Coral rubble			
Sand		RECENTLY DEAD CORAL	CORAL ROCK <small>(includes dead coral)</small>
Total	100 %	CORAL RUBBLE	SAND

PHOTOS TAKEN
 (Please provide details e.g. image no./name, what it is, and a description)

CORAL IMPACTS (Complete 1, 2 and 3 below. Circle Y or N)

1 Is any coral white? Y / N

▼

Is living coral tissue present? Y / N If yes: **BLEACHING**

▼

Is coral being eaten? Y / N If yes: **PREDATION**

▼

If yes, by what? How many seen?

Crown-of-thorns starfish

Juveniles (size of hand or smaller) _____

Adults (larger than size of hand) _____

Drupella snails (all sizes) _____

▼

Is coral banded in appearance? Y / N If yes: **DISEASE**

▼

Is coral competing with something else? Y / N If yes: **COMPETITION**

2 Is any coral broken or damaged? Y / N

If yes: ▼

What is the likely main cause? (Circle one)

Storm Animal Vessel Anchor Divers Snorkellers

Unknown Other: _____

3 Is any rubbish present? Y / N

If yes: ▼

Number of pieces in survey area:

Fishing line _____ Plastic _____

Netting _____ Rope _____

Other (please specify)

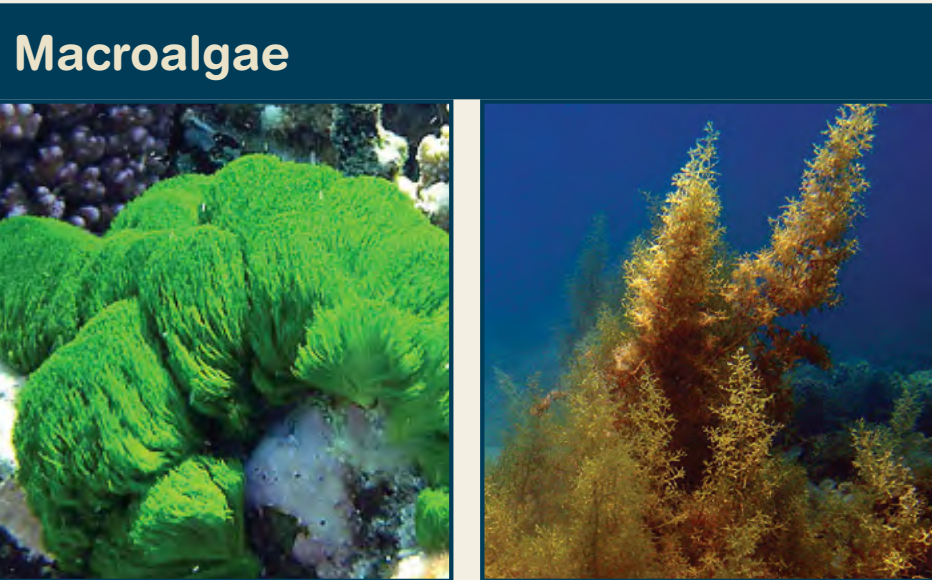
IMPACT DETAILS
(How much bleaching, predation, disease, damage? Other impacts?)

OTHER THINGS OF INTEREST?
(Mating, spawning, behaviour, etc.)

What is benthos?

Benthos refers to the seabed and the animals and plants that live there.

The Rapid Monitoring survey records data on these categories of benthos:



Choosing a survey area

Survey guide

Timed swim



▶ Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

▶ While surveying, use the time to find an area that is representative of the survey site and come back to that area to do your 360° survey.

360° survey



▶ Pick an area which represents the sea bed and overall condition of the site you are surveying. Pick a central point in your selected area which is easy to see and identify.

▶ Swim three body lengths away from that central point and then swim around, surveying the whole area within a circle of 5 metre radius around the central point.

Use your timed swim to choose an area representative of the survey site for your 360° survey.

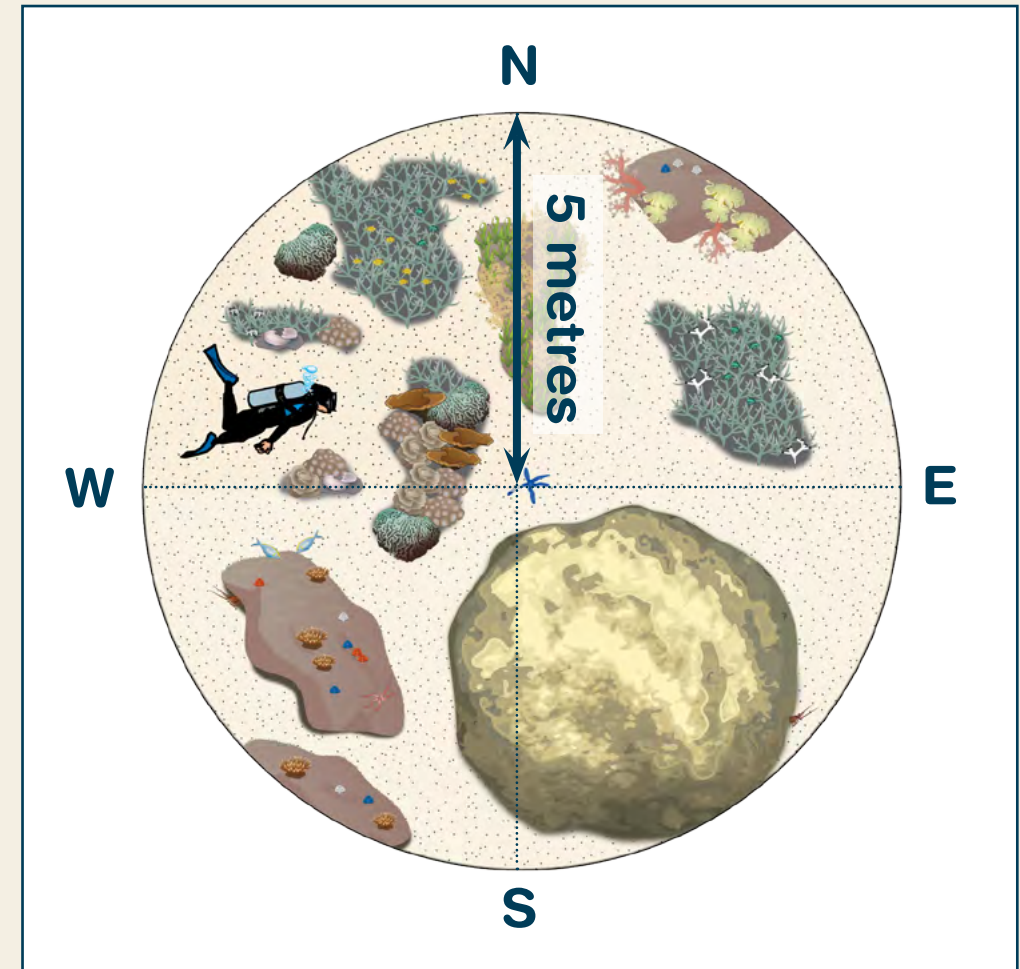
This means selecting a 360° survey area in an unbiased way, in an area typical of the whole survey site.

Be careful not to focus only on an area of high coral cover, or an area with a particular impact such as bleaching or damage, unless this is truly representative of your whole survey site.



Establishing the 5 metre radius circle

- » Choose a central point that is easy to see and identify. In this example, a blue linckia starfish marks the central point.
- » From the centre point, visualise your circle as 4 quadrants. Swim 5 metres to the north, south, east and west of the centre and select perimeter reference points.
- » Swim the perimeter between these points, looking towards the centre.
- » Consider which benthic categories are most and least common.



Tips:

Five metres is approximately three body lengths, but everyone is different. The first time you do a survey, calibrate your underwater distances as fin kicks.

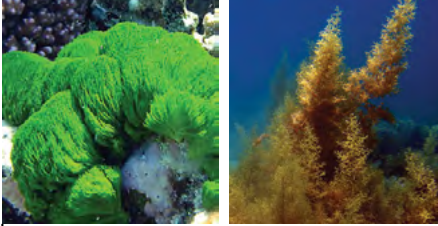
You could use a measuring tape or a 5 metre length of rope for your surveys until you are comfortable with estimating distance.

Estimating percent cover


Roll your mouse over each step for more information.

360° survey (One 5 metre radius circle)

BENTHOS	
<i>Insert % for each benthos type to total 100%</i>	
Macroalgae	
Live coral	
Recently dead coral (white)	
Live coral rock	
Coral rubble	
Sand	
Total	100 %




MACROALGAE




LIVE CORAL

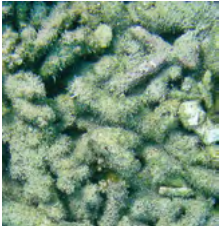
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(Please provide details e.g. image no./name, what it is, and a description)




RECENTLY DEAD CORAL



CORAL ROCK
(includes dead coral)



CORAL RUBBLE



SAND

Macroalgae

Macroalgae:

- are plants
- are usually green, brown or red
- have no hard skeleton so are always softer than rock and hard coral
- are generally attached to substrate (for this survey, record only benthic macroalgae that is attached).

The presence of Macroalgae can be used as an indicator of certain environmental factors and the overall health of a coral reef.

There are different types of Macroalgae: slime; entangled / mat-like; filamentous; leafy / fleshy; tree / bush-like.

You do not need to know these types, just be able to distinguish Macroalgae from other benthos categories.

Roll your mouse over each photo to see a large version.

Recognising benthos

Live coral

Coral is a generic term for the group of animals that have polyps.

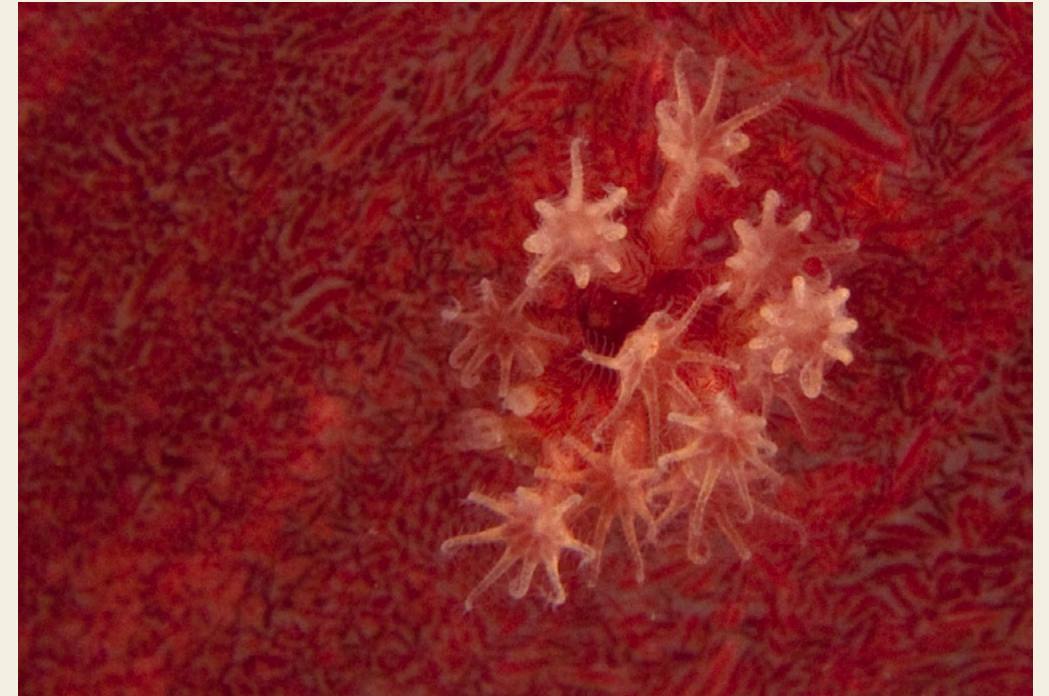
Soft corals have soft, flexible bodies with many polyps that always have 8 tentacles. The polyps are often supported by tiny calcareous spines called spicules.

Hard corals vary in shape and have a rigid, stony skeleton. Their polyps have multiples of 6 tentacles.

There are different types of hard corals:

- branching
- bushy
- plate / table
- vase / foliose
- encrusting
- mushroom
- massive.

You do not need to know these types, just be able to distinguish Live coral from the other benthos categories.



Soft coral



Hard coral

Recognising benthos



Live coral

Roll your mouse over each photo to see a large version.

Recognising benthos



Recently dead coral (white)

Soft corals are made of soft tissue, so when they die they break down quickly and leave no remains.

When hard corals die, the flesh and polyps are no longer present. The coral skeleton is initially bright white, and its detailed structure is still visible.

Recently dead coral gradually becomes green or brown as algae grows on the skeletons. When the detailed structure of the coral skeleton is still visible under a light covering of algae, classify it as Recently dead coral. When the detailed structure of the coral skeleton is no longer visible under the algae, classify it as Live coral rock.

It is important to know if Recently dead coral is present at a site as it is a potential early warning that something may be affecting the health of corals in the area.

Roll your mouse over each photo to see a large version.

Live coral rock

Any solid substrate which is stable and relatively free of macroalgae can be classified as Live coral rock.

This can include bare rock or coral skeletons, including coral rubble that has become cemented together with calcareous algae.

The key point to remember is that Live coral rock provides a surface on which another plant or animal can settle and grow.

This category is used to determine if there is substrate available for coral larvae to settle on (recruitment).

If the surface is covered with macroalgae, use the 'Rule of Thumb' – if the algae is less than a thumbnail high, classify the benthos as Live coral rock. If the algae is more than a thumbnail high, classify it as Macroalgae.

Roll your mouse over each photo to see a large version.

Recognising benthos



Coral rubble

Coral rubble is dead coral or gravel-sized material that is loose and can be moved by wave action.

Coral rubble is a natural part of the reef system, like the branches of trees on the forest floor.

When Coral rubble is cemented together with calcareous algae, it is categorised as Live coral rock.

Roll your mouse over each photo to see a large version.

Recognising benthos



Sand

**Sand is smaller than Coral rubble.
It is composed of the broken-down
skeletons of different marine
creatures.**

**Keep an eye out for the animals
that occupy the sandy habitat,
such as rays, sea cucumbers
and some fish species.**

**Roll your mouse over each photo
to see a large version.**

Common benthos mistakes



What is the difference between Recently dead coral and Live coral rock?
Roll your mouse over each label below.

When does Coral rubble become Live coral rock?

When Coral rubble is cemented together with calcareous algae, it is categorised as Live coral rock. This is a gradual process.



Coral rubble is dead coral or gravel-sized material that is loose and can be moved by wave action.



When the loose material has become attached to the surrounding substrate and is not moved by wave action, it is classified as Live coral rock.

Common benthos mistakes



Is it Live coral?

Corals always have polyps, but remember that the polyps can be retracted which makes them hard to see.

Roll your mouse over each label for more information.



Interactive Rapid Monitoring form



360° survey (One 5 metre radius circle)

BENTHOS

Insert % for each benthos type to total 100%

Macroalgae



MACROALGAE

Live coral

Recently dead coral (white)



LIVE CORAL

Live coral rock

Coral rubble

Sand

Total

100 %



RECENTLY DEAD CORAL

CORAL ROCK
(includes dead coral)



CORAL RUBBLE

SAND

PHOTOS TAKEN

(Please provide details e.g. image no./name, what it is, and a description)

Review questions

Review questions

Once you are familiar with the content of this module, test your knowledge with the Module 3 review questions.

When you have finished the questions, move on to Module 4.

