Become a CCMI Marine Biologist: Species Identification

At CCMI, our scientists have been conducting annual AGRRA surveys on the reefs of Little Cayman since 1999! Researchers require a good knowledge of the different species of fish and coral to conduct these surveys. Identifying fish species can be challenging as fish can look very different throughout their life. Match the juvenile and adult fish with the species name.

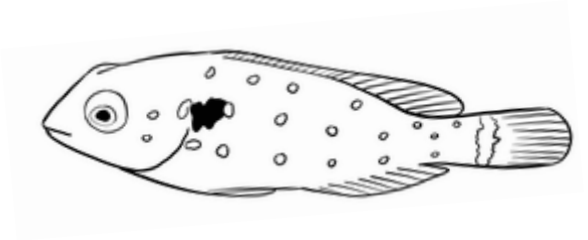
Juvenile Fish	Fish Species	Adult Fish
	French Angel Fish	
	Blue Tang	
	Yellowtail Damselfish / Disco Fish	
	Spotted Trunkfish	
	Striped Parrotfish	

Become a CCMI Marine Biologist:

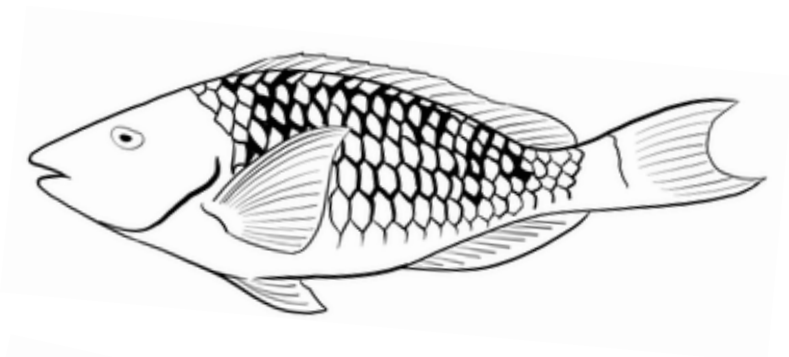
Species Identification & Fish Surveys

At CCMI, our scientists have been conducting annual AGRRA surveys on the reefs of Little Cayman since 1999! Researchers require a good knowledge of the different species of fish and coral to conduct these surveys. Identifying fish species can be challenging as fish can look very different throughout their life. For example, the stoplight parrotfish gets its name due to the colour changes it goes through during its life: amber, red & green. Stoplight parrotfish are very common on the reefs of Cayman, which is fantastic, as they are a key herbivore species! The three phases of a stoplight parrotfish are juvenile, initial and terminal phase. For each phase the fish looks very different!

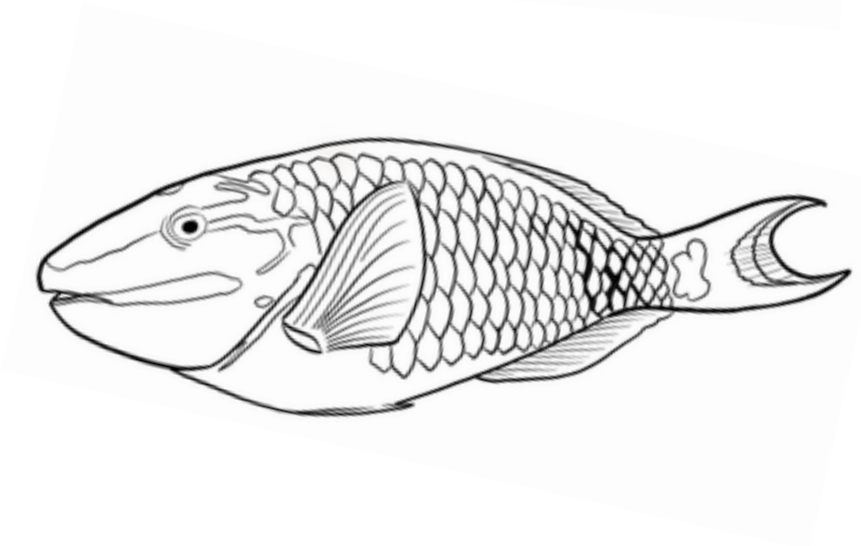
Colour in the different phases of the stoplight parrotfish:



Juvenile Phase



Initial Phase



Terminal Phase

Become a CCMI Marine Biologist:
Species Identification & Follow the Scientific Method

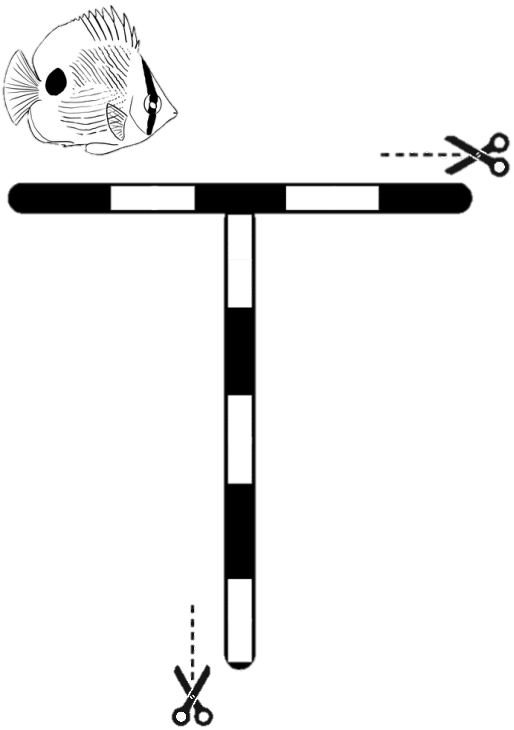
Researchers use some very simple equipment to conduct our annual fish and coral reef surveys, the equipment listed below you will get to use!

- **T-bar** – Used to help measure the size of fish, the bar is marked with 10 cm intervals. Every colour bar represents 10 cm.
- **Dive Slate** – We use a dive slate with waterproof paper, this allows our scientists to write underwater. For the fish surveys, this is used to record the species of fish in a table.
- **Identification (ID) Sheet** – With over 500 species of fish in the Caribbean sometimes it is helpful to have a fish identification card.

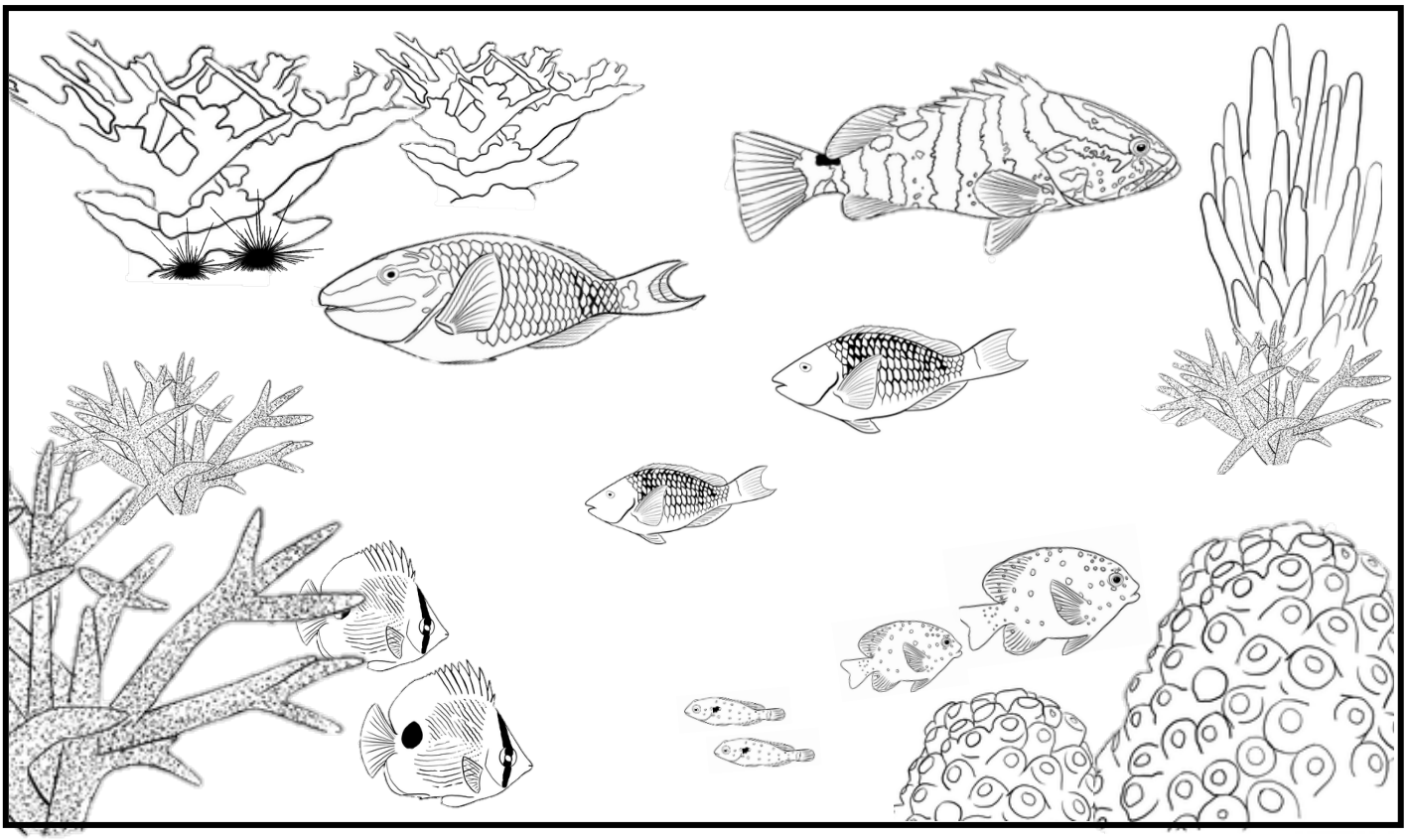
Our scientists need your help, one dive site on the next page has not been surveyed so we challenge YOU to be a marine biologist and survey this site. You have a T-bar to cut out, a dive slate to record the fish species and size of the fish you see as well as a fish ID card to help you identify the different species.

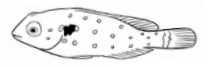
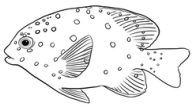
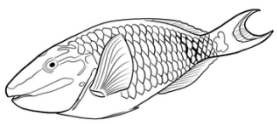
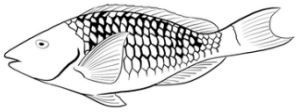
Scientific Method:

1. Use scissors to cut out the T-bar on right.
2. Use the Fish Identification card 'Common Caribbean Reef Species ID Sheet' to identify the different species of fish.
3. Use the T-bar to measure all the fish you have identified. For example, the fish on the right can be identified from the dive ID Sheet as a Foureye Butterfly Fish. This Foureye Butterfly Fish is the size of two intervals on the T-bar. Therefore, the Butterfly Fish is 20cm.
4. Record the species and size of all the fish using the 'Fish Identification Slate' by making a tally in the table.
5. Hint: Remember fish species can look very different at different stages. They are still the same species of fish even if they look different.
6. BONUS: Your teacher has been provided with a colour version; you can colour your reef in to help you identify the different species. Make sure you follow the colours of the fish species.



CCMI
REEFS GO LIVE



Common Caribbean Reef Species ID Sheet	
	
Nassau Grouper	Foureye Butterfly fish
	
Stoplight Parrotfish (Juvenile)	Yellowtail Damselfish/ Disco Fish
	
Stoplight Parrotfish (Terminal)	Stoplight Parrotfish (Initial)

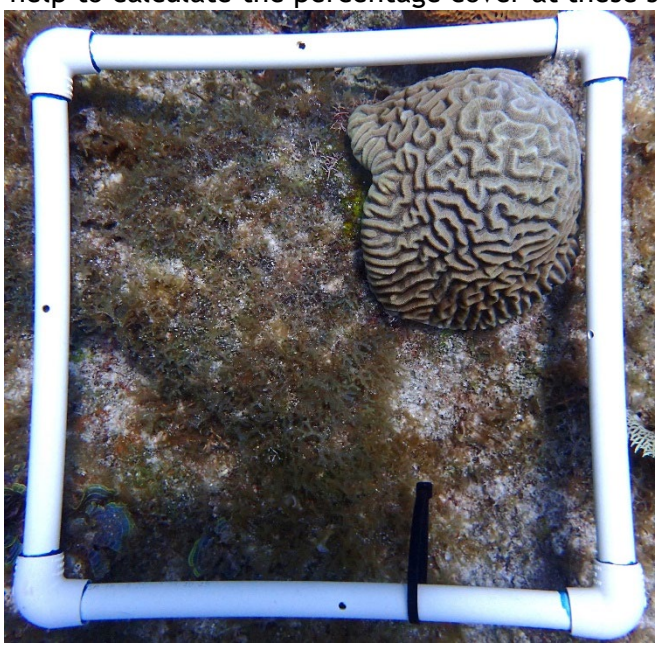
Fish Identification Slate					
	10cm 1 Bar	20cm 2 Bars	30cm 3 Bars	40cm 4 Bars	50cm 5 Bars
Nassau Grouper					I
Foureye butterfly fish		II			
Yellowtail Damselfish	I	I			
Stoplight Parrotfish	II	I	I	I	

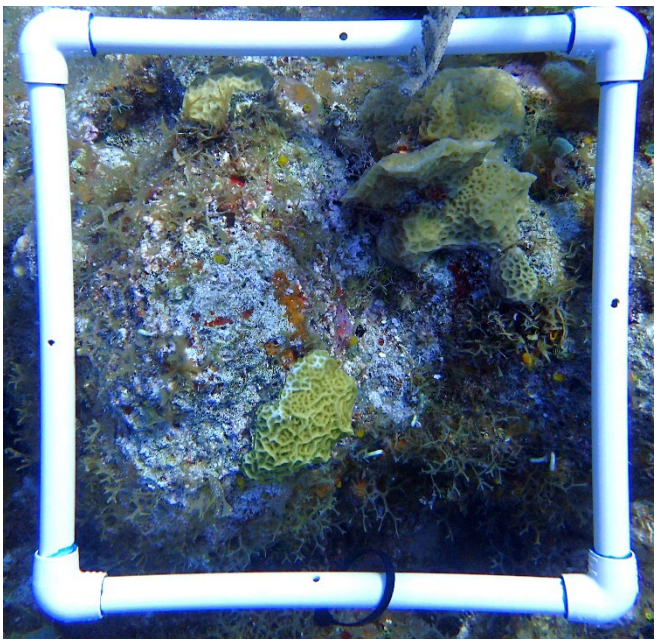
Become a CCMI Marine Biologist:

CCMI has been monitoring the reefs of Little Cayman every year for over 20 years! Documenting the changes seen on the reefs over time. CCMI's 2022 surveys show that overall **coral size has decreased over time, with a shift to smaller species however coral cover has remained stable.**

The team at CCMI follow the same method used throughout the Caribbean. They lay out a transect tape over a 10 m section of the reef. Along the transect the team identifies every coral species and measures the length, width, and height of each coral within 1 metre of the transect tape. To calculate the percentage cover of corals, 25 cm^2 quadrats are placed at 1 m, 3 m, 5 m, 7 m and 9 m points along the transect. Researchers then look at each quadrat and estimate the percentage of the quadrat which is coral, algae or rock.

Below we have two images of the quadrats at a survey site in Little Cayman. We need your help to calculate the percentage cover at these sites.





Quick Questions:

1. How many coral colonies can you count in…

   Quadrat 1: _____ Quadrat 2: _____
2. We know that each side of the quadrat is 25 cm. Estimate the length and width of the coral(s) in each quadrat.

   Quadrat 1: _____ Quadrat 2: _____
3. Be creative! What name would you give the coral species based on how it looks?

   Quadrat 1: _____ Quadrat 2: _____

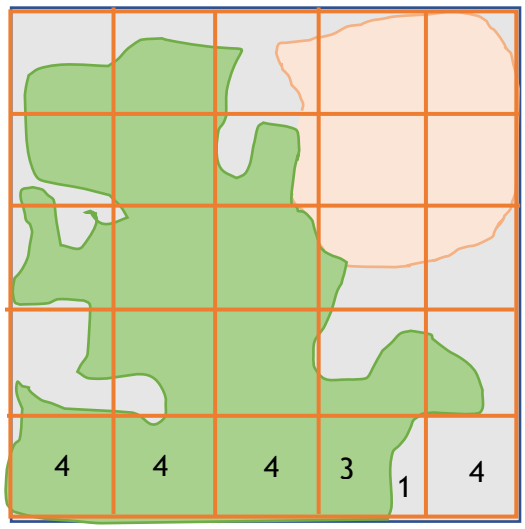
Fun Fact!
Quadrat 1 has **a symmetrical brain coral** whereas quadrat 2 has several small colonies of the **lettuce coral**. The lettuce coral is one of the most common corals on our reefs! Our surveys are showing a shift on our reefs, with a decrease in larger boulder species such as the symmetrical brain coral and increase in smaller species such as the lettuce coral.

To make it easier to estimate the percentage coral cover a sketch of the quadrats has been created to help identify the coral, algae, and rock, use the key on the right to help you. A grid has been placed over the image to help with cover estimates. Each square within the grid = 4% cover out of the total 100% in the quadrat, ½ square = 2%.

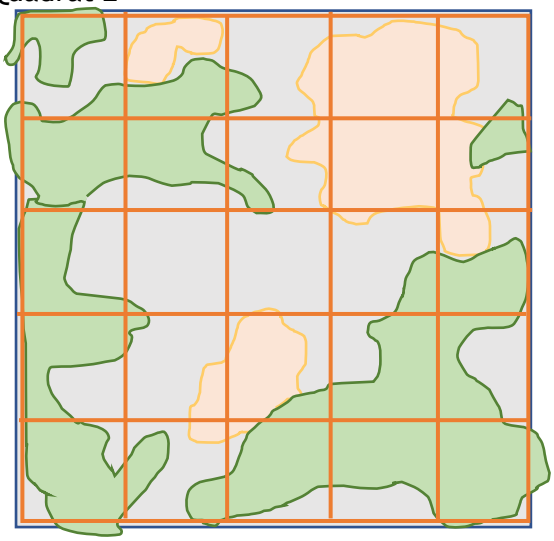
Key	
	Coral
	Algae
	Rock

Hint You can write numbers on the sketch to help calculate the percentage cover. The bottom row has been done for you. The bottom row has 15% algae cover and 5% rock cover.

Quadrat 1



Quadrat 2



Quadrat 1:
Coral Cover: 22%
Algae Cover: 58%
Rock Cover: 20%

Quadrat 2:
Coral Cover: 23%
Algae Cover: 46%
Rock Cover: 31%

This is an estimate- students should all have similar numbers but do not need to be exactly the same.

*Remember all your percentages within each quadrat must add up to 100%!

Now you have collected data on the coral cover on two quadrats we need to calculate the average coral cover of this transect. Below we have the data of the other quadrats at the site. Add your data to the list then calculate the mean: *add all the coral covers together and divide by the number of quadrats (5).*

Quadrat 1: _____

Quadrat 2: _____

Quadrat 3: 20%

Quadrat 4: 25%

Quadrat 5: 23%

Average coral cover: _____

Add your average coral cover percentage to the table below and complete the graph.

Year	Coral Cover (%)
2000	24
2002	25
2004	19
2006	16
2008	18
2010	22
2012	20
2014	15
2016	19
2018	17
2020	24
2022	

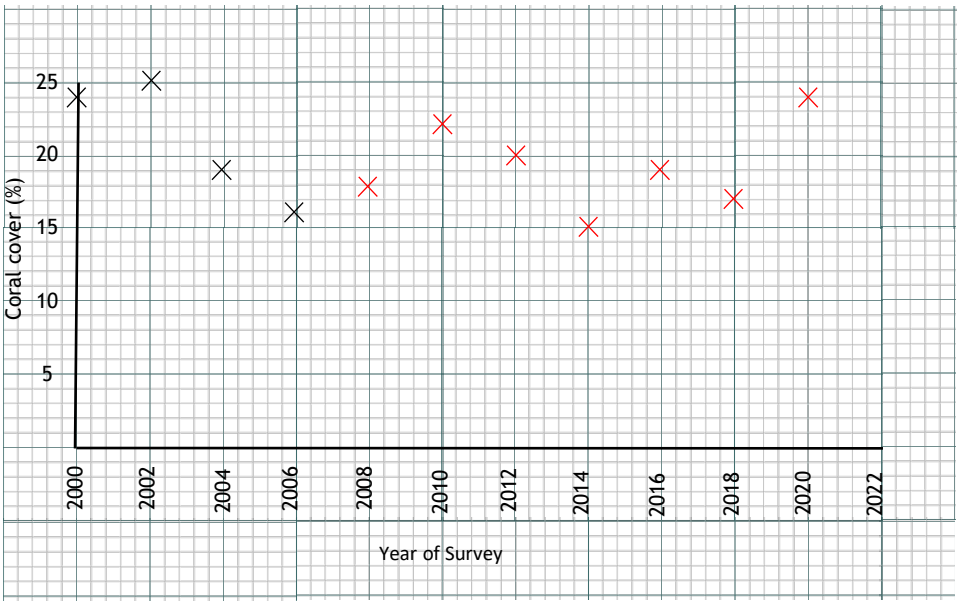


Figure 1: Graph showing the percentage coral cover on each annual survey over time in Little Cayman.

Questions:

What trend do you notice in the graph from 2002- 2006? Decrease in coral cover.

What conclusion could you make if you only had the data from 2002-2006?

Coral cover was declining, overall reef health is in decline.

Over different time periods on the graph it is easy to draw different conclusions. For example, 2006 – 2010 coral cover increased from 16% to 22% showing an increase in coral cover. Whereas 2010 – 2014 shows a decrease in coral cover from 22% to 15%. Using this information explain why long-term data is so important.

Long-term data is important as it helps identify patterns that may occur over a longer period and increase validity of data. A shorter data set could allow a wrong conclusion to be drawn from the data.

Describe the pattern you see in the graph from 2000-2022?

Coral cover between 2000-2022 goes through periods of disturbance causing a decline, then a period of recovery, then a recruitment where coral cover increases again. Ultimately, there is no significant increase or decrease.

Global warming is the largest threat to our coral reefs and contributes to the global decline in coral cover. What can YOU do to help protect our coral reefs?

Anything that reduces carbon footprint.