



Sasalu Tawamudu Why I Love My Tabu Area!



Management background to 'tabu' areas

Issues:

- Catch same amount of fish - getting harder to fish
- Fish being smaller
- Important fish disappearing
- Not enough food on the table

Threats:

- Overfishing
 - Too many licenses
 - Too big catch/ taking too many
- Destructive fishing practices
- Poaching

Root Cause:

- Lack of money/financial planning
- Lack of awareness
- Apathy/laziness
- Bad governance/decision making

Possible Solutions:

1. Reduce number of licenses
2. Ban night fishing, use of poisons & small mesh sized nets
3. Declare part of your *i Qoliqoli* as a **tabu**.

More than 200 communities in Fiji are now using **tabu** areas to overcome some of these threats....



What is a 'tabu' area?

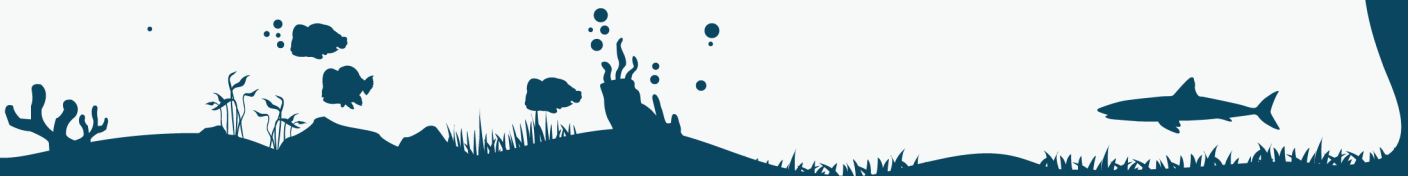
A '**tabu**' area is an area of your reef which has been declared '**tabu**' by members of your **i Qoliqoli** Committee. Fishing is completely banned in some '**tabus**'. Fishing is seasonal and tightly controlled in others.

There has been a long history of interaction between the coastal people of Fiji with the natural environment.

This traditional knowledge and practices have been passed down from one generation to another and include seasonal bans on fishing and temporary no take zones during certain occasions. Therefore traditional systems have been the basis for setting up '**tabu**' areas or other forms of marine management.

The main difference between then and now is the period of the '**tabu**.' Whilst it used to be for a short time, now '**tabu**' areas are put in place for a longer period of time and now include best available modern knowledge and practice.

A '**tabu**' area is one management tool with which you can manage the use of your **i Qoliqoli**. Reducing number of licenses to take fish from your **i Qoliqoli**, stopping the use of destructive fishing methods, having one of two seasonally closed areas to meet unplanned for events, are other examples from amongst many tools that can be used.



Ecosystem benefits

- Greater habitat quality
- Increase resilience of the reef ecosystem to climate change
- Reduction in the loss of threatened species
- Protection of spawning areas
- Assist recovery of ecosystem from human damage/exploitation and natural disasters.

Fisheries benefits

- Lower fish mortality
- Higher density of targeted fish
- Larger average size of targeted fish
- Greater biomass of targeted fish
- Higher production of propagules (eggs and larvae)

Benefits of a 'tabu' area

Socioeconomic benefits

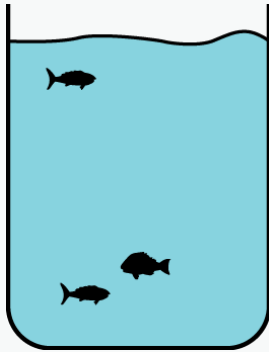
- Improved engagement and education of the community around issues of marine ecosystem
- Source of food supply that is sustainable for communities
- Source of income through sale of marine resources
- Potential area for tourists to visit and explore the marine diversity with a payment of access fees.

You need to be aware 'tabu' areas do not address the following threats. You will need separate management actions for these:

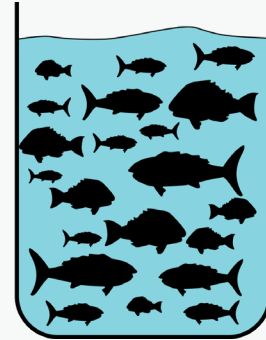
- To address destructive fishing practices
 - To prevent bleaching
- To stop sedimentation impacts on the reef ecosystem



How a 'tabu' area works:



Fish are safe in the '**tabu**' area because they are not fished and because their habitat is not protected.



At the start of the '**tabu**' area, there are few and small fish. This is why you set up a **tabu** area.

After a period of time, the fish inside the '**tabu**' area reproduce and grow bigger so that there are more and bigger fish inside the **tabu**.

The amount of time this takes depends upon a few things;

- The size and location of the '**tabu**' area (see page on what makes a good '**tabu**' site)
- The speed at which the fish or invertebrates reproduces and grows (see species facts at end of book)
- If poaching happens or the **tabu** is lifted and fished, it may never get full of big fish.



What makes a good 'tabu' area?

There are certain things to think about when deciding where a '**tabu**' area should be

Social

- Areas where there is no dispute over ownership
- Areas that are not always used by fishers
- Areas that are easy to enforce and patrol
- Area selected by good process

Ecological

- All habitats included (mangrove forests, seagrass beds, coral reefs) (see note on linkages)
- Size as large as possible for the species you want to protect (see note on size and species)
- Any important sites such as spawning sites

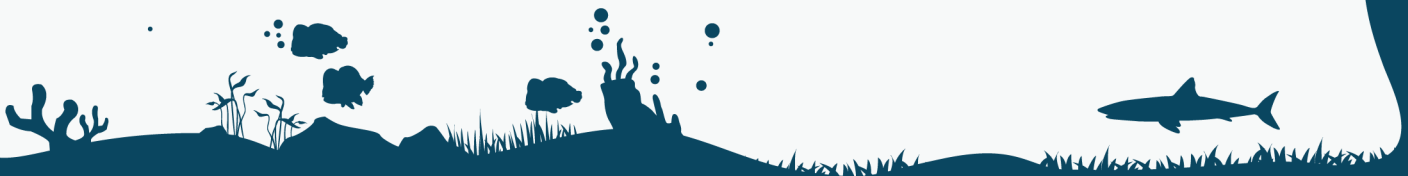
How big is big?

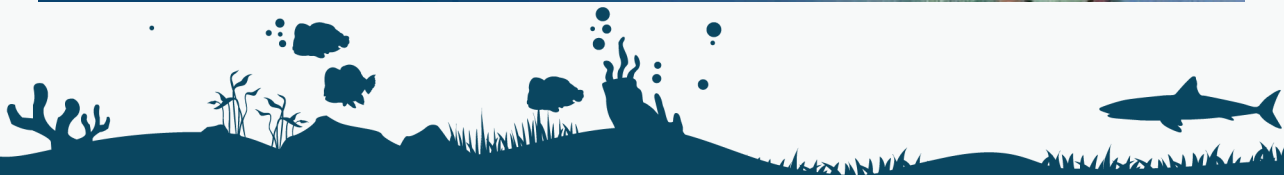
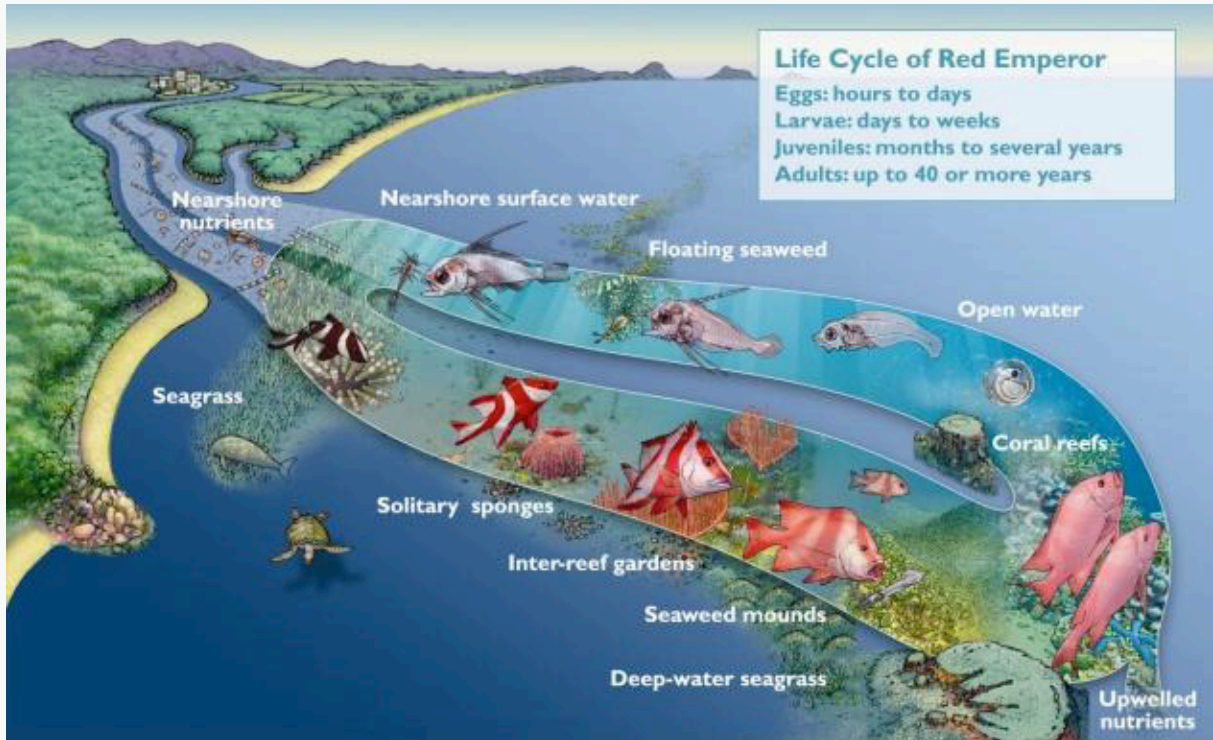
'**Tabu**' areas work by keeping fish safe from fishing. Fish move every day-some fish move further than others. Your **tabu** area should be as big as the area over which fish you want to protect move. **Saqa** for example move many kms. **Kabatia** move around 1km each day.

Why all habitats linkages?

Food fish need different habitats for feeding, sheltering and breeding and move between them-see the example on the next page for a species of **Damu** (Red Emperor).

A healthy reef ecosystem needs healthy surrounding linked habitats (estuaries, mangroves and seagrass)



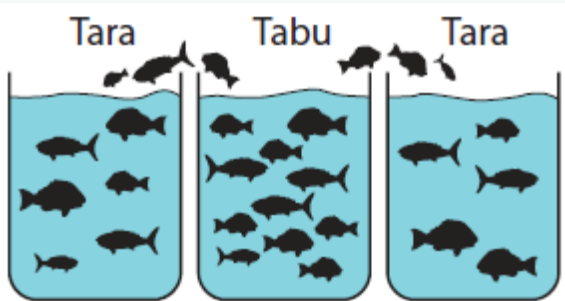


How a 'tabu' is likely to benefit the rest of the fishing ground

There are two important things that can happen to make the '**tabu**' area have benefit in the surrounding area

1)

Spillover is the movement of adults and juveniles from within the full '**tabu**' area into adjacent and surrounding fished waters.

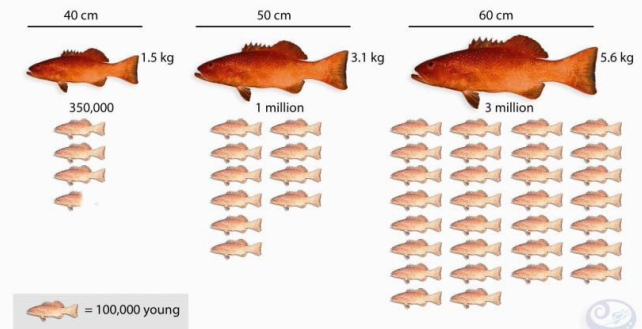


2)

Seeding is when eggs and larvae are released into the water, spread out and then become baby fish in the surrounding area.

Big adult fish have more babies than small fish-this is why big fish that are safe in '**tabu**' areas are important-see the example below for a species like **Kawakawa**.

Eggs may travel far-fish eggs may travel many hundreds of kilometers but science suggests that they may return as babies to the reef where they were born.



What are some 'tabu' management options

Option 1 - permanent closure

This is the best option which allows for maximum chance of spillover and seeding happening.

Option 2 - periodic opening

It is possible to open the '**tabu**' area and only fish a very small amount of fish from it.

However-if you take too many all benefits of spillover and seeding will be lost!

Option 3 - one permanent, one periodic opening

If you have a big **i Qoliqoli**, you can have one or more '**tabu**' area that is permanently closed and one or more that is periodically opened.

If you decide to open your *tabu*, to make sure you don't empty it:

You need to do the following;

1. Contact partner organisation, inform them of your plans and seek their advice.
2. Seek permission at village meeting and of the **i Qoliqoli** Committee
3. Together gather information and decide types of fish to be harvested and duration of opening.

Detailed guidelines on "Make Sure You Don't Empty Your Tabu, If You Decide To Open It" is available with your i Qoliqoli Committee and on the back of this book.



Species specific information

The following pages give information on the 15 most commonly caught food fish in the FLMMA catch survey. For each fish, the following information is given together with why this information is important. The information relates to the content in this booklet on how **tabu** areas work and their design.

Note: Fish images in this next section by Les Hata, courtesy of the Secretariat of the Pacific Community.

Fact	Why is it important
Habitat use and food preference	Some species need different habitats to breed in or to feed in. To protect these species you will need to include these habitats within a tabu area. We have seen an example of the Damu on page 7.
Lifespan	Some fish grow fast, breed quickly and die young. For these species, the tabu area will become full quickly and spillover and seeding will happen sooner. For species that live longer and have babies later, the benefits within and outside of the tabu area will take longer to occur. One key measure of life span is length at maturity. This is the size at which fish can have babies.
Home range	The home range of an adult fish is the distance that it moves around on a day-to-day basis. In order to protect a fish, the size of the tabu area needs to cover most of the home range of that fish. We do not know exactly the home range of fish, but we can put them into groups (less than 1km, greater than 1km, greater than 10km) . Be aware that some fish move much further when it is time to breed for example
Breeding and spawning	Whilst it may be easy to catch fish when they group together to breed, by doing so, you are removing pregnant females. With no pregnant females, no babies are born and no adult fish grow. Therefore it is best to avoid fishing at these times of the year at places where fish group together to breed.



Name of fish:

Thumbprint emperor

Lifespan:

Length at maturity is at 60cms

Breeding and spawning time:

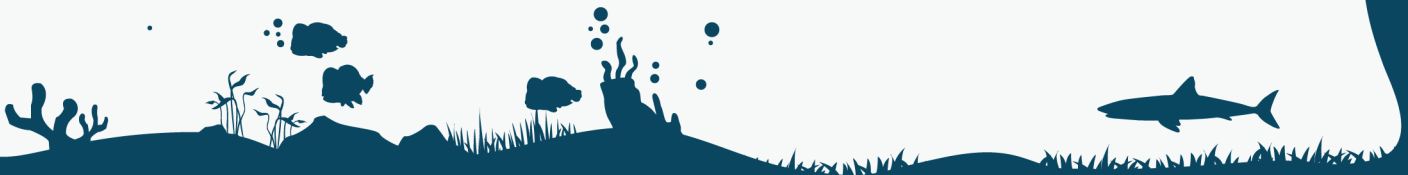
Spawning occurs in large aggregations. main habitat of reproduction are in particular areas near a reef, either in a lagoon or on the outer edges of a reef. They spawn throughout the year and peak after the first few days of the lunar month in large aggregations.

Home Range:

This fish species travels a distance of less than 1km.

Habitat use and food preference:

Found alone or in small schools over shallow, sandy, coral rubble, mangroves, lagoons, channel and seagrass areas inshore and adjacent to coral reefs. Typically feeds on sea-worms, crabs, shrimps, small fish, etc.



Name of fish:

Pacific Yellowtail Emperor

Lifespan:

Length at maturity and maximum age is 23cms and 3 years old.

Breeding and spawning time:

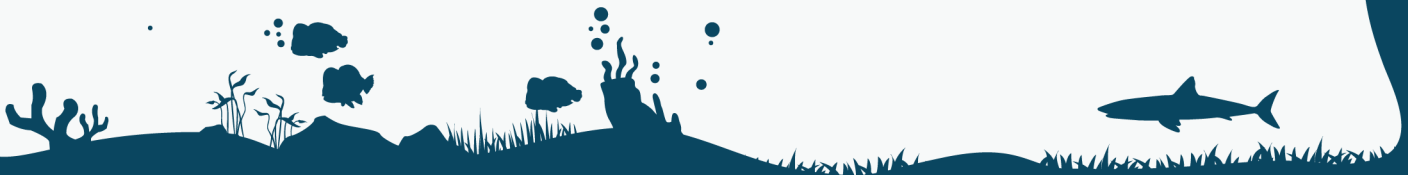
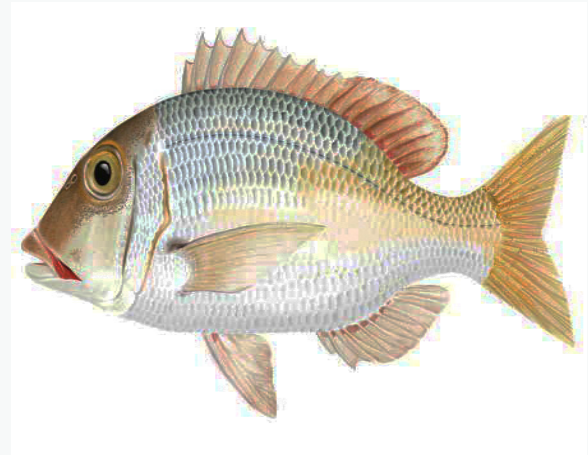
It spawns in seagrass areas and in mangroves. It spawns all throughout the year. This species does aggregate.

Home Range:

This fish species travels a distance of less than 1km.

Habitat use and food preference:

This species lives in seagrass, sandy areas and coral reefs. It feeds on small lobsters, crabs and small fishes.



Name of fish:

Blue fin trevally

Lifespan:

Maximum length and weight of male is 117cms and at 43.5 kg. Age at maturity is 2 years old.

Breeding and spawning time:

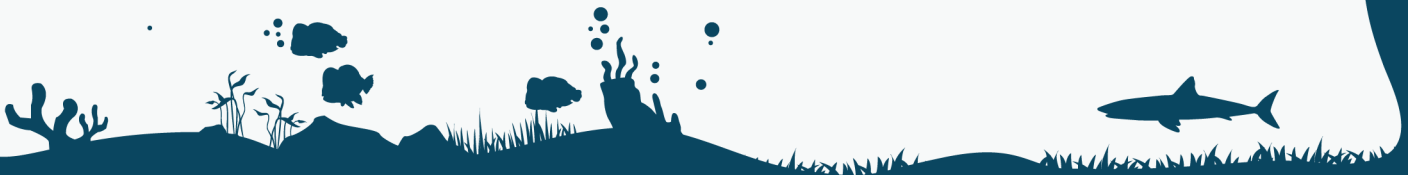
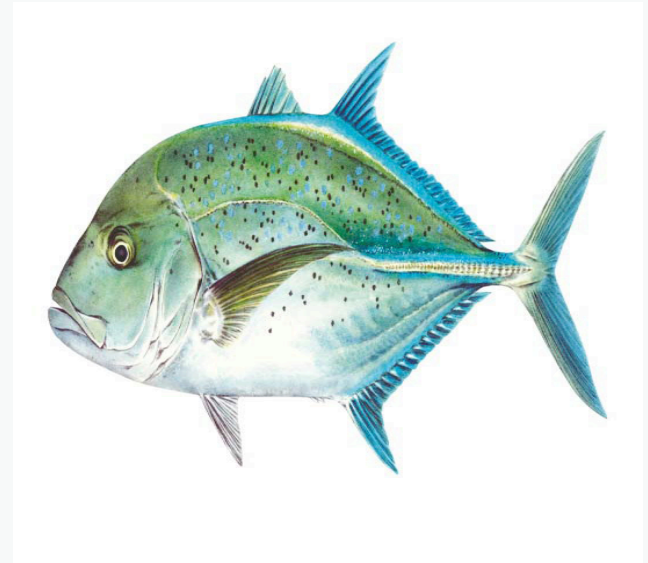
Adults do school to form spawning aggregations of temporarily while hunting. This species breeds from August to November.

Home Range:

This fish species travels a distance of less than 10 km.

Habitat use and food preference:

It is usually seen singly or occasionally in small schools. It inhabits the shallow fast moving waters of the wave impact zone or near shore flats.



Name of fish:

Bluespot mullet

Lifespan:

Maximum length is at 60cms.

Breeding and spawning time:

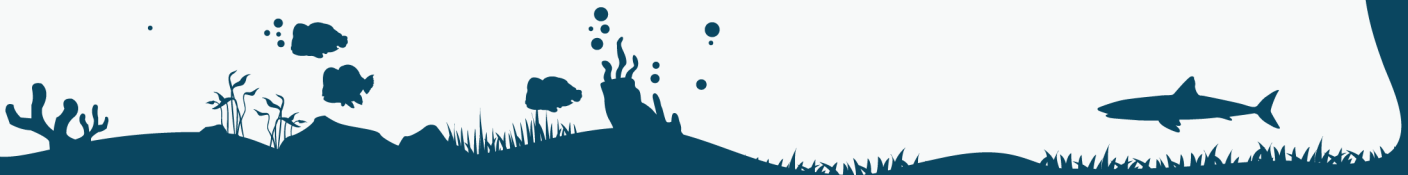
Reported to spawn in large aggregations after dark. Spawning habits takes place in the sea and not in fresh water. Mullet frequently ascends rivers and streams during rainy spells and occasionally, towards breeding season, mullets approach deep water to lay their eggs. Breeding season for mullets in Fiji is in early summer (October-December) in the West and North Viti Levu. Spawning migrations are reported to occur in mid-late December.

Home Range:

This fish species travels a distance of less than 1 km.

Habitat use and food preference:

Lives in lagoons, reef flats and is common along protected sandy shorelines. Frequently, enters river mouths and rivers. Juveniles found in rice fields and mangroves, may be used as bait fish. Mulletts consume insects, fish eggs and plankton.



Name of fish:

Seaperch blacktail snapper

Lifespan:

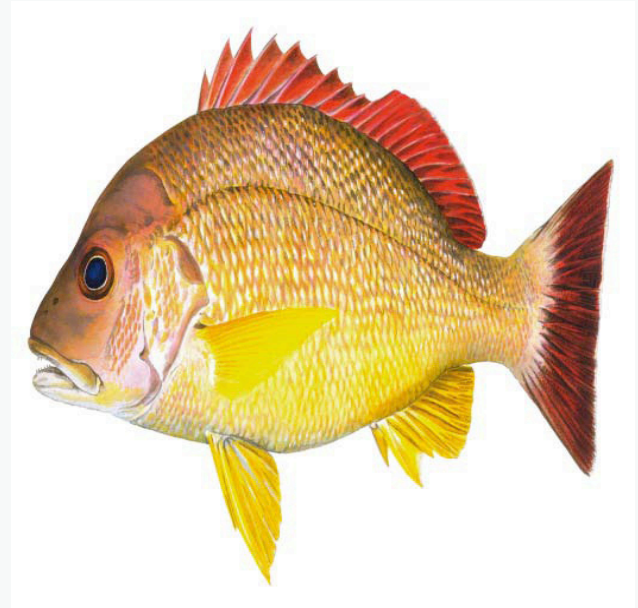
This species grows to 40cms in length. Reaches maturity when it is about 20-30cms in length, reaches maturity after 2 years.

Breeding and spawning time:

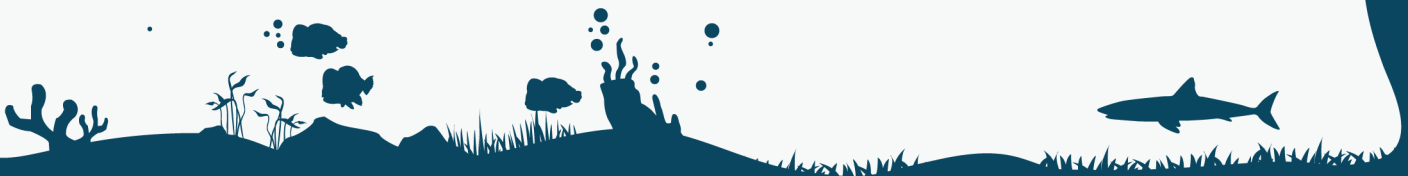
Group spawning of 10 or more fish occurs in the evening or at night during August.

Home Range:

This fish species travels a distance greater than 1 km.

**Habitat use and food preference:**

Inhabits inshore coral reefs and lagoons. It may also enter mangrove areas and the lower reaches of rivers. It prefers areas with deep holes and rocks. This fish is found at depths from 1-75m.



Name of fish:

Barred gar fish

Lifespan:

Length at maturity is 50cms.

Breeding and spawning time:

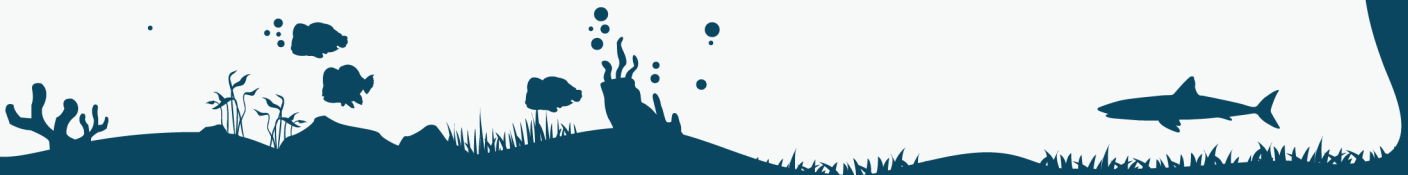
This species breeds in estuaries and in freshwater. It is a non-migratory species.

Home Range:

This fish species travels a distance greater than 1 km.

Habitat use and food preference:

Normal habitat for juveniles and adults occur in coastal waters of high islands and continental shorelines; generally in areas rich in vegetation and sand flats. Forms schools.



Name of fish:

Bluespine Unicorn fish

Lifespan:

It can reach up to 70cms in length.

Breeding and spawning time:

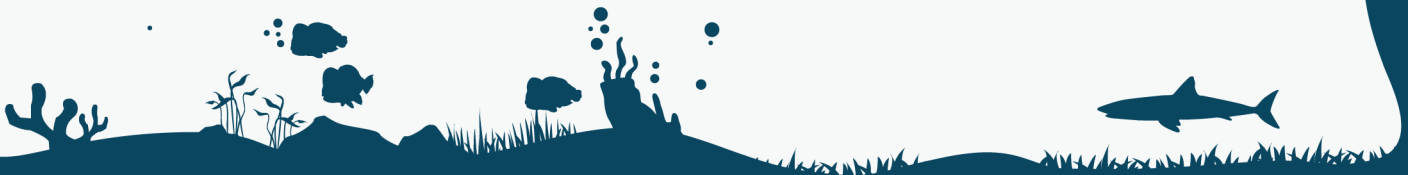
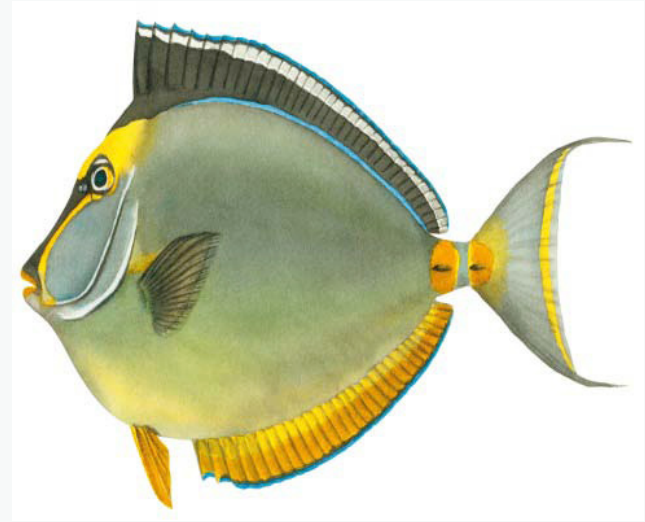
They pair off and breed.

Home Range:

This fish species travels a distance greater than 1 km.

Habitat use and food preference:

Lives in reef passages, within reefs and in lagoons. They feed during the day, and eat seaweed. Live in depths of up to 180ms.



Name of fish:

Surgeon fish

Lifespan:

Unknown

Breeding and spawning time:

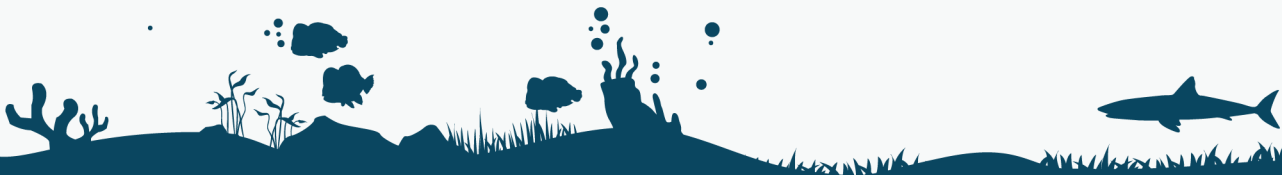
This species aggregate in large numbers to breed at dusk. Spawning is started by the males, swimming around the females. After a while, both the male and the female release their eggs and sperms.

Home Range:

This fish species travels a distance of less than 1 km.

Habitat use and food preference:

Individuals can be found at 2m in depth. They sleep at night in openings on the reef. They feed on seagrass and other seaweed growing on the reef.



Name of fish:

Grouper

Lifespan:

This species can grow as large as 2.7m, weighing up to 600kg. This is for the Giant Grouper. For other species of Grouper, like the Coral Grouper, it can grow to 62cms in length and average length at sex change is 42cms. Giant groupers are not sexually mature for many years because of their long life span. When sexually mature, the dominant female will change to male in order to reproduce.

Breeding and spawning time:

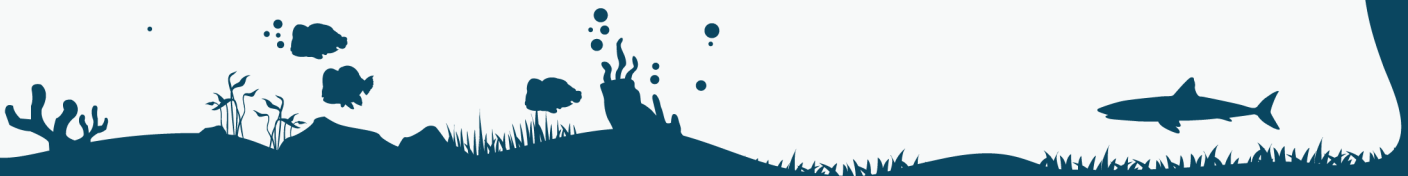
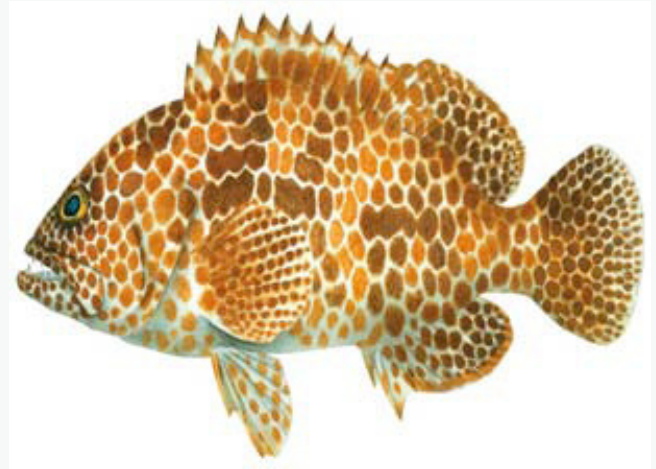
During June to July, it is possible that smaller aggregations of some of these groupers form in the months preceding and following June and July.

Home Range:

This fish species travels a distance of less than 1 km.

Habitat use and food preference:

This species of the grouper (Giant Grouper) has a large mouth and a rounded tail. It takes decades for the grouper to reach adulthood and juveniles are hard to find. They occur chiefly in coral reef ecosystems at depths from 15-300 feet.



Name of fish:

Yellow Goatfish

Lifespan:

Length at maturity is 30cms (12 inches). Average size at first maturity for this species is estimated to be 12.74cms for females and 11.83 cmsfor males.

Breeding and spawning time:

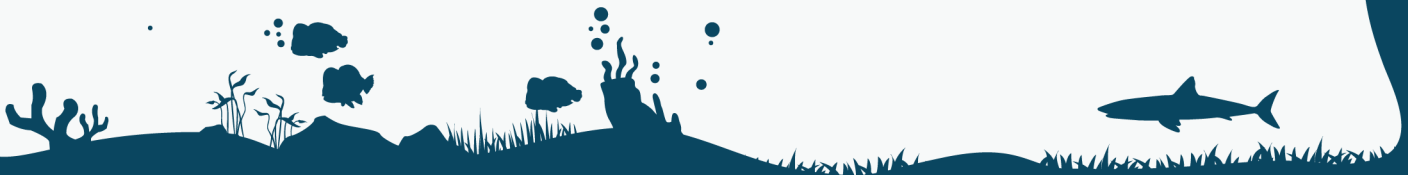
There is a ritual to spawning of this species. The male moves around the female displaying antics.The male and female stay very close to each other at this time.Spawning takes place close to the water surface or at the bottom of reef edges. The male and female go their different ways after spawning. The babies grow from December through to September the following year, in particular during March and April.

**Home Range:**

This fish species travels a distance of less than 1 km.

Habitat use and food preference:

They feed on small animals. they can be found in coral reefs, sandy areas, rocks and sometimes found in waters up to a depth of 100m.In general, found in shallow sandy waters.



Name of fish:

Chub Mackerel

Lifespan:

Length at maturity is 27cms.

Breeding and spawning time:

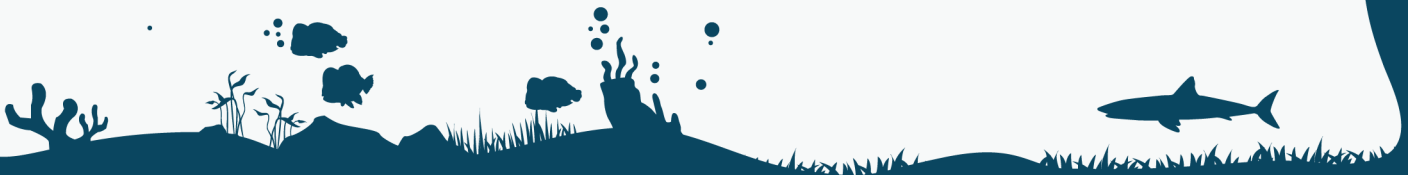
Spawning occurs in the second year of their life, during the summer months. Spawning is observed in September. Females spawn eggs throughout the spawning season from as short as 7-10 days, spawning depends on water temperatures.

Home Range:

This fish species travels a distance greater than 1 km.

Habitat use and food preference:

Common in clearer reef waters. Feeds on the largest zooplankton organisms.



Name of fish:

Scribbled Rabbitfish

Lifespan:

It grows to 10 inches in the wild. Becomes sexual mature after 1 year.

Breeding and spawning time

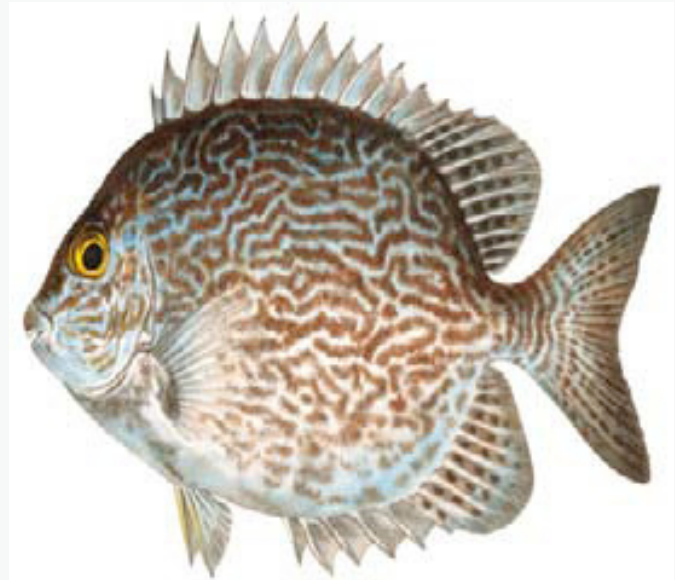
During the reproductive season, spawning of scribbled rabbitfish is associated with moon phases. Rabbitfish spawn around reefs and seagrass/seaweed beds. Around November-December, fishes release gametes.

Home Range:

This fish species travels a distance of less than 1km.

Habitat use and food preference:

Coastal reef flats and outer reefs to 6m. Juveniles and adults occur in small schools (2-100) and around coral reefs, typically in surge zones at reef edges. Rabbitfish are herbivores. Graze on algae. Adults and juveniles are day feeders.



Name of fish:

Parrotfish

Lifespan:

Length at 50% maturity occurs at 13.5 inches.

Breeding and spawning time:

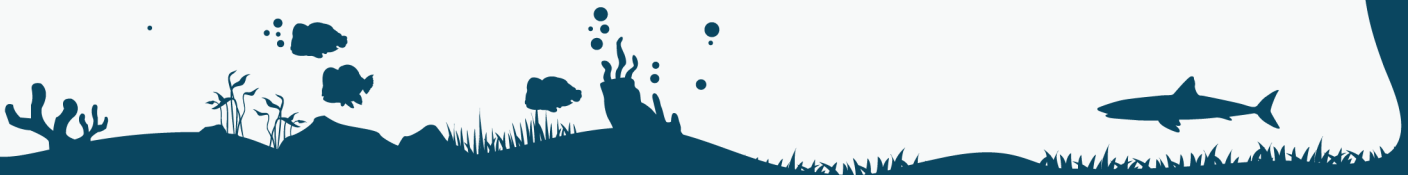
Mating activity usually takes place down current reef edges, some species go to the outer edges of the reef and others within define territories. Spawn all year round during evening with an increased rate of reproduction during the summer months. Most parrotfish species develop rapidly and reach maturity between 2-4 years. Age of maturity ranges from 3-3.5 years.

Home Range:

This fish species travels a distance greater than 1km.

Habitat use and food preference:

Commonly found along the coral reefs in depths ranging from 3-50m, lagoons and seaward reefs. Juveniles generally are solitary. Adults often school together. Parrotfish are herbivores and grazers. They eat algae coated coral.



Name of fish:

Yellow surgeon fish

Lifespan:

Length at maturity is 4.5 inches and sexually mature between 9-12 months. The length of the adult ranges from 25-30cms. The maximum length usually does not exceed 50 cms (20 inches).

Breeding and spawning time:

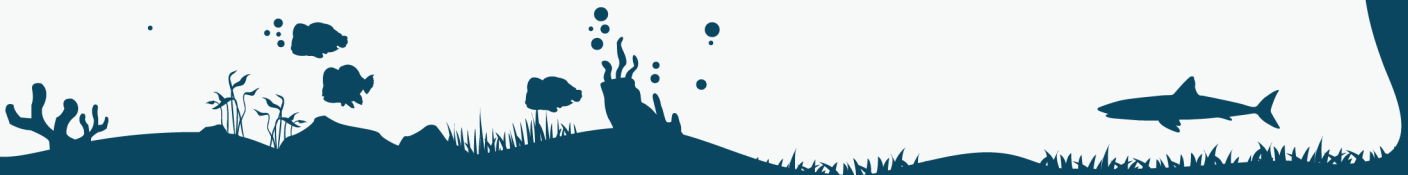
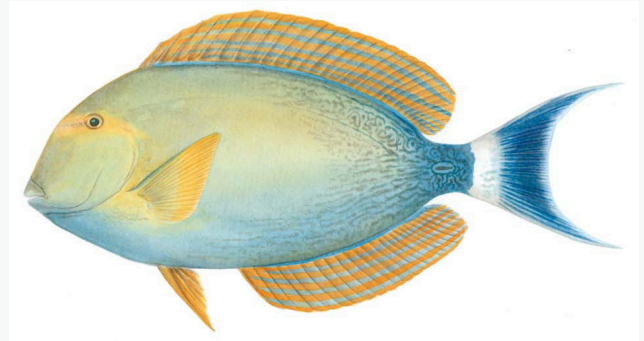
Breeding season is from the months of January to May. Fertilization is external.

Home Range:

This species travels a distance of less than 1km.

Habitat use and food preference:

Lives in various reef habitats, sand slopes and lagoons. Juveniles inhabit shallow, protected, dirty inshore waters while adults prefer deeper areas of protected bays and lagoons. Also in outer reef areas.



Name of fish:

Silver Biddy

Lifespan:

Minimum standard length is 89.7mm.

Breeding and spawning time:

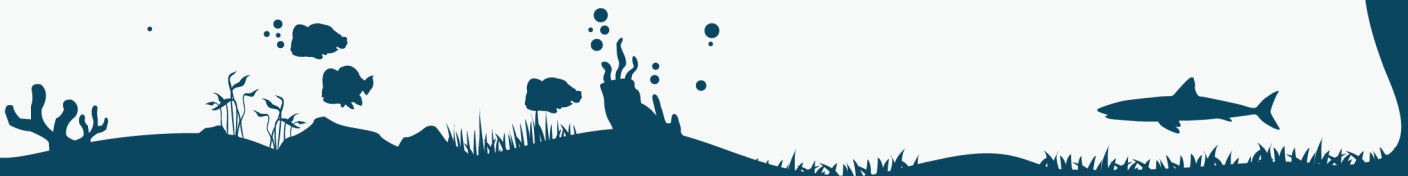
They stay in the river mouths until maturity. Spawning is between the months of April-August. The female attains sexual maturity at a minimum size of 14cms standard length. Males at 19cms and females at 22cms.

**Home Range:**

This fish species travels a distance of greater than 1km.

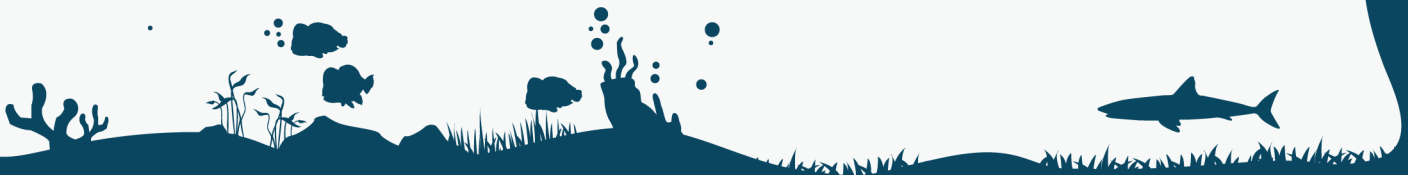
Habitat Use & Food Preference:

It lives in river mouths and on coastal reefs. It is usually observed in schools over sandy bottoms. Adults live in clear coastal waters down to about 50 m, whereas juveniles are found in estuaries or lagoons influenced by freshwater.



Make Sure You DOn't Empty Your Tabu, If You Do Decide to Open It.

1. The permission to open is to be sought and given by the Village meeting, **Tikina** meeting, **Vanua** meeting, depending on the authority that instituted the **tabu**.
2. Request to the **i Qoliqoli** Committee on "opening of the **tabu** area" is made 1 month before the suggested event is to occur.
3. At the request, the **i Qoliqoli** Committee meets to review information available to it (i.e. from the booklet, result of monitoring, CPUE analysis, as well as obtaining advise FLMMA scientists and partner organizations).
4. Notification also needs to be made at least two weeks prior to the opening of the **tabu** area to the partner organisation for monitoring purposes and as an advisory to the **Qoliqoli** Committee.
5. Based on its review (3) , the **i Qoliqoli** Committee must determine the amount of catch in terms of bags of fish and non-fish and in kilograms and the day and time of opening and closing. This forms part of its decision.
6. The **i Qoliqoli** Committee needs to respond back to the village/district within a week or two.
7. Fish wardens must be the first to arrive and position themselves at strategic points before the opening, and the last to leave after closing the area, ensuring every one has left.
8. Fish Wardens must monitor fishing and to record the numbers, size and type of fish and non-fish being collected, to make sure the limits set by the **i Qoliqoli** Committee are not exceeded.
9. Catch then is taken to the **Turaga ni Vanua**, for presentation and advise on numbers of bags and contents of catch; **yaqona** presentation of thank you from the **Vanua** to the Committee and the Fish Wardens; **Qoliqoli** Committee advises the **Vanua** of closure and commitment to manage **qoliqoli** as planned.



ACKNOWLEDGEMENTS.

The Fiji Pride Campaign would like to acknowledge and say a big “VINAKA VAKALEVU” to the organisation that funded for this Booklet for the Communities- CONSERVATION INTERNATIONAL and to the many individuals who contributed their time and efforts towards the compilation and translation of this booklet.

- 1. James Comley of IAS/USP.*
- 2. Rahul Tikaram (Student Graduate-USP)*
- 3. Professor William Aalbersberg (IAS and Supervisor for the Campaign)*
- 4. Sunia Waqainabete (Fisheries Department & Supervisor for the Campaign)*
- 5. Kesaia Tabunakawai (WWF & Supervisor for the Campaign)*
- 6. Rusiate Lawalevu (Graphic artist at Niuwave Media)*
- 7. Les Hata of SPC Noumea, New Caledonia for the fish images.*
- 8. Loraini Sivo (Conservation International)*
- 9. Adam Murray (Rare)*
- 10. Hugh Govan (LMMA)*
- 11. Ilaitia Tamata & Joji Sivo for the Species Matrix Fish Information.*

