An example of distribution at Goat Island Bay

Read extract ‘Goat Island, Cape Rodney’ from *Margins of the Sea* by Ron Cometti and John Morton

The following description is for a fragmented transect down the broad terraces of Echinoderm Reef, about 65 m from high tide to low tide marks. It is not possible to find an uninterrupted sequence of steps over a short distance like those at Long Bay because, in some parts, they are tilted and backwardly sloping and elsewhere some steps are very long (over 10 m). However, all parts of a stepped series can easily be identified on a broken transect down the shore and are shown in the schematic diagram here as a partitioned series.

Teachers should position student sub-groups at suitable (uncomplicated) sites from the top to the bottom of the shore so that the distribution of the common zoning of shore animals and seaweeds will be assessed at all levels by the whole class.

Goat Island Bay (Echinoderm Reef)

Top step
Grazing periwinkles and nerita are the only colonisers.

Periwinkles are scarce along most of this shore because the upper beach's coarse sand is moved around by wave action that regularly scours or smothers the upper steps.

2nd step (30 cm down)
Nerita, topshells and occasional limpets graze the clean areas. Elsewhere column barnacles form sheets and are predated by oyster borers. There are a few rock oysters at their upper limit. Towards the seaward edge are a few snakeskin chiton and clusters of ribbed barnacles.

3rd step (30 cm down, in uneven 10 to 15 cm steps and slopes)

Surface patchily covered with ribbed barnacle and oyster with nerita, snakeskin chiton and small numbers of topshell and radiate limpet between.

Shallow, damp hollows may have patchy coralline turf and small cats eyes.

4th step (10 cm down)
Patchy coralline turf with topshells and radiate limpets and few nerita between.

Also sparse patches of column barnacle with predating oyster borer.

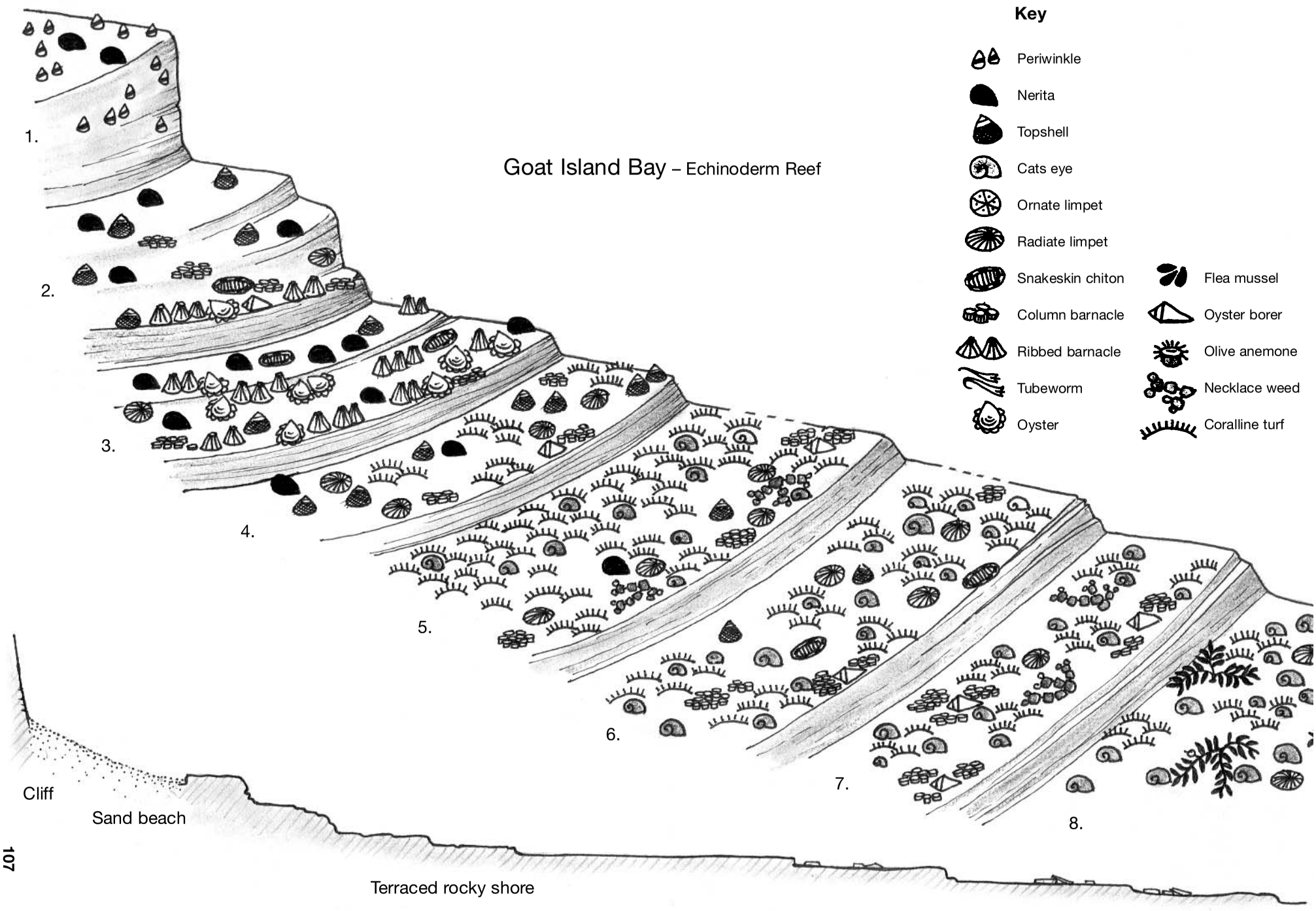
5th step (10 cm down – broad flat, over 10 m in places)
At the back almost a complete cover of coralline turf with very small cats eyes.

The front (seaward) half has patchy turf with nerita, radiate limpets, some column barnacles and oyster borer and a few specimens of necklace weed.

6th step (15 cm down)
Patchy coralline turf with very small cats eyes. On bare or pink paint covered rock in between are medium cats eyes, radiate limpets, a few topshells and chitons. Column barnacles are in patchy sheets with packs of oyster borer.

7th step (15 cm down – broad flat, over 5 m)
Many small and medium cats eyes on and between patchy coralline turf, as well as a few necklace weed plants. Substantial sheets of column barnacle with oyster borer packs on bare areas.

8th step (15 cm down)
Broad low tidal terraces of the sublittoral fringe with small bladder wrack plants between coralline turf patches. There are a few radiate limpets but abundant cats eyes are the main grazers.


Goat Island Bay – Echinoderm Reef
Key
Periwinkle
Nerita
Topshell
Cats eye
Ornate limpet
Radiate limpet
Snakeskin chiton
Column barnacle
Ribbed barnacle
Tubeworm
Oyster
Flea mussel
Oyster borer
Olive anemone
Necklace weed
Coralline turf
1.
2.
3.
4.
5.
6.
7.
8.
Cliff
Sand beach
Terraced rocky shore

Examples of distribution at Long Bay

See extract 'Long Bay – Hauraki Gulf' from *Margins of the Sea* by Ron Cometti and John Morton.

The descriptions below show changes from high to low tide along a single sampling line at each of the terraced shores at Long Bay and can be used as models in pre-visit and post-visit lessons. At both sites the precise step heights vary along the terrace and the number and size of steps changes from place to place. The distribution of animals and seaweeds will vary accordingly but in tidal height terms it will remain constant.

Granny's Bay Reef

Top step
Periwinkles are dominant and the only grazing snails over large areas. There are often 5,000 per sq m. There are some nerita and many periwinkles where the surface is castellated and has small puddles. At seaward edge are periwinkles, nerita and ornate limpets, along with some column barnacles and their predatory whelk, the oyster borer.

2nd step (40 – 50 cm down)
Main grazers are topshells, radiate limpets and a few snakeskin chitons. Occasional cats eyes are around small pools and puddles (which also have olive anemones). At seaward edge the rock is well covered with the large, ribbed barnacle, with oyster borers amongst them. Four grazers – radiate and ornate limpets, cats eye and snakeskin chiton feed between and over them.

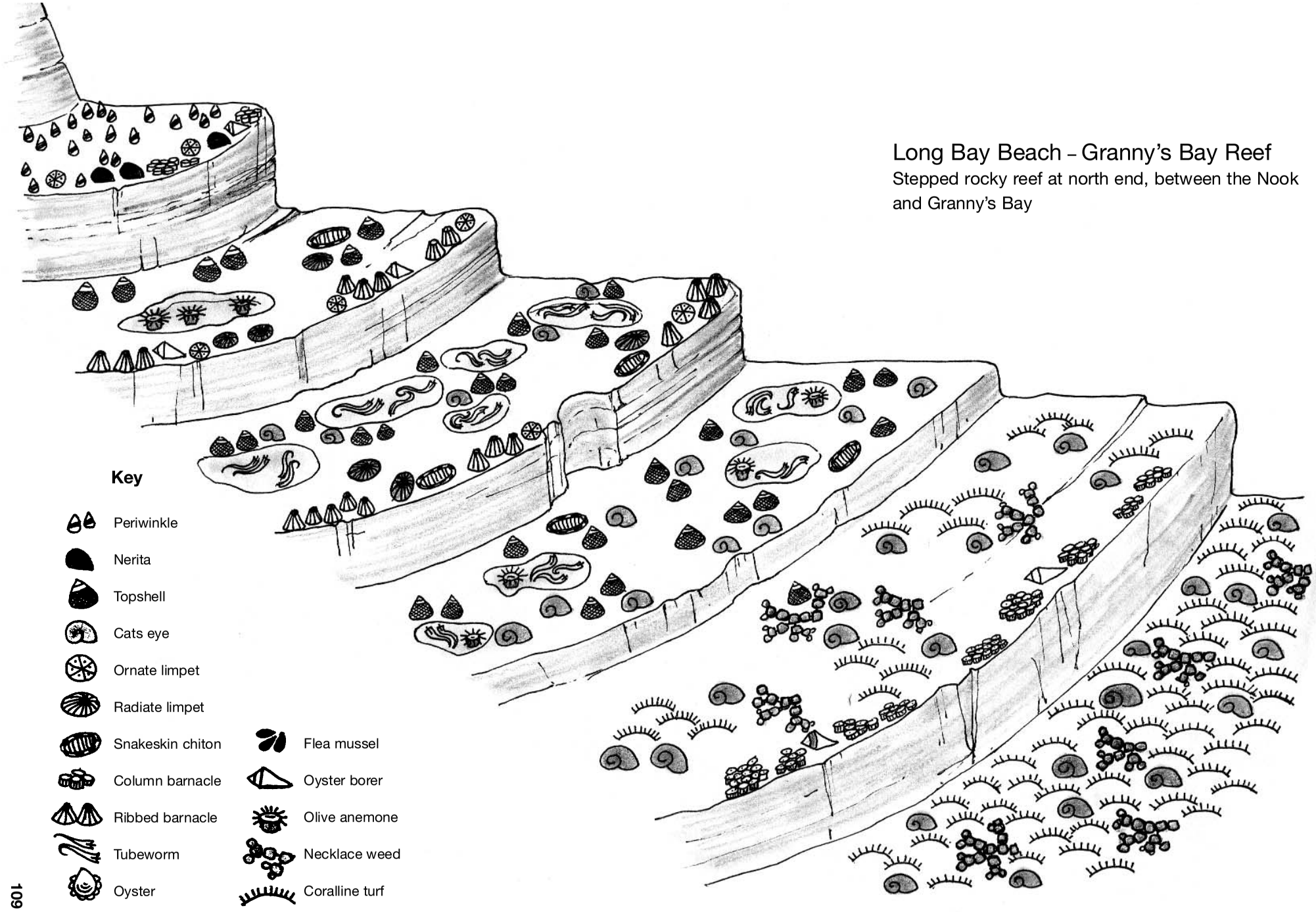
3rd step (about 30 cm down)
There are many puddles and small pools containing indigo crowned tubeworms and cats eyes. Topshells are found around the pool edges. At the seaward edge, among scattered ribbed and column barnacles, are good numbers of radiate limpets, some snakeskin chitons and a few ornate limpets.

4th step (30 – 40 cm down)
The pitted surface has tubeworms and olive anemones in puddles. The main grazers are cats eyes and topshells with a few snakeskin chitons.

5th step (15 cm down)
Rock surface has a patchy cover of Neptune's necklace weed and coralline turf. The main grazer is the cats eye but there are also a few topshells. Seaward edge has column barnacles on which packs of oyster borer are feeding.

6th (bottom) step (30 to 40 cm down)
Rock surface is well covered with coralline turf but there are also scattered specimens of necklace weed and small toffee coloured seaweed *Laurencia botricoides.*

The cats eye is almost the only sizeable grazer.



Long Bay Beach – Granny's Bay Reef

Stepped rocky reef at north end, between the Nook and Granny's Bay

MERC Reef (South Reef)

Top step
Periwinkles numerous

2nd step (10 cm down)
Main grazers are periwinkles and nerita and there are a few ornate limpets.

Along the seaward edge the surface is well covered with column barnacle, with scattered specimens of ribbed barnacle and their predatory whelk the oyster borer.

3rd step (10 cm down)
Main grazers are periwinkles and topshells with a few snakeskin chitons and radiate limpets

The surface has sheets of column barnacles and dense patches of ribbed barnacle, both with oyster borer. Ornate limpets are among the barnacles and oyster borers, towards the seaward edge.

4th step (10 cm down)

Main grazers are topshells and radiate limpets.

Towards the seaward edge ribbed barnacles are dense and interspersed with clumps of little black flea mussels, a few rock oysters and tubeworms. In mini-pools and puddles there are olive sea anemones in between some coralline turf patches.

5th step (20 cm down)
Surface densely covered with rock oyster interspersed with a few flea mussels. The topshell is the main grazer but there are also a few cats eyes.

6th step (10 to 20 cm down – not a sharp step but stepped slope)
Surface with patchy coralline turf interspersed with tubeworms and small clumps of flea mussel amongst which are white rock whelk predators.

Cats eyes are the main grazers.

Long Bay Beach – Merc Reef

Stepped rocky reef at the South End of Long Bay Beach