

## Plants of the Pauatahanui Inlet

### Saltmarsh plants

Around the Inlet you will find many interesting plants that manage to survive in the salty environment. Read this information and look carefully at each photo.

#### Coprosma propinqua

Maori name: **mingimingi**

One of the first shrubs you will meet once you are on the track from the carpark, this plant will grow up to 6 metres high but in this area its maximum height is closer to 3 metres.



The easiest way to identify **mingimingi** is by the distinctive coprosma leaf arrangement. The small, bright green leaves are placed in pairs opposite each other. Each pair is at right angles to the pair above or below it. The branches are thin and close together so that the growth looks dense or thick.

(Photo:<http://www.TeAra.govt.nz/en/shrublands/4/3/1>)

#### Plagianthus divaricatus

Common name: **saltmarsh ribbonwood**

You will find this shrub near the mingimingi and the two plants look



quite similar and grow to a similar height. However, the **ribbonwood**'s small thin green leaves have a reddish touch and they are not so regularly placed: the branches are a lovely red and they weave in and out of each other.

(Photo: [www.taranakiplants.net.nz](http://www.taranakiplants.net.nz))

### **Coprosma repens**

Common name: **taupata**

This is a very common plant around coastal regions of the North Island and the top of the South Island. Its leaves are a roundish-oval glossy rich green and the stems of



the new growth are pale green. It has berries which become bright orange when they are ripe.

You will find the taupata all along the track right out to the water but its shape and height vary as its habitat changes. Have you noted the way the leaves are

placed on the stem? This is a member of the Coprosma family so its leaf arrangement is the same as the mingimingi. You might like to sketch the leaf pattern.

### **Salicornia**

Common name: **glasswort**

There are a number of different species of **glasswort** and they are found in many countries around the world. You will find our **glasswort** next to and in the mudflats. It is a small succulent, usually less than



30 cm tall, with a jointed horizontal main stem and upright branches. The leaves are small and scale-like and the plant may look leafless. Many species are green, but



their foliage turns red in autumn. When the tide has been in sometimes the plant is left covered in the mud and it looks grey! Unlike most plants, the **glasswort** can tolerate being totally covered by seawater. It also has an interesting history as it was once used in the manufacture of an everyday product.

(photo: [www.glaucus.org.uk](http://www.glaucus.org.uk))

### Phormium family – flaxes

There are two species of flax found throughout New Zealand. The height and the stiffness of the leaves are how to tell them apart. Phormium tenax can grow over 2 metres and the leaves and seed pods stand tall. Phormium cookianum leaves and seed pods flop and the plant is much smaller. However, where the two different species grow together, hybrids can breed. Even though it is commonly known as the mountain flax it is also found in scrub areas and on the coastline.



Phormium tenax



Phormium tenax seed pods



Phormium cookianum seed pods

Seedpod photos: <http://www.fernwood-nursery.co.uk/phormium/2phspsc.htm>

## Reed family

You will find two different types of reed close to and in the water – the **sea rush** (*Juncus maritimus*) and the **jointed rush** (*Apodasmia similis*), which is also known by its Maori name *oioi*. The **sea rush** has a smooth, dark green stem and is thicker than the **jointed rush**, which has grey-green leaves with brown bumps up the stem. (These are the bumps that give it its name.) The jointed rush stretches over large areas in the upper tidal area of the mud flats. When it turns its distinctive red-gold shade it adds to the beautiful colours of the inlet.



Jointed rush (above)

Sea rush (left)



## **Selliera radicans**

Maori name: **remuremu**

Common name: **Shiny swamp mat**



The **remuremu**, found in New Zealand, south-eastern Australia and Chile, does not like to dry out so it is found in salt marshes, wetlands and lakes. It grows in the water, or very close to it, as a dense mat of tiny fleshy, flattened, club-shaped leaves, no higher than 15cm. In spring to summer it has many white, lop-sided half-flowers.

Photo: [www.davesgarden.com](http://www.davesgarden.com)

When remuremu is submerged by the tide, it can get covered with mud and silt. This is what it looks like then:



## Pupil Activity One

### Questions

1. Many of the plants found around the Inlet are smaller than the size they can grow in gardens or in the bush. Can you suggest a reason why?
2. When a plant grows by the sea its foliage can be much greyer than when it grows further away. Can you think of a reason why?
3. Can you think of a reason why the taupata's ripe berries are such a bright colour?
4. The branches of the taupata grow differently in different places along the track. The height changes too. Can you guess why?
5. Have you noticed the leaf pattern of the taupata? How is it similar to another plant that you have been looking at? Look at the botanical name as this will give you a clue.
6. The name **Phormium** means 'basket' or 'wickerwork'. What do Maori use the flax for that links it to this name?
7. The small succulent, glasswort, has an interesting history. Find out why it has the name glasswort.

## Pupil Activity Two

Be a plant detective – in class activity.

1. Compare the two flax plants. Which is more likely to grow nearer the sea edge and why?
2. The sea rush and the jointed rush both grow near the edge of the estuary. How do you know which one is which?
3. The leaves on the salt marsh plants can be one of two types. What are the two types? (Think about size and shape). Can you name one plant of each type?
4. Think about the trees in a forest. Draw and label a large forest tree. Now draw one of the plants from the Inlet pathway. What features does your forest tree have that your coastal plant does not?
5. Choose four plants from the pathway. Try to find two close to the water and two at the carpark end. Copy the diagram below and sketch your plants on the appropriate place on the line.

Sea \_\_\_\_\_ Carpark

6. What do you notice when you compare the heights of the plants at either end of the line? What other differences can you see between the plants at either end? Can you make a comment about the colours of the plants at each end?

## TEACHER NOTES: PLANTS OF THE SALTMARSH

When writing botanical names, always put the genus first with a capital letter then the species after it with a small letter – never a capital.

Plants of the saltmarsh are called Halophytes, from the Greek word for salt.

Many conditions affect the plants on the margins of the Pauatahanui Inlet estuary, especially those in the tidal areas: the length of time that the plant is submerged; the surrounding salinity or saltiness; the speed of the water moving past; the type of substrate present (the material in which a plant grows); and the amount of oxygen. The rise and fall of the tide affects all these things. To live in or by the sea, a plant must be able to cope with the salt water, so only a few, special plants can survive here. Plants within the saltmarsh grow in distinct zones created by the changes in **salinity**. These plants can tolerate salt but the balance between the salty sea water and the fresh water from the rivers is critical for the plants to thrive. **This is the central concept of an estuary.**

**Some interesting fact about the saltmarsh plants.**

**(This section takes you from the water back to the carpark on your return journey.)**

### Eel Grass

Only one New Zealand flowering plant can live below the mid-tide zone and this is **eel grass**.

When submerged, its ribbon-like leaves float along the bottom like eels. It is a plant that grows for several years and presents as one of the most diverse ecosystems on the planet. It has the following functions in the Inlet.

1. It is a vital food source for the breeding grounds of fish and shellfish, especially flounder and mullet. The fish eat very little of the live plant because it is high in cellulose, which many animals cannot digest. The food source comes from detritus (partly dead leaves and partly other decaying matter) that becomes trapped in the long leaves of the eel grass.
2. Its leaves float upward and have a slowing effect on the water flow, so sediment and larvae are collected more easily.
3. The eel grass helps prevent erosion and maintain stability of the shore by anchoring the sediment with its spreading roots (rhizomes).
4. It has an important role at the bottom of the food chain (If you have been to one of our workshops, you will find a food chain diagram in the booklet.)

5. It photosynthesizes and contributes to the air we breathe.
6. It provides a habitat for the numerous invertebrates (crabs, snails etc). There are twice as many species in an **eel grass** bed as in the sand.

### Other plants

To survive on land a plant must take up water through its roots and transport it to the leaves where it is used in the manufacture of food. Obviously, the saltmarsh plants take up a considerable amount of salt with the water and they must have strategies to cope with this excess salt if they are to survive.

**Glasswort** lives on the margin of the high tide area and stores large amounts of water in its fleshy stems. This stored water dilutes the salt. Other plants continually produce new leaves and dispose of the salt as they shed the dead ones.

As you follow the planting profile from the water to the car park, look for subtle changes in the form of the various plants.

### Answers

#### Activity One

1. The conditions found at the estuary are quite harsh – the wind, the salinity in the soil and the lack of a tree canopy mean that the plants struggle to thrive.
2. When a tree grows in a very exposed place, the leaves adapt to the condition by creating a tougher exterior to the leaf through which it does not easily lose water. (Many alpine plants also have grey leaves to prevent water loss in the high winds.)
3. The bright colour of the taupata berries and many other native plants is because these plants rely on birds eating them and excreting them in a rich drop of fertilizer for propagation.
4. See answer one and draw the children's attention to how the vegetation height becomes lower as they walk closer to the sea.
5. This plant is a coprosma so it has the same alternate formation of leaf pairs.
6. The use of flax in Maori weaving – eg kete.
7. The glasswort ash used to be used in the glassmaking process because of its chemical properties when it was burnt.