

The background of the entire page is a deep blue underwater scene. Several sharks are visible, including a large one on the left and others swimming in the distance. In the lower half, a transparent submarine is filled with people. Hand-drawn white outlines of a shark and a jellyfish are also present.

Kelly Tarlton's

UNDERWATER
W O R L D

WELCOME . . .



To Kelly Tarlton's Underwater World, New Zealand's most popular attraction and the largest aquarium of its type in the world.

Since opening in 1985 Kelly Tarlton's has hosted over two million visitors from around the world and has undergone major extensions to provide larger display areas, educational facilities, administrative offices and laboratory facilities.

This booklet tells you about Kelly Tarlton, the designer and builder of the aquarium, and describes how he created an international attraction on the shores of Auckland Harbour.

Many people ask questions about the daily routine at the Underwater World. What foods do the fish eat? What types of fish live here? Do they need special care?

Our booklet explains the different environments contained in the aquarium. It tells you a little about the fish and other sea-dwellers of the Underwater World. We show you how they live and how we have created a natural and healthy environment for over 50 different types of fish.

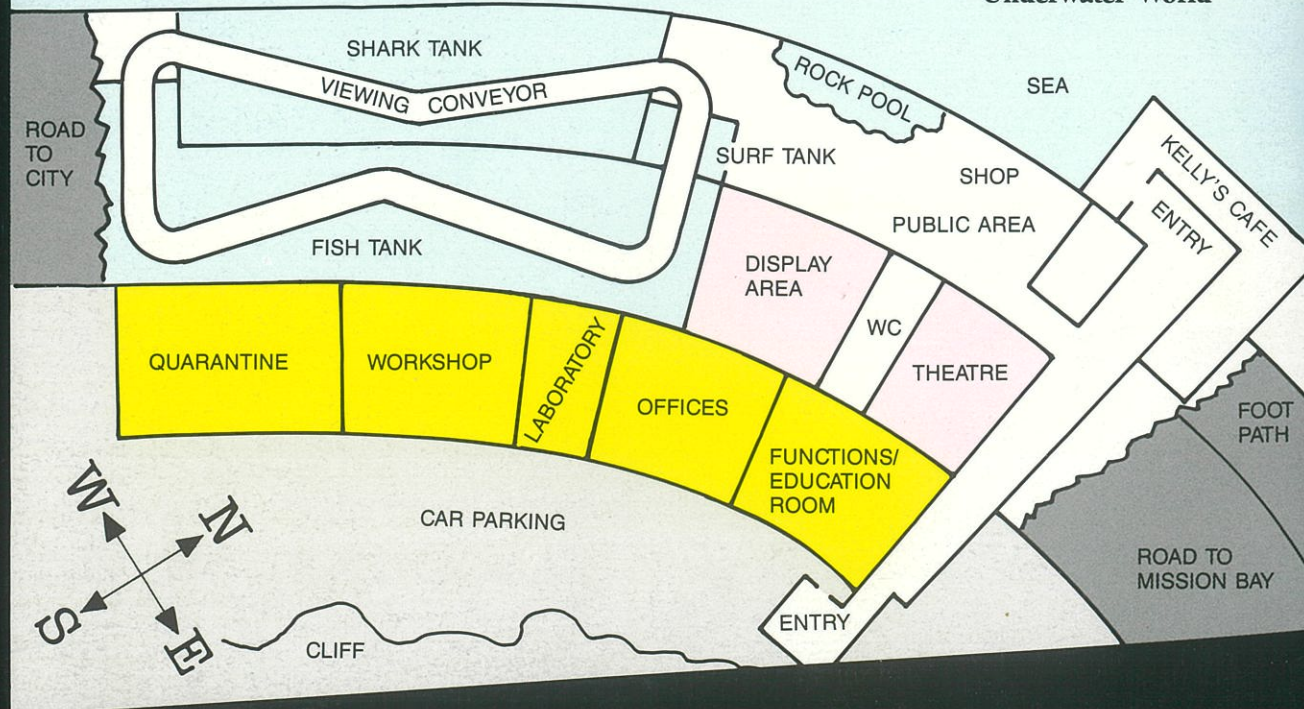
I wish you an enjoyable stay with us at Kelly Tarlton's Underwater World.

Keith Goodall
Managing Director
Argus Questar Corporation Ltd

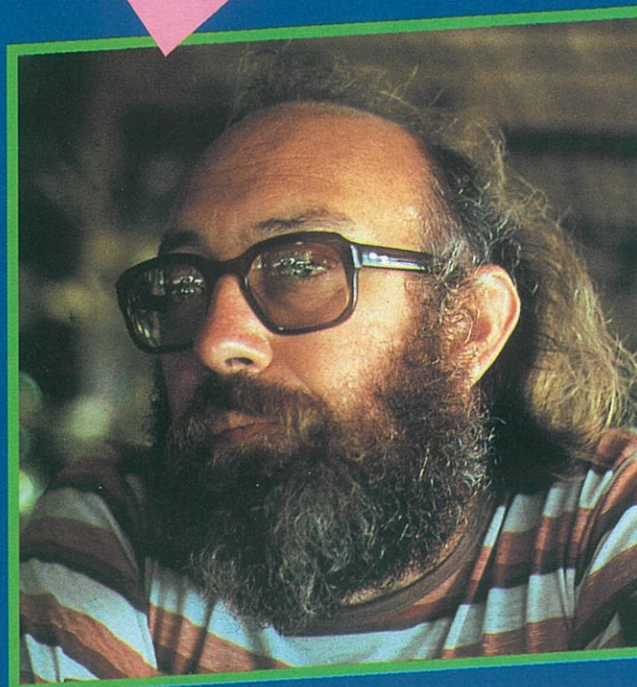
Index

The Underwater World	1
The Life of Kelly Tarlton	2
Construction	4
The Journey Under The Sea	
Rockpools	6
The Kelp Forest	8
Sandy Beds	10
The Rocky Reef	12
Caves	14
The Realm of the Shark	16
Special Display Tanks	18
Catching a Shark	20
Education	21
Behind the Scenes	22
Special Moments at The Underwater World	24

Plan of Kelly Tarlton's Underwater World



KELLY TARLTON



Kelly Tarlton 1937 – 1985

Diver, dreamer, explorer, inventor, instigator, worker, storyteller and father; A man who linked us all with his love of the sea.

Kelly Tarlton's Underwater World is open from 9 am to 9 pm 365 days in the year.

Kelly Tarlton's Underwater World
Orakei Wharf, Tamaki Drive, Orakei
Auckland 5, New Zealand
Telephone (09) 580 603

Information Line 24 hours (09) 589-318
P.O. Box 42 021, Orakei, Auckland
Telex Rainco 63422 Facsimile (09) 602 875

Kelly Tarlton's Underwater World is a member of the Argus Questar group of companies.



The Underwater World

Imagine you are walking into the cold waters of the ocean, stepping through the waves and out into deeper water off New Zealand's coastline.

The sea is full of many different types of fish and unusual creatures living at different depths.

At Kelly Tarlton's Underwater World your journey begins as you step into the theatre to learn about Kelly Tarlton's shipwreck explorations and observe the patterns and colours of the sea in a special 15 minute audio visual presentation. Before you move through to the tunnels, you may spend a while beside the Rockpools or take a close look at the Special Display Tanks.

As you step into the tunnel, your journey will take you through six different marine environments. It is 120 metres long, the longest underwater acrylic tunnel in the world, and measures 2.4 metres from side to side. Only 7 centimetres of acrylic plastic separate you from the inhabitants of the ocean floor.

Because the wall of the tunnel is curved inwards, the fish and their surroundings look much smaller than they really are. For example, a three metre shark will appear to be two metres long. So when you see a fish, or an eel, or a shark, remember, it's half as large again! Take your time to move through the tunnel. If you wish you may step off the conveyor to watch the movements of the fish that interest you. The Underwater World has many secrets, so be sure to watch carefully!



THE LIFE OF KELLY TARLTON

Kelly Tarlton, designer and builder of The Underwater World

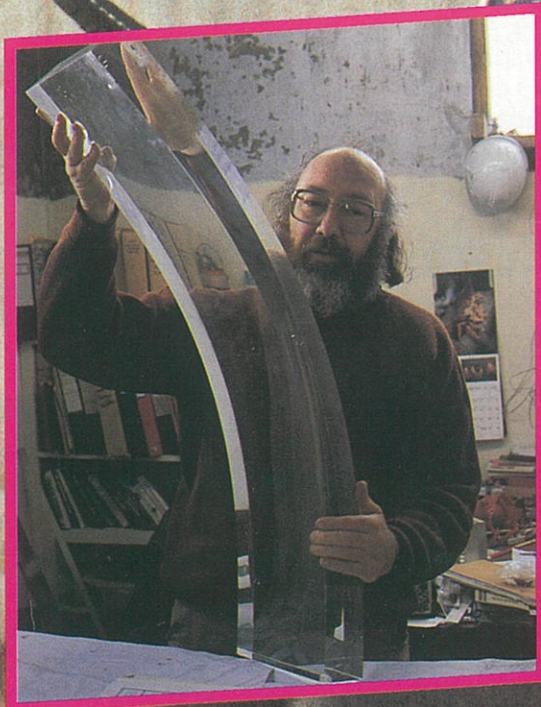
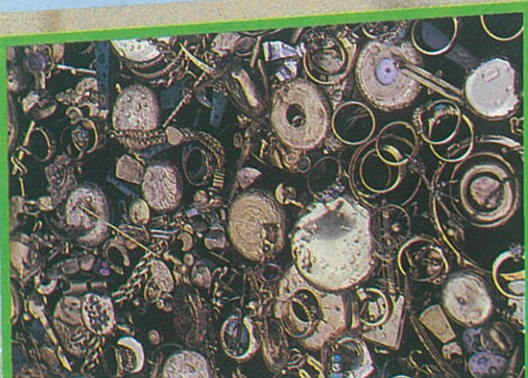
If any single quality characterises Kelly Tarlton's life, it would be his enthusiasm for exploring unfamiliar places and new ideas.

As a youth Kelly saw French marine scientist and explorer Jacques Cousteau's film 'Silent World' and was moved by the unexplored beauty of the sea. Soon Kelly had copied parts, pieced them together and built his own scuba equipment.

Kelly gained a reputation as an adventurous underwater photographer when his interest in diving took him to unusual locations. His diving adventure stories and photographs appeared in magazines worldwide.

Kelly formed a commercial diving company to enable him to develop his experience in marine archaeology. He spent a great deal of time around some of New Zealand's famous shipwrecks, such as the *Elingamite* at the Three Kings Islands, the sailing ship *Boyd* in Whangaroa Harbour, the elusive *General Grant* at the Auckland Islands and the steamship *Tasmania* off Mahia Peninsula. The Museum of Shipwrecks at Waitangi, Bay of Islands, was established by Kelly during these years.

By 1978 Kelly's explorations meant that he spent a great deal of his time overseas. During this year he was involved in recovering Captain Cook's lost anchor in Tahiti, working over a Spanish treasure galleon in Florida, USA, and surveying for the famous wreck of the *Lutine* in Holland.





Research for his Underwater World began in 1982 when Kelly and his wife Rosemary travelled to aquariums in Hawaii, Hong Kong, USA, Canada, Japan, Singapore and Australia. As planning for Auckland's Underwater World continued, Kelly spent 10 weeks recovering 53 more pieces of jewellery from the wreck of the *Tasmania*.


On 1 April 1984 construction on Kelly Tarlton's Underwater World began. On 25 January 1985 the aquarium opened to the public, and Kelly greeted the 100,000th visitor in March 1985.


Visitor levels for the first year exceeded all expectations. By August 1986 the Underwater World had received 1 million visitors.


Kelly Tarlton died the day after he greeted the 100,000th visitor. He is remembered as a diver, photographer, inventor and salvage expert of international renown.

 The fabulous Rothschild jewels recovered from the wreck of the *Tasmania*.

 The section of acrylic tunnel held by Kelly is 7 centimetres thick.

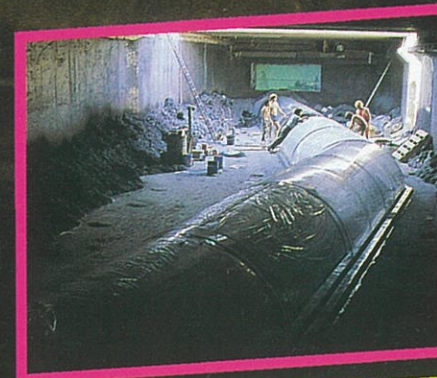
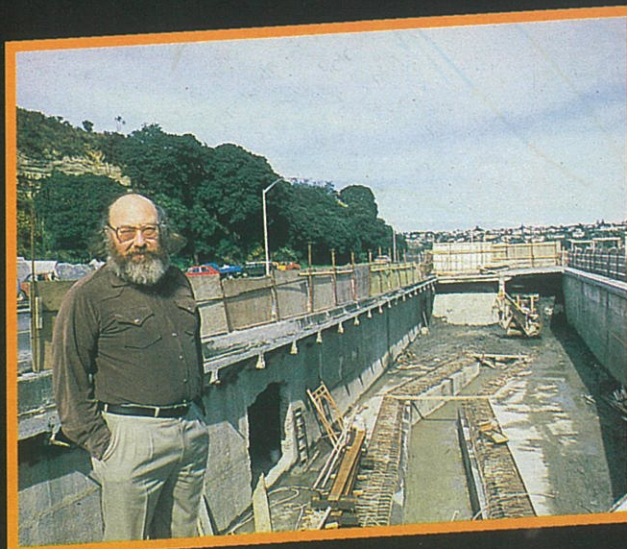
 Kelly holds more treasures from the *Tasmania*.

 The barque *Tui* houses The Museum of Shipwrecks in the Bay of Islands.

 Kelly (second from left) during his 1959 expedition to the Coral Sea.



CONSTRUCTION





Takaparawha Point, the site for Kelly Tarlton's ingenious underwater aquarium, was once the home of the Maori Ngati Whaatua tribe. The land was originally gifted to the New Zealand Government as a defence area. Later, holding tanks for the storage of stormwater and sewerage were built at the water's edge. In 1960 the tanks became redundant with the completion of the Manukau treatment plant, and the tanks remained unused for two decades.


In December 1983 Kelly made his first inspection of the tanks after investigating other sites for an underwater aquarium. Soon work had begun excavating the tanks to make way for the special acrylic tunnels.


Because of the expense of importing the prefabricated tunnel sections, Kelly imported huge flat sheets of the acrylic himself. These were formed into the correct dimensions, and were then placed in an oven where heat moulded the plastic to the correct curve. Craftsmen spent many hours polishing and wrapping each section for installation on the floor of the tanks. At last the sections were brought to the site where they were lowered very carefully, and in a special order, through a hole in the roof of the present shark tank. The tunnels were then sealed and on testing proved to be 100% leak free. Kelly's ambition and technical ingenuity had resulted in a world class project.


For others the work had just begun. Skilled craftsmen were asked to create cave and rocky reef settings out of concrete. Aquarium staff were busy capturing a variety of fish and sharks for months prior to the actual opening of the aquarium. Finally, the tanks were filled with the especially filtered seawater and the marine life given a new home. Kelly Tarlton's Underwater World opened after nine months of construction. The aquarium currently uses less than a quarter of the space available in the holding tanks.

 Slime - this is what Kelly saw when he first explored the old stormwater and sewerage system.

 Kelly stands in front of the shark tank during the excavation of the trenches for the tunnels.

 The huge mould used by the New Zealanders to curve the acrylic sections into shape.

 Construction workers wait for the last section of tunnel to complete the shark tank.

 A sample of the acrylic tunnel standing in the Underwater World's foyer attracts a great deal of attention. The tunnel was designed and moulded in New Zealand. It represents the most advanced construction techniques in aquariums worldwide.

A Journey Under the Sea

ROCKPOOLS

Kelly's desire was to create an experience of the underwater environments common in New Zealand's beautiful coastal waters. The Underwater World is a journey through the sea, from the quiet intertidal rock pools, through the surf-tossed kelp forest to the strong ocean currents beyond.

There is a great diversity of life in natural rockpools. It may take you quite a while to find all the creatures. Rockpool dwellers must be adaptable to cope with the enormous changes in salinity (the amount of salt in the water). For example, when it rains the water becomes diluted. But if it is a hot day then the water will evaporate. The temperature rises rapidly and the pool's water loses most of its valuable oxygen. The most dramatic changes of all come when the first wave of the returning tide splashes in.

The Underwater World rockpool has no tidal ebb and flow, but a flow-through system imitates the effect of waves on the pool.

Look carefully and you will see how each living thing has adapted to this changeable environment. Some pool creatures are camouflaged to merge with the background, while others wear protective exoskeletons or carry shells. Many cling strongly to the rocks to prevent themselves from being swept away by waves or eaten by predators.

▲ Kelly enjoyed watching the inhabitants of rock pools go about their business. Many creatures can only live in certain places within a pool, and some die if put back in the wrong position. If you are looking in a pool for animals at the beach be careful with anything fragile and always turn back rocks when fossicking about.

▼ Camouflage crabs have a wonderful way of hiding from their enemies. They pick up weed or sponge and hook it through special hairs on their backs, looking like part of the pool's vegetation.

▼ You will have to look closely to see shrimps because they are almost transparent. Only their sudden movements, twitching feelers and glowing markings give them away.





A Journey Under the Sea


THE KELP FOREST

Just below the turbulent surface of the waves on a rocky shore grow the kelp forests, where smaller fish move between the swirling leaves of kelp. Spottys, Eagle Rays, Grandfather Hapuku and their relative the Jock Stewart are common in these forests. Seaweed grows in these forests wherever it can obtain enough sunlight.

Because no sunlight can enter the water in The Underwater World, artificial weed is used to create the character of a kelp forest and man-made currents circulate in the tanks. Divers regularly bring in fresh live weed for the kelp forest fish to feed on.

 A well camouflaged Kelpfish braces itself against the current by using the water flow to hold its body in position.

 Sandagers Wrasse are commonly found among kelp in the warmer northern waters of New Zealand. This unusual fish goes through three stages in its life cycle—juvenile, female and male. The bright colours indicate that this example is a male.

 Kingfish can be encouraged to visit the kelp forest by offering tasty morsels, as the diver finds out.



A Journey Under the Sea

SANDY BEDS

On parts of New Zealand's coastline the sandy floor of the sea may stretch for many miles, or it may form pockets between rocky reefs or settle on the bottom of caves. These beds of sand are made up of minute particles of shell and rock broken up by the force of the sea. Sand may not seem like a comfortable home to us, but flounder, skate, star gazers and stingrays may rest on the sandy floor or hide in it for protection. Marine animals use the sand in different ways. Marine worms and cockles bury themselves in the beds and feed by siphoning water down through the sea floor. Fish such as the gurnard and goatfish eat these worms in their search for food. Sandagers Wrasse are one of a variety of fish which shelter in the sand while sleeping.

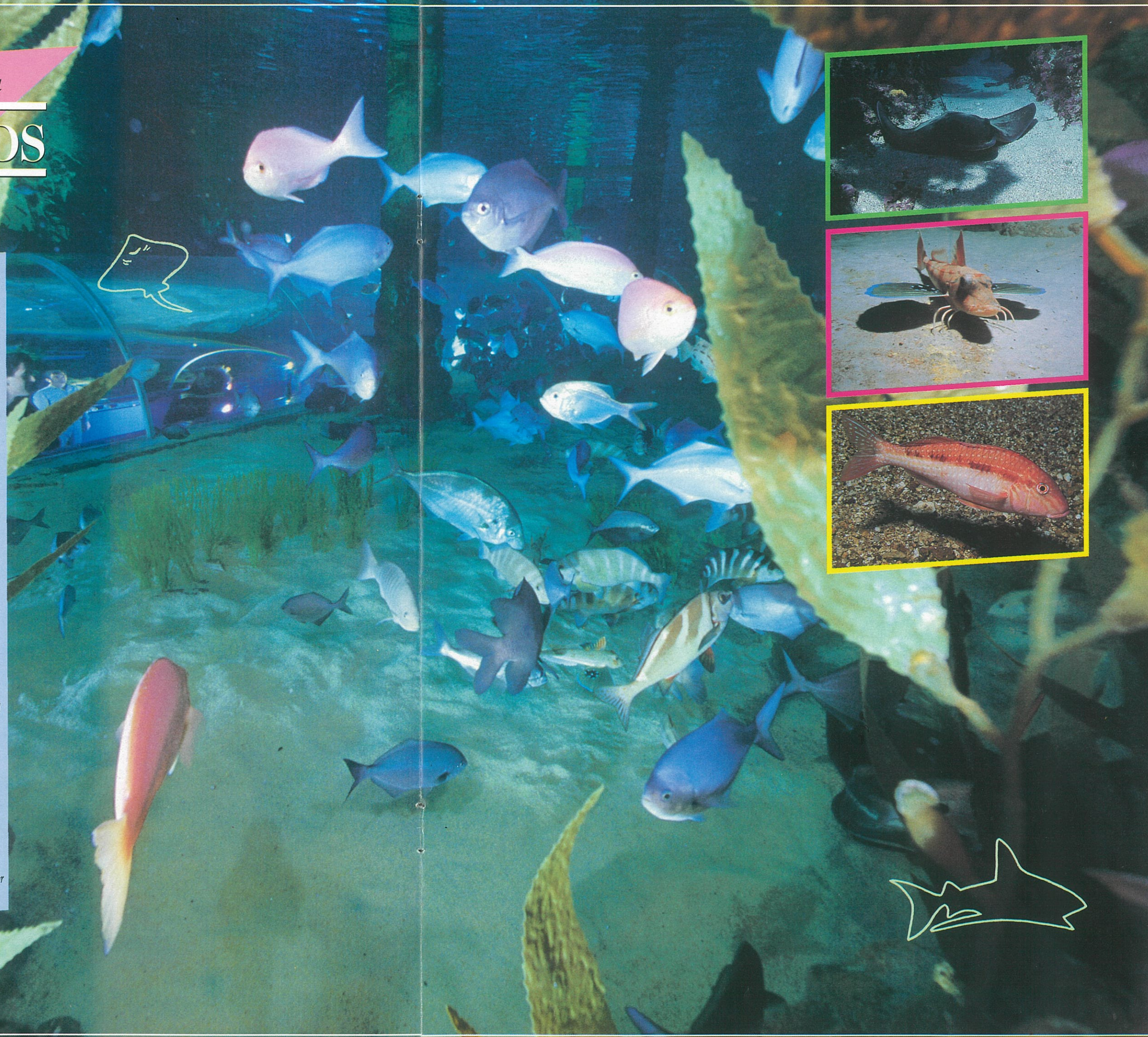
You can see these fish settling into the sand from about 8.30pm when the aquarium lights are dimmed to imitate sunset. They will rest here until 7am the next morning, when the brightening of the lights bring 'sunrise' to The Underwater World.

▼ The Underwater World tunnel passes through a large sandy bed, where marine life in the sand beds can be seen at close range. Special care is taken to keep these beds free from food scraps and fish wastes. Divers regularly vacuum the sandy floor, a job normally carried out by wave currents in coastal waters.

▼ Eagle Rays like to rest on the sand and may conceal themselves by flicking sand over their bodies.

▼ The strange gurnard appears to walk across the sand using the first three rays (fingers) of its pectoral fins. A thin membrane stretched between the remaining rays forms a colourful pair of wing-like fins, which are used to signal to other fish.

▼ The goatfish has a pair of long barbels used to forage for worms and other sand-dwelling creatures.





A Journey Under the Sea

THE ROCKY REEF

The rocky reef is like an underwater garden. It is profuse in the variety of marine plants and animals its crevices and hollows provide a home for. Every plant and fish seems to be a different colour, shape or design.

Reef organisms are a plentiful source of nourishment for well-known marine creatures such as the octopus and schools of Blue Maomao, common visitors to the reef. A continual competition for food and space in this rich environment makes the reef a beautiful and fascinating place to study.

Sponges and coral feed on plankton, tiny marine organisms which are one of the basic foods in the ocean. Because plankton would cloud the water, making it very difficult to see into the aquarium, most sponges and corals can not live in The Underwater World.

These bold yellow Finger Sponges are found in deeper waters around the North Island. It shares the rocky outcrop with a colourful community of sponges, plants and small fish.

Many small fish make their home in the reef, each with distinctive colours or markings. The Red Pig Fish has a reputation for being particularly inquisitive.

Sea urchins graze on seaweed growing on rock formations. Urchins are often found in crevices, where the bright colouring of their spines has betrayed their presence to sharp-eyed divers.

The fearsome-looking Scorpion Fish, also known as the Grandfather Hapuku, feeds on smaller fish. Its mottled skin blends with the surrounding reef habitat while it lies in wait for prey.





A Journey Under the Sea


CAVES


Discovering a natural underwater cave can be an enthralling experience. At first the cave may seem empty. But caves are the preferred home of crayfish and moray eels and are often visited by stingrays. Red Moki like to rest motionless in crevices. No seaweed can grow in these dark caves, but sponges and corals, which feed on plankton, are abundant and provide a mosaic of colours for visiting divers.

A cave with crevices to house moray eels is a special part of The Underwater World. The stars on the ceiling of the cave are air bubbles left by divers, who handfeed the moray eels and fish.

 A diver floats in the mouth of a cave, eager to explore its strange interior.

 Golden Snapper live in spacious deep water caves. Their large eyes are thought to provide better vision in these dark habitats.

 Slithering through their crevice homes, moray eels are approachable despite their vicious appearance. Morays can be coaxed out if you have the courage to offer a tasty morsel of food.

 As a crayfish grows it moults its shell. The soft replacement underneath hardens into a shell over a few days. In the sea, crayfish make homes of the numerous crevices in caves. You will find crayfish in the rockpools at The Underwater World, where there are also many crevices and holes to hide in.



THE REALM OF THE SHARK

Past the reefs and sandy beds of New Zealand's shoreline lies the vast, deep ocean. Peering into its depths from the surface, we can only see as far as the sun's rays penetrate, and it may appear to be empty. Many fish and marine animals such as whales, dolphins and far-ranging fish swim beyond coastal waters.

The ocean is also the territory of the shark. There are over 250 species of shark of which 40 are found in New Zealand waters. Some species take their food from the ocean floor, dining on crabs, flounder, crayfish and stingrays. During certain times of the year, sharks can be found in the shallower waters of New Zealand harbours. Some sharks give birth to live young, while the more primitive shark species lay purse-like eggs.

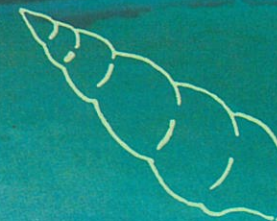
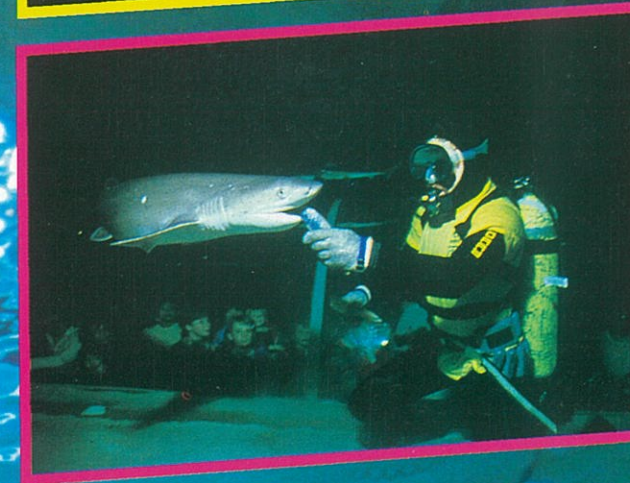
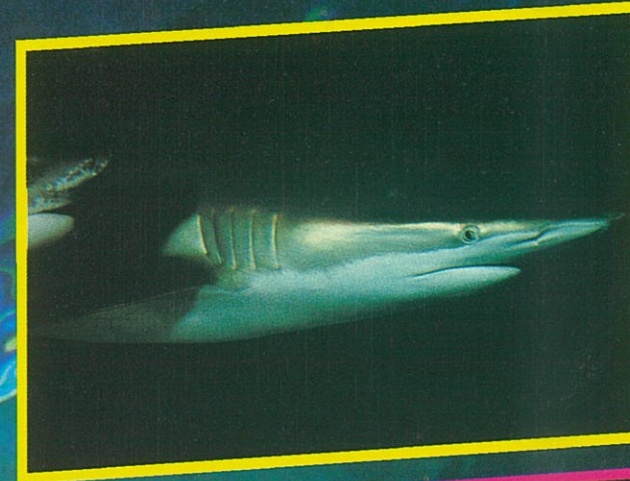
A number of sharks have been born at The Underwater World; some are presently growing to maturity in the shark tank.

As they grow, sharks shed their teeth regularly. Divers find these teeth on the floor of the tank and can tell which mouth they came from. Each species has teeth of a particular shape. Some sharks, like the Bronze Whalers, need to swim all the time to stay alive. Others, like the Spotted Smooth-Hound, can spend long periods motionless on the sea bed.

The Underwater World's shark tank is designed to provide few obstacles for sharks gliding through its waters. This makes the tank more like the shark's natural environment, the open sea. The larger stingrays at The Underwater World belong to the same family as the shark and can be housed in the same tank.

The Bronze Whaler shark commands respect in the South Pacific. Common to New Zealand waters, the Bronze Whaler is regarded as a maneater in Australia. The shark pictured here is nearly three metres (nine feet) long, and is too wide to put your arms around!

The sharks are usually fed by lowering fish fillets on the end of a long fork from a platform. Occasionally the sharks must be hand-fed by divers to ensure that each shark receives the correct nutrients.



SPECIAL DISPLAY TANKS

Some marine animals require special feeding or protection at The Underwater World because they are more sensitive or come from unusual habitats.

Octopuses are kept in their own tank because they use their suckered legs to climb out of the main tank! The octopus' healthy appetite is also a problem – it will eat display fish as snacks between meals if given the opportunity.

Seahorses are kept separately as they cannot compete with the other fish for food. They feed on live shrimp caught especially for them by the Underwater World staff.

The seahorse's reproductive cycle is unusual. The female lays her eggs in a brood pouch on the male's abdomen. He carries the eggs until mature, and the young emerge from the pouch fully developed. The Underwater World often has new families of seahorses.

Most turtles need warm water and usually swim north of New Zealand during winter. The turtle's tank is kept at a constant temperature. This turtle was washed up on a West Coast beach in late autumn with damaged eyesight. Her eyes were treated and after a year of careful feeding and warm water she had doubled in weight.



CATCHING A SHARK

Most sharks at The Underwater World come from the Manukau Harbour, on Auckland's west coast. Staff and fishermen from the area combine their skills, equipment and enthusiasm to supply the aquarium with these ocean predators.

Bronze Whalers, Sevengill Sharks, Smooth and Spiny Dogfish and School Sharks are some of the species which the team has learned to handle.

A shark is difficult to capture and requires special attention to prevent its death from extreme shock. The shark is stimulated during transport to keep its blood circulating.

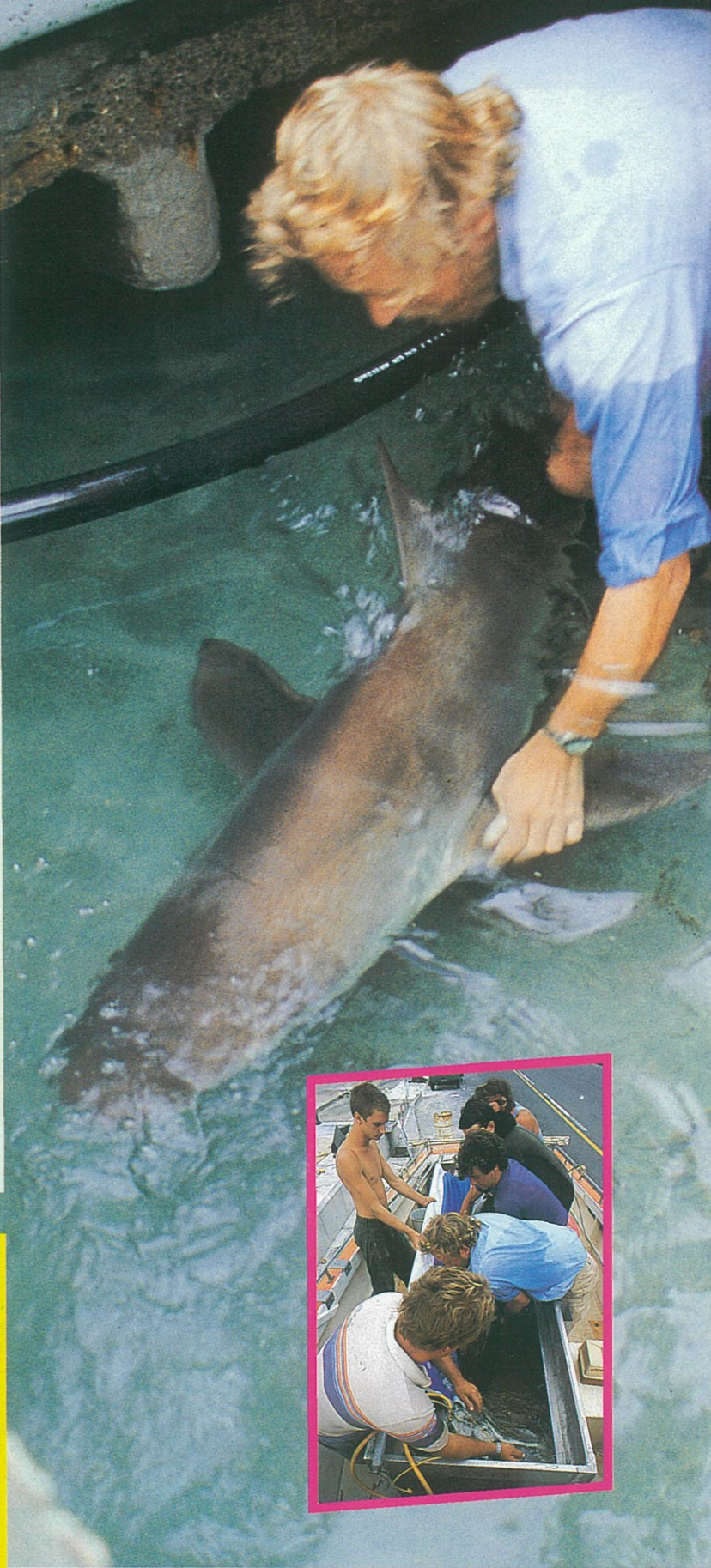
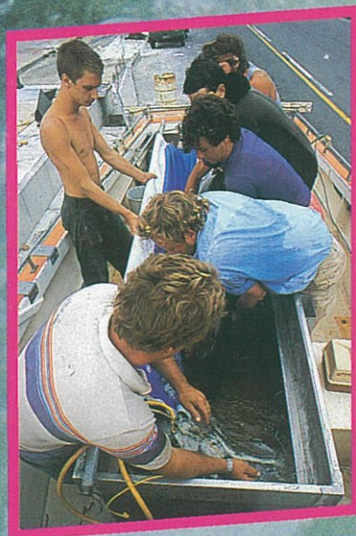
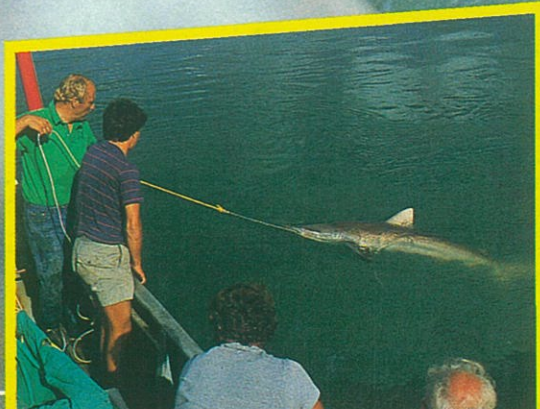
The shark may be in shock on entering The Underwater World. Divers are close at hand to guide it past any obstacles and to help it swim, which is essential for survival in some species. After a few hours the shark becomes familiar with its new home and is able to swim alone.

The Underwater World works closely with New Zealand and international experts to make sure that sharkfishing techniques and equipment are the most advanced available.

Sharks are caught with baited barbless hooks and drawn alongside the boat. A special stretcher will cradle the shark between the sea and its travelling tank.

Once the shark has swum into the stretcher, it is placed in a padded aluminium tank. Oxygenated water is pumped into the tank as the boat begins the journey to The Underwater World.

A road-level hatchway opens at The Underwater World to make way for the shark. It is lowered into a shallow pool above the shark tank, where it will be encouraged to swim by staff 'walking' it through the water.



EDUCATION



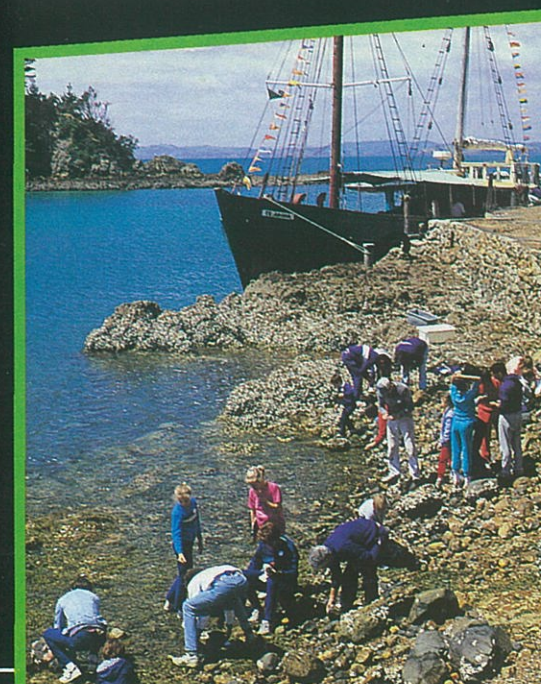
Kelly believed that the aquarium should be used to teach New Zealanders, both young and old, to appreciate and convert their rich coastal resources.

The Underwater World employs specially trained staff to answer the hundreds of questions posed by visitors of all ages. The Underwater World's educational facilities for schools include on-the-spot explanations of displays, information materials, pictures and complete resource kits for classroom lessons. A special Maritime Course is available for groups of all ages. Kelly Tarlton's Underwater World provides community educational services and holiday programmes which have gained major recognition in New Zealand and internationally.

Members of the Junior Jaws Club enjoy outings to the Hauraki Gulf Islands to further enjoy their Marine Education.

Children love to take a close but safe look at these fearsome shark jaws.

An Education Officer explains some of the marine life in the educational area to visiting school children.



BEHIND THE SCENES


Marine biologists, divers, technicians and administrative staff are just some of the people who work behind the scenes at The Underwater World.


The aquarium complex emphasises the need to maintain the quality of facilities in both the marine environments and visitors' areas. The cleanliness of the salt water is monitored constantly and new methods, special foods and medical techniques are tested to give the aquarium inhabitants the best environment possible.


In the quarantine area new arrivals are assessed before joining other fish in the display tanks. The Underwater World has become a hospital for sick or injured marine animals including those brought in by conservation groups or the public. Staff have also looked after marine animals on behalf of the Department of Conservation.


Daily work includes preparing food and feeding the aquarium's inhabitants, vacuuming the tanks, cleaning the glass, repairing weed and collecting live food for special diets. Maintenance is carried out regularly on the seawater filters, pumps and the electrical equipment that controls temperatures, lighting and water circulation.

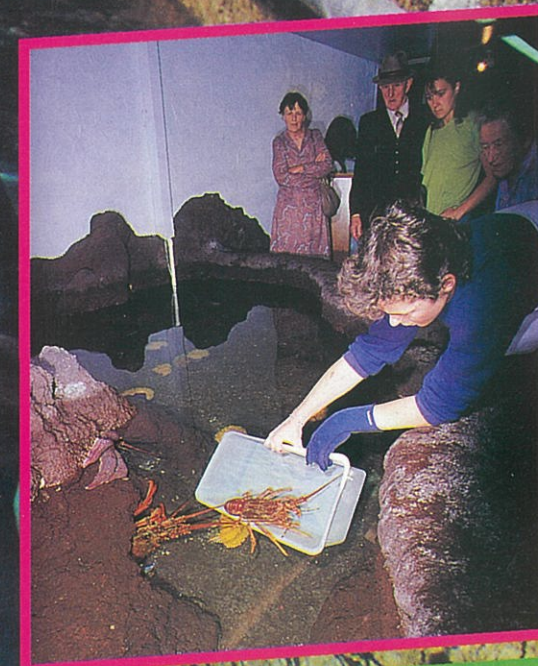
The Underwater World would not continue without the dedication of its experienced staff, who often think of the aquarium's inhabitants as a large family!

 Sometimes fish are fed from a raft.

 Part of a fish technician's work is to make sure that each exhibit is comfortably housed. In this example, a crayfish is being introduced to its new home.

 New animals born in The Underwater World require special attention. Even baby School Sharks look cute when they are young!

 Fish technicians carry out a regular check for parasites.



SPECIAL MOMENTS



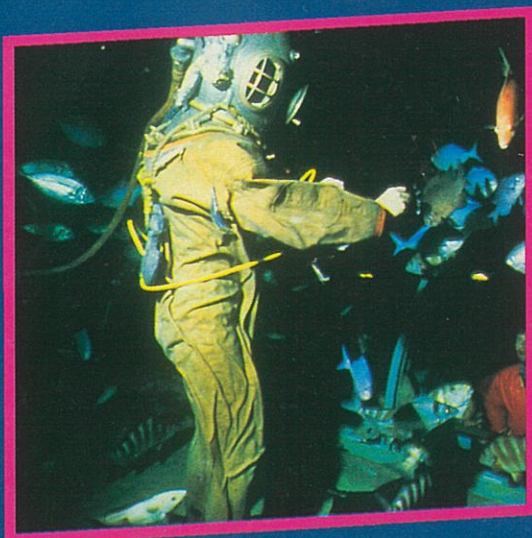
Special moments at The Underwater World

From time to time the aquarium receives special visitors.

This veteran diver appeared in the tank. The hard hat diving suit, which was built in 1900, belongs to the Museum of Transport and Technology in Auckland. The air is pumped to the diver from a manual pump. Perhaps some of the fish recognised the suit – some of them are old enough.

Here's our underwater version of the Easter Bunny, handing out a special treat.

Scuba Santa dropped in at Xmas to give tasty gifts to the fish, much to the surprise of aquarium visitors!



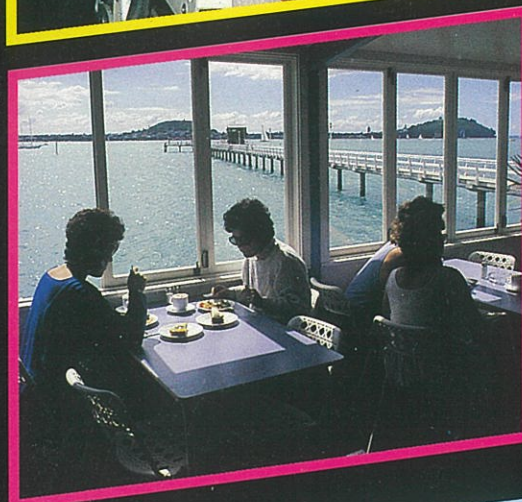
The souvenir shop at Kelly Tarlton's Underwater World has an excellent range of unique products to remind you of your visit.

Colourful T-shirts

Blow-up sharks for the bath!

You can enjoy superb food and a spectacular view of Waitemata Harbour and the City of Sails at Kelly's Cafe, above The Underwater World.

During weekends, public holidays and school holidays the Questar Fun Bus provides free rides along Tamaki Drive, Auckland's scenic waterside route, from the City to St Heliers bay. The bus stops at Kelly Tarlton's Underwater World en route eight times a day.



Kelly Tarlton's

UNDERWATER WORLD



Photographic credits
Photographs by Peter Thompson. Additional photographs by Kelly Tarlton, Jenny Ploenges, Darryl Torckler, Barbara Cotton, Dave Moran, Sue Thompson, Roger Grace, NZ Picture Agency.

Published for Kelly Tarlton's Underwater World
by Sea Tech Limited
P.O. Box 55-069, Mission Bay
Auckland New Zealand

Kelly Tarlton's

UNDERWATER
W O R L D

