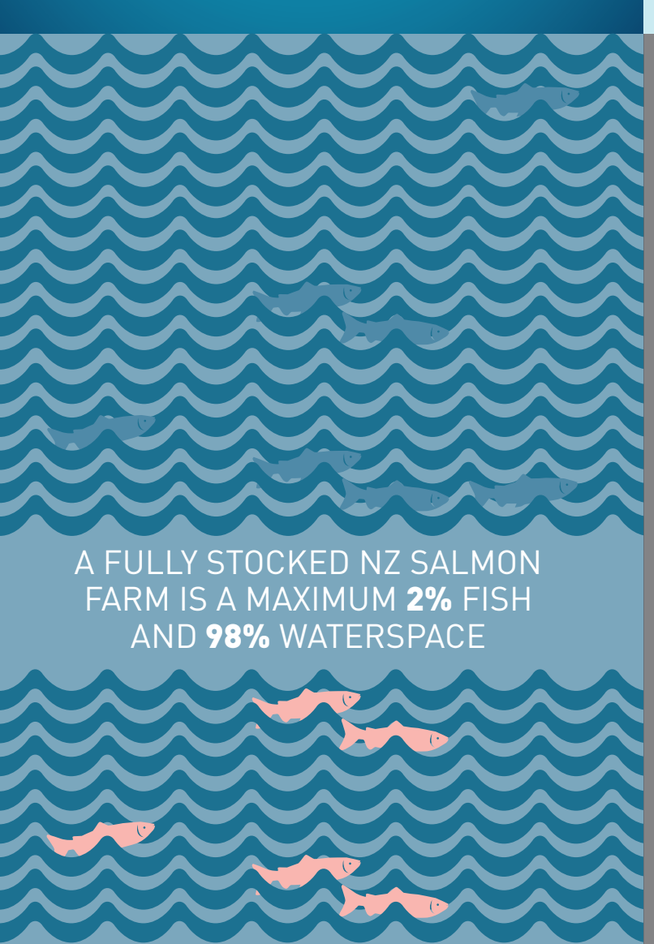
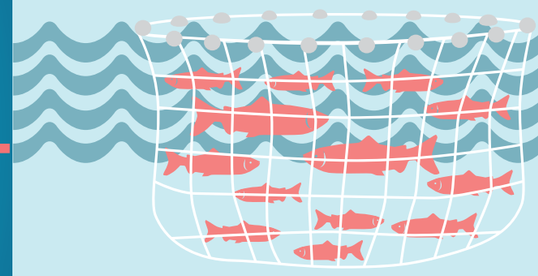
EXTREMELY EFFICIENT FARMERS ARE IN New Zealand

Ministry for Primary Industries
Manatū Ahu Matua

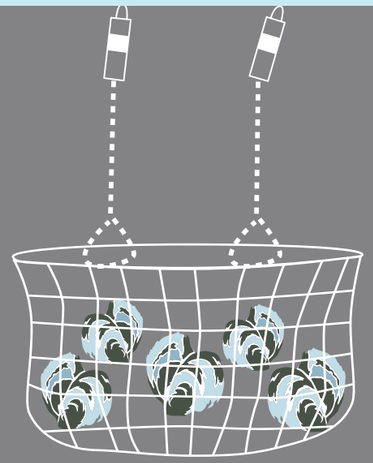


A FULLY STOCKED NZ SALMON FARM IS A MAXIMUM **2%** FISH AND **98%** WATERSPACE

KING Salmon



KING SALMON ARE RAISED IN THE PENS FOR UP TO **19–31 MONTHS** UNTIL THEY REACH A HARVEST WEIGHT BETWEEN **4-6KG**.

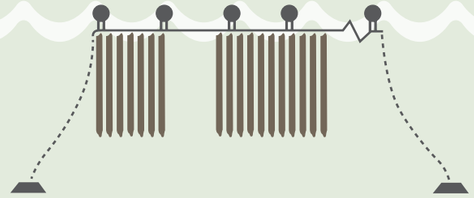


Pacific Oysters

PACIFIC OYSTERS ARE PREDOMINANTLY GROWN ON **STICKS** AND IN **TRAYS** AND **BASKETS** ON **INTERTIDAL** FARMS.

The Pacific oyster was unintentionally ***introduced to NZ in the 1960s,*** most likely through ballast water and from the hulls of Japanese ships in NZ to build the Auckland Harbour Bridge.

Greenshell™ Mussels



NEW ZEALAND GREENLIPPED MUSSELS ARE A **SUBTIDAL** SPECIES, **FARMED ON A SUSPENDED ROPE SYSTEM KNOWN AS LONG-LINE FARMING** AND MARKETED AS GREENSHELL™ MUSSELS.

KING Salmon

- New Zealand farmed salmon begin their life in a **freshwater**, **land-based hatchery** and are then grown to harvest size in the sea.
- Fertilised **eggs** are **incubated** under controlled conditions (approx 10–12°C).
- Salmon are raised in the **hatchery** for 8–13 months before being transferred to a salt water farm.
- **Sea pens** are made of netting that allow good water flow and are up to **24 metres deep**.
- Fish are fed a diet of **food pellets**, specially formulated to meet the fish's full nutritional requirements. The **food pellets** contain **fishmeal** and **fish oil**, with some producers also incorporating plant proteins and oils and by-products from the poultry and meat industries.

Pacific Oysters

- Farms are stocked with **spat** sourced both from the wild and produced in a **hatchery**.
- Wild **spat** are collected on timber sticks in waters from specific areas.
- These **spat** covered sticks are transferred to the farms and spaced out on **intertidal racks**.
- A Pacific oyster will only attach itself to a structure once, so any undersized oysters collected during harvesting, and those sourced from a commercial **hatchery**, have to be grown out in **trays** or **baskets**.
- **Hatchery** produced **spat** is raised in a controlled environment for **4–6 months** before being **seeded** onto farms in **trays** and **baskets**. The **intertidal racks** which make up an oyster farm are usually located in **sheltered harbours or estuaries**.
- The oysters are washed over by two tides a day and spend some time suspended out of the water.
- Oysters are ready for harvest after **12–20 months**.

Greenshell™ mussels and Pacific oysters are filter feeders and take all their nutrients from the water. ***No food is added.***

Greenshell™ Mussels

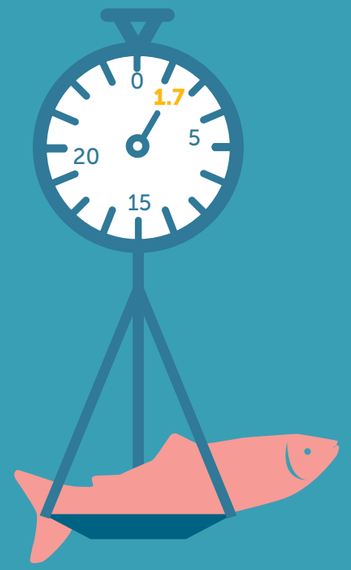
- Farms are stocked with wild **spat** either found **washed onto beaches** on seaweed, or collected on dedicated spat catching farms.
- **Spat** are **seeded** onto a long continuous rope and held in place with a special biodegradable mussock. They are stocked at a rate of approximately **1000–5000 spat** per metre of rope.
- After **3-6 months**, the **nursery lines** are lifted and the young **spat** are stripped from the ropes and **reseeded** on a final production rope at approximately 150–200 per metre.
- Mussels take between 15–18 months to reach a harvest shell size of 90–100mm.

WWW.MPI.GOVT.NZ

EXTREMELY EFFICIENT PROTEIN SOURCE

Farmed Seafood

Ministry for Primary Industries
Manatū Ahu Matua



Sea Farmed King Salmon

FCR = **FEED CONVERSION RATIO**
FRC MEANS **THE AMOUNT OF FEED** IT TAKES TO PRODUCE 1 KILOGRAM OF FISH.

How will we feed the future?

IN THE NEXT **40 YEARS,** WE MUST PRODUCE MORE FOOD THAN THE PREVIOUS **10,000 YEARS.**

THE WORLD NOW PRODUCES **MORE FARMED FISH** THAN IT DOES BEEF.

AQUACULTURE IN NEW ZEALAND IS A **LOW IMPACT** METHOD OF PROTEIN PRODUCTION.

FISH ARE COLD-BLOODED, WHICH MEANS LESS OF THEIR FEED IS WASTED BEING BURNED AS ENERGY TO KEEP WARM.

ABOUT **1/2 THE SEAFOOD** THE WORLD EATS COMES FROM AQUACULTURE.

"We must turn to the sea with new understanding and new technology. We need to farm it as we farm the land..."

- JACQUES COUSTEAU

THE GLOBAL SUPPLY OF PROTEIN FROM WILD FISHERIES IS **LIMITED**.

WITH FARMED FISH THERE IS PLENTY OF WILD FISH PROTEIN LEFT OVER TO **GROW OTHER SEAFOOD** LIKE PAUA. BY GROWING A NUMBER OF AQUACULTURE SPECIES TOGETHER WE COULD MAKE A GLOBAL FCR OF 1.

A CHANGING CLIMATE WILL PRESENT **NEW CHALLENGES** FOR AQUACULTURE - OCEAN ACIDIFICATION, WATER TEMPERATURE CHANGES AND OCEAN CURRENT CHANGES.

NEW ZEALAND PRODUCES 0.5% OF THE WORLD'S FARMED SALMON BUT THAT'S ALSO

70% **OF THE WORLD'S FARMED KING SALMON.**

IN NZ **11,000 TONNES** OF KING SALMON ARE GROWN IN **15 HECTARES** OF OCEAN.

When we needed to store them we would make a circle of rocks just offshore and keep the live mussels there. It was like our fridge

MATAPI BRIGGS - NGA PUHI

Aquaculture:

The farming of seafood or growing of plants and animals in water.

WWW.MPI.GOVT.NZ

EXTREMELY

Efficient Farming

IS

AQUACULTURE

Ministry for Primary Industries
Manatū Ahu Matua

NEW ZEALAND'S **SALMON FARMING** INDUSTRY HAS BEEN RECOGNISED AS THE **WORLD'S GREENEST.**

MONTEREY BAY AQUARIUM,
SEAFOOD WATCH PROGRAMME

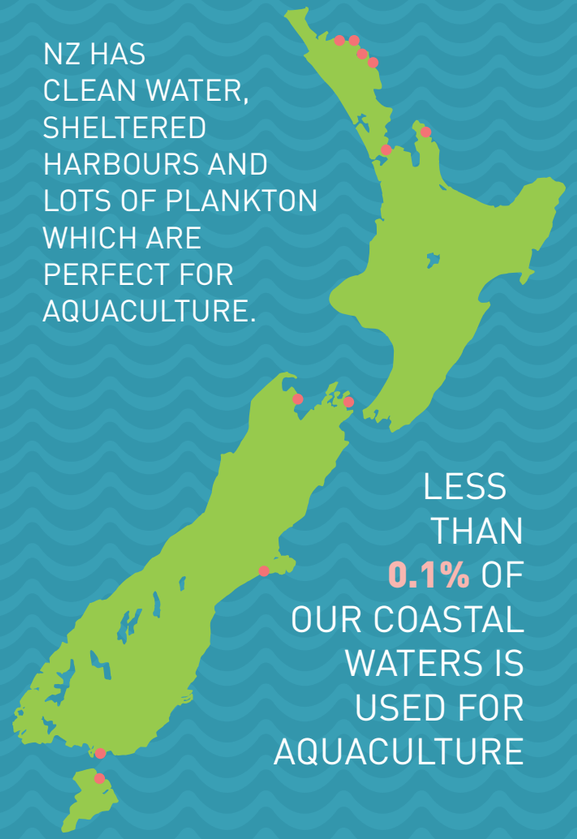
Speaker's Notes

"THE OPPORTUNITY IS FOR MAORI TO BECOME LEADERS IN PRESENTING NEW ZEALAND SEAFOOD TO THE WORLD."
- RACHEL TAULELEI, YELLOW BRICK ROAD

"FARMED SEAFOOD PROVIDES AN ANSWER TO INCREASING DEMAND FOR PROTEIN SOURCES AS THE WORLD'S POPULATION BECOMES MORE AFFLUENT, URBANISED AND APPROACHES 9 BILLION BEFORE 2050."
- WORLD WIDE FUND FOR NATURE (WWF)

IN 2015 $338 MILLION WAS GENERATED THROUGH EXPORTS OF AQUACULTURE PRODUCTS TO 79 COUNTRIES AROUND THE WORLD.

NZ HAS CLEAN WATER, SHELTERED HARBOURS AND LOTS OF PLANKTON WHICH ARE PERFECT FOR AQUACULTURE.



LESS THAN **0.1%** OF OUR COASTAL WATERS IS USED FOR AQUACULTURE

NEW ZEALAND **GREENSHELL™ MUSSELS** ARE ONE OF THE **TOP 2** 'ECO-FRIENDLY SEAFOODS' **IN THE WORLD.**

THE TECHNOLOGY TO FARM **GREENSHELL™ MUSSELS** WAS INVENTED BY CLEVER NEW ZEALANDERS. ONE FARMER CREATED THE MUSSOCK BY USING HIS DAUGHTER'S FRENCH KNITTING MACHINE.

NZ AQUACULTURE HAS A GOAL OF INCREASING ANNUAL SALES FROM **$400 MILLION** TO **$1 BILLION** BY 2025.

A+

NEW ZEALAND
Sustainable AQUACULTURE

NZ MARINE FARMERS OPERATE THE A+ SUSTAINABILITY PROGRAMME

We set world leading sustainable aquaculture standards and then publically report on the industry's performance against those standards.

Maori Commercial Aquaculture Claims Settlement Act 2004
Iwi with a coastal rohe (area) are entitled to 20% of all new aquaculture space.

Maori are a key part of the NZ Aquaculture industry, now and into the future.

THERE CAN BE NO DEBATE ABOUT THE KEY ROLE KAIMOANA (SEAFOOD) OCCUPIES FOR MAORI CULTURE; IT PLAYS A PART IN MANY TRIBAL HISTORIES, IDENTITIES AND POLITICAL ALLEGIANCES.

WWW.MPI.GOVT.NZ