

**“We’re uniquely placed
to help maximise
production and minimise
environmental impacts”**

Andrew Forsythe, Chief Scientist
– Aquaculture & Biotechnology

Towards a billion dollar industry

The New Zealand aquaculture industry aims to become a billion dollar business by 2025. To reach this target, it needs high volume, high value production.

“Cage culture of new high value marine finfish could grow the value of production by perhaps tenfold, with a modest increase in environmental footprint,” says Andrew Forsythe, NIWA's Chief Scientist, Aquaculture & Biotechnology.

We estimate that new species such as kingfish and hapuku (groper) could return well over \$1 million per hectare, potentially more than the \$1.35 million per hectare currently derived from salmon, and substantially more than the \$35,000–40,000 per hectare for mussels and oysters.

With our industry partners, we're working to optimise production of three high value species – kingfish, hapuku, and paua – while minimising costs and environmental impacts. “NIWA's multidisciplinary nature puts us in a unique position to achieve this,” says Mr Forsythe.

Our experts in aquaculture, fish nutrition and health, and biotechnology have the production side covered. NIWA ecologists and oceanographers can assess the

environmental footprint of existing marine farms and advise on the best place to site new farms to maximise benefits and minimise environmental effects. And our fisheries scientists provide expert advice on the sustainability of aquaculture feeds sourced from wild fish stocks.

Food is often the biggest cost of finfish rearing and wasted food has big economic and environmental costs.

We're refining finfish diets to improve the efficiency with which they convert food to flesh. Trials with kingfish show they perform well in the warmer waters of the North Island. We're developing hapuku for the cooler conditions elsewhere.

Rearing healthy fish with the minimum of treatment is another key to maximising production while minimising environmental impacts. In the past year, we've developed novel culture systems for testing the effects of pathogens and their treatments in kingfish. And we've developed a new encapsulated parasite treatment for kingfish, thereby minimising the release of chemicals into the environment.

We've also made great strides in our selective breeding programmes for kingfish and paua, providing a firm

foundation for selecting traits with high market value. With kingfish, we've achieved world firsts by establishing full control over the life cycle and successfully crossing a single male and female. And for paua, we've established multiple family lines to begin determining the heritability of key performance traits. “By selecting for traits such as growth, we estimate stock performance can be improved by as much as 10–20% per generation,” says Mr Forsythe.

These developments are forging the way for a higher value, higher volume, and sustainable aquaculture industry.

FUNDERS:

- Foundation for Research, Science and Technology
- NIWA Capability Fund
- Sealord

COLLABORATORS:

- OceaNZ Blue Ltd
- Sealord
- University of Auckland
- University of Otago



Finfish aquaculture scientist Steve Pether and technician Chris Ormandy prepare one of the Bream Bay kingfish broodstock for a health check.