New Zealand King Salmon

Mark Gillard - MPI Site Relocation Presentation

APRIL 2017

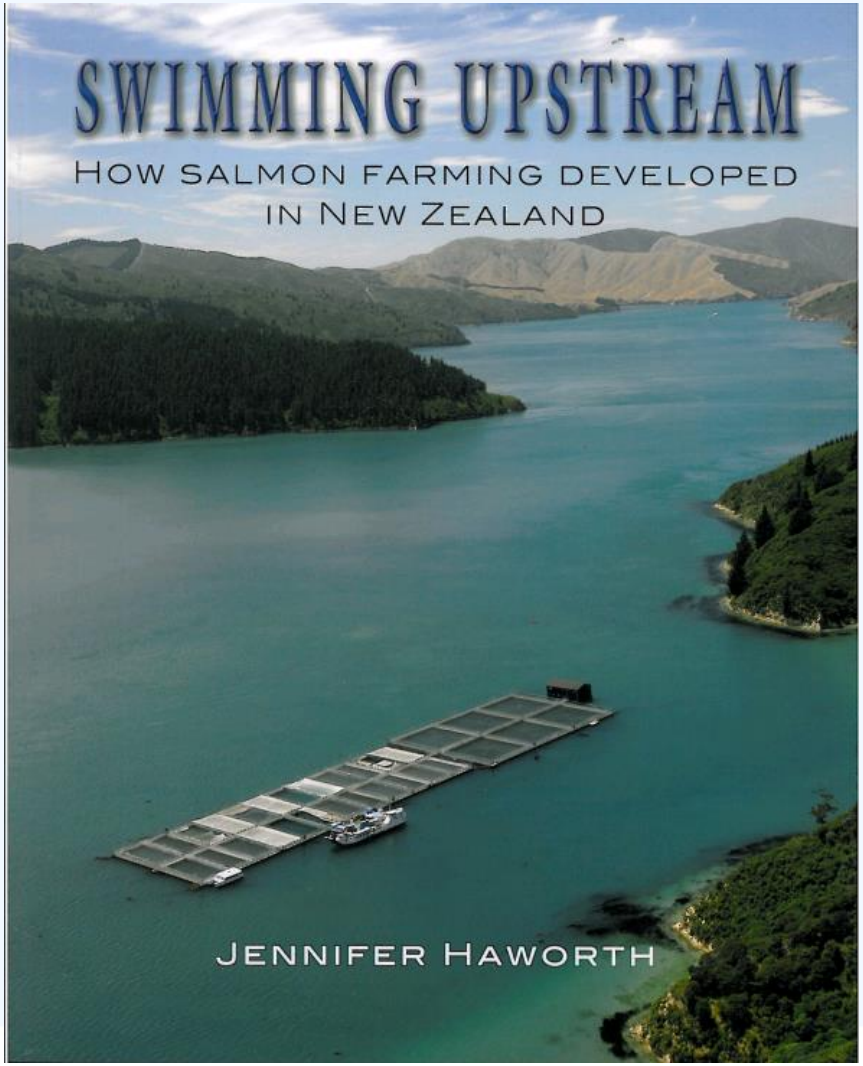
NZ King Salmon

My Early Involvement in the Industry

Hallam Cove salmon farm in the 1980's

Humble Beginnings - The Salmon Industry

Swimming Upstream -
by Jennifer Haworth



Waihinau Bay in the early 90's

Te Pangu salmon farm 1994

Clay Point salmon farm 2009

Net Pens

Hallam Cove net pens

- **Wooden walkways**

Ngamahau salmon farm - Tory Channel 2016

Waitata 2016 - Wavemaster Pens

Large plastic circle pens Huon Salmon Company Tasmania

Harvesting

Hallam Cove - the first harvest

Harvest equipment 2017

Below - Fish Pump

Right - Auto Stunning

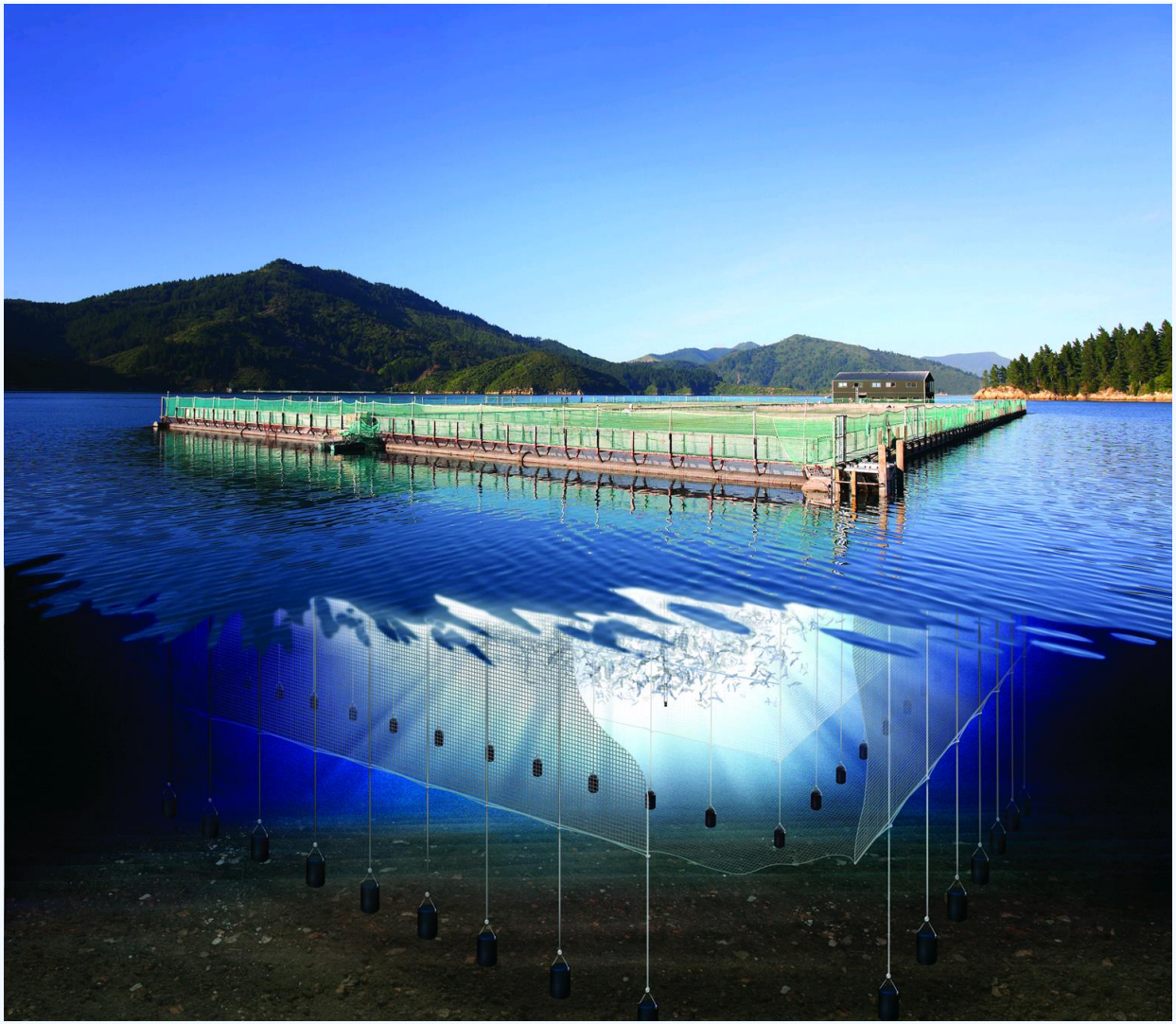
Bulk tankers for harvested fish

Feeding the fish

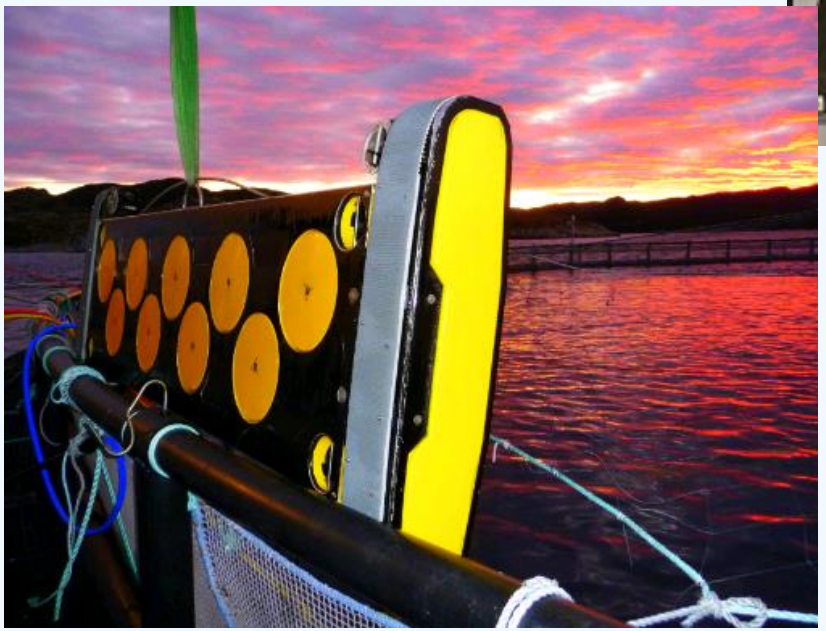
Remote feeding using camera's and "Fishtalk" software

Roto feeder - spreads feed across the pen

Clay Point salmon farm with diagrammatic view underwater of grower and predator nets



Net cleaner



Screw anchor

Underwater lights

Note the localised nature of effect

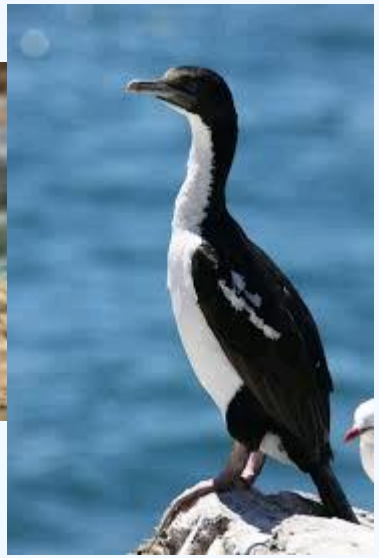
Remotely Operated Vehicle (ROV)

- **Used to check nets and seabed**
- **Replaces some diving**
- **A lot safer**

Remediation Trial

The ‘plow’- used to scape aside the top 15cm of sediment (exposing the underlying sediments and simulating removal)

King Shag



Offshore conditions - this is a calm day

Best Management Practice guidelines for salmon farms in the Marlborough Sounds:

Best Management Practice guidelines for salmon farms in the Marlborough Sounds:

Benthic environmental quality standards and monitoring protocol

Final: November 2014

Prepared by the Benthic Standards Working Group:

Nigel Keeley (Cawthron)

CAWTHRON INSTITUTE

Mark Gillard (New Zealand King Salmon Company Ltd)

New Zealand King Salmon

Niall Broekhuizen (NIWA)

NIWA

Richard Ford (Ministry for Primary Industries)

Ministry for Primary Industries
Manatū Ahu Matua

Rob Schuckard (Sounds Advisory Group)

Steve Urlich (Marlborough District Council)

MARLBOROUGH DISTRICT COUNCIL

Specialist advice was also provided by Ross Sneddon (Cawthron) in relation to the monitoring and management of copper and zinc.

November 2014

Marlborough District Council - Compliance Report

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The New Zealand King Salmon Company Limited- 2015 Compliance Report for Coastal Permit (021247)

Assessment of Compliance with Resource Consent U021247

This report sets out the compliance status for the disposal of discharge from the New Zealand King Salmon Ruakaka Bay Site. The information in this report is based on the 'Environmental Impacts of the Ruakaka Bay Salmon Farm: Annual Monitoring 2015' Report provided by Cawthron Institute.
Compliance Status has been indicated using a monitoring traffic light system where green indicates compliance; yellow indicates technical non-compliance; orange indicates that corrective or remedial action(s) is required and a time frame for completion has been set, and red indicates non-compliance.

Please note that the following consent conditions are representative only, they do not include the complete list of conditions of consent.

Condition	Comment	Compliance Status
Coastal Permit Stage3 11. Following receipt by Council of the reports required in Stage 2 above and subject to any review of the conditions of this consent, pursuant to condition 24 of this consent the consent holder may then discharge the maximum volume permitted under the consent of 4000 metric tonnes per annum.	The total tonnage of feed inputs for the twelve months between November 2014 and October 2015 was 2,172 tonnes. The report notes that the feed input has increased for the past two years. A bar graph of the monthly feed inputs was provided.	
Environmental Quality Standards 14. The environmental quality standards (EQS) that shall be applied for seabed effects follow the model as presented in the application i.e seabed effects are 'zoned' around the cages to allow for a mixing or transition zone. Outside this zone no adverse effect on the seabed is allowed. Three 'zones' under and around the marine farm shall be established as follows: a. Referred to as 'Zone 1'- Beneath the cages and out to 50m from the cages. b. Referred to as 'Zone 2'- From 50m to 150m from the outside edge of the cages. c. Referred to as 'Zone 3' – Beyond 150m from the outside edge of the cages.	The EQS standards were applied to the three zones described in condition 14. The sampling stations were set up at Pen 1 and 2, at the 50m site and at 150m. There is also a control station ~3.2km from the pens.	
17. The EQS in each zone is as follows: Zone / Spatial Extent / Description and Bottom Line 1 / Beneath the cages and out to 50 m from their outside edge / Sediment becomes highly impacted and contain low species diversity, dominated by opportunistic taxa (e.g. polychaetas, nematodes). It is expected that a gradient will exist within this zone, with higher impacts present directly beneath the cages. 2 / From 50 m to 150 m from the outside edge of the cages / A transitional zone between zones 1 and 3. Within this zone, some enrichment and enhancement of opportunistic species may occur, however species diversity remains high with no displacement of functional groups. It is expected that a gradient will also exist within this zone. 3 / Beyond 150 m from the outside edge of the cages / Normal conditions (i.e. background or control conditions). All Zones / These conditions are not permitted beneath any NZKS farm / Sediment that are anoxic and azoic (i.e. no life present) will not be permitted.	All of the sampling stations had an ES less than the EQS limits outlined from the BMP guidelines. Although the ES levels are specific to condition 17, they correspond to the description and bottom line of each zone. The pen stations had soft, dark muddy sediments with shell debris. It was noted that pen 2 had more shell debris and bacterial coverage than pen 1 but overall were similar. The redox potentials were negative at the pen stations with an increase with distance from the pens. Pen 2 sulphide levels were extremely elevated. Both pens had low species richness and high total abundances. The redox, sulphide levels and biological communities indicate a highly enriched environment. A single sample at Pen 2 exceeded the ANZECC ISQG-low trigger level of TRC and TRZ however the combined average concentration at both pen stations was below the ISQG-Low. The DO levels had a less than 20% reduction. The chorophyll-a concentrations tended to peak below the thermocline at all stations except the control. The 50 to 150m stations had lighter sediment which was	

	not so easily disturbed and had fewer shells. In regards to biological communities, the 50m station had signs of mild enrichment while the 150m station was similar to the control. The redox and sulphide concentrations indicate mild enrichment. Conditions at the zone boundaries from the last 4 monitoring assessments have stayed consistent with the EQS of condition 17.	
Ongoing Annual Monitoring 21. A monitoring report is to be prepared at least annually and will include: a. a description of the types, location and area of structures within the 2 hectare authorised area and a description of any movement or relocation of structures over the previous year; b. presentation of monitoring results; c. a comprehensive and integrated report on the effects of the development and operation of the farm to date, including maximum biomass of fish and feed volumes discharged over that year; d. an assessment as to whether or not the farm is having a significant adverse effect on the environment or not; e. recommendations as to how any adverse effects on the environment can be avoided, remedied or mitigated; and f. the adequacy of the monitoring programme. NB: The monitoring programme shall be public record.	An annual monitoring report for 2015 was completed and provided to Council in March 2016. The annual monitoring report contained a description of the salmon farm and a presentation of the results in written, tabulated and graphed forms. The report covers the effects of the farm on both the sediment and water column and assessed that the farm is having an enrichment effect below the pens. The report concludes that continued deterioration at these stations is likely given the poor sediment chemistry and that a recovery period would be needed to prevent an exceedance of the EQS. The report provides a recommendation of a follow up survey focusing on the pen location to check that benthic assimilative capacity persists beneath the cages and that higher replication at the pen stations would benefit interpretation.	
22. The consent holder shall commission an independent person (or persons) with appropriate expertise in environmental monitoring to undertake the monitoring and reporting work required by the conditions of this consent.	The annual monitoring and corresponding report was completed by the Cawthron Institute who are suitably qualified and experienced for this work.	
23. The Council may require an independent peer review of the surveys, monitoring and reporting required under conditions 17 to 22 above. Such a peer review will be at the cost of the consent holder.	An independent peer review of this site and a number of other New Zealand King Salmon sites was sought. This was undertaken by Professor Kenny Black. Professor Black has provided comment in regards to the high sulphide values at pen 2, stating that the site will require careful future management to ensure the seabed under the cages in the middle of the farm are no more seriously degraded. Professor Black has agrees that a fallow period would reduce the chance of future non-compliance but that the site should move to the BMP guidelines as soon as possible. Professor Black has said that it is likely that pre-BMP compliance can be assured by reducing feed input rather than insisting on a fallow.	

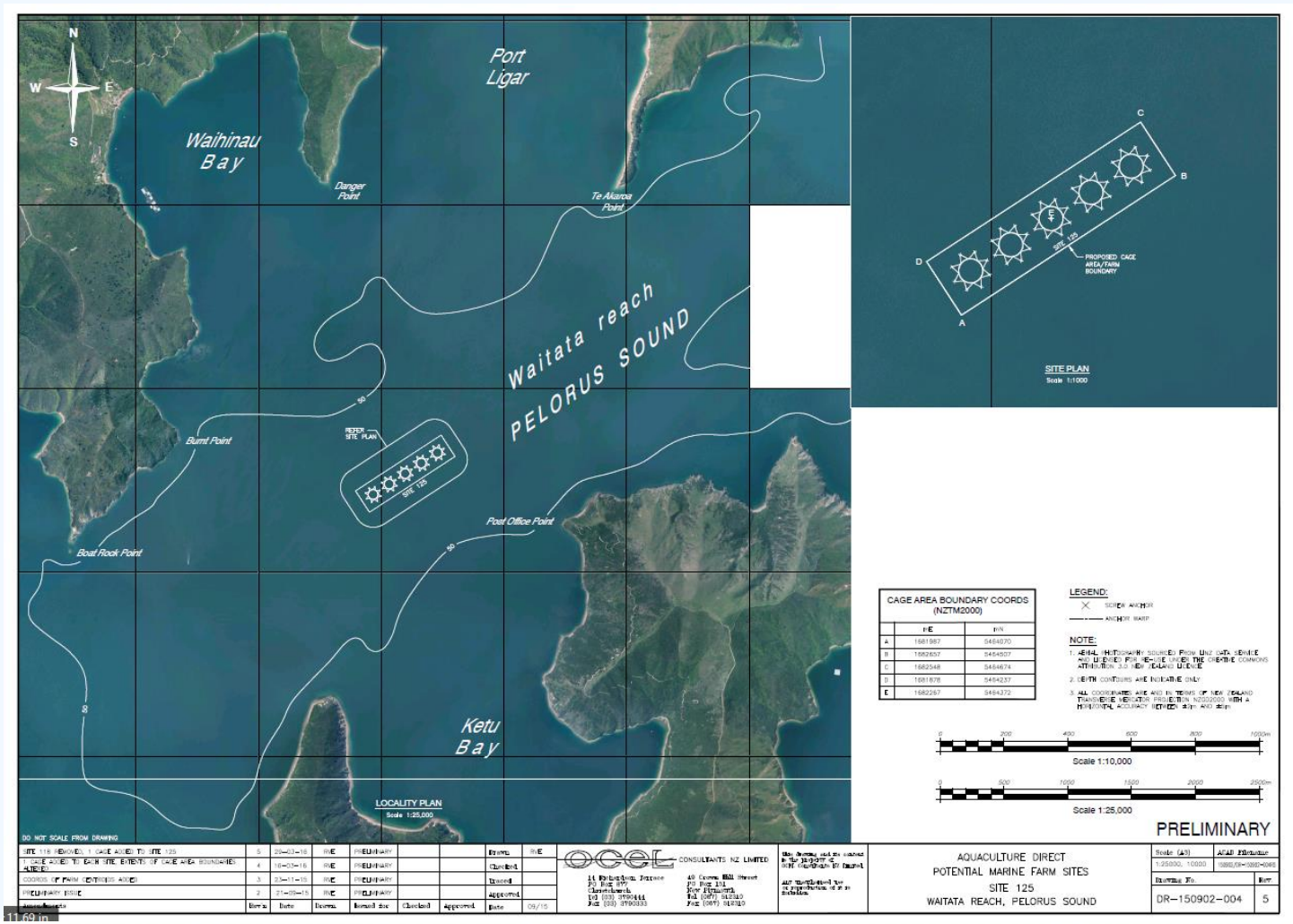
Please Note:

Pursuant to section 36 of the Resource Management Act 1991 and the Marlborough District Council's schedule of fees, the consent holder shall be responsible for all costs associated with the monitoring of this consent in accordance with the schedule of fees.

Where non-compliance is noted on an inspection visit, remedial action is identified and advised to the consent holder in writing. A follow-up visit may confirm that appropriate remedial action has been taken. No charge is made for this visit if the consent holder is at this stage complying with the consent conditions. If the conditions of the consent are not being complied with the consent holder is charged and subsequent visits maybe required.

Blowhole Point North

Outer Pelorus - Waitata Reach



Thank you