

Tasmanian Salmon Industry Environmental Scorecard

SNAPSHOT 2018-19

The Government's vision is for the Tasmanian salmon industry to be the most environmentally sustainable in the world



The Tasmanian Government recognises the importance of the salmonid industry to the State and strongly supports sustainable growth of the sector.

The Government understands that it requires a constructive partnership with salmonid growers and the Tasmanian community to create an environment for growth. In 2017, the Government released the Sustainable Industry Growth Plan for the Salmon Industry (*the Salmon Plan*). A commitment in the *Salmon Plan* was to release a scorecard for the Tasmanian Industry that benchmarks the industry against international best practice.

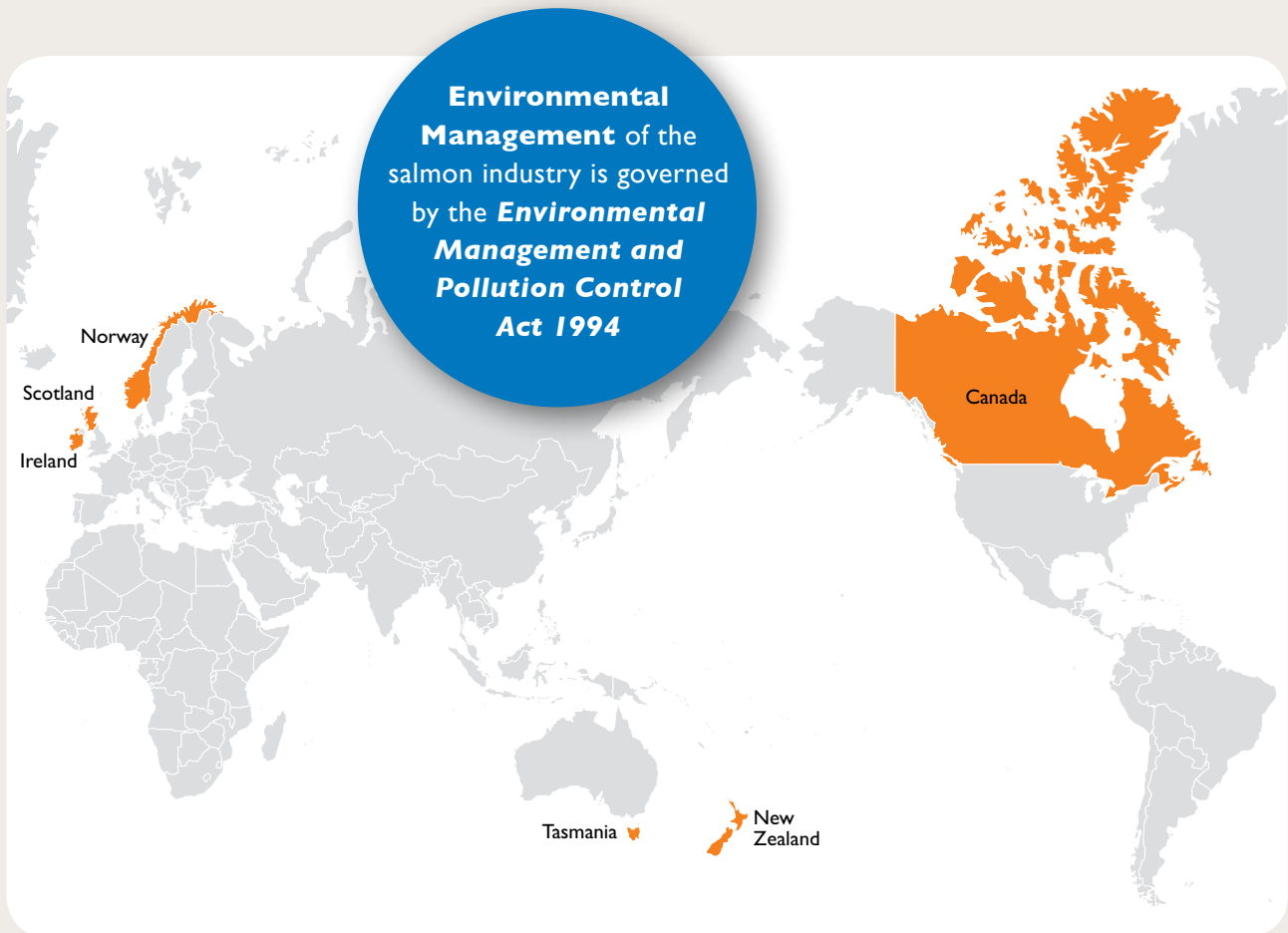
The following tables provide a comparison of how Tasmania's current environmental monitoring regime compares to environmental monitoring programs in other countries where salmon are grown.

Salmon aquaculture in Tasmania has been commercially operating for more than 30 years.

In 2018/19 production of salmonids exceeded **56,000 tonnes** HOG (head on and gutted) worth an estimated **\$820 million** to the state economy and resulted in the employment of more than **1800** fulltime and casual positions and a further 3500-4000 jobs in ancillary sectors like cage manufacturing, net cleaning, feed production, training, transport and logistics and a range of contract and consultancy services.

The Tasmanian Salmon Industry Scorecard benchmarks the State's environmental monitoring regime against international regulatory practices for salmon aquaculture.

Jurisdictions commercially farming salmon used for benchmarking



Aquaculture production and value by country in 2017. (FAO 2019)

	Tasmania ¹	Scotland ^{1*}	Ireland ¹	Canada ¹	New Zealand ²	Norway ¹
Production ^a	51 298 ³	202 748 ¹	18 989 ¹	121 625 ¹	14 890 ²	1 303 255 ¹
Value ^b	738 694 ³	1 402 201 ¹	152 697 ¹	821 342 ¹	196 783 ²	7 824 187 ¹

^a tonnes; ^b \$1000 USD; ¹ Atlantic salmon and Rainbow trout; ² King salmon; ³ Values reported for the 2016/2017 financial year to Department of Primary Industries, Parks, Water and Environment; * Combines production across the UK.

Reference:

Food and Agriculture Organisation. 2019. FAO yearbook. Fishery and Aquaculture Statistics 2017. Rome/Roma. ISBN 978-92-5-131669-6.



Linking monitoring to environmental performance

All finfish marine farms conduct some level of environmental monitoring to detect impacts on the environment.

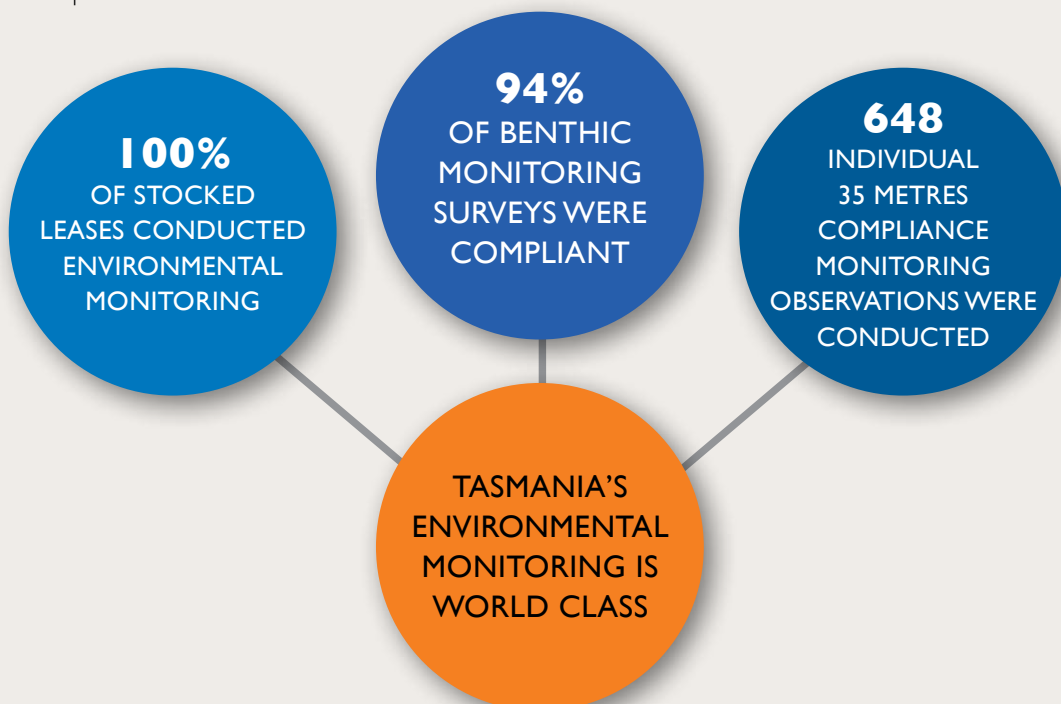
	Tasmania	Scotland	Ireland	Canada	New Zealand	Norway
Peak production periods monitoring	* ¹	✓	✓	✓		✓
Annual monitoring	✓ ²				✓ ³	
Baseline sampling	✓	✓	✓	✓	✓	✓
Performance based / adaptive management	✓	✓	✓	✓	✓	✓
Broad-scale environmental monitoring	✓	✓			✓	
Application of modelling tools	✓	✓		✓	✓	

¹ Approximately 50% of all environmental monitoring surveys at finfish farms outside of Macquarie Harbour occur at peak feed input. Macquarie Harbour is currently subject to a more rigorous monitoring regime every four months.

² 50% of on-lease video monitoring is undertaken at peak production;

³ Annual monitoring must coincide with the period of maximum biological impact

- In Tasmania, biomass and nitrogen caps have been used as part of the management approach in two regions.
- Broad-scale environmental monitoring conducted in Tasmania to detect environmental changes in the water column and on the seabed at a regional scale is world leading.
- Internationally, seabed monitoring takes place when impacts on the seabed are likely to be at their greatest.
- Adaptive management is adopted internationally for regulating environmental performance of salmon aquaculture.
- The use of modelling tools to assist with environmental regulation and monitoring of salmon farming are becoming common place.



Monitoring methodology

A variety of science based monitoring techniques are used in all countries.

Required survey types	Tasmania	Scotland	Ireland	Canada	New Zealand	Norway
Video surveys	✓	✓	✓	✓	✓	✓
Sediment grab sampling	✓	✓	✓	✓	✓	✓
Water quality sampling	✓				✓	
Other habitat type monitoring	✓	✓			✓	

- Internationally, the use of visual observations coupled with the collection of sediment samples are universally adopted for monitoring the footprint of salmon aquaculture on the seabed.
- In Tasmania, visual surveys are the primary tool used for annual regulatory monitoring against licence conditions.
- **Water column monitoring practices in Tasmania are world leading, with collected data being utilised by CSIRO¹ to validate regional modelling tools.**
- Monitoring of other seabed habitat types including reef habitats, seagrass meadows and habitats associated with threatened species to detect regional impacts of salmon aquaculture are considered best practice.
- The methodology employed for environmental monitoring of salmon aquaculture in Tasmania has been established through scientific research undertaken by IMAS².

¹ Commonwealth Scientific and Industry Research Organisation;

² Institute for Marine and Antarctic Studies

The foundation for environmental regulation in Tasmania is science based management

Sensitive and vulnerable habitats are included in broad-scale environmental monitoring programs



Photo: Olivia Johnson, IMAS

Environmental indicators for monitoring

Key environmental indicators are critical to effective monitoring.

Required environmental indicators	Tasmania	Scotland	Ireland	Canada	New Zealand	Norway
Sediment chemistry (e.g. organic content, heavy metals, sulphides, etc.)	✓		✓	✓	✓	✓
Sediment characteristics (e.g. particle size, smell, colour, etc.)	✓	✓		✓	✓	✓
Fauna diversity/abundance	✓	✓	✓		✓	✓
Indicator species	✓	✓			✓	✓
Fauna presence/absence				✓		✓
Presence of fish feed/faeces	✓	✓	✓	✓	✓	✓
Bacterial mats	✓		✓	✓	✓	✓
Gas bubbling	✓		✓	✓	✓	✓
Barren substrates				✓		
Dissolved oxygen	✓				✓	✓
Dissolved nutrients	✓				✓	
Chlorophyll a	✓				✓	

- Environmental indicators used to measure organic enrichment vary globally. Each of the listed indicators are valid for detecting enrichment footprints from fish farming.
- Threshold levels for environmental indicators are country specific.

Quantitative sampling and analysis is needed to benchmark environmental performance

Visual assessment techniques used in Tasmania have proven robust and effective

Industry management responses/actions to environmental non-compliances

Adaptive management requires appropriate and varied management responses to reduce unacceptable environmental impacts.

Management responses / actions	Tasmania	Scotland ¹	Ireland	Canada	New Zealand	Norway
Conduct additional / more detailed monitoring	✓	✓	✓	✓	✓	✓
Modify production/farming operations	✓	✓	✓	✓	✓	✓
Fallowing	✓	✓	✓	✓	✓	✓

¹ While Scotland has recently introduced new regulations. This summary is based on the former regulations. Minimal information is currently available for management responses/actions under the new regulations

- Conducting additional monitoring or more detailed monitoring are common management responses/actions to minor environmental non-compliances.
- The use of remediation planning to mitigate ongoing breaches of environmental compliance is adopted internationally, with fallowing being frequently used by all jurisdictions farming salmon.
- Internationally, other regulatory action can be undertaken. This can include for example, modifying licence conditions, suspending licences and decommissioning of sites.

In conclusion

Based on the EPA review of international practices, it is clear that current environmental monitoring requirements were established to be relevant and effective in the Tasmanian context and to maintain sustainable aquaculture practices. This is being delivered through a combination of both on-farm monitoring, as well as broadscale monitoring of a number of indicators that provide both qualitative and quantitative assessment of sediment and water quality conditions that ensure sustainable aquaculture practices. To ensure that current and future Tasmanian aquaculture practices remain sustainable, the EPA is currently reviewing existing monitoring practices and developing a new environmental standard aligning with best practice for Tasmania.



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CONTACT:

Department of Primary Industries,
Parks, Water and Environment

E: enquiries@dPIPWE.tas.gov.au

W: www.dPIPWE.tas.gov.au

Information provided in this document has been extracted from the draft review of 'Tasmanian and international regulatory requirements for salmonid aquaculture' conducted by the Environment Protection Authority. This review can be found at: www.epa.tas.gov.au