MARINE BIOSECURITY PORTHOLE: https://marinebiosecurity.niwa.co.nz/forecast-impacts-of-the-mediterranean-fanworm-and-clubbed-tunicate-on/

Counting the cost of biofouling pests on mussel aquaculture

Non-native biofouling species are an increasing problem for shellfish aquaculture. Infestations on growing lines and the shells of cultured mussels can increase production costs and have adverse effects on growth and the market appeal of the product. This study used a range of information sources to develop an economic forecast of the potential long-term (24 yr) effects of two recently arrived biofouling invaders - the Mediterranean fanworm and clubbed tunicate - on green-lipped mussel aquaculture in New Zealand.

Green-lipped mussels account for ~76% of the total export value of NZ aquaculture (~NZ $ 281 million). The clubbed sea squirt, *Styela clava*, and the Mediterranean fanworm, *Sabella spallanzanii*, present threats to production. Both species can form heavy infestations on seed socks, growing lines and on the mussels themselves. Their distribution in New Zealand is currently limited and they have yet to infest many of the major mussel growing areas, but they are spreading steadily.

This study combined outputs from farm infestation and ecosystem energy budget models with partial budgeting and equilibrium models to forecast potential cumulative economic impacts of the fouling pests on producers and export markets for mussels. Societal impacts were also estimated to reflect changes in producer and consumer surplus after adjustment to altered market prices.

The forecasts suggested that uncontrolled spread of the two species could lead to direct impacts on producers of $26.4 m, and possibly up to $99 m over a 24 year period. Societal impacts at the market level were estimated to be $10.7 m over the same period.

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Additional reading

- Soliman T, Inglis GJ (2018) Forecasting the economic impacts of two biofouling invaders on aquaculture production of green-lipped mussels Perna canaliculus in New Zealand. Aquacult Environ Interact 10:1-12. https://doi.org/10.3354/aei00249

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