

# Re-carpeting the Hauraki Gulf

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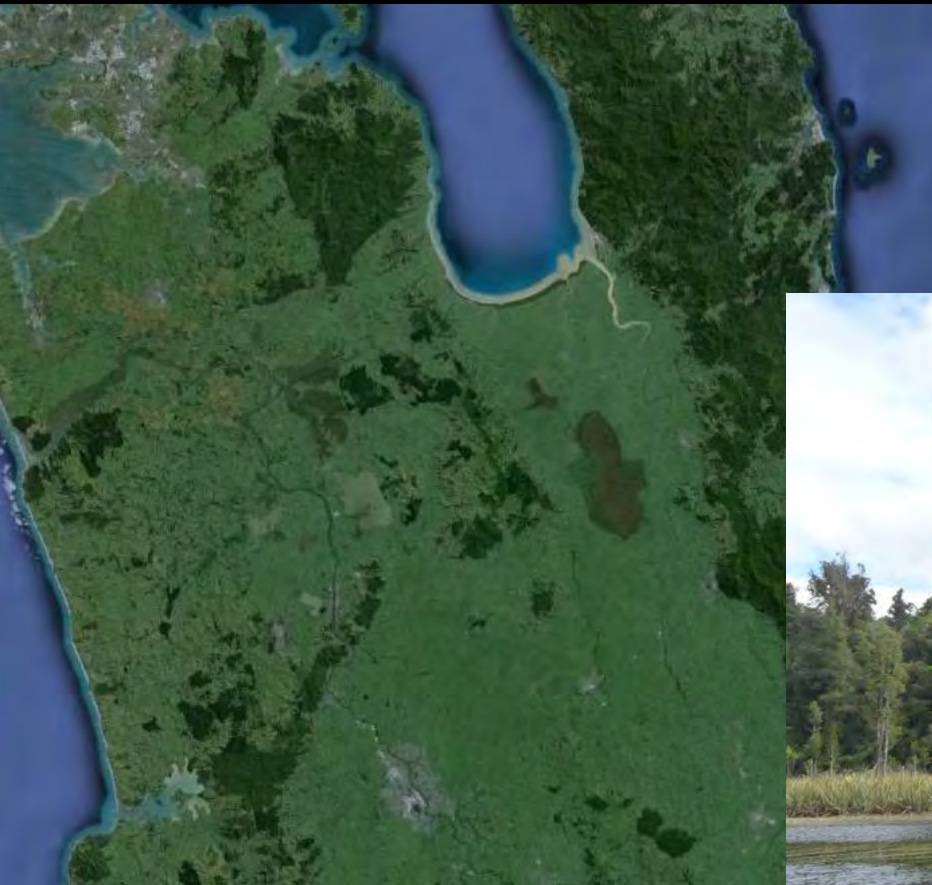
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**AUCKLAND**  
Te Whare Wānanga o Tāmaki Makaurau  
NEW ZEALAND

**SCIENCE**  
INSTITUTE OF MARINE SCIENCE



# State of the Hauraki Gulf

In 1769 Captain James Cook travelled up the Waihou River to harvest some of the “lofty trees which adorn its banks.”





# State of the Hauraki Gulf



Kauri logs on the coast at Coroglen ~1840



# State of the Hauraki Gulf



Thames during goldrush days ~1850s



# State of the Hauraki Gulf



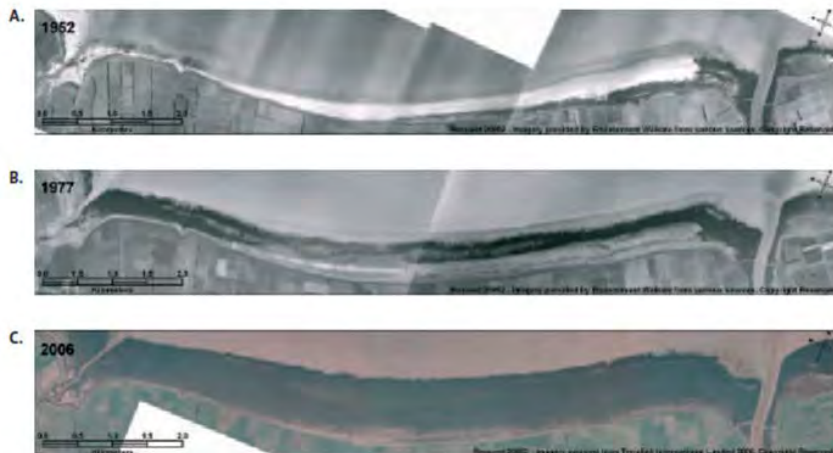
Alexander Turnbull Library, Wellington, Diary farming ~1850s



# State of the Hauraki Gulf



Figure 10: Expansion and infilling of mangroves in the southern Firth of Thames between (a) 1952, (b) 1977 and (c) 2006. Imagery provided by Waikato Regional Council and Terralink International Ltd. Copyright reserved.



- Waihou River to contribute in excess of 1900 tonnes of nitrogen and 138 tonnes of phosphorus to the Firth of Thames each year
- In 2012 nearly a quarter of the 4141 dairy farms in the Waikato were operating outside their effluent discharge rules
- In NZ 250 million tonnes of dirt dumped each year into the sea from the land.



# State of the Hauraki Gulf

“The Gulf has undergone an incredible transformation over two human lifespans. That transformation is continuing in the sea and around the coast, with most environmental indicators either showing negative trends or remaining at levels which are indicative of poor environmental condition.

Further loss of natural assets will occur unless bold, sustained, and innovative steps are taken to improve the management and utilisation of its resources, and to halt progressive environmental degradation.”

– State of Our Gulf, 2011





500 square kilometres of mussel reefs

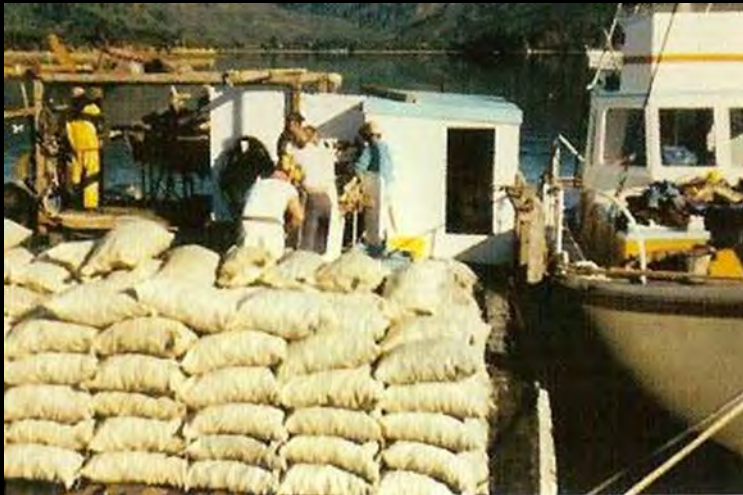


# Mussels in the Hauraki Gulf



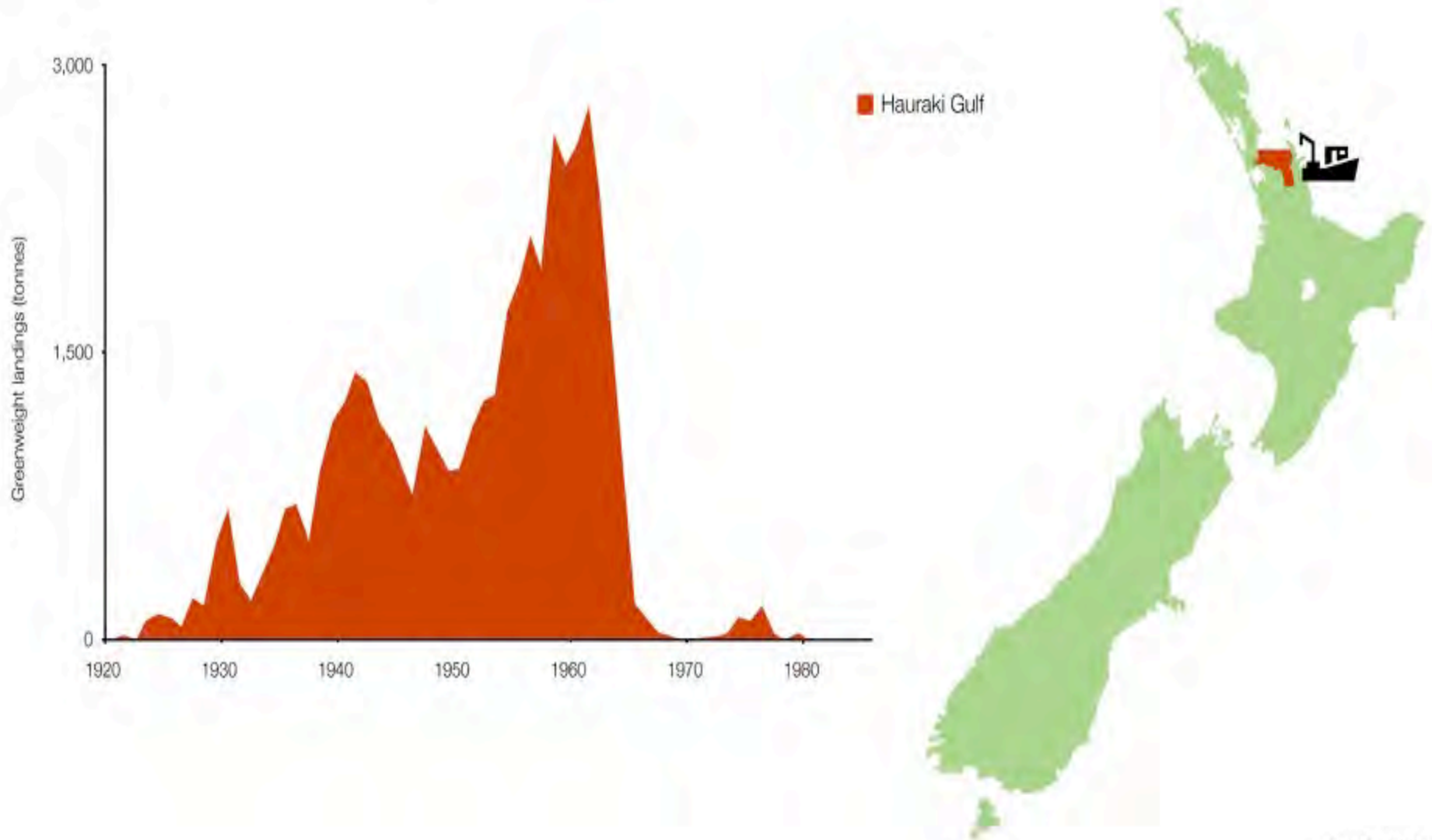
*Fishing vessel "Roā"*

Hauraki Gulf 1963

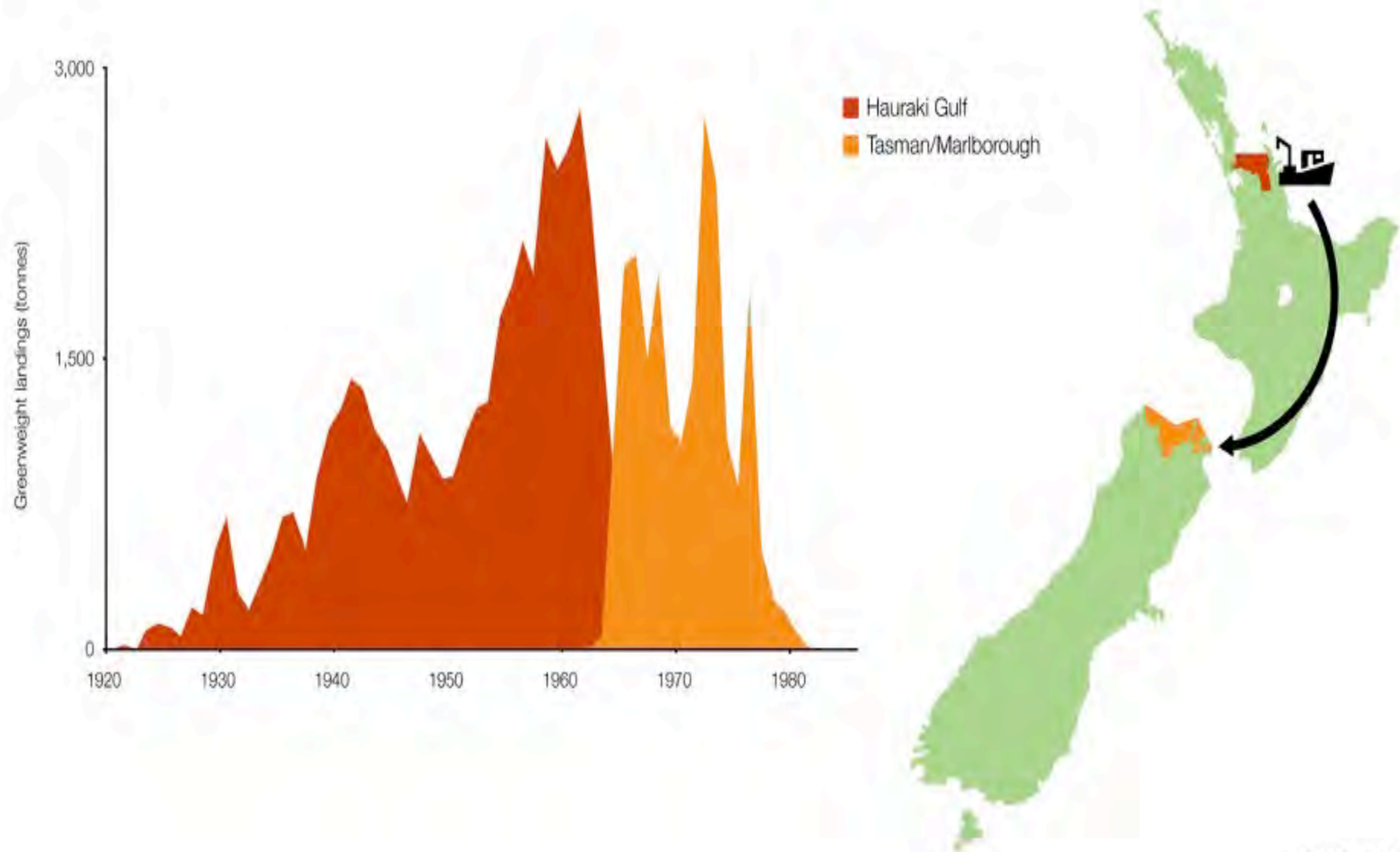


Sir George Grey Special Collections, Auckland Libraries, AWNS-19371110-49-4

# Regional green-lipped mussels fishery collapse

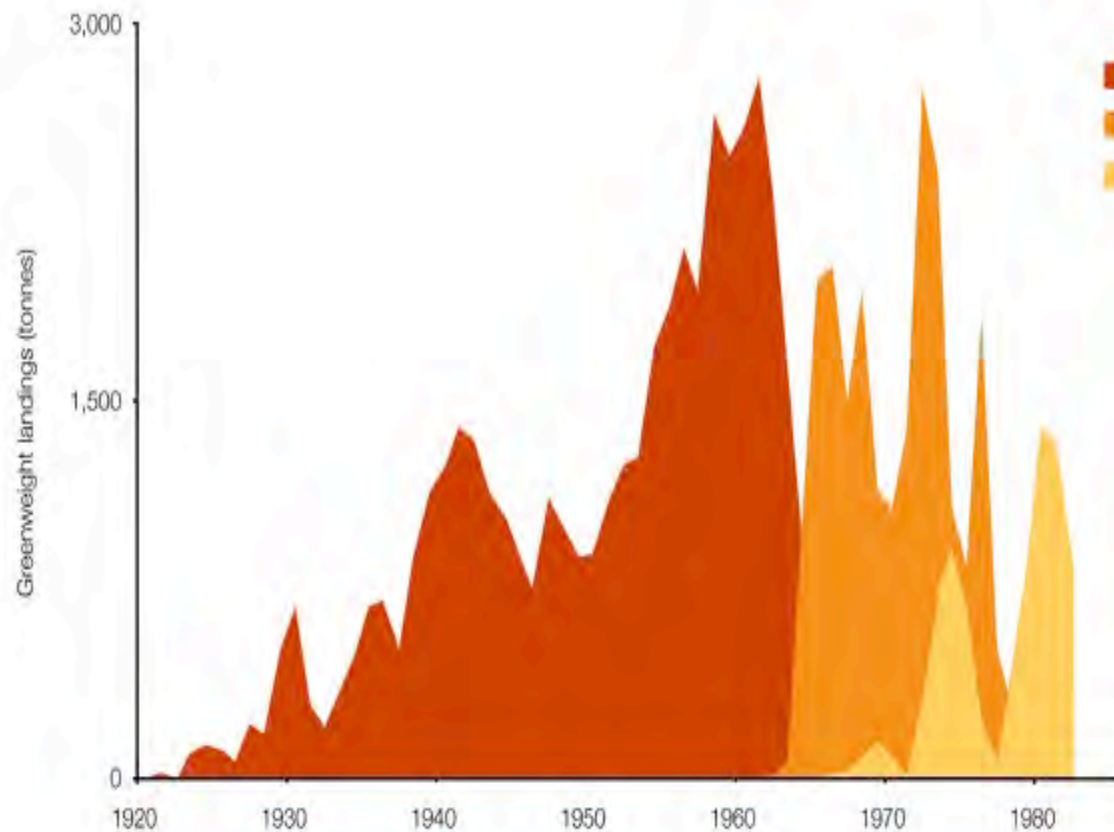


# Regional green-lipped mussels fishery collapse

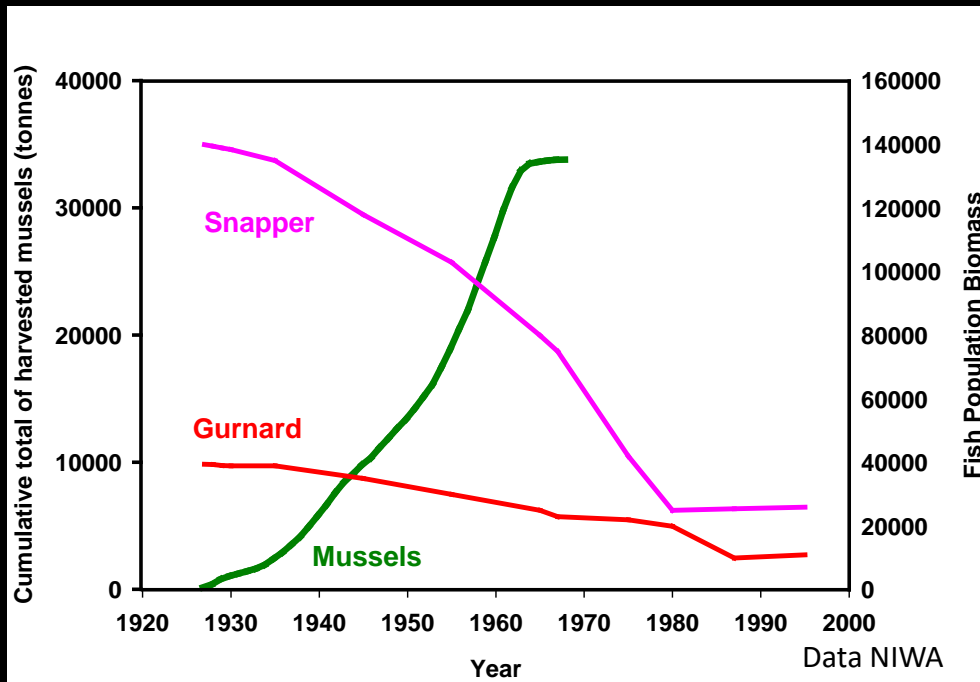




# Regional green-lipped mussels fishery collapse



# Mussels in the Hauraki Gulf



- Mussels removed
- Fish populations declined
- Coincidence?

- 3000 snapper
- 48 fishers
- 4 hours



# Hauraki Gulf 2018

Photo: Shaun Lee



# Mussels in the Hauraki Gulf



## Mussel beds versus bare seafloor

- 6 times the productivity – same as a rain forest
  - 4 times more mobile critters – crabs, worms, snails etc
  - 10 times more small and juvenile fish
  - 3 times more types of species
  - Removes excess nitrogen from the water
- 
- Before 1950s mussels production around 16,000 tonnes of small fish a year
  - Now only 20 tonnes of small fish a year

(McLeod et al. 2012, McLeod et al. 2014)

Two glasses of muddy water from the Hauraki Gulf.



Revive  
ourGulf

Photo: Shaun Lee

Plus one small green-lipped mussel...



Revive  
ourGulf

Photo: Shaun Lee



...in less than 15 minutes!



Revive  
ourGulf

Photo: Shaun Lee

# Clearing the water



Photo: Shaun Lee



# Re-carpeting the Hauraki Gulf with Mussels



- About 10 million mussels in 6 years
- More than 120 tonnes of mussels
- More than 16 rugby fields in area
- But only 50,000 times more needed
- They need some help!!!



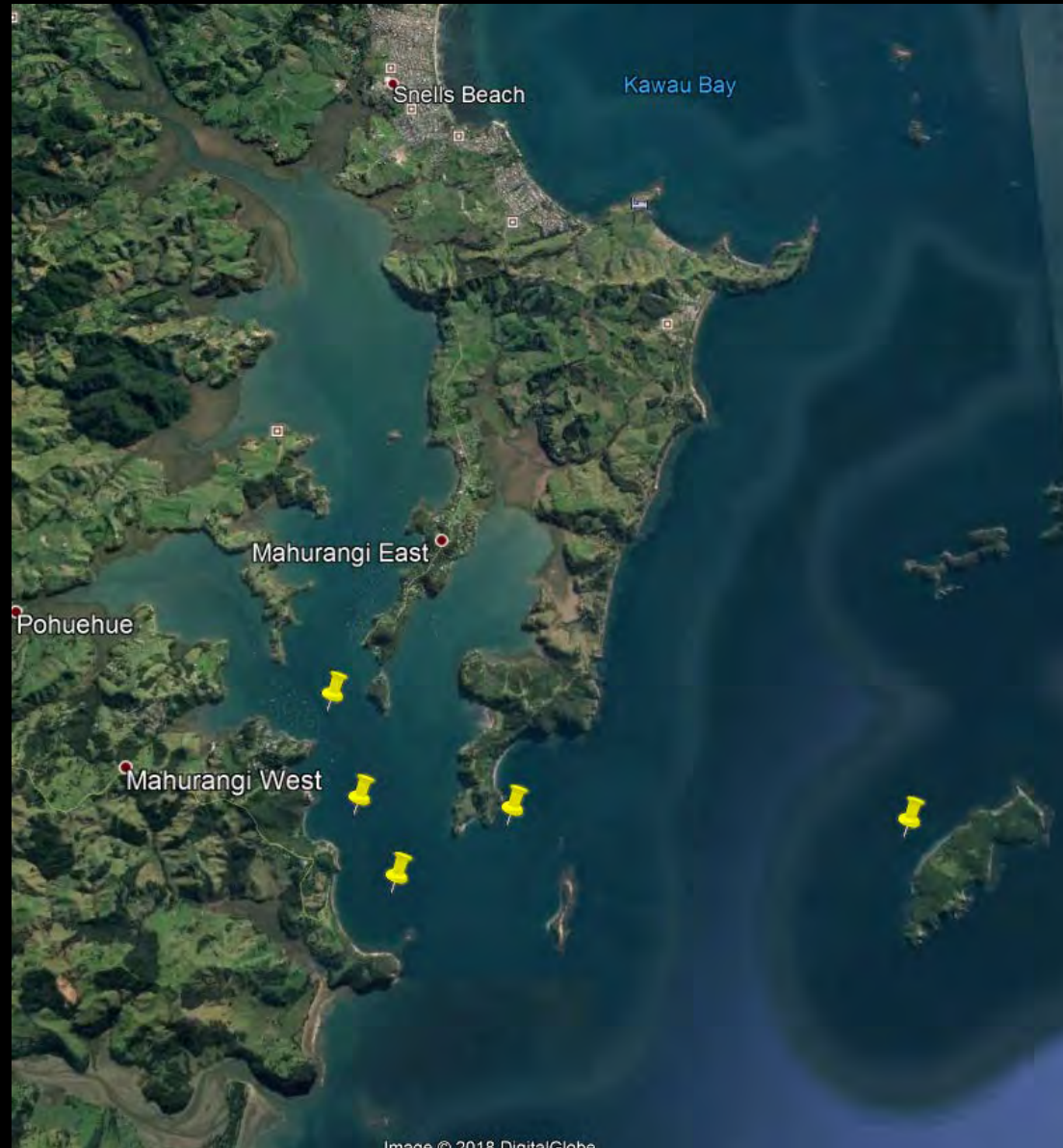


# Restoration is hard work & costly



Video: Shaun Lee

# Mahurangi Mussel Story





# Mahurangi Mussel Story

## Predators



Photo: Shaun Lee



# Mahurangi Mussel Story

## Communities



Photo: Shaun Lee

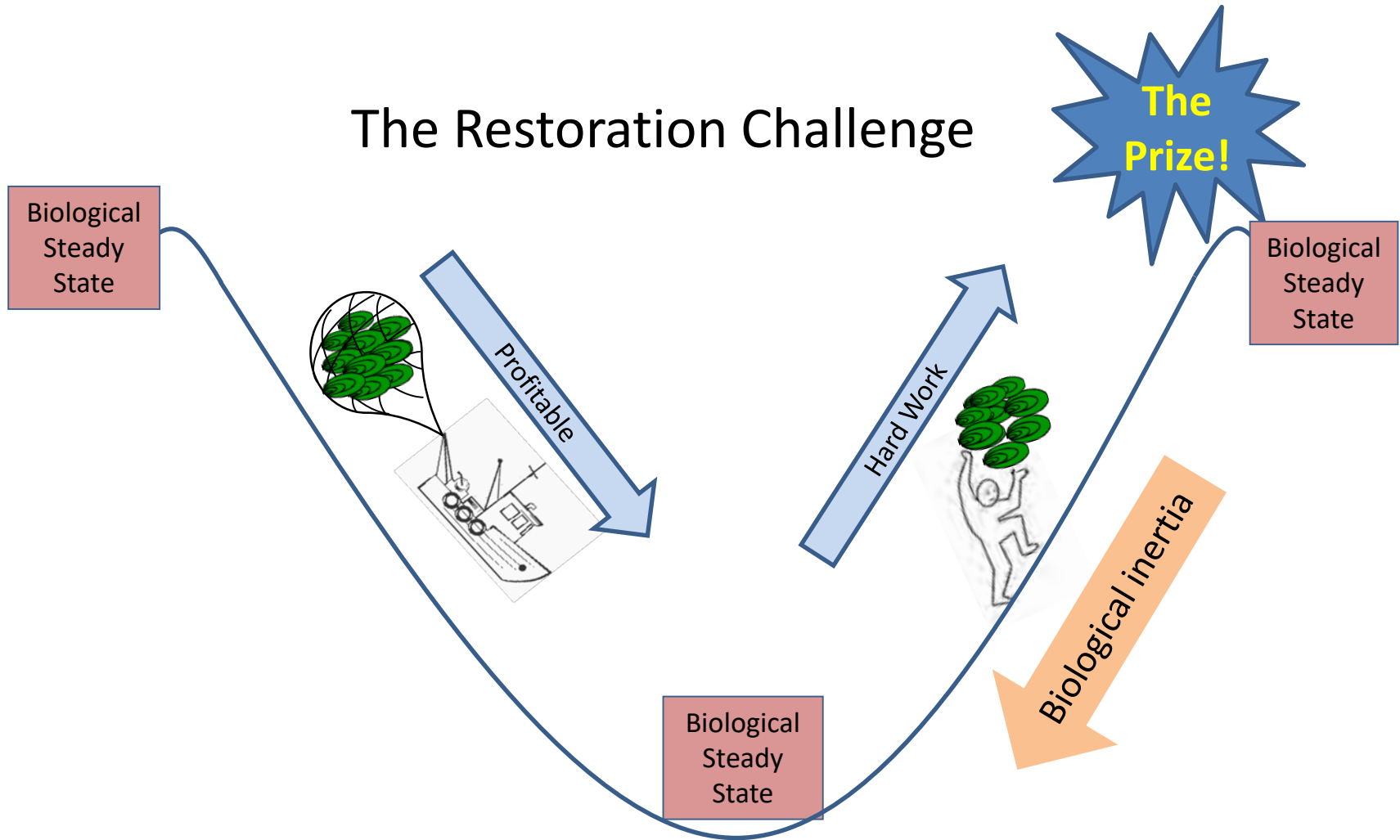
# Mahurangi Mussel Story

## Nurseries



Photo: Shaun Lee

# The Restoration Challenge





# Restoration - The Ultimate Prize!



Photo: Shaun Lee

- Living mussel reefs
- Self-sustaining
- Biodiversity boom
- Ecosystem benefits
- Fisheries benefits
- Economic benefits

**What's not to love!**