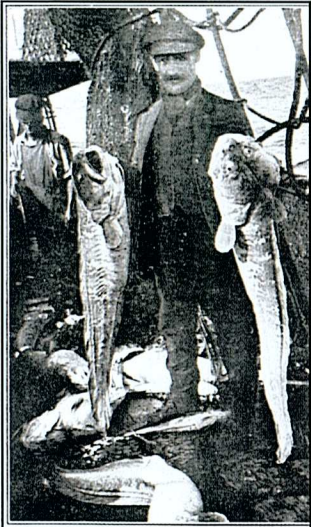
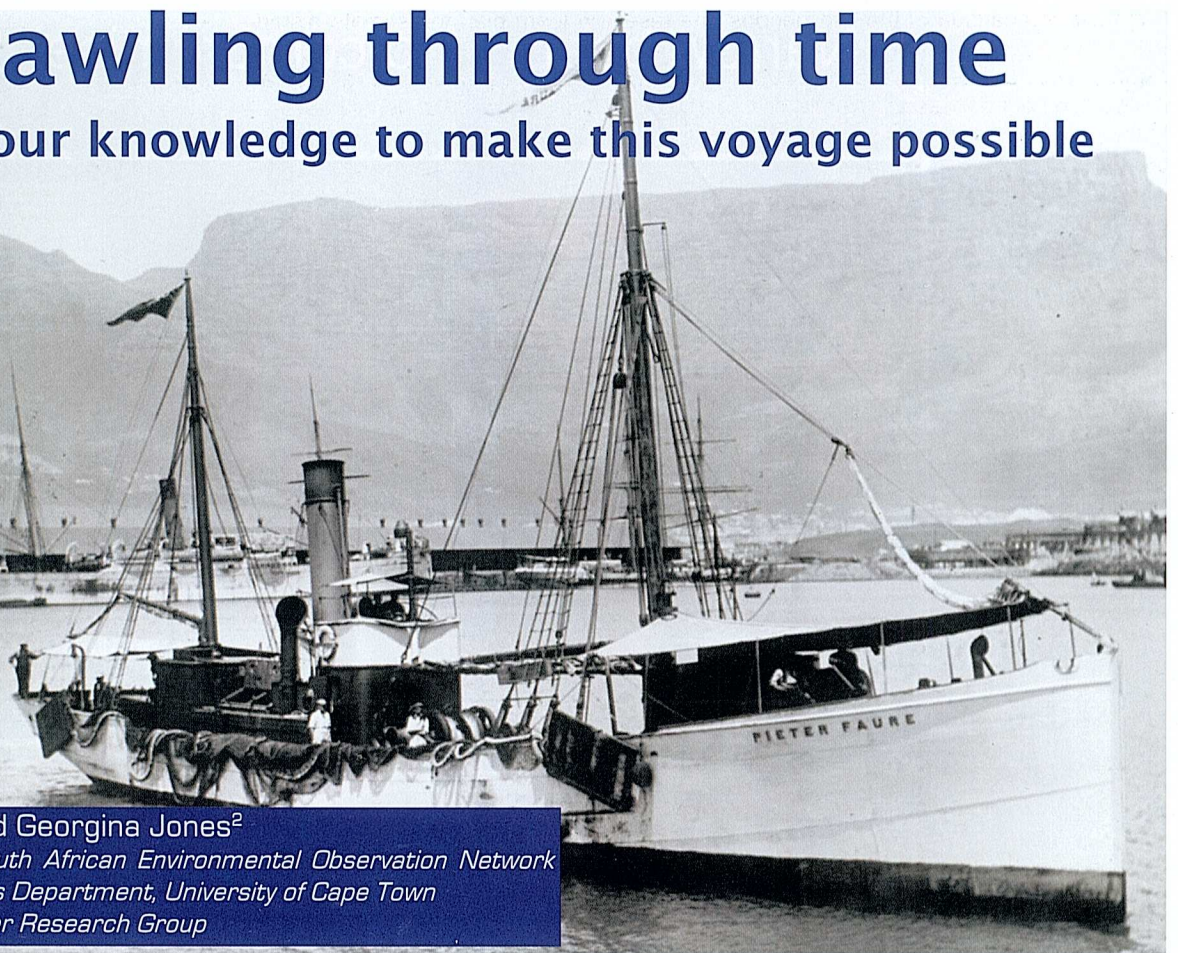


Trawling through time

Share your knowledge to make this voyage possible



King-Klip-fish from Deep Water off Cape Town (Station 89, 211 fathoms).



By Jock Currie¹ and Georgina Jones²

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A group of Cape Town-based researchers are embarking on a unique historical trawl experiment that will revolutionise our knowledge of century-old base-lines and subsequent changes in South Africa's trawl fishery.

Investigating long-term changes using fishery statistics is often problematic, because technological advances affect not only the numbers and sizes of fish caught, but also the composition among different species. Scientists are therefore undertaking a bold new project, to regress trawling technology by over a century, and make valid comparisons with trawl surveys conducted about 115 years ago. They would like to hear from anyone who can help with accomplishing this project.

The story begins with the re-discovery of a gold mine of historical marine data, unearthed from dusty archive shelves. Within these records lies a remarkably detailed, yet forgotten perspective of the exploration of abundant fishery resources and teeming biodiversity in South Africa's rich oceans.

The data are a legacy of John Gilchrist, South Africa's first, and perhaps most prodigious, Marine Biologist. His mission was, in his own words, to demonstrate "what the seas around the coast really contain and the best way of developing them prac-

tically".

Under Gilchrist's leadership and using the first steam trawler brought to South Africa, extensive trawl surveys were initiated in 1897-1904 and continued from 1920 onwards, providing catch records from thousands of trawl stations that have not been analysed since.

These archives are extremely thrilling to researchers, since elsewhere in the world, such quantitative surveys usually started decades or centuries after the ecosystems concerned had been significantly affected by human exploitation.

However due to South Africa's unique history, Gilchrist's records provide unprecedented insight into sea-floor ecosystems, at a time before human pressures, such as industrial fishing and climate change, could have affected them.

Although the re-discovered data already provide fascinating information on the historical trawl ecosystem, they would be far more valuable if researchers were able to directly compare catches between then and now, by removing the technological bias.

Working with government researchers and trawl industry partners, the team is planning the experimental fieldwork that will allow such comparisons. These expeditions will employ a present-day trawler, but will otherwise re-enact the historical trawl surveys.

The plan is to reconstruct a granton trawl

The steam ship Pieter Faure, South Africa's first research vessel, arrived in Cape Town in March 1897 (DAFF Communications Archive Photo Library).

that will closely imitate the catching capacity of the net used on the *Pieter Faure*, the steam trawler commissioned by Gilchrist from Scotland. The fine details of this historical gear were painstakingly gathered from old books and reports, which required a trip to Britain, where much of the history of trawling evolved and is documented.

Besides meticulous details on the dimensions and materials of each component making up the otter trawl, the authors also studied trawl speeds and the operation of the gear during Gilchrist's era. The reason for emulating the methods and gear so carefully, is to make the modern trawl samples directly comparable with those of the historical surveys, so that they can see how catches have changed in size, abundances and species composition.

Fieldwork will be initiated in early 2015. Three areas have been selected off the south coast of South Africa, where trawl grounds were densely surveyed by the *Pieter Faure* and will thus allow robust measures of the fauna from that period. The expedition will charter a commercial inshore side-trawler, together with captain, crew and scientists, to revisit the selected sites and carefully re-survey them using the re-constructed granton trawl.

In their comparison of the two periods, the research team plan to estimate historical baselines and assess the changes that have taken place during the intervening century. Their analyses will focus both on the composition of trawl catches, as well as the relative abundances of different fish species. Besides their value to fishery assessments, ecosystem models, resource managers and policy makers, these results will provide a sorely lacking historical context to more recent (or future) changes detected in South Africa's trawl environment.

The trawl nets are being made according to century-old instructions. A captivating glimpse into the past awaits. Anyone interested in this project is encouraged to make contact with the group. They would especially appreciate input from people knowledgeable about historical trawl gear and would also welcome any assistance in the undertaking of building the trawl gear and chartering an inshore trawler.

Acknowledging the untapped potential of valuable historical marine datasets in South Africa, a historical working group is being coordinated under the auspices of a new national project called SeaKeys: Unlocking foundational marine biodiversity knowledge.

Inquiries for both the trawl project and the broader historical working group can be made via email (jock@saeon.ac.za) or by phone (+27 78 333 7287).

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The marine aquarium trade has resulted in some severe alien invasions in different parts of the world

NEMA marine alien & invasive species - the implications

By Rory Haschick

The National Environmental Management: Biodiversity Act – alien and invasive species lists and regulations were published for public comment on 12 February 2014.

Although most of the species lists and regulations apply to land and freshwater species, there are a number of invasive, alien and prohibited marine species as well.

There are lists of invasive species for which certain activities are restricted, exempted or which require a permit. These species may be placed in category 1a; 1b;

2 or 3. A species may be categorised 1a for a certain activity or area and in another category for a different category or area.

If this sounds confusing, its because it is! The Department of Environmental Affairs has dithered for a number of years over these categories and over geographical zoning of alien species. In general though, the listings of 1a, 1b and 3 prohibit a range of restricted activities. Category 2 species require a permit for most of these restricted activities. Restricted activities may include growing, possessing, cultivating or trading.

Fortunately there are only 13 listed invasive marine species and these can be found in list # 9. A number of these listed species are important aquaculture species such as mussels, prawns and oyster species. Some – like the mussel *Mytilus*

galloprovincialis and oyster *Crassostrea gigas* are already cultivated commercially in South Africa. Others, like the prawn species *Ferrenereopenaeus indicus* and *F.monodon* are indigenous to KwaZulu Natal but require permits to be held or cultured in other provinces.

Notice 4 lists the prohibited species – those which cannot be held or imported under any circumstance. The door is left open for some estuarine and anadromous aquaculture species like barramundi (*Lates calcarifer*) and Atlantic salmon (*Salmo salar*) but only after some hard lobbying by the aquaculture industry!

The only prohibited marine fish species are the lionfish of the *scorpienad* family. A number of these tropical fish occur in South Africa and are popular in the aquarium trade. Along the eastern seaboard of the USA these fish have become extremely invasive – predated on native fish and multiplying - after either intentional or accidental release by hobbyists. Some reports blame the floods in New Orleans in 2005 for the first releases. They have now spread all the way up to New York State. They are slow moving but with their poisonous spines they are not easily removed from the system.

The only prohibited marine plant is another marine aquarium culprit - *Caulerpa taxifolia*. This green macroalgae has invaded large parts of the Mediterranean sea and could be invasive along the east coast if it became established. The prohibited marine invertebrates listed are the Pacific seastar, the Asian mitten crab and the Manila crab.

The final section of the gazette deals with the regulations pertaining to the species lists and categories – permitting, risk assessments and penalties. The gazette is available online at www.gpwonline.co.za.

• The next issue of *Fishing Industry News Southern Africa* will look in more depth at the impact of alien species on fisheries and aquaculture worldwide.