

REPORT (DEVELOPMENT AWARD)

2009/314.18 FRDC People Development Program: 2010 Australia - US Science and Technology Exchange Travel Bursary

AWARD RECIPIENT: Dr Andrew Levings

ADDRESS: PO Box 41 Portland Victoria 3305

HOST ORGANISATION: University of Maine; Darling Marine Centre

DATE: 9th June 2011

ACTIVITY UNDERTAKEN:

The science and technology exchange supplied knowledge about the use of Australian manufactured LEVO-Tags on the deep sea red crab (*Chaceon quinque-dens*), the opportunity to participate in applied research at the University of Maine's Darling Marine Centre and inspection of fishing gear. The process and merit of Marine Stewardship Council (MSC) fisheries certification and eco-labeling were discussed with regulators and industry in the Maine and greater New England region. The knowledge gained from the visit was relayed back to West Australian deep sea crystal crab (*Chaceon albus*) fishermen, exporters and the West Australian Fishing Industry Council (WAFIC).



Figure 1. University of Maine researcher Morgan Brunbauer holding red crabs

OUTCOMES

- A photographic record of the red crab (*Chaceon quinquedens*) harvest process.
- Knowledge about the applicability of MSC certification to the West Australian crystal crab (*Chaceon albus*) fishery.
- Assistance to post graduate student Morgan Brunbauer in his study of red crab.
- Ongoing assistance as needed from the owner of the New England Crab Company
- Presentation of a seminar at the University of Maine School of Marine Science and the Gulf of Maine Marine Institute, entitled "Australian fishermen participate in research to create a sustainable Giant Crab fishery".
- Peer review of Levings and Gill 2010. "Seasonal winds drive water temperature cycle and migration patterns of southern Australian giant crab *Pseudocarcinus gigas*."
- Supply of information on trap design to Western Australian deep sea crab fishermen
- Exchange of information on the merit of MSC certification and eco-labeling with Western Australian deep sea crab fishermen and WAFIC.

Acknowledgements

David Hall, Australian crab and fish tag manufacturer

Graham Pateman and David Hand; deep sea crab fishermen

Glen Bosman, Southern Trading Pty Ltd

Richard Stevens and Neil McGuffie; WAFIC

Professor Gerry Quin, Deakin University, Warrnambool

Associate Research Professor Rick Wahle, University of Maine Darling Marine Centre

Morgan Brunbauer, University of Maine Darling Marine Centre Red Crab Researcher

Charlene Bergeron and Mahima Jaini; University of Maine Darling Marine Centre

Jon Williams, New England Crab Company, New Bedford

Carl Wilson, Principal Lobster scientist, State of Maine

Matt Parkhurst, Boothbay lobster fisherman

Adjunct Professor Roy Melville Smith, Curtin University



Figure 2. Conical red crab trap with mesh and draw string base



Figure 3. Red crabs being placed in refrigerated salt water storage

Background

The red crab (*Chaceon quinque-dens*) fishery is conducted along a narrow swathe of the upper continental slope in depths of 400-800m by 4 vessels that are 27m to 35m in length from the New England states of Maine, Massachusetts and Rhode Island. The desired commercial size for the crabs is in excess of 114 mm carapace length and they are taken with baited traps, mostly of conical design (Figure 2.), then processed and distributed throughout the United States. It is a limited entry fishery conducted in accordance with a management plan implemented in 2002 to establish sustainable harvest levels. The plan, forged through the initiative of the New England Red Crab Harvesters Association provides catch records, access to vessels as research platforms, and expertise in the red crab fishery. The fishery has recently achieved Marine Stewardship Council (MSC) certification and global eco labeling. The University of Maine provides research support for the fishery.

Further information on red crabs can be found at:-

www.nefsc.noaa.gov/publications/crd/crd0625/crd0625.pdf

Need

The crab tag, manufactured by Hallprint Pty Ltd (South Australia) was developed by Andrew Levings during FRDC project 93/220. Marketed as the LEVO-Tag, it has proven to be extremely durable and is used in many countries around the world. The University of Maine which provides research support for the red crab fishery, requested advice about crab tags and tagging methods; initially to Australian tag manufacturer Hall Print Pty Ltd and then referred to Andrew Levings. As the crystal crab (*Chaceon albus*) of Western Australia (Figure 4.) is a similar species caught at similar depths to the red crab, there was further interest from Western Australian fishermen in the fishing methods used in the fishery and more generally the way the New England red crab industry operated.

Further information on crystal crabs can be found at:-

<http://laptop.deh.gov.au/coasts/fisheries/wa/deep-sea-crab/pubs/appendix-3-dec09.pdf>

Objectives

The objectives of this bursary were to:

- Disseminate knowledge at the University of Maine on the use of Australian manufactured crab tags and meet with world leaders in crustacean research to discuss current work on lobsters and crabs.
- Assist the University of Maine's red crab research project by joining a post-graduate student on a 10 day industry-sponsored tag/ release voyage and observe harvest methods

- Observe the MSC process in practice and by discussion obtain fishermen's views on the merit of this certification in the context of an environmentally conscious market place and the imperative to achieve sustainable harvesting
- Disseminate the knowledge gained through objects 3 and 4 to West Australian deep sea crab fishery stakeholders.

Methods

The grantee assisted the University of Maine and Hallprint Pty Ltd with the final design for the tag and hands on assistance in its application. While in Maine a televised seminar about Australian crab tagging and industry assistance to research was presented at the University of Maine School of Marine Science (SMS) lecture series (Appendix 1) and at the Gulf of Maine Marine Institute at Portland. Information was exchanged in many other diverse settings on campus, the wharf and boats at sea; and complemented by photography and literature searches. The grantee then travelled to Western Australia and provided feedback about the red crab fishery to crystal crab fishermen, industry officials, marketers and the lead scientist.



Figure 4. Western Australian Crystal Crab *Chaceon albus*

Results and Discussion

Although the red crab of New England and the crystal crab of Western Australia are similar species and may have similar life histories, the fisheries are vastly different. Red crabs are processed and sold in portions, or the meat extracted then frozen or canned, while crystal crabs are sold live. The production from the red crab fishery is more than 10 times larger and the processed product is sold into an environmentally sensitive north American and European food service and retail market where there are competing crab products. In this setting market edge is enhanced by MSC certification and eco-labeling.

Australian and Asian market sensitivities for the crystal crab differ markedly. Rather than an eco-label inducing a purchase, it is the display of live, healthy, undamaged crabs from this small volume fishery that triggers consumers to buy and consume them on the spot. In Australia, ecological sustainability is achieved through compliance with state and federal government laws for the management and export of endemic species.

A comparison of MSC core principals and Australian Government EPBC guidelines shows there is little difference, although the MSC certification is for 5 years compared with the EPBC export permit tenure of 3 years.

The MSC's standard for sustainable fishing is comprised of 3 core principles that require:

- 1) healthy fish stocks;
- 2) that the fishery does not jeopardize the supporting ecosystem;
- 3) that management systems ensure the long-term future of all resources.

Reference <http://www.msc.org/documents/msc-brochures/msc-theory-of-change>

The EPBC guidelines for ecological sustainability rely on two principals:-

- 1) A fishery must be conducted in a manner that does not lead to over-fishing, or for those stocks that are over-fished, the fishery must be conducted such that there is a high degree of probability the stock(s) will recover.
- 2) Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem.

Reference <http://www.environment.gov.au/coasts/fisheries/publications/pubs/guidelines.pdf>

Western Australian Fishing Industry Council (WAFIC) officials are familiar with the application of MSC certification as the Western Rock Lobster (*Panulirus Cygnus*) fishery is MSC certified. The WAFIC display booth at the 2010 Hong Kong Asian Seafood Exposition received inquiries from a number of Asian food service businesses about environmental certification of Australian seafood products. This new line of inquiry had not been observed previously and is noted in their report on the exposition, viz:

“Australian Seafood’s Diversity Quality Sustainability – was well received by many buyers and particularly by the World Wildlife Fund (Hong Kong) whose representatives visited the stand twice and which is making significant inroads with consumers in Hong Kong. At least three genuine buyers mentioned that they will only purchase sustainable seafood, two requiring MSC certification or similar. This was a noticeable change in attitude of buyers at previous Asian expos attended by WAFIC and was confirmed by a market survey where sustainability rated higher than product range and consistency of supply and the highest of all the perceptions of Australian Seafood.”

The new line of inquiry reflects an increasing global focus on sustainability and the ability to demonstrate it through recognized certification. The efficacy of MSC certification can vary with the context: it is advantageous for penetration of food service and retail distribution chains, especially in

north America and Europe, or can be useful politically in the Australian context as a ready demonstration of environmental credentials in (for example) the South Western Marine Protected Areas debate. However, Western Australian fishermen and exporters indicated that presently there is little sign that MSC certification (or the lack of it) is influencing consumer choice in the crystal crab fishery.

Benefits and Adoption

Technical extension for West Australia was completed during the second quarter of 2011. Western Australian deep sea crab fishermen were primarily interested in trap design as a means of achieving greater harvest efficiency. These discussions, at a more general level, also encouraged fishermen to be diligent about reporting information from recaptured tagged crabs, as knowledge about growth and migration patterns provides a foundation for sustainable management.

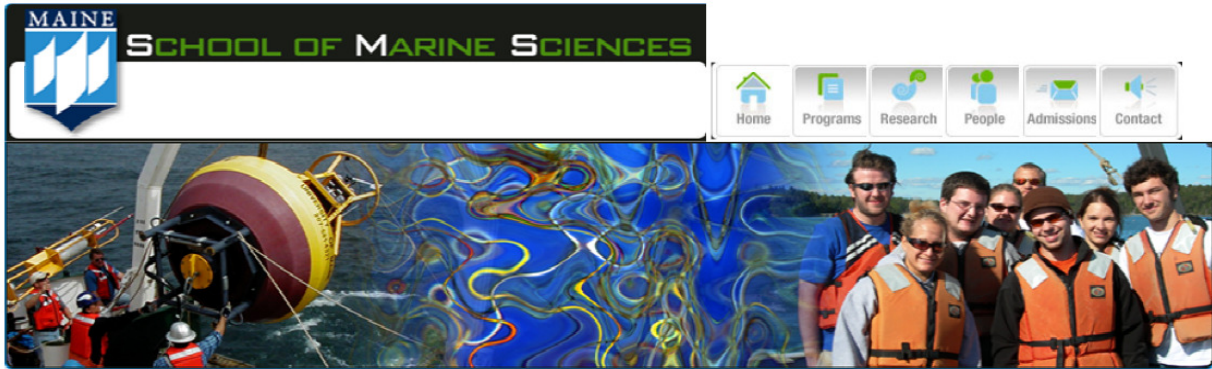
Examination of the MSC process was beneficial because there is increasing global consumer awareness about ecological sustainability; in north America and Europe this is well developed and in Asia is starting to develop. The north American and European market context influenced the decision by the red crab fishery operators to become MSC certified. By way of contrast, in the Asian market, which is less influenced by ecological sustainability, the additional cost of being MSC certified is an issue for crystal crab fishermen, especially when the process it is redundant on state regulation and federal EPBC compliance, and the product involves live rather than processed animals. The appearance of the live product, rather than the logo on the package grabs consumer interest and triggers sales.

Nonetheless it would be prudent for the crystal crab fishery to be able to showcase its sustainable performance to interested parties going into the future. This may be achieved relatively easily as existing controls of a similar nature to MSC certification are already applied through Australian law and gives industry or government the basis to present a positive profile that can withstand scrutiny from consumers concerned about sustainability.

In summary; the visit gave the opportunity to examine research, education and fisheries in the greater New England region. The inception of the Gulf of Maine Marine Institute and its education of children provide great models for Australia and is highly recommended to persons visiting Portland, Maine; see (<http://www.gmri.org/>). Some of these insights on the use of eco-labeling to demonstrate sustainability were relevant to the Australian context, but some were not because a different product form is sold in a less discriminating market at the present time. However, in contemplation of a future where consumers become more concerned about sustainability Australia has the existing advantage of a regulatory framework quite similar to the MSC certification process on which eco-labeling could be based.

END

Appendix 1.



SMS Seminar Series

Fall 2010
Fridays at 11:00 a.m. in 354 Aubert Hall

Date	Speaker and Title	Host
September 3	LABOR DAY WEEKEND - NO SEMINAR	
September 10	Dr. Andrew Levings, Commercial Fisherman & Visiting Research Scientist, Deakin University School of Life and Environmental Sciences, Deakin University, Australia, " <i>Australian Fishermen Participate in Research to Create a Sustainable Giant Crab Fishery.</i> "	Rick Wahle
September 17	Dr. Joseph Kelley, Department of Earth Sciences, Chair, UMaine, " <i>Terrestrial landscapes (with evidence of people) preserved beneath the Gulf of Maine.</i> "	Becky Van Beneden
September 24	Dr. Randy Olson will be on campus to present seminars and films – NO SMS seminar this week	
October 1	Dr. Steve Cadrin, Department of Fisheries Oceanography, UMass-Dartmouth –SMAST, " <i>Fisheries Science and Management: victims of our own success?</i> "	Jim Wilson & Yong Chen
October 8	Dr. Nick Makris, Director of the Laboratory for Undersea Remote Sensing, MIT, " <i>Rapid Formation of Vast Oceanic Fish Shoals Observed Using Ocean Acoustic.</i> "	Pete Jumars
October 15	Dr. Heather Deese, Island Institute, " <i>Environmental Challenges of Offshore Wind Energy: Current Understanding and Ongoing Studies.</i> "	Pete Jumars
October 22	Dr. Charles Mazel, Physical Sciences Inc., Andover, MA, " <i>Fluorescence of Corals and Other Marine Organisms: What it Means to Them and to Us.</i> "	Warren Riess
October 29	Dr. Walt Golet, "TBA"	Andy Pershing
November 5	Dr. Graham Shimmiel, Executive Director, Bigelow Laboratory for Ocean Sciences, " <i>The Impact of Oil Exploration and Production on the Ocean: Lessons from the North Sea.</i> "	Mary Jane Perry
November 12	Dr. Peter Countway, Bigelow Laboratory for Ocean Sciences, " <i>Microbial Eukaryotes at deep-sea hydrothermal vents: Diving into their diversity, activity and ecosystem function.</i> "	Ivona Cetinic
November 19	Dr. Fei Chai, School of Marine Sciences, University of Maine " <i>Development and Issues of Climate Intervention Technologies.</i> "	Becky Van Beneden

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