

CURRICULUM VITAE

1. Personal:

Name: Neil Randell LONERAGAN
Address: 4 Port Close
Leeming
Western Australia 6149
Australia
Nationality: Australian

2. Education:

1990: PhD, Murdoch University, Western Australia. Thesis: "The populations and community structures of fishes in two large estuaries of south-western Australia". Supervisor: Professor Ian Potter.

1981: Bachelor of Science (Honours, First class), Murdoch University, Western Australia. "The development and use of computer techniques for analysing data on estuarine fish populations". Supervisor: Professor Ian Potter.

1978: Bachelor of Science (Zoology), University of Western Australia

3. Scholarships and awards:

1989-90: National Science and Environment Research Council Post-doctoral fellowship. Professor Geoff Power, University of Waterloo, Ontario, Canada

1986: Commonwealth Scholarship for PhD studies

4. Appointments:

2005 Professor of Fisheries Science, Murdoch University

2003-04 Research Group Leader, Northern Fisheries and Ecosystems, CSIRO Marine Research

1-0 Adjunct Associate Professor, University of Queensland

2-0 Principal Research Scientist, CSIRO Marine Research

1993-1996: Senior Research Scientist, CSIRO Marine Research

1992-1995: Project Leader, Tropical Prawn Ecology

1990-1993: Research Scientist, CSIRO Division of Fisheries, Cleveland Australia

1989-1990: Post-doctoral Research Fellow, University of Waterloo, Ontario, Canada

1982-1989: Research Officer, Murdoch University, Western Australia

1979-1981: Graduate Research Assistant, Murdoch University, Western Australia

5. Major scientific projects:

Summary of research

During my career, I have developed both quantitative and descriptive approaches to understand the dynamics of estuarine and coastal species, particularly prawns. More recently, I have led research across disciplines and agencies to better understand

linkages between coastal systems and prawn fisheries, develop a greater ecosystem understanding of fisheries and to investigate the potential for commercial stock enhancement. I have also worked collaboratively with fishery modellers to investigate the impact of changes in fishing practice on tiger prawn stock assessments and the dynamics of a relatively unknown prawn species in northern Australia. Throughout my career, I have taken an active interest in setting broad strategic directions, implementing processes to make research teams more effective and developing staff and students. This has provided me with excellent background and experience in my current role as the inaugural leader of the Northern Fisheries and Ecosystems group in CSIRO Marine Research.

My research on prawn and coastal ecology and that of my team has resulted in a major review and fully funded invitations to International conferences and workshops. Research in this area and on prawn fisheries has been essential for the NPF, one of Australia's most valuable Commonwealth fisheries (\$100 million per year), to demonstrate that it is a sustainable fishery and pass the Commonwealth Strategic Assessment to maintain an export license. The innovative approach adopted by me and my research team to enhancement research has resulted in funded invitations to an International conferences and workshops and an invitation to contribute to a major review of invertebrate stock enhancement. The research also provided the basis for the MG Kailis Group to decide not to proceed with the commercial scale enhancement. Research on the impacts of new fishing practices in the Northern Prawn Fishery has provided management with the basis for more reliable and accurate stock assessments and highlighted the need to regulate fishing effort to sustain the production of the fishery.

Individual projects (for detailed list of major individual projects see Table 2)

1. "Biology and status of prawn stocks and the fishery in the Gulf of Papua". A study of the prawn fishery in the Gulf of Papua, New Guinea to assess the species distribution, status of the stocks and levels of fishing. Principal Investigator: Dr Neil Loneragan. Funding from ACIAR (\$400,000 over 3 years, 2003-).
2. "Bycatch monitoring project" A project to evaluate monitoring strategies for the Northern Prawn Fishery and transfer them to the Management Authority. The project also involves assessing the risks of trawling to bycatch species, and describes the prawn trawl bycatch in the Joseph Bonaparte Gulf. Principal Investigator: Dr Neil Loneragan, Co-Investigator: Trysh Stone (AFMA). Funding from FRDC (\$1,400,000 over 3 ½ years, 2003-).
3. "Spatial arrangement of estuarine and coastal habitats and the implications for fisheries production and biodiversity" A study to extend previous approaches to understanding habitat/fauna relationships. The innovative new approach considers the suite of adjacent habitats that the fauna might potentially use. Principal Investigator: Dr Greg Skilleter, University of Queensland, Co-Investigator: Dr Neil Loneragan. Funding from FRDC (\$430,555 over 3 years, 2002-).
4. Estimating the extent of coastal habitats in the Fitzroy River, Queensland. Funding from the Coastal CRC to support the operating budget of Ms Fiona Manson, a CRC PhD student (\$30,000 over 2 years, 2003-)

5. “Developing surrogates for species assemblages, assessing the impacts of trawling and modelling the effects of spatial closures on the Northern Prawn Fishery”. A pilot study to integrate information on the fishery, currents, economics and biology of the Gulf of Carpentaria to evaluate whether surrogates can be developed to describe the marine ecosystems of this region and the potential selection of Marine Protected Areas. Collaborative project across Program (Tropical and Pelagic Ecosystems, Multiple Use, Management and Evaluation of the Economic Zone) and organisation (CMR, Environment Australia, Australian Bureau of Agriculture and Resource Economics). Principal Investigator: Dr Neil Loneragan, Co-investigator: Mr Mick Haywood. Funding from FRDC (2000/166, \$360, 000 over 2 years, 2000/01 – 01/02). This project was delegated to Dr Burke Hill after funding was granted by FRDC.
6. “Developing techniques for enhancing prawn fisheries, with a focus on brown tiger prawns (*Penaeus esculentus*) in Exmouth Gulf”. A collaborative study with MG Kailis Group of Companies and Fisheries WA, to develop techniques for high density culture, transport and release of juvenile tiger prawns, and determine the optimum release strategies for stock enhancement of prawns. Funding from FRDC (99/222, \$620, 000 for 3 years, 1999/00 – 2001/02). Principal Investigator: Dr Neil Loneragan.
7. “Developing and assessing techniques for enhancing tropical Australian prawn fisheries and the feasibility of enhancing the brown tiger prawn (*Penaeus esculentus*) fishery in Exmouth Gulf”. A collaborative feasibility study with MG Kailis Group of Companies and Fisheries WA, to assess the bioeconomics of stock enhancement. Funding from FRDC (98/222, \$50, 000 for 12 months, 1998/99). Principal Investigator: Dr Neil Loneragan.
8. “Sustainable development of tropical Australia: research and development for land, estuary and marine resources”. A feasibility study with CSIRO Tropical Agriculture and Land & Water to assess focus regions and key issues for sustainable development in northern Australia, from the catchments to oceans. Funding from FRDC and LWRRDC (\$50, 000 for 12 months 1998/99). Principal Investigator: Dr Andrew Johnson, Dr Ian Poiner. Co-investigator: Dr Neil Loneragan
9. “The impact of mangrove removal on the production of prawns in Malaysia, particularly banana prawns”. The removal of mangroves is an important issue in southeast Asia and Australia. There have been extensive areas of mangroves removed in Malaysia and some areas where they have been retained. This project provided the opportunity to link the extent of nursery habitat to fishery production and involved collaborations with Griffith University, the Fisheries Research Institute of Malaysia (FRI) and the Universiti Sains Malaysia (USM). Principal Investigator: Dr Neil Loneragan, Ms Choo Poh Sze (FRI), Professor Ong Jin Eong (USM). Funding from the Australian Centre for International Agricultural Research (ACIAR PN9218) of \$514, 000 over 4 years from 1997/98–2000/2001.
10. “The growth, mortality and nursery habitats of red-legged banana prawns *Penaeus indicus* in the Joseph Bonaparte Gulf”. A major project stemming from the 12 month pilot study to obtain realistic estimates of growth and mortality for this species, as well as determining its key nursery habitats. Funding from FRDC

(97/105) of \$750 000 over 3 years from 1997 - 1999. Principal investigators: Dr Neil Loneragan, Dr David Die.

11. “The impact of changes in fishing patterns on Red-legged banana prawns (*Penaeus indicus*) in the Joseph Bonaparte Gulf”. A pilot study on the effects of tagging on growth and mortality of this species in the laboratory and use of simple models to investigate the consequences of changes in fishing patterns on the potential yields of this little known species. Funding from FRDC (96/15) of \$100 000 for 1 year in 1996. Principal Investigators: Dr Neil Loneragan, Dr David Die.
 12. “Stock recruitment relationships for tiger prawns in the Northern Prawn Fishery”. Investigates the impact of recent changes in fishing patterns on estimates of stock and recruitment. Involved collaboration with Tony Smith, Andre Punt, David McDonald and Scoot Condie of the Division of Marine Research in Hobart. Funding from FRDC (95/14) of \$865, 000 over 3 years from 1995/96–1997/98. Principal Investigators Dr David Die, Dr Neil Loneragan.
 13. “The role of coastal nursery habitats in determining the long-term productivity of prawn populations in the Northern Prawn Fishery”. A project involving staff of the Tropical Prawn Ecology Project to investigate key processes in seagrasses and mangroves that limit prawn populations. Funding obtained from the Fisheries Research and Development Corporation (FRDC 92/45) \$890, 000 from 1992/93–1994/95. Principal investigator: Dr Neil Loneragan.
 14. “Assessing the factors that affect the fish populations of the Swan estuary, Wilson Inlet and Nornalup estuary.” Another collaborative project between WA Fisheries and Murdoch University to describe seasonal, annual and spatial patterns of variation in the fish fauna of this system and to assess changes in this system with those of the eutrophic Peel-Harvey. Principal Investigators: Professor I.C. Potter and Dr R.C.J. Lenanton. Funding from the Fisheries Dept of WA, Dept. of Conservation and Environment and the Waterways Commission for the 6 years from 1983-89.
 15. “Influence of eutrophication on the fish and crustacean fauna of the Peel Harvey Estuary”. A collaborative project between WA Fisheries and Murdoch University to investigate the effects of anthropogenic inputs on the fish fauna of one of the largest estuarine systems in Western Australia. Principal Investigators: Professor I.C. Potter and Dr R.C.J. Lenanton. Funding from the Fisheries Dept of WA and Dept. Of Conservation and Environment for 2 years from 1979-83.
- 6. On-going collaborations with external researchers**
- Dr Ken Leber, Director Mote Marine Laboratory, Florida. Enhancement research.
 - Dr Johann Bell, Program Leader, World Fish Center, Penang. Enhancement research, coastal research in developing countries.
 - Malaysian Department of Fisheries – mangrove/prawn fishery relationships

- Indian National Institute of Oceanography – influence of environmental factors on prawn fishery production
- Professor Stuart Bunn, Griffith University. Linkages between river flow and the production of coastal fisheries, coastal food webs. Funded by Queensland Department of Natural Resources and Brisbane River Management Group.
- Dr Rod Connolly, Griffith University. Functioning of coastal food webs. Funded by small ARC grants, CRC for Estuaries and Coastal Waters.
- Dr Greg Skilleter, University of Queensland. Relationships between fauna and habitat in estuaries and shallow marine systems. Funding from the Fisheries Research and Development Corporation of Australia, Ports Corporation of Brisbane.
- Dr Ian Williamson, School of Life Sciences, Queensland University of Technology. The effects of canal developments on fish populations in coastal waters. Funded by joint CSIRO/Universities funding scheme.

7. Academic teaching, supervision of students and mentorship of young scientists

(a) Undergraduate teaching

- University of Queensland – Three lectures per year on Marine Ecology (Third year students) and one on Fisheries Biology – the Northern Prawn (Third year students), University of Queensland. 1996-present
- Two to three lectures each year on coastal fisheries (Third year students), Griffith University. 1995-97
- University of Waterloo – Introduction to Fisheries Biology (39 lectures, Final year students)

(b) Supervision of postgraduate students

Postdoctoral research fellow

1993-1994 Dr Liu Heng. from the Chinese Institute of Oceanology, Qingdao, Peoples Republic of China. Response of tiger prawn postlarvae to light and seagrass.

PhD

- 2000-2004 Michaela Guest: Griffith University, Gold Coast. Tracing the sources of carbon and nitrogen in estuarine food webs. (awarded 2004)
- 2000-2004 Fiona Manson: University of Queensland, Brisbane. Linkages between mangrove systems and coastal fisheries (submitted November 2004).
- 1998-2002 Justin Meager: Queensland University of Technology, Brisbane. Microhabitat distribution of juvenile banana prawns, *Penaeus merguensis* de Man in subtropical eastern Australia and processes affecting their distribution and abundance. Ph.D Thesis. Queensland University of Technology. 221 pp. (awarded 2003).
- 1-0 Ben Longstaff: University of Queensland, Brisbane. Light regimes and their impact on loss and recovery of seagrass beds (awarded 2002)

- 1-0 Simon Costanzo: University of Queensland, Brisbane. Estimation of the extent of sewage nitrogen on aquatic primary productivity. (awarded 2002).
- 1997-2005 Darrin Drumm: University of Otago, Dunedin, New Zealand. Exploitation of reef resources on Rarotonga, Cook Islands. (submitted December 2004).
- 1997- Ahmad Adnan bin Nuruddin: Griffith University, Brisbane, Australia. Fishery dynamics of banana prawns *Penaeus merguensis* on the west coast of peninsular Malaysia.
- 1994-1999 Paul Mayes: Queensland University of Technology, Brisbane. Effect of canal developments on larval fish populations. (awarded 2000)
- 1989-1990 Scott McKinley. University of Waterloo. Physiology of sturgeon in northern Ontario lakes. (awarded 1992)

Masters

- 1998-2001 Rohasliney Hasim: Universiti Sains Malaysia, Penang. Impact of different mangrove management regimes on the macrobenthic fauna of the Sungai Merbok Estuary, Kedah (awarded 2001)
- 1990-1994 Rob Kenyon: Griffith University, Brisbane. Interactions between behaviour, habitat and predation on prawn populations. (awarded 1994)
- 1989-1990 Yosef Tekligordias: University of Waterloo, Canada. Age and growth of Tilapia populations in Ethiopian lake systems. (awarded 1990)
- 1989-1990 Trevor Friesen: University of Waterloo, Canada. Nesting behaviour and impacts on reproductive behaviour of small mouth bass. (awarded 1990)

Honours

- 2000 Tim Sampson: University of Queensland, Brisbane, Australia. The spatial arrangements of habitats and their influence on epibenthic fauna. (2A)
- 1999-2000 Rodney Duffy: Griffith University, Brisbane, Australia. The influence of seagrass patch dimensions on fish and crustacean communities. (First Class)
- 1 Michaela Guest: Griffith University, Brisbane, Australia. Developing sampling strategies for seagrass fish communities over large areas (First Class).
- 1-0 Michelle Winning: Griffith University, Brisbane, Australia. The use of stable isotope enrichment studies to distinguish between seagrass and their epiphytes as sources of nutrition for juvenile prawns. (2A)
- 1995-96 Ben Longstaff: University of Queensland, Brisbane, Australia. Light regimes and their impact on loss and recovery of the seagrass *Halophila ovalis* (First class)
- 1994-1995 Angela Grice: University of Queensland, Brisbane. Impact of light on physiology and ecology of 6 seagrass species in Moreton Bay, south-east Queensland. (First class)
- 1989 Darrin Drumm: University of Waterloo, Ontario Canada. Impact of tournament fishing on survival of bass (High Distinction)

(c) Mentoring of young scientists

I have taken on both a formal and informal mentoring role for several young scientists, new staff and staff who I have line-managed at CSIRO. The mentoring role to staff has included providing advice on developing research, working in teams and leading research. I have also

provided advice on career directions and potential opportunities within CSIRO. My commitment to the development of staff has resulted in increased publications by staff, staff developing new technical skills and taking on leadership roles. It has also contributed to several successful promotion cases. Four of my Honours students have progressed to PhDs. Former students have obtained employment in government agencies (Queensland Natural Resources and Mines, Queensland Environmental Protection Authority) and consultancies. The Chinese post-doctoral fellow became vice-director for Research and Development in the Chinese Institute of Oceanology.

8. Memberships of scientific review committees and funding bodies

1. Invited member of the Scientific Advisory Panel (2002-) and invited reviewer of ACIAR sea cucumber stock enhancement project (May 2002, March 2004)
2. Funded, invited participant in Indian Ocean Global Ocean Observation Systems workshops on “Prawns as indicators of coastal ecosystem health” (November 2003, Perth, Western Australia)
3. Invited participant in ICLARM project review (September 2000, Penang, Malaysia)
4. Subprogram coordinator for the Marine Subprogram of the Ord-Bonaparte Program. 2000-2004
5. Invited member of the Scientific Expert Panel to evaluate the environmental flow requirements for Stage 2 of the Ord River development (April 2000, meeting in Perth).
6. Member of the NORMAC subcommittee on Research and Environment. 1999-present
7. Councillor for Australian Marine Sciences Association 1998-1999.
8. Key researcher in the development of the CRC for Estuaries Coastal Zone and Waterways management proposal. Funded in 1999.
9. Scientific Expert Panel for the Brisbane River and Moreton Bay Wastewater Management Study (BR&MBWMS). 1996–2001. This panel reviews and coordinates the scientific component of the BR&MBWMS. It is responsible for identifying the priority research areas, writing terms of reference for the research, and reviewing tenders for contracts and the research as it progresses.
10. Scientific Advisory Group for the BR&MBWMS. 1994–97. This group has reviewed the work of consultants in Stage 1 of the Brisbane River study and will review reports of research progress as the Study progresses.

9. Seminars and conferences (since 1994)

a) *Invited presentations*

* = funded presentations

1. Does the arrangement of coastal habitats influence fisheries production and biodiversity. Estuarine Research Foundation Conference, Ballina, NSW, Australia. 20th June, 2004. Co-organiser (with Dr Greg Skilleter, University of Queensland) of Symposium on “New Approaches to habitat fishery relationships” at the Conference).
2. Investigating connections between coastal habitats and fishery production. Invited key-note speaker for CSIRO Marine Strategic Fund for the Marine Environment (SRFME) postgraduate student symposium. Perth, Western Australia, 16th June, 2004.
3. *Potential for the use of prawn populations as indicators for estuarine and coastal ecosystem health. Indian Ocean Global Ocean Observation Systems, Perth, Western Australia, September 2003.
4. *Ecological research to enhance understanding and the management of prawn fisheries in northern Australia. ACIAR funded workshop at the Indian National Institute of Oceanography, Goa, November 2002.
3. *An approach to evaluating the potential for stock enhancement of brown tiger prawns (*Penaeus esculentus*) in Exmouth Gulf, Western Australia. (NR Loneragan, PJ Crocos, R Barnard, S Lehnert, PC Rothlisberg). Kobe, Japan, January 31st to 4th February 2002.
6. *The importance of mangroves to the prawn fisheries of western peninsular Malaysia (NR Loneragan, Adnan AN, MDE Haywood, RM Connolly). ICLARM workshop on Mangrove/Fisheries relationships. Penang, Malaysia, November 6 to 8, 2001.
7. *Variability in the ecological role of mangroves for fishes in northern Australia (NR Loneragan, S.J.M. Blaber, G.A. Skilleter, D.J. Vance). ICLARM workshop on Mangrove/Fisheries relationships. Penang, Malaysia, November 6 to 8, 2001.
4. Developing techniques for the stock enhancement of prawns in Australia: brown tiger prawns (*Penaeus esculentus*) in Exmouth Gulf, Western Australia *Invited paper for Australian Society of Fish Biology, Workshop on Stock Enhancement, Albury-Wadonga, August 2000.*
9. The use of stable isotope techniques in studies of aquatic ecosystems. (Connolly, Loneragan and Bunn). *Invited plenary presentation for Australian Marine Sciences Association, Sydney, July 2000.*
10. *Review of studies on coastal habitats and fisheries production. *Invited presentation to the Queensland Department of Primary Industries, Habitat Research Review. Cairns, Brisbane, October 1999.*

11. River flow, coastal habitats and estuaries: implications of change for coastal fisheries. *Invited paper for International Conference on Ecologically Sustainable Development*. September, 1998. University of Queensland, Brisbane, Australia.
12. *River flow and estuarine food-webs: implications for the production of coastal fisheries. *Invited thematic presentation at the International conference on The Ecology of Estuaries and Soft Sediment Habitats*. Deakin University, Warrnambool, Victoria. February 3 to 7, 1997.
13. Instream flow requirements for the Logan River, south-east Queensland. *Workshop on Water Allocation and Management Plan for the Logan River, Beaudesert, Queensland*. Queensland Department of Natural Resources, Griffith University, Water Resources Commission of South Africa. November, 1996.
14. Studies of mangrove and prawn relationships in Australia. *Seminar to the Fisheries Research Institute of Malaysia, Pulau Penang, Malaysia*. December, 1995.
15. *Use of Geographic Information Systems for the management of natural marine resources: a case study of the Torres Strait, Australia. *Australian Marine Sciences and Technology workshop, Jakarta, Indonesia*. April, 1994.

b) *Other presentations to national and local conferences*

- Loneragan NR, Kenyon RA, Haywood MDE, McCulloch R (2000). Developing techniques for the stock enhancement of prawns in Australia: brown tiger prawns (*Penaeus esculentus*) in Exmouth Gulf, Western Australia. *Invited presentation to the Australian Society of Fish Biology Workshop on Stock Enhancement*. Albury-Wadonga, August 2000
- Loneragan NR, Ahmad Adnan N, Connolly RM (2000). The prawn fishery of western peninsular Malaysia: assessing impacts of rainfall, changes in fishing and loss of mangroves on prawn landings. *Queensland Department of Primary Industries, Deception Bay*. October 2000.
- Loneragan NR, Haywood MDE, Heales DS, Kenyon RA, Pendrey RC, Vance (DJ) (1997). Effect of density on the growth and survival of juvenile grooved tiger prawns. *Australian Society of Fish Biology Conference, Darwin July, 1997*.
- Loneragan NR, Haywood MDE, Ahmad Adnan, Haris Hilmi (1998). Impacts of mangrove removal on banana prawn populations: within estuary and regional studies. *Australian Marine Sciences Association, July 1998, Adelaide*.
- Loneragan NR, Bunn SE (1995). Are seagrasses and mangroves sources of carbon for juvenile prawns in tropical estuaries? A multiple stable isotope study (1995). Seminar at CSIRO Cleveland laboratories. February, 1995.
- Loneragan NR (1995). Research in the Northern Prawn Fishery and studies of tropical coastal food webs (1995). Seminar at Deakin University, Warrnambool. March, 1995.

- Loneragan NR, Bunn SE, Kellaway D (1994). Contribution of seagrasses and mangroves to inshore tropical food webs: a stable isotope study. Australian Marine Science Association conference. Townsville, July, 1994.

c) Presentations to industry, boards and community groups

Each year, I have made on average two presentations to workshops or committees of the Northern Prawn Fishery. I have also synthesised research for presentations of major research directions by CSIRO, both within the Division of Marine Research and to meetings involving several divisions, particularly those in the Environment and Natural Resource Cluster. I have given presentations to Boards for the M.G. Kailis Group of Companies and the Ord-Bonaparte study. I have not listed the numerous presentations given with projects to enhance clarity about research findings and future directions.

10. Reviews of papers, proposals and reports (since 1995)

Reviewer for the following International journals: Marine Biology, Marine Ecology Progress Series, Australian Journal of Ecology, Marine and Freshwater Research, Journal of Experimental Marine Biology and Ecology, Journal of Fisheries Management and Ecology, Limnology and Oceanography, Canadian Journal of Fisheries and Aquatic Sciences, Netherlands Sea Research.

Proposals, Reports and Theses

5 proposals for the Australian Research Council.

5 Honours Theses (Griffith University, University of Queensland)

1 Masters Thesis (Murdoch University)

4 PhD Theses (Murdoch University, University of Adelaide)

2 reviews for FRDC (Seagrass Review – links between seagrass and fisheries production)

2 reports for GBRMPA (seagrass research)

1 ACIAR project review (Sea cucumber stock enhancement in New Caledonia)

11. Referees

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