

NICHOLAS T. SHEARS

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Born 28th October 1975, New Zealand Citizen

EDUCATION

PhD, Marine Science, University of Auckland, New Zealand, 2003

Supervisor: Assoc. Prof. Russell Babcock. Thesis title: Ecological response of shallow subtidal reef communities to marine reserve protection in northeastern New Zealand.

First year MSc, Marine Science, University of Auckland, New Zealand, 1997

Awarded transfer to PhD, Nov 1998.

BSc, Biological Science, University of Auckland, New Zealand, 1997

APPOINTMENTS

Sept 2006-Present - New Zealand Science and Technology Postdoctoral Fellowship

Marine Science Institute, University of California, Santa Barbara. Advisor: Prof. Steven Gaines. Project title: The effects of marine protected areas on recruitment, exploited species and fishing.

Mar 2005-Aug 2006 - Research consultant

Private research contracts on marine reserve monitoring, marine reserve design, biogeography and the classification of New Zealand's marine environment.

Mar 2003-Feb 2005 - Postdoctoral Research Fellow

University of Auckland, Leigh Marine Laboratory. Advisor: Prof. John Montgomery. Project title: Biogeography, ecology and the effects of fishing on New Zealand's subtidal reefs.

PUBLICATIONS

Shears NT, Babcock RC (in press) Quantitative description of mainland New Zealand's shallow subtidal reef communities. *Science for Conservation*.

Shears NT (in press) Biogeography, community structure, and habitat types of highly wave exposed subtidal reefs on the South Island West Coast, New Zealand. *Science for Conservation*.

Shears NT, Grace RV, Usmar NR, Kerr V, Babcock RC (2006) Long-term trends in lobster populations in a partially protected vs. no-take Marine Park. *Biological Conservation* 132: 222-231

Shears NT, Babcock RC, Duffy CAJ, Walker JW (2004) Validation of qualitative habitat descriptors commonly used to classify subtidal reef assemblages in northeastern New Zealand. *New Zealand Journal of Marine & Freshwater Research* 38: 743-752

Parsons DM, Shears NT, Babcock RC, Haggitt TR (2004) Fine-scale habitat change in a marine reserve, mapped using radio-acoustically positioned video transects. *Marine & Freshwater Research* 55: 257-265

Shears NT, Babcock RC (2004) Community composition and structure of shallow subtidal reefs in northeastern New Zealand. *Science for Conservation* 245. 65 p

Shears NT, Babcock RC (2003) Continuing trophic cascade effects after 25 years of no-take marine reserve protection. *Marine Ecology Progress Series* 246: 1-16

Shears NT, Babcock RC (2002) Marine reserves demonstrate top-down control of community structure on temperate reefs. *Oecologia* 132: 131-142

Babcock RC, Kelly S, Shears NT, Walker JW, Willis TJ (1999) Changes in community structure in temperate marine reserves. *Marine Ecology Progress Series* 189: 125-134

MANUSCRIPTS IN REVIEW OR ADVANCED PREPARATION

Shears NT, Smith F, Babcock RC, Villouta E, Duffy CAJ (in review) Evaluation of biogeographic classification schemes for conservation planning: application to New Zealand's coastal marine environment. *Conservation Biology*

Shears NT, Babcock RC (in review) Effects of wave exposure on the vertical zonation of macroalgal communities in northern New Zealand. *Marine Ecology Progress Series*

Shears NT, Babcock RC, Salomon AK (in prep) Context-dependent effects of fishing: Variation in the trophic control of macroalgae across environmental gradients. *Ecological Applications*

Salomon AK, Shears NT, Babcock RC (in prep) Cascading effects of fishing can alter carbon flow and are context-dependent. *Ecological Applications*

Smith F, Shears NT, Duffy CAJ (in prep) Relevance of physical environmental classifications as a proxy for biological patterns in the nearshore coastal zones. *Journal of Applied Ecology*

PUBLISHED TECHNICAL REPORTS*

Shears NT (2007) Shallow subtidal reef communities at the Poor Knights Islands Marine Reserve after eight years of no-take protection. Department of Conservation, New Zealand. 48 p. (<http://www.doc.govt.nz/templates/MultiPageDocumentTOC.aspx?id=43000>)

Shears NT, Usmar NR (2006a) The role of the Hauraki Gulf Cable Protection Zone in protecting exploited fish species: *de facto* marine reserve? *Department of Conservation Research and Development Series* 253: 27p

Shears NT, Usmar NR (2006b) Response of reef fish to partial and no-take protection at Mayor Island (Tuhua). *Department of Conservation Research and Development Series* 243: 31p

Shears NT, Babcock RC (2004) Indirect effects of marine reserves on New Zealand's rocky coastal communities. *Department of Conservation Science Internal Series No. 192*. 49p.

*I have also written 17 unpublished technical reports for research contracts between 1999 and 2007.

REVIEW OF RESEARCH

My main research interests lie in the ecology and biogeography of temperate reefs, and how marine reserves affect marine ecosystems and fisheries. My research addresses fundamental questions in modern ecology that have clear applications to marine conservation and fisheries management.

My PhD research provided mechanistic evidence that long-term changes in kelp forest habitats in New Zealand's oldest marine reserve at Leigh were a result of the recovery of previously fished predators and a decline in their herbivorous prey (Babcock et al. 1999, Shears and Babcock 2002, 2003). This research provided one of the first examples of how marine reserves can be used to assess the top-down effects of predators on kelp forest ecosystems, and how fishing can trigger trophic cascades. The papers relating to this work have been highly cited with one in particular, Shears and Babcock (2002), listed in Thomson Scientific's top 20 most cited recent papers in reef ecology. Subsequently, my postdoctoral research position at Leigh sought to understand the generality of these effects around New Zealand by surveying subtidal reefs at 247 sites throughout the country. This work has provided valuable insights into where trophic cascades are likely to occur

as a result of marine reserve protection around New Zealand (Shears and Babcock 2004, Shears et al. in prep.). Another major outcome of this work has been the development of a biogeographic classification scheme aimed at facilitating the establishment of a network of representative marine reserves around New Zealand (Shears et al. in review, Shears and Babcock in press). The unprecedented national dataset on rocky reefs collected during this study will continue to provide a valuable resource for future research into the ecology (e.g., Shears in press), classification (e.g., Smith et al in prep) and long-term change (e.g., Shears 2007) of New Zealand's reef communities.

In my current position, I am working on a large cross-disciplinary research project investigating the relationship between physical oceanography, larval dispersal, fishing and the effects of MPAs in the Channel Islands marine reserve network in California.

CONFERENCE PRESENTATIONS AND OUTREACH

I have given presentations at 16 conferences between 1998 and 2007 in New Zealand, Australia and the USA, including the International Temperate Reef Symposium (2003, 2006) and the Western Society of Naturalists (2002, 2004). I have been a co-author on approximately 10 graduate student posters and presentations, and have been invited to give presentations at numerous workshops, school groups and public meetings.

TEACHING EXPERIENCE

Undergraduate (2002-2005 at Auckland University)

MARINE 302 "Dynamics of marine systems" – 2003 and 2004. I coordinated and ran the management of marine systems component, which included preparing and presenting 10 lectures, coordinating a 2 day field trip, setting assignment and exam questions, and grading.

BIOSCI 394 "Conservation Ecology" – 2003 and 2004. I lectured on the ecological effects of marine reserves.

ENVSCI 726 "Marine Reserve's Course" – yearly from 2002 to 2005. I lectured on the value of marine reserves for ecological research.

I also tutored and helped coordinate numerous undergraduate and Masters level field trips and labs at Auckland University between 1997 and 2005.

Research students

As part of my postdoctoral fellowship at Auckland University I collaborated with and played a co-supervisory role to a number of PhD and Masters students, including Darren Parsons (Parsons et al 2004), Natalie Usmar (Shears and Usmar 2006a, 2006b, Shears et al. 2006) and Anne Salomon (Salomon et al. in prep).

AWARDS AND PRIZES

2006 *Foundation of Research, Science and Technology*. Postdoctoral fellowship, 2006-2009. \$264,000

2004 *New Zealand Marine Sciences Society*. Prize for best research talk on Marine Reserve's. NZMSS Conference, Dunedin. \$500

2003 *Auckland University*. Leigh Marine Laboratory Postdoctoral Fellowship, 2003-2005. \$108,000

2003 *Auckland University*. Nominated for Vice Chancellor's Best Doctoral Thesis Award.

2002 *University of Auckland Graduate Research Fund*. Conference travel. \$1,500.

- 2002 *New Zealand Marine Sciences Society*. First Overseas Conference Travel Award. \$1,000
2001 *University of Auckland Graduate Research Fund*. Conference travel. \$1,400.
2001 *New Zealand Marine Sciences Society*. Prize for best research talk on Marine Reserve's. AMSA/NZMSS Conference, Townsville 2001. \$300
1997 *School of Environmental and Marine Science, Auckland University*. Summer Studentship. \$3,000
1996 *Auckland University*. Senior Prize in Biological Sciences

JOURNAL ARTICLE REVIEWING

Ecological Applications
Environmental Marine Research
Fisheries Research
Journal of Experimental Marine Biology and Ecology
Marine Environmental Research

PROFESSIONAL SOCIETIES

Australasian Society for Phycology and Aquatic Botany
Australian Society for Fish Biology
Ecological Society of America
New Zealand Marine Sciences Society
Western Society of Naturalists

REFERENCES

Professor Steven D. Gaines
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Dr Russell C. Babcock
CSIRO Marine and Atmospheric Research Cleveland, 4163, Queensland, Australia
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Dr Stephen Wing
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