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Editor's note

With COP 10[1] just wrapped up here in Nagoya, Japan, the lead article, "'What does this tell about us?' Social research and indigenous peoples – the case of the Paq'tnkek Mi'kmaq", by McMillan and Davis, is particularly timely. Although long and highly detailed, and based on a case from Nova Scotia, Canada, this article provides a sorely needed practical, generic model that is just as useful in the Pacific Islands region as elsewhere.

As was amply demonstrated at COP 10, indigenous peoples' conditions and issues have attracted worldwide attention, especially as they still must work strenuously to benefit from their rights. McMillan and Davis demonstrate that social research collaboration potentially has much to contribute to these efforts, especially in documenting resource use practices and understandings in order to generate the quality of evidence required to win court battles, and thereby empower indigenous peoples.

In part of their article, McMillan and Davis describe the approach through which university-based and local resource-harvesting collaborators participated in "workshop processes" that distilled four attributes to guide thinking about research design and operations. These were 1) that the road to hell is paved with good intentions; 2) garbage in … garbage out; 3) useful research is rarely, if ever, an act of confirmation; and 4) strong partnerships foster independent capacity and mutual responsibility, not dependency. It is truly a pity that more social researchers fail to adopt such a commonsensical approach to their field research design and practice.

Research design and the quality of social science research with respect to "local ecological knowledge" (or LEK)[2] has been the focus of several articles and presentations that I have been involved in co-authoring recently with Anthony Davis. Because they are closely related to the McMillan and Davis article, and support the thesis that this is a generic model worthy of emulation, I mention them here.

In a 2009 paper that appeared in the journal *Ecological Applications*[3] and in a paper presented at a recent conference at the Asian Institute of Technology[4], Bangkok, we (Davis and Ruddle) demonstrated that for LEK to become a reliable source of data, the limitations of research for it must be recognized. The basic problems characterizing social research on LEK are the use of unsophisticated theories or concepts with often undocumented and non-systematic research designs and methodologies, which, in turn, give rise to unwarranted or indefensible outcomes. Social science research on LEK has much to contribute to framing and understanding an alterna-

tive approach to resource management. However, given the trends evident in the most cited literature, it is far from obvious that current social research is following a path to fulfil that important mandate.

Supporting documentation is based too commonly on unsystematic study; thus, much is unrepresentative and unreliable, producing data and outcomes that do not permit comparisons and generalisations. Consequently, it is ill suited for sustainable resource management policy recommendations. Standards of accountability and transparency need to be raised, beginning with the elementary requirement that researchers provide descriptions of research designs and methodologies sufficient to enable assessment of the reliability and representativeness of findings, and to facilitate comparison, generalization and evidence-based conclusions. Only then will LEK be assayed as essential for inclusion in resource management. In a forthcoming paper in the journal *Society and Natural Resources*[5], Ruddle and Davis show both the importance and content limitations of LEK acquired during collaborative research between local fishers and scientists in Canada and Vietnam. The cases demonstrate that although important, harvesters' local experiences and observations may not characterize accurately such ecosystem processes as predator-prey dynamics, for example. And it is unrealistic to expect fishers' LEK and understanding of ecology to embody such attributes, since stomach contents of commercially important target species are rarely examined, and fishers interact with ecosystems primarily to earn a living.

Now isn't this really what you would expect when you free yourself from all the pseudo-academic rigmarole that some vociferous and discombobulated advocates of LEK would ram down our gullets? Rather, it is common sense that will win court battles for indigenous peoples![6]

Related to this general issue of good research design and practice is the second article, "Why is the shark not an animal? On the division of life-form categories in Oceania", by our now regular contributor, Thomas Malm. The precision of rigorous classification in the ideas expressed here is important conceptually, as well as in research design and the conduct of research because "…there is a strong linguistic link between terms for marine resource exploitation and the division of life forms". So let's try to get it straight, and then keep it that way. Amen!

Kenneth Ruddle

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1 COP10 refers to the tenth meeting of the Conference of the Parties, which is the governing body of the Convention on Biological Diversity.
2 Also known as "traditional environmental knowledge" (TEK) or "indigenous ecological knowledge" (IEK).
3 "Constructing confidence: On the importance of rational skepticism and systematic enquiry in local ecological knowledge research". Ecological Applications 20(3):880–894.
4 "Incorporating local knowledge into education for the management of nearshore capture fisheries".
5 "What is 'ecological' in local ecological knowledge? Lessons from Canada and Vietnam". 2011.
6 See, for example: Ruddle, K. 1995. The role of validated local knowledge in the restoration of fisheries property rights: The example of the New Zealand Maori. p. 111–120. In: Property rights in a social and ecological context: vol. 2. Case studies and design applications. Hanna, S.and Munasinghe, M. (eds). The Beijer International Institute of Ecological Economics and The World Bank. Stockholm and Washington D.C.
See also: Ruddle, K. 2007. Wronging rights and righting wrongs. p. 215–228. In: Globalization: Effects on Fisheries Resources. Taylor W., Schechter M. and Wolfson L. (eds). Cambridge: Cambridge University Press.

PIMRIS is a joint project of five international organisations concerned with fisheries and marine resource development in the Pacific Islands region. The project is executed by the Secretariat of the Pacific Community (SPC), the Pacific Islands Forum Fisheries Agency (FFA), the University of the South Pacific (USP), the Pacific Islands Applied Geoscience Commission (SOPAC), and the Pacific Regional Environment Programme (SPREP). This bulletin is produced by SPC as part of its commitment to PIMRIS. The aim of PIMRIS is to improve the availability of information on marine resources to users in the region, so as to support their rational development and management. PIMRIS activities include: the active collection, cataloguing and archiving of technical documents, especially ephemera ("grey literature"); evaluation, repackaging and dissemination of information; provision of literature searches, question-and-answer services and bibliographic support; and assistance with the development of in-country reference collections and databases on marine resources.

PIMRIS
Pacific Islands Marine Resources Information System

"What does this tell about us?" Social research and indigenous peoples: The case of the Paq'tnkek Mi'kmaq

L. Jane McMillan[1] and Anthony Davis[2]

Abstract

Indigenous peoples' conditions and issues have attracted considerable global attention, especially since the United Nations Rio Declaration and Declaration on the Rights of Indigenous Peoples. Yet, indigenous people continue to struggle to achieve the benefits that are inherent to their rights. Often these struggles are played out within judicial settings wherein "reliable evidence" is a requirement for decisions that affirm rights. Social research collaborations potentially have much to contribute to these processes. In this article we outline key attributes of a social research collaboration between university researchers and an indigenous Mi'kmaq community in Nova Scotia, Canada. The strengths and limitations of social research processes and contributions are discussed with respect to documenting indigenous resource use practices and understandings, especially in relation to providing the quality of evidence most likely to advance indigenous peoples' legal rights and empowerment.

Introduction

Indigenous peoples' conditions and issues have attracted considerable attention within world governance fora, especially since the United Nation's Rio Declaration. This attention is best represented in the United Nations Declaration on the Rights of Indigenous Peoples, which was adopted by 144 member nation states on 12 September 2007.[3] In addition to passing the Declaration, the United Nations (UN) has also re-invigorated the UN Permanent Forum on Indigenous Issues as a means to assess progress on achieving the Declaration's goals as well as to sustain focus and work on realizing the Declaration's key provisions.[4] The four nations that initially voted against adopting the Declaration (i.e. Australia, Canada, New Zealand and the United States), have a history of extremely troubled relations and legal struggles between indigenous peoples and settler societies. Of these, only the United States has yet to revise their position and sign the Declaration. The Canadian government formally endorsed the document on 12 November 2010.[5]

The Declaration provides an unambiguous assertion of the "...urgent need to respect and promote inherent rights of indigenous peoples...especially their rights to their lands, territories and resources" (UNDRIP 2007:2). Many of the rights specified concern the enabling of conditions that are critical to advancing indigenous peoples' determination of their social and economic development. For instance, the language in Articles 3, 18, 20, 21, 23, 27 and 32 affirms the right of indigenous peoples to self-determination and decision-making with respect to access and use of territories and resources for the purposes of social and economic development. The Declaration affirms within its preamble that the signatories recognize "...that respect for indigenous knowledge, cultures and traditional practices [as well as affirmation of existing treaties and agreements] contributes to sustainable and equitable development and proper management of the environment" (UNDRIP 2007:2).

To move beyond stated intentions, nations must be prepared to take on and resolve considerable challenges. First among these in many settings is the need to change existing resource use and socio-economic development policies and practices so that indigenous peoples are empowered to exercise their rights within a context that enables respect for and expression of traditional knowledge and culture. In many cases, there are conflicts of interest that place indigenous rights in direct opposition to existing economic and political power. For

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3 See http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf
4 See http://www.un.org/esa/socdev/unpfii/en/session_ninth.html
5 See http://www.marketwire.com/press-release/Canada-Endorses-the-United-Nations-Declaration-on-the-Rights-of-Indigenous-Peoples-1352695.htm

instance, the right to self-determine socioeconomic development requires access to highly valued land and resources that are already possessed and used by others such as private citizens, public agencies and industrial corporations. In such situations, in order for indigenous people to achieve and express their rights, governments are expected to take the lead in creating the enabling conditions, for example through the redistribution of land and access to resources. In 2004 and 2005, the Supreme Court of Canada — in the *Haida* (2004 SCC 73), *Taku River Tlingit* (2004 SCC 74) and *Mikisew Cree* (2005 SCC 69) cases — developed the duty-to-consult doctrine, which says that governments making decisions that may impact aboriginal or treaty rights have a duty to consult potentially affected aboriginal communities, even prior to final proof of the rights in court or a final settlement on the rights in negotiation processes (Newman 2009). However, governments serve to enable the existing systems of resource control, and to date, government resistance to such changes, irrespective of the rhetoric, has been a major contributor to stalling progress on these issues.

In Canada, the primary contests to date over these matters occur in courtrooms, and mainly concern so-called legal clarifications of treaty-based rights. These processes are contentious and divisive, and take years and millions of dollars to arrive at final decisions, often after appeals of lower court decisions to the Supreme Court of Canada. Yet, even unambiguous Supreme Court affirmations of treaty-based rights and clarifications respecting the scope of treaty provisions are resisted by government bureaucrats through tactics such as questioning interpretations, blurring definitions of adequate consultation and accommodation, stalling on implementation, and/or insisting that treaty rights be forced to conform with existing policies and practices.

One recent example of the latter strategy concerns a Supreme Court decision affirming the Mi'kmaq[6] treaty right to harvest marine resources for commercial purposes. In response, Fisheries and Oceans Canada (DFO) insisted that this right be expressed within the existing practice of limited entry access and effort control through allocation management policies such as licenses and quotas, otherwise resource conservation would be jeopardized. To this end, DFO began negotiating deals with each Mi'kmaq band, as well as buying boats, fishing gear, licenses and quotas for distribution to the bands. In the process, DFO exacerbated inter-Mi'kmaq band divisions and intra-Mi'kmaq community conflicts, as well as fuelled Mi'kmaq-non-native suspicions and deepened negative ethnic stereotypes (Davis and Jentoft 2001).

While the rhetoric of good intentions predominates, achieving the conditions essential for indigenous peoples' empowerment most often requires legal leverage combined with evidence-based knowledge. Social research can potentially make an important contribution towards indigenous empowerment. For instance, the veracity of indigenous peoples' culturally framed oral histories and resource use practices have been acknowledged by the Canadian Courts, particularly in *Delgamuukw v British Columbia*, [1997] 3 S.C.R 1010, as an important and credible source of evidence in treaty rights cases. The manner in which these are documented is a critical attribute in so far as decision-makers, including judges, must be convinced of the efficacy of oral history and use practices as a key factor in accepting these as reliable evidence and knowledge (Napoleon 2005). Well-designed and conducted social research will deliver outcomes positioned to withstand public and legal scrutiny. As such, social research may provide a critical input to achieving and framing indigenous rights, especially within legal and public policy settings.

It should be understood that the most reliable evidence and documentation will, at best, contribute to empowering indigenous peoples' pursuit of their rights. Research alone, however, will neither assure outcomes nor achieve rights, which will result from political struggles and decisions informed by the type of knowledge that is made available through social research.

This essay outlines the approaches of and several key outcomes from a social research collaboration between Nova Scotia, Canada Mi'kmaq and university researchers. The collaboration was developed to build productive research-based relations between the university and the local indigenous community, and to facilitate training of indigenous peoples to conduct rigorous research in order to gather necessary evidence for their land claims and treaty rights negotiations. It was acknowledged from the outset that both university researchers and the Mi'kmaq would benefit from this collaboration. This paper outlines key attributes of these collaborative processes and resulting research approaches, particularly as these may highlight potential and essential qualities of social research-linked contributions to indigenous peoples' empowerment. This paper also illustrates and discusses the strengths and limitations of social research outcomes as they may contribute to indigenous peoples' pursuit of their rights and empowerment.

6 The Mi'kmaq are the indigenous peoples of eastern Canada who have lived in that territory for over 12,000 years.

General context

Atlantic Canada's indigenous peoples have been dominated and devastated by European nations for over 400 years, a much lengthier period of control and marginalization than that experienced by many of Canada's aboriginal nations. Remarkably, resistance prevented total assimilation; some retained the language, and the cultural strength of family, kin and friendship relations provided the support that, in large measure, enabled survival as a distinct people. The pre-1940s federal government requirement that Indian Act-defined "status Indians"[7] be registered with and reside on reservations furthered vulnerability to assimilation, and certainly advanced isolation and marginalization. Although the treaty reservation was ostensibly designed to facilitate the centralization and provision of services for aboriginal nations, for the most part it has accelerated threats to culture and language. This has been accomplished in a variety of ways.

The greatest impact has stemmed from the mandatory incorporation of Mi'kmaq children within a Eurocentric and authoritarian residential (and more recently provincial) school system in which all things "modern" are valued (e.g. expressed through classroom organization and learning processes that reward behavioral self-regulation, individual accomplishment, and competitive success). The values and worth of Mi'kmaq culture are denigrated and dismissed as being of only historical interest and relevance. This is evident in efforts by Nova Scotia's government and public school system to acknowledge the Mi'kmaq through initiatives such as Mi'kmaq History Month (designated in 1993 by the Government of Nova Scotia as the month of October). Instead of representing and valuing Mi'kmaq worldviews, interpretations, understandings and communal learning practices within the core curriculum and learning processes, Mi'kmaq culture, understanding and practices are presented as objects for consideration, as if they were museum pieces that demonstrate the resourcefulness and creativity of a bygone people. One living legacy of these experiences for the Mi'kmaq is the deepening disconnection between present identity and practice from Mi'kmaq customary ways of being and understanding.

Currently, there are 13 Mi'kmaq bands in Nova Scotia, and they have almost 15,000 hectares of land reserved for their "use". This land comprises various sized parcels that are distributed across the province. Lands reserved for the Mi'kmaq comprise less than 0.003% of Nova Scotia's 5,528,300 hectares. Status Mi'kmaq[8] comprise a little over 1.9% of Nova Scotia's total population (18,145 of 940,397 people). Mi'kmaq are under-resourced in terms of the proportion, by population, of lands reserved for their residence and use. Furthermore, the lands reserved for the Mi'kmaq have limited potential for sustaining rural economic activity, and generally offer little in the way of agricultural potential and forest resources. Access to marine resources from reserve lands is also extremely limited. Most Mi'kmaq communities are crowded, resulting in population densities that are much higher than ordinarily seen among non-natives in surrounding rural settings. Over 50% of the Mi'kmaq population is under 25 years of age, and the Mi'kmaq are the fastest growing segment of Nova Scotia's population, with the result that crowding will only worsen without creative and effective interventions.

The rural locations of the majority of Mi'kmaq communities and reserve lands also pose major challenges with respect to economic development and the generation of sustainable, high quality employment. Primary resources are the main basis for sustainable economic development and high quality livelihoods in rural settings, but the size of Mi'kmaq reserve lands is insufficient to support sustainable natural resource livelihoods. The location of most Mi'kmaq reserve lands also precludes ready access to shorelines and watercourses, thereby severely limiting economic development and livelihoods associated with these such as tourism (e.g. ecotourism, marinas) and marine resource harvesting and processing. These factors contribute to high rates of "on reserve" unemployment, ranging between 25% and 47%, and an employment profile where government supported community governance and services (e.g. council, social services, health services and education) account for the majority of earned income and benefits. As a result, the position of all Nova Scotian Mi'kmaq communities on the Statistics Canada well-being index averages 12 points below the provincial mean score of 80.

The passing of every elder represents the loss of cultural knowledge and memory. Documenting Mi'kmaq customary practices and belief systems through working with elders and others is urgent and critical, as is the need to document and position cultural knowledge as equally valid to other

7 A status Indian is a person who is a federally registered member of a band or First Nation, having special rights under the Indian Act in Canada. Entitlement to Indian status and Indian band membership are complex and controversial issues. The legal definition of the term "Indian" has brought with it certain benefits and eligibility for federal programs, as well as a history of limitations on rights. Disputes over the definition of Indian status, the authority to determine band membership, and access to rights tied to status and membership have given rise to conflicts between Indian bands and governments, and within Indian communities.

8 Mi'kmaq people who are federally registered as status Indians.

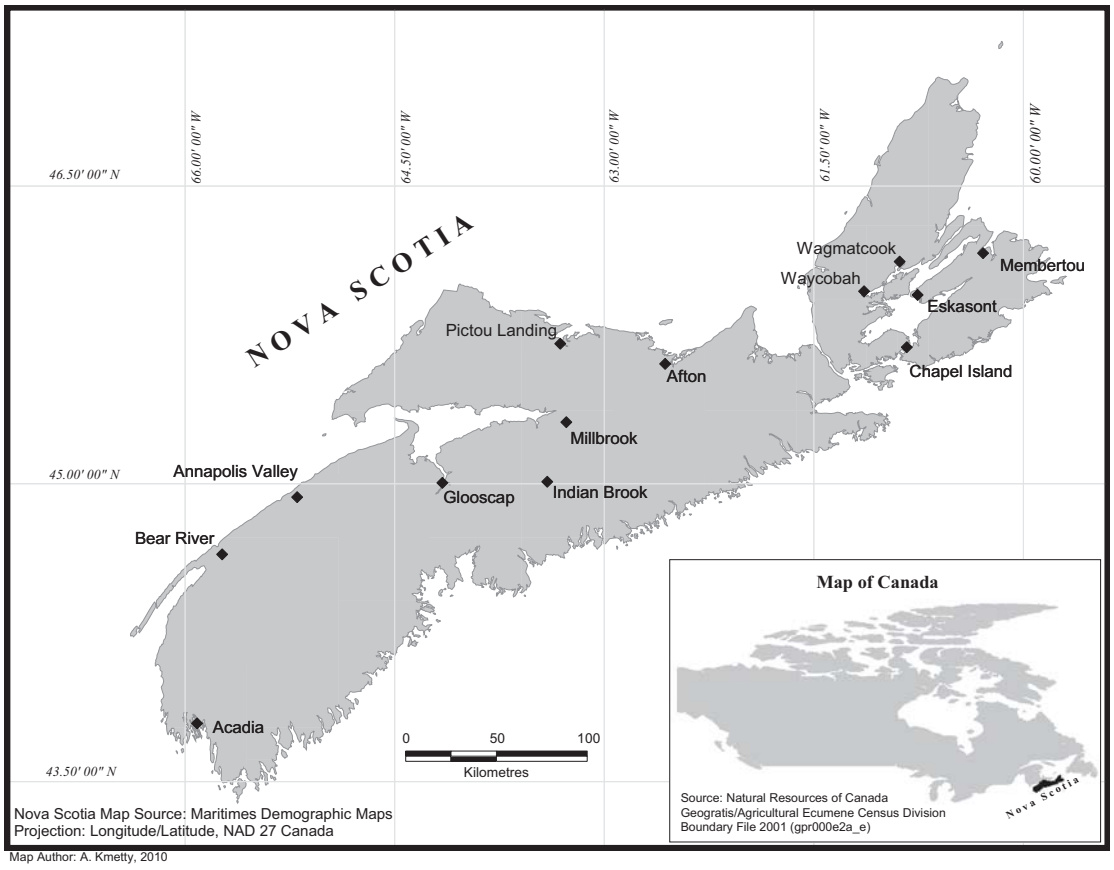

Figure1. Mi'kmaq First Nations.

epistemologies. Both will help to reconnect people — and particularly the burgeoning Mi'kmaq youth population — with Mi'kmaq ways of being and understanding. This knowledge and the reconnecting processes are essential aspects of re-casting and affirming Mi'kmaq identity as honored and valued, which is essential as the Mi'kmaq struggle to overcome generations of marginalization, victimization and racism. Documenting Mi'kmaq conventions and observances can contribute to the evidence needed to advance Mi'kmaq pursuit and achievement of their treaty-based indigenous rights.

Well thought out and inclusive research collaborations offer tremendous potential to contribute meaningfully to thorough documentation of Mi'kmaq customary intellectual property, as well as the association of these with legal interpretations and affirmations of treaty rights, the development of sustainable natural resource-based livelihoods and economic development, and the achievement of self-governance informed by Mi'kmaq culture and customary knowledge. Social research designs and techniques that assure comprehensive and representational documentation, in particular, offer considerable promise, especially if these are informed by and embody Mi'kmaq knowledge about how to engage in learning, to participate in conversations, to ask questions, and to record experiences.[9] It is essential to capture and employ, where practicable, the strengths and benefits of systematically framed and conducted research. The sensibility of this is made even more emphatic as aboriginal nations assume direct governance over areas such as health, education and resource management in a situation where cultural knowledge continues to vanish with the passing of every elder. Learning and employing the strengths of this approach to research offers the prospect of developing the qualities of evidence needed to inform governance decisions. It also provides a thorough means to document cultural knowledge and understandings so that these may also inform pursuit of rights

9 Many aboriginal researchers and others argue that a basic, perhaps irreconcilable, conflict characterises the relation between First Nations' ways of knowing, and Western, particularly scientific, ways of knowing. For some, this is the ground on which the struggle against Western, Eurocentric dominance must be and is engaged. There is no question that the liberal-democratic belief in self-possessing individualism remains an instrument of cultural and institutional domination, a belief that assaults and denigrates the more communal and familial basis of First Nations identity, being and solidarity. There is also no denying that First Nations' experiences of science has been oppressive and abusive, whether in the form of medical research (e.g. DNA extraction), social engineering (e.g. so-called evidence-based program delivery), or natural resource management (e.g. setting harvesting quotas that effectively preclude First Nations' access and participation).

and governance decisions, while also enlivening the connection of honored cultural understandings and knowledge to identity formation.

These essential qualities, strengths and needs, which are recognized and asserted by some indigenous researchers, are particularly critical to providing evidence that will withstand scrutiny and support aboriginal land and resources claims within legal settings (Jorgensen 2007; Smith 1999; Tobias 2000).

Background to the collaboration

In February 1999, the Social Sciences and Humanities Research Council of Canada (SSHRCC) launched the Community-University Research Alliances (CURA) Program. From its inception, the CURA initiative was intended to foster and support action-oriented and applied research (i.e. research mobilized to intersect with and impact on real world human conditions). The program also requires that collaborating community organizations engage as full and equal partners.[10] The research partnership and processes detailed herein developed in the context of a CURA grant called Social Research for Sustainable Fisheries (SRSF)[11] that involved as core partners Mi'kmaq and non-native fisheries organizations. The collaboration has been extended and sustained recently through funding awarded from the SSHRCC Aboriginal Research Grants Program.[12]

The SRSF research project began in 1999, in an extremely volatile, uncertain and fast-changing Atlantic Canadian fisheries setting. By 1998, the Atlantic Canadian closure or down-sizing of many fisheries had stripped thousands of people of their livelihoods, reshaped coastal community inter- and intra-family dynamics, and fuelled a massive out-migration of young men and women. Recovery still remains a distant hope. Many communities' remaining small-boat fleets are now able to work for only three or four months in one or two limited entry and highly regulated fisheries. Once the cornerstone in coastal community life and livelihood, small-boat fisheries have been transformed from full-time, multi-species-based livelihoods into part-time, specialised activities that depend on the abundance of one or two marine resources, particularly lobster.

This is the context in which the September 1999 Supreme Court of Canada's *Marshall* decision was made.[13] The *Marshall* decision affirmed that the Mi'kmaq in Atlantic Canada had a treaty right to participate in commercial fisheries for the purpose of achieving a "moderate livelihood" (R v. *Marshall*, [1999] 3 S.C.R. 456). Consequently, the region's commercial fisheries were now required to somehow accommodate the Mi'kmaq as largely new entrants in an environment completely stressed by single-species dependency, social upheaval, and pervasive feelings of vulnerability and powerlessness. For the Mi'kmaq — who were dispossessed from access to primary resource-based livelihoods, including fisheries — the *Marshall* decision represents a key piece in developing the economic foundations essential for realising successful self-governance, to improving social and economic conditions within families and communities, and to further revitalising culture, identity and language (Davis and Jentoft 2001).

These attributes provide the broad social and political context within which SRSF project was launched. By consensus, documenting the local ecological knowledge of Mi'kmaq and small-boat fishers became SRSF's primary research focus. Among the Mi'kmaq, relations with and knowledge about American eel (*k'at*, pronounced *ka:taq*) were identified as the priorities. Marshall was fishing for eel at the time he was charged. While the research projects addressed specific issues as identified by each SRSF partner organisation, all of the partners participated in conducting the research, as well as the research design and methodology development. This approach and the associated experiences fostered inter-partner working relations and engagements.

The value of research and research values

As in all SRSF-related research processes, the Mi'kmaq-centered research began with a series of workshops concerning what research can and cannot contribute to understanding, capacity and indigenous empowerment These discussions involved all of SRSF's partners, were wide ranging, and concerned questions such as:

- What is social research?
- What are the best ways and means of designing and conducting social research?
- Why are there important concerns with how research is designed and conducted?
- Why should social research be concerned with qualities such as reliability, representation, and the defensibility of results?

10 See http://www.sshrc.ca/funding-financement/programs-programmes/cura-aruc-eng.aspx
11 See http://faculty.msvu.ca/srsf
12 See http://www.sshrc.ca/funding-financement/programs-programmes/aboriginal-autochtone-eng.aspx
13 The Marshall decision was named after Donald Marshall Jr, a Mi'kmaq eel fisher who was charged with illegal fishing and the sale of eels in Mi'kmaq territory in 1993. Marshall successfully argued in Canada's Supreme Court that he had a treaty right to fish and sell his catch to earn a livelihood. Donald Marshall is also well known as a man wrongfully convicted of murder and who spent 11 years in prison for a crime he did not commit. A Royal Commission Inquiry into his wrongful prosecution demonstrated that racism in the Canadian justice system played a key role in this miscarriage of justice.

- In what ways can research assist with understanding, building capacity, and enhancing the Mi'kmaq voice in their counter-colonial efforts?
- Which designs and methodologies fit best with conducting inclusive and accountable research with and among the Mi'kmaq?

These discussions drew on a wide range of information, materials and experiences. For instance, invited university social researchers outlined the design and methodological attributes of their work, and explained the reasons for adopting particular approaches. Shortcomings were also identified and discussed. Materials from standard social research design and methodology textbooks were also distributed, consulted and discussed. These experiences were important to isolating, developing and incorporating the approaches and practices considered most likely to succeed among the Paq'tnkek Mi'kmaq.[14]

Early in the workshop processes, participants distilled four attributes that should guide research design. These qualities soon adopted a mantra-like place within SRSF research processes and decisions. As simply expressed qualities, they provided guidance, reminders and alerts about what each SRSF partner hoped to accomplish through social research, and what social research might reasonably be expected to contribute. The four SRSF social research mantras are:

- The road to hell is paved with good intentions.
- Garbage in … garbage out.
- Useful research is rarely, if ever, an act of confirmation.
- Strong partnerships foster independent capacity and mutual responsibility, not dependency.

All of these mantras express core values about the qualities most likely to result in useful and capacity-building social research, especially within a context of partnerships between community organizations and university researchers, where university researchers are likely to be perceived (and to perceive themselves) as "experts." All agreed that the desire to "do good" and to accomplish helpful and useful outcomes was a necessary, but insufficient, condition for the partnership to accomplish its social research goals. All acknowledged that the partnership's research processes and decisions had to embrace practices that would enable each partner to recognize that they must learn from the others, to welcome skeptical observations and discussions of all claims of fact and preference, to identify researchable issues, and to commit to completing the research activities undertaken. The partners acknowledged early on that, through social research, claims of fact must welcome the tests of evidence and burden of proofs. As well, useful research outcomes, particularly outcomes intended to enhance understanding and empower organizational voice, must also withstand public scrutiny. The partners also recognized and discussed the fact that they each embody distinct vested interests and aspirations. Differences in interests and aspirations were such that they underscored the need for collaboration in order to develop and reach agreement on a memorandum of understanding and a research protocol. These documents specified matters such as governance structure, decision-making processes, relationships that respect the ownership of research materials and data, and researcher responsibilities.[15] Realizing the desired qualities required that the partnership focus on defining researchable questions, and designing research and developing methodologies that are most likely to deliver thorough, reliable, representative and defensible evidence. Notably, these are the very qualities emphasized in a Canadian Aboriginal Nations research guidebook as essential to useful design and the productive conduct of land use studies (Tobias 2000).[16]

A respectful and results-rich research design and process

As a consequence of the dialogue and workshop processes, a three-phase approach was adopted in the design and conduct of the proposed research. The three phases are best summarized as building the socioeconomic context, systematically gathering reliable and issue-specific background information, and thoroughly documenting Mi'kmaq knowledge and experiences through work with community-specified knowledge experts. This approach was adopted for several reasons. First, SRSF was committed to assuring that the research process contributed to building capacity and transferring know-how between the Mi'kmaq and their university partners. For the non-Mi'kmaq (and particularly the university partners) this entailed a process of building trust and confidence through

14 Paq'tnkek Mi'kmaq community is a federally recognized reservation located in northwestern Nova Scotia, 20 kilometers from Saint Francis Xavier University. It is home to the indigenous peoples who partnered in the SRSF research collaboration. Paq'tnkek is also the location in which Donald Marshall Jr. was fishing eels when the Department of Fisheries and Oceans charged him with illegal fishing.

15 See http://faculty.msvu.ca/srsf/Organization,GovernanceAndPersonnel/MemorandumOfUnderstanding.html

16 For instance, Tobias advises First Nations that: "When you think of the long-term benefits that can result from negotiations about who gets access to your territories, and the potential role of data in these negotiations, it makes sense to adopt a single, consistent approach to research. Simply, if you are going to do it, do it well…Quality has to do with the manner in which data are collected…" (2000: 20–21).

learning Mi'kmaq preferences and practices. Many Mi'kmaq have experienced research as an important information-gathering tool used by those in a dominant position to develop new ways and means of increasing and deepening regulation, containment, and marginalization. This understanding guided SRSF's approach and conduct when engaging (through research) with the Paq'tnkek Fish and Wildlife Society (PFWS) and the Paq'tnkek First Nation. A second equally important quality was the understanding that a) it would mainly be the Mi'kmaq who would conduct the research, b) the research process would be directed by PFWS, and c) all research results would be controlled by PFWS.

PFWS, through its SRSF Community Research Coordinator and Senior Research Assistant, consulted with the Paq'tnkek community to identify topics of concern respecting natural resources and resource use. The consultations involved several community meetings, informal conversations with community members, and discussions with several elders and community leaders. Through community and SRSF dialogues, the PFWS determined that a research focus on Paq'tnkek Mi'kmaq relations with and knowledge of *ka't* (American eel, *Anguilla rostrata*) was a pressing issue. *Ka't* was identified as an important customary resource that remained central to Mi'kmaq culture, as signified by the place of *ka't* in ceremonial practices. However, few present-day Mi'kmaq seemed to be either fishing or eating American eel. Consequently, Mi'kmaq relations with and knowledge of *ka't* were judged to be at risk, particularly because many of the elders holding this knowledge were passing away. Also, documenting the use and knowledge of eel was identified to be important potential evidence in anticipated court cases concerning Mi'kmaq fishing and resource use rights.

As might be expected, the primary use of eel is for food. Eel is important for much more than a meal, however. *K'at* occupy important places to this day within Mi'kmaq ceremonial activities, particularly feasts associated with births, marriages and deaths. Customarily, eel were a source of medicinal oils as well as skins for bandages. Notably, *k'at* distribution within extended families and throughout the community as a food gift remains a notable aspect of usage. The social meanings of such gifting are substantial, encompassing exchanges that build and sustain social solidarities while also enhancing harvesters' reputations and regard within the community as well as of themselves. Finally, eel catches were and remain for some an important source of cash revenue, essentially a key supplement within an environment of income poverty.

SRSF fostered and supported research communications with the entire Paq'tnkek Mi'kmaq community and the broader Mi'kmaq nation through all phases of the research. Feedback was reflected on, discussed and incorporated where possible in either the design and conduct of subsequent research or the communication of research outcomes. The demonstrated commitment to and respect for this process was critical to building relations of trust, confidence and accountability between the SRSF research group, PFWS, and the Paq'tnkek community. These relations were furthered through respect for and engagement with the Mi'kmaq research ethics review process, as described below.

Ka't (American eel, *Anguilla rostrata*)

Mi'kmaq woman cleaning eels.
(Photo: Kerry Prosper)

Each phase in the research process was understood to provide essential inputs for subsequent phases. The first phase focused on gathering and synthesising background and historical information concerning topics such as Mi'kmaq use of *ka't*, treaty-based entitlements to land and natural resources, and the terms and conditions specifying and framing how the Paq'tnkek reservation came to be established. A report on the results of this research[17] was further developed into three SRSF Fact Sheets,[18] on the highlights of the *Marshall* decision, the life history of *ka't*, and the Mi'kmaq relationship with *ka't*. These were distributed throughout the Paq'tnkek community by PFWS, and to the general public. This also informed the design and methodology adopted for the second phase of the research.

The second phase of the research was designed with a focus on thoroughly documenting basic attributes of household-centered experiences in Paq'tnkek with fishing, preparing, cooking, sharing, and otherwise using eel. This phase was also intended to solicit recommendations from the Paq'tnkek community regarding the people whom they thought of as knowing a lot about catching, preparing and cooking eel. The SRSF-PFWS team developed a questionnaire loosely modelled on a household-centered census approach to gathering information, as it was determined that survey techniques employing telephone or self-reporting methods (and focused on individual respondents), would result in poor levels of participation and engagement. Mi'kmaq households were characterised as socially fluid in their dynamics and composition, and an approach that invited participation by the entire household in responding to research questions was determined to be the most inclusive and engaging, and most likely to be successful. The survey and consent forms were designed during a series of SRSF and PFWS workshops, and were pretested within several PFWS-member households.[19]

While these instruments were being developed, SRSF and PFWS submitted a description of the research and its purposes to the Mi'kmaq Research Ethics Watch for their review, advice and approval.[20] All of the research design and methodological attributes incorporated in the subsequent research conformed to the research ethics provisions specified by the Mi'kmaq Research Ethics Watch in their review and approval of the studies. These included provisions concerning assurance of confidentiality and signed informed consent, management of records, storage of forms, archiving and sharing of all data and information, and sharing of any benefits that may arise from the research.

PFWS staff began by assembling a list of and assigning a number to each Paq'tnkek household. A letter in English from PFWS, introducing the study was then hand-delivered to every household, as well as to the Chief and Band Council. Copies of two PFWS-SRSF fact sheets accompanied the letter. In addition to PFWS's research staff, two additional Mi'kmaq interviewers were contracted to assist in the completion of the study. Both interviewers were selected, in part because of their capability in the Mi'kmaq language and their previous interviewing experience. While the household survey was not translated into Mi'kmaq, PFWS and SRSF determined that it was important that respondents have the option of being interviewed in the Mi'kmaq language. Mi'kmaq-speaking interviewers translated key questions into Mi'kmaq as part of their preparation. They were trained with respect to the particular attributes of the household questionnaire's design and intention and in the consent form protocol and information recording procedures. For instance, they were required to learn anthropological acronyms for recording household members' kinship relationships as well as the stipulation that only household members' initials were to be recorded on the form for the purposes of protecting confidentiality and anonymity. Finally, all interviewers were encouraged to record any notable comments and observations on the household survey form, and to do so as verbatim as possible. PFWS staff and the contracted interviewers conducted all of the interviews.

Each household's number was pre-recorded on the questionnaire. The only copy of the household master list and corresponding numbers was securely stored within PFWS's office. This list, as the only document linking specific households with completed questionnaires, was destroyed upon completion of this phase of the study. All record-keeping concerning matters such as tracking completion rates and assuring completion and storage of consent forms and questionnaires was managed by PFWS staff. The database for the information gathered was constructed and managed in the Statistical Package for the Social Sciences (SPSS). Additionally, information was entered from the surveys as the interviewers completed them. Any extra information recorded by the interviewers on the survey forms was identified by household number and recorded verbatim in a separate Word document.

17 "Mi'kmaq and the American Eel (Ka't)"; see http://faculty.msvu.ca/srsf/ResearchReports/FinalReports/Report4.pdf.
18 Available at http://faculty.msvu.ca/srsf/ResearchReports/Factsheet.html
19 To view the household survey document and other research tools employed, see http://faculty.msvu.ca/srsf/ResearchResources/researchtools.html.
20 See http://mrc.uccb.ns.ca/prinpro.html.

Complete copies of both the SPSS data file and Word document were provided for PFWS and university-based SRSF group.

The second phase of the study was carried out between 15 May and 8 July 2002. All interviews were conducted by two interviewers and took place within participants' households. On many occasions — as anticipated in the research design — two or more household members participated in the interviews. Almost all (93 out of 98) on-reserve Paq'tnkek community households participated in the study, representing a 95% completion rate. This was an outstanding result, one that clearly reflects community interest in the study, the appropriateness of the design and method, and the diligence of the interviewers in their pursuit and completion of interviews. It is rare that studies attain such a high level of participation.

Immediately after completing the survey database, a preliminary analysis of data was completed in an SRSF report,[21] copies of which were hand-delivered to each Paq'tnkek household, as well as the Chief and all members of the Band Council. In order to maintain interest and engagement, it is critical that the initial analysis and writeup be completed as quickly as possible following completion of the survey. Aspects of these data, contextualized by the assembled background and historical information, were also prepared and presented in a more academic research paper published in *The Canadian Journal of Native Studies*.[22] Finally, PFWS and SRSF prepared a variety of shorter articles for publication in Mi'kmaq, other aboriginal nations, and fishing industry newspapers as a way of more broadly sharing research outcomes and messages.[23]

The third and final phase of the research involved thoroughly documenting Paq'tnkek Mi'kmaq knowledge of and experiences with *ka't*, including fishing, preparing, cooking, sharing and otherwise using eel. In order to identify the people that the Paq'tnkek community thought should be interviewed, participants in the household survey were asked, "Other than yourself, who would you say knows a lot about eel fishing among the Mi'kmaq?" and "Other than yourself, who among the Mi'kmaq would you say knows a lot about preparing and cooking eels?" People were asked to identify as many as two people in response to each of the questions. In total, 79 Mi'kmaq men and women were named in this manner, 8 of whom were identified as living somewhere other than among the Paq'tnkek First Nation.[24] Those named were ranked within each category (fish and prepare/cook eel), on the basis of the number of times they were mentioned; several were named in both categories. Within each category, a distinctive subset received four or more mentions, clearly identifying them as the people considered by their community as the most experienced and knowledgeable. Twelve Mi'kmaq, mainly males, were identified four or more times as knowing a lot about fishing eels;[25] four people received twenty or more mentions. These 12 people became the focus for the final research phase of intensive face-to-face interviews.

The interview schedule was developed through another series of SRSF workshops. The interview schedule comprised three interrelated sections. The interview began by gathering the person's family history of involvement with *ka't*, and used a genealogical approach, beginning with the person's natal family and extending back in time to at least their grandparents and as many collateral kin, both consanguineal and affinial, as memory allowed. For those kin who were identified as fishing for eel, participants were asked to identify where they mainly fished, who they fished with and learned from, where they primarily lived, and what they did with the eels that they caught. They were also asked to relate any memories of stories regarding eel fishing and use associated with each of these people. The primary purpose for this initial approach was to document, as accurately and with as much detail as possible, the attributes and richness of Mi'kmaq family and kin relations with *ka't*.

The next phase focused on documenting personal life histories and experiences with *ka't*. This phase of the interview process began with queries concerning how old participants were when they first

21 "The Paq'tnkek Mi'kmaq and Kat American Eel (Anguilla rostrata) — A Preliminary Report of Research Results, Phase I." SRSF Research Report #4 (see http://faculty.msvu.ca/srsf/ResearchReports/FinalReports/Report4.pdf).

22 See http://faculty.msvu.ca/srsf/ResearchReports/Publications/Mikmaq and Eel.pdf.

23 For examples of these see: Kerry Prosper and Mary Jane Paulette, 2003, "The Paq'tnkek Mi'kmaq and Kat (eel)", *Mi'kmaq-Maliseet News*, July, page 11; Kerry Prosper and Mary Jane Paulette, 2004, "Cultural Relationship with Kat", *Native Journal*, June, pages 37 and 39; Kerry Prosper, Mary Jane Paulette, and Anthony Davis, 2004, "Traditional wisdom can build a sustainable future", *Atlantic Fisherman*, August, page 2; Kerry Prosper and Mary Jane Paulette, 2004, "Sharing Eel Catch Mi'kmaq Tradition", *Anishinabek News*, October, page 24; and, Kerry Prosper and Mary Jane Paulette, 2005, "Living Memories of Our Ancestors", *Mi'kmaq-Maliseet Nations News*, February, p. 8.

24 Notably, and as an expression of respect, several specified deceased persons among those named.

25 The count of four or more mentions was selected as the point determining community identification of and recommendations for those knowing a lot about fishing *ka't* because it indicated some community breadth in this perception. As well, the count of four mentions identified a sufficient critical mass of potential participants to assure three or more independent observations for each knowledge and experience claim, thereby providing confidence that the claims made are shared.

began fishing for eel, who they were fishing with, who taught them about eel fishing, where they fished, the time of the year they fished, what they did with the eels caught, and the fishing technologies that they used. These questions and others were asked with reference to at least four explicit life-cycle stages, beginning with memories of first fishing experiences and memories of fishing while an adolescent, through memories when first fishing as an independent young adult (either beginning their own family or living separate from their natal family), to memories when last (or currently) fishing eel. The interview schedule was designed to also encourage all participants to share their memories of and thoughts on eel fishing, irrespective of whether immediately associated with any one or more of the life-cycle stages.

The life-cycle approach was adopted to provide a means to establish a relative chronology for the related memories and experiences. This is a particularly important quality of the research design in that it offered the prospect for systematic, time-linked comparisons of individual memories, experiences, and observations, comparisons from which the system of Paq'tnkek ecological knowledge of *ka't* could be discerned and documented. The life-cycle approach to orienting the gathering of life histories was also important to assisting participants to identify and locate their memories, experiences and observations during the map-referenced phase of the interview.

In the third and final phase of the interview, participants were asked to provide locational information on a topographical map of the region of Antigonish County (adjacent to the Paq'tnkek reserve); this included information such as where they fished for eel in each season within the area's lakes, rivers and, especially, estuaries, for each of the four life-cycle time periods. The household survey results unambiguously identified Antigonish County estuaries and their associated rivers — and particularly Antigonish, Pomquet and Tracadie Harbours — as the most heavily and regularly fished locations. Participants were asked to locate on the map all specific observations, thoughts and memories about features such as attributes of the habitat where they found and fished *ka't*, the size and abundance of eels, environmental factors informing decisions about when to start fishing and where to fish, and the ways and means that they accessed shoreline and fishing locations. Different coloured pencils were associated with each life-cycle period and used to record each period's observations directly on the map.[26]

The research team determined it would be desirable to record the face-to-face interviews. Once the interview schedule was drafted, the research team developed a new informed consent letter. This letter described the purpose of the research, the reason for their selection for participation in this phase of the study (i.e. community recommendation), the request to tape record the interview, assurances of anonymity and confidentiality, and the promise to return the original tape recording, map and a copy of the full verbatim transcription of the interview to them once all the information provided had been transcribed. If they agreed, the participant was asked to sign two copies of the consent letter, one for the PFWS-SRSF team and one for their own records.[27]

SRSF and PFWS decided that a pair of interviewers would conduct the interviews; one to ask questions and to engage in core conversations, while the other managed the tape recorder and noted the tape counter when either a new section of the interview was begun or a particularly pertinent observation was made. The second member of the interview team was also tasked with writing down the genealogical information as it was being provided in order to assist the interviewer with name sequences (birth order) and name recollection. At least one of the two interviewers spoke Mi'kmaq and provided language assistance when needed.

Interviews were completed with 9 of the 12 people who received the most recommendations from the Paq'tnkek community. PFWS teams generally completed the interviews, with non-Mi'kmaq SRSF researchers participating in a couple of interviews. Interviews usually took place over a number of days, with every effort made to conduct the interviews in a conversational and relaxed atmosphere. Of the three not interviewed, one person fell gravely ill and was unavailable, another declined the invitation for the interview, and it proved unnecessary to interview the third as the team's measures for information saturation indicated that all available information had been gathered well before the tenth interview.

The interviews were completed between Fall 2003 and Spring 2004, and were transcribed as completed. The genealogical information was entered into the software package Family Tree Maker, the hand-recorded mapped information was transferred to identical digital base maps employing the software packaged MapInfo-Professional, and the transcribed interview text was prepared for analysis within the qualitative software package Atlas.ti

26 The complete interview schedule is available for review at: http://faculty.msvu.ca/srsf/ResearchResources/Eel_Interview 2.htm
27 A full copy of this letter is available at: http://faculty.msvu.ca/srsf

(Version 4.1). SRSF organized and delivered workshops on these software packages, assuring that community partners attained some literacy with them. Copies of the software packages were also loaded on each of the community partners' SRSF desktops, and complete cleaned data sets, including the digital maps, were provided for PFWS. Thereafter, PFWS was positioned to conduct independent analyses and prepare independent reports. This achieved one of SRSF's core goals of establishing independent community partner research and data analysis capacity.

Research enriched outcomes and their implications

A thoroughly comprehensive and reliable body of information concerning Paq'tnkek Mi'kmaq experiences with and knowledge of *k'at* is now assembled and available. Examples of the research findings are represented in Figures 2, 3 and 4. Figure 2 summarizes information gathered from the household survey about where people fished for eel. This map indicates (for the first time) the specific locations and intensities of fishing within the Paq'tnkek Mi'kmaq living memories and lifetime practices. It unambiguously establishes key qualities of Mi'kmaq eel fishing such as where they fished, how commonly specific areas are fished, and the fact that they fished for eel in these locations on a sustained basis.

The comprehensiveness, reliability and representational attributes of the data represented in the map are a direct outcome of the survey research design and methodology that achieved a 95% participation rate. As a result, it can be asserted with extremely high levels of confidence that the information gathered captures and describes the depth and breadth of Paq'tnkek Mi'kmaq eel fishing within the locations specified. This is precisely the quality of evidence required within legal adjudications to establish critical elements of the scope of Mi'kmaq treaty rights.

Figure 2 does not present changes over time in the specific locations and patterns of Mi'kmaq eel fishing; key features of these changes are presented in Figure 3.

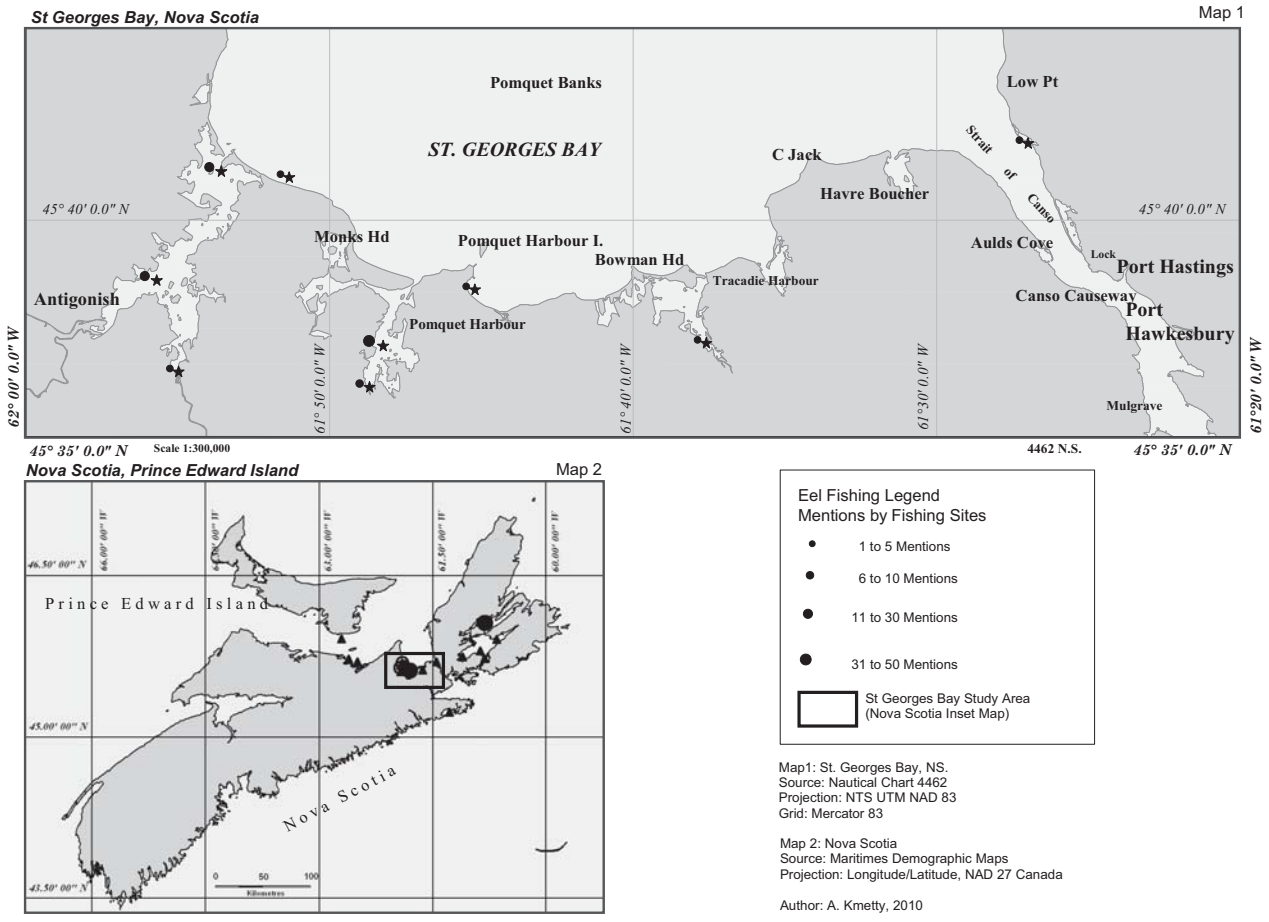

Figure 2. Mi'kmaq eel fishing areas.

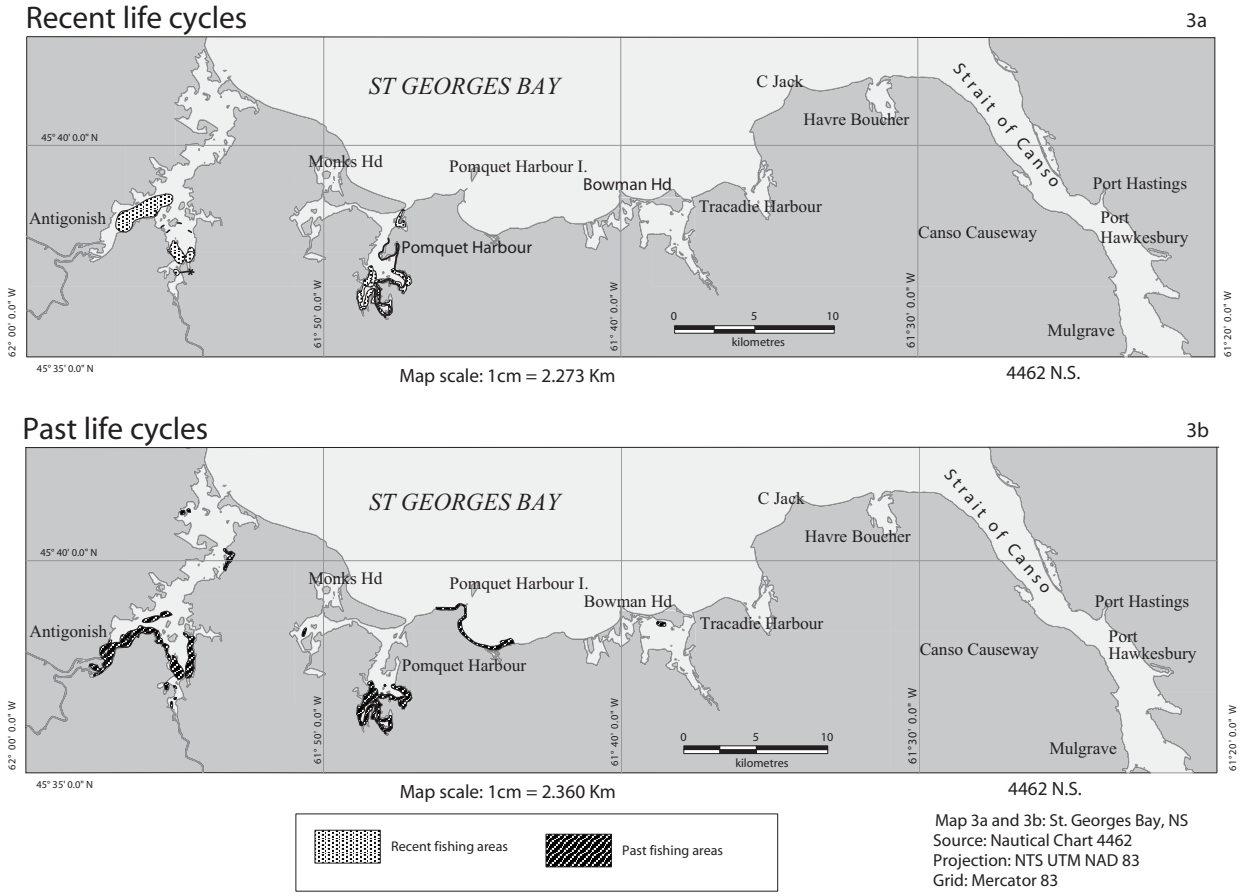

Figure 3. Mi'kmaq fishing life cycles.

Employing the information gathered during the interviews of experts recommended by the Paq'tnkek community, Map 3a, in Figure 3, represents where experts fished in recent times and Map 3b where they fished when they were younger. This information was gathered using the mapping of recommended experts' life cycle experiences. This information provides independent and detailed affirmation for the claims presented in Figure 2, and provide a more precise record of where and when Mi'kmaq fished/fish eel. Finally, the evidence gathered with life cycle reference demonstrates that in more recent time the Mi'kmaq have come to fish eel in a much more restricted set of locations than was the case in the past.

There were several explanations provided for this constriction in fishing locations. One is that Mi'kmaq were increasingly prohibited by non-Mi'kmaq landowners from crossing their land in order to access eel fishing sites. Another explanation was that intensified agricultural land use around estuaries had resulted in changes in eel habitat, largely as a consequence of increased use of fertilizers and water runoff from cleared land. The quality of the information presented in the map rests on the attributes of the research design and method; the latter is highly reliable, providing confidence that the information accurately represents Mi'kmaq use patterns and range of experiences. Documenting these attributes in this manner may be critical to positive legal adjudications of Mi'kmaq treaty right claims respecting access to and use of eel. Additionally, for the Mi'kmaq these data describe the scope and character of eel fishing.

It may be well and good to have thoroughly documented Mi'kmaq eel fishing in these locations, but what is the importance of this to the Mi'kmaq? Figure 4 represents data concerning Mi'kmaq use of *k'at*. This information was gathered during the household surveys; it demonstrates the multifaceted relations the Mi'kmaq have with *k'at*.

These data reliably and comprehensively capture and represent key attributes of the importance and significance of *k'at* to the Mi'kmaq and within Mi'kmaq culture and customary practices, qualities that are potentially critical to any treaty legal claims the Mi'kmaq may have to pursue in achieving legal affirmation of their rights. Additionally, the research has thoroughly documented core qualities of Mi'kmaq customary cultural and social relations with *k'at*, and their dynamic historical and residual contemporary place within family and community life. The research has documented customary

practices and made these available for reference to Mi'kmaq youth, in support of cultural revitalization and sustainable self-determination.

As noted earlier, some of the material has been communicated directly to all members of the Paq'tnkek Mi'kmaq community through reports and fact sheets. Other aspects of the material have been presented, usually employing a PowerPoint format, to a variety of regional, national and international meetings. These research outcomes thoroughly document over 70 years worth of Paq'tnkek Mi'kmaq resource use patterns and practices within the Antigonish and Pomquet estuaries and related watersheds. This documentation alone may contribute substantially to future Paq'tnkek Mi'kmaq land claims and resource access settlements. The research team continues to explore ways of incorporating the research results into public school curriculum, in both Mi'kmaq studies and regular programmes. Additionally, the research focus is being extended to Mi'kmaq relations with moose, salmon and other natural resources.

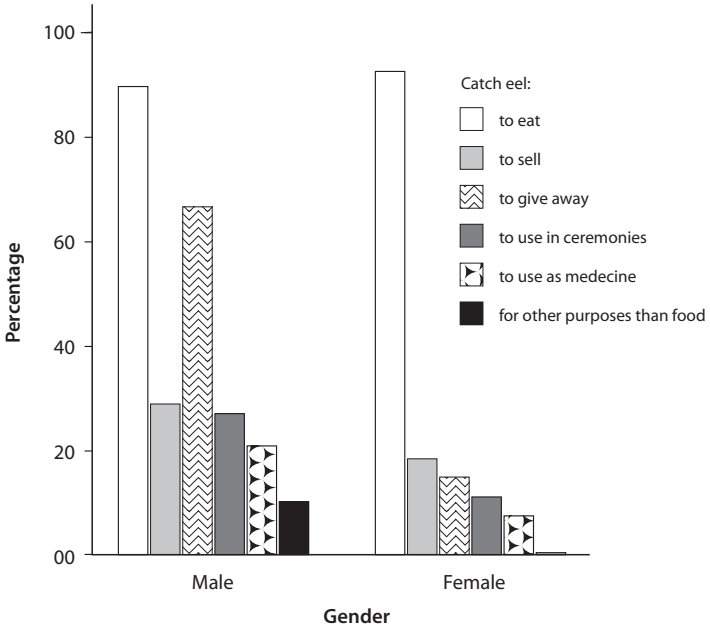

Figure 4. Mi'kmaq uses of *k'at* (eel).

Conclusions

The processes and learning described here were essential to building SRSF and PFWS community partner research literacy and capacity. The approach combined community and research team inputs and consultations with more formal study of research design and methodology and experience-based learning. Establishing specific research milestones and identifying ways of achieving these were critical elements. Of course, the community-university partnership commitment to achieving the agreed upon milestones was the essential ingredient for realising SRSF and PFWS goals. This commitment sustained engagement through the sometimes tedious processes of learning the basics of how to use the software and data analyses programs; learning the attributes of various approaches to designing social research; developing research tools; questionnaire design (including word selection, sentence construction, and question development); conducting interviews requiring informed consent; and tape recording. The experiences of conducting research, analysing data, preparing results, and communicating outcomes all contributed substantially to organizational, membership, community, and individual literacy and capacity. Perhaps most importantly, the experience of working together on achieving mutually agreed on research milestones built trust and confidence in the SRSF-PFWS partnership.

At a key point in the research process, one Mi'kmaq team leader asked, in part out of frustration with the emphasis on research design, "What does this tell about us?" This question was expressing the deeply felt need for research to contribute in meaningful ways to Mi'kmaq identity and understandings, especially by isolating ways in which Mi'kmaq experiences and understandings are unique to and singular for "being" Mi'kmaq and as distinct from those of any other people. In part, the question also asks that if research didn't accomplish this in some essential way, was it actually a useful and sensible activity for the Mi'kmaq? Certainly the Mi'kmaq know what they know about *k'at*, and all other things of importance. Revealing what is known and understood surely exposes the Mi'kmaq to an even greater risk of marginalization, domination and exploitation.

Arriving at a convincing answer to this question was and is difficult. After all, well-designed and conducted social research is a risky and demanding activity. To begin with, it will in all likelihood challenge expectations, desires and preferences. Arguably this is an essential purpose of the research enterprise — to distance understanding from culturally framed and individually referenced preferences and beliefs about the world and one's place in it. Reliable and useful research is rarely, if ever, a satisfying way to provide personal confirmation through the simple provision of verifications. Rather, at the personal level, research results will most likely test one's beliefs and preferences. Further, research is likely to complicate things. That is, it is very unlikely that the results will demonstrate

unanimity in experiences, behaviors, beliefs and understandings. Which are the "right ones?" Well, there are no "right ones." Distilling reliable and defensible meanings from such outcomes focuses on group-level patterns that will invariably be at odds with some aspects of individual experiences, beliefs and preferences. Further, research can tell us what people experience, think and believe, but it cannot tell us whether experiences, thoughts and beliefs are true or meritorious.

There is no question that well-designed and conducted social research will generate information that is useful to furthering indigenous peoples' rights and capacity for sustainable self-determination. Again, it is not enough to simply desire to "do good". One must commit to and complete the frequently challenging work required for careful and thorough documentation. Achieving unquestioned reliability and confidence in the evidence gathered offers potential advantages that are otherwise unattainable. This is particularly critical when the struggles for indigenous rights are waged ever more frequently within judicial settings that require "hard proofs."

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Mi'kmaq man drying eels.
(Photo: Kerry Prosper)

Why is the shark not an animal? On the division of life-form categories in Oceania

Thomas Malm[1]

Abstract

In Oceania, there is a strong linguistic link between terms for marine resource exploitation and the division of life forms. Aspects of this relationship (especially in Cook Islands and Tonga) are described and discussed in this paper from a cross-cultural perspective. A Polynesian response to the question of why the shark is not an animal shows that modern science, which is a "science of the abstract", has something to learn from traditional taxonomy, which is a "science of the concrete".

Introduction

It has been argued that the human species by nature is a classifying animal whose continued existence depends on the ability to recognise and linguistically mark similarities and differences among objects. Berlin (1992:4–5) states that the biological resources of a local environment must be classified before they can be used by people. He writes that people must be able to recognise, categorise and identify examples of one species, then group similar species together and differentiate them from others, and also be capable of communicating this knowledge to others.

While no one could deny the adaptive importance of recognising and naming useful or dangerous organisms, it has also been argued that humans have a much more fundamental cognitive need to make sense of the biological diversity that surrounds them. The best known of those who have exemplified the latter position is Lévi-Strauss (1966), who notes that the use of more or less abstract terms is a result of interests that are differently marked or detailed in different societies, and that one often encounters a very detailed terminology for species that occur in the environment of the people in question but that things generally become useful according to the way they are known, rather than vice versa.

The ethnobiological literature abounds with examples of traditional knowledge about plants and animals. My own list of vernacular plant and animal names used in Tonga totals more than 1,400 items (Malm 2007a). A major task for ethnobiologists, or human ecologists, is to not only collect information on the uses of named organisms, but to also try to understand the cognitive principles through which people create an order in diversity, particularly the ways these are reflected in the taxonomy.

If, for instance, a Westerner argues that a shark is an animal, and a Polynesian that it is not, how is it possible for both of them to be correct and fully rational? In this paper, comparisons are made between Polynesian (especially Tongan) and modern Western (essentially scientific) traditions of classifying organisms, in order to find an answer to this riddle. In this regard, the relationship between marine resource exploitation and the division of life-form categories in Oceania are discussed.

All animals are not "animals"

Although a local people's detailed knowledge of organisms and their names may be considerable, if not overwhelming, certain general terms are often lacking. This can be quite confusing to someone from another cultural background. I made my first acquaintance with this classic ethnobiological issue as a young biologist while working at the Rarotonga Marine Zoo in the Cook Islands in 1983–1984. One day, a Cook Islander who was also working there and who was in his early-20s, told me that I was entirely wrong in speaking and writing (in English) about sharks as "animals". "The shark is not an animal", he said. "It is a fish. Animals do not live in the sea." I answered that the shark was a fish, but that fish of course are animals. After further discussion that lead nowhere, he just shook his head and left.

The matter remained unsettled until I learned from a dictionary that the Cook Island word for animal is *vaevae ʻā*, which translates as "four-legged" (Strickland 1979:33). Cook Island children who learn that

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vaevae ʻā means "animal" in English may end up in confusing conversations such as the one I had with my friend, because while a *vaevae ʻā* certainly is an animal, an animal is not necessarily four-legged.

After some inquiry, I found out that quadrupeds are also called *manu vaevae ʻā* and that birds are called *manurere,* meaning "flying animals". I thought that because animals have legs or wings they were perceived as *manu*, or animals, whereas fish, which are called *īka*, were not regarded as animals.

I came to realise, however, that it was not legs or wings vs fins, but land and/or air vs water — a habitat segregation — that was of fundamental importance to the cognitive distinction between a *manu* and an *īka.* As I was to find out 10 years later during anthropological fieldwork, it is exactly the same in Tonga, where no sea animal, no matter how many legs it may have (and crabs and lobsters have many legs), can be spoken of as a *manu.*

If one asks a Tongan about the word for animal, the answer will be *manu* or *monumanu.* The first term refers to a particular animal, whereas the second is used generally. On closer investigation, it is clear that these words do not cover the whole spectrum of organisms that are defined as animals in English, because they are used only for animals that are living on land: birds and bats, four-legged mammals, lizards and insects.

Similar notions are, for example, found in the Society Islands (Lemaître 1977) and Cook Islands (Clerk 1981). It is not certain if terms signifying "four-legged" were used in Polynesian classification during the pre-Christian era. For Tahitian, Lemaître (1977:176) states that *manu ʻāvae maha* is an example of how translators of the Bible "had to find expedients for transposing Judaic ideas about the animal world into Tahitian". What is clear, however, is that the word *manu* and its cognates (e.g. *manuk, manok* and *maan*) are found among many Austronesian-speaking peoples, from eastern Polynesia to Indonesia and the Philippines in the west (Brown 1981:93–96). *Manu* often refers to birds, as among the Nuaulu people of Seram in the Moluccas (Indonesia), where *manue* refers to "dwellers of the sky", and *ikae* to "ones of water", but only when there is no comparable term for land animals (Ellen 1993:112).

The Polynesians' lack of a word to describe all "animals" is not as surprising as it may seem, and reflects a common principle of folk taxonomies according to which a taxon marking "animal" at the rank of "kingdom" generally is not named (Berlin 1992:27). It may be that birds constituted the primary, perhaps the only, zoological referent of the Proto-Polynesian term, and that daughter languages, in some cases independently, expanded their reflexes of **manu*[2] to additional animals, because most Polynesian islands had very few mammal species.

What is a "life form"?

What I had encountered in Rarotonga was a taxonomic system that was entirely different from what I had been taught in classes on systematic biology, and in order to understand it better I have found Berlin's (1992) analytical perspective useful. It gives scientists the possibility of comparing folk taxonomies by listing taxa (named categories) according to rank from "top" to "bottom". That is, from the most encompassing to the most specific.

As has been pointed out by Ellen (1993:96), it has become conventional to begin descriptions of folk classifications at the "top", presuming that there are actually levels. This may reflect scientific, but not necessarily indigenous, notions. In other words, general categories are accorded a prominence and primacy whether or not there is any independent ethnographic evidence for ascertaining their salience. For the sake of consistency, I have chosen to discuss the categories at the "top" as those categories that encompass the greatest number of organism types.

Berlin (1992) uses the term "kingdom" for such high taxonomic ranks as "plant" or "animal", whereas the second-order term life form refers to general taxa such as trees, fish and birds. Life forms are taxa that indicate a highly distinctive morphotype named by a simple word or idiom (a primary lexeme), which is not included in any other taxon than "kingdom", and which includes a number of lower-order taxa sharing the recognised characteristics of the type.

Ellen (1993:116–118) argues that it is possible to discuss the encoding sequence of animal terms in a language without referring to life forms, but instead referring to "primary term" or "primary category". According to Ellen, just because certain life-form categories are found in many cultures, this does not necessarily mean that scholars should accord them greater salience in particular folk classifications, because other categories may be more culturally salient. He writes that the taxa that Berlin, for instance, regards as life forms are salient and most often found in word lists "because they are terms

2 The asterisk signifies that the word is reconstructed.

most commonly in use, and which occur most frequently in ordinary speech correlated strongly with the order in which they are added to languages" (Ellen 1993:118). With regard to folk taxonomies discussed here, I consider "life form" to be quite apt for the categories under discussion, because indigenous terms occur frequently in ordinary speech, and also because the reason why organisms are classified as belonging to these categories is that they live in a certain way.

If asked what the general word for "organism" is, a Tongan may answer *me'a mo'ui,* which means "living thing", or just *mo'ui,* "living". Although it might have been used in the pre-Christian era, the Tongan term *me'a mo'ui* is connected mainly to the modern teaching system (introduced in the 19th century), and is most likely to be heard in classrooms or in religious addresses. Rather than in daily speech, it is used in textbooks for Tongan students and in the translation of the Bible where Tongan words were needed for expressions such as "all the living things that creep upon the Earth". Another question, however, is whether a "living thing" has the same meaning to a Polynesian as to a Westerner. There is no reason why animals and humans should be grouped together with trees and seaweeds in contrast to winds, water, clouds and stones. Although scientists talk about organic life as being made up of cells with a metabolism, this does not necessarily mean that all life is organic. Tahitians, for example, extend the domain of "living beings" to everything in the universe not made by humans (Lemaître 1977:177), and on Satawal in the Caroline Islands of Micronesia, inanimate objects such as water, stones and fire are grouped together with immovable trees and plants as a category, *miin,* which is in contrast to another category, *maan,* which includes humans and animals (Akimichi 1996:508).

Thus, within a framework other than the modern scientific one, a much wider understanding of living things is just as logical. And because "living things" include almost everything in creation, a term for it may not have been needed until fairly recently.

Ika and fingota

In the Tongan animal world there are not only *monumanu,* but also two main categories of aquatic (mainly marine) organisms: *ika* and *fingota.*

According to Churchward (1959:240), *ika* is the general word for fish and includes turtles and whales, but not eels or cephalopods, whereas Dye (1983:259) states that in Niuatoputapu, in Tonga's northernmost islands, this term does include eels and cephalopods (this may just be a local difference). In his list of fish names, Dye also includes sea snakes. McKern (n.d.:368) writes that cephalopods (squids and octopii), shrimps, jellyfish and palolo worms are classified with fish, turtles and sea mammals, probably because of their occurrence in deep water as swimmers or floaters in contrast to "shellfish", crabs and similar nearshore and seafloor animals. Dye (1983:259) notes that *ika* is a category characterised by scales, a head, eyes and free swimming ability.

The very earliest definition for *fingota* was "shells" (Samwell 1967 [1777]:1046; Labillardière 1799:43). A more common and recent definition is "shellfish" (e.g. Clark 1981, 1991; Collocott 1925:162; Schneider 1977). The general description of animals that belong in this category, in contrast to *ika,* is that they are stationary or move by creeping or crawling, often have shells, and lack a head and often also eyes. Churchward (1959:190) states that *fingota* means "sea creature of any kind other than *ika*", and that this category includes "shellfish" (by which I take it that he means molluscs with shells), crustaceans, cephalopods, jellyfish, eels, sea snakes, sea cucumbers, starfish, and even seaweeds. McKern's statement about cephalopods, shrimps, jellyfish, and palolo worms being classified as *ika* was not generally agreed on by my informants, and none had ever heard of the palolo worm occurring in Tongan waters (see Malm 1999:247–251).

The need for clearly defined categories presents more of a problem to researchers than to Tongans, probably because modern science has been built up as a "science of the abstract", whereas traditional knowledge is basically a "science of the concrete" (see Lévi-strauss 1966). From my conversations with fishermen and women, it is clear that *ika* and *fingota* are two generally recognised categories, but that a very specific vocabulary is usually preferred when one speaks about particular kinds of animals. If one talks about collecting marine invertebrates in general, *fingota* is used, and *ika* can be used as a general word for swimming animals that men catch in the open sea or that one looks for at the fish market. However, even if a whale is seen as a big fish, one mainly speaks about it as a *tofua'a,* and whether a moray eel is a *fingota* or an anomalous, scale-less kind of *ika* does not seem to matter, because one always uses its particular name (*toke*). There would be no point in saying that one had caught a big *ika* if it happened to be an octopus or a turtle. Some would see an octopus as an *ika,* others (and most, according to my experience) as a *fingota,* but everyone would know what an octopus was: simply a *feke.* Tongan folk taxonomy has, until fairly recently, existed only orally and not in books, where a generally accepted system of clearly defined categories was needed for treating various groups of organisms in different chapters, or to place the books on the correct shelf in a library. To the Tongan, it is not important to have a clear division between these

two categories, as a specific word can hardly be misunderstood in its context.

Neither *ika* nor *fingota* are defined in relation to whether they are caught by women, children or men. Bataille-Benguigui (1994:117) defines *fingota* as invertebrates in general that are collected by women and children. But although collecting *fingota* is mainly women's work (Malm 1999, 2007b, 2009a, 2009b), it does not mean that an organism is a *fingota* because it is collected by a woman, or that another organism is an *ika* because it is harvested by a man. A fish (other than an eel) is never viewed as a *fingota* if it has been caught by a woman, and even men collect *fingota*. Giant clams, for example, are regarded as *fingota*, not *ika*, whether they are collected by women or brought to the surface by men who dive for them. On the other hand, corals are not regarded as belonging to either of these two categories, but are instead seen as rocks or, especially if the colony looks like a tree, as marine plants (such as *toa tahi*, "ironwood of the sea", for black coral).

Both *ika* and *fingota* are words that are used by a number of people in Oceania. With varying local pronunciation, *ika* is found from eastern Polynesia to Southeast Asia as *i'a* (Tahitian), *yiik* (Satawal) and *ikan* (Indonesia). *Fingota*, however, occurs only in western Polynesia, on Polynesian outliers (Clark 1991).

Fingota has various definitions, but usually includes seashells or shellfish. I use "shellfish" somewhat reluctantly, within quotation marks for two reasons. First, "shellfish" does not refer to any special group of organisms recognised by modern systematic zoology. Second, I would, at least for the Tongan context, dispute "shellfish" as an adequate definition of *fingota* because it not only leaves out seaweeds, but also animals that have no shell. (Besides, with the exception of eels, none of them is a fish.)

It may, of course, be the case that the use of these words varies among islands (as between Tongatapu and Niuatoputapu), or even people on the same island, but it is obvious that some dictionary compilers have not been careful in finding out exactly what kinds of organisms a category in question covers. The latter is exemplified with the language of Niue, where *fingota* means "an edible sea-crab" or "shell-fish", according to two different dictionaries (quoted by Clark 1981:79).

Fingota and fāngota

More widespread than the noun *fingota* and its cognates, are cognates of the related verb *fāngota*. The latter word is, with varying pronunciation, found all over western Polynesia, on Polynesian outliers, in some Melanesian languages and among the Cook Islands in the east (Christiansen 1975, Clark 1991; Dye 1983; Foale 1998; Pawley 1996). In the rest of Polynesia, both *fingota* and *fāngota* are, apparently, unknown terms. (The occurrence of the word in the southern group of Cook Islands can probably be explained by the roots of some of its people in Samoa western Polynesia.)

The terms used for "shellfish" in the rest of Polynesia seem to be less inclusive, referring either to specific types (e.g. lobsters or sea urchins) or to molluscs with shells. In Hawaiian and Tahitian, for instance, *pūpū* refers to shells, especially gastropods, but there is no special word used for all marine invertebrates, in contrast to fish. Neither does there seem to be any special verb corresponding to *fāngota* for obtaining them. Instead, in Hawaiian, the ordinary word for "to find/catch" (*loa'ā*) or "to gather/collect" (*'ohi;* as in *'ohi 'i'o pūpū*, "to gather shells") is used (Pukui 1983; paragraphs 307, 607, 2263). In Tahitian, the verb *ofa* is used for "collecting or amassing food", and *ao* for "collecting, gathering or netting" (Andrews and Andrews 1944:13, 97). In Mangaia, Cook Islands, where marine invertebrates and smaller lagoon fish are caught by women, the activity is simply referred to as "women's fishing" or *tautai va'ine* (Clerk 1981:212).

Clark (1991:81) suggests that *fingota* originally was not a biotaxon, but rather a category of produce obtained during an activity called *fāngota*, or something similar, and that subsequently it might have evolved, in one or more languages, into a biological category. He also concluded that the slightly varying forms of the words *fāngota* are recent cognates of an original Proto Polynesian word, **faangota*, and possibly an even older Proto Remote-Oceanic or Proto Oceanic word, **pangonta*, with the basic meaning "having shellfish or *fingota* as its main catch, the reef as its location, and women as fishers", which evolved into **pingonta* as a biological category (cf. Pawley 1996:134–135).

On some islands, women and children probably catch *fingota* only on the reef simply because the lagoon is too deep, even at low tide, or because there are only fringing reefs and no lagoon at all. But on some islands, such as Tongatapu, the lagoon is important (Malm 1999, 2007b, 2009a, 2009b). Therefore, I suggest the following, albeit somewhat lengthy, definition of *fāngota* in its exclusive sense (i.e. not as a general term for fishing) as "the collecting or catching of mainly invertebrates — non-*ika* marine organisms (excluding coral) — in the area between the beach and the open sea, mostly by women and children".

According to Clark (1991:81), the basic meaning of *fāngota* as "women gathering mainly shellfish"

has, over time, been broadened independently in a number of languages to mean "fishing in general". He discusses why this might have happened. One reason is that it reflects a principle suggested by Berlin (1972:66): words that are elevated from generic meaning to a major class are those that are the most culturally salient because of their distribution and cultural importance. Referring to the fact that *fāngota*, as in Tonga, is considered unworthy of a man's attention, Clark (1991:81) writes that culturally it does not seem to be the most salient form of fishing. He goes on to suggest two ways in which the repeated shift in meaning of *fāngota* might be explained: First, whereas it is women's and children's work, and thus the opposite of the more prestigious fishing activities of men, it is nevertheless the activity that people do the most often, and spend more time doing, than any other. Second, owing to the low prestige accorded to *fāngota*, the term might have been used by men — in jest, through modesty, or perhaps for reasons of word taboo — to refer to more "serious" types of fishing. The lack of ethnographic data from pre-European times makes it hard to say which one of the two suggestions is most plausible, although I lean towards the first one.

Conclusion

Going *fāngota* for *fingota* is a culturally salient form of obtaining food in Oceania, and is connected to traditional ways of dividing organisms into life forms that exemplify what Lévi-Strauss calls "a science of the concrete", in contrast to "a science of the abstract". Ways in which island people divide organisms into life forms according to habitat, morphology and behaviour offer us an opportunity to see scientific biological taxonomy from a comparative cultural perspective. Scientific taxonomy, empirical and rational as it may seem, is by no means more so than traditional taxonomies, such as those discussed in this article. To a scientist it is quite self-evident, for example, that a shark is an animal, and to a Rarotongan Maori, it is equally self-evident that it is not. From each one's perspective, only one of those opinions could be correct, but through a cross-cultural analysis we understand that neither one is more logical or empirical than the other. There is, therefore, something very important to learn from the answer to the question about why the shark is not an animal in a part of the world where *fāngota* has been many a child's first steps towards the more prestigious fishing in the open sea.

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Recent publications and conference presentations

(related to the first article in this issue)

Constructing confidence: Rational skepticism and systematic enquiry in local ecological knowledge research

Anthony Davis and Kenneth Ruddle

Source: *Ecological Applications* (2010) 20(3):880–894.

Key attributes of the social research contributions on indigenous ecological knowledge (IEK), local ecological knowledge (LEK), and traditional ecological knowledge (TEK) are analyzed using the most frequently cited literature generated by the ''ISI Web of Knowledge'' and ''Google Scholar'' search engines. They are further exemplified by an examination of two contrasting approaches to the analysis of IEK/LEK/TEK. The results show that IEK/LEK/TEK is treated predominantly via definitions, and few articles examine concepts, research design, methods, or operational attributes. Consequently, there is no consensus on the content of IEK/LEK/TEK, the primary components of which await examination via focused research. These are fundamental issues because IEK/LEK/TEK misrepresented by social research would probably deepen disempowerment of those it purports to champion. Research topics are suggested to address these issues.

What is 'ecological' in local ecological knowledge? Lessons from Canada and Vietnam.

Kenneth Ruddle and Anthony Davis

Source: *Society and Natural Resources* (2011) 24(9)

Case studies from Canada and Vietnam demonstrate both the importance and content limitations of local ecological knowledge (LEK) acquired during collaborative research between local fishers and scientists. The Canadian research disproved fishers' contentions that white hake (*Urophycis tenuis*) was the main predator on juvenile lobster (*Homarus americanus*). In the Vietnam case, the LEK of 400 fishers was used to test a hypothesis about monsoon seasonality and the availability of fish for fermentation. Fishers' LEK was important in both confirming the basis of the hypothesis and highlighting anomalies. The cases demonstrate that although important, harvesters' local experiences and observations may not characterize accurately such ecosystem processes as predator-prey dynamics or seasonality. It is unrealistic to expect fishers' LEK and understanding of ecology to embody such attributes, since stomach contents of commercially important target species are rarely examined, and fishers interact with ecosystems primarily to earn a living.

Incorporating local knowledge into education for the management of nearshore capture fisheries

Kenneth Ruddle and Anthony Davis

Source: Paper presented at the Asian Institute of Technology, Bangkok, Symposium on Aquaculture and Fisheries Education, December 2009 (Symposium proceedings in preparation)

Alternative models that generally include "adaptive management" and "the Ecosystem approach" have been advocated to replace "standard" Western models and approaches for managing tropical nearshore fisheries. However, they remain generally unfamiliar. As a result, "local ecological knowledge" or LEK (also known as "traditional" [TEK] or "indigenous ecological knowledge" [IEK]) is widely promoted as a source of data on these alternatives, in order that the best of non-Western, pre-existing models and Western approaches could be blended to provide acceptable and sustainable solutions. This would require tertiary level training on LEK. Before that occurs, however, the limitations of LEK research must be recognized. A recently completed study by Davis and Ruddle demonstrated that the basic problems characterizing social research on LEK are the use of unsophisticated theories or concepts with often undocumented and nonsystematic research designs and methodologies, which, in turn, give rise to unwarranted or indefensible outcomes. Social science research on LEK has much to contribute to framing and understanding an alternative approach to resource management. However, given the trends evident in the most cited literature, it is far from obvious that current social research is following a path to fulfill that important mandate. Supporting documentation is, at best, based on unsystematic study, thus much is unrepresentative and unreliable, producing data and outcomes that do not permit comparisons and generalizations. Consequently, it is ill-suited

for sustainable resource management policy recommendations. Standards of accountability and transparency need to be raised, beginning with the elementary requirement that researchers provide descriptions of research designs and methodologies sufficient to enable assessment of the reliability and representativeness of findings, and to facilitate comparison, generalization and evidence-based conclusions. Only then will LEK be suitable for inclusion in Fisheries Social Science instruction at any level.

Managing coastal and inland waters: Pre-existing aquatic management systems in Southeast Asia

Kenneth Ruddle and Arif Satria (Eds.)

This book examines pre-existing management systems in fishing communities in Indonesia, Laos, the Philippines, Thailand and Vietnam. Besides the erroneous assumption that tropical fisheries are 'open access', the cases demonstrate that pre-existing systems (1) are concerned with the community of fishers and ensuring community harmony and continuity; (2) involve flexible, multiple and overlapping rights adapted to changing needs and circumstances; (3) that fisheries are just one component of a community resource assemblage and depend on both the good management of linked upstream ecosystems and risk management to ensure balanced nutritional resources of the community; and (4) pre-existing systems are greatly affected by a constellation of interacting external pressures.

(More available on http://springer.com/978-90-481-9554-1)

UNESCO and Fiji Government commit to marine education and traditional knowledge at International Pacific Conference

Source: Indigenous Peoples Issues & Resources website (http://indigenouspeoplesissues.com/)

Strengthening the role of marine education and traditional knowledge is crucial to the future of sustainable development in the Pacific region, according to the 2010 International Pacific Marine Education Network (IPMEN) conference. Held at Outrigger on the Lagoon, Viti Levu, Fiji Islands, the three-day conference concluded with several key outcomes, including commitments from UNESCO and the Fiji Ministry of Education to undertake immediate initiatives to make this a reality.

"Pacific Islanders, who are custodians of the rich but threatened marine biodiversity in the region, have for centuries applied customary management practices in the traditional governance of their fishing grounds," noted associate professor Joeli Veitayaki, coordinator of the Marine Studies Division at the University of the South Pacific (USP). "While remnants of the system remain today, the people have witnessed increasing threats as they have to share their resources with other people with whom they must now work to ensure its sustainability."

Hosted by the USP Marine Studies Division and Institute of Applied Science, the conference brought together 87 participants from a dozen countries to address ways marine education can help Pacific communities prepare for the new millennium. The conference topics included climate change impacts on Pacific children, incorporating traditional and place-based knowledge to build healthy coastal communities, the changing role of women in fisheries, and gaps in existing Pacific marine education.

(More available on http://www.ipmen.net)

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