Knowledge Gains Power When Shared

Nigel Haggan, Jo-Ann Archibald* & Silvia Salas

Fisheries Centre, UBC
**First Nations House of Learning, UBC*

Abstract

Three researchers from very different backgrounds describe their experience with Ecopath as a way to integrate different traditions of knowledge, represented by the voices of First Nation Elders, the academic tradition of the University of British Columbia, and commercial and sport fishers. The role of human nature and thought in our present ability to catch all the fish in the sea is discussed. Two challenges are posed: how to reverse the course of human thought about fisheries and how different traditions of knowledge and branches of science can learn to communicate and work together with dignity and respect. The paper explores the role of UBC as a neutral forum and facilitator, and the potential of ecosystem modelling to focus discussion and integrate information from disparate sources. It introduces, and is focussed upon, the Sto:Lo Nation insight that "Knowledge Gains Power When it is Shared."

Introduction

People have been fishing since the dawn of time. No one knows how it all began. Maybe from watching other creatures catch fish and eat them. Herons spear them. Bears flip them up on the bank. Eagles seize them in their talons. Maybe traps were invented after watching fish stranded by the ebb tide or caught in a basket left in a stream. 85,000 years ago, people in Africa carved fish spears out of deer antlers (Yellen et al. 1995). Fishing skills evolved and spread very fast. People watch, learn and adapt. They communicate with each other. They learn from people they meet in their travels and pass on their own skills in return. If they are fishers, they brag and compete.

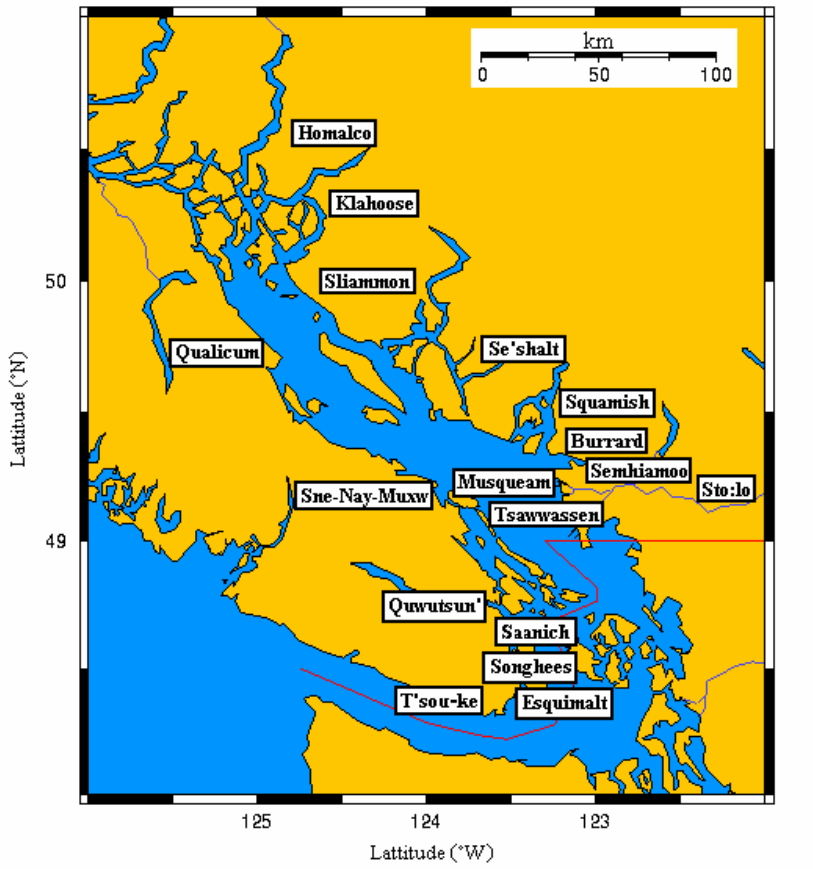

Figure 1. First Nations language groups around the Strait of Georgia (Prepared by Dave Preikshot based on data from the UBC Museum of Anthropology web page; www.moa.ubc.ca).

They lie awake at night trying to think of better ways to catch fish. Above all, they pass knowledge from one generation to another.

In the years since people invented fishing technology, we have learned to catch virtually all the fish in the sea. The food needs of a growing world population, expanding seafood markets and excess catching power threaten fish stocks with extinction. Humankind is now faced with a challenge of mythic proportions: how to halt the decline in major fisheries and re-direct human ingenuity to rebuilding aquatic ecosystems (Pitcher and Pauly, 1998).

The consequences of failure are ecologically, economically and culturally devastating. The collapse of the east coast cod was a disaster (Walters 1996; Walters and Maguire 1996; Ommer 1994). Mitigating community impact has cost Canada $3 billion to date (Anon. 1997). The social and cultural loss to outport communities is incalculable. The grief felt at this loss is well understood by BC First Nations who had earlier lost access to the salmon and other resources forming the economic, cultural and spiritual basis of their societies (Brown, 1993).

Another deep issue is the reversal of the fragmentation of knowledge. The Christian Bible tells of a nation who set out to build a tower so high that it would reach up to Heaven. God was not amused and punished them for their arrogance by causing them to speak in different languages. They had to give up on the tower because they couldn't work together anymore. The story of the Tower of Babel parallels the development of science. In the 19th Century, it was possible for one, well educated person to grasp the elements of all branches of science. As inquiry progressed, scientists had to content themselves with narrow fields of enquiry. Each field acquired its own language and rules.

And yet, questions such as what really goes on under the surface of the ocean fascinate fishers, scientists and other people alike. Fish seem to have a powerful hold on the human mind. There are few people who won't stop and look into a body of water. Fewer who won't smile with quiet satisfaction if they see a fish. Clean water and healthy fish are a metaphor for the health of the social and physical environment. Similarly, the message sent by science about the disappearance of fish from the world's oceans is deeply upsetting, as reflected, for example, in the strong media response to the paper of Pauly et al. (1998).

Nigel Haggan spent 12 years working with First Nations on the design and implementation of cooperative management programs and policy. His thinking was profoundly influenced by two early experiences as a Technical Advisor to the Oweekeno Nation on the central coast of BC. First was an April night when an Oweekeno Nation member took his three young children to the lakeshore and shone a Coleman lantern in the shallows so that they could see the sockeye salmon fry emerging from the gravel. The second was the same man going to all resource users in the territory, loggers, commercial fishermen and sportfishing lodge operators to seek funds and in-kind contributions for a salmon hatchery. This example of First Nations, other resource users and government joining forces to restore depleted fish stocks formed the basis for 12 years work with the Oweekeno and other First Nations in planning and implementing fisheries programs and policy development.

Over this time it became clear that the divisive influence of allocation disputes was much stronger than the pressure for First Nations, government and industry to work together in the interest of conservation and good management. 'Fish wars' between Canada and the US, allocation disputes between commercial gear types, a growing sportfishing industry, the re-emergence of First Nations' fishing rights and an increasingly effective environmentalist movement contributed to a climate of polarization. Evidently a new type of forum was needed. Something with no baggage or alignment to any one sector. The one possibility seemed to be a university such as UBC. Within UBC, the Fisheries Centre and the First Nations House of Learning joined forces to explore ways to integrate different traditions of knowledge.

The First Nations Longhouse was the site for the November 21-22, 1997 workshop with various community representatives. The Longhouse serves as a 'home away from home' for the First Nations students who study at UBC and a gathering place where people can share their knowledge and culture with others. The building blends traditional architecture with the modern and reminds us to be respectful and responsible as we seek to combine various kinds of knowledge. While the Fisheries Centre is anchored in the European academic tradition (Cahill, 1995), the FNHL longhouse reminds us that the university itself is located on land occupied by the Musqueam Nation, whose culture was founded and sustained for thousands of years by the fisheries of Georgia Strait and the Fraser River (ref).

Two traditions of knowledge and thought come together in the present study. The Traditional Environmental Knowledge (TEK) of Aboriginal communities (Hunn 1993, Inglis 1993) combines with science carried out by government laboratories and universities (Preikshot, this vol.). TEK involves sources such as:

- Myths and stories illustrating the relationship between people and the rest of creation (see Williams, this vol.);
- Information from First Nations Elders see Archibald et al., this vol);
- Information from commercial fishers;
- Information from sport fishers;
- Fish remains and human artefacts in the archaeological records;
- Archival sources and popular literature (see Wallace, this vol.);
- Information on past, present and future trends in climate.

Integration of Traditional Knowledge

There has not been a great deal of crossover between TEK and formal scientific knowledge. TEK is primarily concerned with relationships and connections within the ecosystem. Fisheries science, at least heretofore, has focused on one or two commercially important species.

TEK illuminates the whole stage, while fisheries science spotlights key performers. From this perspective, at first sight, the myths and stories that characterize TEK shed little light on the dynamics of fisheries. But previous analyses of TEK have provided helpful insights in terrestrial ecosystem management (e.g. Bomford & Caughley 1996). Moreover, TEK has been cross-validated with ecology in tropical marine ecosystems (Ruddle & Johannes 1985, Johannes 1981, 1978). The scope of TEK in Canada is reviewed by Kuhn & Duerden (1996). There have been several descriptive attempts to show how TEK might be used to help sustainable management in Canada (Richardson 1992, Freeman & Carbyn 1988), Australia (Williams & Hunn 1982) and for aquatic resources in British Columbia (Weinstein 1994, Kew & Griggs 1992). Back to the Future goes beyond this description, however.

Many First Nations have a story about the importance of returning salmon bones to the river. If this is not done, the salmon will not come back. Fisheries scientists have known for a long time that the productivity of lakes and streams is related to the amount of nutrients which salmon bring back from the ocean and contribute to the waters when they die. Indeed, salmon carcasses have been identified as a major contributor to the forest ecosystem. When you think about it, rain leaches nutrients from the land. Water runs from the mountains of BC like rain off an iron roof. Returning salmon bring nutrients back. Bears, eagles and other agents spread them over the forest.

Science is precise. It expresses itself in defined terms, it feeds on numbers and expresses them in figures, tables and graphs. TEK is much less precise. Names may link fish species, weather or other factors. Similarly, names of time of year or months may relate to important fish runs. Numbers where they exist, range from none at all, to some to lots.

Ecopath offers a way to link scientific data with TEK. Both Ecopath and TEK are concerned with the relationships, ratios and connections within the ecosystem than with achieving an absolute understanding of individual elements. In their own way, both Ecopath and TEK are comprehensive, just as local fishers consider an entire constellation of factors along with the target species, prey, associated species, weather, current, tide, phase of the moon, to name but a few. They will also compare and balance their observations on any particular fishing day with previous years and with the information which has been handed down to them.

The mathematical side of Ecopath uses the scientific data available for as many species as possible to build a mass-balance or 'Eat or be Eaten' model of an ecosystem. Where data is lacking on the abundance of a species known to be present, Ecopath generates a number that is reasonable in terms of the food available for it and of how it contributes to the diet of other species. More precisely, Ecopath generates a range of values for that species.

This 'intuitive' ability of Ecopath stems from precisely the kind of ecosystem relationship that forms the basis of TEK. Practitioners can look at the range generated by Ecopath and compare it with their knowledge, where information on presence or absence are of key importance. Knowledgeable people from the First Nations, commercial fishing, sport fishing, scientific and other communities thus have a common basis for discussion. Where their knowledge indicates different values, they can be entered in the Ecopath model. The model will then adjust other elements of the ecosystem to accommodate the new values. In turn, scientists and TEK practitioners can compare the new values with

their experience.

The value of Ecopath in integrating TEK is that the whole ecosystem approach strikes an immediate chord at the local community level. This is where the opportunity lies to connect the two. Ecopath sheds light on relationships poorly understood or unknown before. The project documented in this report is the first attempt to incorporate TEK into an ecosystem model.

Respect, Responsibility, Reciprocity and the Power of Knowledge

Jo-ann Archibald points out that, in Sty-Wet-Tan Hall of the First Nations Longhouse, carved doors depict the life cycle of the salmon, within a circular shape, and two human figures are situated on both sides. The artist, Bradley Hunt of the Heiltsuk people of the Northwest Coast, noted that the human figures are dependent upon the salmon for sustenance and we humans are reminded about maintaining respectful relationships with the salmon.

The principles of respect and responsibility were critical for the 'Back to the Future' project. The First Nations House of Learning informed First Nations community members about the project and sought participation from individuals who have traditional ecological knowledge. Dr. Archibald also piloted the interview questions developed by the other project team members. The three Elders interviewed were Chief /Dr. Simon Baker of the Squamish Nation, Dr. Vincent Stogan of the Musqueam Nation, and Elder Bob George of the Tsleil-Waututh Nation. All three Elders are respected for their particular types of traditional cultural knowledge. Each carries out a teaching role and is asked by numerous educational and community groups to share and teach their knowledge to First Nations and others alike. Dr. Archibald, Who learned from each for at least five years, had also asked a woman Elder to participate. She would have liked to, but was not in good health. However, in an earlier work with Coast Salish Elder woman, Ellen White, conducted in 1992, Jo-ann gained an appreciation about the power of words and how cultural knowledge gets power:

> *"I have heard and come across many speakers' messages about the power of words: power to heal and the power to hurt. The message they give is, 'think carefully about the words you say, choose them wisely; and let silence help.' Not too long ago, I spoke to a group of first-year university students about the power of words. I talked about it as the notion of knowledge as power, as words from knowledge. One student asked whether the knowledge of the speaker or storyteller didn't give them power over the learners? I explained that our [Sto:Lo] people believe that the power contained in the knowledge and words of the speaker, storyteller or teacher had to be 'given back,'. This giving back, though, is to others who need the knowledge, the power, the teachings; thereby ensuring the perpetuation of cultural teachings, values, and beliefs that contribute to the cultural strength and understanding of the people."*

The movement of power is not hierarchical, as from the teacher at the top down to the student at the bottom. The movement of power may be pictured as flowing between concentric circles. The inner circle may represent the words, knowledge itself that expands and moves as it is taught to and shared with others. The other circles may represent the individuals, family, community, nature, nation, and spiritual realm that are influenced and in turn influence this power. This may be called knowledge-as-power and it must be based on cultural reciprocity and grounded in respect and responsibility.

Going to the Elders

Jo-ann and Silvia visited two of the Elders at their homes and one came to the First Nations House of Learning. Each talk/interview lasted between one and two hours. Silvia and Jo-ann took notes. For the first interview, the Elder asked if we had a tape-recorder. He is accustomed to using one and seemed disappointed that we didn't have one. For the other two interviews, Silvia brought a tape recorder but we didn't use it. As we started talking with the Elders, it seemed inappropriate to bring out the tape-recorder. It felt like the flow of the talk would be disrupted. It was important to pilot the questions and process before going to other First Nations people along the Strait of Georgia. Because the Elders knew Jo-ann and knew that the work of the First Nations House of Learning is centered in quality education guided by community involvement, they readily agreed to participate.

Remembering … long ago

During the sessions, it turned out that each Elder had vivid memories of a life style centered on sea life. Each one recalled what it was like in their childhood, before attending residential school, and also in their early adult lives. Each one said that the food from the sea was "abundant." One of the interviews took place on the porch, on a warm sunny November morning. The interviewee remembered his people going down to the beach to gather shellfish and that the bay, nearby rivers and streams teemed with fish. That lifestyle no

longer existed for this Elder, and all we could do was share his memories and look out to a beautiful but 'empty' bay.

Because each interviewee was remembering the greatest abundance during childhood, they could not identify quantities of food or numbers of people using it. The usefulness of an interdisciplinary approach becomes evident in this situation. Piecing together qualitative and quantitative information from different sources is critical to the accuracy of the reconstructed ecosystem. The need to go back to the same individual and also to other individuals in the same community to verify and build upon the ecosystem information was also reinforced from the interview experience.

Further Reflections of the process

In disciplines which study natural resources, there is a tendency to concentrate on understanding these resources, often ignoring those who make use of them. These people, in permanent contact with their resources have accumulated knowledge that can be of great value in the process of understanding those ecosystems. However, incorporating qualitative information has been difficult for academics, particularly in the natural sciences.

The integration of traditional knowledge in rebuilding ecosystems however is not an easy task. It is not as easy as going to the archives (which by the way is not easy work either; see Wallace, this vol.) and opening a book that will provide the information. It is not simply a matter of selecting a group of people who will become our source of information. It is a long process of work and interaction with people who, in the first place, have the right to deny or accept participation in the process.

In this project, the process of interaction with First Nations people was initiated by Jo-Ann. The participation of interviewer and interviewee in the interviews was open and confident. They knew Silvia was an outsider, but she was brought there by Jo-Ann, thus Silvia must be a reliable person. That made Silvia feel very committed to the work she was involved in, and determined to deal the best she could with the information they gave her.

The results we have obtained so far are encouraging, not only in compilation of information, but also in finding that interaction among researches from other disciplines and Native people is possible. The integration of their knowledge in the process of understanding ecosystems and the possibility of extending this type of work as a potential to explore ways to rebuild ecosystems is exciting. It is important to note that research interaction among people with diverse experiences and understandings can be very rich. But respect for the views of people with whom we conduct our research is necessary, to ensure the possibility of maintaining this interaction and open more channels of communication, otherwise this potential can be lost.

References

Anon. 1997. Fisheries and Oceans Canada: Sustainable Fisheries Framework: Atlantic Groundfish, Report of the Auditor-General, Chapter 14. www.oag-bvg.gc. ca/ domino/ reports.nsf/html.

Bomford, M. and J. Caughley. 1996. Ecologically sustainable harvesting of wildlife by aboriginal peoples, p. 60-74. In M. Bomford and J. Caughley (eds.). Sustainable Use of Wildlife by Aboriginal Peoples and Torres Straight Islanders. Australian Government Publishing Service, Canberra.

Brown, P.T. Cannery days: a chapter in the lives of the Heiltsuk. MSc. Thesis. University of British Columbia, Vancouver.

Cahill, T. 1995. How the Irish saved civilization: the untold story of Ireland's heroic role from the fall of Rome to the rise of medieval Europe. Hodder and Stoughton, London.

Freeman, M.M.R. and L. Carbyn (Editors). 1988. Traditional knowledge and renewable resource management in Northern Regions. Edmonton: University of Alberta.

Haggan, N. 1996. Integration of local environmental knowledge, p. 88-89. In D. Pauly and V. Christensen (eds.). Mass-Balance Models of North-eastern Pacific Ecosystems. UBC Fisheries Centre Research Reports, 1996, 4 (1).

Hunn, E. 1993. What is traditional knowledge?, p. 13-15. In N.M. Williams and G. Baines (eds.). Traditional Ecological Knowledge: Wisdom for Sustainable Development. Centre for Resource and Environmental Studies, Australian National University, Canberra.

Inglis, J.T. (Editor). 1993. Traditional environmental knowledge: concepts and cases. Ottawa: International Program on Traditional Knowledge and International Development Research Centre.

Johannes, R. E. 1981. Words of the lagoon: fishing and marine lore in the Palau district of Micronesia: Univ. Calif. Press. Berkeley.

Johannes, R.E. 1978. Traditional marine conservation methods in Oceania and their demise. Ann Rev Ecol Syst. 9: 349-364.

Kew, J.E. and J.R. Griggs. 1992. Native Indians of the Fraser basin: towards a model of sustainable resource use. In A.H.J. Dorsey (ed.). Perspectives on Sustainable Development in Water Management: Towards agreement in the Fraser River basin. Westwater Research Centre, Vancouver, University of British Columbia.

Kuhn, R.G. and F. Duerden 1996. A review of traditional environmental knowledge: an interdisciplinary Canadian perspective. Culture XVI (1): 71-84.

Ommer, R. 1994. One hundred years of fishery crisis in Newfoundland. Acadiensis 23 (2): 5-20.

Pauly, D., V. Christensen, J. Dalsgaard, R. Froese and F.C. Torres Jr.. 1998. Fishing Down Marine Food Webs. Science, 279: 860-863.

Pitcher, T.J. and D. Pauly. 1998. Rebuilding ecosystems, not sustainability, as the proper goal of fishery management. Pp. 311-329. In: T.J. Pitcher, P.J.B. Hart, and D. Pauly (eds.) Reinventing Fisheries Management. Chapman and Hall, London.

Richardson, A. 1982. The control of productive resources on the Northwest coast of North America. In N.M. Williams and E.S. Hunn (eds.). Resource managers: North American and Australian hunter-gatherers. Canberra: Australian Institute of Aboriginal Studies.

Ruddle, K. and R.E. Johannes (Editors). 1985. The traditional knowledge and management of coastal systems in Asia and the Pacific. Jakarta: Unesco.

Walters, C.J. and J. J. Maguire. 1996. Lessons for stock assessment from the northern cod collapse. Rev. Fish. Biol. Fisheries 6: 125-137.

Walters, C.J. and P. H. Pearse. 1996. Stock information requirements for quota management systems in commercial fisheries. Rev. Fish. Biol. Fisheries 6: 21-42.

Weinstein, M.S. 1994. The role of tenure and the potlatch in fisheries management by Northwest Pacific coast Aboriginal societies. American Fisheries Society Workshop, Vancouver BC. MS.

Williams, N. and E.S. Hunn (Editors). 1982. Resource managers: North American and Australian hunter-gatherers. Canberra: Australian Institute of Aboriginal Studies.

Vancouver, BC V6T 1Z2. Phone: (604) 822-5991. Fax: (604) 822-9003. E-mail: judewill@unixg.ubc.ca.

Winship, Arlis: UBC Marine Mammal Research Unit: 2204 Main Mall, Vancouver, BC V7R 2L7. Phone: (604) 822-8181. Fax: (604) 822-8180. E-mail: winship@zoology.ubc.ca.