Salmon Farms and Salmon People:

Applications and Directions for TEK in Aquaculture management

The decline of the wild salmon fishery in British Columbia- a result of poor resource management and environmental degradation- has prompted the growth of an alternative fisheries industry for the province, which promises and economic development for coastal communities. This new industry is aquaculture. Aquaculture is defined as the "farming of aquatic organisms including fish, mollusks, crustaceans and aquatic plants with some sort of intervention in the rearing process to enhance production (Tollefson & Scott, 2006, p.5)." The cultivation of marine organisms is not actually a new idea, and has been practiced on the Northwest Coast by generations of First Nations who tended clam gardens and enhanced seaweed production in their territories (Moss, 1993; Turner & Clifton, 2006). However, the farming of salmon, mainly Atlantic salmon, is an introduced practice, and with it comes environmental concerns about the impact on wild fisheries and human well-being. The aquaculture industry is looking to "Traditional Ecological Knowledge" (TEK) of coastal First Nations to provide information on how to minimize environmental impact and manage the resource in a more sustainable manner. Can TEK be incorporated into the industry this way, or is the utilization of TEK an attempt to placate First Nations and quiet their opposition to salmon farm operations? This paper will explore the applications for and problems with TEK integration in the aquaculture industry.

Fish farms are most highly concentrated in the Broughton Archipelago off Vancouver Island, which boasts over 20 salmon farms. First Nations have expressed concern about the adverse environmental impacts from fish farm operations in Broughton, where wild pink salmon runs have faced a dramatic decline, due to sea lice infestation (Morton, 2004). First Nations have also noticed adverse impacts from fish farms in their traditional harvest sites for herring spawn, seabirds, and shellfish (Schreiber, 2002). In interviews with the Namgis First Nation a respondent said "It's a really sad industry for me to watch because I see the impact every time I am out on my boat. I see that changes in the clam beds; I see the changes in the clam beds; I see the changes in wild stock. Lice everywhere and it is going to be the major killer of the wild"species (Richmond et al., 2005, p. 359). Another informant asserted that "we'd probably lose our crabs, because the biggest impact that we have been trying to promote awareness on is the damage to the floor bed…the sea bed. That would mean our crabs would more than likely suffocate or just go away…what we know so far is that it's not just underneath the farms. It spreads out" (Richmond et al., 2005, p. 359.) Environmental Organizations, such as the David Suzuki Foundation, are using TEK that speaks to the environmental damages caused by fish farms, to support their campaign against the industry (Richmond et al., 2005). However, the question remains if TEK can be utilized by the industry itself, to improve its resource management practices.

The Union of BC Indian Chiefs is vehemently opposed to fish farming in First Nations traditional territories, and the majority of indigenous nations in BC support this position (Schreiber & Newell, 2006). In 1998 the T'Sou-ke Nation, concerned about pollution caused by fish farms, served Prime Pacific Seafarms, operating within their territory, with an eviction notice ("Band Serves", 1998). In 2003, the Sierra Legal Defense Fund launched a lawsuit on behalf of the Namgis nation and three other bands, against fish farms in the Broughton Archipelago, the traditional territory of the Kwakwaka'wakw ("BC Natives", 2003). The Namgis, Heiltsuk, and most other First Nations maintain a zero-tolerance policy towards salmon aquaculture (Schreiber & Newell, 2006). Such opposition minimizes the possibilities for aquaculture companies to work together with First Nations to incorporate TEK into their management schemes.

There are a few First Nations in the province who are in favour of aquaculture for the employment opportunities it creates for their community (Gerwing & McDaniels, 2006). The Kitasoo/Xai'xais operates its own salmon farm in partnership with Marine Harvest Canada (Schreiber & Newell, 2006). This decision was spurred by historical unemployment as high as 85 percent (Hume, 2004). In September of 2002, the Ahousaht Nation, who formerly objected to aquaculture in their territory, signed a protocol agreement with Pacific National Aquaculture, which operates in their traditional territory of Clayoquot sound (Schreiber, 2002). The agreement granted fish farms access to the First Nations' traditional territory in exchange for input in the environmental monitoring and research process, as well as for recognition of hereditary chiefs

(Schreiber, 2002). In the opinion of Anne Atleo, Deputy Chief Councillor for the Ahousaht, the situation is not ideal, but since fish farms already operate in their territory they wanted some control and influence in the industry's operations (Schreiber & Newell, 2006). In cases such as this, TEK can be a vehicle for First Nations to exert their influence on the industry in their territory.

There is a tension, however, between sharing TEK to influence decisions of industry and using TEK to exert their inalienable rights to control their own resources. This tension is evident among communities in the Skeena watershed (Menzies, 2006). Kitkatla, a Tsimshian community in the Skeena watershed is in support of aquaculture development in their territory, whereas the Wet'suwet'en, Gitxsan, Gitanyow, and Allied Tsimshian Tribes in the adjacent territories are in opposition, fearing the impacts on the Broughton Archipelago will occur in their territory (Schreiber & Newell, 2006).

All salmon farming operation in British Columbia fall within the unceded traditional territories of the diverse coastal First Nations (Gerwing & McDaniels, 2006). Ocean tenures for these farms are granted to multinational aquaculture corporations without the approval of the First Nations that have an aboriginal claim to that land (Schreiber, 2002). However, as a result of recent judicial decisions, the government and industry have legal obligations to consult with First Nations on resource management and land use decisions in their territory and integrate First Nations' values into decisions (Gerwing & McDaniels, 2006). Consequently, Gerwing and McDaniels suggest that "First Nations' values

regarding salmon aquaculture need to be articulated in a way that can help structure and inform resource management decisions" (2006, p.261). They conducted interviews with native peoples at Ahousaht, Alert Bay, Bella Bella, and Fort Rupert, using a model in which feedback and advice was sought from participants through to the end of the process. These four First Nations communities all have salmon farms operating in their territory that employ members of their community (Gerwing & McDaniels, 2006). The responses were compiled into the themes of farm locations, perceived costs and benefits, decision processes, and potential consequences. These concerns included, but were not limited to, the location of farms near wild salmon streams, clam beaches, and seaweed forests, as well as issues of profit distribution and decision authority (Gerwing & McDaniels, 2006). These values and concerns were then characterized into objectives and performance measures for aquaculture decisions, such as to "promote protection of the natural marine environment" and "promote good governance of salmon aquaculture" (Gerwing & McDaniels, 2006, p. 270). Incorporating indigenous values within TEK integration frameworks is important to prevent the distillation of TEK (Nadasdy, 1999), and therefore this value-focused thinking is a useful application of TEK in aquaculture.

Gerwing and McDaniels' intention in applying value-focused thinking was "to help redress power imbalances" (2006, p.263), but inequalities of power cannot be eliminated if First Nations do not, themselves, have decision control (Nadasdy, 1999). Ultimately, aquaculture in First Nations' traditional territories

is a question of sovereignty (Menzies, 2006). The salmon farming industry avoids dealing with historical circumstances and issues of sovereignty by incorporating TEK into their existing framework of production (Schreiber & Newell, 2006). Resource managers and scientists perceive and conceive of TEK differently than indigenous people. From the industry's perspective TEK is "local indigenous knowledge, outside the realm of Western science, that can enhance existing resource management practices and be a way of establishing better relations (i.e., eliminating contention with local First Nations in the pursuit of existing resource management goals" (Schreiber & Newell, 2006, p.80). Fish farm companies consider First Nations demands for land and resource rights to be outside the realm of TEK. Rather, for them, TEK is a product that can be integrated and hybridized with their own existing meanings and framework (Schreiber & Newell, 2006). The aquaculture industry has falsely assumed that the conflict with First Nations over fish farming can be alleviated by collecting practical bits of information from First Nations "without regard for the history, culture, or political context within which that knowledge arose (Schreiber & Newell, 2006, p.82)."

There is a danger that continuing arrangements in which TEK is transferred from First Nations communities to fish farms, before the underlying question of sovereignty is resolved, will only further disguise power imbalances, and potentially "legitimate the ongoing transfer of Aboriginal waters to fish farming companies without treaty (Schreiber & Newell, 2006, p.99)." In the interim, working together with First Nations to incorporate traditional ecological

knowledge, including value-focused applications, into aquaculture management has many practical applications. Ultimately, however, fish farm companies need to recognize the issue of sovereignty that is at the core of both TEK, and First Nations' opposition to aquaculture in their waters.

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