

...Weirs...

Report and Annotated Bibliography compiled by

Alyssum Nielsen

*Submitted in partial fulfillment of
ES481A: Community-based Research in Clayoquot Sound (Summer Session 2005)
School of Environmental Studies, University of Victoria*

Background

The First Nations people on the west coast of North America use fish weirs to catch fish. Fish weirs are just one of the traditional fishing techniques employed in this area of the world. It is a popular way to catch fish as it is very productive; many fish can be caught at a time. Weirs vary depending on the target fish species, the marine environment, the available building materials, and the culture of the people. Fish weirs can be tailored to catch a specific fish. One of these fish species is the salmon. The salmon are caught in this manner during their migratory journey.

Weirs are fence-like structures that allow water to flow through but prevent fish from doing the same. Weirs are made from the resources extracted from the region in which the weir is constructed. Typically weirs were either made from trees or stones. The term 'fish weir' can encompass a large variety of tools used to capture fish. The two main types are river weirs and ocean or tidal weirs. Both of these types of weirs can be used by themselves or in conjunction with a trap.

River Weirs

Salmon annually migrate through the ocean. The salmon lifecycle dictates that, upon maturity, the salmon must return to the river of their birth to spawn. This migration means two things to the technique of weir fishing. First, it can be predicted when the salmon will come, or, in the words of Daniel Conner and Doreen Bethune-Johnson, the authors of *Our Coast Salish Way of Life*, "the passing of the months was told by the

return of the salmon.” Secondly, salmon have a strong desire to enter streams or rivers to spawn.

Weirs are constructed on shallow slow-moving rivers. Typically, river weirs are fence-like structures that obstruct the path of salmon on their migratory journey. Weirs consist of several large stakes lodged into the river bed at intervals. These posts are pounded into place with a piledriver. Lattice work is intertwined between the stakes to form a fence impenetrable by fish. Typically, the latticework is made of cedar boughs, maple saplings, or other available resources. The stakes are permanently put into the ground; however, the lattice work is removed after the salmon run to avoid damage. Figure 1 shows a picture from the BC Archives website of a fish weir on the Cowichan River.



Figure 1. Fish weir on the Cowichan River.

Source: BC Archives website <http://www.bcarchives.gov.bc.ca>

(Last accessed June 23, 2005)

River weirs work in a number of ways. One way is to form a solid fence to prevent passage to the salmon. Due to the salmon’s strong desire to continue up stream to spawn, they wait at the fence. The fish can then be speared or netted by waiting fishermen. Another option is for the weir to guide the fish into a trap. Two fence-like

weirs form a 'V' shape that funnels the salmon into a trap. Figure 2 is a drawing of how archaeologists presume fish weirs work. This picture shows a trap at the end.



Figure 2. Archaeologists' depiction of how fish weirs work.

Source: Department of Transport website

http://www.highways.gov.uk/roads/projects/a_roads/a6/alvaston/arch/images/fish_weir.jpg

(Last accessed June 23, 2005)

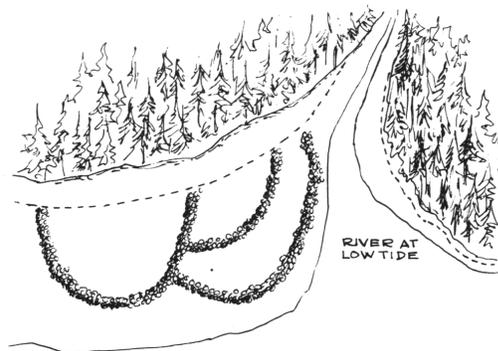
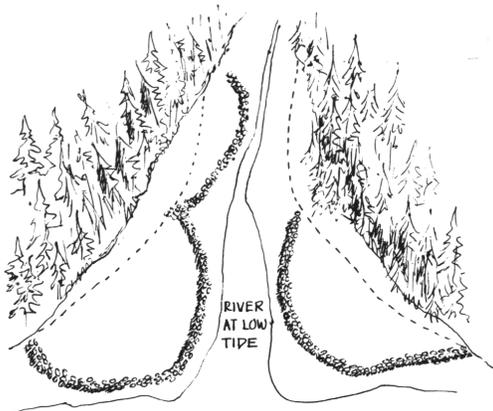
Ocean or Tidal Weirs

As the name suggests, ocean weirs are dependent on the tide. Water moves in on the flood tide and out on the ebb tide. Tidal weirs depend on the fact that migrating salmon will move with the water inland and then back out to sea. Ocean or Tidal weirs are constructed on shore in a crescent shape. Typically they are tall structures made of either wood or rocks. Rock weirs are made of large boulders mounded together to form a high rock wall. The weirs are so successful that often the entire shore line is filled with these weirs. Wooden weirs are made similarly to river weirs; however, they are typically higher. On the flood tide fish move inland over the weir, when the tide recedes, the salmon are stranded on the shore side of the fence. Like river weirs, ocean weirs

can be constructed in conjunction with a trap. Figure 3 is from Hilary Stewart's *Indian Fishing*. It shows multiple examples of the crescent shaped tidal weirs.

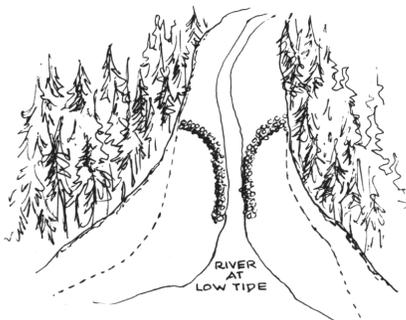
STONE TRAPS

--- HIGH TIDE
 — LOW TIDE

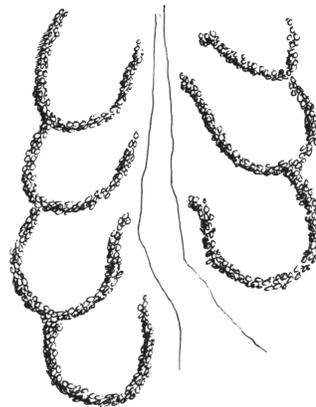


STONE TRAP AT MOUTH OF RIVER IN TIDAL WATER WHERE SALMON CONGREGATE PRIOR TO MIGRATION UPSTREAM. FISH DRIFT IN OVER ROCK WALL WITH INCOMING TIDE, ARE TRAPPED WHEN TIDE GOES OUT. 54 · KW

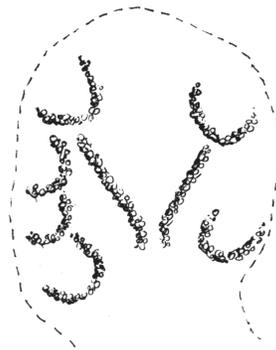
SERIES OF STONE TRAPS ON RIVER MOUTH BANK EXPOSED AT LOW TIDE - 54 · KW



ROCK ALIGNMENT. QUITE LIKELY USED WITH BASKET TRAP AT NARROWED NECK 54 · KW



WING DAMS SOMETIMES BUILT IN MULTIPLE GROUPS ON RIVER BANKS 28 · KW



APPROXIMATE LAYOUT OF TRAPS IN BAY ON MITELNATCH ISLAND. V NECK PROBABLY FUNNELLED FISH INTO BASKET TRAP. CS

Figure 3. Crescent shaped tidal weirs.

Source: Stewart 1977: page 120.

Traps

Fish weirs can be used in tandem with a trap. Traps can act as a holding cell for fish to be harvested at a later point. This makes the weir very low maintenance. Traps can also lead fish into an area where they are harvested immediately. Another trap design is to have multiple long narrow tunnels for fish to swim down. These tunnels are too narrow for fish to turn around. Alternatively, traps can take the form of a maze. These traps confuse the fish and make them unable to exit the trap.

Summary

Fish weirs are used by the First Nations people of British Columbia to catch fish. They are a very productive way of fishing. As such they are considered, according to Shelly Reid of the Royal British Columbia Museum, an “ingenious fishing technique.”

...Annotated Bibliography...

Salmon and Weir References

1. **Conner, Daniel C. G. and Doreen Bethune-Johnson, 1984.** *Our Coast Salish Way of Life – The Squamish*. Prentice –Hall Canada Inc, Ontario.

This educational children's book discusses many aspects of the Coast Salish culture and traditional life style. Chapter 8 is devoted to the interaction between humans and salmon. In this chapter the Squamish peoples' respect for salmon is discussed. Traditional weirs are explained in this section. A picture from this book has been included in the accompanying paper (see Nielsen 2005).

2. ***First Nations Portraits***, Peter von Puttkamer (director), Gryphon Productions, 1995.

The fifth section of the film ***First Nations Portraits*** highlights the traditional fishing techniques of the Nuu-chah-nulth people of Port Alberni. This short film was done in association with the Province of British Columbia: Ministry of Education, Skills and Training.

3. ***LAXWESA WA: Strength of the River***, Barb Cranmer (director), Nimkish Wind Production and National Film Board of Canada, 1995.

LAXWESA WA: Strength of the River is a film by filmmaker Barb Cranmer of the 'Namgis First Nation. The film is a documentary of traditional fishing techniques of the Sto:lo, Heiltsuk, and 'Namgis First Nations. The film interviews elders and other members of the band about their experience with fishing. The film explores traditional fishing techniques and explains how these techniques are still used today. The focus of this film is on salmon fishing; however, other fish stocks are discussed.

4. **Pacific Coast Salmon Fisheries** website
<http://collections.ic.gc.ca/pacificfisheries/techno/weir.html>

This website discusses a wide variety of fishing and fish processing techniques. A substantial portion of this website is devoted to weirs making it one of the best sources on salmon weirs. Both river and tidal weirs are discussed in detail. The website also discusses weirs in relation to culture.

5. **Reid, Shelley E.**, "The Beauty of Technology." Royal British Columbia Museum website
<http://www.royalbcmuseum.bc.ca/hhistory/beautyoftechno.html>

The Beauty of Technology is an overview of traditional fishing techniques. The ocean was the main source of food for West coast Aboriginal people including pacific salmon,

eulachon, halibut, cod, sturgeon, seaweed, sea mammals, and shellfish. Traditional tools were made from the resources from the forest, rivers, and the sea. This article reviews many of these traditional fishing techniques including two-piece hooks, hooks of bent yew wood, lures, dip nets, basket traps and stone and pole weirs.

6. **Stewart, Hilary, 1977.** *Indian Fishing: Early Methods on the Northwest Coast.* Douglas & McIntyre, Vancouver.

This is a very good source for traditional fishing techniques. There are many drawings of fish weirs in use. These aid the reader's comprehension as they show visually what has been written about in many other sources.

7. **West Coast Vancouver Island Aquatic Management Board** website
http://www.westcoastaquatic.ca/fisheries_overview.htm#WeirsTraps

This website discusses a wide variety of traditional fishing techniques. A portion of the website is devoted to weirs. The website discusses the functionality of weirs. It also discusses the present day use of weirs as a way of selective fishing.

Pictures

8. **British Columbia Archives** website
<http://www.bcarchives.gov.bc.ca>

The British Columbia Archives website is an excellent source for visual representations of salmon weirs. Twenty-four photos representing a wide variety of examples of river and ocean weirs have been included in the accompanying paper (see Nielsen 2005). These weirs are located throughout British Columbia. The BC Archives has almost all of their photos on-line currently and is working towards making the rest of their photo collection available on-line.

9. **Croes, Dale R. ed. 1976.** *The Excavation of Water-saturated Archaeological Sites (wet sites) on the Northwest coast of North America.* National Museum of Canada, Ottawa.

This is an academic book about archaeological sites. Section 3 concerns the Wapato Creek fish weir site in Tacoma, Washington. Three photos of this archaeological dig have been included in the accompanying paper (see Nielsen 2005).

10. **Department of Transport** website
http://www.highways.gov.uk/roads/projects/a_roads/a6/alvaston/arch/images/fish_weir.jpg

This British website contains one drawing of a fish weir that closely resembles the fish weir at Hesquiaht Harbour. This photo has been included in the accompanying paper (See Nielsen 2005).

11. **Pacific Coast Salmon Fisheries** website

<http://collections.ic.gc.ca>

This website has an adequate supply of visual representations of salmon weirs. The most compelling photos are those of current day remains of weirs like that of Hesquiaht Harbour. These photos come from the Campbell River Museum and the Royal British Columbia Museum. Five photos of past and present weirs have been included in the accompanying paper (see Nielsen 2005).

12. **University of Southampton** website

<http://www.arch.soton.ac.uk/Projects/projects.asp?ProjectID=4>

This British website discusses research concerning fish weirs that is being done in the United Kingdom. There are two interesting visual representations including a photo of the remnants of a fish weir and a drawing of a recreation of the same fish weir. Both of these photos have been included in the accompanying paper (see Nielsen 2005)..

13. **Watershed Watch Salmon Society** website

<http://www.watershed-watch.org>

This website contains one photo of a weir under the “selective fishing” section which has been included in the accompanying paper (see Nielsen 2005).

General Fishing References

14. ***Counter Currents: the fight for fish on the Fraser River***, Filmwest Associates, 1993.

Counter Currents: the fight for fish on the Fraser River is a very interesting film that discusses the politics that revolve around Aboriginal food fishing. Salmon is a mainstay of the Aboriginal culture and economy; however, fishing and the selling of fish was made illegal at the turn of the century. In 1992, certain Native communities became the first to sell their fish legally in over one hundred years. People from the community were hired and trained as Aboriginal Fisheries Officers to enforce regulations. The film also discusses the importance of teaching Aboriginal children traditional fishing techniques.

15. ***Hearing the Native Voice***, University of Victoria, 1996.

Hearing the Native Voice is a film that acts as a discussion of fisheries management in the past and present. The discussion is facilitated by Hamar Foster, a professor of legal history specializing in Aboriginal Law at the University of Victoria. The three discussers are Mark Point of the Sto:lo Nation, Edwin Newman of the Heiltsuk Nation and Simon Lucas of the Aboriginal People’s Fisheries Commission of British Columbia.

16. ***T'LINA: The rendering of wealth***, Barb Cranmer (director), Nimkish Wind Production and National Film Board of Canada, 1999.

T'LINA: The Rendering of Wealth is a film about 'the only free fisheries left': the eulachon. This fascinating film demonstrates traditional methods of fishing eulachon at night and during the day. The film goes on to show the traditional process of grease making. The final portion of the film shows the importance of eulachon grease to the potlatch ceremony. The film sites logging as the main reason for declining eulachon stocks.

Note: All internet sites were last accessed June 23, 2005.