

XVII International Congress on Dry Stone

“Dry stone perspectives: challenges after the UNESCO inscription”

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Fishing Traps and Weirs

Summary:

An overview of dry stone fishing traps and their relevance to coastal communities. Found worldwide, their role in sustainable community fishing has declined sharply due to competition from factory trawlers.

Keywords: *Sustainability, coastal, river, seasonal, trap, weir.*

Introduction

Dry stone structures are frequently used to make use of water. Terraces and check dams control the flow of water down slopes, dry stone dams control rivers, canal systems, while irrigation channels follow contours to deliver water to crops. In these cases however, stone is used with soil behind the structure, particularly clay for pond linings, dams and wells. Stone on its own with water is much more rare however. Fast flowing streams can be guided in mountainous regions to local small mills with stone walls alone over short distances. The loss of water laterally is insufficient to reduce the efficiency of the mill by a meaningful amount. Another use of stone walls alone with water is for fish traps. These seldom attract a great deal of attention, yet are found on coasts and rivers worldwide.

Fish traps are also called weirs, the word derived from ‘wer’, an Anglo Saxon word, one meaning being ‘a device to catch fish’. They were sometimes built of wood, especially on the east coast of England, but stone was more durable and used where available..



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Figure1 water mill fed by dry stone lined water channels alone. (no backing)

How do they work? In Great Britain the more traditional form was one or more rock walls built between high and low tide, as close to the low tide point as possible, with a small gap. The tide would overtop the wall, allowing some fish in (but mainly through the gap) and the gap also prevented obstruction to river traffic. The gap could then be blocked by a temporary wooden fence when the tide turned to flow out again. However, they were frequently built across rivers as well, where they could catch migrating salmon or sea trout travelling upstream, or eels migrating the other way. Seasonal runs of migratory salmon and sea trout swim through marine river channels that at low water often act as holding pools. The fish would then use the ebb or flood tide to progress further down or upstream. The traps were placed at right-angles or obliquely to the channels so that the fish could be prevented from continuing their journey. The principle was very similar everywhere however, with just local differences.



Figure 2 Fishing Weir, Countisbury Cove, Somerset, UK

Fish traps often provided a massive supply for very little effort, bar that of hauling the trapped fish from behind the walls in nets, baskets or with spears. However, the catch was highly dependent on the run of fish – In the UK it would probably be mackerel, salmon and herring, or elsewhere in the world, sardines, mullet or anchovies. There were months of hardly any catch, then a substantial glut for drying or salting. Hence, fish traps rarely provided full time employment, but rather were the ancillary occupation of coastal dwellers, usually farmers. In most parts of the world, fish traps declined in use after the beginning of the development of trawlers. These not only provided year round employment, but also reduced the amount of fish close inshore.



Figure 3 Fish trap, The Menai Straights. Anglesey Wales, in the UK has at least fifteen traps alone.

Wherever the trap, construction methods were similar, with adaptation to local conditions. The walls were usually around one to one and a half metre tall, and also quite thick, although some 'guiding' walls could be lower than this. The tidal forces and storms meant that there had to be regular maintenance. A gap was nearly always left to allow a number of fish to pass, allowing for replenishment of the stock, and it was quite likely the gaps between stones were also calculated to allow small fish to escape. Often weirs were constructed with curves, taking advantage of the tendency for fish to turn around when they hit a curved surface. The fish will keep turning, continually hitting curves in the weir, and ultimately get stuck. For many centuries, stone weirs were considered an ideal method for catching fish, not only because of the sheer volume that could come in with the tide, but also because they created diverse tidal pools. The weir enclosures stimulated an abundance of oyster, shrimp, crab and anemones.



Figure 4 Fish trap,

As mentioned, fish traps are not noticed much these days, but there are countless examples from nearly every coastline in the world. In England the earliest reliable (albeit circumstantial) evidence for individual fish traps so far published, dates from the early Neolithic (approximately 6,000 years ago), but traps in association with weirs have been excavated in Ireland that are 8,000 years old. Fish trap sites have been recorded in estuaries in all the UK countries. Other areas where fish traps have been noted are Bronze Age traps in Sweden, California and elsewhere by Native Americans, Canada, throughout the Pacific, Australia and in particular, Taiwan, where the Penghu area is famous.



Figure 5 Cherokee fishing weir, Smokey Mountains, N. Carolina., USA

These latter are worthy of further attention. Penghu' is currently the most densely populated 'weir area' in the world, and they are listed as one of the most important cultural heritages of Taiwan, yet In Britain they seem to attract little attention. Back in the late 1600s and early 1700s, fishing in Taiwan was a major enterprise. Fisherman were known to catch hauls that could reach up to 1,300 pounds (c.500 kg.) and they were capturing them in particularly elaborate stone weirs. The largest, stretching nearly two miles long (3.2 kilometres) and about 900 feet (c.300 metres) wide, took decades to complete. Constructing the weirs was often a family project or one for the whole village, with one person in charge of the project who would select co-builders and delegate tasks. The group would observe tides over time and decide where to build the weir based on water flow and currents. Then, everyone would work together, stacking rocks to stop water from encroaching on the build site, lugging basalt to the spot to construct the main shape of the weir, and filling in holes with coral and limestone. This would seem very likely to have been the method elsewhere as well. Penghu fish traps are maintained for the demonstration and promotion of its local fisheries culture. The area continues to hold fishing demonstrations with these ancient engineering marvels today in a festival called the Penghu Stone Weir Festival. The biggest cluster of the weirs is around Jibei and Qimei Islands in Penghu, where 88 can be found close together.

Some can only be visited by boat, Overall, 570 of these structures dot the coast in the Penghu area. Though reminiscent of artistic works, these ancient tidal fish traps were used for centuries in Taiwan to feed the local community. The most famous of these traps, the Twin-Heart Weir (above), has become one of the most photographed destinations in Taiwan, particular for couples, and though originally built as an anchovy killing field, has become a symbol of romance. Other unique shapes include one that looks like a giant heart-shaped pendant on a necklace, and another structure that looks like two outstretched legs. The Penghu community maintains an effort to keep them in good shape as a tribute to its cultural practices and heritage. Penghu's collection of intact tidal traps is the largest to be found anywhere in terms of density.

As with so much else appertaining to dry stone, this is a huge subject barely touched on here. Fishing traps and weirs are like the stone walls we are all so familiar with – so common and such a vital and routine part of coastal communities around the world that their presence was deemed unremarkable and little recorded outside of archaeological interest. They represent a sustainable method of food production that worked very well until the advent of the mass extraction by factory fishing vessels. Take a trip to any rocky coast and there is a good chance you will find the remains of one.

More information:-

#alaskaextreme# How does a Fish Weir Work?

Historic England – River Fisheries and Coastal Fish Weirs

Philippine Quarterly of Culture and Society Vol. 37, No. 1 (March 2009),

Jennifer Billock, Smithsonian Magazine

Bill Jeffery - Furthering the Sustainable, Historical & Economic Role of Fish Weirs and Traps. (The final publication is available at link.springer.com)

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Short biographies of authors:

Richard Tufnell is a dry stone consultant, specializing in large scale dry stone structures. He has advised governments and NGO's in more than forty countries, has published numerous journal articles and booklets, and has pioneered techniques for use in the developing world. He has been given numerous awards for his services including an Honorable mention in the Rolex Awards, and received the BBC's Small Rural Business Award. He continues to research. Recently he analysed the landscape around Batir, a World Heritage site on the West Bank with Antonia Theodosioua..

