

REBOUNding FROM EXTRACTIVISM

The history and re-assertion of traditional weir-fishing practices in
the Interior Sea of Chiloé

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ABSTRACT: This study analyses the use of traditional fishing weirs in the Interior Sea of Chiloé, in southern Chile. Although fishing weirs were in operation the time of the arrival of the first Europeans in the area in the mid-16th Century, when the indigenous Chono and Williche populations led distinctly aquapelagic lifestyles, we contend that they proliferated in subsequent centuries during the process of *mestizaje* (mixing) between indigenous populations and Spanish settlers and in response to the pressure exerted by population growth and associated social transformations in an insular location. Weirs remained in use until the second half of the 20th Century but have fallen into disuse in recent times due to the profound socio-productive changes resulting from modern development models favouring intense extractivism. Such developments have exacerbated socio-environmental conflicts and caused a population decline in small islands in the region. Based on our discussions of the above, we propose that the traditional insular fisheries model has allowed sustainable inhabitation of these islands; that its decline has dismantled key community assets; and that a return to socially-managed, non-extractivist fishery practices is essential for regional communities.

Keywords: Fishing weirs; the Interior Sea of Chiloé; sustainable fisheries; extractivism

Introduction

The Interior Sea of Chiloé¹ marks the northerly beginning of the variegated fjordland coast of Chile that extends south to Cape Horn. Bordered by two regions (Los Lagos and Aysén) and four provinces (Llanquihue, Chiloé, Palena and Aysén), the sea contains around 100 islands, almost half of which have been assessed as being inhabited and/or visited by humans at some time during the last 6,000 years (Munita, Mera and Álvarez, 2017). At the time of initial European visitation to the region, it was home to two indigenous people, the Chono and Williche, who were highly dependent on and skilled in harvesting and marine flora and fauna, creating what Hayward (2012a) has characterised as an “aquapelagic assemblage”, in which the aquatic spaces between and around groups of islands are utilised for livelihood activities in a manner that is fundamental to communities’ habitation of land and their senses of identity and belonging. In its present form, the region is a complex space, which Ther Ríos has characterised as comprising “a territory of sea and sea border loaded with ports and places of arrival, in which different maritime routes converge between islands and populated sectors that structure trajectories and dynamics embodied in memories of the past and imaginary of the future” (2011: 68).

The islands and northerly shores of the Inland Sea are also notable for having the greatest concentration of multiple marine-coastal uses in Chile (many of which are incompatible with each other). There are hundreds of fishing weirs – many currently in a state of neglect – scattered across the region (Figure 1). Most of these weirs are found on smaller islands and on the northern continental fringe of this area. Our research has primarily focused on these smaller islands (defined as having a land area of approximately 80 km² and below) because it is on these that traditional insular lifestyles have existed in the most intense forms (Skewes, Álvarez and Navarro, 2012). While these have been historically robust, they are currently fragile.

Around 9,600 people currently reside on these minor islands (2017 census), existing within a pluri-active subsistence economy that allows them to survive comfortably without requiring or generating money. As a result of their primarily cash-less lifestyle, local populations are significantly immobilised and currently face a series of regulatory restrictions on their capacity to fish, collect and/or trade their products. But despite increasing intervention into the marine and terrestrial situation of the region by outside corporate and/or administrative bodies, the populations of the islands continue to demonstrate a surprising resilience. Conversely, those islanders who have migrated to cities to pursue more contemporary lifestyles have realised that traditional community assets, such as solidarity, do not operate in the cities, where they are forced to overcome their problems in relative isolation, establishing a cycle of economic dependence on the state and private entities in order to continue to have even the most marginal access to the satisfiers that motivated them to abandon their islands in the first place.

¹ While the maritime area that extends from the Reloncaví Basin towards the south is generally referred to as an interior sea although it might more accurately be characterised (after Whittow, 1998) as a *marginal sea* - being a portion of partially closed sea that has a significant opening towards the ocean (as opposed to his definition of an *interior sea* as a large body of isolated salt or brackish water, without connection to the open sea). Marginal seas occur in depressed areas of the latter (and this definition is appropriate to the interconnected Reloncaví, Ancud and Corcovado gulfs as well as to the channels between the region’s archipelagos. Following common linguistic usage, we refer to it as an *interior sea* throughout the article.

The solid materiality of the region's fishing weirs (Figures 2 and 3) – many of which were functional until three decades ago - has allowed them to resist the onslaught of waves over an extended location (albeit with periodic repair, which is currently in abeyance in most areas). Historical records indicate that these stone weirs were complemented by an enormous number of interwoven reed fish weirs in former times; however, due to the perishable materiality of the latter, they are no longer present (even in remnant forms), although they still persist in cultural memory and in the oral history provided by older inhabitants. Weir-based fisheries operated during periods in which marine resources were abundant before the current extractivist model came into operation. As Gómez-Barris has identified, extractivism is dedicated to the conversion of local primary resources into globally tradeable commodities in a process that “violently reorganizes territories as well as continually perpetuates dramatic social and economic inequalities that delimit Indigenous sovereignty and national autonomy” (2017: xviii).

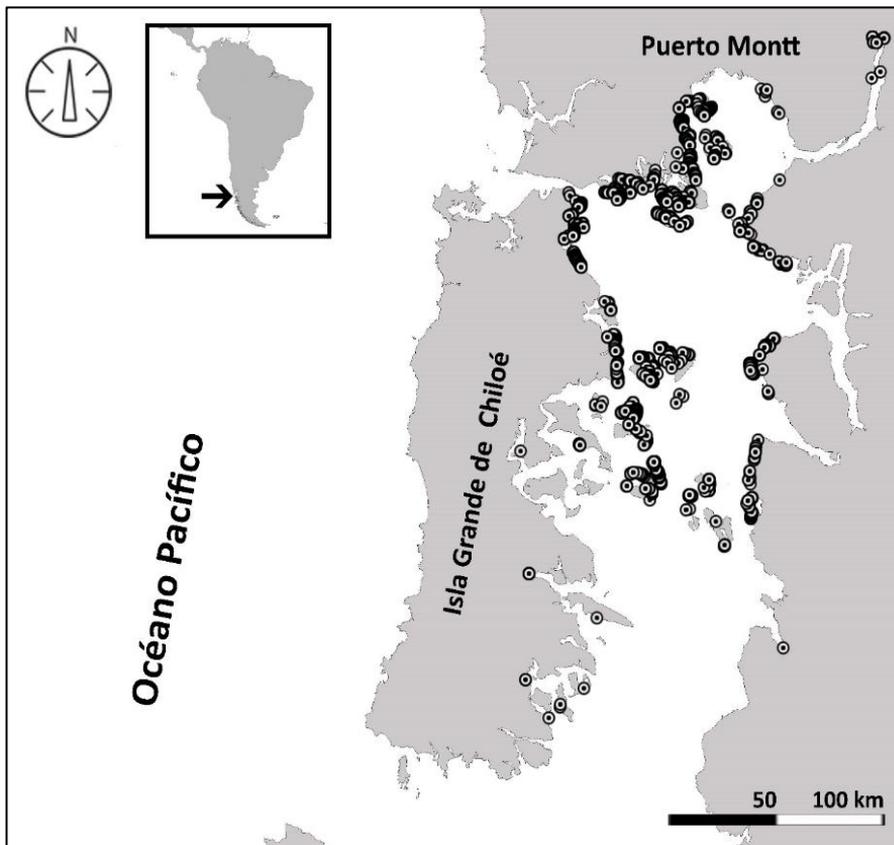


Figure 1 - Fishing weirs (represented by points) detected through surveys and remotely (through Google Earth) in the Interior Sea of Chiloé. (Map prepared by the authors.)

As Burchardt and Dietz have identified (2014: 469-470) contemporary extractivism² has two key features:

- 1) its domination by transnational agencies that extract and export both natural resources and the profits they can make from them; and
- 2) the support that this enterprise has been given by national governments that have actively cooperated in facilitating international agencies' activities.

Within this model, increased access to marine resources by external agencies was normalised and actively facilitated by the Chilean state from the 1970s on; encouraging the development of extractive industries while weakening the viability of local communities to use ancestral methods to access fish and shellfish.

Different types of fishing weirs

At the global level, fishing weirs take multiple forms, including wooden weirs (often composed of stalks rooted in the intertidal substrate and interwoven with foliage or other materials) and stones piled on top of one another to create walls. In Europe, the weirs around Cadiz, in south-western Andalusia (Spain), are well-known (Florida, 2014) and there is a shellfish weir gatherers association (named Jarife) that protects and promotes this fishing practice in the face of normative transformations that threaten it.³ Elsewhere in Europe, there are weirs in France (Langouët and Daire, 2009; Bordereaux, 2009; Daire and Langouët, 2008, 2010), Denmark (Fischer, 2004, 2007), and England (O'Sullivan, 2004; Cooper, 2017). Outside of Europe there are also fishing weirs in Africa and the Middle East (Huyge, 2005; Gribble, 2006), in Japan, Korea, and Taiwan (Imamura, 1996; Billard and Bernard, 2008; Iwabuchi, 2014 and Luo et al, 2015); in Australia (Goodwin, 1946; Stockton, Memmott, Robins and Errol, 2008; Rowland and Ulm, 2011), and throughout Oceania (Dieudonne (ed), 2002; Jeffery, 2013). In eastern Asia and Micronesia, in particular, there are several notable examples. In Penghu island, Taiwan, the state has declared weirs a "cultural landscape" (Yu, Chu and Tsai, 2015) and in Yap, Micronesia, there are so many weirs grouped into narrow coastal spaces that complex social procedures are required to access the sea through them (Hunter-Anderson, 1981).

For North America, the literature is extensive (eg Johnston and Cassavoy, 1978; Decima and Dincauze, 1988; Bannerman and Jones, 1999; Moss and Cannon, 2011), with weirs existing in coastal areas (as in British Columbia) or in low rivers, forming part of the active heritage of indigenous American populations (Stewart, 1982).⁴ In Central America, there are marine weirs in Panama and its Las Perlas archipelago (Jimenez and Cooke, 2001; Martínez, 2004), Puerto Rico (García, 2002) and Cuba (Córdova, 1995). Lastly, in South America, there are significant weirs in Brazil, many located in fluvial and marshy environments that can be linked to an American-Portuguese ancestral *mestizo* origin (Hornborg and Hill, 2011; Mendes and Méndes, 2008). Colombia has a rich tradition of fluvial environments

² See Burchardt and Dietz (2014) for a summary of and reflection on the development of concepts of neo-extractivism by Latin American governments intent on returning some of the profits from extractivist practices to national socio-economic and infrastructural development.

³ See Jarife (nd) for details on their activities and membership.

⁴ The 1967 documentary *Netsilik Eskimos, VII: Fishing at the Stone Weir* (Quentin Brown, 1967), is especially interesting as an audio-visual investigation of the phenomenon.

(Calderón, 2010), in Ecuador there are marine weirs in the Ligüipi area and in Amazonic Bolivia there are ancient weirs linked to lacustrine and marshy environments (Erickson, 2000). Argentina has a history of marine weirs in the Gulf of San Matías, in the province of Río Negro (Cardillo and Scartascini, 2016) and in the Beagle Channel (Vázquez and Zangrando, 2017). In Chile, there are references to marine weirs between latitudes 4°S - 54°S (Álvarez et al, 2008) and it is possible to find structures both on continental marine coasts and on islands and in archipelagic systems (eg Furlong, 1917; Emperaire, 1963; Cárdenas et al, 1991; Torres, 2009; Borlando, 2016) and fluvial weirs also exist between latitudes 37°S - 42°S (Álvarez et al, 2013).

Fishing weirs in the Interior Sea of Chiloé

It is important to consider that the distribution of fishing weirs in the Interior Sea of Chiloé is due to several factors. The nature of the available intertidal zone is relevant with regard to the large tides that allow the existence of sandy beaches, mud or glacio-fluvial deposits, which fluctuate daily and are hospitable to the fish and other organisms that can take advantage of these spaces. Aquapelagic societies have developed to access this varied natural productivity since pre-Columbian times, orienting their patterns of life, settlement, materiality, coexistence agreements and cosmivision to this purpose. Their livelihood orientation was maintained after the arrival of European settlers and the formation of a *mestizo* ('mixed race') *Chilote* society in the region that practiced marine harvesting (using both indigenous and European techniques) and on-shore cultivation.

From the 18th Century on, the insular coastal settlements began to expand in size and population, as reflected in the distribution of weirs shown in Figure 1, which coincide with the island areas in which chapels and associated settlements were established. The model of life that was generated in these places involved an elaboration of resource harvesting techniques and technologies (and related cultural attributes) of islanders who sustained themselves in a limited environment until the second half of the 20th Century. At the latter juncture, the Chilean state disrupted local societies with large-scale regulatory changes that favoured the implementation of extractive industries over the socio-productive viability of small, regional communities. As a result, traditional communities' ways of accessing the sea and the coastline and distributing their catches underwent profound modifications and much of their traditional model and its artifactuality declined rapidly.

The decline referred to above was not only due to productive and technological factors but also involved the devaluation of an insular cosmology materialised through a particular form of cohabiting with non-human species in island spaces. The latter focus – still maintained by some indigenous territories in the region – produced insular worldviews that ensured sustainability (and thereby avoided generating the socio-environmental disasters generated by mass aquaculture that have typified the region in the late 20th and early 21st centuries). The validity of traditional practices and community trust in them was represented in ritual and festive practices that are not part of current development models (or their well-being ideals). The absence of such aspects in the prevailing extractivist model, is, we believe, the reason for conflicts among multiple users of marine environments because earlier worldviews provided an ethical basis to prohibit excessive harvesting (and/or other disruption of environments), showing awareness that such activities could jeopardise the sustainability of the species concerned and of the overall eco-system they formed part of.

The historical background to the regional use of weirs

The Los Lagos Region of southern Chile, an administrative territory measuring 230 km from north to south and 150 km from west to east, comprises a network of islands and postglacial fjords (Villagrán et al, 2004) that produce a coastline of approximately 4,600 km (FSP, 2016). This aspect is important because it accounts for the landscape's complexity, the multiple realities that it contains and for the complex form of inhabitation that this landscape materially expresses. Today, traditional livelihood practices are overlaid by modern artisanal fishing, industrial fishing, mytilid (mainly mussel) and salmonid aquaculture, passenger and freight transport operations, coastal housing developments and port works, etc. However, in many places, remnants of a traditional way of life that marked the landscape through particular features that were similar both on land and in the intertidal zone are evident in the form of hundreds of fishing weirs (Figure 2).



Figure 2 - Fishing weirs on Apiao Island, Quinchao commune. Note how this set of structures resembles the division of terrain for agriculture on land, illustrating the material expression of this insular culture. (Photograph: Drago Bartulín, 2004.)

To date, there is no clear indication of the age of weirs in the region. A report from the late 16th Century refers to the pre-Columbian existence of weirs, identifying the similarity between the weirs that the Spanish explorers observed and those that existed in Spain. Referring to a type of fish found in the area similar to that of the Spanish *arencada*, a Spaniard observed that they were sourced from weirs that were harvested in rotation (Vivar, 1558, cited in Vásquez de Acuña, 1988: 208). During the following centuries chroniclers and researchers described the weirs both in the area identified by Vivar and around the southern channels (Anrique, 1897; De Beranguer, 1893; Moraleda, 1888; Wever, 1903; Albert, 1913; Cavada, 1914, 1921, 1926; Emperaire, 1963; Olgúin, 1971; Plath, 1973; Cárdenas et al, 1991; Bridges, 2000).

The modern population of the region resulted from the early *mestizaje* ('mixing') between native and Spanish peoples around the Interior Sea and Chiloé and its fringing islands were effectively cut off from the rest of the conquered territories of the Americas for at least two centuries by both their territorial islanding and by the presence of Mapuche clans hostile to Spanish imperialist forces and settlers on the adjacent mainland. As a result, families dispersed along the coast of the insular sea followed a similar livelihood pattern and lifestyle to pre-existing indigenous populations and adopted many of their customs and culture (Garrido, Bendrup and Hayward, 2019: 13-27). Given this situation, and the vulnerability of the territory to attacks by corsairs and the incursion of foreign powers during the 18th Century, imperial authorities promoted a coastal settlement pattern aggregated around island chapels. Over time, these villages consolidated and continue to exist today (Álvarez, 2016).

As a result of their spatial martialling and restrictions on expanding agricultural and livestock production due to the limited land areas of their islands, settler families and communities intensified their weir-fishing activities to support the large numbers of indigenous people coerced into indentured labour under the *encomienda* system (Burgos, 2004) and the interest of local families in acquiring foreign goods through exchange or trade with other colonies located in Chile or Peru (which usually happened only once a year). The export of smoked fish was added to large shipments of fine woods (such as larch and cypress), knitted ponchos and hams. As Olgúin has identified, during the 18th Century:

Every year, quantities of smoked fish and salted sardines were sent to Peru. The extraction of these products was mainly carried out by weirs. These were stakes placed in the mouths of the inlets that, when filled with water with the rising tide, left the fish in the emptied tank-like area. The indigenous people were especially dedicated to this task. (1971: 51 – authors' translation).

The isolation to which this *mestizo* society was subjected meant that its needs and satisfiers had to be met internally. Rather than relying on imported technologies and materials, local communities had to use available resources and relied on ingenious, locally-made artisanal contraptions designed to serve livelihood needs (such as fruit-grinding machines manufactured entirely from wood and rock drills made from hard wood and stone that were used to bore for wells) and metal-free building construction methods that utilised similar techniques to wooden ship-building (the latter creating the region's distinctive, and now UNESCO heritage listed, wooden churches⁵). These (and other) innovative techniques and applications were community assets that helped to avoid conflicts and encourage coexistence by promoting access to and use of natural resources under the logic of a common goods system. The latter can be understood to have been premised on:

- a) collective work (manifested, for example, in *minga* practices, whereby groups of community members gather for activities such as collecting shellfish, repairing a house or tilling the land);
- b) festivities related to labour activities, ceremonies and recreational events; and
- c) cosmology (as an exercise in which taboos, rituals, and practices are constantly mobilised and in which nature and its elements possess the quality of subjects (rather than objects) and therefore are required to be treated and perceived under such premises).

⁵ See UNESCO (2000) for documentation of the listing.

Fishing weirs typify this model of life through a subtle system of ownership and access. Each weir belonged to a family or a group of families and protocols operated within this:

These fences belonged to a closed circle of families. For example, a weir belonged to eight families, which was normal... that preferably had to have blood ties, and only a falling-out or the death of a relative could allow another family to enter. No one could invade the territory that belonged to these family groups. The oldest families had greater control over the weir; in the case that some wanted to take more fish than others, it was solved by the oldest families, there was a type of hierarchy in this. (Man from San Juan, Isla Grande de Chiloé in Álvarez et al, 2008: 156 – authors' translation).

But despite the above, the distribution of what was harvested from weirs took place with an awareness of community needs, reflecting the community's participation in all operational phases, from their construction to their inauguration. The latter involved the performance of a rite called *treputo* or *treputun*, which consisted of the protection of the structure through the *guaqueo* (flogging) of the stones or palisade with bundles of aromatic plants⁶ that were considered magical after being passed through smoke. In the past, there was an individual called the *pougtén* ('shaman') or *curioso* ('folk healer') who was in charge of the ritual and who conducted the event by praying in indigenous language and burying objects (such vegetables from the garden, toys, a living lizard, etc.) in the mud or sand as a gift. The rite had a dual aspect. It aimed to both secure a bounteous harvest, by directing gifts and prayers were to tutelary spirits of the sea such as the (human-formed, female) *Pincoya* and to protect weirs from malevolent magical beings. The latter included the *cuchivilu*, a creature with a pig's head and serpentine tail that was prone to damaging weirs in the frenzy of its feeding on their contents and the more generally disruptive, goblin-like *trauco*. In both cases, the behaviour of these beings was perceived to depend in large part on the behaviour of humans. Local folklore reiterates that if there were quarrels over access to marine spaces and resources (including hoarding or other selfish attitudes) or a violation of taboos (such as gathering shellfish with metallic artefacts such as a hoes), these beings would respond negatively, causing an absence of fish and shellfish. As a result, taboos, rituals, and behaviours based on cosmogonic considerations were regularly met (Cárdenas et al, 1991; Álvarez et al, 2008; Álvarez, 2011; Álvarez and Ther, 2016).

When abundant numbers of fish were caught in weirs, the owners invited neighbours, (many of whom did not have access to weirs) referred to as *collis* ('voyeurs')⁷ to come and help themselves to the harvest:

And one day there were so many fish! The fish were [stacked] more than a metre high. He [my dad] woke up early to go see his weir and there was so much fish that he went all along the shore, from over there by Calle to Chucalén. telling neighbours to yoke their oxen to go to the weir and take the fish out before the tide rose. And everybody went down with carts... and they loaded everything. They went home very grateful for their neighbour. (Female from Quetalmahue, Isla Grande de Chiloé, interviewed in research for Ther, Alvarez and Vergara, (2011) – authors' translation).

⁶ *Laureliopsis philippiana*, *Pseudopanax laetevirens* and *Apium graveolens*, among others.

⁷ So-called because they were attentive as to whether there was a good tide and whether fishing had been successful.

In such acts of generosity and altruism, the will to strengthen the delicate social fabric of the island and the relational assets characteristic of this traditional model is manifest. Fittingly, fish collection was, in itself, a celebration, a joyful moment in which all families participated, including children, adults, and the elderly:

they all arrived... with carts, with horses during the night, with [burning] bundles of flax with which they illuminated and played... the lights they displayed were impressive, and they shouted from one side to another when there was a sea bass.... All the fish came together and gathered together in one place. For example, [if] it was divided by the eight families... a small part was always left to hand over to the collis, and those who had no share would go to look... with a face, as if to say: "if you could gift me two fish", something such as that... [Also] once they had fished, the real owners said: "well, now if you want you can also go to the weir and search through other fish that were hidden in the mud and all out there" (Man from San Juan, Isla Grande de Chiloé, in Álvarez et al 2008: 157 - authors' translation).

Transformations of the traditional model and the abandonment of fishing weirs

Fishing weirs were in daily use on the islands of Chiloé until the 1980s and, to a limited extent, continue to be used in some places, such as Maillen island, in Puerto Montt (Borlando, 2016), or in Caguach island, in Quinchao (Álvarez et al, 2008) (Figure 3). The abundance of weirs reflects an era in which shoals of fish were abundant, a situation that changed sharply with the introduction of modern commercial fishing and the industrial extractive processes associated with supplying fishmeal to the Chilean salmon aquaculture industry and the international market (Muñoz, 2009; Hucke, Lo Moro and Ruiz [eds] 2010). For this to be possible, the Chilean state designed a normative construct that opened up Chilean coastal waters to commercial fishers and restricted traditional coastal communities' fishing activities. In a short time, traditional rules were delegitimised and fishing weirs were exposed to audits and penalties as a result of their not being authorised in modern fisheries legislation (Fisheries and Aquaculture Law No. 18.892).

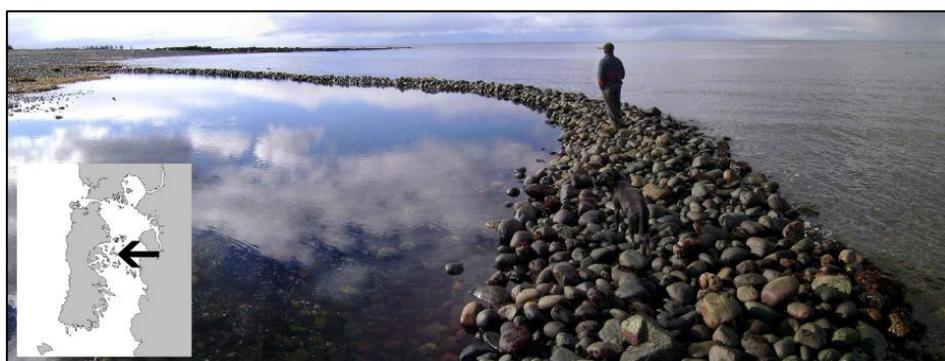


Figure 3 – A fishing weir on Caguach Island, Quinchao, where weir-fishing continues (Photograph: Ricardo Álvarez, 2008).

The end of the traditional model and its material expressions (such as fishing weirs) and immaterial expressions (such as festivities and cosmology) came hand in hand with

accelerated island depopulation. While depopulation is a phenomenon that has been occurring on and off since the 19th Century, it became exacerbated at the beginning of this millennium and an estimated population of at least 13,000 who inhabited the smaller islands of the Interior Sea in the year 2004 had declined to 9,000, according to the 2017 census. This migration is due to the search for the imagined comforts of urban life, to satisfiers based on consumer goods (education, health, food, shelter, etc.) and to the waged labour required to access these. However, because of the prejudice against inhabitants of the small islands (who are viewed as unsophisticated, parochial and old-fashioned), migrants often have difficulties in acquiring work and/or the professional training necessary to gain moderately well-paying jobs and attain the income necessary to living in urban areas.

As a result of the above factors, since the beginning of this millennium there have been hundreds of stone weirs in the intertidal zone of the Interior Sea of Chiloé have been abandoned. Paradoxically, the weirs went from being everyday elements of communal life to being virtually unknown to recent generations. At the beginning of this millennium, it was very difficult to find any young person on the coast of the Interior Sea who could identify a fishing weir; only the oldest could do so. Since 2004 we have identified 1,180 stone fishing weirs through various methodological strategies. This figure is mainly based on remote sensing, low altitude aerial photography, ethnographic campaigns, visual inspections and, to a lesser extent, archaeological prospecting (eg Mera and Munita, 2005; Borlando, 2015, 2016). Almost all the detected weirs are concentrated in the northern area of the Interior Sea, coinciding spatially with the previously mentioned pattern of colonial settlements. Almost 80% of the weirs are located on islands (including on the main island of Chiloé), and only 20% are located on the continental mainland. There are some exceptional concentrations, for example, on Quenu Island (in the northern part of the study area), which has 43 weirs in only nine linear km of coastline (Figure 4). Another example occurs in the extreme northwest of Aulín Island, in the Butachauques archipelago, where along just 1,200 linear metres of coastline, it is possible to observe 26 fishing weirs in an area with a population that does not exceed 120 people (Figure 5).

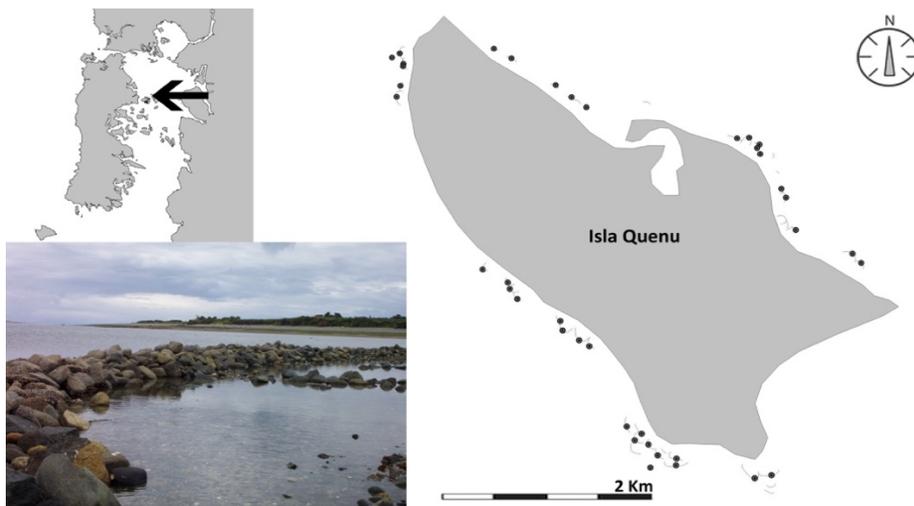


Figure 4 - Concentration of fishing weirs (points) detected remotely (Google Earth) on Quenu island (photographic inset: Drago Bartulín 2004).

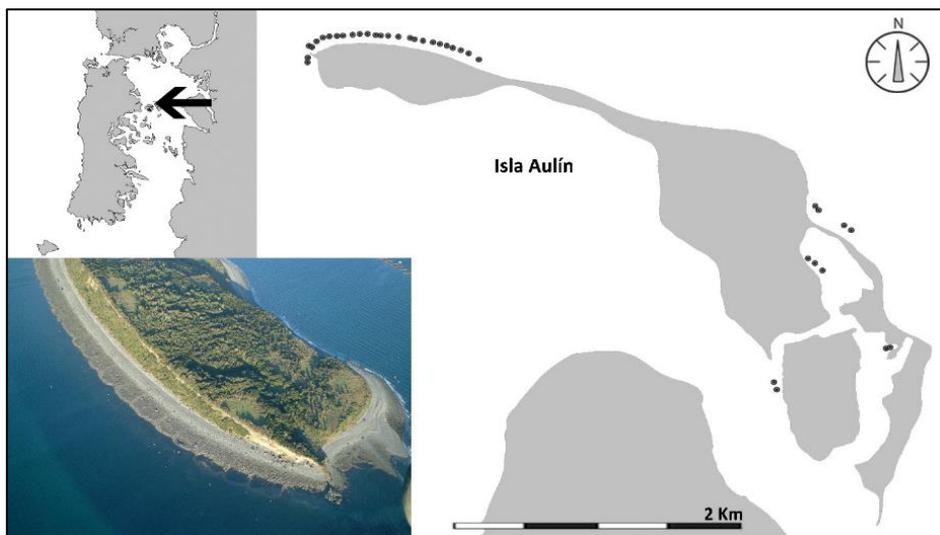


Figure 5 - Concentration of fishing weirs (points) detected remotely (Google Earth) on Aulín Island (photographic inset: Drago Bartulín 2004).

Using traditional assets to counter socio-environmental losses

Today, new generations of islanders are reconsidering traditional livelihood practices and assets motivated mainly by their recognition that socio-environmental crises continue to increase (water scarcity, shortage of marine biomass, eutrophication, social conflicts, etc.) and that intervention strategies established by the nation state and private organisations have failed to solve them (with the latter being premised on techno-administrative and techno-scientific tools and models that are inflexible and/or inoperative at the local level). Many of the generations that actively participated in the extractive model in the last decades of the 20th and in the early 21st centuries feel increasingly frustrated because even though global production figures are important to Chile, at a macro-level, their territories and life situations remain precarious. In this way, some have begun to reflect on their neglect of traditional practices (such as island beliefs and rituals) and the fishing gear once used in the region (such as weirs). While many younger islanders have worked to capture as many fish as possible to supply the commercial industry (without any restrictions other than those indicated in the fishing legislation); older islanders have continued to practice traditional fishing with the aid of magical smoked plants and have warned that greedy extractions would bring misfortune. Traditional perspectives seem to be affirmed since shellfish and fish biota have dropped significantly and island communities can no longer sustain themselves. At the same time, given that the traditional subsistence fishery model does not generate money, it is far from a practical option for modern-day islanders to return to it. In this sense, there can be no simple return to old ways.

During the time in which the traditional model prevailed there appear to have been no associated socio-environmental crisis. In what way, then, do we attempt to restore this spoiled and conflicted coastal location? A long-term alternative involves analysing the practices and assets that facilitated an aquapelagic symbiosis between humans, non-humans and island landscapes in previous centuries with regard to three aspects:

a) Tools and resources. While the weirs were private, in that they were owned and operated by specific families, a series of local cultural understandings allowed a degree of collective access to the catch and to the weir space. In contrast, the administrative allowances provided by the Chilean state to commercial operations, in the form of aquaculture concessions and benthic resource management areas, exclude any possibility of community access and protect the rights of commercial operators through the state's coercive and/or punitive powers.

b) Taboos and beliefs concerning the conservation of non-human species and landscapes. A key aspect here is that nature acquires the quality of subjecthood and therefore requires a very different treatment to that which is currently given to it under the logic of it being an object or resource. In this way, the restrictions imposed by the state on the basis of techno-scientific and techno-administrative considerations (such as capture volumes, capture sizes, permitted levels of contamination etc) are irreconcilable with traditional cultural logic, in which the motivation for avoiding over-exploitation is the consideration of others (humans and non-humans, future generations, etc.).

c) The production rationality of the prevailing model devalues and restricts festivities and cosmology. In contrast, it encourages individual achievement and related access to consumer goods that, in turn, promise to provide satisfiers. However, on the islands, at least, people are neither generally happy nor live in tranquillity under current extractive regimes.

Given the above, we believe that through the inclusion of components of traditional socio-cultural practice it is possible to transform the prevailing development model by changing the underlying norms of modern extractivism. A key element in such contestation in Chile was the passing of the ECMPOs (Marine Coastal Spaces of Indigenous Peoples) Law 20249 (also called the 'Lafkenche Law') by Chilean parliament in 2007. The Law resulted from a sustained campaign of pressure from Williche communities on Chiloé and Mapuche-Lafkenche communities in adjacent continental Chile to persuade the national government to recognise their traditional aquapelagic territories and to allow communities to apply for recognition of their rights over them. The first successful application was approved in 2014 when the Wente Caulín community on the northern coast of Chiloé's main island was recognised as having the right to administer its traditional coastal resources. The Law, and the successful Wente Caulín application has had an unforeseen result in that it has motivated a number of *mestizo* Chilote communities in small islands and remote coastal areas to assert indigenous identity. Such a conscious embrace of indigenous identity marks a significant reversal of the effacement of the latter during much of the 20th Century – when indigenous people were subject to widespread racist stereotyping and discrimination (Barandiarán, 2012). Indeed, the Lafkenche Law marks one of the first occasions in modern Chilean history when the assertion of indigenous identity has been beneficial to the socio-economic circumstances and status of the claimants.

As a result, hundreds of islanders have organised to assert and take advantage of their indigenous heritage, applying for stewardship over coastal marine spaces in order to regulate them and protect them from unsustainable and/or other harmful uses. In order to achieve their aims, island communities have brought together families and organisations (including non-indigenous ones, such as the authors of this article) to support their applications. These have involved the production of participatory cartographies of the areas around their shores and the production of reports to demonstrate the cultural link between

the applicants and claimed coastal territories. In this way, the cadastre of fishing weirs and other intangible elements and archaeological materials, such as shell middens, coastal cemeteries and ritual sites, becomes crucial. Thanks to this phenomenon, today all around the coasts of the Interior Sea, fishing weirs are being returned to use because, through them, the marginalised and invisible population has reclaimed their right to participate in local development and to demand a direction different to that which has prevailed for decades.

Conclusion

Current fisheries legislation in Chile has come under sustained critique by multiple sectors of society. This is because it focuses on facilitating the transformation of large volumes of fish into fishmeal for the salmonid aquaculture industry and the subsequent export of salmonid products. Artisanal fishing communities have been forced to adapt to this situation and are driven to speculate on catch quotas that they have not even extracted and that are no longer destined for consumption. This has led to serious disturbances in the coastal environment, including the critical reduction of biomass volumes on which the inhabitants of the Interior Sea of Chiloé have traditionally depended. Although hundreds of weirs still exist in the intertidal zone, the volume of fish being trapped in them has severely declined (and nowadays often includes escaped salmon). This panorama is completely inverse to what occurred when the weirs functioned on a day-to-day basis. At that time, traditional regulations ensured the supply of fish to those who lived by the sea as a result of conservation mechanisms based on cosmogonic aspects that prevented overexploitation, where unsustainable practices were prohibited by the tutelary spirits of the sea, whose presence affected the lives of human beings.

Despite the onslaught of modernity, there are options to revitalise the weirs as examples of best practices. On the one hand, coastal indigenous communities are requesting portions of sea and beach to establish spaces of traditional use that benefit all inhabitants of the coast and protect them from the excessive extraction of their resources. With this, the communities seek to revitalise a project for inhabiting their islands that would stem the tide of migration to the cities, which the islanders have adopted as a survival strategy. Thanks to these popular movements of territorial re-appropriation, fishing weirs are once again emerging from the critical neglect that have affected them in recent history. In the Los Lagos Region, they are also beginning to be conceived as a significant heritage element, including in decision-making by the regional government, which has included them in its official cartography⁸. It seems to us that in the southern Chilean latitudes, as in many other places in the world, the remnants of a social past premised on an equilibrium with the environment can inform and reorient us and provide a resource for territorial re-composition at a time when it is evident that the externalities of the current development model have had a profoundly negative impact on both the region covered in our analyses and wider regions and environments.

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⁸ See, for instance, <http://geonodo.goreloslagos.cl/geonodo30/index.php?r=site/start&geoprofileId=99> - accessed 21st July 2019.

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