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Landscape Metropolis #7

Circular Water Stories



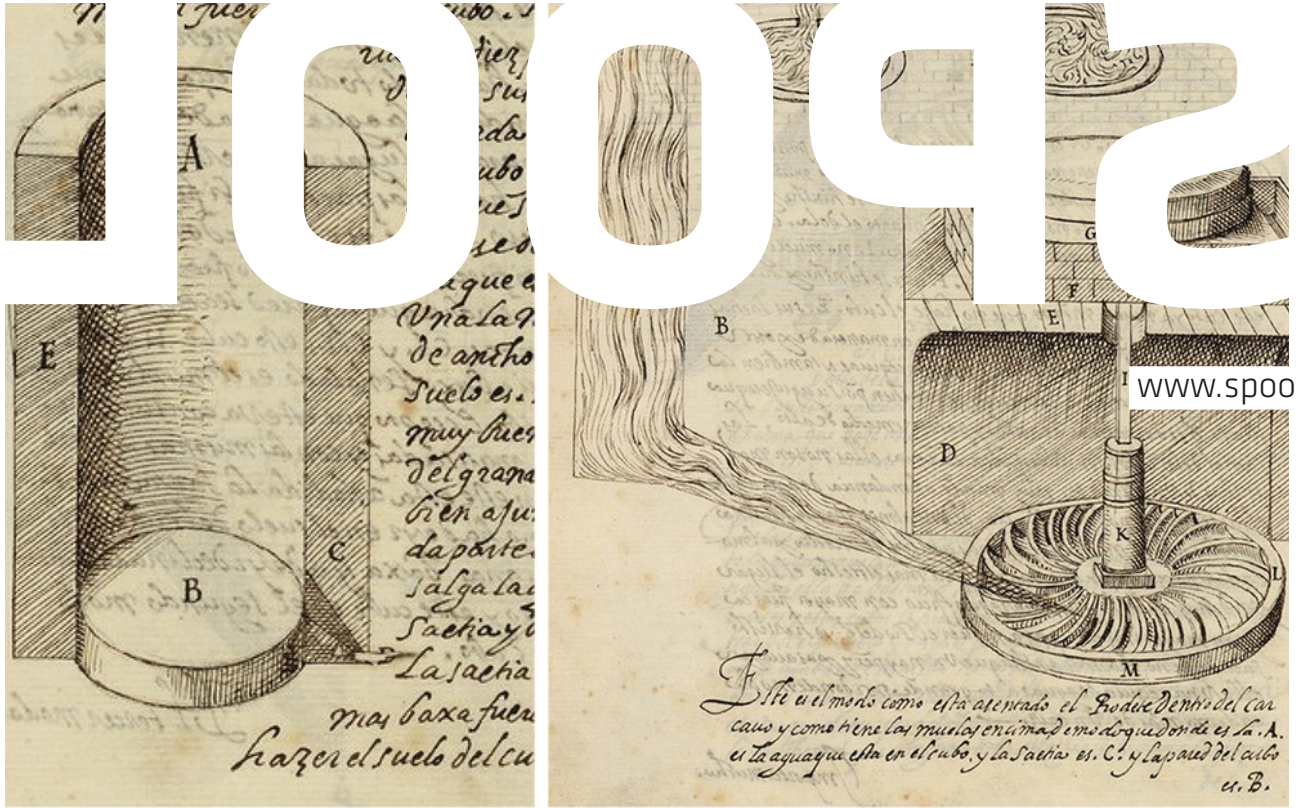
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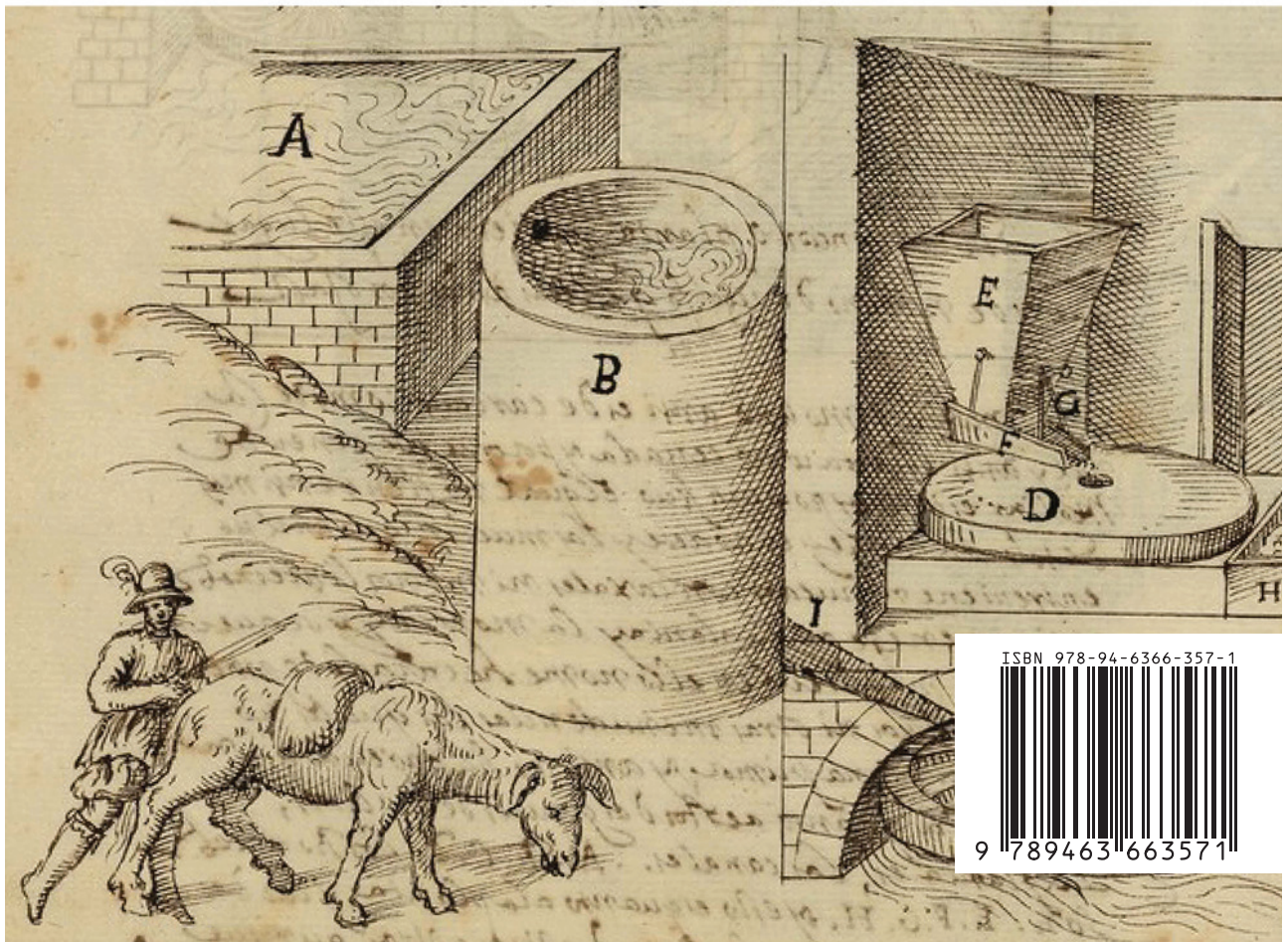
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Front: Kampung Naga from the main access. Image by Ayu Tri Prestasia.

Back: Bucket mill in the 16th-century manuscript "The Twenty-One Books of Devices and Machines" by Pedro Juan de Lastanosa. Images property of the Biblioteca Nacional de España [Spanish National Library].

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Mapping the Maritime Backyards of Póvoa de Varzim

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[Abstract](#)

In order to improve their professional activity, fishermen have developed special methods and procedures for organising the space of their maritime territory. This article presents some of these practices, based on the specific case of the fishing community of Póvoa de Varzim, a town on the north coast of Portugal. Over the years, each fishing family has developed mental maps of the “seas”, creating original names to identify certain places and their different characteristics, while simultaneously producing a remarkable intangible heritage. Together with the productive transformations that were characteristic of industrialisation, traditional fishing methods have also gradually changed, incorporating the use of electronic navigation devices and other mechanisms for the detection of marine resources. In this way, the sea has begun to be mapped digitally through a system of “maritime backyards” that divide the space according to the fishing gear used. The aim of this work is to map and compare the maritime space produced by traditional fishing methods and by the contemporary system of “maritime backyards”, giving visibility to practices and territories that are normally absent from the representations of places.

[Keywords](#)

maritime territory, fishing community, Póvoa de Varzim, intangible heritage, mental maps, “maritime backyards”, map.

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Introduction

This article is an offshoot of the Fishing Architecture research project, whose aim is to map the complex relationships between marine biology and the built environment that results from the exploitation of natural resources such as fish and seaweed, which were fundamental vectors in the urbanisation of coastal towns and cities. The underlying hypothesis suggests that, from the integrated study and reading of the human activities involved in the exploitation of marine resources, new perspectives may emerge for understanding the history of the urbanisation and construction of the terrestrial landscape. As such, this research¹ study examines the fishing community of Póvoa de Varzim and its particular system for organising the space known as “maritime backyards”.

The word “backyard” is normally associated with a plot of land (a vegetable patch, a patio, or a garden) at the back of a house. What meanings are therefore attributed to the word when used in the context of the maritime landscape? There is a common view of the sea as a mere line on the horizon and of the coast as a line that separates two territories, very often regarded as independent from one another. The land has been studied in depth by the disciplinary field of architecture, yet what exists beneath the sea’s surface remains a “silent world”², one which is gradually becoming better known in the field of biology and in other marine sciences (Mustain, 2011). In architecture (urbanism and landscape), the sea is still portrayed in a fairly inexplicit way. To understand the continuity of sea and shore through this system, we need to use sources and records (such as nautical or hydrographic charts for example) and incorporate this information with the fundamental, precise, and sensitive accounts of those who live from and appropriate the sea: the fishermen, creating one common cartography.

After the chapter “*Methods and Materials*”, this article is divided into two main chapters: firstly, the “*Póvoa de Varzim: The traditional fishing sea space method*” that explains the historical and cultural context and the first space method called “seas” created by this fishing community, ending with the sub-chapter “*The creation of a “sea” in memory of the Master “Espojeiro”*” representing the personal experience process of a new “sea” by this ex-fisherman.



FIGURE 1 Photographic record of the conversations with Master “Espojeiro” about traditional fishing.

- 1 This work is largely based on the Master’s Degree thesis presented by José Pedro Fernandes, *Mapeamento dos quintais marítimos na Póvoa de Varzim*, School of Architecture, University of Minho, 2020, and supervised by Marta Juan Labastida.
- 2 *Le monde du silence* is the title of a documentary made by Jacques Cousteau and Louis Malle in 1956. It was one of the first documentaries to include underwater colour images. Besides winning the Palme d’Or at the Cannes film festival, it was also awarded an Oscar by the Hollywood Academy.

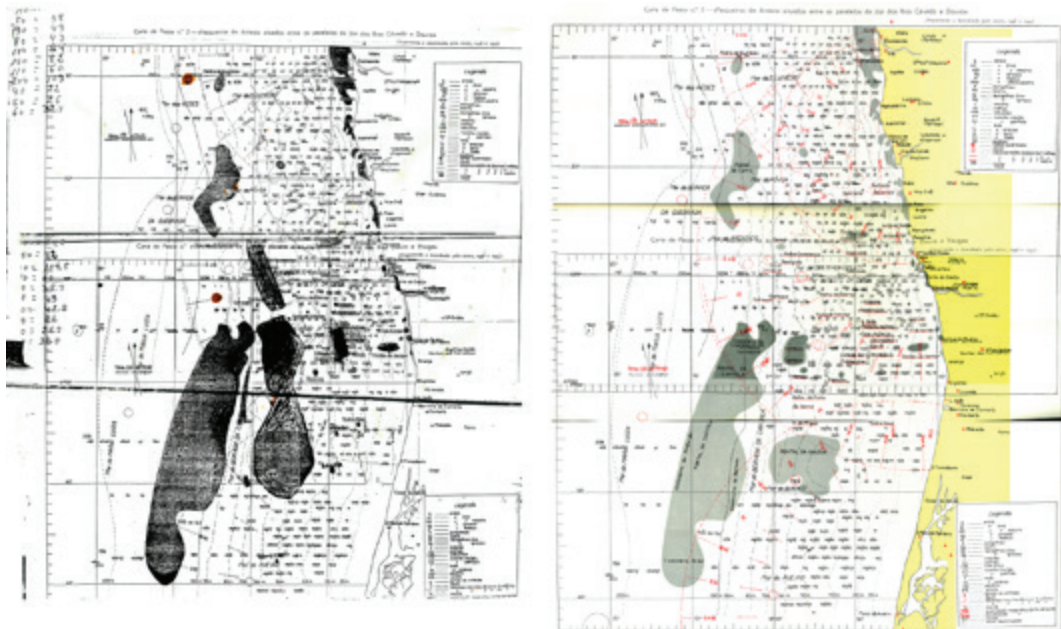


FIGURE 2 Transformation of the morphology of the maritime territory through Master “Espojeiro’s” notes between 1970 and 1990. On the left, a photocopy of the map of the trawling fishing grounds between the Cávado and Douro rivers, drawn up by Joaquim Gormicho Boavida (1948 edition); on the right, the original map.

In the last chapter, “*Póvoa de Varzim: The contemporary fishing sea space method*”, we pretend to explain the reasons of adaption for the actual space method called “maritime backyards”. Then, in the sub-chapter “*The architects of the sea*”, we explain the characteristics of this maritime space system organised by the polyvalent fishing community. And finally, the sub-chapter “*The creation and exploitation of a “maritime backyard”*” represents the personal experience of José Fernandes with a polyvalent fishing crew and his “maritime backyards” system with all of its related process.

The expression “maritime backyards” has given rise to a series of questions relating to their origin and their morphology, as well as to their relationship with the tools of fishing and representation of the space associated with them. The intent is to explore the fishermen’s capacity for organising the maritime space through their professional activity. To better understand this space method, we decided to compose a series of drawings that could help us to visualise and locate their features and dimensions. And, in order to show the relationship between this construction and the evolution of the tools that were used, a comparison is made between traditional (artisanal) fishing and contemporary (polyvalent) fishing – two clearly distinct models that coexisted in this community in the latter half of the twentieth century.

In the first part, the research process is described and followed in drawings, using mental maps of the “seas” and the toponyms created and transmitted under the scope of traditional fishing. We compare documentary and bibliographical sources (cultural newsletters showing the evolution of the local heritage) with the memories of ex-fishermen. The article by Luís Martins (1999) gathers information from this community’s routines, tools, and social structure, which were previously described in the book of Santos Graça (1932).

In order to be able to transcribe this information into credible maps, it was necessary to clarify a number of questions and doubts with the details that only fishermen themselves can provide. We were able to talk to Master Albano “Espojeiro” (Fig. 1), an ex-fisherman from the last generation of the traditional fishing community of Póvoa de Varzim. Over the course of three meetings with him, Master “Espojeiro” shared with us his personal knowledge, notes, and maps, and it was from this information that we were able to reconstruct and represent the processes involved in the creation of the mental map of the “seas”. The most difficult part was to translate his description of the routines into actual physical dimensions, which

sometimes made it necessary to use different scales of representation on the same map. The information that we successfully collected from the various conversations was contrasted with that which was already available in other documents existing about these practices in Póvoa de Varzim at the Municipal Library. In order to assemble our maps, we used the cartography from Gormicho Boavida (1948)³ as the basis for the drawings of the first part, which Master “Espojeiro” himself had used for noting and correcting the changes that had occurred in accordance with his practical knowledge (Fig. 2).

The second part of the article begins with a discussion of the transition to contemporary fishing practices, associated with a paradigm of the global economic pressures, as the article by Luís Martins (1999) shows. There are a number of questions that arise globally, relating to: State or regional conservation policies (Matthews, 1993); the public or private domain of the maritime space (Lueck, 1993); the destruction of ecosystems (McGoodwin, 1989); but also the social transformations taking place in the fishing communities themselves, as in the case of Malaysia (Firth, 1975), the raftsmen of north-east Brazil (Forman, 1970), and the north-west of Newfoundland (Sinclar, 1985), among others. Particularly interesting in this article are the specific changes that took place in the fishing community of Póvoa de Varzim, which permitted the appearance of a new and unique system of spatial organisation: the “maritime backyards”. In order to understand the functioning and morphology of this system for the occupation of the sea, we first had to confront an obstacle associated with its informal condition: there are no graphical or written records. Once again, it was necessary to understand the routines of the fishermen and the construction of their “maritime backyards”. We had the opportunity to accompany a fishing vessel from Póvoa de Varzim over a period of six days. A master and shipowner agreed to explain the construction of his “maritime backyards”, maintaining his anonymity, as well as that of his crew. The master provided us with his explanations on the boat itself, allowing us to take drawings and a photographic and audio-visual record. This experience further enabled us to understand the functioning of polyvalent fishing practices, as well as the tools and techniques that were used. This information made it possible for us to produce the original cartography of the “maritime backyards”. In order to assemble the maps, we used the most recent cartography about the types of seabeds to be found in Póvoa de Varzim (*Carta da Serie*, 2017). In this way, it was possible to arrive at a series of drawings that summarised and explained the standard space of this system, resorting to the only credible existing information: the practical knowledge of the master (Fig. 3).



FIGURE 3 Polyvalent fishermen from Póvoa de Varzim fishing in their “maritime backyard”.

³ Cartography subsidised between 1947/48 by the Guild of Trawler Owners, containing information about the types of seabed and the best fishing grounds (coordinates of fishing points). The aim was to create a guide that would show the hidden/submerged educational culture that this profession had, and to express the intangible heritage that was worked upon daily through the interpretation and knowledge of the national maritime territory.

Póvoa de Varzim: The Traditional Fishing Sea Space Method

In this chapter, we were able to understand the importance of the *Poveiros*⁴ and some of its specificities, which, after being compared with the detailed knowledge provided by Mestre “Espojeiro”, helped to explain the process of mapping their routines and different ways of dividing the sea in a much more understandable and rigorous way.

In 1308, at the time when Póvoa de Varzim was beginning to acquire its administrative shape, activity was characterised by the complementarity between agriculture and fishing, including the harvesting of *sargasso*⁵ (Amorim, 2004, p. 35). The fishing community was set up “on the fringes of the other land-based classes, since they had the privilege of having their own laws, habits, customs and traditions” (Cadilhe, 1977, pp. 157-173). The community was divided into “castes”, organised according to family ties and bonds of consanguinity⁶. At sea and in their fishing activity, each family distinguished themselves from the others through their working tools, namely the handmade depth probes, the marker buoys, and the marking of the boats themselves. These working tools were the main link between the “seas” and the land, as well as the main material inheritance of each family.

Just like most fishermen on the Atlantic coast of the Iberian Peninsula, the *poveiro* moved, on a seasonal basis, from Galicia to the River Tagus in search of work (Areias, 1977, pp. 157-173), which enabled them to extend their knowledge of fishing techniques, maritime dynamics, and marine species (Cadilhe, *op. cit.*, p. 287). They inherited professional codes and skills handed down from one generation to the next within the family groups rooted in empirical knowledge and in the practical experience of everyday life. This experience, today referred to as intangible heritage, is one in which community and economic activity, coexisting simultaneously in one place, constructed a specific cultural heritage.

The territory of this fishing community included their own backyards ashore, which were organised through a system of agricultural land use known as “*masseiras*”⁷, but also included the “seas” of each family. The house and the boat were both situated on the beach, a frontier region that allowed for a continuous use of the territory, in a transversal system that guaranteed the subsistence of the community (Fig. 4).



FIGURE 4 Crossovers in the use of the territory between shore and sea.

- 4 Poveiros – Name given to the fishing community in Póvoa de Varzim.
- 5 An agglomerate of seaweed harvested and dried on a seasonal basis, and used as a natural fertiliser for the sandy soil close to the coast.
- 6 Among these “castas” were the “*rasqueiros*”, who used a “*rasca*” (trawl-net) to fish for ray, lobster, and crab; the “*sardinheiros*” (sardine fishers) or “*fanequeiros*” (whiting-pout fishers), who used a “*pano*” (gillnet) or “*trole*” (hook and line fishing). Master “Espojeiro” belonged to the “caste” of the “*sardinheiros*” or “*fanequeiros*” and either used nets or engaged in line-fishing.
- 7 A unique form of traditional farming practised along the coast of Póvoa de Varzim.

It is worth noting the transfer of vocabulary from land to sea, with words such as “field” and “backyard”, references to agricultural practices, being used to describe the space of the sea. Examples of the farming vocabulary used by Master “Espojeiro” and transferred to fishing included words such as “*caça*” (hunt), used to refer to a set of nets, “*safra*” (crop) to describe the quantity of fish caught, and “*ceifa*” (harvest) to indicate the time that the nets remained in the sea.

With the information that Master “Espojeiro” provided, we were able to understand the forms of the spatial relationship established between the fishermen and the sea. Using their empirical knowledge of the sea’s dynamics to develop their own ways of interpreting and taking ownership of its behaviour, they made it a natural part of their own habitat. The master showed us the main tool that they used for interpreting the maritime space: a handmade probe that measured the depth of the sea and indicated the characteristics of the seabed. With this information, the fisherman was able to know what kind of fish could be caught in a certain area. The probe consisted of a length of rope that indicated the number of *braças* (fathoms – each *braça* measured 1.82 metres) and had a hollow lead cylinder at its end that was filled with tallow. When the probe hit the seabed, it was hauled back up again, the depth of the column of water was measured, and the tallow brought with it the information about the type of seabed in question. This information, which was rarely recorded on the maps and charts, was stored in the master’s memory, and was then used to mark out the areas to be exploited by each family. The fishermen also knew the behaviour of each species of fish and were able to use this knowledge to determine the place and the length of time during which they should work with each kind of fishing technique, which varied according to the time of day and the season of the year.

Besides this, the community also established its own toponymy for dividing up the maritime territory that each “caste” could use. Under the scope of the research that he undertook into the *Poveiros*, (Martins, 1999) describes the classification of four seas, according to its depth:

- “*Mar da beirada da terra*” (“edge of the land”) extended from the coastline up to a depth of 20 fathoms, with the seabed consisting predominantly of stones, its limits being demarcated by the last ridge of rocks before the land, when coming from the sea (east).
- “*Mar das pedradas da faneca*” (“whiting-pout stones”) found at a depth of roughly 38 fathoms, with the seabed consisting mainly of silt or sand, as well as scattered stones of varying sizes.
- “*Mar da beirada de fora*” (“outside edge”) situated at a depth of between 58 and 63 fathoms and defined by the last outside edge (west) of the rocky ridge (as, for example, the Pontal do Cerro indicated on the map) (Fig. 2).
- “*Mar dos Profundos*” (“deep sea”) had a depth of more than 200 fathoms, beyond the reach of the portable probe.

Master “Espojeiro” also specified other areas within these seas, according to the characteristics of their seabeds:

- “*Regueiros*” (“furrows”) composed of two large rocks between which there was a small depression filled with “*cascalho*” (fragmented rocks) or “*burgalho*” (pebbles).
- “*Bancos de areia*” (sand banks) composed of hills of sand and small depressions also filled with sand.
- “*Fundo limpo*” (clean bottom) composed of sand, silt or mud.
- “*Fundo Raso*” (flat bottom) composed of a long ridge of smooth rocks.
- “*Fundo Grosso*” (rough bottom) composed of small stones, such as pebbles.

Each of these morphologies and features of the seabed, depending on the depth of the water column, corresponds to certain kinds of marine species. This knowledge of the traditional fishing activity was the basis for the creation of the “maritime backyards”.

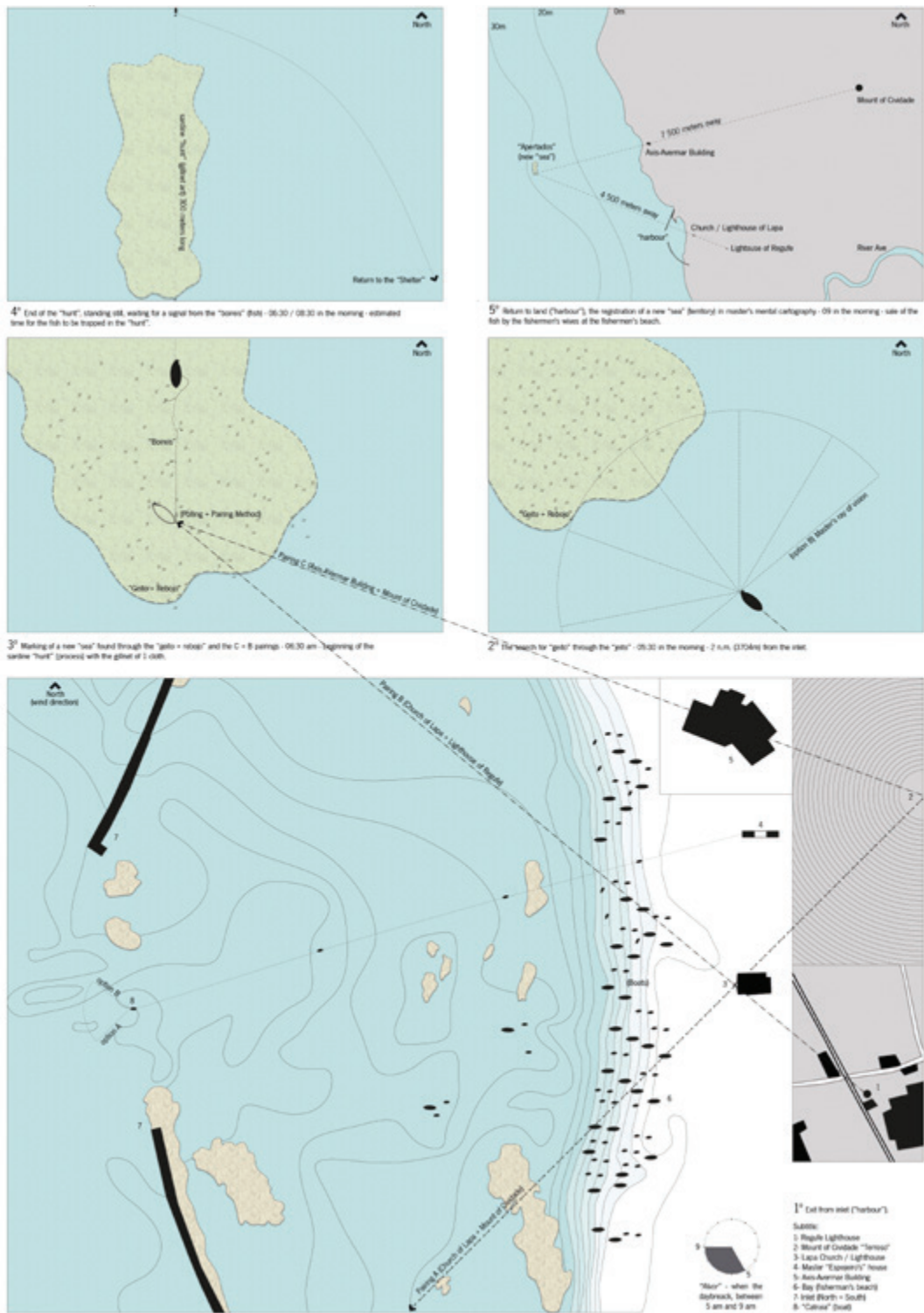


FIGURE 5 Stages in the creation of a new "sea" in Póvoa de Varzim in the culture of artisanal fishing.

The Creation of a “Sea” in the Memory of Master “Espojeiro”

The process of creating a “sea” has various scales and spatial relationships that depend on the routine of a particular master and his crew. In order to represent this, it was necessary to make a detailed description of the actions that comprised the routine of Master “Espojeiro” using the map drawn up by Gormicho (1948) as the basis for drawing the method for this chapter.

Master “Espojeiro’s” day began on the fishermen’s beach, observing the behaviour of the sea and the weather conditions favourable to fishing. Then the fishermen would head out at daybreak from the “harbour” (inlet), with their sail raised, always remaining in line with two landmarks ashore. The sea’s behaviour and the weather are unpredictable, so each master’s methods for finding the fish were crucial for the success of each crew. These methods were known as the particular master’s “*jeito*” (knack), which began with the reading of the behaviour of seabirds. They were also known as “*geito*”, which suggested the direction that the boat should head in as it left the harbour. These birds fly at a height of seven metres and dive repeatedly into the water, reaching up to three metres in depth, in order to capture, for example, sardines. Their diving indicates the position of the shoals of fish. Similarly, the yellowish colour of the water’s surface, caused by the sea’s roughness and known by the name of “*rebojo*”, indicates the presence of shoals. These two methods, among others, made it possible to identify areas where it was presumed that fish would be found in abundance. However, before beginning to release the nets, the master memorised the place through the two visual markers and attributed a name to the new “sea” based on its particular identifying characteristics. One example was the christened “sea” by Master “Espojeiro”, with the name of *Apertados* (“narrow”) due to the characteristics of the seabed: a narrow sand bank that was the width of the boat (Fig. 5).

During the “*faina*” (fishing trip), which lasted between three and five hours, the fishermen’s wives and children would remain on the beach repairing the nets. On returning to the inlet the location of the privileged fishing points, the new “seas”, was kept secret, or shared among family members, giving rise to common mental maps. Consequently, some of these “seas” had more than one name as various masters discovered them on different occasions. The fisherman’s memory was the greatest intangible heritage of each family, representing an immaterial legacy that could be handed down to his descendants. In parallel to this, the boat and the fishing gear were the most important material legacy, inherited by the youngest son.

Póvoa de Varzim: The contemporary fishing sea space method

In 1895, movable fishing gear (trawling and purse seine) began to be introduced at Póvoa de Varzim, as well as steam-powered boats. This gear was fostered by the canning industry, which operated all along the coast, proving to be a decisive factor in the urban transformation of the area (Figueiras, 1981, pp. 220-302). The first consequence of these changes was the progressive increase in the impact of fishing on the marine fauna and flora. Trawlers could capture in just one “crop” quantities that were equivalent to the total catch made by all the local fishing boats in one month (Pardo, Queiroga, Pierce, & Grilo, 2017). By increasing the pressure on the species and stimulating the fishing economy, the modernisation processes ended up endangering their own source of income. According to the French ecologist Didier Gascuel, unlike agriculture and industry, in the case of fisheries, the more that is invested in the means of production, the less is actually produced, inasmuch as the natural resources are limited (Gascuel, 2019). Over-investment ends up leading to an exhaustion of resources.

The changes introduced into production with the industrialisation of the procedures followed in the processing of the catch led to a change in fishing practices. Sailing boats were gradually replaced with boats that were powered firstly by steam and then by diesel. The development of the motor-boat, and the consequent increase in the size and number of such vessels, made it necessary to enlarge and improve the berths at the quayside, bringing an end to the direct relationship between the beach and the sea. The coastal landscape of Póvoa de Varzim gradually began to change as its economic activities became more modernised, with clear impacts on the town's urban and social fabric (Saldanha, 2008. pp. 141-143). (Fig.6)



FIGURE 6 Change of the built environment of the former fishermen's beach to the present-day fishing port of Póvoa de Varzim.

This dynamic was accompanied by another one, which was perhaps even more important, in which fishermen ceased to participate in the production of their own working instruments. And it was in the course of this transitional process that the mental maps of the “seas” ceased to be important, being replaced by other navigational mechanisms and other devices that can be used for identifying the reserved areas for fishing.

These transformations led to the progressive abandonment of traditional fishing practices in Póvoa de Varzim, with fishermen developing new strategies for the performance of their methods.

An example of this adaptation (Martins, 1999), was the work initiated by the company of *Gerónimo Viana*, who invested in the fixed fishing gear of *alcatruzes* (pots) and introduced the system of “maritime backyards”. This system was designed to reduce the characteristic unpredictability of fishing, by combining the traditional knowledge of the “seas” with the new technologies (Fig. 7). The technique of fishing with pots began to be developed in an informal way from the 1980s onwards: in the first phase, clay pots were used, which were later replaced by cylindrical plastic pots. The State only regulated this fishing technique in 1989, adapted for the capture of octopus (Martins, *op. cit.*, pp. 235-270). The development of this system among the fishermen from Póvoa de Varzim led to attempts to reserve portions of sea and specific places so that each fisherman could fish in this way on a permanent basis. These fishing practices were adapted accordingly to a master who discovered a place where no fishing technique had yet been implemented, thus giving him the right to reserve that new “maritime backyard” for himself, attributing it with a place name and registering its coordinates. In this way, a system of “maritime backyards” was initiated, which then became stabilised between fishermen and groups of fishermen.



FIGURE 7 Example of annotations of the various place names of "seas" made by a fisherman from Póvoa de Varzim, on a map between the traditional memory and the record of digital coordinates. (Anonymous owner)

The Architects of the Sea

In Póvoa de Varzim, the polyvalent technique simultaneously uses various fishing gears in just one boat (DGRM, 2019). As it proved possible to discern by watching the ship's owner and its crew in action, this polyvalent fishing technique represents a synthesis between traditional practices and contemporary technologies. The territory of the “maritime backyards”, in general, makes use of pots combined with trammel nets. Currently, each fishing licence is attributed to the boat's owner or skipper. A “local skipper” can navigate and fish between two ports within a limit of six nautical miles in relation to the coastline. The “coastal skipper” can navigate along the whole coast without exceeding the limit of fifty nautical miles in relation to the coast, which is also the limit of the Exclusive Economic Zone. (DGRM, 2019). These categories also correspond to the characteristics of the boats, such as their breadth, tonnage, engine power, and communication equipment. The boat continues to be the most important element for fishing. Besides being both the means of transport and the working tool, it is also a temporary home when the time spent on board is more extensive. In traditional fishing, the boats used to set out at dawn and return to the beach in the evening. In contemporary fishing, activities can spread over several days and, sometimes, over several weeks.

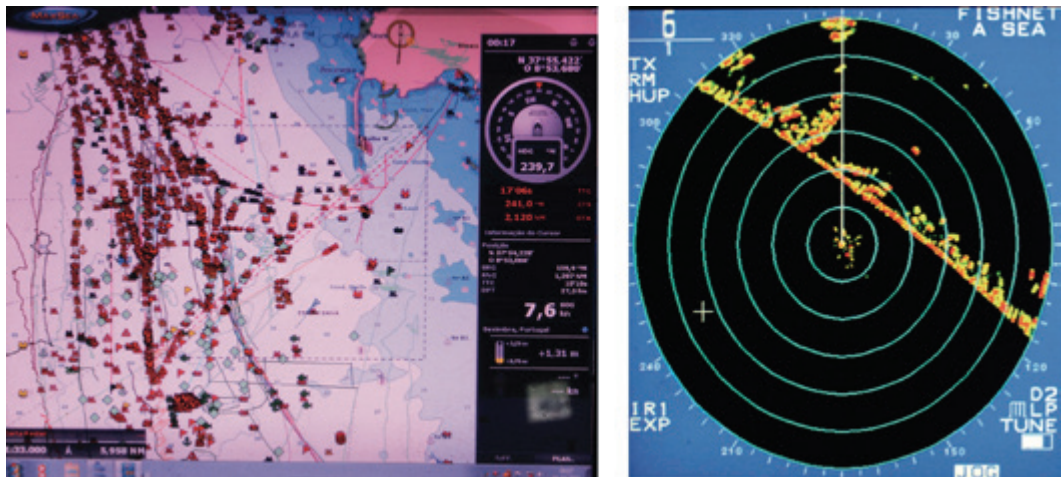


FIGURE 8 A Max Sea digital map at the moment of choosing the destination of fishing (left) and the electronic radar (right) with information about the objects within a radius of six nautical miles around the boat.

In the last few decades, electronic instruments have entered into widespread use as an aid to navigation. The master showed how these instruments were used to control the vessel, take decisions and establish strategies in accordance with the weather conditions, the wind, the temperature, the characteristics of the seabed, and the typical behaviour of the species at each moment of the year. The former “*jeito*” of traditional fishing has been replaced by procedures for reading and navigating in the maritime space through coordinates processed in computer applications such as MaxSea⁸. This programme integrates the information captured in real time by various instruments (GPS⁹ and AIS¹⁰) (Fig. 8). The sharing of this information makes it possible to obtain the position, the characteristics, and routes of other vessels. The sonar replaced the handmade probe in the reading of the conditions and characteristics of the seabed.

8 Developed by the company Time Zero, Navigation Software. Another software application that is widely used in Portuguese shipping is the AIS system developed by ARPA Targets.

9 GPS - (Global Positioning System)

10 AIS (Automatic Identification System)

Once the reading of the variables of the “seas” mental map method was determined by the “*jeito*” of the master, but is now performed through these common instruments that are constantly updated. This new cartography, based on digital tools, is produced by each fisherman and is associated with physical markers placed in the sea: the marker buoys.

It is these buoys that identify the ownership of the “backyards” and the limits of the “backyards” are defined by the art of pots, which the fishermen refer to as “stone walls” (Fig. 9), since the pots are similar in appearance to the stones under which the octopus shelters and reproduces. Besides defining the size of a backyard, the “stone walls” also divide their interior into areas associated with various species. Normally, these separate areas (plots) define minimum distances of 150 and 200 metres between each “hunting ground” in order to enable each species to reproduce without overexploiting its habitat. These divisions enable the master to work in the same backyards throughout the year, using bathymetric lines that allow him to divide his time according to the state of development of each species.

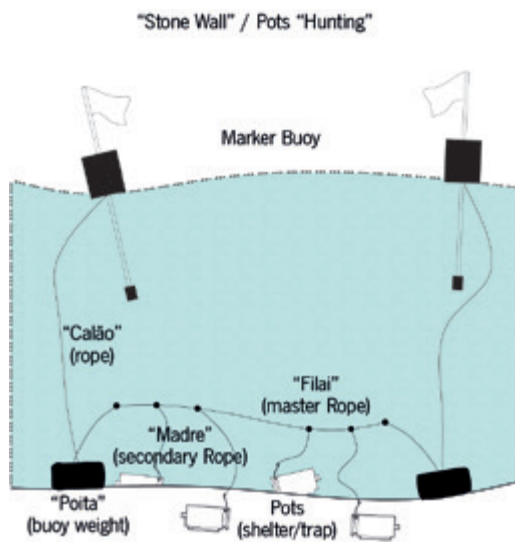


FIGURE 9 Structure of a “stone wall” made of pots in a “maritime backyard”.

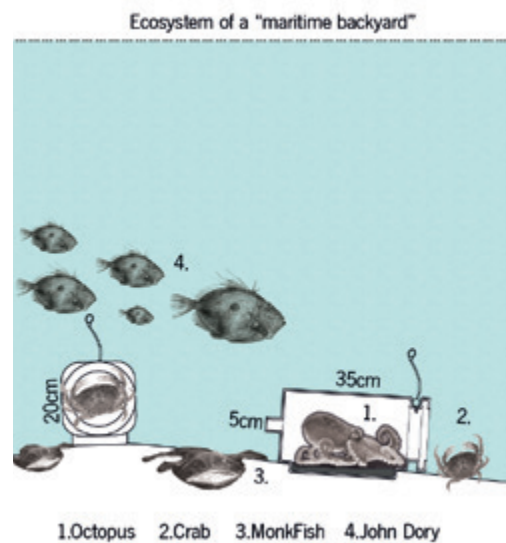


FIGURE 10 Representation of the ecosystem generated in a “maritime backyard”.

The maritime backyard that we were able to analyse was divided into two separate areas of fish: John Dory (*Zeus faber*), which is more frequently found in stone beds, halfway down the water column, and monkfish (*Lophius piscatorius*), which is a fish from the seabed normally caught in pebbly sand. Besides having different capture times and depths, the two fish require different uses of the same fishing gear: trammel nets, in the case of John Dory, stretched out vertically in the form of a “wall”, and, for monkfish, horizontally in the form of a “bed”. The octopus, one of the prey of these fish, attracts its predators to the rocks where it finds shelter, also attracting there the crab, which, in turn, feeds off these fish and serves as food for the octopus. As it happens, the “stone walls”, are used by the octopuses to protect themselves from their predators and to procreate, serving as a dwelling place. The octopuses use the trap to reproduce without falling prey to the fish, taking advantage of the crabs’ shells to cover the exit from the pot (Fig. 10).

The fact that the octopus is a predator of the crab, which would be the predator of the fish, favours the reproduction of the John Dory and monkfish within the separate areas of the backyard. This dynamic of the trophic chain makes it clear that the fishing gear ends up creating its own ecosystem. If this cycle is managed in a balanced way, it makes it possible to capture and stimulate the reproduction of various species, guaranteeing over time the production of each of these “nurseries”. The construction of this system of “maritime backyards” allows the fishermen to organise the maritime space and reproduce submerged landscapes, themselves becoming genuine architects of the sea.

The Creation and Exploitation of a “Maritime Backyard”

The process began at the port, with the consultation of the digital tools (Fig. 11). An “empty” space was located, and the boat set out on automatic pilot in accordance with the GPS. On the bathymetric line at a depth of 38 metres, a marker buoy was placed in the water (point A), from which pots were then dropped into the sea along a 2.5-kilometre-long line (450 pots) on the “outer” western side of the new backyard, as far as point A. Next, the boat moved to point B, defining a new segment with a straight line on the “inner” eastern side, in the form of another bathymetric line at a depth of 36 metres as far as point B’. The fourth step was to divide the backyard into two plots, with a “stone wall” between points C and C’, consisting of 50 pots along a 250-metre stretch, in an operation that is referred to as “closing the backyard”. The coordinates of the boundaries are recorded in the MAXSea (Fig. 12). Until five o’clock in the morning, before dawn, various walls of other backyards are “emptied”, as this is a time when the octopus is sleeping (Fig. 13). And, between five o’clock in the morning and three o’clock in the afternoon, the nets that had been cast two days earlier in an area close to the new backyard in order to catch the John Dory and the monk fish are hauled up (Fig. 11). This time is particularly advantageous, since it is during this period that the John Dory and monkfish come out of their shelters to look for food, increasing the possibility of their becoming trapped in the nets. The fishermen then return with a fully laden boat to the port (Fig. 14).

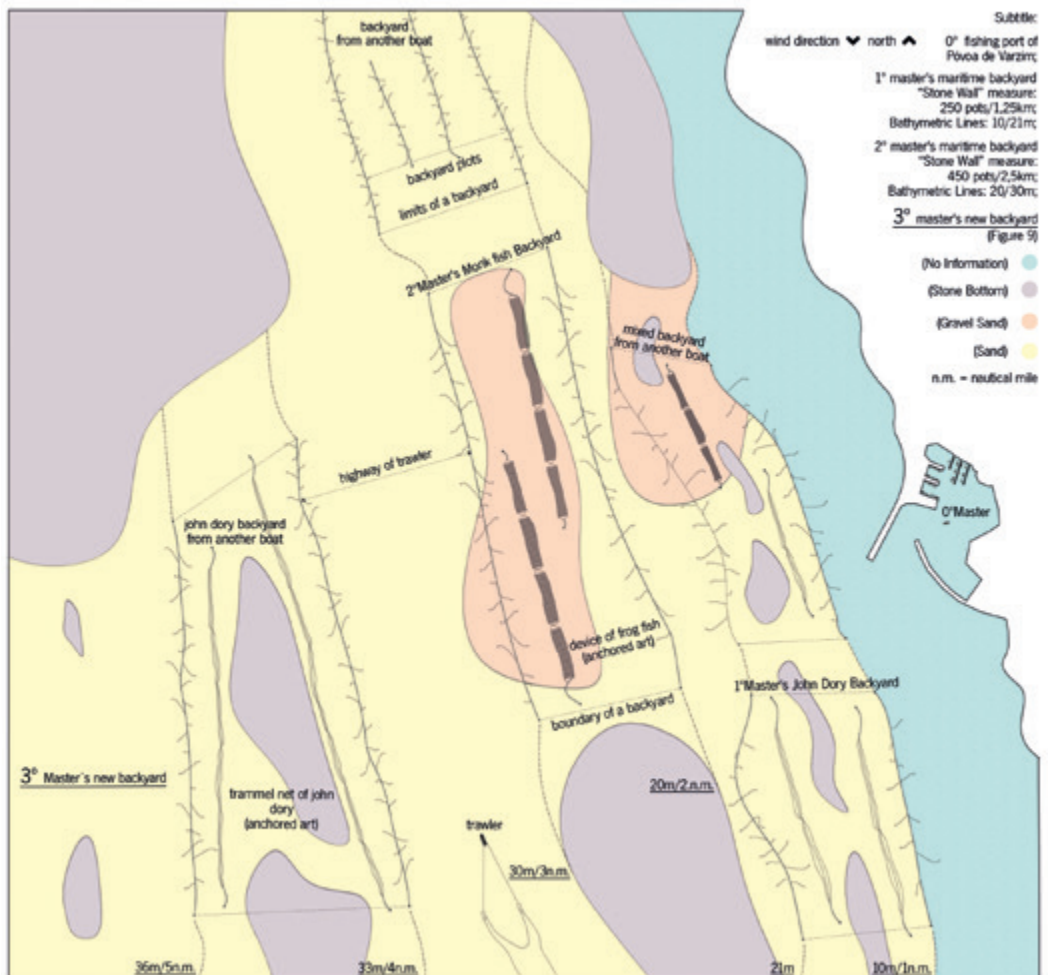


FIGURE 11 Territorialisation of various “maritime backyards” off the coast of Póvoa de Varzim.

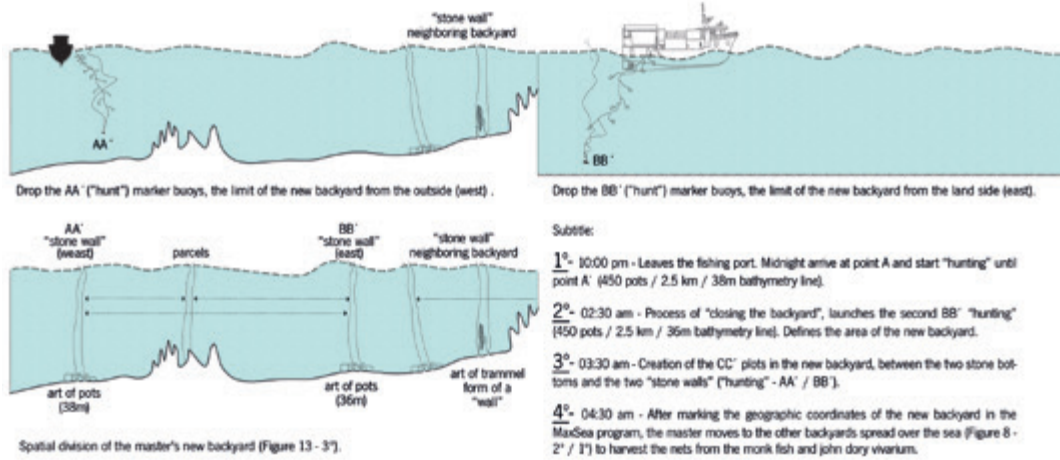
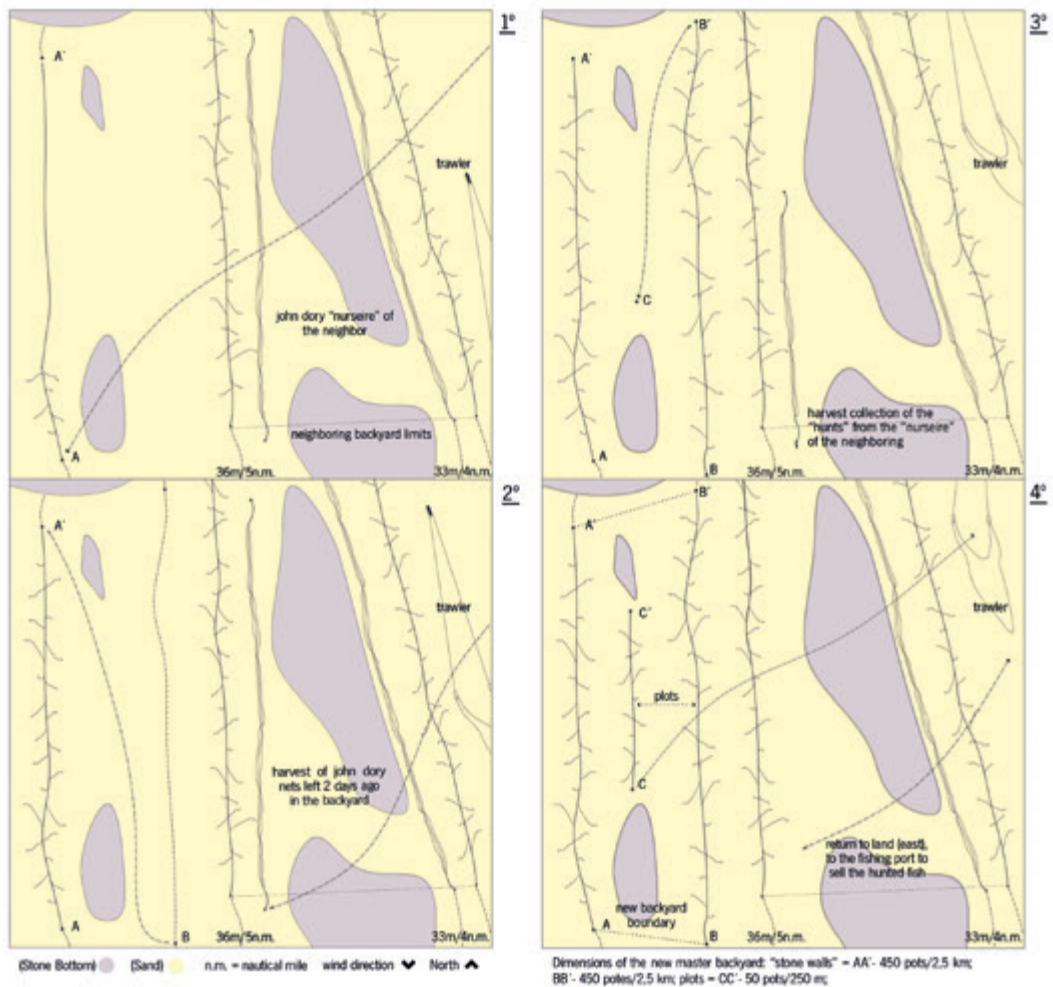


FIGURE 12 Stages in the creation of a new "maritime backyard".

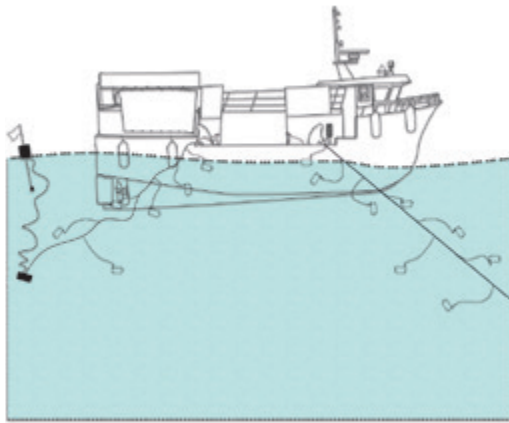


FIGURE 13 Process of emptying the pots. A “stone wall” is repositioned in the same backyard, simultaneously pulling in and letting out the line in order to preserve the territorial marking of the system.



FIGURE 14 Fieldwork.

Conclusions

The fishing activity undertaken in Póvoa de Varzim has adapted to the nature of the maritime territory, appropriating the space. The establishment of a system of “maritime backyards”, today corresponds to a unique and informal territorialisation process that allows for a cross reading of the activities between sea and shore. Because of its scale and dimension, the system is a synthesis between industrial fishing processes and traditional practices, which results in techniques with virtues that are comparable with those of aquaculture, but also guarantee the necessary dynamics and natural environments for the development of the different marine species. Through this system is possible to stimulate, control, and respect the interactions between the different levels of the ecological community, and allow for the development of new submerged landscapes and ecosystems. The specific spatiality of the sea is recognised using fishing gear, through the marker buoys that represent the human reserve area and produce a cartography that allows for a specific reading of this territory.

It is interesting to note the reciprocity that exists between the fishing gear, the marine resources, and the forms and mechanisms that exist for the mapping of these processes and the different ways of territorialising the sea. In this work, based on personal experience and interviews with fishermen from Póvoa de Varzim, it was possible to understand the way in which the use of the information transcribed into maps is directly linked to the evolution of the devices used (firstly analogue and then digital), with practical consequences for the ways and means of appropriating the marine territory (firstly temporarily and then permanently).

With this research process we produce these new cartographies, seeking to highlight the role played by the sea as a territory, considering it as a fundamental submerged landscape for understanding the environments built along the coast, as well as the role played by the exploitation of marine resources, especially in terms of fishing and its different forms of territorialisation.

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