

Spain's Contribution to "The Economic Impact of Responsible Fisheries on Production and Management"

The Shellfish Gathering

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1. The problem of Galician shellfish gathering:

1.1 Galicia as an Autonomous Region of the Spanish State

Galicia is one of the 17 regional autonomous communities (Comunidades Autónomas) into which Spain is divided administratively. In most cases, the divisions have historical and social diversity backgrounds justifying this form of fragmentation inside the State.

Galicia is situated in the North West of the Iberian Peninsula. In that area the relevance of fishing as an economic activity is more important than in the rest of the country. Especially when it comes to shellfish gathering. This can be explained as a multiple effect: it creates a lot of direct employment as shellfish gathering is very manual-intensive and also because it works as an economic driving force for other activities, including transport, freezer machine industries, fishing tools, etc.

The population is heavily concentrated in the coastal areas of Galicia, with a longitude of more than 1000 kilometres, sometimes reaching levels of 600 inhabitants per squared kilometre. That itself constitutes a handicap for managing, because with a population rate per kilometre of such proportions, any governmental decision concerning fisheries will have strong repercussions on the population along the Galician coast.

The shellfish gathering in Galicia is a traditional activity, sustainable until a few years ago. The high productivity of the Galician coast, one of the most productive areas of plankton in the world, due to geographical reasons, led to the situation in the sixties: an apparently unlimited source of shellfish. This activity was originally impelled by the preserving industry. The preserving enterprises acquired the product from individual gatherers at moderate prices.

The gathering of shellfish, was a complementary activity to the agricultural one. It was mainly realised by women because men used to employ themselves as sailors or fishermen.

But the evolution of this situation led to an unsustainable increase of catches. Several reasons contributed to that:

- The development of tourism. Attracted by the quality of the product, tourists used to gather shellfish individually and in little quantities for direct consumption. However, due to the increasing number of tourists, it had more and more important effects on the resource and competed with the local inhabitants.
- The improvement of the transport inside Spain, which made wider the commercialisation chances. Since that moment, shellfish might be sold as a high-valued fresh product as well as in the preserved form.

In the latest eighties, many areas had a big reduction of their production and other suffered their disappearance. At the same time, fights among shellfish gatherers had reached high levels of violence. In a parallel way, there was a decrease in the incomes of, which continued developing the activity.

1.2 The target species

The shellfish gathering is concentrated in four targeted species: *Venerupis pullastra* (slug clams), *Venerupis rhomboideus* (blond clams), *Ruditapes decussatus* (soft-shell clams) and *Cerastoderma edule* (cockles). These four species represent between from 88 to 95% of the total of mollusc catches in Galicia.

As molluscs, they present some similar aspects in their biological behaviour, although they maintain some specific characteristics.

The *Venerupis pullastra* (slug clams): Lives in the sub-littoral and in the lowest part of the inter-tides zone. It does so in small sand, muddy sand or muddy coarse sand banks. Its inferior distribution limit is situated at 40-metre depth and it gets fixed to solid objects by using an appendix. It has short siphons so that it can only get buried 2.5-5 cm. It cannot resist emersion for a long time. Its reproduction rate is higher than the one in the *Ruditapes decussatus*. It can be considered an **r** strategist specie. It grows quickly, 2-3 years until it become suitable to be commercialised. It has not the recruitment problems experimented in the *Ruditapes decussatus*.

The *Venerupis rhomboideus* (blond clams) lives from the highest part of the sub-littoral to the 180-200 meter depth. It lives in coarse sand, sand, muddy coarse sand or grave. To catch it a hackle rod can be used from a boat. Its catch is usually made in the exterior part of the “rías”, near their mouth.¹

The *Ruditapes decussatus* (soft-shell clams). That is a specie with a quite low reproduction rate to be a bivalve, situating itself in the extreme “k” in the “r-k”, PIANKA’s continuous. It is well ecologically adapted. It has a good resistance to emersion. It can also live with low saline concentrations, when high raining frequency take place. It grows slowly, with a period of 3-4 years to reach its commercial size. It lives in the inter-tides zone, near the higher part, preferably in those ones with sand and stones grounds. It lives

¹ In some places, due to a special shape of the littoral, some rivers have their mouth very opened to the sea. Because of that, in its ending part, there is salt water coming from the ocean/sea. This ending part, with salt water, is so-called “ría”.

buried at 15-30 cm, helped by its long siphons. It is unisexual. In their larval stage, it has a planktonic life from 10 to 15 days. In that moment, it falls down to the ground, fixing itself to the big particle by using its appendix. Is the most appreciated specie in the shellfish gathering because of its gastronomical characteristics and also, because its resistance to emersion allows reaching far markets.

The *Cerastoderma edule* (cockles) is a filtrating bivalve. It lives buried at a few centimetres far from the surface. It lives in areas of muddy sand, within the inter-tides zone. It is an **r** strategist in the "r-k" PIANKA's continuous. It is not completely ecologically adapted. It suffers high mortalities, which are compensated with a high reproduction rate and a quick growing. Exploitation along the coastal Galician area is made on the I cohort. It needs less than 18 months to reach the reproductive size. The annual productions suffer strong oscillations that graphically are presented as peaks of decrease.

Other species caught are less importance in economic and biological perspective. Examples of this others are *Pecten maximus* and *Ensis ensis*. As for non-targeted species, we are no considering them, because of their variety depending on the zone or the season we are taking into account as well as for their non-commercial relevance; we have not managed to collect homogeneous data about them.

In order to preserve the resource, legal sizes for catches were established some years ago. In the shellfish gathering, selectivity can be really easy and effective. It is enough to use bolters with a net according to the legal size for all species. When some individual are caught, we keep the ones still on the bolter and leave the ones, which have fallen onto the sand, passing through the net. Those will be able to develop themselves without any problem.

The following are the legally admissible sizes for the four targeted species:

- *Venerupis pullastra*: **38 mm** (millimetres)
- *Venerupis rhomboideus*: **40 mm** (millimetres)
- *Ruditapes decussatus*: **40 mm** (millimetres)
- *Cerastoderma edule*: **28 mm** (millimetres).

Also two not targeted species, are submitted to legally admissible sizes:

- *Pecten maximus*: **100mm**. (Millimetres)
- *Ensis ensis*: **70mm**. (Millimetres)

However, since the sixties, due to the bad situation of the resource, the shellfish gatherers tended to commercialise smaller sizes, out of the legal ones, impairing the problem of over-exploitation.

1.3 The systems of catch

The shellfish gathering is practised using two techniques or gears: "On foot" and "By boat". All of them are artisanal.

The gear called "on foot" has these characteristics:

- i) Capital investment is nearly non-existent in this activity, which requires only a pair of rubber boots and an instrument - a kind of hackle - used as their only gear.
- ii) The main parts of the “on-foot gatherers” are women who perform this activity as a part-time one, combining it with domestic chores or with periodic jobs in the preserves industry.
- iii) Work can only take place during low tide. This means that the gathering surface can change depending on the season, the weather and the tides.
- iv) Most of the catches of *Ruditapes decussatus* and *Cerastoderma edule*, are made using this gear, although the *Ruditapes decussatus* is also gathered by boat.

And the following are the characteristics of gathering “by boat”:

- i) Capital investment is not very important, but some is needed to buy a boat and a hackle.
- ii) The species *Venerupis rhomboideus* and the *Venerupis pullastra* are caught primarily using this gear and *Ruditapes decussatus* is caught both on foot and by boat.
- iii) The gear type is similar than the “on-foot” one, but the way of catching and the length of the hackle rod is different.
Here the tide is not as important, but the weather does play a major role in deciding whether to go out to gather or not. However, tide indirectly affects in the *Ruditapes decussatus*, because both types of gatherers of those species (“on foot” and “by boat”) have the same targeted species and share the same area of catching with a peculiar distribution: the “border” of each gathering zone is marked by the evolution of tides. As a result, a better catching situation for the on-foot gatherers means a worse one for the boat gatherers.
- iv) Men usually perform this work as a complementary job of fishing.

The allowed time of gathering for the “on foot” gear is from two hours before daytime low water to two hours after. There is also a limit fixed at five o’clock in the afternoon. Shellfish gathering is only allowed out of closed seasons, during working days, excepting Sundays and holidays.

The authorised gear changes depending on the species in question. However, given the similitude of the habitat of our studied species, the gear used to extract them can be the same in many cases, or several of them can be used indistinctly for different species. In any case, authorised gears are *Rake*², *Sickle/scythe (fouza)*³, “*salabardo*”⁴ and “*fisga*”⁵. In the annex II, we attach a picture of those tools.

² It has a handle made of wood or other materials with a flat metal section that forms a sharp angle with the handle and that has a sack at its bottom.

³ Same as above, but the difference is that it has a kind of teeth on one edge of the metal sticks (with a length no greater than 10 centimetres)

⁴ This one also has a wood handle but the top features a more or less curved metallic part, allowing the more difficult molluscs to be gathered.

1.4 The social context of this activity

This is an activity that has historically been considered to be marginal, as a complementary way to increase household incomes, and performed without real administrative control.

It is an activity which used to produce complementary incomes to the family economy mainly developed by women. With a coastal men population that generally worked in the sea (as sailors or fishermen), women had a relevant economical and social role. It was the maintenance of the little agricultural activity and the sustainability of their home while men were missing (physically and economically).

Within this context, shellfish gathering was a complementary activity to the agricultural one in the coastal areas of Galicia, where gather was possible.

Several types of conflicts have characterised this activity and have created to Administration the neediness of intervention.

This has led to so-called “furtive” activity (akin to poaching) being widespread, and becoming a major problem for the sector. Both facts an easy access to the resource and a high economical value of this product, have impelled the increase of this illegal activity.

This problem shows clearly the contradiction that appears when a natural resource is exploited in a regime of free access. Since in the local communities there is not enough social control, furtive ones appear as a specific social group, with their own gathering philosophy over the current laws and the local communities. All that put in a very difficult situation the sector in its way to a rational and profitable exploitation

Historically, it was considered to be a problem only by the Administration, but fortunately this mentality has changed in recent times. Now it is the gatherers themselves who demand that the Administration effectively control poachers, because they have realised that the only way for their activity to be profitable, given the limited resources, is to take care of it. And the poachers are the group that least attention pays to legislation relating to minimum sizes, and are therefore the ones who do the most harms to species and, indirectly, to the people who make a living catching them.

Another source of conflict in the development of the activity is the co-existence at the same time of different gears. In this case, problems appear between “on foot” and “by boat” gatherers, when they are gathering the *Ruditapes decussatus*. The origin of the conflict is that the *Ruditapes decussatus* is situated in limit exploitation zone for each gear. The evolution of tides is the only existent delimitation. Sometimes it can be not clear enough and that is when rises a problem. The resolution of them often is made orally and without many problems. Although there might be some fights in beaches, these are limited because the ones implicated in them usually are forming part of the same family or

⁵ Features a rectangular metallic part, the dimensions of which cannot exceed 60x30 centimetres in height, with a net that is used to select the molluscs that are drawn inside when people dig with their hands or a “*sacho*”

neighbour community.

Moreover, there is another possible struggle between men and women. Though the main parts of gatherers are women, historically only men had the legal status as professionals of the activity. Only them were allowed to register in gillnets, an organisation traditionally composed by men. After some years, things began to change. Women can join gillnets, but at practice things have not changed very quickly. In some places a sexual division has happened, leading sometime in conflicts. Men, less in number, felt in danger and looked out for support, getting it from other member of gillnets fishermen.

The professionalising process of women sharpened those problems, which only were the expression of a hard competence for the resource. The existence of discrimination is the distribution of timing and zones, impelled women to create their own shellfish gathering organisations within gillnets. In some cases, the segregation has been total, beside gillnets. There, beaches have been divided in one zone for man another for women. The management of these two areas is separately.

There is another aspect requiring attention in this sector the neediness of preparation of people working in it. The general reasons can be summarised under two categories. Firstly, due to the popular view of the activity as being “marginal” and not stimulating enough to require training, since people think it is not necessary. And secondly, resulting from insufficient effort and attention in the past on the part of the Administration. In the current days, one of the bases in the Administration performance is the investment of money and effort to improve the formation of the shellfish gatherers.

1.5 The action of the administration: the introduction of management

As it was theorised and demonstrated in the fifties⁶, in the exploitation of a natural renewable resource, it will appear many incentives to an over-exploitation if there is not a regulation on the access.

With an absence of regulations, those that exploit the resource know that to avoid catching now is not an investment for the future. On the contrary, it represents clearly a chance for another competitor to get this possible catch. In this situation there will be a non-stopping race to over-exploitation.

More competitors there are more incentives to catch the resource, technically easier to catch and slower the reproduction is, more negative effects will suffer the resource situation.

The shellfish gathering exploits such natural resources with a peculiar status. Shellfish has a limited reproduction and growing capacity. It needs a special exploitation with nearly a non-existence of entrance limits relating to investment. The free access to its exploitation provokes social and important biological problems.

⁶ The pioneer theoretical studies on this kind of problem appear with H. Scott Gordon (1954).

Therefore, Administration must have an active role in its ordination. At the same time is very important the role of shellfish gatherers, conserving industries, traders and consumers.

In Spain, the Administration its self has suffered a remarkable evolution in the last years. Starting from the Democratic Constitution, in 1978, the Spanish Kingdom was divided in Autonomous Communities. This supposed a decentralisation of the old administrative system.

The Autonomous Communities, according to the constitutional regulations, have exclusive competencies in the management of inside waters. These areas are the ones where it is developed the shellfish gathering in Galicia.

The *Xunta de Galicia* is the government of the Galician Autonomous Community since 1981. But until 1993 the development of a fishing regulation by the *Xunta* itself, was not really consolidated. In that year, the *Xunta* elaborated the “*Plan de Ordenación de los Recursos Pesqueros y Marisqueros de Galicia*” (1992).

Regarding to the shellfish gathering problem the *Xunta de Galicia*, co-ordinated with the MAPA (*Ministerio de Agricultura, Pesca y Alimentación*) have produced a wide legislative frame to regulate and to order the exploitation. Therefore, the transition to a responsible fisheries managing is at its highest point for Galicia fishing industry.

The *Xunta de Galicia* from 1989⁷ regulated the shellfish gathering in to “campaigns” trying to recover the resource, which was suffering an important decrease.

The law regulating fishing and shellfish gathering is not new. The problem was that legislation didn't go hand-in-hand with a real implementation, control, monitoring or enforcement of the activity. In practice this meant that there wasn't a working law because it wasn't necessary to obey it.

The legal aspect of the activity is not a recent one. It has been in existence since before: *Ley de Ordenación Marisqueira/Shellfish Gathering Act*, enacted in 1967.

In 1985 things began to change with the drafting of two new laws. They had a two-fold mission: trying to put some order into the situation of the sector as well as beginning to assume the new competencies associated with the decentralising process which was in full swing in Spain at the time. But that was only a half-succeeding intention.

Before 1989, practical efforts to get a better development and the modernisation of the “on foot” sector were only a few.

It is from this year when Administration adopts some measures that begin the deep transformation of the “on foot shellfish gathering”. With this performance, it is possible the starting of a change on the negative trend which, until that moment, experimented the catches.

The new regulation will be based in:

⁷ Order of 22nd September 1989. This order regulates the shellfish gathering campaign 1989-90. (DOG, 5-2-90).

- a) Considering the semi-cultivation as the economical model of production
- b) Ordering exploitation through Exploitation Plans.
- c) Establishing a normative regulation for acceding to shellfish gathering activities with the implementation of licenses of exploitation.
- d) Promoting formation with the foundation of the *Instituto Galego de Formación en Acuicultura*
- e) Controlling the quality of waters with a specialised place *Centro de Control de Calidade do Medio Mariño*.
- f) Computerising of the “lonjas”.

When we talk about exploiting a natural resource in a balanced way to ensure that it will last long, we only can choose between two forms of carrying this out: continuous exploitation or discontinuous exploitation.

The first form is based on having a regular exploitation that keeps nearly at the same level as the targeted stock. The second method is to catch intensively during some periods and then refrain from doing so for other periods called closed seasons. This second method is more commonly used, because it is easier to apply. This is especially true when speaking of Galicia. There the concentration of the population working in fishing, the relevance of the sector in the area's economy and the poor level of professionalisation, all make that kind of managing fishing resources the most rational one. In any case, inside that last category there are several options for its application. Galicia used to do it by a method known as “campaigns” (“*campañas*”) but has replaced it in recent times in favour of a more self-managed one. The “*campañas*” were used until 1992. This method consisted of dividing a year into two parts: one during which fishing is allowed (October to March); and the rest of the year, coinciding more or less with the spring and summer seasons (April to September), when it is not. Since 1992 the way of regulating the fishing seasons has changed.

Now, administrative management is effectuated by the collaboration between the Administration and guilds. The procedure established is as follows: They have a limit by law that they have to obey - they have to apply a closed season of at least two consecutive months within the period from April to June. Besides this mandatory closed season, they can decide longer periods of non-fishing without restrictions. The way to establish this period must be fixed on a year-by-year basis. Each port submits a planning period of fishing and closed seasons to the Autonomous Government. Administration technicians study the proposal using biological criteria (basically) but also having a special consideration for social implications in a historical conflictive aspect. If the proposal is accepted, it will be the official fishing and shellfish-gathering period for the following year.

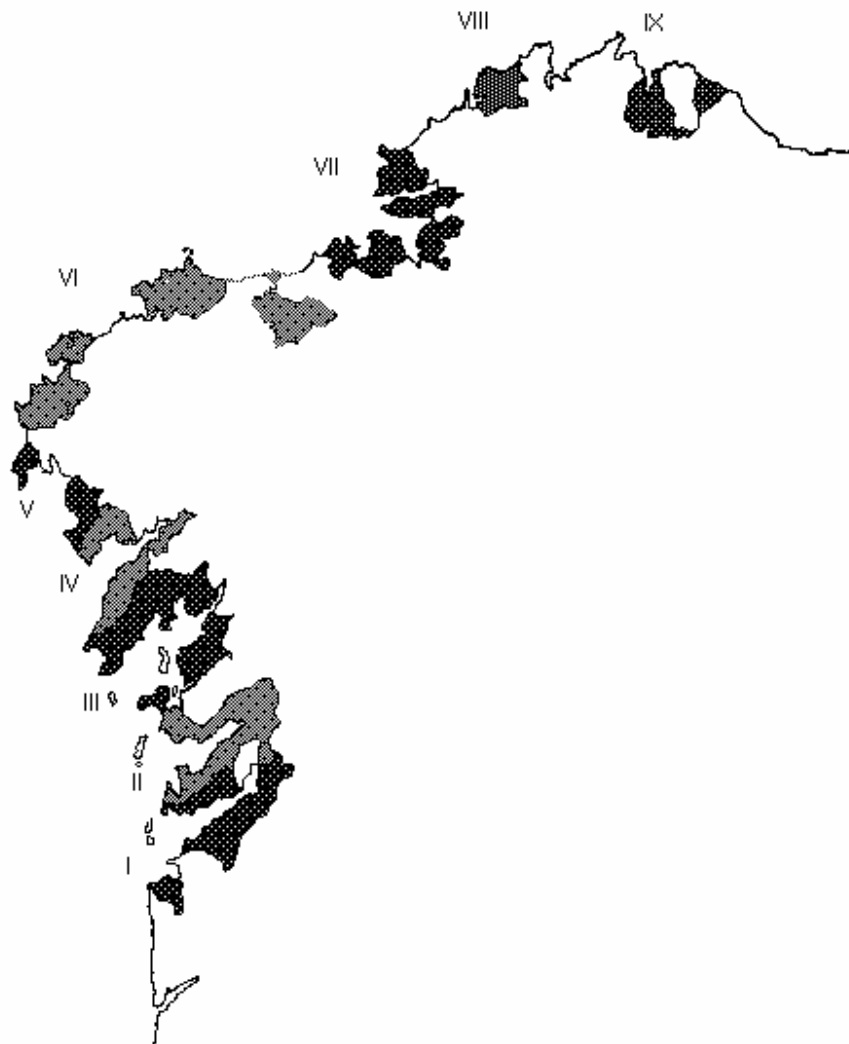
Following what is set out in the maritime regulating plan, shellfish encloses crustaceans and molluscs; however for this paper we are only considering molluscs because of their importance, they represent nearly the 90% of the total catches.

Regarding to the shellfish gathering activity, the coastal area is divided in 9 zones, including some smaller units: gillnets. Each management area/zone, encloses a set of gillnets and it is an autonomous area of reproduction of the resource.

Each gillnet, it is allowed to exploit a part of the inter-ides zone. The division of the zones into gillnets, has not a biological base but an administrative one. The establishment of theses divisions is made in order to facilitate the control and the monitoring of the whole area.

In map 1 we can appreciate the set of fishing gillnets in the Galician Littoral. Among them, only some of them have shellfish gathering activity. In many of these gillnets there are only fishing communities.

Map 2: The division of Galician coast in zones in relation of the Shellfish Gathering activity⁸



⁸ Elaborated by the GEM, from the map 1

Table 1: The zones of the shellfish gathering activity. Enclosed Guilds

<i>Zones</i>	<i>Enclosed Guilds</i>
Zone I:	Arcade, Baiona, Cangas, Moaña, Redondela, Vigo, Vilaboa.
Zone II:	Aldán, Bueu, Lourizán, Marín, Pontevedra, Portonovo, Raxó.
Zone III:	Ribeira, Aguiño, A Pobra do Caramiñal, Cabo de Cruz, Rianxo, Carril, Vilaxoán, Vilanova, Illa de Arousa, Cambados, Grove, Palmeira, Abanqueiro.
Zone IV:	Muros, Noia, Portosín, Porto do Son.
Zone V:	Finisterra, Lira, Corcubión, O Pindo.
Zone VI:	Caión, Camariñas, Camelle, Cornwe, Malpica, Laxe, Muxia.
Zone VII:	A Coruña, Ares, Barallobre, Lorbé, Ferrol, Mera, Miño, Murgados, Sada, Pontedeume.
Zone VIII:	Cedeira, O Barqueiro, Espasante, Cariño, Valdoviño.
Zone IX:	Celeiro, San Cibraio, Ribadeo, Foz, Vicedo.

The real good step to a responsible exploitation of the Galician marine resources wasn't made until the Galician Fishing Act of 11 May 1993⁹. There we find a new concept of management that was an innovation in itself, both in the Spanish legislation and for other foreign legislation: to consider fishing and shellfish gathering globally for their management.

This law was based in an important previous study; the "*Plan de Ordenación dos Recursos Pesqueiros e Marisqueiros de Galicia*" published in 1992.

The publication of the "*Plan de Ordenación dos Recursos Pesqueiros e Marisqueiros de Galicia*" is a very important effort to establish the basis of a new consideration of the sector. The Plan lays out the basis of the situation, which is essential to improving it. The Plan consists of a broad-based description, ranging from its biological to its legal aspects. More concretely, this Plan describes:

i) The shellfish species (including both molluscs and crustaceans as well as some peculiar species like *Pollicipes cornucopia*) referring to all these aspects: Production, Reproduction, Growing and Yield

Moreover, there are conclusions for each species concerning: the areas where it is possible to exploit them, if the species is under- or over-exploited, the role that should be played by the Administration in managing, the optimum strategy to get highest prices, the recommended legal sizes, etc.

ii) The problem of shellfish gathering from five aspects: biological, technical, social, economical and political.

⁹ Fishing law: Ley de Pesca 6/93 (DOG)

iii) The development of the sector.

The period that goes from this first Plan (1992) to the *Plan Galicia* (1996) is characterised by the approbation of several orders at the Autonomous Government level which specify and develop the provisions established under State regulations. These decrees establish a wide range of aspects like: who is in charge of managing, controlling and monitoring the sector (as a result of the decentralisation process), what is the situation of the sector, which are the Administration's targets and how these objectives are going to be applied, allowed legal sizes and gear, etc.

The newest administrative action, currently in full force, is the *Plan Galicia*. This is a technical project designed by the *Xunta de Galicia* (Autonomous Government of Galicia). The plan seeks higher profitability and the professionalisation of the sector by introducing innovations, as well as training gatherers in order to erase the marginal tradition of the activity. It is based on nearly ten years of efforts in this direction, but it was not applied at a practical level until 1996, when a pilot experience took place. This began as a search for a way out of a conflictive situation, transforming it later into an organised action, with the final goal of becoming a reality for the entire Galician coast. The Plan has a totally new outlook regarding shellfish gathering; therefore, it not only targets the regulating of shellfish extraction, but also aims to prepare people and guilds in farming them. So, the Plan works in three ways: controlling extraction, providing professional training to shellfish gatherers, and, finally, increasing the potential production of shellfish by promoting its seeding.

During 1996, the *Consellería de Pesca, Marisqueo e Acuicultura*¹⁰ designed a new project that developed at a new level, the already established regulations.

In its new analysis, the *Consellería de Pesca, Marisqueo e Acuicultura* took as starting point the recognition of the important performance of the shellfish gathering in Galicia and their social relevance in the coastal area. However, it was settled its low profitability as the same time that a context of low individual qualification. The main interpretation of this was the only use of extraction techniques.

From this analysis, the following objectives were fixed:

- The progressive change of the "on foot gathering" into a professional activity with the chance for those which exploited the activity of increasing the incomes.
- Making stronger the organisation capacity of the gatherers, in order to acquire financial, technical and management self-determination.

To reach those objectives, the plan proposed the following actions performed by the administration:

¹⁰ The *Consellería de Pesca, Marisqueo e Acuicultura* is an administrative unit of the regional government in Galicia responsible of fishing, shellfish gathering and acuaculture, similar to the MAPA (Ministry of Agriculture, Fishing and Feeding) for the Spanish Central government.

- Supporting technically and materially the shellfish gathering organisations to insert over-elevated semi-cultivation techniques. These have the purpose of improving the production of bivalves molluscs
- Giving formatting programs to shellfish gatherers in order to adapt them and their organisations to the objectives of the Plan.

On the other hand, Administration wanted the associative organisations to contribute to the plan by applying the following measures:

- Dedicating part of the increase in the individual shellfish gatherers' rents to create organisations own funds. That had a clear purpose, reaching financial autonomy and facing future of the sector in a proper way.
- Establishing full-time working days to all he associated individuals. The objective was to develop genuine shellfish gathering activities and avoid part-time or complementary dedications.

This proposal was experimentally developed by the sector itself. In fact, two places Vilaxoán and Vilanova had already been developing their own work in the same direction. Starting from the exposed criteria and with experimental character, the *Consellería de Pesca, Marisqueo y Acuicultura* established pilot program the **Plan 10**. This was based in implanting over-elevated¹¹ semi-cultivation techniques for bivalves in the shellfish gathering associations of Vicedo, Cariño, Barallobre, Mugar dos, Anllóns, Cabo de Cruz, Lourizán y Moaña. The Consellería upheld the performance by giving technical and material support. In that Plan there were included Vilaxoán y Vilanova, which had already been developing their projects in that direction.

From the evaluation of the results by the technical staff, responsible of the **Plan 10**, there was a proposal: to make wider the implantation of the Plan to other part of the Galicia littoral. It was decided to be extended to other gillnets and associations, in actions of three years, each one. From its beginning in 1997 and conceived for three years, the so-called **Plan Galicia** began its application, in 31 areas of Galicia¹².

The practical implementation of the **Plan Galicia** was developed from 1997. Its base was not only to regulate the access to the resource. Moreover, it had another purpose: the positive and direct intervention to improve the shellfish exploitation and that, in the minimum possible time. To reach so, some aids were established:

¹¹ This system consists in planting some shellfish seeds of the target specie in tables prepared with sand and fixed to the beach floor. The seeds receive salt water directly from the tides. When they reach an enough size, they are disposed on the beach to end their developing.

¹² This 31 areas are the guilds and shellfish gathering associations of: Ribadeo, A Coruña, Vilanova, Baiona, Foz, Baldaio, O Grove, Celeiro, Anllóns, Raxó, O Vicedo, Camariñas, Pontevedra, O Barqueiro, Corcubión, Lourizán, Cariño, Muros, Aldán, Cedeira, Palmeira, Moaña, Barallobre, Cabo de Cruz, Vilaboa, Mugar dos, Rianxo, Arcade, Miño, Vilaxoán, Redondela. More latter go out Lourizán and Pontevedra, but Espasante was included.

- 1) Acquirement of seeds for the associative organisations of the sector
- 2) Acquirement of cultivation tables and materials
- 3) Technical assistance to organisations and formative actions
- 4) Complementary performances in the natural shellfish banks
- 5) Control, caring and monitoring of the shellfish banks

Regional Administration dedicates specific resources to the monitoring and control of the activity in the beaches and to the fighting against furtive gatherers. But this human capital is clearly insufficient to control the entire Galician coast, suitable to be exploited. An increase in the number of persons that control the sector to full levels would suppose dedicating more resources to that purpose than the ones coming from the proper exploitation of the shellfish. Therefore, it would not exist economical reasons to make it. The only valid way is by implicating the shellfish gathering sector in the monitoring of the activity to make fulfil the legally established regulations. With that near and direct control, we will surely obtain more effective results than the ones coming from an external control realised by Administration.

This neediness was a basic reason to promote and facilitate the ordination of the shellfish gathering organisations into organisations with their own personality and an active performance in the control and monitoring of the activity.

From the foundation of shellfish gathering organisations, the role of them in the control of beaches have grown. In the current days, there is a good collaboration between the Administration and the shellfish gatherers in the monitoring of the sector.

The new organisation of women in the sector in self-financed and self-managed associations, is a very important fact to explain the new working of the “on foot shellfish gathering”, orientated towards the proposals of the *Plan Galicia*.

As it has been commented above, along the more than 1000 kilometres of Galicia littoral, women are which normally gather the shellfish on the beach.

The *Plan Galicia* has two main objectives:

- The improvement of the economical results and the obtainment of wider margin of biological security, with a more respectful exploitation of the resource.
- The professionalisation and organisation of women to obtain a more responsible and profitable exploitation of the resource as well as the labour insertion into the labour market of a big number those women.

As it has been mentioned, until few years ago women realised this extractive activity as a supplying source of money, used to increase the family incomes. The relevant thing was to convert this activity into another one where this work was recognised as a professional activity. The purpose was to change the women’s mentality and their active implication in the management, caring and development of the resource.

In order to manage so, new organisations were founded within or out of the already existence gillnets. These are the women shellfish gathering associations. In them, several

tasks were going to be made, under the direct control of the own associated women:

- Control on the extractions to avoid falls in prices
- Cultivation of species using the over-elevated system
- Control of the shellfish banks to avoid robberies

In the following paragraphs we are going to examine the results of the real development of the management politics of the *Xunta de Galicia*. The studied period will be 1989 – 1997. The *Plan Galicia* is the latest development of those management politics. It is not possible to examine this Plan in a separately way because there are not enough data or perspective to do so.

The results evaluation on the administrative management until the recent days will consider in a different section the effect on the resources, the economical profit and society.

2. The outcomes of the news administrative regulations

2.1 The evolution of catches from the biological perspective:

We consider four target species, all of them molluscs. Those species represent approximately 88 to 95 per cent of all shellfish caught in Galicia:

The analysis is concentrated in the registered data. This data concerned only to the final catch. There are not data on larval or juveniles stages. There are not data on natural stock in the sand. Only have data on the catch of adult population.

In the case of juvenile ages, gatherers are not allowed to catch shellfish under this stage. As a result, data do not exist in this respect. Moreover, it would not be possible to collect information from larval stage, because molluscs have microscopic dimensions at this stage.

Data on catches are analysed taking 9 zones or management areas, presented in section 1.5. Each management area/zone, encloses a set of gillnets and is an autonomous area where the resource is reproduced.

In the annex III.1, are presented the catches evolution by species, by zone and from 1989 to 1997.

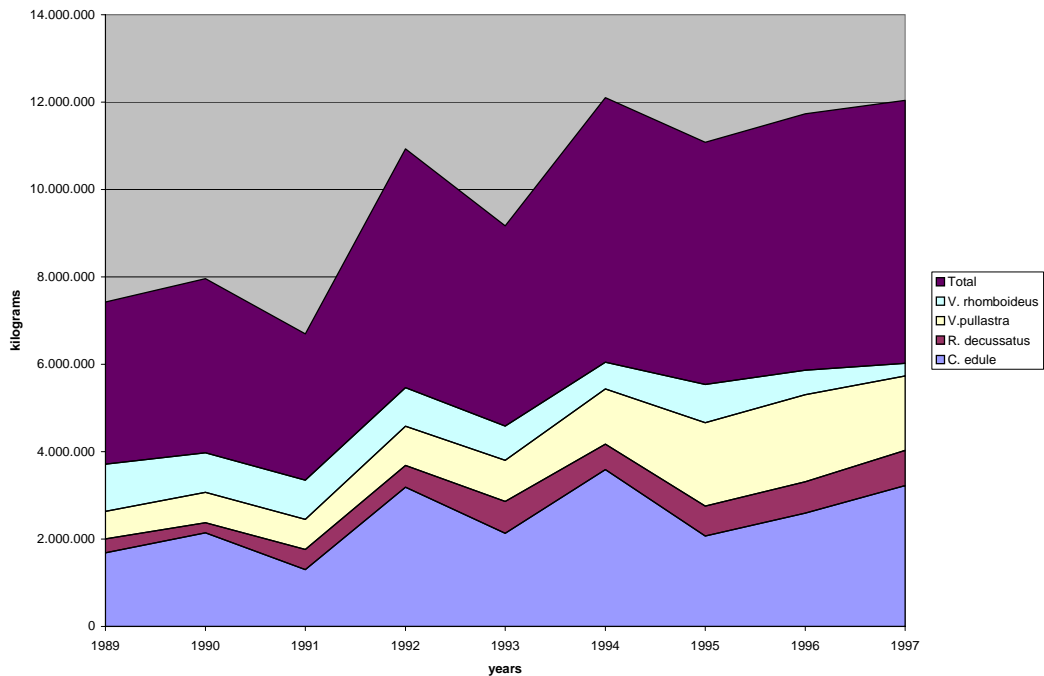
In the following table 2 there is a summary of the compiled information and it can be also observed in graphic 1.

Here we observe a positive evolution of the total catches, during all the period. At late eighties, catches decrease extremely due to the uncontrolled exploitation of the resource. The posterior evolution of the total catches shows an improvement of the resource situation in 3 out of the 4 target species.

Table 2. Target Species: Evolution in weight of the total catches

	C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
1989	1.687.438	320.170	624.623	1.080.424	3.712.655
1990	2.142.968	230.890	692.784	911.640	3.978.282
1991	1.298.446	462.040	691.282	894.593	3.346.361
1992	3.185.578	497.777	900.071	881.253	5.464.679
1993	2.133.204	726.359	941.703	783.421	4.584.687
1994	3.588.774	585.910	1.262.560	612.380	6.049.624
1995	2.071.923	681.565	1.910.643	874.655	5.538.786
1996	2.590.518	720.793	1.991.765	562.922	5.865.999
1997	3.220.352	812.110	1.701.851	287.584	6.021.897

Graphic 1. Target Species: Evolution in weight of the total catches



Globally, we can say that in the present days the resource status is better. Now, we can get nearly double the production than in 1989. As we are going to see, this higher production is combined with a decrease of the effort (less shellfish gatherers and less gathering days).

However, for the *Venerupis Rhomboideus* the situation is different. The catches have decreased until a third part of the initial production. It is a target specie of the “by boat” shellfish gathering. This decrease might indicate a less effectiveness in the control of

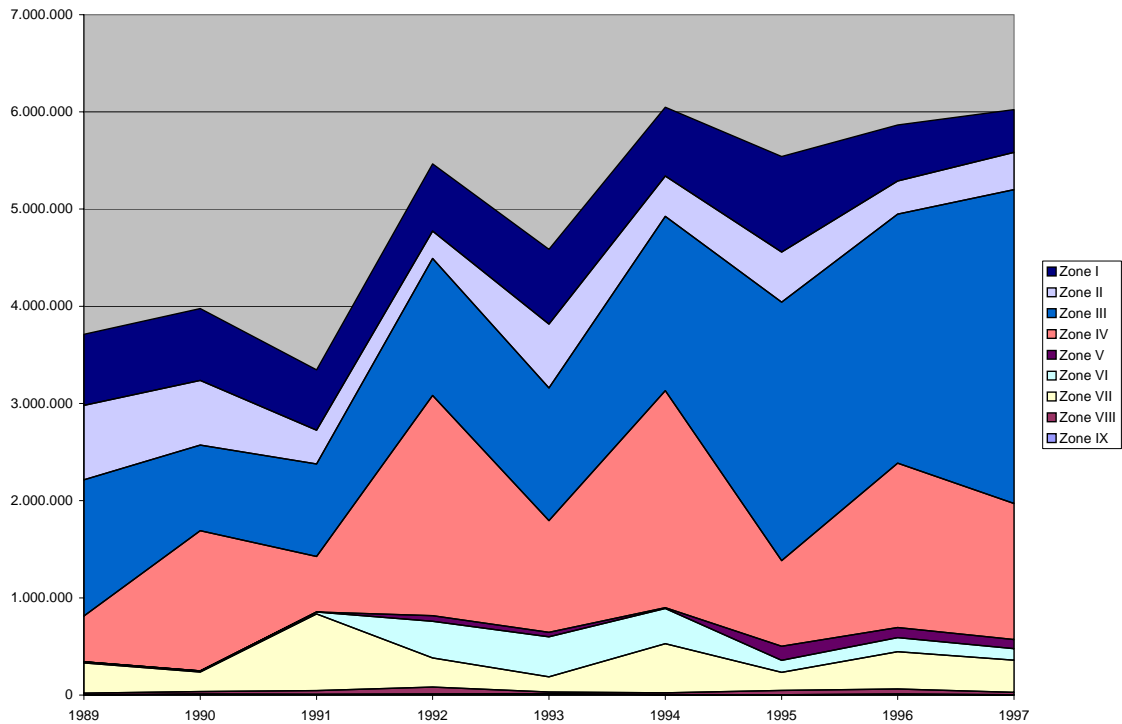
the “by boat” shellfish gathering, mainly realised by men, and a consequence of the non-cultivation of this specie.

If we consider the production by zones, we can obtain table 3 and graphic 2.

Table 3: Management Zones: Evolution in weight of the total catches

	1989	1990	1991	1992	1993	1994	1995	1996	1997
Zone IX	4.017	11.023	9.022	12.715	13.043	5.172	4.067	12.727	3303
Zone VIII	15.931	26.595	37.415	69.638	19.550	18.339	43.621	50.357	25861
Zone VII	312.789	199.734	786.560	300.144	155.720	505.029	187.889	381.258	330960
Zone VI	8.812	10.520	19.950	378.210	411.017	362.357	120.975	145.767	116832
Zone V	0	0	0	55.969	46.374	7.701	146.240	105.552	95343
Zone IV	474.023	1.442.514	572.239	2.267.221	1.148.568	2.232.657	880.692	1.691.233	1397945
Zone III	1.398.976	880.765	951.118	1.407.812	1.366.629	1.793.906	2.660.148	2.562.701	3230753
Zone II	765.174	665.170	349.466	283.865	656.641	414.256	514.075	339.579	380838
Zone I	732.934	741.961	620.591	689.105	767.145	710.208	981.079	576.824	440063

Graphic 2: Management Zones: Evolution in weight of the total catches



These results indicate the improvement of the production in the main part of the zones, excepting in the south part of Galicia: Pontevedra and Vigo “rías”. Even if these zones are potentially rich, with the most industrial developed zones and the ones with the

highest city population density (including Vigo, the economical capital of Galicia), it seems clear that the direct management formulas, have better results in the rural zones, where the social control is stronger.

2.2. The evolution of the economic outcomes

In III.2 annex, we present the results of the catches in value for the 4 target species. These values are expressed in thousand pesetas and for the period 1989 – 1997.

The catches that are not very important in weight, but these are significantly higher if we consider them aggregately with the farmed variety of shellfish, especially in the case of the *Mytilus edulis linnaeus*. Another vision is found for this sector when we look at the value of the sales proceeds of shellfish products, since most of these products fetch high market prices.

In addition, it would be important to pay attention to the number of jobs it can provide to the fishing industry and the Galician economy in general, because the manual work is the most important production factor for it. Obviously this will work if the stock is preserved and exploited rationally.

We can observe some characteristics in the shellfish commercialisation:

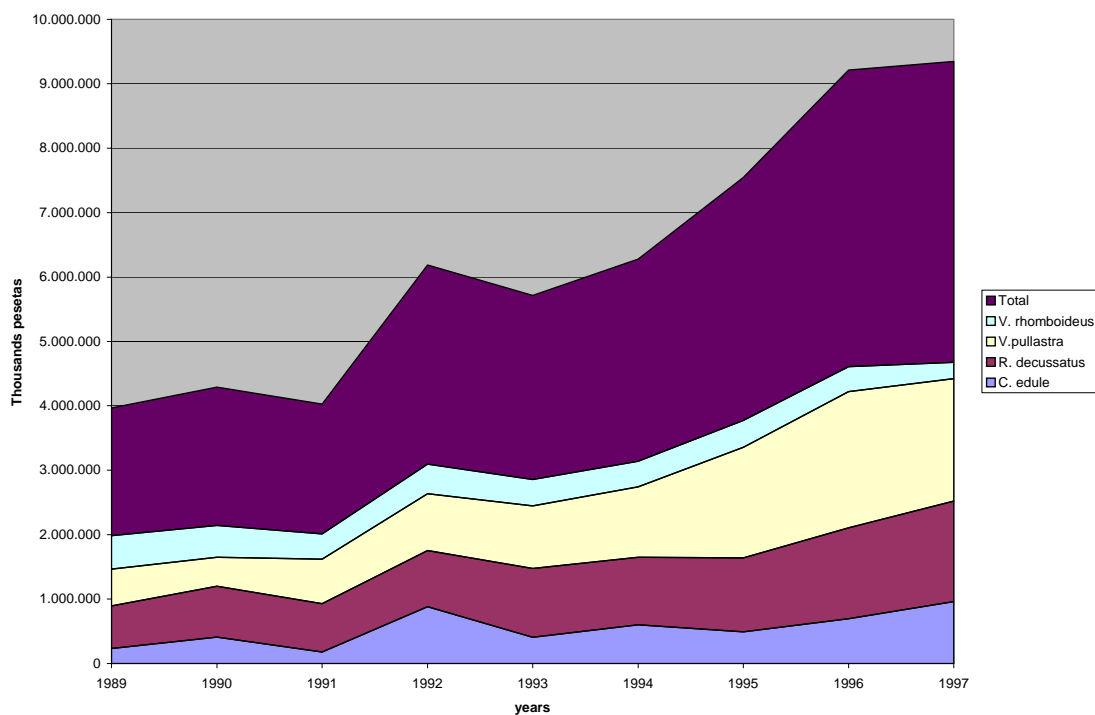
- *Venerupis pullastra*: This crustacean gathering is concentrated in a few ports that enclose a high percentage of catches.
- *Venerupis rhomboideus*: This is the species of a more diversified origin and it is gathered in many ports.
- *Ruditapes decussatus*: This one has a similar behaviour concerning catches than *Venerupis pullastra*: a few ports enclose nearly all the quantity of *Ruditapes decussatus* gathered.
- *Cerastoderma edule*: The same scheme can be applied to this species.
- Every *lonja* has its own particular selling structure.

In table 4 and graphic 3, we present a synthesis of the obtained results. It can be appreciated an increase in value, more important than in the case of catches in weight. Meanwhile catches in weight risen a 62%, catches in value reached a 135% increase.

Table 4. Target Species: value of the total catches in thousand pesetas

	C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
1989	231.209	661.216	573.220	518.265	1.983.910
1990	410.491	788.016	449.828	496.355	2.144.690
1991	179.553	749.867	689.816	393.368	2.012.604
1992	880.473	876.608	879.870	455.937	3.092.888
1993	408.761	1.067.535	968.019	412.624	2.856.939
1994	601.495	1.049.017	1.091.452	397.476	3.139.440
1995	491.042	1.151.155	1.716.297	414.169	3.772.663
1996	695.806	1.409.926	2.116.795	383.983	4.606.510
1997	962.059	1.558.391	1.900.485	253.211	4.674.146

Graphic 3. Target Species: value of the total catches in thousand pesetas



An inference can be made from it: there was a quite important increase in prices as it can be observed in table 5. In this table we present the evolution of the average prices for the 4 target species during all the period.

Table 5. Price per kilo of the target species in pesetas

	C. edule	R. decussatus	V. pullastra	V. rhomboideus	Total
1989	137	2.065	918	480	534
1990	192	3.413	649	544	539
1991	138	1.623	998	440	601
1992	276	1.761	978	517	566
1993	192	1.470	1.028	527	623
1994	168	1.790	864	649	519
1995	237	1.689	898	474	681
1996	269	1.956	1.063	682	785
1997	299	1.919	1.117	880	776

This table shows that although there is an increase in production relating it to a more rational exploitation, prices have not fallen but have had a clear increasing trend.

This increase can be explained from two reasons.

On one hand, by the diversification and improvement of commercialisation. The shellfish gathering organisations, supported by Administration, have penetrated in new markets, especially in those, which really appreciate shellfish in fresh form (big Spanish cities). This has allowed a substantial increase of the added value.

On the other hand, the increasing control relating to minimum sizes, made by shellfish gatherers and Administration, have given positive results. Since it exists a positive correlation between shellfish price and size, the results of an increase in sized due to a major control have led to an increase in the obtained prices.

Anyway, the price behaviour also can give us information on the complexity of the regulation of those exploitations with free access. Therefore, in the actual conjuncture a more rational exploitation can lead to a fall in prices due to an increase of the offer. On the contrary, a non-rational exploitation might provoke high prices when there is a meanness of the product. These conjuncture oscillations of prices can threaten the stability of the management systems and stimulate processes of non-rational or sustainable exploitation.

2.3. The social effects

The social effects coming from adopted measures have a wide scope. There are some aspects difficult to be quantified as the improvement in the labour security, the decrease of the violent conflicts or the women insertion in the labour market. But there are other things easier to be appreciated, those related to the shellfish gatherer incomes.

This aspect can be deduced from correlating the catches in value with the employed population, because investment in the extractive process is nearly non-existent. What is remunerated is basically the work.

Lamentably, we do not dispose complete series with the number of shellfish gathering licenses for all the period. What is available is in annex III.3. This table contains data on the beginning and the end of the period, but there is a lack for the years 1993-1996.

The data collected in this section contribute to gaining a clear knowledge of the composition of the sector by gears but unfortunately not by age or sex, because of the lacking of such data.

From the obtained data we can know a remarkable reduction of people working in the sector, from 20.842 people to 11.641. This has been nearly a 50% reduction.

Correlating this variable with the evolution of catches in value, we observe how from the average per person in 1989 of 106 thousand pesetas, in 1997 this one is at 401 thousand pesetas. These last incomes, is nearly the equivalent to 6 months of the established minimum wage in Spain.

Without any doubt, these results are still insufficient but they allow thinking about a professionalisation of the sector.

Data on the number of licenses/shellfish gatherers are completed with data on the total productive employment in Galicia. That is also presented in III.3 annex. From that we can know, shellfish gathering represents the 1% of the total employment in Galicia. It is a low percentage but still important within the special context in Galicia.

3. Some general conclusions

The **increasing Administration effort in monitoring the activity** to assure those licensed gatherers will be the only ones who will be able to catch shellfish. This is a key point to reflect the relevant evolution of Administration behaviour concerning the sector.

Those previous points have been very important for the sector in different ways. Firstly for allowing people who earn their living from these activities to have a more stable life because they can now earn more regular incomes. Moreover, this has aroused greater interest among them in taking care of the resource as a method of preserving their future, and as it is known, the involvement of the sector is a very important means to achieve more responsible fisheries management.

The development of the Administration activity has had a wide purpose: recovering the resource situation (really threaten), regulating and professionalising the activity, impelling the associated work and introducing modern management criteria. This sector was socially conflictive, within a country more economically developed.

We have not enough perspective or data, at the present moment, to evaluate the results of the last period in the administrative management. The ***Plan Galicia*** was applied in 1997 and 1998, and we can no assume definitive results from those recent years.

For the moment, what is clear is that administration intervention has allowed:

- 1) The recovering of the most part of stocks and a quantitative and qualitative improvement of production in a sustainable way
- 2) The control and reduction in the number of those, which participate in the exploitation
- 3) The professionalisation of the ones within the sector
- 4) The increase of associations in the activity that can assume the direct management of the resources
- 5) The improvement of the obtained results
- 6) The incorporation of women into the productive economical activity in a peripheric area of the Spanish Economy

A thing to be monitored in future is the real possibility of introducing massively the semi-cultivation in the shellfish gathering associations as the ***Plan Galicia*** pretended to.

The results of the current efforts will be visible in the 2000. However, the trajectory of the obtained results has allowed the formulation of this last period. It is not possible a regulation without a process of transition to a new situation. This process must allow going from a traditional levels of free access, deregulation and resource crisis to a new situation with a sustainable exploitation, harmonical with the possibilities of the environmental and an universal accepted definition of duties and rights.

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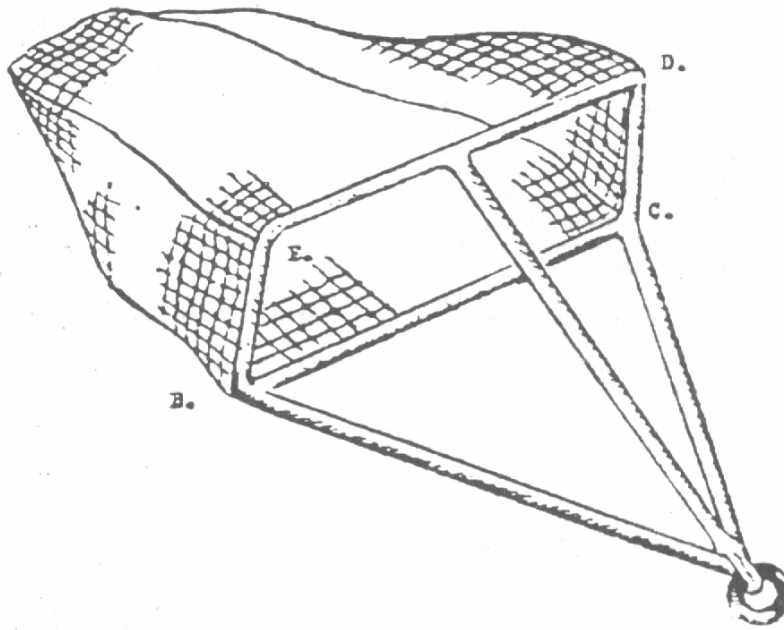
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Annex I. Fishing gears employed in the Shellfish Gathering

RAKE (1)

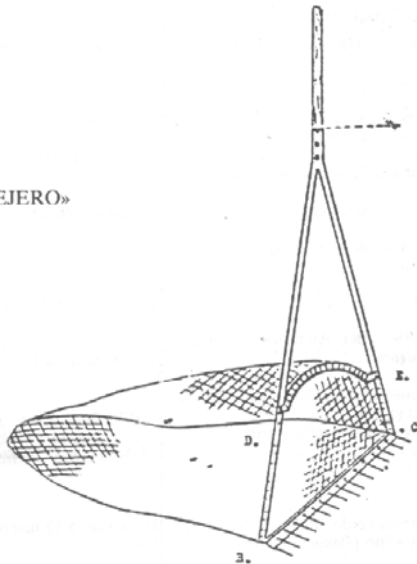
«ENDEÑO» O «RASTRO»
(Para vieira, ostra, zamburiña y cangrejo)



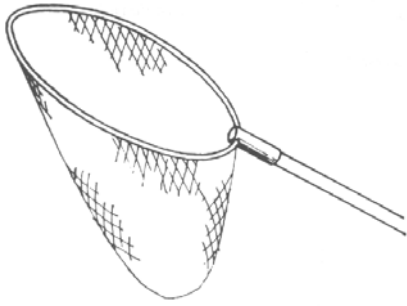
SICKLE/SCYTHE (FOUZA) (2)

ANEXO II

«RASTRILLO» O «ANGAZO ALMEJERO»
(Para almeja y berberecho)



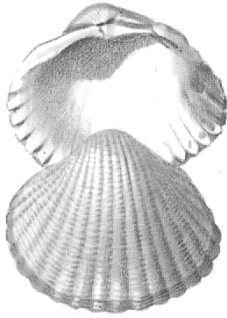
SALABARDO/SALABRE (3)



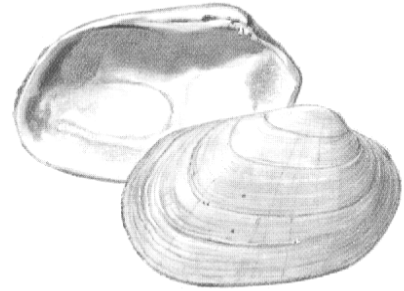
FISGA (4)



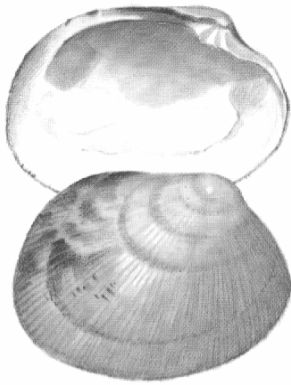
Annex II. Exploited species in the Shellfish Gathering



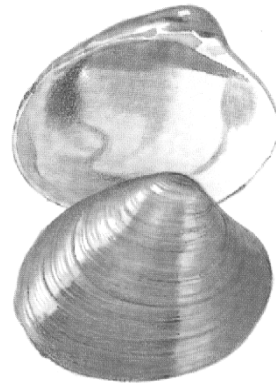
Cerastoderma edule (Linnaeus, 1758)



Ruditapes decussatus (Linnaeus, 1758)



Venerupis pullastra (Montagu, 1803)



Venerupis rhomboideus (Pennant, 1777)

Annex III. The statistical data

1 Biological data

1989		Species (in Kg)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	1.112	2.753	151	0	4.017
Zone VIII	Coruña Norte	169	15.593	169	0	15.931
Zone VII	Ría de Ferrol	41.671	37.403	232.941	774	312.789
Zone VI	Arco Ártabro	0	5	8.807	0	8.812
Zone V	Costa Noroeste	0	0	0	0	0
Zone IV	Rías de Muros y Noia	331.118	88.683	7.176	47.046	474.023
Zone III	Ría de Arousa	702.127	22.018	301.699	373.132	1.398.976
Zone II	Ría de Pontevedra	354.353	34.460	22.350	354.012	765.174
Zone I	Ría de Vigo	256.888	119.254	51.331	305.461	732.934
Total		1.687.438	320.170	624.623	1.080.424	3.712.655

1990		Species (in Kg)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	4.148	5.288	1.587	0	11.023
Zone VIII	Coruña Norte	6.035	19.764	796	0	26.595
Zone VII	Ría de Ferrol	50.830	28.953	119.056	895	199.734
Zone VI	Arco Ártabro	9.741	774	5	0	10.520
Zone V	Costa Noroeste	0	0	0	0	0
Zone IV	Rías de Muros y Noia	1.361.760	42.920	15.367	22.467	1.442.514
Zone III	Ría de Arousa	93.887	25.000	308.332	453.546	880.765
Zone II	Ría de Pontevedra	297.900	37.519	80.585	249.166	665.170
Zone I	Ría de Vigo	318.667	70.672	167.056	185.566	741.961
Total		2.142.968	230.890	692.784	911.640	3.978.282

1991		Species (in Kg)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	2.263	4.950	1.809	0	9.022
Zone VIII	Coruña Norte	29.544	6.872	999	0	37.415
Zone VII	Ría de Ferrol	568.502	10.709	204.894	2.455	786.560
Zone VI	Arco Ártabro	19.095	855	0	0	19.950
Zone V	Costa Noroeste	0	0	0	0	0
Zone IV	Rías de Muros y Noia	304.394	202.293	10.235	55.317	572.239
Zone III	Ría de Arousa	180.232	46.010	311.175	413.701	951.118
Zone II	Ría de Pontevedra	5.591	52.480	98.595	192.800	349.466
Zone I	Ría de Vigo	188.825	137.871	63.575	230.320	620.591
Total		1.298.446	462.040	691.282	894.593	3.346.361

1992		Species (in Kg)				
Zones		C. edule	R. decussatus	V. pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	6.116	4.942	1.657	0	12.715
Zone VIII	Coruña Norte	42.362	25.068	2.208	0	69.638
Zone VII	Ría de Ferrol	76.225	30.671	158.435	34.813	300.144
Zone VI	Arco Ártabro	373.134	5.066	10	0	378.210
Zone V	Costa Noroeste	0	0	0	55.969	55.969
Zone IV	Rías de Muros y Noia	1.929.462	159.405	113.291	65.063	2.267.221
Zone III	Ría de Arousa	447.268	100.332	445.670	414.542	1.407.812
Zone II	Ría de Pontevedra	53.393	30.576	44.014	155.882	283.865
Zone I	Ría de Vigo	257.618	141.717	134.786	154.984	689.105
Total		3.185.578	497.777	900.071	881.253	5.464.679

1993		Species (in Kg)				
Zones		C. edule	R. decussatus	V. pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	1.741	9.878	1.424	0	13.043
Zone VIII	Coruña Norte	7.712	10.832	1.006	0	19.550
Zone VII	Ría de Ferrol	36.035	12.678	106.872	135	155.720
Zone VI	Arco Ártabro	402.087	8.930	0	0	411.017
Zone V	Costa Noroeste	0	0	0	46.374	46.374
Zone IV	Rías de Muros y Noia	670.397	255.823	97.315	125.033	1.148.568
Zone III	Ría de Arousa	309.068	143.550	528.549	385.462	1.366.629
Zone II	Ría de Pontevedra	376.171	114.637	65.251	100.582	656.641
Zone I	Ría de Vigo	329.993	170.031	141.286	125.835	767.145
Total		2.133.204	726.359	941.703	783.421	4.584.687

1994		Species (in Kg)				
Zones		C. edule	R. decussatus	V. pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	489	2.880	1.804	0	5.172
Zone VIII	Coruña Norte	5.275	12.106	958	0	18.339
Zone VII	Ría de Ferrol	155.248	48.411	301.278	93	505.029
Zone VI	Arco Ártabro	354.324	7.122	911	0	362.357
Zone V	Costa Noroeste	1.081	0	3	6.617	7.701
Zone IV	Rías de Muros y Noia	1.896.361	150.509	81.478	104.309	2.232.657
Zone III	Ría de Arousa	588.461	156.673	688.658	360.113	1.793.906
Zone II	Ría de Pontevedra	172.545	114.736	88.623	38.352	414.256
Zone I	Ría de Vigo	414.990	93.474	98.848	102.896	710.208
Total		3.588.774	585.910	1.262.560	612.380	6.049.624

1995		Species (in Kg)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	171	2.135	1.761		4.067
Zone VIII	Coruña Norte	30.200	13.142	280		43.621
Zone VII	Ría de Ferrol	6.340	1.661	179.888		187.889
Zone VI	Arco Ártabro	46.639	26.701	47.635		120.975
Zone V	Costa Noroeste	136.013	10.227			146.240
Zone IV	Rías de Muros y Noia	439.460	199.154	156.744	85.334	880.692
Zone III	Ría de Arousa	692.331	165.471	1.328.843	473.503	2.660.148
Zone II	Ría de Pontevedra	237.212	181.460	38.054	57.349	514.075
Zone I	Ría de Vigo	483.557	81.614	157.439	258.469	981.079
Total		2.071.923	681.565	1.910.643	874.655	5.538.786

1996		Species (in Kg)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	10.279	2.068	379	0	12.727
Zone VIII	Coruña Norte	36.264	13.405	688	0	50.357
Zone VII	Ría de Ferrol	9.958	3.360	367.940	0	381.258
Zone VI	Arco Ártabro	56.745	42.173	46.849	0	145.767
Zone V	Costa Noroeste	70.998	10.319	2.192	22.043	105.552
Zone IV	Rías de Muros y Noia	1.347.683	99.384	82.509	161.657	1.691.233
Zone III	Ría de Arousa	688.735	265.555	1.325.462	282.950	2.562.701
Zone II	Ría de Pontevedra	96.994	194.293	14.118	34.175	339.579
Zone I	Ría de Vigo	272.862	90.236	151.628	62.098	576.824
Total		2.590.518	720.793	1.991.765	562.922	5.865.999

1997		Species (in Kg)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	372	2.443	487	0	3.302
Zone VIII	Coruña Norte	13.392	11.517	952	0	25.861
Zone VII	Ría de Ferrol	759	2.736	327.461	4	330.960
Zone VI	Arco Ártabro	37.497	45.481	33.854	0	116.832
Zone V	Costa Noroeste	70.581	17.802	6.960	0	95.343
Zone IV	Rías de Muros y Noia	1.149.837	135.967	59.511	52.631	1.397.945
Zone III	Ría de Arousa	1.588.264	357.774	1.124.647	160.069	3.230.753
Zone II	Ría de Pontevedra	162.265	179.847	19.952	18.775	380.838
Zone I	Ría de Vigo	197.387	58.543	128.028	56.106	440.063
Total		3.220.352	812.110	1.701.851	287.584	6.021.897

2.2 Economic data

1989		Species (in thousand Ptas.)				
Zones		C. edule	R. decussatus	V. pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	165	5.141	156	0	5.462
Zone VIII	Coruña Norte	19	22.738	186	0	22.943
Zone VII	Ría de Ferrol	4.445	61.537	175.415	406	241.803
Zone VI	Arco Ártabro	0	5	6.497	0	6.502
Zone V	Costa Noroeste	0	0	0	0	0
Zone IV	Rías de Muros y Noia	98.960	204.344	6.609	24.072	333.984
Zone III	Ría de Arousa	44.529	74.408	306.277	201.504	626.718
Zone II	Ría de Pontevedra	42.121	74.552	26.341	139.566	282.580
Zone I	Ría de Vigo	40.971	218.491	51.739	152.718	463.918
Total		231.209	661.216	573.220	518.265	1.983.910

1990		Species (in thousand Ptas.)				
Zones		C. edule	R. decussatus	V. pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	373	1.451	0	9.083	10.907
Zone VIII	Coruña Norte	873	891	0	28.835	30.599
Zone VII	Ría de Ferrol	4.138	103.005	440	57.009	164.592
Zone VI	Arco Ártabro	1.135	3	0	1.372	2.510
Zone V	Costa Noroeste	0	0	0	0	0
Zone IV	Rías de Muros y Noia	306.774	20.673	10.006	141.397	478.850
Zone III	Ría de Arousa	16.080	398.232	227.802	49.927	692.041
Zone II	Ría de Pontevedra	22.660	93.516	115.086	60.637	291.899
Zone I	Ría de Vigo	58.458	170.245	96.494	148.095	473.292
Total		410.491	788.016	449.828	496.355	2.144.690

1991		Species (in thousand Ptas.)				
Zones		C. edule	R. decussatus	V. pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	362	7.237	1.602	0	9.201
Zone VIII	Coruña Norte	4.463	11.143	933	0	16.539
Zone VII	Ría de Ferrol	49.876	22.614	158.342	851	231.683
Zone VI	Arco Ártabro	2.123	891	0	0	3.014
Zone V	Costa Noroeste	0	0	0	0	0
Zone IV	Rías de Muros y Noia	56.868	339.999	13.280	24.501	434.648
Zone III	Ría de Arousa	27.840	80.328	348.511	191.025	647.704
Zone II	Ría de Pontevedra	397	68.578	95.063	76.856	240.894
Zone I	Ría de Vigo	37.624	219.077	72.085	100.135	428.921
Total		179.553	749.867	689.816	393.368	2.012.604

1992		Species (in thousand Ptas.)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	959	7.628	1.619	0	10.206
Zone VIII	Coruña Norte	5.786	35.878	2.064	0	43.728
Zone VII	Ría de Ferrol	29.918	45.911	88.193	17.231	181.253
Zone VI	Arco Ártabro	59.861	7.388	36.083	0	103.332
Zone V	Costa Noroeste	0	0	0	33.266	33.266
Zone IV	Rías de Muros y Noia	619.693	336.714	104.813	30.199	1.091.419
Zone III	Ría de Arousa	77.472	158.142	463.167	221.514	920.295
Zone II	Ría de Pontevedra	5.617	37.506	25.918	75.244	144.285
Zone I	Ría de Vigo	81.167	247.441	158.013	78.483	565.104
Total		880.473	876.608	879.870	455.937	3.092.888

1993		Species (in thousand Ptas.)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	370	11.470	1.274	0	13.114
Zone VIII	Coruña Norte	769	13.921	1.056	0	15.746
Zone VII	Ría de Ferrol	4.196	14.422	81.952	51	100.621
Zone VI	Arco Ártabro	54.057	10.060	0	0	64.117
Zone V	Costa Noroeste	0	0	0	21.659	21.659
Zone IV	Rías de Muros y Noia	177.384	416.753	106.553	63.584	764.274
Zone III	Ría de Arousa	60.319	227.837	572.902	204.372	1.065.430
Zone II	Ría de Pontevedra	50.165	132.807	52.555	46.566	282.093
Zone I	Ría de Vigo	61.501	240.265	151.727	76.392	529.885
Total		408.761	1.067.535	968.019	412.624	2.856.939

1994		Species (in thousand Ptas.)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	92	3.514	1.739	0	5.345
Zone VIII	Coruña Norte	438	17.411	1.034	0	18.883
Zone VII	Ría de Ferrol	12.253	76.440	228.605	39	317.336
Zone VI	Arco Ártabro	51.043	7.606	1.002	0	59.651
Zone V	Costa Noroeste	72	0	2	2.845	2.920
Zone IV	Rías de Muros y Noia	344.569	289.200	71.701	47.085	752.555
Zone III	Ría de Arousa	96.675	330.685	587.856	272.935	1.288.151
Zone II	Ría de Pontevedra	25.666	174.049	63.359	18.249	281.322
Zone I	Ría de Vigo	70.688	150.112	136.154	56.323	413.276
Total		601.495	1.049.017	1.091.452	397.476	3.139.440

1995		Species (in thousand Ptas.)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	44	3.726	1.500		5.270
Zone VIII	Coruña Norte	3.325	19.566	237		23.128
Zone VII	Ría de Ferrol	1.281	3.328	141.786		146.395
Zone VI	Arco Ártabro	6.652	46.277	22.848		75.776
Zone V	Costa Noroeste	23.012	12.762			35.774
Zone IV	Rías de Muros y Noia	134.056	373.847	141.799	33.607	683.309
Zone III	Ría de Arousa	148.706	308.082	1.221.236	231.655	1.909.678
Zone II	Ría de Pontevedra	54.968	233.701	32.622	26.938	348.229
Zone I	Ría de Vigo	118.998	149.867	154.270	121.969	545.104
Total		491.042	1.151.155	1.716.297	414.169	3.772.663

1996		Species (in thousand Ptas.)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	1.697	5.587	433		7.717
Zone VIII	Coruña Norte	7.508	27.746	1.721		36.975
Zone VII	Ría de Ferrol	1.886	8.372	293.580		303.839
Zone VI	Arco Ártabro	14.553	89.974	34.502		139.029
Zone V	Costa Noroeste	18.467	15.562	2.959	8.845	45.833
Zone IV	Rías de Muros y Noia	326.262	257.646	99.949	102.728	786.585
Zone III	Ría de Arousa	208.154	551.635	1.473.524	193.095	2.426.407
Zone II	Ría de Pontevedra	27.520	261.275	11.544	24.714	325.053
Zone I	Ría de Vigo	89.759	192.127	198.584	54.601	535.072
Total		695.806	1.409.926	2.116.795	383.983	4.606.510

1997		Species (in thousand Ptas.)				
Zones		C. edule	R. decussatus	V.pullastra	V. rhomboideus	Total
Zone IX	Costa Lucense	109	5.373	595	1.658	7.736
Zone VIII	Coruña Norte	3.102	24.244	1.374	0	28.720
Zone VII	Ría de Ferrol	90	6.119	318.384	3	324.595
Zone VI	Arco Ártabro	10.001	96.056	28.913	0	134.969
Zone V	Costa Noroeste	24.760	35.259	7.132	0	67.152
Zone IV	Rías de Muros y Noia	386.152	325.055	91.210	43.409	845.826
Zone III	Ría de Arousa	451.057	736.358	1.246.674	134.580	2.568.668
Zone II	Ría de Pontevedra	29.729	211.032	20.987	15.289	277.037
Zone I	Ría de Vigo	57.058	118.896	185.216	58.272	419.442
Total		962.059	1.558.391	1.900.485	253.211	4.674.146

3 Social data

3.1 Distribution of Shellfish Gatherers licenses in Galicia by zones (number of licenses)

1989		By boat	%	On foot	%	Total
Zone IX	Costa de Lugo	106	2,56	619	4,27	725
Zone VIII	Costa N. De la Coruña	302	7,28	566	3,90	868
Zone VII	Rías Coruña-Ferrol	374	9,01	2.701	18,61	3075
Zones VI-V	Costa de Morte	179	4,31	555	3,83	734
Zone IV	Ría de Noia	587	14,14	1.286	8,86	1873
Zone III	Ría de Arousa	1.289	31,04	4.285	29,52	5574
Zone II	Ría de Pontevedra	597	14,38	705	4,86	1302
Zone I	Ría de Vigo	720	17,34	3.803	26,20	4523
Total Galicia		4.154	100	14.520	100	18674
% on the total			22,13		77,87	100

1990		By boat	%	On foot	%	Total
Zone IX	Costa de Lugo	120	2,51	546	3,34	666
Zone VIII	Costa N. De la Coruña	246	7,64	1.311	8,35	1.557
Zone VII	Rías Coruña-Ferrol	388	5,82	1.913	12,18	2.301
Zones VI-V	Costa de Morte	187	3,91	898	5,72	1.085
Zone IV	Ría de Noia	782	16,35	1.124	7,16	1.906
Zone III	Ría de Arousa	1.514	31,67	5.094	32,45	6.608
Zone II	Ría de Pontevedra	738	15,29	932	5,93	1.670
Zone I	Ría de Vigo	808	16,89	3.879	24,71	4.687
Total Galicia		4.783	100	15.697	100	20.480
% on the total			23,35		76,65	100

1991		By boat	%	On foot	%	Total
Zone IX	Costa de Lugo					
Zone VIII	Costa N. De la Coruña					
Zone VII	Rías Coruña-Ferrol					
Zones VI-V	Costa de Morte					
Zone IV	Ría de Noia					
Zone III	Ría de Arousa					
Zone II	Ría de Pontevedra					
Zone I	Ría de Vigo					
Total Galicia		4.767	100	16.075	100	20.842
% on the total			22,87		77,13	100

1992		By boat	%	On foot	%	Total
Zone IX	Costa de Lugo	119	3,35	393	3,41	512
Zone VIII	Costa N. De la Coruña	215	6,06	602	5,23	817
Zone VII	Rías Coruña-Ferrol	242	6,83	1.421	12,35	1.663
Zones VI-V	Costa de Morte	193	5,44	557	4,84	750
Zone IV	Ría de Noia	403	11,37	739	6,42	1.142
Zone III	Ría de Arousa	1.217	34,34	3.807	33,10	5.024
Zone II	Ría de Pontevedra	423	11,93	776	6,74	1.199
Zone I	Ría de Vigo	731	20,63	3.205	27,86	3.936
Total Galicia		3.543	100	11.500	100	15.043
% on the total			23,55		76,45	100

1998		By boat	%	On foot	%	Total
Zone IX	Costa Lucense	3	0,10	207	2,38	210
Zone VIII	Coruña Norte	26	0,88	257	2,96	283
Zone VII	Ría de Ferrol	85	2,87	838	9,65	923
Zone VI	Arco Ártabro	80	2,70	308	3,55	388
Zone V	Costa Noroeste	2	0,07	152	1,75	154
Zone IV	Rías de Muros y Noia	742	25,07	1.198	13,80	1.940
Zone III	Ría de Arousa	1.445	48,82	2.151	24,78	3.596
Zone II	Ría de Pontevedra	151	5,10	989	11,39	1.140
Zone I	Ría de Vigo	426	14,39	2.289	26,37	2.715
Total Galicia		2.960	100	8.389	96,64	11.349
% on the total			25,43		74,57	100

3.2. Employed population by "provincias" in Galicia (thousands people)

"Provincias"	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
La Coruña	370,6	374,9	382,9	373,1	353,3	336,9	334,2	345,5		
Lugo	173,0	161,7	149,2	149,3	153,3	151,6	147,2	144,6		
Orense	174,6	180,8	165,4	150,1	145,8	139,3	135,4	129,5		
Pontevedra	321,2	318,7	319,2	316,4	308,3	304,6	300,4	295,0		
Galicia	1039,4	1036,2	1016,7	988,9	960,75	932,4	917,2	914,6	911,8	913,1

3.3 Percentage of the employed population in the shellfish-gathering sector within the Galician employed one

	1989	1990	1991	1992		1998
By boat	0,39%	0,46%	0,47%	0,36%		0,32%
On foot	1,39%	1,51%	1,58%	1,16%		0,95%
Total	1,78%	1,97%	2,05%	1,52%		1,27%