

***Crangon crangon*, endangered or merely on a via dolorosa?**

Received for publication, November, 1, 2011.
Accepted, May, 15, 2012

Roger H. CHARLIER

*Vrije Universiteit Brussel [VUB] Brussels, Belgium, Florida Atlantic University,
Boca Raton FL, USA*

Abstract.

The short Belgian coast has been subject to numerous transformations in its physical and human geography aspects. Major changes have affected its economic geography. From an area essentially devoted to fishing, and, further inland, agriculture, it is today more centered on tourism. With that new vocation former occupations have vanished, yet, some survived as part of the folkloric patrimony. A specific and colourful example is shrimp-fishing on horseback. There are about 1950 species of shrimps of which 300 are edible.

Key words: overfishing; shrimpboats; horseback fishing; cultural heritage; shrimps and prawns.

*Avec la mer du Nord pour dernier terrain vague
Et des vagues de dunes pour arrêter les vagues
Et de vagues rochers que les marées dépassent
et qui ont à jamais le cœur à marée basse
Et qui ont infiniment de brumes à venir
Avec le vent de l'est écoutez le tenir
Le plat pays qui est le mien.
Jacques Brel*

1. Introduction

Is the Dutch shrimp fishery sustainable? A question appropriately raised by Henny C. Welleman and Niels Daan in 2001. The same query may be brought to the fore for Belgium and a few other shrimp “producing” nations . Brown shrimp to the English, Grey or North Sea shrimp to others *Crangon crangon*

Linnaeus, 1758¹ to all, has been fished for centuries. Is the fishery sustainable or will the absence of management result in overfishing, or has it perhaps already reached that stage? “The time series of shrimp abundance, commercial landings per unit of effort and the shrimp consumption by cod and whiting provide a perspective for nature conservation and fishery management. The results indicate that predation mortality by only two of the predator species present in the coastal areas exceeds the landings by a factor 2 to 20, and that, despite large annual fluctuations in shrimp consumption, the shrimp stock has remained remarkably stable over 30 years even though landings declined since 1950. Moreover, predators exploit juvenile shrimp, while the fisheries target adult shrimp after the predators have levied their toll. The international catch of approximately 26,000 tons is of the same order of magnitude as the consumption of one natural predator. Apparently, there is no indication that the shrimp stock is fished at unsustainable levels.”

The US shrimp production involves million of tons of shrimp and is a major source of income in the Gulf of Mexico riparian States. At the very end of the 20th century and at the beginning of the current millennium production exceeded 3 million tons; it has been in a slight decline since 2004 (Table 1). The US has imported shrimps from Belgium—very modest amounts—probably because of a demand for the grey variety *Crangon crangon* L., representing 7 tons in 2003, valued at \$35,000, 17 tons in 2004 valued at \$85,000.

Table 1. US production of shrimps

Production	1999	2000	2001	2002	2003	2004	2005
Million tonnes	3.03	3.09	2.96	2.97	3.55	3.54	3.42

1.1. The shrimp

Crangon crangon lives in shallow water, is nocturnally active, while during the day, buries in the sand to escape predatory birds and fish. It is commercially fished mainly in the southern North Sea (Germany, Netherlands, Belgium, France, British Isles), and to some extent in the Irish, Baltic, Mediterranean and Black seas, as well as off Scandinavia’s and Morocco's Atlantic coasts.

Crangon crangon L., immortalized by William Hogarth’s 1759 painting of the shrimps’ sales hawker [la marchande de crevettes] (now in the National Gallery, London, UK), is the grey, nearly black, North Sea shrimp, often confused with the

¹ **Classification:** Biota > Animalia (Kingdom) > Arthropoda (Phylum) > Crustacea (Subphylum) > Malacostraca (Class) > Eumalacostraca (Subclass) > Eucarida (Superorder) > Decapoda (Order) > Pleocyemata (Suborder) > Caridea (Infraorder) > Crangonoidea (Superfamily) > Crangonidae (Family) > Crangon (Genus)

prawn. According to a brief pamphlet circulated in England, it is found all around its coasts. Perhaps indeed, but in decisively small numbers as a log of fishermen reported that “the catch was sufficient to satisfy a few meals”, then when once upon a time it was fished on horseback on a big commercial basis on both sides of the Dover Straits, and still was rather recently in the Morecambe area on the Lancashire coast. Horses yielded to tractors, with ensuing unavoidable ecological damage, and in many sites to bicycles. Boddeke, R., 1965b Een beter garnalennet. *Visserijnieuws*, 18(7):213–5

Based upon current literature actual fishing is predominantly an artisanal undertaking, done on foot, in hip boots, with hand-held nets attached to a frame itself affixed to a handle. The fishing nets are quite similar in England and Northern France; they are also found across the France-Belgium border, but, though of a smaller size, they are mostly part of the beach paraphernalia that parents have to log to the beach for their children.

If the appellations shrimp and prawn seem to be interchangeably used in Great Britain for the small crustaceans that are part of the gastronomic delights, marine biologists seem to differ. Shrimp of the North Sea, fished for centuries on the continental shelf, and particularly in the benthic part of the French, Belgian, Zeeland and Friesland coast are designated as *Crangon crangon* in the scientific literature (Charlier & Chaineux, 2012)² while prawns - including some of estuarine and riverine origin--are more apt to be the “bouquet rose” on the French’s restaurant menu. *Crangon* has been fished for centuries and was not a semi-luxury item as it is nowadays; the catch was then destined to feed the fisherman and his family (Figure 1).

Overfishing seems to have taken its toll and populations like those of herring (*Clupea sp.*) have dwindled (Table I). The “poor man’s steak” has also gravitated to the rank of pricy delicacy in the aftermath of WW II.³

² Several synonyms are also in use

³ A true anecdote recalls that Belgian soldiers, in WW I, tired of being fed herring continuously, decorated trenches, paths and feeding places, to greet visiting Belgian Socialist Party minister of war Emile Vandervelde (1866-1938) with herrings. History holds that the message percolated to the politician and the menu got diversified. It is doubtful that shrimp found its way to it. From a plethora of herring, modern fishing methods and disregard for age of individuals caught, managed to cause perhaps a threatening dearth.

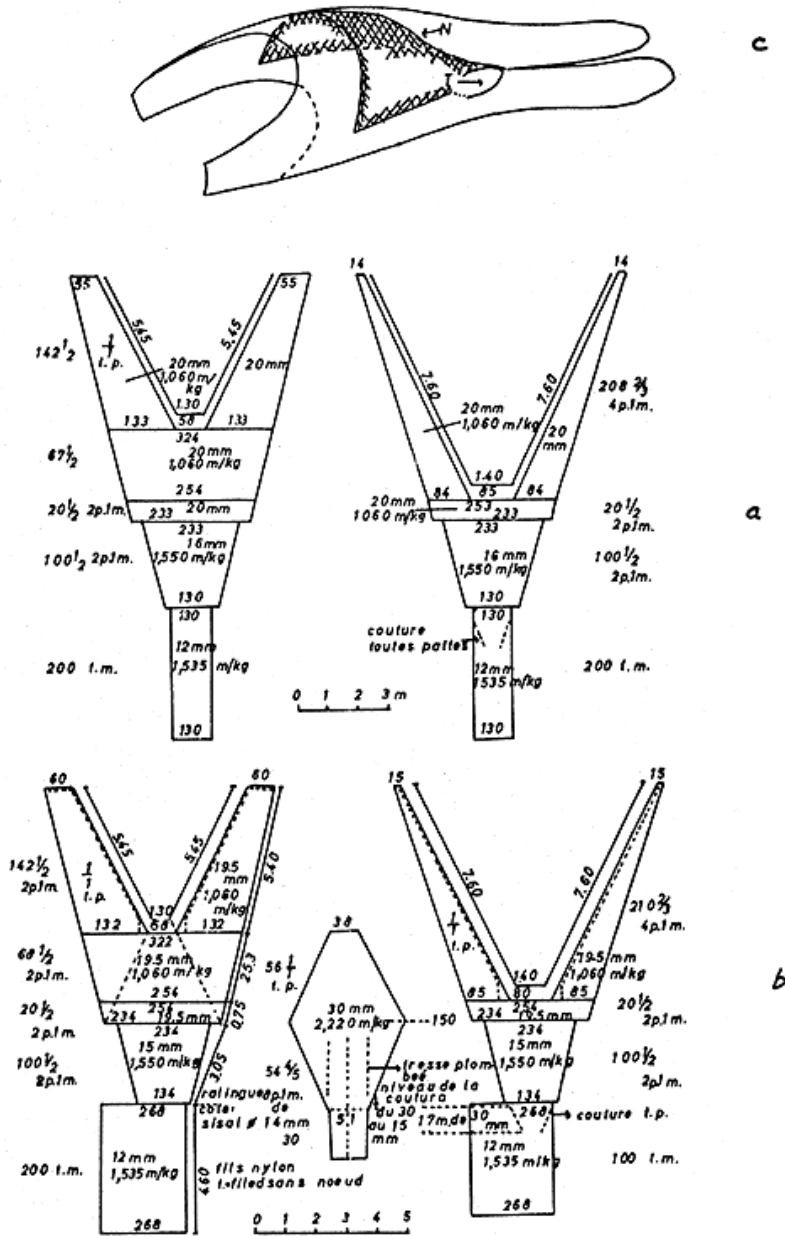


Figure 1 French otter board shrimp, trawl made of nylon, knotless, used in Vendée
 (a) = classical type,
 (b) = the same net, but with second selection bag (Devismes²²-type)
 (c) (Kurc, Faure and Laurent 1965b).

There were at a time important fleets of French, Dutch and Belgian “shrimpers”, and the industry occupied a ranking place in coastal zone economics, alongside that plying the areas for soles (*Soles sp.*), plaice (*Pleuronectis sp.*), and other benthos fishes whose catches have dwindled and market prices have soared. Barring a lack of updated information, the last Belgian shrimp boats were launched in 1942, amidst the throes of German nazi occupation (the *Zeemanshoop*)⁴, though after the war the *Benny*, and recently the “mixed” shrimper-and-tourist *Crangon* came unto the North Sea scene. (Figure 2a, b)



Figure 2a Benny, modern shrimp fishing boat, with home port at Ostend, Belgium (O. 106), currently in service.



Figure 2b "Zeemanshoop", last built shrimper (1942)

Catch statistics of the Belgian shrimp fishery have been collected since 1935. During the years 1935 to 1939 the annual catches fluctuated between 2,671 and 4,059 t, on an average 3,181 t. From 1946 to 1950 the catches varied between 1,289 and 2,034 t and were on an average 1,664 t. During 1951 to 1953 the annual average catch amounted to 2,051 t but decreased during the period 1956 to 1959 to 1,509 t. In Belgium and France there is no fishery of small shrimps for industrial use which is practised in some other countries. (Fig 1)

Over 37,000 tons of *Crangon crangon* were caught in a “good year” (1999), with Germany and the Netherlands taking over 80% of this total. At least thirty species of shrimp are commercially fished. Table 2 reproduces a part of a list of some included in a FAO study and provides an opportunity to place the “common shrimp” in perspective with other commercialized species. One may regret the FAO denomination of “common shrimp” for *Crangon crangon L.* as it is all but a common species. Anyhow there is no shortage of other names: FAO publications

⁴ Registered until 1987 as N 106 [Nieuwpoort], thereafter as O.106 [Ostend].

list no less than ten scientific names that are synonyms of *Crangon crangon* L. (Table 3) and at least a dozen languages have a “usual” name for the “common shrimp”.

Table 2

Catches of shrimp (per 1000 units *Note: units: tons*). **Predominant commercial species**

FAO Name	Scientific Name	1965	1975	1985	1995	2005
Natantian decapods	Natantia	239	524	629	542	887
Akiami paste shrimp	<i>Acetes japonicas</i>	104	13	222	406	664
Southern rough shrimp	<i>Trachypenaeus curvirostris</i>	5	93	154	29	605
Northern prawn	<i>Pandalus borealis</i> ²	25	63	235	275	376
<i>Penaeus</i> shrimp	<i>Penaeus</i> spp.	194	261	277	296	230
Giant tiger prawn ²²	<i>Penaeus monodon</i> ²²	9	12	12	207	218
Fleshy prawn	<i>Penaeus chinensis</i>	34	33 ²	44	106	329
Banana prawn	<i>Penaeus merguensis</i>	22	39	39	71	83
<i>Metapenaeus</i> shrimp	<i>Metapenaeus</i> spp	10	30	36	51	63
Atlantic seabob	<i>Xiphopenaeus kroyeri</i>	8	13	18	18	52
Northern white shrimp	<i>Penaeus setiferus</i>	32	26	44	39	50
Common shrimp	<i>Crangon crangon</i>	52	36	27	30	44
Northern brown shrimp	<i>Penaeus aztecus</i>	57	44	70	57	44
Total (all species)		829	1 311	1 974	2 447	3 416

Source: FAO 2007 [R. Gillett, 2008, Global Study of Shrimp Fisheries: Rome, FAO]

Table 3 (source FAO)

(a) Scientific synonyms for *Crangon*

- *Astacus crangon* (Linnaeus, 1758)
- *Astacus crangon* Müller, 1776
- *Cancer crangon* Linnaeus, 1758
- *Crangon vulgaris* Fabricius, 1798
- *Crago vulgaris* Lamarck, 1801
- *Crango vulgaris* (Fabricius, 1798)
- *Crangon rubropunctatus* Risso, 1816
- *Crangon maculosa* Rathke, 1837
- *Crangon maculatus* Marcusen, 1867
- *Crangon maculosa typica* Czerniavsky, 1884
- *Steiracrangon orientalis* Czerniavsky, 1884
(with var. *longicauda* forma *intermedia* and var. *brevicauda*)
- *Crangon crangon typicus* Doflein, 1900
- *Crangon crangon mediterranea* Brashnikov, 1907

Besides landings from fishing, some shrimp species are also raised in ponds, a practice that has had some debatable environmental and social outfalls, particularly in Asia.

2. Trawlers, horses, bicycles

The North Sea shrimp fishers use trawlers of types closely similar to those in Northern France and all the way to Denmark, even similar to nets common to the Vendée region of France. The same nets are in use in Belgium, though there, a difference must be made for boat fishing and horseback fishing carried out in rather shallow shoreline waters, a practice once very common on both sides of the channel. Paraphrasing Redant (2002).

Dutch shrimp fishermen use and have used similar beam trawls, (Tesch and de Veen, 1938) and so has the French fishery (Belloc, 1938). Today the French fish far more commonly with otter trawls, though beam trawls are still in use on boats equipped with smaller engines of 20 to 25 hp, (Kurc, Faure, and Laurent (1965a), like in Belgium for that matter, where the otter trawl replaced the beam trawl; recently however the Belgians reverted to beam trawls considered more effective in the shrimp fishing tidal area (Verbrugghe, 1932).

The “type Devismes modifié” is a new otter-trawl developed for shrimp fishing in the Gulf of Gascony (Bay of Biscay) (Figure 1) (Kurc 1964; Kurc, Faure, and Laurent, 1965b) where in “the net is divided into two sections and has two cod ends with different mesh sizes. The small mesh of the upper section catches the shrimps which jump through the netting that separates the lower from the upper section. The lower cod end has larger mesh to allow any small fish caught to escape easily, thereby thus considerably reducing catches of undersized fish”.

The design of the two-section shrimp trawl has been modified and used recently in still another model, a Dutch design beam-trawl (Figure3). Using this newer type of beam trawl cuts by one sixth by-catches (Boddeke, 1965) though the improved net’s greater efficiency was put in doubt by Tiewes (1966).

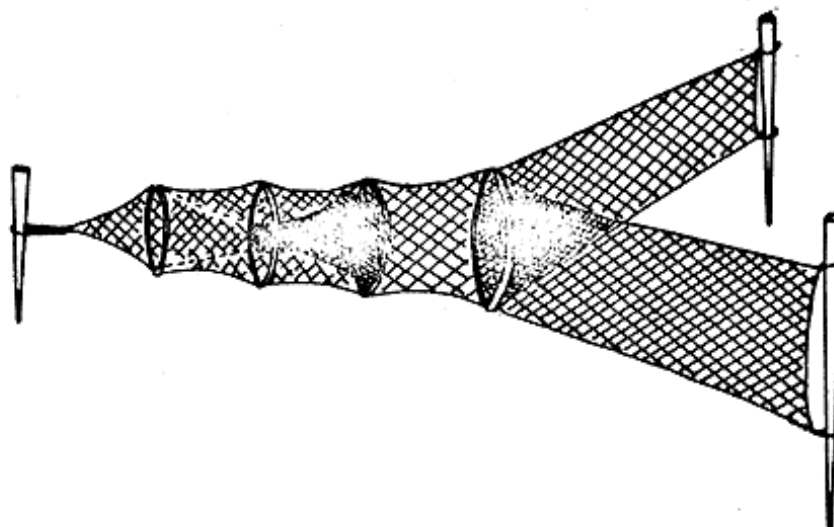


Figure 3 German shrimp fyke net with wings (Meyer-Waarden, 1931).

On the east coast of England the beam trawl is exclusively used for fishing brown and pink shrimps (Mistakidis, 1958). In the Thames River area the otter trawl was introduced during the last decades; furthermore on the northwest coast in addition to the beam trawl, fishing of brown shrimps is done by push and shank nets, the latter *de facto* small trawls pulled by horse carts. In the Bristol Channel small quantities of brown and pink shrimps are taken in salmon putts and stall nets. However, at least 90 percent of the total landings are fished by the beam trawl whose beam length varies between 5.5 m and 7.3 m.

The German push nets and shrimp basket, the *fyke net* with wings and shrimp stow net had virtually disappeared half a century ago. (Meyer-Waarden, 1931). (Figure 4) The shrimp basket is a fishing gear for the shallow and sheltered fishing waters, the shrimp stow net is used in deeper creeks with more rapid currents. Stow nets can be used only either in the ebb or flood tide. (Meyer-Waarden, 1931)

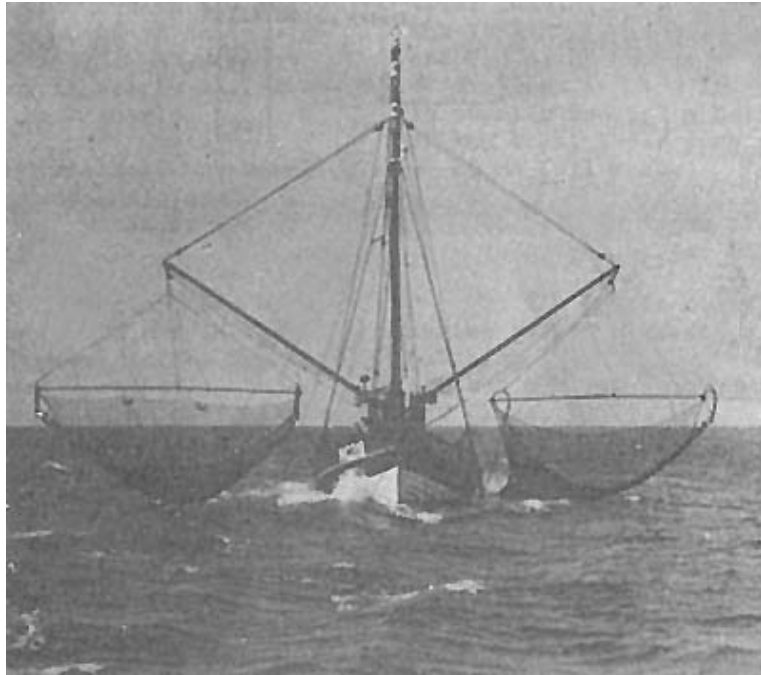


Figure 4 German “modern” shrimp fishing vessel from Cuxhaven (Meyer-Waarden and Tiews, 1957). (Photo: Dr. Nolte)

Though this type of stow net has been modified to facilitate operation during both tides, with a special hanging design that permits considerable increase of catching power, it is not widely used for shrimp fishing according to Meyer-Waarden (1931). Echo-sounding is used today in the German shrimp fishery, but *Crangon* cannot be detected on fish-finding sonar.

Some beam trawls are still used in the Baltic Sea for fishing *Crangon crangon L.* Shrimps are caught there as bait for the cod fishery, large shrimps not being abundant enough to sustain a large-scale shrimp fishery (Henking, 1927).⁵

Horses were used for towing shrimp nets in England, France and Belgium (Verbrugghe, 1932) The horseback shrimp fishing is discussed in detail further in this paper. The Belgian shrimp trawl was kept open by a ground beam in the middle of which a stick was attached to keep the mouth of the net open.

⁵ For a description of the original “shrimp net” used in the neighbourhood of the Thames Estuary, prior to 1930–40, its modification in early 1850, and the introduction of the “four beam trawl” at the same period see Mistakidis (1958).

In Belgium, since the early 20th century, fisheries for molluscs and crustaceans focused on North Sea shrimp - alias brown shrimp - (*Crangon crangon*), whelk (*Buccinum undatum*), lobsters and cephalopods. A peak of 4,343 tons was attained for molluscs and crustaceans in 1937 and nearly in the 1950s and 1970s, a gradual decline set in accompanied by a drop in cash value. During the last half century (1960s) commercialization concentrated on expensive species of crustaceans such as shrimp and lobsters.

This is not the agora to discuss recreational shrimping, but it is practiced and particularly in England, in areas where once commercial enterprises flourished. Peter Talbot-Elsden, from Southwick (Sussex), has even produced a small booklet “*Shrimping for Food and Fun*” about catching the brown shrimp around the coasts of Britain. The shrimps are caught in nets; push-netting is seen

over the sand in shallow water in spring, off the Sussex coast. Equipment of the sport shrimper includes the bicycle. (Figure 5)

The celebrated Morecambe Bay shrimps were originally captured by cart shanker (sleeve- or leg-like) shrimping with a horse and cart in deeper water off the Lancashire coast, later replaced by a tractor. (Figure 6) At Formby, commercial shrimpers experimented with amphibious vehicles after World War II. Nowadays, most commercial shrimping on the east coast around King’s Lynn trawls from small boats using a net off the stern.



Figure 5. Shrimper’s bicycle



Figure 6. Fishing net (Great Britain)

Common methods for recreational shrimping include shrimp baiting, dip netting, and ozello shrimping. (Figure7)



Figure 7 An Ozello shrimper in use

Shrimp baiting involves using bait patties, a time-release bait, typically concocted of at least fish meal and clay, put in the water, waiting for the shrimp, then throwing over the shrimp a net, 1 1/3 to 3 1/2 m long when unfurled, and weighted around the bottom. Dip netting, named for the traditional tool used to scoop shrimp out of shallow water grass flats by individual shrimpers. Hand nets, in use for centuries and traditional "push" nets are still used along the French and British coasts.

A mechanical variation is "Ozello shrimping", that involves a specialized device allowing recreational shrimpers to selectively catch shrimp along low tidal area zones with minimal tidal force impact. The device utilizes a string activated trap that opens and closes a trap door to contain individual shrimp for capture; it eliminates bending over, filtering by-catch and avoids environmental damage to seagrass in estuaries. (Figure 7)

Dutch shrimpers occasionally take along school children to familiarize them with the profession. Whether this is to be considered recreational shrimping or eco-tourism can be left to argumentation, but an opportunity for hands-on experience and a close-up look into the shrimp fisherman's journey is also offered in Belgium. In Ostend, the impeccable modern shrimpboat *Crangon* takes on passengers-many guests of the high class hotel of the same name—for a coastal journey along the Belgian coast during which shrimps are fished. Scraping boards are affixed to the sides of the nets. As the ship navigates these boards scrape outwards, whereby the net is kept open horizontally, keeping the catch inside. Sorting, rinsing and cooking is done aboard. Cooking is done on shore by Oostduinkerke horseback fishermen. (Figure 8)



Figure 8 Sepia postcard of the mid twenties showing a horseback fisherman cooking his shrimp haul on his farm (Courtesy Westhoek domein, Oostduinkerke).

Many nets for recreational shrimping do not differ, except in size, from those this author's parents provided him with to use as a child at the water's edge to catch a few individuals, that he carefully placed in a small pail. They were routinely returned to the sea regardless of his loud lament.

The image of the horseback shrimp fisherman is everywhere in Oostduinkerke from streetmarkers (Figure 9) to restaurant (Figure 10) billboard and National Fisheries Museum (Figure 11 a, b). An old decommissioned shrimp fishing boat even greets the visitors as he has left the international speedway leading to the French border. (Figure 12)



Figure 9 Streetmarker with horseback fisherman



Figure 10 Vintage estaminet called Peerdevisser (Horseback-fisherman),
across National Fisheries Museum, now HQ to the Guild (Order of)
the Horseback-Fishermen



Figure 11 a Horseback shrimp fisherman



Figure 11b Sculpture of horseback shrimp fisherman in hall of National Fisheries Museum (Oostduinkerke)



Figure 12 Decommissioned shrimper, mounted as monument at the North Sea town's entry to the speedway.

This short coast had, throughout geological and even historical times several sea inlets: from west to east, across contemporary borders there used to be one near Gravelines (Grevelingen) and then in Oostduinkerke an inlet (Schipgat) allowed at one time ships to penetrate inland towards Dixmude (Diksmuide). The few meters that today hardly ever get invaded by the sea are nevertheless still known as *het Schipgat*⁶. And where the Belgian-Dutch (Flanders-Zeeland) border runs today, the Zwin, is the remnant of an inlet that a particularly heavy storm let the sea penetrate all the way to Bruges (Brugge) and made that city the wealthiest one in Western Europe⁷ (Figure13), a powerful military player that once held the Germanic emperor [Holy Roman Emperor] Maximilian a captive and held him for ransom, and the wealthiest one in 13th through the 16th century Western Europe city to such extent that it got the nickname of Venice of the North.⁸



Figure13 Sea inlet, *Schipgat*, once leading to Diksmuide

3. Fishing on horseback

The image of horseback shrimp fishermen is everywhere in Oostduinkerke : on street-name-markers, sculptures, greeting you as you enter the just renovated National Fisheries Museum, adorning the facades of old fishermen's houses along canals or even brand new villas that were just completed.

The Belgian coast is a mere 67 km long; near 120 km if you add the segments lost to France (now called Flandre Française-French Flanders) and to the Dutch (Zeeuws[ch] Vlaanderen-Zeelandish Flanders). But horseback shrimpfishing never involved, at the very most, more than the two adjoining towns of Oostduinkerke (~East Dunkirk) and Coxyde (Koksijde), both at a stone's throw from the border with France. Coastal farmers used some fish as fertilizer in their fields, while the fishermen brought home their shrimp to feed the family and

⁶ Literally “the hole (or opening) for ships”, as these could enter the channel at high tide.

⁷ See *JCR*, “The Golden Inlet”.

⁸ See *Journal of Coastal Research* Charlier, “The Golden Inlet”. [in press, 2012]

especially sell the majority of their crustacean catch at market. Today it is recognized by UNESCO as one of the world's few remaining types of artisanal fishing.

The few kilometers of Belgian coast have however squeezed in an unusually large number of geological, geographical, historical and economic developments.

The sea has, at various times—and not the least during the Pleistocene and Anthropocene -invaded the land, sedimented the littoral, dug and filled inlets, created sandbanks, moved them and the shoreline, swallowed entire villages even islands. A large variety of dunes have been built and removed—not all Nature's own doing.

Monks have “sprinkled” the land behind the string of coastal dunes with abbeys, some that left some timid traces, some that even maintained themselves to the present. They tilled the land with the help of oxen and sturdy horses and got a solid reputation as the producers of the three b-s: butter, bread and beer, of never doubted quality.

The economy of the Flanders' maritime plain has indeed undergone major changes in the historical period. Hardly is one aware today that Flemings of the sleepy resort of Wenduine, that prided itself Princess-of-Beach-resorts, were once reputable whale hunters whose tradition lives on in the “Flemish Islands”, now called the Azores?⁹ It is equally difficult to visualize most of the generous dozen of towns lined up along the coast as fishermen communities and, except for three or four among them, all stranding¹⁰ harbors. Gone are the boats carrying initials C, O, B, W, etc.¹¹ Gone too are the narrow houses huddled behind the protective sea-dikes.¹² Gone even the fancy Victorian-type sea promenade villas—occasionally referred to as Art Nouveau or Belle Époque--that Nazi-occupation forces cemented together during WW II into the “impregnable” *Atlantik-Wall*. Sold are the royal villa, affection of Leopold II, second king of the Belgians who turned the tiny fishing port and village of Ostend into a ranking fashionable sea-side resort, and changed into a private auberge is the former abode of the late Prince Charles, regent of the Kingdom during the aftermath of Word War II. Wiped out for as long as a century are the remnants of the very first marine station in the world¹³

⁹ See Charlier, R.H., 2005, “Cetaceans and Belgian whalers”, in Morcos, Zhu, Charlier, *et al.*, (ed-s), Ocean Sciences, *Proc. 5th Int. Congr. Hist. Oceanog.*: Paris, UNESCO & Qingdao, China Ocean Press 385-398.

¹⁰ After the French terminology *port d'échouage*, a port where there are no portuary facilities and where ships beach themselves, unload their cargo and then await the next high tide to re-float and depart.

¹¹ See: Van Bladel, G., 1930, *Le littoral belge de la mer du Nord: Bull. Ligue Maritime belge* 49pp.

¹² One such house has been preserved in Blankenberge.

¹³ Built in 1843 by university professor Pierre-Joseph Van Beneden

(Figure 14). And vanished were the oyster breeding beds nearby (so appreciated by the British), until their timid “resurrection” during the last lustres. Gone also the ornate thalassotherapy facilities and mineral water springs of Ostende-Thermal.¹⁴



Figure14 World’s first marine biology research station – Ostend, Belgium
(Demolished to allow extension of Ostend’s port)

The fishermen-tradition has yielded to tourism, now a year-round economy, many a former farmer is now a bed-and-breakfast operator, the seals are sunning—even reproducing--protected-on breakwaters and close-to-shore sand banks; the celebrated Zwin North Sea inlet that made Bruges (Brugge) the wealthiest city of Northwest Europe during the 14th to 16th centuries, is now a natural reserve, home to rare plants, such as the elusive Zwinneblomme (*Limonium vulgare*), an ornithological haven and a natural swimming pool overarching an international border.¹⁵ New thalasso-care centers such as those of Knokke and Ostend are aimed at the well-heeled traveler and social medicine facilities fell under the ax of the developers. As there are for instance Brotherhoods of Wine Producers, there is also a 1967-created Order of the Shrimp Horseback-fishermen. Membership is of course minimal because the horse mounted fishermen’s number dwindled from 40 in 1940, to seven in 1968, ”surging back to” eight by 2010.

If the once thriving fishing harbors of Nieuwpoort, Ostend, Blankenberge and Zeebrugge-Heist have yielded much of their commercial activity to make room for pleasure crafts accommodation, traditions have been kept alive in

¹⁴ La Barre, J., no date, De thermen van Oostende. Samenstelling en therapeutische eigenschappen van de bron Albert I: Brussel, Vrije Universiteit Fac. Geneeskunde & Farmacie; See also: Charlier, R.H. & Chaîneux, M-C, 2009, The healing sea....Thalassotherapy, *J.Coast.Res.* 25, 4, 835-856.

¹⁵ From to Hansa Harbour to Natural Reserve: in press 2012, *J.Coast.Research*

Oostduinkerke. True the shrimp fishing on horseback has especially a folkloric cachet. The question might logically be raised “Why did this type of artisanal fishing maintained itself on only one beach of Belgium?” The reason might well be that, for some obscure administrative motive, Oostduinkerke remained the only resort where no breakwaters were installed, thus no interference exists to the free passage of horses and trailing nets.

Perched high on the powerful Belgian horses, with big baskets attached to each side of the saddle, garbed in long all weather raincoats, slickers, *cirés-jaune* to the French because it is an “oil” coat of yellow color’, modernized into less heavy and less cumbersome yellow outfits made out of nylon, capped with the well-known “southwestern”, fishermen deamble as stately as a procession of judges would, down , the main street of Oostduinkerke on the way towards dike and strand, according to the schedule of the tides. Low tides are now the fishing time. And unto the beach. The horses unhesitantly enter the surf , sometimes to their underbelly¹⁶, as their riders rake up the rather small-size grey shrimp then scooped up into the baskets. However, according to archive records, the fishermen also accessed the sea by way of the Schipgat, the former inlet, now, like the Zwin, protected as a natural reserve.

The Belgian draft horses are fitted with wooden saddles and drag fishing nets behind them. Originally the nets were seines, dragged by two horses, but gradually such nets were replaced by the *schee*, an oblique board about four meters long that slid over the sand and lift the shrimps into the net. Mules were preferred but have disappeared from the scene. The nets are kept open horizontally by two side boards, a chain drags on the sand and floaters keep the upper side of the net afloat. When the horse and its rider reach the low tide water line, the cart is unhooked, tools set aside and the baskets affixed to the saddle. Fishing time lasts generally three hours of which one follows low tide.

Still on the beach the catch goes through a sift and collateral products such as some flat fish, crabs and small jellyfish are thrown back into the sea, as they are useless to enrich soil inland.

The shrimp are gathered in the baskets, the net is washed out, the cart hooked on and the trip “back home” started. There the hard worked horse is fed oats. The catch is washed again, with sand removed as much as possible, before being thrown in the broiling brine. Once boiled the shrimps are no longer grey or brown, but red. The brine is poured off and the small shrimps (Figure 15) / prawns (Figure 16) ready for the market (Figure 17).

¹⁶ Some veterinarians claim that horses develop arthritis because of the low temperatures of the North Sea waters.



Figure 15 A landing of shrimp



Figure 16 *Crangon crangon* Linnaeus
(photo author: Misjel Decler)



Figure17 Cooking of shrimp (picture Westhook)

Catching shrimp was not the only form of beach fishing as is shown in the National Fisheries Museum. The Belgian Government introduced, in 2009, a request for the registration of the horseback fishery on the World's Cultural Heritage List.¹⁷

¹⁷ Supeley, M, 2005, "De Oostduinkerke Paardenvissers - van Armada tot enkeling": Koksijde, Vereniging voor Vreemdelingenverkeer; Anonymous, 2009, Paardenvisserij, [Deze traditie heeft de](#)

But, only seldom are they seen anymore, the powerful Belgian draft horses, carrying shrimp fishermen on their backs, dragging fishing nets behind them or a flat cart loaded with tools of the trade. In days gone by the fisherman brought home the shrimp to feed the family and sell the majority of the catch at the fish-market. He and his wife did, and still do, the cooking at their house.

Overfishing of the crustacean-not just locally-has rendered this type of fishing hardly profitable and the second stage of the process-cooking in vats or drums is done at the fisherman's home in a brine of his own concoction; it is part of the "show" only in the peak tourist season (July-August). *Crangon crangon*, is to the Flemings Noordzeegarnaal, to the French *Crevette de la mer du Nord*, or *crevette grise*; why grey shrimp is known to the Anglophones as Brown Shrimp (but also as grey shrimp) has not yet been elucidated by this writer, though shrimp are said to be of cryptic coloration, as they occasionally take a sandy brown color, changeable to match the environment.

In Britain a given assimilation is commonly made between shrimp and prawn. This is not the case elsewhere, the French clearly differentiate between *crevette grise* and *crevette rose*, particularly on restaurant menus! (Figure 18, 19, 20)

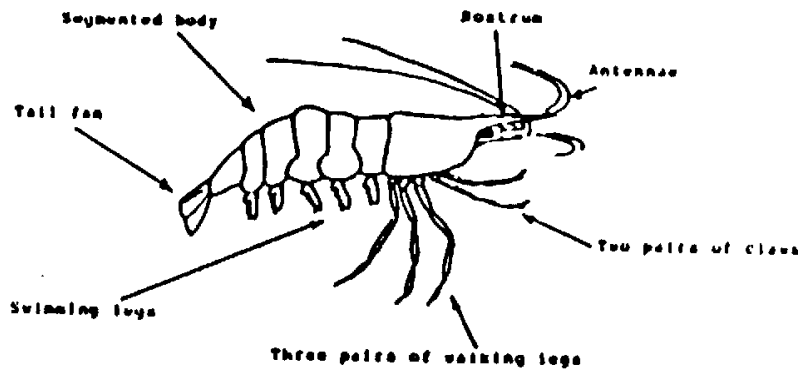


Figure 18 The common shrimp, a decapod

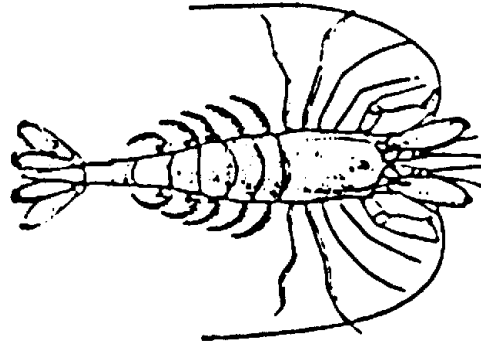


Figure 19 The prawn (*Palaemon*) is transparent with long legs.



Figure 20 The Flemish banks where shrimpers go fishing

4. Wrap-up remarks

The recent world shrimp catch is about 3.4 million tonnes per year, with Asia as the most noteworthy area for shrimp fishing. World production of shrimp, both captured and farmed, is about 6 million tonnes, of which about 60 percent enters the world market. Shrimp is now the most important internationally traded fishery commodity in terms of value. In many tropical developing countries, it is the most valuable fishery export; the employment aspect is significant. The economic importance of shrimp needs to be reconciled with considerable concern about the environmental impacts of shrimp fisheries. Belgian and Dutch shrimpers ply the waters off Suriname and bring the catch back to Europe. But cultivated shrimps are also brought to Belgium, predominantly *Palaemon*, and they have brought

about a controversy.¹⁸ Indeed, not only for consumption in Belgium, but internationally, shrimps from aquaculture ponds in Turkey and Thailand, are shipped deep-frozen to a plant in Fleurus, Belgium where they are irradiated. If the process does indeed kill all organic impurities, many an ecologist holds that it causes radioactivity and could be conducive to developing cancer in the consumer. The enterprise denies access to would-be visitors, leaving the matter of the irradiated product unresolved.

Crangon has been mainly exploited in the Atlantic Northeast Ocean and the Mediterranean.¹ The total catch reported to FAO for 1999 was 37 223 t with Germany accounting for 17 457 t and The Netherlands for 13 772 t.

There exist mechanisms, instruments and models to enable effective mitigation of many of the difficulties associated with shrimp fishing taking a precautionary and ecosystem approach to fisheries. With an appropriate implementation capacity, shrimp fishing, including shrimp trawling, is manageable. However where weak agencies deal with fisheries, where a lack of political will is endemic or inadequate legal foundations perdure failures occur in the management of shrimp fisheries. The histogram below (Figure 21) shows a reduction in landings and should be regarded as a signal pointing to the need for management as the current catch is the lowest since 1950.

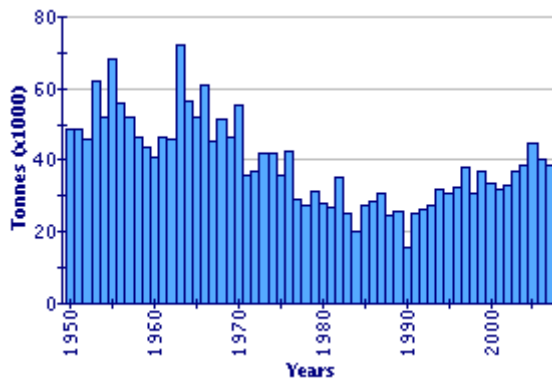


Figure 21. Landings of shrimp for the last 60 years. Source: FAO

Some 44 million people are directly engaged, part time or full time, in the business of wild or raised fish and four more on an occasional basis, 2.5 million in India alone. Most, 86%, ply their trade in Asia and their majority is small-scale, artisanal fishers. China alone accounts for 8.1 million fishers and 4.5 million fish

¹⁸ Aired March 23, 2012 on Radio Télévision Belge Francophone, 9 AM Channel 1, interview of a responsible spokeswoman for the Belgian Federal *Inspection de la Chaîne Alimentaire*.

farmers. India, Indonesia, the Philippines and Viet Nam come in as close seconds. Nevertheless this is an economic factor of US\$ 33 trillion per year or approximately €30 trillion inclusive of living and non-living resources, transportation, communication, recreation, energy production, and waste disposal. The ocean's share exceeds 60%.

The oceans are threatened by marine pollution (sewage, health challenges, eutrophication, algal blooms, classic pollution by metals, oils, organic substances, radionuclides, endocrine-disrupting chemicals, man-made debris/litter); ecological balance (over-fishing and destructive fishing practices, reduced biodiversity, transfer of alien species); and habitat change (climate change, sea-level rise and coastal flooding; marine habitat destruction-coral reefs, mangroves, wetlands; deforestation and changes in hydrology, turbidity, sedimentation; mineral, sand and gravel extraction).

The increase in human populations in coastal cities and climate change affects sustainable services and resources of the oceans. Humankind exploits marine resources and services in an inhumane manner. Over-exploitation and depletion of living resources compounded by land-based and seaborne pollution has resulted in the current scarcity of affordable protein making a mockery of attempts to achieve goals relating to health and poverty reduction. And yet fishing nations still flout UN protection, failing to implement vital United Nations (UN) resolutions designed to protect vulnerable deep-sea species and ecosystems, including South Korea, Russia, the Cook Islands, Spain, Portugal, France, Australia, New Zealand and Japan that continue to allow their vessels to fish the deep-ocean in international waters using bottom trawl gear, a highly damaging fishing technique, with devastating implications for the future of deep-sea marine life. And this five years after the UN General Assembly took action to protect them.

A Deep Sea Conservation Coalition (DSCC) report highlights a series of failures to implement key provisions of the UN resolutions including completion of proper impact assessments before fishing, and establishing regulations to ensure the long-term sustainability of deep sea species. Reviews have shown that while some high seas areas have been closed to bottom fishing, countries continue to allow their vessels to engage in this type of fishing in contravention of the commitments they've made."

Deep-sea fisheries are not being managed for long-term sustainability, and vulnerable marine ecosystems are not being given sufficient protection from significant adverse impacts. Deep sea bottom trawling is the most serious direct threat to deep-sea ecosystems. Once destroyed, slow-growing deep-sea species are either lost forever or unlikely to recover for decades or centuries. And yet close to 300 vessels were in a single year engaged in high seas bottom fishing, 80% were

from 10 countries, to wit Australia, Belize, Estonia, France, Japan, New Zealand, Portugal, Russia, South Korea and Spain. In the shrimp fishing sector some laudable efforts have been made. Indeed, regardless of claims that the shrimp are probably not over-fished, some restrictive rules covering grounds and seasons have been implemented by “fishing nations”. There are no limitations at all in the Belgian shrimp fishery, but the Dutch have prescribed that fishing boats landing shrimps are not allowed to have a dragging power above 2,000 kg. In England, the different Fisheries Districts have exercised various legislative restrictions on the sizes of fishing boats, length of beam of trawls and push nets, diameter of nets, duration of operation of trawls and obligatory release of undersized fish. In Germany, credit facilities for replacement of old shrimp fishing boats are given only on condition that the old boats are destroyed in order to limit the number of fishing boats. Yet, so far no number has been fixed by law.

According to the Fisheries Convention for the Northeastern Atlantic, passed June 24th 1959, the industrial by-catches of the shrimp fishery are not allowed to include more than 10 percent of undersized protected fish and seemingly the industrial catches of the German shrimp fishery during the years 1954 to 1960 contained less than the 10 percent.

There is still a lack of promising industrial-scale alternatives to shrimp trawling; as a result most shrimp gear technology efforts in recent decades have been channelled into improving trawl gear and trawl techniques, rather than developing new industrial shrimp fishing technologies. What progress has been booked in the shrimp trawl gear innovations, especially those concerning by-catch reduction, has, however, also benefited other trawl fisheries.

The nexus between oceans and coasts indicates a continuity and long-term pressure to the oceans posed by the increase of human populations in coastal cities and climate change impacts. This will affect sustainable services and resources of the oceans. Humans have failed to live with the oceans and from the ocean in a sustainable relationship. The economic and social welfare of humankind depends to a large degree on the oceans’ productive sectors and services. The manner in which humans exploit those resources and services, have been anything but humane. Over exploitation and depletion of living resources compounded by land based and seaborne pollution has resulted in the current scarcity of affordable protein making a mockery of attempts to achieve goals relating to health and poverty reduction.

Acknowledgments

The author wishes to express his sincere gratitude to Dominique Lemey and Lancelot De Moor of the staff of Westhoek Domein for searching local Oostduinkerke archives and providing vintage illustrations re horseback fishing, local traditions and shrimp cooking. His appreciation is extended to Dr Patrick Vanouplines, director, library of the [Flemish] Free University of Brussels (Belgium) [VUB] for advice and technical suggestions, and to Dr J. Rudy Senten, retired faculty member of the Higher Education Institute of Antwerp for critical reading of final manuscript. High appreciation is expressed to Eng. Mihail Carutasu of the Academy of Romanian Scientists for critical reading of the manuscript and ultimate formatting.

Selected References

- Alverson D.L.; Freeberg M.H.; Pope J.G.; Murawski S.A., (1994) - *A global assessment of fisheries bycatch and discards*. FAO Fisheries Technical Paper, No. 339, Rome, FAO, 233.
- Anon., (1906 – 1992) - ICES Fisheries Statistics. *Bulletin Statistique des Pêches Maritimes*. ICES: Copenhagen, Denmark. ISSN 1018-1571.
- Anon., (1969 – 2000) - Series De Belgische zeevisserij *Landbouwstatistieken*. Brussel, Nationaal Instituut voor de Statistiek.
- Anon., (1973 - 2006) - “*De Belgische zeevisserij. Aanvoer en besomming*” Brussel, Dienst Zeevisserij.
- Anon., (2000). ICES fisheries statistics 1973-2000 [CD-ROM]. ICES: Copenhagen, Denmark.
- Anon., (2008) - *Strategische Milieubeoordeling van het Nationaal Operationeel Plan voor de Belgische visserijsector, 2007 – 2013*. ILVO Visserij: Oostende, Belgium, 103.
- Anon. (sans date) - *Notice sur la pêche maritime en Belgique*. Available only in Brussels or Ostend at the [Belgian] Maritime Administration Office.
- Belloc G., (1938) - Die Fischerei auf Krebstiere. *Handb.Seefisch.Nordeurop.*, 7(1):83–7.
- Anon., (2008) - *Proc. World Scientific Conf.* – Synopsis Biological Data on the Common Shrimp: Rome, FAO.
- Ben Amar I., (2011) - *Fylogeografische bepaling van Crangon crangon L. binnen het Noordzeegebied*, ILVO Dier-Vezehouderij & Dierenwelzijn, Gent.
- Boddeke R., (1965) - Een beter garnalenet. *Visserijnieuws*, 18(7):213–5.
- Boddeke R., (1966a) - Is it possible to forecast the landings of brown shrimp? *ICES, C.M., Shellfish Committee, M:7*.
- Boddeke R., (1966b) - Sexual cycle and growth of brown shrimp (*Crangon crangon*). *ICES, C.M., Shellfish Committee, M:6*.
- Charlier R. H., Chaineux, M.C., (2012), Fishermen cavalry, *J. of Coastal Research*, (in press)

- Davis, F.M., (1927) - An account of the fishing gear of England and Wales. *Fishery Invest., Lond.* (2), 9(6):122.
- De Clercq A., (1937) - De samenstelling van *Crangon vulgaris* (garnaal) [The composition of *Crangon vulgaris* (shrimp)], in: (1937). *1st National Congress of the Sea, Antwerp, 17, 18 and 19 July 1937: reports*, 299-301.
- FAO, (1965) - *Yearbook of Fishing Statistics*. Rome, Italy. (18).
- Gilis C., (1952) - La pêche crevettière sur la côte belge: son évolution au cours des années 1935–1951 et son influence sur le stock de la crevette. *Mém. Inst. Etudes marit. Belg.*, (8):1–55.
- Gilis C., (1960) - *Crise Crevettière sur la côte belge*. ICES, C.M., Comité des Mollusques et Crustacés, 18.
- Gillett, (2008) - *Global study of shrimp fisheries*: Rome, FAO.
- Havinga B., (1930) - Der Granat (*Crangon vulgaris Fabr.*) in den holländischen Gewässern., *Journal du Conseil permanent international pour l'Exploration de la Mer*, 5:57–87.
- Henking H., (1927) - Der Fang der Nordsee-Garnelen (*Crangon vulgaris L.*) in der Ostsee. *Mitt.dt.Seefish Ver.*, 43(1):1–14.
- Holthuis L.B.; Franssen C.H.J.M., (1993) - Coastal Shrimps and Prawns. *Synopses of the British Fauna* 15, Second Edition.
- Kingsley J.S., (1886) - The development of *Crangon vulgaris*. *Bull. Essex Inst.*, 18(7–9):99–151; *ibidem*, 1889, 21(1–3):1–34.
- Koller G., (1928) - Versuche über die inkretorischen Vorgänge beim Garnelenfarbwechsel. *Zeitung vergleichende Physiologie*, 8:601–12.
- Kourist W., Mauch E. und Tiews K., (1964) - Ergebnisse von im Jahre 1962 durchgeführten Garnelen-markierungsexperimenten. *Arch.FischWiss.*, 15(1):16–22.
- Kurc G., (1964) - Première série d'expériences sur la sélectivité du chalut à poissons. *Sci.Pêche* (123):1–6.
- Kurc G., Faure L. et Laurent T., (1965a) - La pêche des crevettes au chalut et les problèmes de sélectivité. *Rev.Trav.Inst.(scient.tech.) Pêches mari.*, 29(2):137–61.
- Kurc G., (1965b) - Essais d'un nouveau type de chalut équipé d'un dispositif de sélectivité pour la pêche des crevettes. *Sci.Pêche*, 136:1–7.
- Mann D., (1777) - Mémoire sur l'Histoire-Naturelle de la Mer du Nord, & sur la Pêche qui s'y fait. *Mémoires de l'Académie impériale et royale de Bruxelles* II: 159-222.
- Meyer-Waarden P.F., (1931) - Die im Jadebusen gebräuchlichen Granatfängergeräte und ihre Eignung für den Fang. *Mitt.dt.Seafish Ver.*, 47:3–30.
- Meyer-Waarden P.F., (1963a) - Further results of the German shrimp research. *Veröff Inst.Küst. - u.Binnenfisch.*, 27:24–38, also issued as ICES, C.M. Special meeting on Crustacea 1962(35):1–13.
- Meyer-Waarden P.F., (1963b) - Catch composition of the German shrimp fishery in 1962. *Veröff.Inst.Küst.-u. Binnenfisch.*, 27:39–41.
- Meyer-Waarden P.F., (1965a) - Der Beifang in den Fängen der deutschen Garnelenfischerei in den Jahren 1954–60. *Ber.dt.wiss.Komm.Meeresforsch.*, 18(1):13–78.

- Meyer-Waarden P.F., (1965b) - Grundlagenmaterial zu "Die Zusammensetzung der Fänge der deutschen Garnelen-fisherei in den Jahren 1954–1960. *Ber.dt.wiss.Komm.Meeresforsch.*, 18(1), also issued as *Veröff.Inst.Küst.-u.Binnenfisch.*, 35:1–29.
- Mistakidis M.N., (1958) - Comparative fishing trials with shrimp nets. *Fishery Invest., Lond.* (2), 22(1):1–21.
- Muller Y., (2004) - *Faune et flore du littoral du Nord, du Pas-de-Calais et de la Belgique: inventaire*. [Coastal fauna and flora of the North, Pas-de-Calais and Belgium littoral: inventory]. Commission Régionale de Biologie - Région Nord Pas-de-Calais: France. 307.
- Pauly D., (Ed.), (2007) - Reconstruction of marine fisheries catches for key countries and regions (1950–2005). *Fisheries Centre Research Reports*, 15(2). Fisheries Centre, University of British Columbia: Canada. 170.
- Polet H., (2004) - *Evaluatie van de bijvangst in de Belgische visserij op grijze garnaal Crangon crangon L.) en van technische middelen om teruggooi te verminderen*. [Doctoral Thesis]. Universiteit Gent: Gent, Belgium, 212.
- Redant F.; Polet H., (2002), De garnaalvisserij: een kustgebruikersgroep met kopzorgen. *De Grote Rede* 5: 13–17.
- Tesch J.J., de Veen J., (1938) - Die niederländische Seefisherei. *Handbuch Seefisch.Nordeurop.*, 7(2):1–99.
- Tiewes K., (1952) - Zur Rentabilitätsfrage der Krabbenfisherei. *Fischereiwelt*, 4(3).
- Tiewes K., (1954b) - Einfluss der Gezeiten und der Wassertemperatur auf die Garnelenfisherei. *Ber.dt. Komm.Meeresforsch.*, 13(3):270–82.
- Tiewes K., (1966) - Erprobung einer neuartigen holländischen Garnelen-kurre. *Fischerblatt*. (2):1–3
- Türkay M., (2001) - Decapoda, *in*: Costello, M.J. *et al.* (Ed.) (2001). *European register of marine species: a check-list of the marine species in Europe and a bibliography of guides to their identification*. *Collection Patrimoines Naturels*, 50: 284–292.
- Verbrugge L., (1932) - Die belgische Seefisherei. *Handb.Seefisch.Nordeurop.*, 7(3):1–39.
- Vlietinck Edw., (1975) - Het oude Oostende en zijne driejarige belegering (1601–1604): opkomst bloei en ondergang met de beroerten der XVIIe eeuw. *Reprint of the 1897 edition by Zeller*.
- von Brandt, A., (1959) - Fanggeräte der Kutter- und Küstenfisherei. *Schr-Reihe AID*, (113):1–105.
- Welleman H.C., Daan N., (2001) - Is the Dutch shrimp fishery sustainable? *Marine Biodiversity* 31, 2, 321–328.
- Williamson H.C., (1901) - On the larval stages of decapod Crustacea. The shrimp (*Crangon vulgaris Fabr.*). *Rep.Fish.Bd Scot.*, 19(3):92–120.
- Williamson H.C., (1915) - Crustacea Decapoda. Larven. *Nord.Plankt.*, 3(6):315–588.

Additional references

Research has been conducted elsewhere than in western countries, for instance in Romania, i.a. by V. Gheorghe in 1951, by Pora, Ruşdea, Stoicovici and Şuteu in 1965.

Additional bibliographic listings:

- Broekema M.M., (1941) - Seasonal movements and osmotic behavior of the shrimp *Crangon crangon* L.: *Arch. Neerl. Zool.* 6, 1-100.
- Fry D.H.J., (1933) - Operation of a California shrimp trawl. *Calif. Fish Game* 19:264-267.
- Havinga B. (1930) - Der Granat (*Crangon Crangon nign'cauda* and *Crangon franciscomm vulgaris*) in den hollandischen Gewässern. J. in Yaquina Bay, Oregon. *Northwest Sci. Con. Cons. Int. Explor. Mer* 553-87. 49:216-240.
- Lloyd A.J., Yonge C.M. (1947) - A study of *Crangon vulgaris* L. in the Bristol Channel and Severn Estuary. *J. Mar. Biol. Assoc.* U.K. 26:626-661.
- Maucher W.D., (1941) - Statistische Untersuchungen in den Körperproportionen zwischen der Nord- und Ostform von *Crangon crangon*. *Eel. Meeresforsch.*, 17:219-227.
- Meredith S.S., (1952) - A study of *Crangon vulgaris* in the Liverpool Bay area. *Proc. Trans. Liverpool Biol. Soc.* 58:75-109.
- Scofield N.B., (1919) - Shrimp fisheries of California. *Calif. Fish Game* 5: 1-12.
- Schmitt W.L., - (1921) - *The marine decapods crustacea of California*. Univ. Calif. Publ.