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# An endangered regional cuisine in Sweden: the decline in use of European smelt, *Osmerus eperlanus* (L., 1758), as food stuff

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## Abstract

Only a handful freshwater fish species are still commercially sought after in Sweden. Subsistence fishing in lakes and rivers is also rare nowadays and has in general been replaced by recreational fishing. However, fishing for European smelt, *Osmerus eperlanus* (L.), once popular in many areas of central Sweden, has survived into the twenty-first century, particularly in the province of Värmland, as a minor, but interesting regional food speciality. It is a dish with character, since smelt has a very particular scent and it is therefore esteemed by some and rejected by others. Nowadays, it is eaten locally, especially by the elder generations, and attempts to popularize it as a regional food have so far failed. However, smelt deserves to be marketed as a regional culinary specialty, and has great potential to become popular among modern foodies. A traditional dish known as “smelt pancake” can be promoted. Interesting enough, there are new categories of smelt enthusiasts that have discovered the possibility of fishing in large numbers in spring, especially Thai and other immigrants. There are also a significant numbers of sojourners and visitors from the Baltic States, especially Lithuanians, fishing for smelt in Värmland.

**Keywords:** Ethnoichthyology, Food-cultural studies, Foodways, Regional cuisine, Small-scale fishing, Wild food

## Introduction

European smelt, *Osmerus eperlanus* (L.), is a small fish species of the family Osmeridae found in the coastal waters of the northeastern Atlantic, as well as in rivers, streams, and lakes in northern Europe [1] (Fig. 1). It has been caught seasonally and used as human nourishment in Sweden since at least the Mesolithic period [2].

Aquatic resources have always been utilized by human beings all over the world [3]. Rivers and lakes are important elements in the northern European landscape, and freshwater fish have therefore been of immense importance for the economy of the rural population [4–6]. These resources were regularly used as human food, animal feed, fertilizer, and other purposes. People were making the most of available fish resources. Freshwater fish have also had significant cultural values. Some species are culturally salient and even play an important role in the local identity in certain areas [7–9]. The

native utilization of fish resources in European lakes and rivers are therefore of great interest for research on local cuisine, regionalism, and contemporary tourism [10].

For the rural population in Sweden, fishing in lakes, rivers, river mouths, and other freshwater habitats was of great importance until recently. Many freshwater fish species were caught and utilized within households or commercially exploited. Peasant fishermen could sell the catch in the local markets. However, the receding of lakes in the nineteenth century, and the expansion of hydropower and worsening of water pollution in the twentieth century, contributed to the decline of inland fisheries [6, 10].

At the same time, trade of sea fish became more competitive on the Swedish food market [11]. The artisanal or local subsistence fishing conducted by local households vanished. In some regions, however, certain freshwater species continued to be caught for household consumption well into the mid-twentieth century. The seasonal fishing of smelt was one of them.

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**Fig. 1** European smelt, *Osmerus eperlanus* (L.), from the river Arbogaån. Normally, smelt reach 8–14 cm, but can be found up to 30 cm in some waters. When newly captured, smelt has the characteristic scent of cucumber, which is produced by the same chemical substance found in cucumbers. Some people find the scent appealing, while others regard it as disgusting (Photo Ingvar Svanberg, 2017)

## Objectives

The general objective of this article is to highlight the contemporary fishing for smelt against its historical background in order to discuss changes in the attitude towards it as food. The study, which is based on an inter-disciplinary ethnoichthyological approach [10], deals with the historical and contemporary use of smelt as nourishment in central Sweden, defined as a region in the middle of Sweden that covers the provinces of Södermanland, Uppland, Värmland, Dalsland, Västergötland, and Västmanland. The social, economic, and cultural significance of smelt fishing and smelt as human food then and now will be discussed.

Thanks to earlier recorded data we can provide not only a synchronic perspective but also a diachronic perspective indicating the development of interest in smelt over the last few centuries. This article examines people, smelt, and their changing interrelationship over time. It also briefly discusses catching methods, preparation, and consumption of this regional fish resource, as well as attempts to promote the contemporary way of utilizing smelt. The questions we aimed to answer were when, where, and by who is smelt caught and how it is exploited?

## Materials and methods

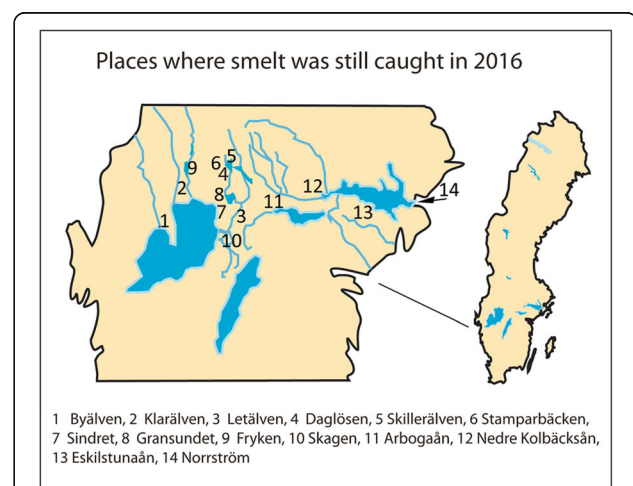
With the help of scattered records in various printed sources (local ethnographical studies, topographic literature, travelogues, zoological literature, fishing reports, dictionaries over local dialects), this article sets out to review and analyze the historical prevalence of fishing, trade, fishing techniques, and the use of smelt in Sweden.

The usage of qualitative questionnaires for documenting and collecting data about local economic activities is a fruitful method for gathering information about traditional fishing and its methods. The responses to qualitative questionnaires consist of memories, opinions, and experiences and thus offer understandings of great value [12]. Between 1860 and 1911, a questionnaire concerning local fresh water fishing in Sweden was distributed to fishery inspectors in Sweden [13]. This material has been analyzed by Schreiber et al. [14]. Important for this study is the questionnaire No. 37 distributed by Uppsala Archive of Dialect and Folklore in 1935. A few respondents gave detailed information about catching methods and how the smelt was utilized in the early twentieth century [15].

The present documentation of contemporary smelt fishing in Sweden is based on a questionnaire distributed to local fishery experts and fishermen in spring 2016 (Fig. 2). In total, 20 forms were returned. In addition, conversation and open interviews with smelt fishers and field observation were made in spring-time 2014, 2016, 2017, 2018, and 2019.

## Biology, distribution, and populations

European smelt, *Osmerus eperlanus*, commonly known in Swedish as *nors* (recorded since 1450) or regionally *sлом* (recorded since c. 1670), is a relatively small fish, usually between 8 and 14 cm; very seldom larger. Larger specimens, known as *sломkung* (“smelt king”) in Värmland and *sломhäst* (“smelt horse”) in Bohuslän, Dalsland, and Värmland, can reach up to 25 to 40 cm. Large smelt from Stockholm, eastern Värmland, Södermanland,



**Fig. 2** The map shows locations where smelt was fished in 2016, according to respondents of a questionnaire. Smelt are spring spawners migrating from major lakes into rivers. The fishing most commonly takes place in the early spring at creek or river mouths below the first dams or hydro power stations which are barriers to the fishes' further migration (Map Madeleine Bonow)

Östergötland, and elsewhere was called *norskung* (“smelt king”). In reality, they are large females [16–19].

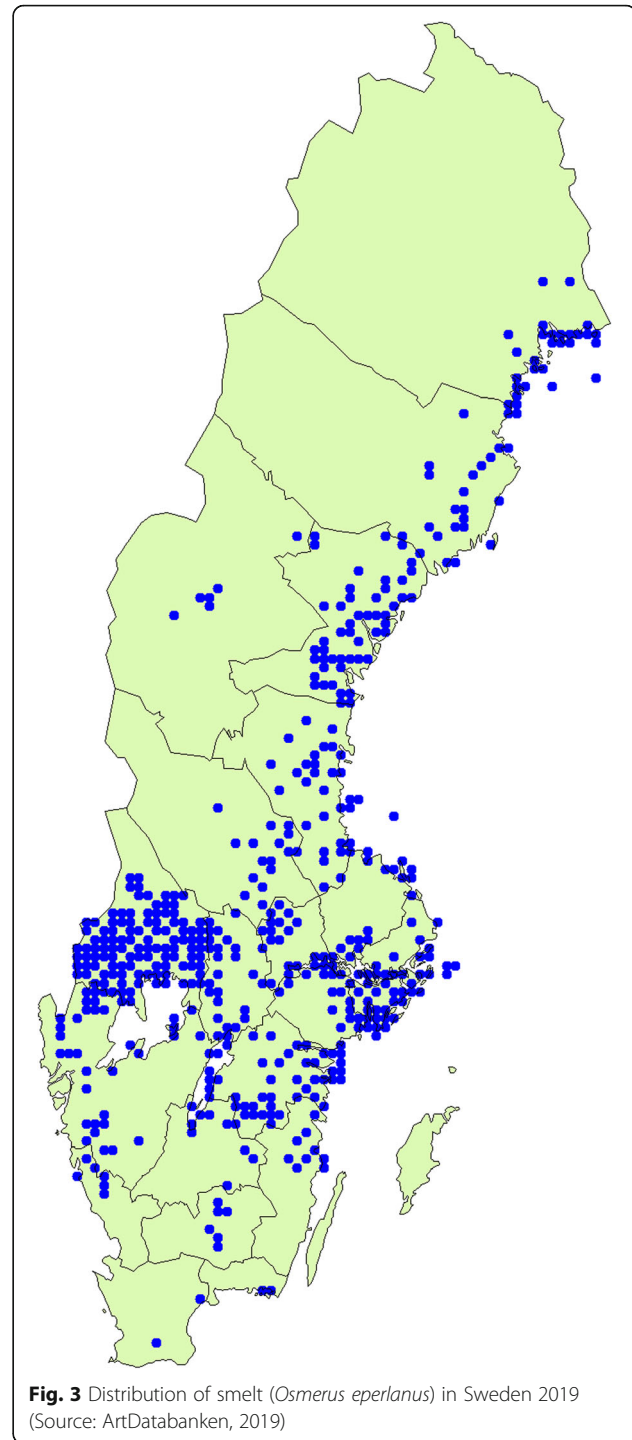
Many people are of the opinion that smelt smells like cucumber, and according to some, this is an unpleasant smell. The smell is polarizing—some seem to appreciate it, while others think it is rather horrible. It is strange that humans—with our relatively underdeveloped sense of smell—react so strongly to a smell (fish/cucumber) that is rather common and normal as food [9, 20]. Ethnologist Nils Storå suggests that the intense scent of smelt is reminiscent of a corpse. However, the fish does not smell rotten—the disgust for its scent is culturally learned and can change over time. The taste of the fish, on the other hand, reminds many of violet [21].

*Osmerus eperlanus* is distributed in the coastal waters of the White, Barents, Baltic, and North Seas and can be found around Great Britain, western Ireland, and in the Atlantic Ocean southward to the Garonne Estuary. Landlocked populations occur in larger lakes of Scandinavia, Russia, Belarus, and the Baltic States. It is native to Russia, Finland, Estonia, Latvia, Lithuania, Belarus, Poland, Czechia, Sweden, Norway, Denmark, Germany, the Netherlands, Belgium, France, Germany, Ireland, and the UK [1] (Fig. 3).

In the Swedish landlocked lakes, smelt is a glacial relict that originates from time after the last ice age, approximately 12,000 years ago. In Sweden, it occurs in coastal waters from the province of Östergötland northwards. It is found in the large lakes of Siljan, Mälaren, Hjälmaren, Vänern, and Vättern, and also in many smaller lakes in the highlands of Småland. It seldom occurs above the postglacial highest sea level of the Baltic Ice Sea. In the province of Skåne, it can be found in the lakes Ivösjön, Oppmannasjön, and Sövedsjön, but it has vanished from Lake Vombsjön. Along the west coast, it inhabits an area between Ringhals and Gullmarsfjorden, and from the river Göta älv and a few smaller lakes, such as Sundsjön and Stensjön in Halland, and Lyngern between Halland and Västergötland [22, 23].

Due to its importance as prey for predator fish, smelt has been successfully introduced in many waters in order to promote populations of pike-perch, *Sander lucioperca* (L.), and Arctic char, *Salvelinus alpinus* (L.). Such introductions took place about 100 years ago in Jämtland (e.g., Storsjön), Dalecarlia, and Småland. However, these new populations have never been subject to fishing [24, 25].

Smelt is the most abundant species in the pelagial zone; in larger lakes, smelt makes up between 70 and 90% of the fish population. In the nineteenth century, smelt existed in 11% of Swedish lakes. It was especially common in southeastern Sweden (found in 24% of the region’s lakes). In lakes in southwestern and northern Sweden, smelt populations were reported at 9% and 5%



of total fish populations, respectively. The species preferred rather large and deep lakes on relatively low sea level [13]. In the 1996 Riksfiskinventeringen (the Swedish National survey on the status of fish), smelt was found in 6% of Swedish lakes [26].

In fresh water lakes, smelt is anadromous and spawns in river mouths or in rivers. Smelt from Vänern migrates up rivers like Klarälven, Byälven, Letälven, and Tidan;

smelt from Hjälmarén is found in Svartån river, while smelt in Mälaren lives in the rivers Arbogaån, Eskilstunaån, Kolbäcksaån, Svartån, Fyrisån, Köpingsån, Sagån, Örsundaån, and Räckstaån. Smelt can also be found in the Norrström within Stockholm city that connects Lake Mälaren with the Baltic Sea, which is important spawning ground for smelt. The arrival of running smelt in the rivers is a traditional sign of the arrival of spring in places where the fish was caught [9, 22, 26].

## Results and discussion

### Historical background

Fish traps for smelt are explicitly mentioned in late Swedish medieval sources from 1450 [27]. Trade with barrels of smelt (*3 tunnar norss*) in Stockholm is mentioned already in late medieval sources from 1482 [28]. Additionally, we have many eyewitness accounts and ethnographic descriptions of smelt fishing in Sweden from the early modern period up to the mid-1900s [29]. Particularly in the provinces of Värmland, Västergötland, Västmanland, and Uppland, as well as in the city of Stockholm, there is a long tradition of local smelt fishing [10]. The river Moälven in the northern province of Ångermanland has also been a site for this activity. By the in the early 1950s, between 12 and 20, tons were being harvested with fish-trap baskets annually in Hoppstafjorden [30] (Fig. 4).

In 1670, one observer in Värmland recorded anadromous smelts being caught in basket traps. Lift nets were also used, according to several reports. Eighteenth-century authors frequently describe the catching and consumption of smelt in Sweden. In a manuscript from 1716, dean Erland Hofsten gives a detailed account of smelt fishing in Värmland, with information on folk taxonomy, fishing gear, fishing methods, and the uses of

the catch [31]. In April 1693, King Charles XI observed peasant fishermen using lift nets in the river Arbogaån at Kungsör in Västmanland [32].

In preindustrial Sweden, smelt was very much regarded as food for the poor. It could be caught in large numbers and distributed among a large population [33]. Ethnographic data on smelt fisheries in Värmland, Bergslagen, and Norrström—gathered through questionnaires, interviews and written sources—point to far-reaching continuity in the technology, terminology, local knowledge surrounding smelt fishing. The most important smelt fisheries in Sweden during the twentieth century were in Värmland; in 1918, that area accounted for 54% of the country's smelt catch [34].

As recently as the early twentieth century, the production year was divided up according to the most favorable times for catching different species. First came the “smelt time” (Swedish: *norstiden*, *norsaveckan*, *slomtiden*, *norsnätter*), in the spring. The time for the catch coincided with the post-winter thaw, when smelt began appearing in the river mouths. Water temperature had to rise above 6 °C, at which point it was time to take out the fishing gear [1, 10, 20, 29].

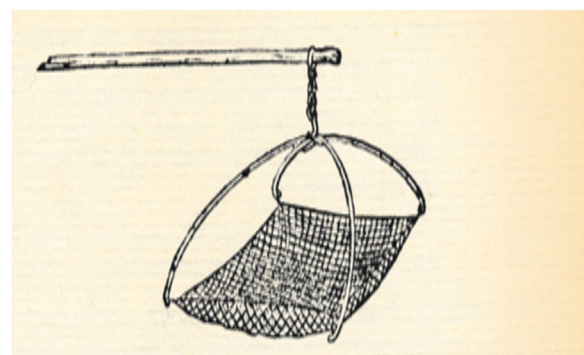
### Smelt catching methods

In older times, the fish was caught with a range of gear: nets, seine nets, lift nets, hand nets, or basket fish traps set amid the rapids [20, 26, 29, 33]. Written accounts of the use of lift nets from boats can be found dating back 300 years or more [32, 35]. In a travelog from 1747, for instance, Carl Linnaeus describes this device [36]. This gear represents an ancient technique, known to many around the world [37]. Nowadays, lift nets and hand nets are mainly used [22, 23, 38, 39] (Fig. 5).

It was important to carefully observe when the fish arrived. In some locales, vegetation was inspected for signs that the spawning time had come. When the alder leaves



**Fig. 4** Fishing boats with typical dip nets at Norrström, Stockholm, in the early twentieth century. Smelt was a common catch in spring for these urban fishermen who sold the fish to the locals and to restaurants. City residents enjoyed watching them catch the smelt in the evenings (unknown photograph, courtesy of the Maritime Museum, Stockholm)



**Fig. 5** A traditional lift net for smelt fishing observed, described, and sketched by Swedish researcher Carl Linnaeus in Persberg, eastern Värmland, in 1746. The same kind of lift nets are still used in that area today. (Source Carl Linnaeus, *Wästgötha Resa*, 1747 [36])

(*Alnus glutinosa*) are “as big as rat’s ears”—that is when the smelt has arrived. A similar proverb was common in Bergslagen: the spawning time has come when the “birch leaves are the size of mouse ears”. The saying in Uppland was that smelt runs when the goat willow (*Salix caprea*) blooms [39]. Given that the timing of smelt spawning differs by about 2 weeks between nearby lakes and rivers in Värmland, much more than the timing of leafing varies, such signs must have been rather local. In western central Sweden, the Tiburtius night (April 14) was a signal for the smelt spawning [29, 40].

According to yet other reports, smelt spawn in the spring when the cold gusts blow, often with a touch of snow. In Bergslagen, in fact, winds of this kind were named after the fish (Swedish: *norsilingar* (Södermanland, Västmanland, E. Värmland, Västergötland, Östergötland), *slomälär* (Värmland), and *slomkula* (Värmland, Bohuslän)). Appearance of many gulls in the rivers is also considered a sign for smelts are running to spawn [9, 20, 41] (Fig. 6).

Due to the special occasions associated with a few late spring evenings of smelt fishing—when conditions are optimal—bonfires were often lit on the shores or firewood were kept in an iron holder, so-called *lyskäring*. The smelt is said to come towards the light [42]. The catch attracted many people who came to watch. It was a fairly dramatic event, with an entertainment value: adults and children—even tourists—looked on. In Stockholm the fish were caught in the city center, enabling a large number of spectators to watch [29].

### Changing attitudes and decline of fishing

The smelt itself seems to have made an upward social movement in the last centuries. In the eighteenth and nineteenth century, it was commonly regarded as poor



**Fig. 6** Smelt fishing from typical flat-bottomed boats within the city of Arboga in the 1960s. Many people continued to catch fish for human food there in the 1960s. Today, only a couple of boats take part in the local fishery, and only one person makes these specialized nets (courtesy of the Arboga Museum)

man’s food in many areas [10, 29, 43]. The situation was the same for instance in Finland, where it was eaten mostly by Russian soldiers and peddlers, but seldom among the locals [9].

With modernization and the advent of urbanization, this disdained food became appreciated by more and more working class people. It was sold for low prices in large numbers in Sweden’s urban markets and fish stores. In the 1950s and the 1960s, it was a common food in lunch restaurants in Stockholm and other towns. In Karlskoga, Värmland, and in Arboga, Västmanland, it was still appreciated as generally free food for the urban population in the 1960s [44]. Young boys fished and brought the catch home for their families. Until a few decades ago, smelt was therefore caught on a large scale in several parts of Värmland and Bergslagen, as well in the rivers around Lake Mälaren, Hjälmaren, Vänern, and Vättern. This has now declined and almost vanished in most areas. There is for instance no smelt fishing in Uppsala, Västerås, Örebro, or Karlskoga anymore. The smelt is still running in the rivers, but they are rarely fished, other than in very insignificant numbers to use as bait [9, 22].

Within the city of Stockholm, smelt fishing was thriving well into the 1950s and 1960s and beyond. In the early 1950s, there were still 40 boats in Stockholms Ström and Norrström (the innermost and western part of Saltsjön) in central Stockholm that caught smelt with large lift nets [45]. Since the spawning sometimes took place earlier in the season in Stockholm, smelt were sent to restaurants in Värmland before the fishing took place there, according to our interviewees. Just a few years ago, four boats remained on Strömparterren outside the Parliament House, although smelt fishing was insignificant. Now, there is no fishing boat operating in Stockholms Ström [46]. Along the Klarälven some smelt are still caught for household consumption, mainly with the help of scoop nets from the river shore (Fig. 7).

The decline in smelt’s prevalence in Swedish cuisine reflects a number of factors. Smelt fishing grew less common throughout the postwar years, although it retained a degree of popularity. Increased toxic emissions from industries near the lakes of Vänern and Hjälmaren were a death blow, as fisheries in the area were badly damaged. The postwar period saw large-scale fish deaths in several areas. Industries resulted in lower water quality, causing smelt to die in large numbers when migrating past sulfite plants [22].

In some areas, there was still smelt fishing in the mid-1980s, but demand for the fish had declined. Fish of other kinds, especially Baltic herring, were readily available for very low prices on the market



**Fig. 7** Smelt fishing in front of the Royal Castle, Stockholm, in the early 1940s. Fishing for smelt in Stockholm's Ström had been known since at least the medieval times. In 2016, however, this long tradition ended when the last fisherman, known as Stor-Olle, sold his boat. An ancient food tradition for the people of Stockholm is thus gone (photo Lennart af Petersens, courtesy of Stockholm City Museum)

throughout Sweden; and as eating habits changed and economic conditions improved under the expanding welfare state, they enjoyed increasing popularity. Consumption of red meat and poultry also increased rapidly. Higher standards of living and lower prices on meat meant that the consumption in meat over the last 30 years increased [47].

At the same time, the demand for freshwater fish has fallen sharply. Freshwater fish in general grew less important as a staple food in Swedish homes. Our interviews indicate, moreover, that housewives in the 1960s were not amused when their children would come home with yet another bucket full of odoriferous smelt, which the women were then expected to clean and to cook. Smelt does not last very well frozen for more than a few months, even if vacuum freezing today has increased its durability. The variation was limited in how the fish could be prepared. It was usually fried in margarine and then eaten with potatoes. Some realized the fish could be pickled and then eaten at Midsummer instead of herring. Due to the smelt's scent, however, many who were unaccustomed to the fish did not care to eat it. European smelt is so closely connected with Värmland, and since 1992, it has been regarded as a symbolic provincial fish of Värmland [48].

In most places, where it was traditionally conducted, smelt fishing has largely ceased [21, 29].

### Contemporary fishing and consumption

While fishing of smelt for human food has disappeared in most places in central Sweden [22], the responses to our 2016 questionnaire show that it is still utilized as bait in some places where it used to be gathered as human food. In order to re-awaken interest in the fish and beyond a springtime regional dish, some enthusiasts have held special smelt festivals. Making smelt a local attraction helps build regional identity, while at the same time keeping a fine old tradition alive that is in danger of being lost. Contemporary fishing for and consumption of smelt still occur in a few places, especially in the rivers in Västmanland and Värmland [9] (Fig 8).

*Mariestad, Västergötland* is a small town with 15,000 inhabitants, situated on the eastern side of Lake Vänern of the province of Västergötland. There is an old tradition in Mariestad of exploiting spawning runs of smelt in the river Tidan, which empties into Lake Vänern within the city [49]. In 1983, the city celebrated its 400th anniversary, and in connection with the occasion initiated a festival—known as the Smelt Festival (Swedish: *Norsival*)—devoted to the catching and consumption of smelt. The festival drew many visitors and attracted the attention of the national media, including television. It took place on a yearly basis thereafter, but came to an end in 2010. Lack of interest from the public seems to be the reason for its disappearance. It is uncertain if the fishing still takes place in river Tidan [9, 22], but there was no fishing reported in 2019.

*Arboga* is a medieval town in the province of Västmanland. Smelt gathering in the river Arbogaån probably has a very long tradition. The town Arboga has made smelt fishing a tourist attraction. Known as “Norsylingen” (in reference to a biting wind associated with the smelt fishery), the festival usually takes place on a



**Fig. 8** Fishers at Klarälven in the province of Värmland in April 2019. The fishing normally starts at dusk and continues for 5 or 6 h until midnight. Immigrants and people from neighboring countries like Lithuania now make up the majority of fishers, but some native and local Swedes continue this spring tradition (Photo Armas Jäppinen, 2019)

Saturday in mid-April. It is seen as a way of greeting the spring. The festival began in 1981, through an initiative by the Arboga Lions Club. A local fishing club, Sturefiskarna, has been responsible for organizing it since 1999 [9, 10, 22].

The fishing is done beforehand and the catch is frozen. An estimated 200 kilos of smelt are sold on the festival day, during which time a couple of traditional boats go out on the river with lift nets and show how the fishing is done. The festival is held in a restricted area along the river, where representatives of the fishing club bone and grill the fish and then serve it in flatbread with onions. This all takes place under the supervision of older men who are bearers of the tradition and who took part in smelt fishing in the past. The smelt can also be purchased for home consumption. The number of visitors is increasing each year. The festival is very simple, and it attracts young and old alike (often together). Grandparents see it as an opportunity to convey a culinary heritage to their grandchildren—as a sort of counterbalance to the multinational fast food that the latter otherwise eat. The fishing club has tried to interest local politicians in the idea of opening a summer restaurant where smelt and other local fish may be served, but it has not yet succeeded in securing their support. Local restaurants have not shown any interest either. Nor have tourists found their way to this event. Smelt fishing remains otherwise marginal. According to our observations, “norsylingen” still occurred in the spring of 2019 (Fig. 9).

*Forshaga, Skived, Karlstad (Klarälven).* The only place where smelt is still caught in the traditional fashion is along Klarälven, and on some other streams in that



**Fig. 9** Poster for the smelt festival Norsylingen in 12 April 2014. In order to revitalize the local tradition of smelt fishing in the city of Arboga, local organizations have developed a local food festival. It is popular especially among elderly locals who remember eating the fish when they were young. Some bring their grandchildren to encourage them to taste the now-rare food (photo Madeleine Bonow, 2014)

province. Improvements in water quality have contributed to the species' return; some fishing for household consumption has thus been able to live on. Knowledge of how smelt is caught is handed down within families. When the fish makes its appearance in the river, local landowners fetch their gear and make their way to the water. It is an experience for the whole family. Taking active part in the catch—following a tradition which is practiced just a few evenings each year—is seen as exciting and fun. It is dark and the weather is cold, but the occasion makes for excitement; and the catch itself makes for a special kind of meal at home. No great fuss is involved, even as seasonal fare becomes available which people do not otherwise eat. Some families, however, freeze portions of the catch for consumption at other times of year (Figs. 10 and 11).

*Sindret, Åsjöälven near Storfors.* Locals still seem to be the main fishers of smelt in 2019. Catching a species such as smelt, when it appears in large numbers in the spring, is of course appealing. The fact that the catch takes place at night may also contribute to the excitement. Smelt fishing has always attracted people. Smelt are caught and utilized locally within households (Fig. 12).

*Stockholms ström, Norrström, Stockholm.* For centuries, smelt fishing has been a common sight on Stockholms ström and Norrström in the very center of Stockholm. However, the fishing has now entirely vanished and the



**Fig. 10** A typical modern smelt fisher in Forshaga. The traditional fishing at the river's shore at Klarälven is done with a handheld net on a long wooden pole. The fisher moves downstream holding the net by the river's bottom where the migrating spawning smelt are. This method has been adopted by foreign fishers, and modern equipment including wader trousers, and telescoping aluminum pole nets can be bought in local retail stores for less than 100 Euros. In most years, the best area for Klarälven smelt fishing is a few hundred meters below the hydro power station in Forshaga, and coincides with one of best spots for salmon fishing using rods in Sweden. The salmon fishing is highly regulated, and its fishing permits are limited and pricey (photo Armas Jäppinen, 2019)



**Fig. 11** Traditional smelt fishermen look for signs of smelt coming up in the river. The presence of gulls and golden eyes indicate that smelt are running in the river Klarälven (Photo Armas Jäppinen, 2019)

last boats were sold a couple of years ago. In the 1950s and 1960s, smelt was still being served at lunch restaurants in Stockholm in the spring. Smelt was abundant in the water and fishermen could, according to our interviewee Olle Högberg, harvest 5 tons a day in February and March. Smelt was also caught in the fall. Most fish were sold as feed to the mink farmers at Listerlandet in Blekinge, but some was also transported to the fish retailers in Värmland and Västmanland, where the local fishing season started a month later. In Stockholm, it was sold in the food halls Hötorgshallen and Östermalmshallen.

Olle Högberg, who began to fish in Stockholmsström in 1947, told us that he kept some smelt alive in his boat, to use as bait when fishing perch, *Perca fluviatilis* L. He could store between 70 and 80 kg of smelt in his boat. Smelt fishing was a kind of event with many spectators. In connection with the ceremonial launching of the boats in spring, Mr. Högberg set up a tent and invited people to drink beer and



**Fig. 12** Night fishing with traditional dip net at Sindret, Värmland, in 2019. The man is using the same kind of net that Carl Linnaeus described from neighboring Persberg in 1746 (photo Armas Jäppinen, April 2019).

wine. A Minister of Culture once ceremonially launched Mr. Högberg's boat with champagne. Since the government offices and the Royal Castle were nearby, the government and the royal family was also invited, and Olle offered fried smelt.

In recent years, the fishermen felt pressure from the increasing numbers of recreational fishers. The fishermen have since the 1980s, when salmon and trout was introduced, been threatened by the recreational fishers. People were throwing stones at the smelt fishers, especially when they were fishing below the bridge at the Parliament House, according to our interviewee. There is currently no commercial fishermen left in Stockholmsström. A centuries-old tradition known from the late medieval times, mentioned by authors such as Fredrika Bremer, August Strindberg, Willy Walfridsson, and Stig Claesson, has thus disappeared.

#### Lithuanians and Thai immigrants

However, recently new categories of the Swedish population have discovered smelt as a food resource. During the last few years, a substantial category of fishers along Klarälven have been Lithuanians, coming from their home country on the other side of the Baltic Sea or from Norway, where the Lithuanians, a rather recent arrival, are currently the third largest immigrant group in Norway [50]. Smelt is still very appreciated as food in Lithuania, and in the town of Palanga, a yearly smelt festival is held [9]. In 2018 and 2019, many Lithuanian fishers came to the river Klarälven when the smelt were running.

There has been increasing interest in smelt fishing among some immigrant groups in Sweden. According to a respondent on the 2016 questionnaire, the Italians in Västerås is said to have been fishing for smelt in Svartån when permitted.

Thai immigrants are known to be industrious and well-integrated when it comes to using local food resources for their own consumption or for trade. Wild berries, mushrooms, and plants are gathered in large quantities by them [51]. For their own consumption, they catch and dry a variety of fish [16]. In the province of Värmland, they have discovered smelt as a freely available fish that could be caught in large number and incorporated into Thai cooking.

#### Traditional dishes made by smelt

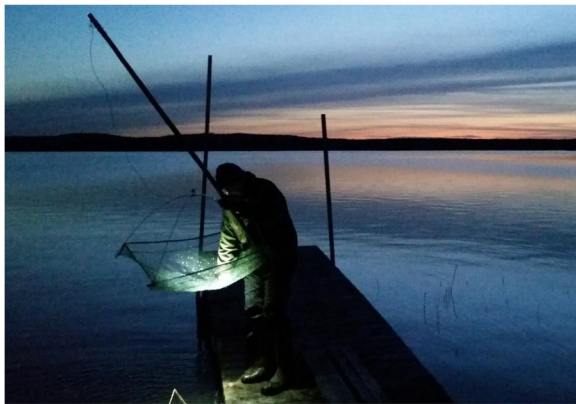
Another thing that changed during the twentieth century's modernization of food culture was the treatment given to caught smelt (Fig. 13) Since smelt was caught in very large quantities, the most common preparing methods prior to 1900 was drying it with (Swedish *speken*) or without salt. According to Lars Roberg in 1727,



the fish was consumed after being air-dried and baked in the oven [52]. An account from nineteenth century Solerön in Dalecarlia describes how the catch was spread out on roofs or on boards laid on the ground. The sun-dried fish were then put into sacks and stored in warehouses [53]. This procedure was simple and cheap. The method also made it possible to transport the fish in large quantities over long distances and thus to sell it in the cities of central Sweden, for instance in Åmål or Uppsala [29].

In its dried form, smelt provided protein-rich nourishment even for the poorest layers of the population. The dried fish could be eaten as it was or roasted in the oven or fried in a pan [18, 29]. In the nineteenth century, dried smelt was popular protein-rich lunch pack food among lumberjacks in Värmland. It was also preferably eaten as a kind of snack with schnapps [54]. Dried smelt is still eaten in parts of Russia and Estonia, but hardly in Sweden, although attempts were made in Uppsala some 20 years ago to sell imported packets from Estonia to bar owners for use as an appetizer [9].

A common way to prepare smelt was to fry the fish in a pan, so it became a hard, thick cake, known as *norspannkaka* in Södermanland and Västergötland or *slompannkaka* in Värmland, i.e., “smelt pancake.” Sometimes it is made as a real pancake with fried fish and batter of eggs and flour. It could be eaten with potatoes or



**Fig. 13** A catch of smelt in plastic boxes, Forshaga, Värmland. On peak nights and at the right moments, each move with the net can yield dozens of fish and, in just a few hours, dozens of kilos. These nights and moments are, however, rather few and for most fishers, it is more often a question of catching none or a few smelt. Local fishing rules, as adopted by the private land and fishing rights owners, allow only for “household” smelt catches by the public without fishing permits. Traditionally, rich catches from a few evenings of fishing are shared in the villages along the river Klarälven. However, the emerging smelt-fishing tourism means that some large loads of smelt are being transported to neighboring countries and sometimes sold using social media as a market place, e.g., Facebook. Some local people question whether the generous fishing rules can be maintained (photo Armas Jäppinen, 2019)

mashed potatoes. This is the way smelt is occasionally prepared within households [55, 56]. An interviewee from Uppsala reports that hundred years ago, smelt was prepared for supper, boiled with bay leaves and pepper, and eaten with a sauce seasoned with horse-radish [57] (Fig. 14).

During the twentieth century and up to the present day, the most common way of preparing smelt has been to fry it in margarine or butter. It is eaten with mashed potatoes with chives and cowberry (*Vaccinium vitis-idaea*) jam. Deep-frying is another popular method. Sometimes the rinsed fish is soaked in milk and then rolled in rye flour before frying. The fish dish is served with lemon, parsley, and boiled potatoes. Striking new ways of preparing smelt are rarely mentioned. The fish can be frozen for some months and then fried later in the year. Some interviewees stressed that it is not suited for freezing. Pickled smelt prepared and eaten in Midsummer Eve (like pickled herring) was mentioned by one informant from Arboga. According to the authors of one of Sweden’s most popular cookbooks during the postwar period, smelt can be fried, deep-fried, boiled, smoked, or prepared *au gratin*. Bonnier’s cookbook was first published in 1960 and reprinted many times. It is a collection of many traditional dishes from the twentieth century and long a standard for many Swedish housewives and others. It was used in many, if not most, households in the 1960s and 1970s [58]. In Arboga, the organizers of the local smelt festival have been innovative and broil the smelt and serve it in flatbread with onions (Figs. 15 and 16).



**Fig. 14** Bowl of traditional fried smelt in Skived, Värmland. This is the way most local people still prepare smelt. The dish is eaten for lunch or dinner with mashed potatoes and cowberry (*Vaccinium vitis-idaea*) jam. If you have plenty of small smelt, you can press them together into a pancake shape, fry, and eat them in the same way (photo Katharina Leibring 2014)



**Fig. 15** In order to increase interest in smelt, new dishes have to be developed. A *norsklämman* of traditional soft flatbread, fried smelt, and raw onion is a kind of fast food sold at the smelt festival in Arboga (photo Madeleine Bonow, 2014)

Tore Wretman (1916–2003) was a legendary Swedish chef and food creator, and from the mid-1950s to 1977 owned the renowned classic restaurant Operakällaren (founded in 1787) in the very center of Stockholm. He was fond of traditional Swedish domestic food and ingredients. After restorations, Wretman reopened Operakällaren in 1961 with a new food concept. Smelt was readily available from the fishermen in Stockholms Ström, just outside the restaurant, and he created a spring primeur dish with deep-fried smelt, which he served to his friends and customers. The recipe can be found in his now classic cook book *Svensk husmanskost* (1967). His successors in the late 1970s (among them a Swiss-born chef), did not share the same enthusiasm for smelt and its characteristic scent [59]. As far as we



**Fig. 16** *Norsklämman* served at the smelt festival Norsylingen in Arboga. Smelt is a delicious, healthy, and sustainable food that deserves to be popular again, according to the organizers of the festival. During the smelt season, there are plenty of fish in the river, but very little is harvested nowadays (photo Madeleine Bonow, 2014)

know, only one restaurant (Kajsa Stinas kök) in eastern Värmland served fried smelt in 2019.

#### Fish with terroir?

If fish and seafood have terroir in the same way as bread, cheese, and wine, smelt must fit into that kind of food. It is very deeply connected with the rivers and landscape where it is harvested. It has been a regional culinary specialty for centuries, and it is still known as typical Swedish cuisine. “The idea of terroir is associated with *savoir-faire*, the culinary knowledge of some members of the family, always the oldest ones, which therefore varies from one generation to the next,” writes anthropologist Isabelle Techoueyres. Reference is made to family memories, or to festive occasions; to tradition, or what everybody else did [60].

Individual taste was acquired within families where food was made from available resources. However, the younger and middle age generations of the smelt-fishing regions are brought up nowadays with highly industrialized food, including fish, with insipid flavor and taste, from the modern grocery shops and fast food stands that are highly detached from local and regional food [61]. Artificial and exquisite flavors have long ago since replaced nature’s multifaceted flavors. Standardized and predictable taste experiences have killed the space for genuine food stuff and its varying taste experiences have disappeared [62]. The real experts, of homemade cooking, housewives using real unprocessed fish, meat, or vegetables, do not exist anymore [63].

In the twenty-first century, Nordic chefs have been more and more interested in using locally available ingredients whose characteristics are particularly excellent in the climate, landscape, and waters. A Manifesto for the New Nordic Cuisine was created by chefs from all the Nordic countries in 2004. It includes key words like freshness, purity, and simplicity [64]. Thanks to these younger chefs, the concept of New Nordic Cuisine has become widely known. Despite the new interest in terroir, the return of traditional food [65], the intention to reflect the changing of the seasons, and to promote local ingredients, so far, none of these modern chefs have discovered smelt. The Slow Food movement (including Slow Fish) has not done anything to promote smelt either [66]. It remains undetected. Smelt is a sustainable food and a wider use would promote local small businesses in regions with few jobs [67].

Of course, for those interested in food, there are many ways to prepare, cook, and serve smelt. The way smelt is cooked has not changed considerably in the last hundred years. Here is a great potential for developing smelt as a modern food suitable for both restaurants (including food trucks) and conscious households. There should be a future for smelt when consumers are asking for tasty,

fresh, sustainable, and locally produced food. With its very particular scent and taste, smelt would fit very well into the concept of Nordic Cuisine. Traditional smelt pancake is a dish that qualifies and has terroir. It is a dish made of raw material which could be claimed to have connection with the provinces where smelt occur [56]. The smelt roe makes excellent caviar, but is not used in Sweden at all. Smelt is a hidden delicacy waiting for food ecological entrepreneurs, skilled chefs and local tourist industry to act. Similarly, many other freshwater fish species—clean, rich in flavor and safe—are waiting to be exploited. It is not only for gourmet restaurants to discover this richness [68, 69]. Simpler eateries, food trucks, and other eating places could also use it. The populations of smelt in the great lakes of Sweden are big enough for sustainable harvesting [70]. In Norway, it has been used more as bait and animal feed than for human food [71]. Smelt and closely related species are still eaten eagerly during spring-time in East Asia, especially in Japan and Korea (*Hypomesus nipponensis*, *Sprinchus lanceolatus*), Russia, Germany (*Osmerus eperlanus*), and North America (*Osmerus mordax*, *Thaleichthys pacificus*) [9, 72]. Why would people in Sweden not do so in the future as well?

## Conclusions

Nowadays, only a handful of freshwater fish species are still commercially sought after in Sweden. With the wave of global food marketing and improved transportation, local knowledge and use of such species has faded. Consumption of marine fish, farmed species (especially salmon, *Salmo salar* L.), and highly industrialized and processed seafood have taken over the market. Subsistence fishing in lakes and rivers is now rare and has in general been replaced by recreational fishing. Fresh-water fish constitute an excellent food. Swedish lakes and rivers are in general clean and should therefore be used as safe food to a greater extent than now.

However, fishing for European smelt has survived into the twenty-first century in a few places in Värmland, Västmanland, and until recently in Västergötland. It seems to have vanished entirely in Stockholm and Uppsala. Smelt fishing has dimensions which are not only culinary, but social and cultural as well. It has some importance for modern regional identity. Värmland, especially around Klarälven, remains the stronghold of smelt fishing in Sweden today, and it is the only region where local fishing for household consumption continues with some vivacity. In 1994, smelt was proclaimed the “provincial fish” of Värmland. However, its survival as a regional seasonal food and local gastronomical heritage of Värmland is dependent on appropriate initiatives from fishery experts, restaurateurs, and the tourist sector.

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## Authors' contributions

IS was responsible for study design. All authors participated in the field works and data collection, and data analysis. Historical data was gathered by IS. The three authors wrote the manuscript. All authors read and approved the final manuscript.

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