Aquatic Genetic Resources (AqGR) in The Netherlands

Country report

Wout Abbink and Sipke Joost Hiemstra

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Dit rapport is gebaseerd op de ingestuurde vragenlijst over de Aquatische Genetische Bronnen in Nederland, die werd opgesteld op verzoek van de FAO als input voor de *State of the World's Aquatic Genetic Resources for Food and Agriculture*. Het rapport beschrijft de huidige staat van de Nederlandse aquacultuursector en de belangrijkste factoren die van invloed zijn op diversiteit aan soorten in de aquacultuur en de wilde familieleden van deze soorten in Nederland.

This report is based on the submitted questionnaire on Aquatic Genetic Resources in the Netherlands, which was prepared on request of the FAO as input for the State of the World's Aquatic Genetic Resources for Food and Agriculture. The report describes the state of the Dutch aquaculture sector and the most important factors influencing species diversity in the sector and their wild relatives in the Netherlands.

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Contents

Preface

The FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) requested countries to submit country reports for the Preparation of the First State of the World's Aquatic Genetic Resources for Food and Agriculture (Link).

The CGRFA noted that the preparation of a country-driven State of the World's Aquatic Genetic Resources for Food and Agriculture would provide countries with opportunities for assessing the status of their aquatic genetic resources for food and agriculture and enhancing the contributions of aquatic genetic resources to food security and rural development. Additionally, the process of producing Country Reports would assist countries in determining their needs and priorities for the conservation and sustainable use of aquatic genetic resources for food and agriculture, and help raise awareness among policy-makers.

On behalf of the Ministry of Economic Affairs, the Centre for Genetic Resources, the Netherlands (CGN) of Wageningen University & Research (WUR) developed the Dutch country report in close collaboration with the Ministry and relevant stakeholders. The answers to the questionnaire, which was provided by FAO, were submitted to FAO by the end of June 2017. The answers were later used to write this report, which summarizes the submission of the Netherlands to FAO.

The Dutch country report on aquatic genetic resources is relevant for improving the conservation, sustainable use and development of aquatic genetic resources at national and regional level. Threats, information gaps and needs for the strengthening of the national capacity to effectively manage aquatic genetic resources were identified. This will further help the development of national policies, legislation, research and development, education, training and extension concerning the conservation, sustainable use and development of aquatic genetic resources. Moreover, the report will contribute to raising public awareness about the importance of aquatic genetic resources and aquaculture.

Summary

This report describes developments in aquaculture in the Netherlands and particularly highlights the state of conservation and use of aquatic genetic resources (AqGR). The report is largely based on the contents of a survey of the Food and Agricultural Organisation of the United Nations (FAO) for the Preparation of the First State of the World's Aquatic Genetic Resources for Food and Agriculture.

The aquaculture sector in The Netherlands is a relatively small and diverse sector. The sector comprises the production of mainly shellfish and fish, as well as pilot companies that produce seaweeds. Besides the relatively small aquaculture production sector, there are key multinational companies in the supply chain (breeding, feed, system design) and top educational and research institutions that cover all aspects of aquaculture.

The producers of fish and shellfish are all SME's. Production of shellfish is located mainly in the Southwest of The Netherlands, and uses the Wadden Sea for the production and collection of mussel seed. These seeds are further grown to market-size shellfish in the South Western Province of Zeeland.

Fish production systems are exclusively Recirculating Aquaculture Systems (RAS), and therefore companies are not bound to (natural) water bodies. This also means that there is no direct contact and exchange between the cultured fish and their wild relatives.

Total production levels of shellfish (mussel and oyster) are more or less stable (around 40-50,000 tons per year), whereas the production of fish has declined in recent years, from 12,000 tons in 2008 to around 6,000 tons in 2016. European eel and two species of catfish (African catfish and the hybrid of Vundu catfish and African catfish) are the most important fish species.

As for the wild relatives of the species used in aquaculture, only the shellfish (mussel and oyster), eel, turbot and pike perch live in the wild in The Netherlands. Other species, such as the catfish species, are exotic and do not survive in the Dutch climate. In addition, some species that occur wild in The Netherlands are being produced in other European countries, but not in The Netherlands, such as carp.

Because of the limited production volumes, the small size of the companies and the fragmentation of the aquaculture sector, no operational breeding programs exist in Dutch aquaculture. However, two promising scientific programs designing breeding programs for oyster and yellowtail kingfish, may become operational in the coming years. For all other fish or shellfish species, production is based on domestication or positive mass selection at company level.

As a member state of the EU, The Netherlands is subject to implementation of European laws and regulations, which also apply to the surrounding countries, including on the protection of main water bodies and fish habitats, and on trade of live animals.

The Dutch National Strategic Plan for Aquaculture developed in the framework of the EU Common Fisheries Policy states that the best chances for the Dutch sector are offered by the production of exclusive and/or niche products, and the exploitation of top class products and knowledge. For production in RAS specifically, a high level of technical know-how is needed, and substantial investment is necessary to start a competitive company. This makes it challenging to start a fish farm, or to switch from other livestock or agriculture sectors to the production of fish.

Stakeholders involved in aquaculture include companies, NGO's in the field of animal welfare, retailers, environment and organic production, and educational and research institutions. Policy makers are in

close contact with the stakeholders in order to maintain legitimacy of the National Strategic Plan and policies.

In spite of the small size of the aquaculture production sector, The Netherlands has some major companies in the aquaculture supply chain for the production of fish feeds, genetic material and the design and construction of aquaculture systems. In addition, there are some top research institutions and educational organizations that are strongly involved in all aspects of aquaculture in The Netherlands, as well as in collaborative programs in developing countries to improve or to develop an aquaculture sector.

The high level of knowledge available and the collaboration in many international projects, ensure an important role for The Netherlands in global aquaculture, in spite of the small size of the aquaculture production sector in the Netherlands.

1 An overview of the Dutch aquaculture sector

This chapter refers to chapter 1 of the questionnaire: The Use and Exchange of Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction.

The Netherlands has three large rivers and borders the North Sea. A large part of the country is basically a delta, with large sections, approximately 30% of the area of the country, being below sea level. This has resulted in an extremely advanced level of water management to protect the land from being flooded by the rivers and the sea, and to adequately regulate the draining of rainfall from the land to small ditches, main water bodies and into the sea.

The aquaculture production sector in The Netherlands is small, but diverse. The production sector has two main components; shellfish and fish production. In addition, there are initiatives to produce seaweeds and micro algae. In total, there are around 100 companies in the aquaculture production sector.

Total production levels of shellfish (mussel and oyster) are more or less stable (around 40-50,000 tons per year), whereas the production of fish has declined in recent years, from 12,000 tons in 2008 to around 6,000 tons in 2016. European eel and two species of catfish (African catfish and the hybrid of Vundu catfish and African catfish) are the most important fish species, while the production of turbot and pike perch is marginal. Initiatives to introduce new species in aquaculture come and go. Recently a sturgeon farm was realized, and production of yellowtail kingfish has started in 2017.

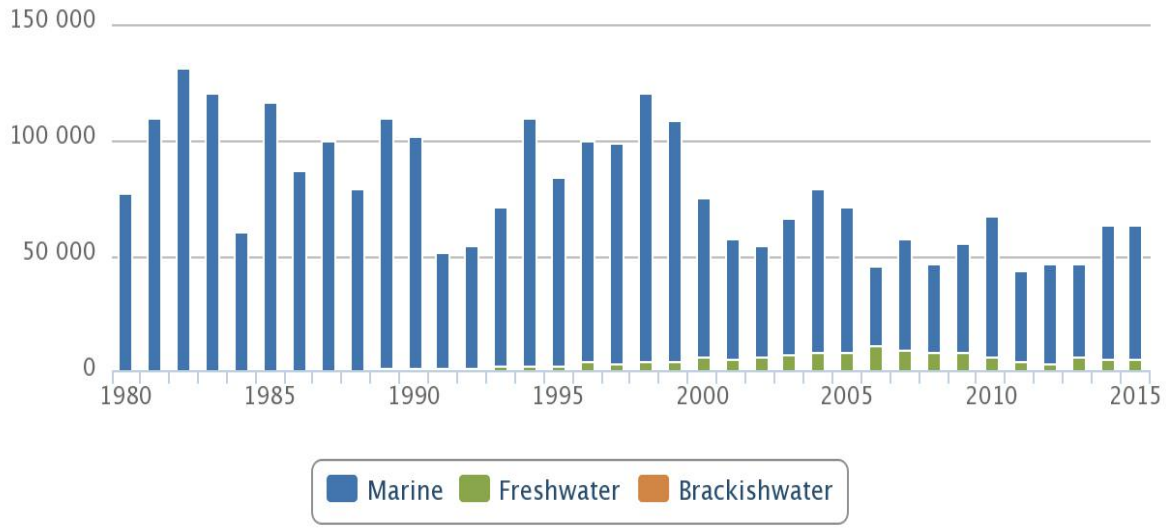
Fish production systems are exclusively Recirculating Aquaculture Systems (RAS), and therefore companies are not bound to (natural) water bodies. This also means that there is no direct contact and exchange between the cultured fish and their wild relatives.

Global seafood production (fisheries and aquaculture) is expected keep increasing in the coming years, but this growth is expected to come mainly from aquaculture, with global fisheries production being expected to remain constant (FAO). The European aquaculture production is marginal on a global scale, and future growth will mostly be realised outside the EU as well. The increase in global aquaculture production has consequences for production costs, with feed ingredients, availability of water and locations becoming more scarce. This makes efficient production of fish a major challenge.

The Dutch sector is too small to contribute much to the global increase in aquaculture production. The Dutch sector mainly produces for domestic (niche) markets, and for the export to surrounding countries (Germany, Belgium, France) and other EU countries, with limited possibilities for substantial growth.

The National Strategic Plan Aquaculture sets out the priorities for sustainable development of the aquaculture sector in The Netherlands for the coming years in relation to the European Maritime Fisheries Fund. The document describes the global trends and developments in aquaculture, describes the perspectives of the Dutch Aquaculture sector, sets out specific market chances for Dutch production companies in the aquaculture sector, and provides a SWOT analysis (European maritime and fisheries fund and National Strategic Plan Aquaculture).

Aquaculture production by culture environment the Kingdom of the Netherlands (tonnes)
Source: FAO FishStat



The species that are currently being produced on a commercial scale in the Netherlands are:

Shellfish:

- *Crassostrea gigas* (Japanese oyster)
- *Mytilus edulis* (common mussel)
- *Ostrea edulis* (European flat oyster)
- *Venerupis corrugate* (pullet carpet shell)

Oysters

Mussels

Fish:

- *Anguilla anguilla* (European eel)
- *Clarias gariepinus* (African catfish)
- *Clarias gariepinus* x *Heterobranchus longifilis* (Claresse catfish)
- *Sander lucioperca* (pike perch)
- *Scopthalmus maximus* (Psetta maxima) (turbot)
- *Seriola lalandi* (yellowtail kingfish / amberjack)
- *Tilapias nei* (tilapia)
- *Acipenseridae* (sturgeon)
- *Oncorhynchus mykiss* (rainbow trout)

European eel

African catfish

Seaweeds:

- *Saccharina latissima* (brown algae)
- *Ulva lactuca* (sea lettuce)

Regularly, there are initiatives to start the commercial production of a 'new' aquatic species in The Netherlands. Of these initiatives, the production of *Solea solea* (common sole) has the potential to become a commercially important species. Key issues to be resolved are growth, health, nutrition, and competition from commercial fisheries for this species.

Genetic data of the farmed species are not freely available, but for some species companies will have these data for their own use.

For production of larvae and fry, either wild seed (eel), wild broodstock (pike perch, shellfish), or domestication and mass selection (catfish, turbot, pike perch) is practiced. For two species (oyster and yellowtail kingfish), breeding programs are currently being designed in public-private research projects.

Three of the farmed fish species (eel, pike perch and turbot) and all of the shellfish and seaweeds have wild relatives living in The Netherlands. In addition, there are species that occur wild in The Netherlands and are farmed in other European countries, but not in The Netherlands, such as carp and pike.

2 Drivers and trends in Dutch aquaculture

This chapter refers to chapter 2 of the questionnaire: Drivers and Trends in Aquaculture: Consequences for Aquatic Genetic Resources within National Jurisdiction.

The aquaculture production sector for eel, oyster and mussel rely on specimens caught wild, or has its culture processes partly in natural waters. The largest part of the produced aquatic species are exported, and most consumed aquatic species are imported. In addition, it is important to note here that for fish, because of the production in Recirculating Aquaculture Systems (RAS), no genetic pollution between animals from production sites and wild relatives of the same species occurs. By using this form of production, the use of water and energy is limited, and culture conditions can be controlled to optimise conditions for the fish. However, there is a high level of technological know-how needed, and production volumes are relatively low compared to cage culture.

The fish products that are being produced are mostly sold to the foodservice segment, or to surrounding countries. Often, the products are sold to retailers, sometimes directly to restaurants. Possibilities to supply the deep frozen segment of the market are limited, due to imports of products such as salmon or pangasius and to the small volume and discontinue production.
The shellfish are mostly sold to the surrounding countries in the foodservice and retail segment. Mussels are being sold to retailers as a fresh and conserved product. Oysters are mostly sold to the foodservice market.

In the past, wild relatives of farmed aquatic species in The Netherlands were negatively impacted by several drivers that have changed aquatic ecosystems, such as the pollution of waters, the introduction of invasive species, and capture fisheries. Nowadays, wild relatives of farmed aquatic species are positively impacted by governance (ability of government, industry and the public to work together in managing resources) and by changes in values and ethics of consumers. This has resulted in initiatives to incorporate fish protection measures in water management, such as the eel recovery plan (see chapter 3), the construction of fish passes in infrastructural barriers in waterways, and quota for glass eel. In addition, the perception, values and ethics of consumers for fish produced in aquaculture are improving due to improving sustainability of the sector, and the public image of shellfish production is positive.

Yellowtail kingfish

3 *In situ* and *ex situ* conservation of Aquatic Genetic Resources

This chapter refers to chapters 3 and 4 of the questionnaire: *In Situ* and *Ex Situ* conservation of Aquatic Genetic Resources of farmed aquatic species and their wild relatives within national jurisdiction.

Responsible and well managed aquaculture contributes to *in situ* conservation of the AqGR of farmed aquatic species and their wild relatives. For the endemic species that are farmed in The Netherlands, this is true for eel, mussels and oysters, whereas for the endemic turbot and pike perch, the aquaculture has no effect on wild populations, but these species do profit from more general protection regulations of the environment.

For example, the control plan for eel aims to allow 40% of the adult eels in Dutch inland waters to be able to reach the sea. This has to be achieved by the reduction of commercial and recreational fisheries for eel, measures to make the habitats more eel-friendly (e.g. at hydro-electric turbines) and to realize reproduction and breeding for aquaculture purposes. This recovery plan is based on Regulation (EC) 1100/2007 establishing measures for the recovery of the stock of European eel.

For mussels and oysters, strict regulations exist concerning the catch of seed from the wild. Healthy populations of mussels and oysters in (protected) wild areas are vital for a healthy industry.

The importance of *in situ* conservation of AqGR of farmed aquatic species and their wild relatives in The Netherlands for the future of the aquaculture sector lies in the preservation of aquatic genetic diversity, and the maintenance of good strains for aquaculture production and future breed improvement in aquaculture.

There are many aquatic protected areas in The Netherlands that are contributing to the *in situ* conservation of AqGR of wild relatives of farmed aquatic species. The Wadden Sea and the Eastern Schelde Estuary are the main sea water areas apart from The North Sea. The IJsselmeer, the main rivers (Rhine, Waal, Maas (Meuse), IJssel) are the main freshwater bodies. In addition, there are many lakes, canals and smaller rivers and streams that are protected and contribute to the *in situ* conservation of AqGR in The Netherlands.

In vitro collections and gene banks of gametes, embryos and tissues of farmed aquatic species and their wild relatives include yellowtail, eel, tilapia, catfish and oyster. These are mainly used for selective breeding programs and reproduction purposes by companies or research institutes.

For *ex situ* conservation of AqGR of farmed aquatic species and their wild relatives, preservation of aquatic genetic diversity, maintenance of good strains for aquaculture production, and future breed improvement in aquaculture are important considerations.

4 Research, education and networking

This chapter refers to chapter 7 of the questionnaire: Research, education, training and extension on Aquatic Genetic Resources within national jurisdiction: coordination, networking and information

The national research programme of The Netherlands supports the conservation, sustainable use and development of AqGR of farmed aquatic species and their wild relatives. Current key research programs target the reproduction of European eel, the ecology of shellfish, the reproduction and production of shellfish, and the realisation of breeding programs for yellowtail kingfish, turbot and oysters. In addition, there are research programs on European organic aquaculture and the optimization of the culture conditions of fish and shellfish (systems, feed, physiology, health, welfare), and pilot studies to commercialise the culture of seaweeds.

Wageningen University and Research (WUR) is the main organisation for aquaculture research, including AqGR, in The Netherlands. WUR is involved in all aspects of research related to the conservation, sustainable use and development of AqGR of farmed aquatic species and their wild relatives, either via research and education, or via contract research.

Biofilters at CARUS, the facilities for fish research of Wageningen University and Research

Other education and research institutes include several Universities that have a department on aquatic ecology, and several applied research educational institutions, of which the HZ University of Applied Sciences in Zeeland is strongly involved in applied research on shellfish and ecology of the Delta areas in The Netherlands.

Capacity strengthening, needed to improve national research in support of the conservation, sustainable use and development of AqGR of farmed aquatic species and their wild relatives, can be achieved by improving the basic knowledge on AqGR, the capacities for characterization and monitoring of AqGR, and the capacities for genetic improvement and genetic resource management of AqGR.

The National Strategic Plan Aquaculture sets out the priorities for aquaculture for the coming years in relation to EMFF (see also chapter 1) (European maritime and fisheries fund) and (National Strategic Plan Aquaculture).

In addition, several organisations in The Netherlands provide information about the conservation, sustainable use and development of AqGR of farmed aquatic species and their wild relatives. DUPAN (Foundation for sustainable production of European eel) is strongly involved in a research program to

reproduce eel in captivity, and also in protecting and improving the habitats and natural population of eel. Other organisations include Sportvisserij Nederland (organisation for recreational fishing), Dutch Aquaculture Experts, NeVeVi (Dutch association of fish farmers), NGvA (Dutch association for Aquaculture), Nederlandse Vissersbond (Dutch organisation of Fishers), and the Vereniging Producentenorganisatie van de Nederlandse mosselcultuur (Dutch organisation for the production of mussels).

Possibilities for capacity strengthening to improve national information systems to support the conservation, sustainable use and development of AqGR can be found in improving access to the information that is available, which is now fragmented and not always easily accessible. A complicating issue is that production information is not always reliable and varies from year to year.

5 National policy, legislation and international collaboration

This chapter refers to chapters 5, 6 and 8 of the questionnaire: (5) Stakeholders with interests in Aquatic Genetic Resources of farmed aquatic Species and their wild relatives within national jurisdiction; (6) National policies and legislation for Aquatic Genetic Resources of farmed aquatic species and their wild relatives within national jurisdiction and (8) International collaboration on aquatic genetic resources of farmed aquatic species and their wild relatives.

Several EU and national legislations and policies address AqGR of farmed species and their wild relatives. EC 1100/2007 (measurements for recovery of European eel), EC 708/2007 (concerning the use of alien and locally absent species in aquaculture), EC 88/2006 (animal health requirements for aquaculture animals and products thereof), Natura 2000 (on the production of mussel seed) and EC 60/2000 (the Water Framework Directive, on the classification of shellfish production areas) are all EU regulations that impact the AqGR in The Netherlands directly. In addition, Dutch laws, such as the Animals Act, the Nature Protection Act and the Fisheries Act all influence the AqGR in The Netherlands, as do veterinary regulations and health and bio-security regulations.

Due to the small scale of the aquaculture sector in The Netherlands, there is only limited specific legislation for aquaculture. More general laws concerning livestock, animal protection or environmental laws also cover the aquaculture sector:

- Natura 2000 is a network of nature protection areas in the territory of the European Union. It is made up of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated respectively under the Habitats Directive and Birds Directive. The network includes both terrestrial and marine sites (Marine Protected Areas (MPAs)). The protection of habitats and fauna in these habitats include the aquatic genetic resources present. Management plans should ensure the conservation of the aquatic habitats and fish species (natura2000).

The Water Framework Directive (Kaderrichtlijn water, EC 60/2000) deals with the water quality within the European Union. Since many water bodies cross borders, the protection and improvement of the water quality is a multi-national task (water framework directive).

- The EU marine strategy framework directive (MSFD) aims to achieve Good Environmental Status (GES) of EU marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. It is the first EU legislative instrument related to the protection of marine biodiversity, and it contains the explicit regulatory objective that "biodiversity is maintained by 2020", as the cornerstone for achieving GES. The Directive enshrines in a legislative framework the ecosystem approach to the management of human activities having an impact on the marine environment, integrating the concepts of environmental protection and sustainable use (marine strategy framework directive).

The international, regional or sub-regional agreements in The Netherlands that cover AqGRs of farmed species and their wild relatives include the United Nations Convention on the Law of the Sea (UNCLOS), the Convention of Biological Diversity (CBD), International associations for the protection of rivers, the OSPAR commission -Oslo/Paris convention (for the Protection of the Marine Environment of the North-East Atlantic)- and the Nagoya Protocol. These agreements help to protect AqGR, but Priorities for further improvement of the conservation and sustainable use of AqGR of farmed aquatic species and their wild relatives on an international level are improved information technology and database management, improved basic knowledge on AqGR, improved capacities for characterization and monitoring of AqGR, improved capacities for genetic improvement, improved capacities for conservation of AqGR, and improved access to and distribution of AqGR.

In addition, The Netherlands participates in various international networks which support the conservation, sustainable use and development of AqGR:

- The International Commission for the Protection of the Rhine, the International commission for the Maas (Meuse), and the International commission for the protection of the Schelde. For the benefit of the rivers and of all waters running into the rivers, these international commissions successfully co-operate in order to harmonize the many interests of use and protection of the rivers. Focal points of work are sustainable development of the main water bodies, its alluvial areas and the good state of all waters in the watershed. The cooperation along the Rhine was important for the establishment of the Water Framework Directive and the Floods Management directive of the EU (International commission for the protection of the Rhine).

- Regional Fisheries Management Organisations (RFMOs) are international organizations formed by countries with fishing interests in an area. Some of them manage all the fish stocks found in a specific area, while others focus on particular highly migratory species, notably tuna, throughout vast geographical areas. The organizations are open both to countries in the region ("coastal states") and countries with interests in the fisheries concerned. While some RFOs have a purely advisory role, most have management powers to set catch and fishing effort limits, technical measures, and control obligations. The EU, represented by the Commission, plays an active role in six tuna organizations and 11 non-tuna organizations.

- The mission of the European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC) is to promote the long-term sustainable development, utilization, conservation, restoration and responsible management of European inland fisheries and aquaculture, consistent with the objectives and principles of the FAO Code of Conduct for Responsible Fisheries and other relevant international instruments, and to support sustainable economic, social, and recreational activities towards these goals (European inland fisheries and aquaculture advisory commission (EIFAAC)).

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Abbink, W., and Hiemstra, SJ., 2017. Aquatic Genetic Resources (AqGR) in The Netherlands; State of the World's Aquatic Genetic Resources for Food and Agriculture. Submitted to FAO 30 June 2017.

European inland fisheries and aquaculture advisory commission (EIFAAC)

European maritime and fisheries fund

International commission for the protection of the Rhine

List of production animals for aquaculture in the Netherlands

Marine strategy framework directive

National Strategic Plan Aquaculture

Natura2000

Questionnaire on Aquatic Genetic Resources in the Netherlands for the FAO

Water framework directive

Annex 1 List of animal species approved for aquaculture in The Netherlands

The following animal species are approved for aquaculture in The Netherlands (lijst productiedieren); list of production animals for aquaculture in The Netherlands:

Fish species

Osmerus eperlanus	(European smelt; spiering)
Salmo trutta fario	(brown trout; beekforel)
Salmo trutta trutta	(sea trout; zeeforel)
Oncorhynchus mykiss	(rainbow trout; regenboogforel)
Salmo salar	(Atlantic salmon; Atlantische zalm)
Anguilla anguilla	(European eel; Europese aal)
Clarias gariepinus	(African catfish; Afrikaanse meerval)
Silurus glanis	(Wels catfish; Europese meerval)
Perca fluviatilis	(European perch; Europese baars)
Stizostedion lucioperca	(zander (pike perch); snoekbaars)
Scophthalmus maximus	(turbot; tarbot)
Dicentrarchus labrax	(European bass; Europese zeebaars)
Pagellus bogaraveo	(blackspot seabream; rode zeebrasem)
Esox lucius	(Northern pike; snoek)
Sparus aurata	(gilthead seabream; goudbrasem)
Oreochromis niloticus	(Nile tilapia; Nijltilapia)
Oreochromis mossambicus	(Mozambique Tilapia)
Hoplosternum litterale	(a catfish species, no English or Dutch name found)
Acipenser spp.	(sturgeons, steuren)
Solea spp.	(sole, tong)
Huso Huso	(Beluga sturgeon, Beluga steur)
Seriola lalandi	(yellowtail kingfish) will be added to this list

Crustaceans

litopenaeus vannamei	(whiteleg shrimp, Pacific white shrimp, king prawn; garnaal)
Homarus gammarus	(European lobster; Europese zeekreeft)
Homarus americanus	(American lobster; Amerikaanse zeekreeft)
Astracus leptodactylus	(Danube crayfish (Turkish crayfish); Turkse zoetwaterkreeft)
Orconectus limosus	(spiny-cheek crayfish; Amerikaanse rivierkreeft)
Procambarus clarkii	(Red swamp crayfish; Louisiana- of Rode rivierkreeft)
Palinurus spec.	(spiny lobsters; langoesten)
Eriocheir sinensis	(Chinese mitten crab; Chinese wolhandkrab)
Cancer pagurus	(brown crab; Noordzeekrab)
Cladocera	(water flea; watervlo)
Copepoda	(Copepod species; Roeipootkreeftje)
Balanus spec.	(Barnacle species; zeepok)
Artemia salina	(brine shrimp species; pekelkreeftje)
Artemia franciscana	(brine shrimp species; zoutkreeftje)
Artemia gracilis	(brine shrimp species; Amerikaans zoutkreeftje)
Daphnia pulex	(water flea; watervlo)
Moina macropoda	(water flea species; Japanse watervlo)

Bivalvia:

Mytilus edulis	(blue mussel; gewone mossel)
Ostrea edulis	(European flat oyster; gewone oester)
Crassostrea gigas	(Pacific oyster; Japanse oester)
Crassostrea angulata	(Portuguese oyster; Portugese oester)
Crassostrea virginica	(Eastern oyster; Amerikaanse oester)
Cerastoderma edule	(common cockle; Kokkel)
Pecten maximus	(great scallop; St. Jacobschelp)
Veneridae	(Venus clams; venusschelpen)
Glycimeris glycimeris	(dog cockle; gewone marmerschelp)
Donax trunculus	(wedge-shell; stomp zaagje)
Donax vittatus	(banded wedge shell; zaagje)
Spisula subtrunculata	(subtruncate surf clam; halfgeknotte strandschelp)
Arenicola marina	(lugworm; Zeepier

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Wageningen University & Research
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The mission of Wageningen University and Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 5,000 employees and 10,000 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.

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