



INTRODUCTION

The Czech traditional aquaculture is a reasonably stable branch, respected by the public as a sphere that enjoys a growing popularity and attention. Let us introduce to you a small book about aquaculture, which provides information and brings to you awareness of our production aquaculture. The purpose of the book is to serve as the basic reference material characterizing all important properties and features of this branch. Versions in the English and German languages are available for foreigners. The electronic version can be downloaded from the website of the Czech Fish Farmers Association www.cz-ryby.cz. We believe that requirements of all readers interested in finding essential and current information will be satisfied.

However, the Czech aquaculture faces rather a difficult period, with environmental pressures on the increase directed at imposing of restrictions on fish farming and sustaining the quality of the environment. For many companies, requirements for farming stipulated by nature conservation bodies are liquidating, and these companies today weigh up the pros and cons of being active in this difficult business activity. Piscivorous predators, which are protected and decimate stocks of small fish, in particular fish for hatching, present yet another large problem for production aquaculture; for these losses, follow-up farming activities become considerably more expensive.

Needless to say, the interest in freshwater fish is on a slight increase, a fact which we are pleased about and which motivates us in our, though difficult, work. We hope that we will be able to overcome these difficulties and that aquaculture will remain unchanged in the form we know it today and in the form which was passed to us by our ancestors.

Do not forget: If there are no fishermen, there will be no ponds!!! This would cause an irretrievable damage.



*Harvesting
of pond Rožmberk*



HISTORY, SEVERAL HUNDRED YEARS TRADITION OF AQUACULTURE

Czech fishpond cultivation is first mentioned in the 11th century, which saw the construction of first ponds, chiefly attached to monasteries, for which fish farming was the most profitable agricultural activity. The dawn of the golden age of Czech fishpond cultivation, dating back to the 14th and 15th centuries, may be connected with the formation of a certain organization unit - fishermen's guild. Fishermen grouped in guilds established their own rules to follow, laying thus foundations for today's aquaculture standards, fishing methods and the aquaculture law as such. However, the greatest boom came about in the 16th century, when, beside nobility, towns and the Church participated in the construction of fishponds. This period is also termed as the "golden age of fishpond cultivation". The total surface of fishponds reached as many as 180,000 hectares. The fast process of expansion was stopped by the Thirty-Year War in the first half of the 17th century, bringing with it a decline in fishpond cultivation. In the following centuries, agriculture was another factor that contributed to the reduction of fishpond surfaces by the staggering 50%. Farming on fields had continuously extended and kept on imposing larger and larger demands on arable land, which, logically, resulted in ponds that were transformed or even defunct - mainly those in arable regions in the Elbe Valley [Polabí] and South Moravia. The 19th century is considered the renaissance of the Czech fishpond cultivation.

The aforesaid implies that aquaculture has enjoyed a long tradition in the Czech lands. This stipulation does not only apply to aquaculture in the commercial sense or aquaculture practised as a means of one's subsistence. Sportsmen with fishing rods could be seen as early as the 19th century. Sports fishing was brought to this country probably from England, where it was customary that fish could be caught solely for the enjoyment that fishing itself could bring.

Long tradition of Czech aquaculture





Harvest begins



*Fishermen in
a leader outfit
holding a carp
catch (1906)*

2



THE MAIN SPECIES OF FISH FARMED IN THE CZECH REPUBLIC

More than 60 species of fish live in waters of the Czech Republic. Most of them are not used for farming. However, in places of their occurrence, these species of fish play a crucial biological, indication or other roles or are in the spotlight of sports fishing, etc. Out of the whole spectrum of fish, approximately as little as a quarter of all existing species is important in terms of breeding and farming. Such species of fish include:



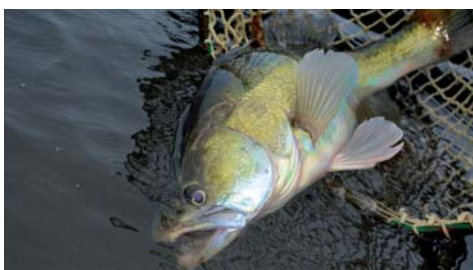
Common carp

The carp is the most widespread freshwater type of fish in the world. It reaches its market size at the age of 3 or 4 years. The carp is supplied to the market in 4 weight categories. Its quality meat is a source of both easily digestible proteins and valued omega-3 fat acids, which have beneficial effects in the prevention against civilization diseases. Carp is suitable for all possible methods of preparation in the kitchen; frying and roasting are the most frequent way of preparing carp.



Tench

The annual production of tench in the Czech Republic amounts to 180 tons, and this fish, in live form, is available in our shops chiefly after fish hauls in spring. Tench is often reared together with carp in a polyculture system; there exists a problem in the mutual food competition of both types of fish. Tench is most often found near the bottom of the watercourse and feeds on smaller and coarse animals. It has a preference for plankton and especially benthic food, which can be done for high stocks of carp in main fishponds only with difficulty, therefore tench is stocked in ponds with fingerling carp ($K_1 - K_2 + L_2 - L_4$). Tench can tolerate adverse environments (O_2 deficiency). Meat of market tench is soft, fatter, but very tasty.



Predatory species of fish

Pike perch

The pike perch is one of the two species of zander to be found in the Czech Republic. The Pike perch ranks among "pure-farmed" species of fish. Pike perch is esteemed for the high quality of its meat, and becomes a dish much sought after in hotels and restaurants. For its tasty meat, the Pike perch is considered an exclusive freshwater fish in gastronomy. Its meat is white, firm and delicate and is popular since it has few bones.



Wels catfish

The catfish is one of the most often farmed predatory species of fish. The optimal condition for farming the catfish is water temperature of at least 22 to 30°C. It grows relatively fast, reaching the size of consumption of 1 to 5 kg in the first or second year of life if farmed in warmed water. With its qualities, this fish is able to utilize warm water, feed provided and the farming capacity of pools to the utmost extent. Its meat is fatter, but very delicate and has no inter-muscular bones.

Common pike

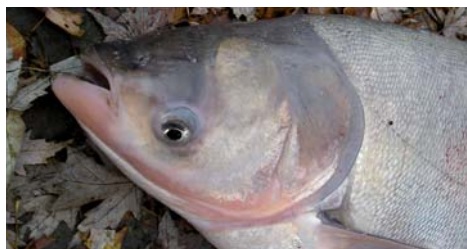
The pike is a medium-demanding species, which can tolerate eutrophic water with a higher temperature. However, the fish needs a rugged terrain (barriers, flooded vegetation). It first feeds on zooplankton, then, after reaching the length of 30 mm, it becomes fully predatory. The pike grows rather fast, and its weight reaches 1.5 kg in two years provided that the pike can feed on an adequate quantity of food species of fish, which even in winter, the pike eats under the ice. Its meat is tender, with no bones and it is rather dry. The live fish as well as refrigerated products are available from October to April. Frozen pike products can be bought the whole year round. The live market pike is sold at the weight of 1 to 3 kg.



Herbivore species of fish

Grass carp and silver/bighead carp

Their acclimation took place in the middle of the 1960s. While the diet of the grass carp focuses on water vegetation, the silver carp chiefly feeds on phytoplankton, which makes 90% of the food it consumes. For the bighead carp, the proportion of food, i.e. zooplankton and phytoplankton, is 1:1. The stocks of grass carp are used with success to reduce excessive growth of water vegetation. This fish is usually farmed in polyculture with carp. The ideal consumption size of the grass carp is 1.5 to 2.5 kg. Its meat is very delicate, light, dietetic and contains little bones. It is sold in form of a live market fish or as a processed product (refrigerated, frozen and smoked). Meat of the silver carp is fatter and is suitable for production of smoked portions.



Salmonid species of fish

Rainbow trout and brook trout

These two are very popular types of salmonid fish. Currently, the two species belong to the most frequently sold fish on the domestic market. The rainbow trout is now found more often on menus of restaurants in this country in comparison with the past. The fresh trout, kept on ice, will make an ideal ingredient for cooking. Its meat is white, with darker rims; it is very fine and delicate and the meat is easily separated from bones.



The rainbow trout is suitable for all ways of cooking preparations, including grilling. The live rainbow trout is sold in portions of 20 dkg or more. The traditional form of preparation is smoking, usually done in the fish processing plant. Whole fish or portions in the shape of a horseshoe are smoked.

The brook trout has a good yield of meat and belongs to valued fish for the delicate taste of its meat. The density of its stocks must be lower than that of rainbow trout. It can tolerate acidic environments, but is prone to getting mold.



3



PRODUCTION OF FISH AND FISH MARKET IN THE CZECH REPUBLIC

Production fish farming is represented mainly by fishpond cultivation activities and it has been a symbol of stability and success of agricultural entrepreneurship for centuries.

The fishpond surface of almost 43,000 hectares is used for fish farming. In the last years, the annual production of market fish has reached as many as 21,000 tons.

The key fish of the Czech production fish farming has traditionally been the carp, which is considered a fish of high quality both on the foreign and the domestic markets. The annual production of carp has regularly amounted to 18,000 tons, followed after a distance by herbivore, salmonid and other species of fish. A half of this production finds its way to the domestic market, less than the other half is exported abroad, chiefly to Poland, Germany, France, Slovakia, Austria and Hungary. Fish export is an important economic component of the Czech production fish farming. Export of live fish annually stands at 43-46% of the total sale of market fish, and less than 60% of fish (44-47% of live fish and 10% of processed fish in live weight) is sold on the domestic market. Live fish prevail both in the export and on the domestic market (based on the tradition and the low price in comparison with processed fish). However, the volume of processed fish is today on a slight increase, reaching approximately 20% of sold fish, which represents 2,000 tons. A quarter of all live and processed freshwater consumed in this country is sold in shopping chains.

Composition of market fish by species produced in fish farming in Czech republic during 2010-2014 (t)

Fish by species	2010	2011	2012	2013	2014
Carp	17 746	18 198	17 972	16 809	17 833
Salmonid fish	776	738	752	382	392
Tench, whitefish	295	241	184	165	163
Herbivore fish	747	1 071	997	892	779
Predatory fish	218	218	227	238	202
Other	406	603	631	572	466
Total	20 420	21 010	20 763	19 358	20 135



Haulnets

**Evaluation of market fish in the Czech Republic during 2007-2014
in thousands of tons**

Year	Domestic sale of live fish	Processed fish (in live weight)	Export of live fish
2007	8,6	1,9	9,6
2008	8,4	1,7	9,0
2009	9,1	1,6	8,9
2010	9,5	1,8	9,1
2011	9,8	2,1	8,8
2012	9,5	2,3	8,6
2013	9,0	2,3	8,4
2014	8,5	2,1	8,4

4



FISH AS FOOD

In human diet, fish plays an irreplaceable role and its consumption in adequate amounts has a very positive effect on our health. A number of peoples in the world know and fully utilize benefits of consumption of fish. With the healthy life style now in the centre of attention of modern societies, fish begins to assume a prominent task in human diet.

Consumption of fish and health benefits of fish

Czech consumers are growing accustomed to eating fish not only on special occasions. The year-on-year consumption of freshwater fish in the Czech Republic slightly increased during the promotional campaign Ryba domácí, which was held from 2009 to 2011, and was co-financed from the European Fisheries Fund. The campaign informed Czech consumers not only of benefits of fish, but also of suitable ways of preparation of fish with the intention to place fish on menu as a most frequent meal. Needless to say, after the end of the campaign, the consumption of fish has stagnated and the average consumption of fish remains low: it stood at a mere 1.3 kg of freshwater fish of domestic origin per person per year in 2014. The permanent objective is to have this number gradually increased.

Easily digestible proteins in fish

Fish is easily digestible mainly on account of the favourable structure of proteins, which - unlike meat of warm-blooded animals - are of a simpler structure and contain an insignificant quantity of worse digestible ligament proteins. At the same time, fish has all essential amino acids, which puts it on par with meat of warm-blooded animals in this respect. The very low content of ligaments and the absence of elastin protein make fish practical for a fast and easy preparation in the kitchen.

Health beneficial fats

From the perspective of healthy diet, fish is valued for its low amount of fats; the fat content in carp most often reaches 5-7%. Considering this aspect, fish is suitable as a part of reduction diet plans. A special attention should be directed at the composition of fish fat since it contains valuable omega-3 polyunsaturated fat acids (and n-3 unsaturated fat acids) and boast a number of beneficial biological effects.

Fish consumption in the Czech Republic (kg/person/year)

Origin	2010	2011	2012	2013	2014
Consumption of freshwater fish of domestic origin (sale of live fish + processed fish + fish caught by fishing rod)	1,41	1,46	1,46	1,40	1,34
Export of freshwater fish to CZ (re-export deducted)	1,15	1,01	0,52	1,62	0,35
Export of sea fish (excl. seafood) to CZ (re-export deducted)	2,56	2,56	2,69	1,69	2,04
Total	5,12	5,03	4,67	3,71	3,73

Consumption of fish has positive effects on the cholesterol level in blood

The most significant risk factors of occurrence of cardiovascular diseases include a high cholesterol level in blood: excessive amounts of cholesterol may result in arteriosclerosis, when cholesterol builds up inside the arteries and this leads to a loss in their flexibility and reduction of transparency, when a total block of the blood's flow may result. Scientific studies prove that a regular consumption of fish has a positive effect on the cholesterol metabolism in blood.

Omega-3 fat acids in fish fat

Omega - polyunsaturated fat acids (and n-3 unsaturated fat acids, n-3 PUFA) are extremely valuable biologically active substances, whereas the most important natural source of these substances is fish fat of sea and freshwater fish. These substances were proven to feature plentiful beneficial effects on the human organism - a decrease in the cholesterol level in blood, anti-clotting effects and extension of arteries. A regular consumption of fish has therefore a preventive effect against cardiac and arterial diseases and other civilization diseases. The preventive effect is reached if 2 or 3 fish meals are eaten a week (200-g portion).

Several well-tested recipes for preparation of fish:

Carp á la Nové Hradý

First cut carp fillets gently to remove bone, but be careful not to break the skin, which holds meat together. Then mix garlic with salt and spread the mixture over individual portions - if necessary, add more salt. Leave to rest and then coat the portions in a mixture of medium-ground flour, cumin and sweet pepper. Fry in a higher layer of hot lard until golden (10-15 minutes, medium temperature, slowly).



*Carp á la
Nové Hradý*

5



IMPORTANCE OF PONDS IN NATURE

A pond is an artificially created water-management structure (water reservoir), whose primary purpose fish is farming. Fish farming and production of fish meat, i.e. food of high value for human consumption, has always been the essential purpose pursued by constructors of most ponds. Ponds are sometimes created purely for environmental or aesthetic purposes, for sports purposes or for cleaning waste water generated in production plants. From the biological, landscape and aesthetic perspectives, ponds enjoy an extraordinary importance within a region that is agriculturally utilized. Some ponds are overgrown with reeds and cattail since there live no natural consumers. Unlike lakes, these ponds must be looked after, repeatedly cleaned, and fish must be caught in hauls regularly. A pond without a proper aquaculture care will become overgrown and decline, with the result of disappearance of a large number of other animals dependent on such unique aquatic ecosystem.

*Old oaks
in the pond dam
Velký Tisý*



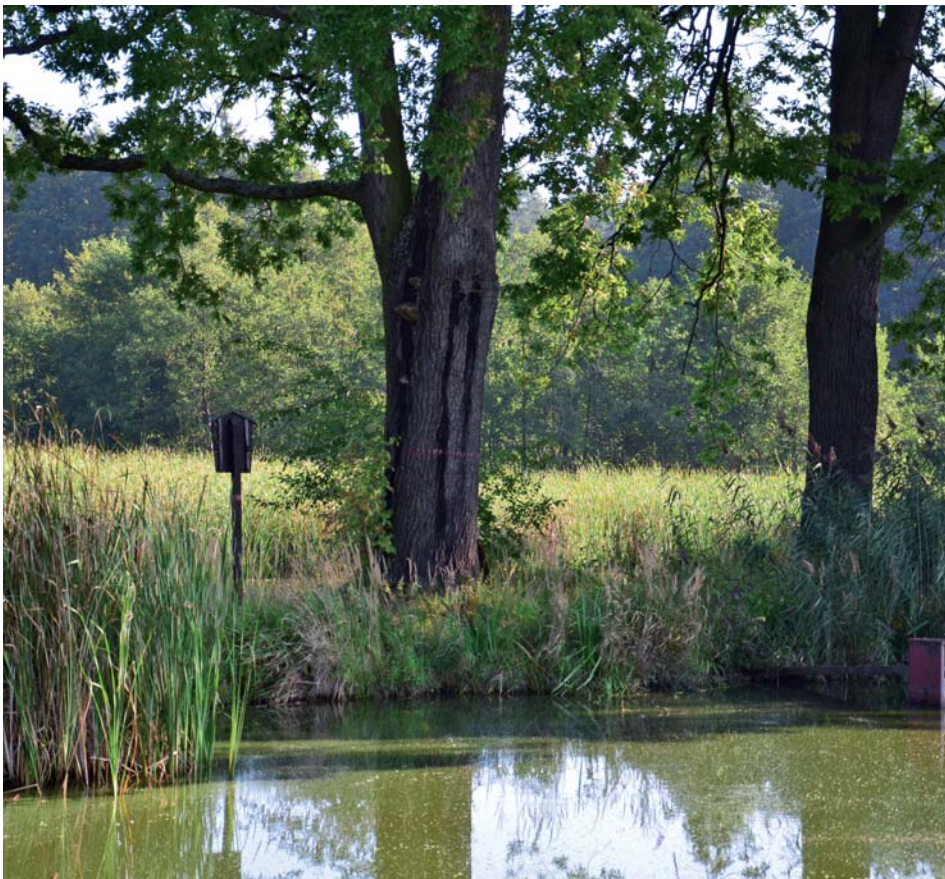
MAIN NON-PRODUCTION FUNCTIONS OF PONDS:

Anti-flood protection and retention of water

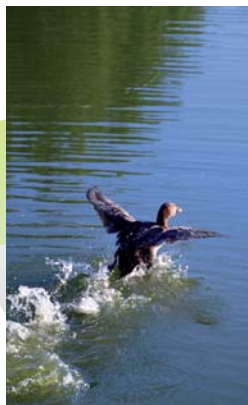
A vital function of ponds for the society as a whole is the role ponds play in the regional anti-flood protection. In dependence on the character of ponds, their quantity and expanse, an extensive amount of water can be captured during floods and flood flows are transformed (reduced), preventing thus potential damage to property or life.

Cleaning of surface water

Surface water is partly cleaned by captured and transformed nutrients that migrate in water currents in ponds. However, this function cannot be considered unlimited or even, ponds cannot be required to perform this function since the whole pond ecosystem can be destroyed by an extensive intake of unsuitable substances and the life of small fish stocks in the pond and organisms reliant on water could be jeopardized. The society is yet to appreciate this function, which is taken for granted and which is provided free of charge. Today, only a few people can imagine all the tasks that must be carried out so that this function might be fulfilled, or how demanding the care of hydro-technical equipment is, when all maintenance, responsibility and financing rest with owners of ponds. This we should not forget.



*Pond significantly
improve water
quality*



MAIN NON-PRODUCTION FUNCTIONS OF PONDS

Improvement in humidity balance in nature

Despite several floods we have witnessed in the last decade, also extreme spells of drought have cropped up, sometimes to a dramatic extent. Not only ponds as such have been affected by a lack of water, but also their vicinity. The result is a lowered surface of ground water, dried water sources and disturbance of the humidity balance of plants. Accordingly, with their accumulation ability, ponds play an important role in improving humidity balance and maintaining the functionality of the small water cycle in nature.

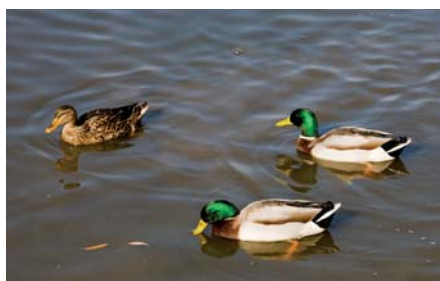
Ecological function of ponds

A whole variety of animals or plants can be seen around ponds. The most frequent representatives of water birds to be found on pond surfaces or in the close vicinity include mallards, mute swans, great crested grebes, common moorhens, common kingfishers, black storks, white-throated dippers, white-tailed eagles and many more. The most common amphibians that live in or on ponds are smooth newts, edible frogs, European fire-bellied toads or European tree frogs. The category of water plants is represented most often by water lilies, nymphoides, yellow water lilies, cattail, reeds etc.

Other functions

Moreover, ponds serve the energetic function, and are also used as a source of water for animals, or for fire purposes, nature protection, recreation, angling, and last but not least, the aesthetic function (landscaping) should not be left aside.

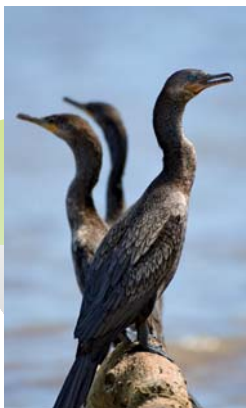
*Ponds are habitat
for a variety
of animals*





*Vrbné ponds
close to the České
Budějovice city*

6

PISCIVOROUS
PREDATORS**Problems regarding piscivorous predators and other pests
in aquaculture**

Piscivorous predators have long been a source of conflict between fishpond managers and the environmental protection guaranteed by the state. The greatest damage is caused by the great cormorant. The situation has turned serious - entities engaged in production aquaculture record the occurrence of as many as 10,000 pieces of overwintering cormorants every year. Approximately 5,000 cormorants are shot every year; however, they grow in number, also due to the large migration of cormorants from the region of the Baltic Sea. As many as 50,000 cormorants are shot in Europe every year, which, apparently, does not lead to the decrease of the number of cormorants, which is replaced without difficulties in the scope of natural reproduction. This problem as such has been caused by the long-term and unreasonable protection of this predator across the whole EU, spanning over many years.

Other substantial damage in stocking of small fish is inflicted by the European otter and grey heron, or even the Eurasian beaver.

Great cormorant (*Phalacrocorax carbo*) lives especially on the coast of the Western Europe, the region of the Black Sea, Danube Basin and on the Baltic coast. The subpopulation last mentioned has spread over the whole of Western and Central Europe. It is estimated that there live more than 2 millions of these birds in the whole of Europe. Cormorants hunt for food mostly in shallow coastal waters, where they are able to dive almost to the sea bottom to reach their catch. The cormorant feeds on a wide variety of fish and is perfectly equipped for "fishing". It dives either from the water surface or from stones or twigs where it sits. The cormorant immerses into water with a small jump, making no noise, and without churning the water surface noticeably. Cormorants cause extensive damage to stocking of small fish in ponds and watercourses - this damage exceeds the amount of CZK 100 million every year.

**Overview of occurrence of predators in production fish farming of members
of the Fish Farmers Association of the Czech Republic in 2010-2014**

Animal	Number of individual pieces					Damage in thousands CZK					Number of pieces caught					Received compensation in thousands CZK under Act No. 115/2000 Coll.				
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
Great cormorant (nesting population)	680	958	802	808	851	12 578	10 913	14 351	14 412	12 912						1 854	4 134	0	0	0
Great cormorant (migrating population)	11 854	9 992	11 756	9 921	10 324	79 605	83 888	80 492	67 622	88 961	5 392	5 324	6 050	5 751	4 615	19 608	19 649	21 064	22 823	0
Grey heron	7 880	7 667	8 247	7 037	7 103	21 650	22 848	22 899	19 462	19 534	154	310	190	169	140					
European otter	1 302	1 294	1 550	1 562	1 558	29 614	30 339	36 651	37 926	36 877						5 401	5 857	6 471	6 575	6 769
Total damage						143 447	147 988	154 393	139 422	158 284										

European otter (*Lutra lutra*) is a well-known mustelidae species and the only type of otter found in the territory of the Czech Republic. For the best part of the year, it lives in seclusion. It is highly territorial and lives in a territory often exceeding 30 km, which the otter marks with its droppings. The otter mainly feeds on smaller fish (up to 10-20 cm). It does not specialize in particular types of fish, as a "food" opportunist, it hunts a most accessible prey. The daily consumption is 0.2-0.9kg. Otters incur damage to stocking of small fish in ponds and watercourses that exceeds the amount of CZK 35 million every year.

Grey heron (*Ardea cinerea*) is a large wading bird from the heron family. It is rather common in all continents of the east hemisphere, except for Australia, and mainly feeds on fish. In Europe, the grey heron is the largest representative of the heron family. Fishermen suffer considerable damage caused by grey herons in the amount of CZK 20 million every year to stocking of small fish in ponds; nonetheless, damage to flowing waters is negligible.

Eurasian beaver (*Castor fiber*) is a podgy rodent, which can grow up to one meter, with dense fur and a long flat tail. It is completely adjusted to living in water. Beavers build systems of canals and dams. They feed on plants, twigs and fibre. The growing population in the Czech Republic, chiefly in Moravia, brings considerable damage mainly on dams of ponds, which may result in catastrophic consequences in case of floods. Beavers inflict damage on water-management structures in the amount of several hundred million Czech crowns every year.



Cormorant



European otter



Grey heron



Eurasian beaver

Pests in aquaculture act milion damages



7



FISHING TOURISM

Fishing done for fun is to go for a walk, taking the fishing rod with you, along with the rucksack and camera, and to wander around our ponds, lakes, rivers, brooks and other streams. Catching a fish is less important than seeing new places. Today's trend is hiking or cycling in fishpond regions, interwoven with nature trails, where it is possible to experience the fishing profession and realise the importance of fishponds in the region. Aquaculture is especially popular during autumn fish hauls or fishing fests, attended by ten thousands of people every year, where fish or other products can be bought on the spot. A role no less important for the Czech society is played by ponds reserved for leisure purposes. Similar to dams, such ponds are the destination for tourists who enjoy swimming or a number of other popular sports - yachting, wind-surfing, kiting, and the like.

*Tourism helps
to popularise
the aquaculture
industry*



SPORT FISHING AND RECREATION

Sport fishing is popular the world over. The Czech Republic boasts a plentiful background of sport fishermen, when as many as 240 thousand of members are organized in the Czech Fishing Union through 484 local organizations, divided into 7 regional associations. Fishing activities carried out in the scope of the Union are oriented mainly at free watercourses, though a number of fishponds are used as preserves. The Union currently manages 1,290 aquaculture preserves (out of which 832 are non-trout preserves and 458 are trout preserves) on the total area of 35,096 hectares. The Moravian Fishing Union groups fishermen in South Moravia and performs similar assignments as its Czech counterpart.

Moreover, sport fishing can be practised on production ponds that are generally unsuitable for fish farming. Sport fishing on production ponds or lakes is regulated by Act No. 99/2004 Coll., on Aquaculture. Fish can be caught by fishing rod by fish farmers or authorized persons, who are issued a permit to catch fish by owners or lessees.



Sport fishing is realised in selected ponds in tended for recreational purposes



8



OPERATIONAL PROGRAMME AQUACULTURE 2014-2020

The global objective of the OP Aquaculture in the programme period 2014-2020 is a sustainable and competitive aquaculture based on innovations, competitiveness and a more effective utilization of resources. The Programme aims at a sustainable development of fish farming in the Czech Republic and its aim is balanced supplies of freshwater fish during the year to the domestic market in the required assortment, including diversification of aquaculture. In the circumstances of the Czech Republic, traditional and well-tested forms of aquaculture must be developed simultaneously, in order to ensure the production of carp and supply of carp to the market. In addition, the introduction of modern intensive farming systems must be promoted to achieve an increase in the production of fish and to contribute to the elimination of adverse impacts on the environment; these farming systems will be procured for the production of salmonidae fish or other types of fish to ensure all-year supplies to the market network.

The main priorities of the OP Aquaculture include in particular:

- Increase in competitiveness of the traditional aquaculture, including investments in maintaining the sustainable production of fish.
- Investments in recirculation equipment, with the result of an increase in production.
- Increase in the proportion of fish processed, promotion of aquaculture and support of consummation of fish.
- Support of transfer of scientific findings to aquaculture establishments (production and process innovations).
- Support of the form of management contributed to maintaining or improvement of the environment and biological diversity.

*Recirculation
for salmonid*



The key pillars of the OP Aquaculture include measures in priority axes 2 and 5

Measure 2.2 - Production investments in aquaculture for the purpose of increasing competitiveness and viability of organizations.

Measure 2.3 - Support of new farmers, with the aim of enabling new entities to enter the industrial branch and ensuring their initial competitiveness.

Measure 2.4 - Recirculation equipment and flow systems with cleaning technologies to support aquaculture utilizing sources in an effective manner.

Measure 2.5 - Aquaculture that provides environmental services with the view of stocking of eel (*Anguilla Anguilla*) in domestic watercourses.

Measure 5.2 - Promotional campaigns aimed at an increase in consumption of fresh-water fish

Measure 5.3 - Investments in processing of products in order to support investments in the branch of processing and placing on the market.

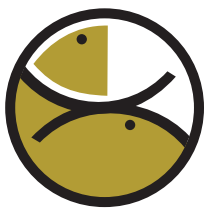


*Autumn harvesting
have traditions*



CZECH FISH FARMERS ASSOCIATION

Czech Fish Farmers Association is a voluntary, interest association of legal persons, which brings together and represents leading producers engaged in fish farming and water poultry, fish-processing establishments, institutes of aquaculture research and educational and aquaculture associations. Member entities of this professional Association generate as many as 90% of the market production of fish in the Czech Republic and manage more than 36,000 hectares of pond surface. The Association was formed in 1991 and its seat is situated in České Budějovice. Currently, it has 65 members. The main mission of the Association is to assert collective interests vis-à-vis state authorities, economic, social, interest and other entities, and to gather and analyse important findings related the branch of aquaculture and production, management and marketing of aquaculture.



The Association provides its members with the following

Services, consultancy and information in the areas:

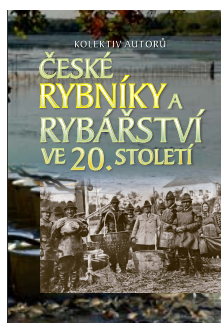
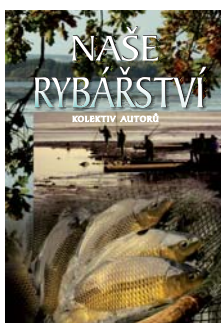
- legislative and legal
- water management and environment
- promotion of aquaculture and marketing
- collaboration with domestic and foreign non-governmental organizations and institutions
- administration of trademarks (Český kapr [Czech Carp])
- subsidies and supports for activities of members of the Association (Operational Programme Aquaculture)

Processing of data:

- about trade in fish, production and prices of fish
- statistics of foreign trade (export and import of fish)
- occurrence and damage caused by piscivorous predators

Coordination:

- cultivation and testing of fish and water poultry
- educational activities (conferences and seminars)
- publication of periodical printed matter and books (the quarterly Rybníkářství [Fishpond Cultivation], books Naše rybářství [Our Aquaculture], České rybníky a rybářství ve 20. století [Czech Ponds and Aquaculture in the 20th Century], information booklets and other printed matter)





3th annual
conference
of the Czech
Fish Farmers
Association



Lecturer

The Czech Fish Farmers Association is a member of:

- FEAP - Federation of European Aquaculture Producers
- Agrarian Chamber of the Czech Republic
- Federation of the Food and Drink Industries of the Czech Republic
- Czech and Moravian Poultry Union



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MEMBERS OF THE CZECH FISH FARMERS ASSOCIATION

Blatenská ryba, s. r. o.
Na Příkopech 747
388 01 Blatná

Rybářství Hluboká cz. s.r.o.
Tyršova 681
373 41 Hluboká nad Vltavou

Rybářství Třeboň Hld. a. s.
Rybářská 801
379 85 Třeboň

Rybářství Třeboň a. s.
Rybářská 801
379 01 Třeboň

Klatovské rybářství a. s.
K Letišti 442
339 01 Klatovy II.

Rybářství Mariánské Lázně s.r.o.
U Mlékárny 717/8
353 01 Mariánské Lázně

Rybářství Chlumeck nad Cidlinou, a. s.
B. Němcové 711/IV.
503 51 Chlumeck nad Cidlinou

Rybníkářství Pohořelice a. s.
Vídeňská 717
691 23 Pohořelice

Rybářství Kolář, a. s.
Zámecká 25
594 01 Velké Meziříčí

Rybářství Přerov, a. s.
gen. Štefánika 5
750 02 Přerov

PEMA, a. s.
ul. Míru 701
289 03 Městec Králové

Jihočeská univerzita v Českých Budějovicích
Fakulta rybářství a ochrany vod
Zátiší 728/II.
389 25 Vodňany

Krajské školní hospodářství České
Budějovice
U Zimního stadionu 1952/2
370 76 České Budějovice

Líšno a. s.
Konopiště 24
256 01 Benešov u Prahy

Colloredo - Mannsfeld, spol. s r. o.
Švabinského 279
338 08 Zbiroh

KINSKÝ Žďár, a. s.
Zámek 1/1
591 00 Žďár nad Sázavou

Lesy a rybníky města
Českých Budějovic, s. r. o.
J. Haška 4
370 21 České Budějovice

Štičí líheň - ESOX, s. r. o.
Jordánská 366
390 01 Tábor

Český rybářský svaz
Nad Olšinami 31
100 00 Praha 10

Moravský rybářský svaz, o. s.
Soběšická 83
614 00 Brno

Mendelova univerzita v Brně
Ústav zoologie, rybářství,
hydrobiologie a včelařství
Zemědělská 1
613 00 Brno

Střední rybářská škola a Vyšší odborná
škola vodního hospodářství a ekologie
Zátiší 480
389 01 Vodňany

Střední škola rybářská
a vodohospodářská Jakuba Krčína
Táboritská 941
379 01 Třeboň

Rybářství Nové Hradky s. r. o.
Štiptůň 78
374 01 Trhové Sviny

Jan KOLOWRAT Krakowský
Správa Kolowratského rybářství
U Broumaru 223
517 73 Opočno

Chov ryb Jistebník s. r. o.
Jistebník 393
742 82 Jistebník

Domažlické městské lesy spol. s r. o.
Tyršova 611
344 01 Domažlice

Rybářství Lnáře, spol. s r. o.
Lnáře 71
387 42 Lnáře

Rybářství Kardašova Řečice s. r. o.
Čečova 662/20
370 04 České Budějovice

BioFish s. r. o.
Zahrádka 40
584 01 Horní Paseka

Rybářství Růžička spol. s r. o.
Brněnská 2386/68
586 01 Jihlava

Petr Dobeš
Výroba a prodej rybářských potřeb
Masarykovo nábreží 4
120 00 Praha 2

Povodí Odry, s. p.
Vodohospodářský provoz rybné hospodářství
Horymírova 2347
738 01 Frydek - Místek

Pstruhový ráj s. r. o.
Bohdaneč 140
285 25 Bohdaneč

ORLÍK NAD VLTAVOU, s. r. o.
Bělohorská 165
160 00 Praha 6

Městské hospodářství Vodňany, spol.
s r. o.
nám. Svobody 3
389 01 Vodňany

Veterinární a farmaceutická univerzita Brno
Ústav veterinární ekologie
a ochrany životního prostředí
Palackého 1 - 3
612 42 Brno

Rybářství Vysočiny, v. o. s.
Hromádky z Jistebnice 439
583 01 Chotěboř

Dvůr Lnáře, spol. s r. o.
Lnáře 18
387 42 Lnáře
okr. Strakonice

Maria Podstatzká-Lichtensteinová
Středisko rybářství
Zámecké schody 1200/4
594 01 Velké Meziříčí

Rybářství Doksy spol. s r. o.
Nerudova 24
472 01 Doksy

BioMar Czech Republic, s. r. o.
JUDr. Krpaty 1369
530 03 Pardubice

Rybářství SALMO
Zdeněk Mašát
náměstí Přátelství 2801
390 05 Tábor

H - FARMA
Ing. Jan Houška
Pístina 2
378 02 Stráž nad Nežárkou

Rybářství Litomyšl s. r. o.
Sokolovská 121
570 01 Litomyšl

Rybniční hospodářství s. r. o.
Sádka 148
533 41 Lázně Bohdaneč

RYBÁŘSTVÍ RYCHVALD s. r. o.
Orlovská 1279
735 32 Rychvald

MVDr. Miroslav Kulich
Pstruží líheň Hynčice
Suchý Důl 98
549 62 Police nad Metují 4

Vojenské lesy a statky ČR, s. p.
Pod Juliskou 5
160 64 Praha 6

UNIVIT s. r. o.
Na Vlčinci 16/3
779 00 Olomouc

Czernin Dymokury s. r. o.
nám. 1. máje 1
289 01 Dymokury

Karel Dunas
Rybářství Holohlavy
Fučíkova 450
503 03 Smiřice

Správa Národního parku ŠUMAVA
1. máje 260
385 01 Vimperkz

Schlikovský dvůr, s. r. o.
Jičíněves 70
507 31 Jičíněves

Kachní farma STRKOV s. r. o.
Na Sádkách 370
391 11 Planá nad Lužnicí

AGRICO s. r. o.
Rybářská 671
379 01 Třeboň

Petr Nieslaník
Jablunkov 940
739 91 Jablunkov

Vladimír Mráz - zemědělská a obchodní
činnost
Nad Lomnicí 1256
388 01 Blatná

Pstruhařství ČRS Kaplice spol. s r. o.
Rybářská 237
373 82 Boršov nad Vltavou

Česká zemědělská univerzita v Praze
Školní lesní podnik
v Kostelci nad Černými lesy
nám. Smiřických 1
281 63 Kostelec nad Černými lesy

Střední škola gastronomie, hotelnictví
a lesnictví Bzenec
náměstí Svobody 318
696 81 Bzenec

Rybářství Křtěnovice, s. r. o.
Křtěnovice 5
391 43 Nová Ves u Mladé Vožice

Milan Plundra
Hlavní 73
564 01 Dluhoňovice

AQUAMONITORING, s. r. o.
Jedovnická 2346/8
628 00 Brno

Rybniční hospodářství Tomáš Gabriška
Příbraz 173
378 02 Stráž nad Nežárkou



SCIENCE, RESEARCH, EDUCATION

Currently, aquaculture education, science and research are conducted in three higher education institutions. At the secondary-education level, study applicants can choose from three secondary schools. The following chapters provide more detail.

Faculty of Aquaculture and Protection of Waters, University of South Bohemia, with the South Bohemian Research Centre of Aquaculture and Biodiversity of Hydrocenoses /CENAKVA/

As the smallest, youngest and most active part of the University of South Bohemia, the Faculty of Aquaculture and Protection of Waters (FROV JU) has found its place on the map of South Bohemia, a region renowned for fishpond cultivation, fish farming and healthy environment. Established in 2009, it is the only higher education institute of its type in Central Europe. The Faculty is seated at three South Bohemian towns: in České Budějovice (the Institute of Aquaculture and Protection of Waters), Vodňany (the seat of the dean of the Faculty and the Research Institute of Fish Culture and Hydrobiology) and Nové Hradky (the Institute of Complex Systems). From the research perspective, all these institutes are interconnected by the South Bohemian Research Centre of Aquaculture and Biodiversity of Hydrocenoses /CENAKVA/.

*Institute
of Aquaculture
and Protection
of Waters*



*International
Environmental
Educational
Advisory and
Information
Centre Vodňany*



Aquaculture education in Moravia

Mendel University in Brno was founded as early as 1919. This event was of a significant importance for our aquaculture education since the university (the former name Agricultural University in Brno) introduced the first specialization programme in the whole of Czechoslovakia in 1949, with the focus on the education of university-qualified professionals in freshwater aquaculture and related branches. In 2013, the construction of new Mendel's Biotechnological Pavilion in the MENDEL area was completed in Brno in Černé Pole. With Mendel's Pavilion, the Department of Aquaculture and Hydrobiology acquired a unique modern educational and experimental background for further pedagogical and scientific development within its professional centre of attention.

Czech University of Life Sciences in Prague, Department of Zoology and Aquaculture

In addition, aquaculture at the university level is taught at the Czech University of Life Sciences in Prague. The Department of Zoology and Aquaculture was formed in 1994, following a long tradition of education and research in zoology and aquaculture in the Czech University of Life Sciences in Prague. The main research area consists in the epidemiology of domestic animals, livestock and wild animals, the evaluation of anthropogenic stress of the environment and its influence on individual groups of animals, the study of animation and course of revitalization of non-natural biotopes, genetics and morphology of fish.



The new Mendel's Biotechnological Pavilion in Brno



Teaching aquaculture also takes place at Agricultural University in Prague



SCIENCE, RESEARCH, EDUCATION

Secondary Fishery School in Vodňany

Václav Josef Štěpán, with support of other remarkable personalities (Josef Šusta, Ing. Václav Šusta, Dr. Theodor Mokřý, and others) played an important role in establishing this professional aquaculture school.

Basic information:

- The school was incorporated in 1920
- The instruction took place in the Town Hall during the first four years
- The instruction commenced in a new building in September 1924
- In 1921, the formation of fishponds started in the School Experimental Area, which serves for practical instructions of students
- Forms of study - the school offered a two-year study ("master") programme until 1953, and then from 1947, the study has consisted of four years
- In 1953, a purpose-directed aquaculture establishment was incorporated - School Aquaculture Protivín (1,435 hectares), where students undertake their practical lessons - the school manages its own aquaculture preserves Blanice 3 and Zlatý potok.
- In 1996, the College of Water Management and Ecology was established and attached to the Aquaculture School - the study programme is offered to secondary-school leavers, who passed the final secondary-school leaving examinations (achieved the "maturita" certificate), and is scheduled over three years.

*Testing laboratory
for teaching*



Secondary School of Fishery and Water Management of Jakub Krčín, Třeboň

The first vocational school was founded on September 1, 1951 as a part of the organization State Aquaculture Třeboň. Its purpose has been to educate qualified professionals for aquaculture operations and assist in introducing of scientific findings into intensive fish farming.

The school was given a new status and name in 2008. The former aquaculture vocational school became the Secondary School of Aquaculture and Water Management of Jakub Krčín. In addition to the existing apprenticeship programme Fisherman, another study programme, completed with the final school-leaving examination ("maturita" certificate) is offered by the school: Ecology and Environment with the emphasis on water management. Since 01 September 2008, future fishermen have been joined by future ecologists - water resource managers.

Programmes and fields of study provided by the school

Apprenticeship Fisherman, field of study Ecology and Environment - Water Resource Manager, post-secondary two-year field of study Aquaculture.

Secondary Forestry and Aquaculture School, Bzenec

The apprenticeship programme Fisherman has been taught by the Secondary Forestry Vocational School Bzenec since 01 September 2005. The education of the fisherman profession has therefore found its way to Moravia, where it follows the famous aquaculture tradition, chiefly associated with the Lords of Perštejn at the dusk of the 15th century, who founded extensive pond systems in the area.

The history of the school as such dates back to the year 1951, when a new Centre of Working Young People was opened in Bzenec - Přívoz on 01 October 1951.

The study programme Fisherman is taught as a full-time study, and is organized in form of quarterly cycles, when weeks of theoretical instruction take turns with weeks of practical instruction.

The three-year study of theoretical professional "aquaculture" subjects is concerned with two content units: applied biology and hydrochemistry, fish farming.



Catch electrical unit

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CONCLUSION

Freshwater aquaculture ranks among the oldest sources of living and is one of the oldest human occupations. The world treats the term "aquaculture" in a rather broad context, and associates with marine aquaculture in particular. Freshwater aquaculture despite the fact that it contributes to the world production of fish with but a small proportion, is no less important since it produces stable yields of water organisms (fish, mollusc, algae etc.) in a long term and in a purpose-directed and sustainable manner. While today the number of economically valuable fish in world oceans and seas plummets dramatically for the reason of excessive hunting, the aquacultural farming is virtually inexhaustible. Accordingly, this advantage should be utilized and customers must be informed and become aware of the advantages and quality of food gained in this way.

*Carp is the main
fish of Czech
aquaculture*

