

## Outdoor Coldwater Fish

### How to care for pond fish

Ponds are popular garden features in the UK and are often filled with various species of fish including goldfish, koi, sturgeon, orfe, rudd and tench. All of these species (except sturgeon) are members of the *Cyprinidae* family and can be widely found throughout Asia and Europe. Due to their popularity, the majority are captive bred.



### Water requirements

Fish which are stocked in ponds are generally tolerant of a range of water parameters. Ideally, ponds should be kept within the parameters shown below. At times, this may be difficult to achieve as ponds are often subject to external changes. Frequent water testing is essential to ensure any potential issues are caught early on.

Temperature:	between 4-24°C
pH:	6.5-8.5
Ammonia:	Zero mg per litre
Nitrite:	Zero mg per litre
Nitrate:	Not to exceed 20 mg per litre above normal tap water levels
General hardness:	Medium-hard (8-18°dH)
Carbonate hardness:	Medium-hard (5-15°dkH)

### Biology

Tench, orfe and koi can grow up to 75cm in length and therefore benefit from being kept in a larger pond. Koi are perhaps the most famous pond fish with multiple colour varieties available, however, they are slightly more delicate than other species and require good water quality with minimal fluctuations. There are different colours of orfe and they should be kept in groups of four or five otherwise they are likely to become stressed. Tench can be found in different colours (dark green and gold) and associate with the bottom of the pond.

Sturgeon will grow very large, with adults reaching 200cm, however 100cm is more likely in a garden pond. They can be kept singly, but will require a large pond and cool, highly oxygenated water.

Goldfish remain smaller making them appropriate for most pond systems. The most common maximum body length is up to 30cm. There are several popular colour varieties including shubunkins, sarasa, and red comets. Rudd also remain smaller than the other species, unlikely to grow over 40cm, and will benefit from being kept in groups.



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All of these fish can thrive for many years in a healthy pond with good water quality. There are reports of goldfish living up to 20 years, but the larger species could live even longer.

### Pond requirements

Ponds for fish should ideally be at least 45-60cm deep, preferably over 90cm for koi and over 120cm for sturgeon. This ensures more stable temperatures, a cool zone at the bottom in warm spells, and a warmer area at the bottom in freezing winters. The pond should receive some sunlight as this helps to promote plant growth and to maintain warmer water throughout the spring and summer months. Shallower ledges around the edges of the pond will help you to grow a wider variety of plants. Live plants are recommended as they will provide oxygen, remove pollutants and provide food either directly or by supporting microorganisms. Too much sunlight may cause temperature issues for the species that prefer cooler waters or drive high algal growth. It is also advisable to avoid any overhanging trees or other large plants which might drop leaves into the pond. If this is not possible, use an autumn cover net as required.

Goldfish and rudd are suitable for most smaller pond systems. Koi, tench and orfe get larger and it is recommended they are kept in a pond of 4,500 litres or more. Adult sturgeon require much larger ponds of around 10,000 litres. Regardless of size, any pond which holds livestock should have a filter as this helps to prevent the build-up of toxic ammonia and nitrite. A pump or fountain will be beneficial as it helps to circulate and oxygenate the water.

Koi and sturgeon require specialist ponds and equipment including filtration systems, pumps, and UV filters to keep the water clear by reducing the amount of algae floating in the water. Sturgeon in particular have a very high demand for dissolved oxygen. Therefore, it is advisable to seek advice from your retailer regarding what is required to maintain these fish before purchase.

It is advisable to cover your pond with a net to prevent wild birds or animals predating on them, especially over winter when there is little shelter from plants. It may also be worth adding a pond net after adding new fish into the pond as fish are more likely to attempt jumping out during the first couple of weeks in a new environment.

**Water testing kits are essential** so that water quality can be checked on a regular basis (once a week) to ensure it does not slip below the water requirements stated above.

### Introducing your fish

Before adding any fish, seek advice from your OATA retailer to make sure that your pond is an appropriate size for the number of fish you would like to keep. Check that the water quality in your pond is suitable i.e. levels of ammonia and nitrite are zero. Only increase the number of fish you have in your pond slowly as the population of beneficial bacteria established when maturing your filter need to increase every time more fish are added and feeding increases. Overstocking or stocking your pond too quickly can



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result in 'new pond syndrome'. This occurs when there are not enough nitrifying bacteria to cope with the increased waste from the fish, leading to unhealthy levels of ammonia and nitrite, which may cause fish to become ill or die. Healthy fish have clear bright eyes, undamaged fins, intact scales, no ulcerations or bumps, appropriate swimming behaviour and steady breathing. Do not purchase a seemingly healthy fish if sickly fish are present in the tank with it. Signs of disease can include clamped fins, flicking against gravel or décor and shimmying (shaking). Diseases can be easily carried by fish that do not show any clinical signs. If in doubt, ask your OATA retailer for advice as they will have in-depth knowledge and experience.

Your OATA retailer will usually sell your fish to you in a plastic bag. Try not to keep them in this for too long. Once purchased, take your new fish home as quickly as possible because fish are easily stressed by bright lights, extreme temperatures, noise and movement.

Once home, your fish will need to acclimatise to their new environment and a common method to do this known as the 'floating bag' method. Take the bag containing your new fish out of its outer wrappings carefully, avoiding exposure to bright light. Float the bag in the water of your pond to ensure the temperature in the bag is the same as the pond water. After 10 minutes, slowly introduce small amounts of pond water into the bag containing the fish. Once complete, carefully release the fish into the pond whilst introducing as little bag water into the pond as possible. After this, dispose of the bag and any excess water appropriately. Monitor your new fish carefully for the first week, paying particular attention to water quality. If in doubt, contact your OATA retailer for advice.

## Maintenance

Test the water to monitor the ammonia, nitrite and nitrate levels, together with pH and water hardness every week, especially during initial set-up and after adding extra fish. Any build-up of waste such as ammonia and nitrite can lead to health problems in the fish and some pollutants such as nitrate and phosphate can induce the growth of unsightly algal growth such as blanket weed or 'green water'. Ensure that any new tap water entering the pond is treated with tap water conditioner to remove any harmful chlorine or chloramine present.

As winter sets in, dead plants and leaves should be removed, and marginal plants should be trimmed back. Otherwise rotting vegetation will break down in the pond and can release toxic gases and chemicals. It is advisable to add a pond heater or floating device to ensure that the surface of the pond does not become sealed with ice. The frequency at which you need to service your filter will depend on your filter type, size and stocking level, and your OATA retailer will be able to advise you on this. However, monitoring the water flow from your filter is important as it will help indicate that the unit is working correctly. If the filter needs cleaning, do not run it under the tap because any chlorine or chloramine present may kill the beneficial bacterial population that has established in the media. Instead, it should be rinsed lightly in the pond water which is removed during a partial water change as this reduces the amount of bacteria which are lost.



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If the system has a UV unit, you should normally replace the bulb yearly but check the manufacturer's recommendations. Be particularly vigilant about monitoring your fish for signs of diseases as the temperature rises. The immune system can be weakened following the cooler temperatures of the winter months. Similarly, it is recommended to re-introduce feeding slowly when temperatures start to increase, as bacterial populations in the filter may take some time to recover.

### What to watch out for

All fish will have slight variations in their behaviour or appearance, but keeping an eye on any changes in the following will help to identify any potential problems before they become a real health issue:

- swimming behaviour – hanging at the surface, sitting on the bottom or erratic swimming
- colour – turning a darker or paler colour than normal
- temperament – changes in level of aggression or hiding more than normal
- breathing – gill covers moving at a slower or faster rate than normal
- appearance – development of white spots or fluffy growths, loss of fins or scales
- condition – increase or decrease in body weight and condition
- feeding – reduced intake or lack of interest in food

If you are concerned about the health of any of your livestock, then test your water quality and contact your OATA retailer for further guidance.

### Feeding

Most pond fish are omnivores, normally feeding upon insects and plant matter. Their metabolism and appetite tends to follow rises and falls in water temperature. Summer feeding will promote growth and can be used to build up the body reserves of your fish for the cooler winter months, so a high protein food should be used. In very warm summers, over-feeding must be avoided, so ask your retailer for advice. As the water temperature falls, it is best to swap to a lower protein, more digestible food such as wheatgerm. If the temperature falls below 8 °C, it may be better not to feed at all. However, sturgeon should continue to be fed all year round, even at lower temperatures. It is recommended to re-introduce feeding slowly when temperatures start to increase in the spring. There are specialised feeds for different species. For example, sturgeon require a high protein and oil content and a sinking pellet whereas goldfish may prefer a more balanced floating feed. Colour-enhancing foods can be purchased to bring out the colour of your fish. Different sized pellets are also available to suit different sizes of fish. Pond fish should only be fed what they can eat within a few minutes once a day. Take care not to overfeed as this can lead to a build-up of uneaten food which breaks down releasing toxic waste into the water. If in doubt, ask your OATA retailer for advice on appropriate feeding levels.



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## Compatibility

Most pond fish are compatible with each other, but they may require slightly different conditions to be kept successfully. For example, sturgeon will not thrive in the slow-moving, low-oxygen and high-nutrient conditions that goldfish are kept in. Always ask your OATA retailer for the specific requirements of the species you would like to keep.

## Breeding

Goldfish are the most likely to successfully spawn. Generally, if there are more adult males than females, and the temperature reaches the correct level, there may be spontaneous spawning events. A shallow area should be provided, which is heavily planted to increase the chances of the fry surviving. Goldfish are not good parents and will eat the eggs before they can develop and also their fry if they hatch.

Koi can be aggressive during breeding and the process can stress the fish, causing permanent damage to the females and, in severe cases, death. This is more likely to happen if the pool contains more males than females. It is important to monitor behaviour and stocking levels to ensure fish are not stressed.

## Checklist

Before purchase make sure:

1. You have the appropriate equipment and position for the aquarium.
2. You have researched all the species in which you are interested and your final choices are all compatible.
3. You are familiar with how to transport and release your fish.
4. You are aware of the daily, weekly and monthly maintenance your aquarium will require.
5. You are prepared to look after your fish properly for the duration of their life.

## Shopping List

- |  |   |
|--|---|
| ➤ Glass or acrylic aquarium            | ➤ Water testing kits (ideally ammonia, nitrite, nitrate, pH and water hardness) |
| ➤ Filter*                              | ➤ Gravel cleaner/siphon cleaning device (recommended)                           |
| ➤ Heater                               | ➤ Aquarium decorations and/or live plants                                       |
| ➤ Lighting (required for live plants)* | ➤ Bucket for water changes  |
| ➤ Gravel or sand                       |   |
| ➤ Tap water conditioner/dechlorinator  |   |

\*may be included in branded aquarium sets  
but can be purchased separately.



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### Before purchase make sure:

- The aquarium is of a suitable size that ideally can accommodate the fish once they are fully grown
- Water parameters are as advised in this leaflet.
- Pond is cycled and ready to receive fish.

### Always buy...

test kits and regularly check the water for ammonia, nitrite, nitrate and pH. This will allow you to make sure the water in your aquarium is not causing welfare problems for your pond fish.

### Maintain...

the water in the aquarium within the accepted parameters highlighted above. You may need to do regular water changes to achieve this.

### Never siphon by mouth...

A fish tank can harbour bacteria which can be harmful if swallowed. Buy a specially designed aquarium gravel cleaner which can be started or primed without the need to place the siphon in your mouth

### Establish a routine...

for testing the water in your aquarium. Record your results to enable you to identify fluctuations quickly. Also check the temperature of the water.

### Always wash your hands...

making sure to rinse off all soap residues, before putting them into your aquarium, or use long sleeved rubber gloves. Wash your hands again afterwards and certainly before eating, drinking or smoking.

### Five Welfare Needs Checklist:

The Animal Welfare Act 2006 states that all pet owners have a legal duty of care to their pets. Anyone who is cruel to an animal or is found not to be providing the five animal welfare needs, as listed below, can be prosecuted.

- A **suitable environment** e.g. appropriately sized tank (with water heater if tropical set up) within a suitable location in your home.
- A **suitable diet** which meets the needs of your chosen fish.
- **Behaviour** - Fish are able to exhibit their normal behaviour e.g. hiding places for timid fish, enough room for fish to swim freely.
- **Companionship** - Ensure you know whether your chosen fish need to be kept with, or apart from, other fish.
- **Health** - Protected from pain, injury, suffering & disease e.g. you are aware of the daily, weekly and monthly maintenance that your aquarium will need.



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- **Water quality test kits are a necessity not an optional extra.**
- **You must be prepared to look after your fish properly for the duration of their life and provide an aquarium which can accommodate your fish when fully grown.**



**\*Never release your aquarium animals or plants into the wild**

It is illegal and for most fish species this will lead to an untimely and possibly lingering death. Any animals or plants that do survive might be harmful to our native countryside. Take care to properly dispose of any soiled substrate (e.g. sand or gravel) water or decorations so that non-native organisms do not enter natural watercourses.

**Visit [ornamentalfish.org](http://ornamentalfish.org) to find a full range of how to guides and species-specific care sheets to help you look after your fish successfully.**



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