

Ecosystem Pond Manual



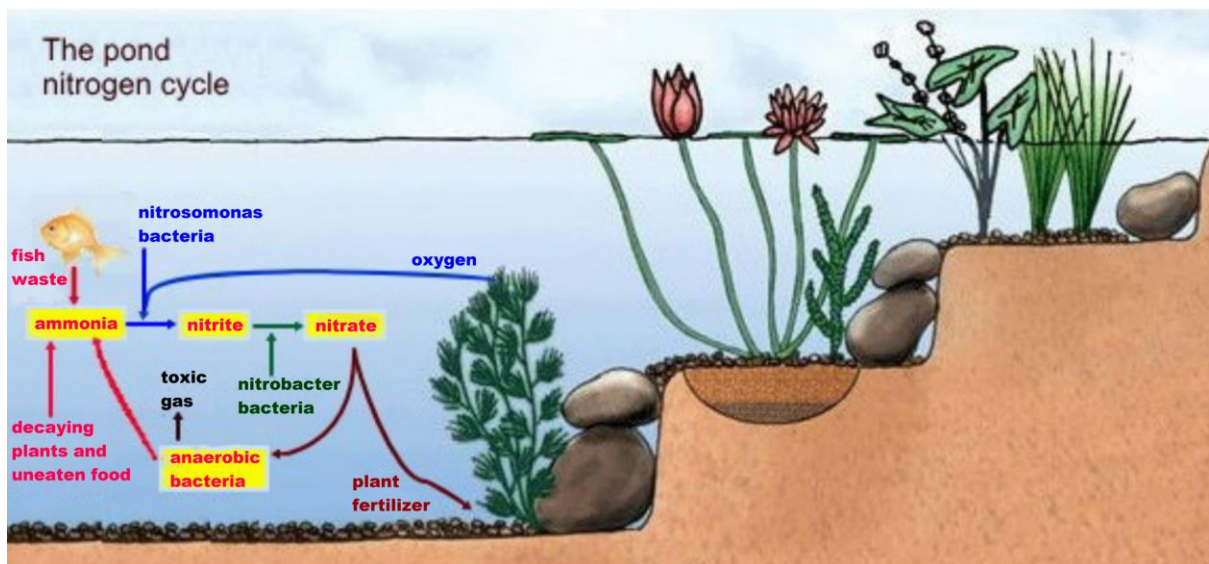
Inspired by Nature,
Created by Us!

The ecosystem in a new pond takes time to balance itself. This can take six to eight weeks or sometimes longer. Unfortunately, this balanced ecosystem can be easily upset by doing the simplest things wrong. But if you follow these basic rules the time and effort that you put in is minimal.

- Always leave your pump going except when washing filters (your pond needs lots and lots of oxygen.)
- The filter mat and net in the skimmer will need cleaning weekly. If things get out of balance or you get an algae boom, they may need a clean more often until things settle down.
- Do not top-up your pond more than 20% per week (I recommend 10%). The city water treatment plant chlorinates the water supply. (chlorine kills the beneficial bacteria and harms your fish.) An automatic top up valve is O.K. as it only introduces very small amounts of chlorine at a time and it becomes diluted and dissipate quickly.
- Add lots of plants (very important to use up nutrients and fish waste.)
- Adding beneficial bacteria can help to maintain a balance and speed up cycling (building a bacterial colony to suite the environment)
- When introducing fish to a new pond, only introduce two fish at a time and leave two weeks between each introduction.
- Don't over stock with fish (one 10 cm fish per 200 litres maximum.) Larger fish means less fish (a 20 cm fish needs 400 litres). Note: this is the maximum fish load for an established ecosystem pond where the planting has developed over two Spring and Summer seasons.
- Don't over feed your fish (only feed them what they can consume in 1-2 minutes, they will have plenty to eat in the pond anyway.) A good rule of thumb is 2-3 mouth-fulls per fish once or twice a day during Spring & Summer. Feed less in winter & do not feed if water is constantly below 10°C
- If your pond starts to develop excess algae cut back on feeding and allow the fish to eat some of the algae rather than tasty fish food.
- Avoid concrete and cement in your pond (lime leach from cement raises pH which is detrimental to fish, plants, beneficial bacteria and it promotes algae growth.)

- Don't use chemicals to kill algae (it only works very short term and the decomposing dead algae produces more nutrients for another algae bloom.)
- Your pond will need an annual clean-out at the beginning of Spring, just like your car needs a service to run well so does your pond. We offer this service or you can do it yourself there is information & videos on our website to help you.

Nature works slowly but she does a great job of maintaining your pond if you work with her rather than against her.



Carbonate Hardness (KH)

Some water supplies have very soft water “low on carbonate hardness (KH)” this means your pond will have no pH buffer and so there will be large swings in pH throughout each day.

If you have fish this will place great stress on them and they will become ill.

The carbonate hardness needs to be above 100 parts per million (100 ppm) this will buffer the pH and keep it stable.

The simplest way to buffer pH is described below:

Test the pond water with an “API” KH test kit.

#1- Rinse the test tube & cap in pond water

#2- Fill the test tube to the 5 ml mark with pond water

#3- Put 1 drop of test solution in, cap and shake. The water should turn blue

#4- Repeat #3 until the water turns yellow.

If it turns yellow on the 6th drop of solution or above then the pond water is over 100 ppm KH and will stay stable.

If it turns yellow on 5-drops or less, then add $\frac{1}{2}$ a cup of sodium bicarbonate (baking soda) per 4,000 litres of pond water this will bring the test up by 1-drop (20 ppm) for small volumes add about $\frac{1}{4}$ teaspoon of sodium bicarbonate for every 40 litres. (do not raise the KH by more than 1-drop (20 ppm) inside a 24 hour period, this gives the fish time to adjust)

When adding sodium bicarbonate, dissolve it in half a bucket of pond water then spread it around the pond.

Try to keep the pond water around 6 or 7 drops. If it is above, that's O.K. and it will naturally come down in time.

NOTE: Carbonate Hardness will get used up over time and will need checking periodically. The biggest drop in KH will occur after heavy rain because rain has no KH and is also slightly acid.

Algae in your Pond!

I need to begin by saying that algae, is just a plant, no different to the aquatic plants that you have growing in your pond. It is not bad or unhealthy and is food for fish and other organisms. It is however unsightly when it blooms and becomes excessive. All algae needs to grow are the same three things that all plants need, sunlight, water and food. We cannot remove the water and if we remove sunlight our pond ecosystem will die so we need to limit the amount of food that the algae has.

During Spring Nature sets up beneficial bacteria colonies to take care of waste produced by fish and other decaying debris. The bi-product of this process is Nitrate. Nitrate gets consumed by some natural bacteria, plants and algae. If you don't have enough aquatic plants growing in your pond or the plants are slow coming away there will be an excess of Nitrate for the algae to feed on and so you get an algae bloom. Some algae, is normal, excessive algae is a symptom of excessive nutrients (Nitrate).

Ponds over stocked with fish will also have problems as the fish become more active they produce more waste (more fish = more waste = more Nitrate) and as nutrient levels rise algae blooms. Maximum stocking should be one 10cm fish per 200 litres. Note: this is absolute maximum and bigger fish means less fish.

Don't over feed your fish (only feed them what they can consume in 1-2 minutes, they will have plenty to eat in the pond anyway.) A good rule of thumb is 2-3 mouth-fulls per fish once or twice a day during Spring & Summer. Feed less in winter & do not feed if water is constantly below 10°C

You need aquatic plants to compete with the algae for nutrients I recommend at least 40% to 60% of a pond surface area to be covered by plants, this includes water lilies. It is normal for a little excess algae growth on waterfalls as there is a concentration of nutrients in that area.

Pond Algae solutions

You may at some point find yourself dealing with either string algae growing from the side of the pond or rocks or perhaps green water where algae is free floating. Algae is nature's response to minerals and

nutrients in the pond not being removed by our two friends, pond plants and natural beneficial bacteria. All three living organisms will compete for the nutrients in the water. We would prefer for the pretty water garden plants and some unseen beneficial bacteria to remove the nutrients rather than getting an algae bloom.

Pond plants and their containers do not cause algae so please do not be afraid to add good heavy soil and pea gravel in containers to the pond, or better still plant your plants directly in the gravel bed. Pond plants remove nutrients (often decaying debris, minerals from stone, and mainly fish waste from the water). This leaves the water clean. Waterlilies also help shade part of the pond.

Shade is important to prevent algae and also to protect fish from too much sunlight and predators like birds.

Over feeding fish is a huge culprit of pond algae problems. Chemicals may kill the algae for 3 days but the dead particles return to algae as soon as the chemical dissipates in the water. The result is a vicious cycle of time, money, and unhappy pond owners.

Waterlilies are good but marginal and bog plants are better, especially when planted without pots or baskets.

Keep your waterfall or fountain running 24/7, your pond needs lots of oxygen (it needs more oxygen at night than during the day).

Prevent runoff from the surrounding landscape from entering the pond.

A high pH promotes algae growth and inhibits plant growth, sometimes a problem in concrete ponds.

Some algae growth is to be expected and normal, especially on waterfalls where there is a high concentration of nutrients. This can be scrubbed off occasionally with a stiff brush. If your pond is well balanced there will be minimal algae growth in the pond itself and the fish will consume some of this.

How to feed pond fish

Yes, pond fish need feeding.

Goldfish are the most common pond fish in NZ so this information applies to them. Comets & Shubunkins do best in ponds and can be fed floating foods.

Your fish cannot store large amounts of food, they have a very small stomach (about the same size as their eye) and if they over eat, the food will just pass through them without being metabolised. Small meals often are much better for them than large meals occasionally.

Always feed a quality food with high protein in Summer and low protein in Spring and Autumn. Store the food in a dark, cool place like your pantry. Do not leave it out in the sun by your pond where it will go stale and loose its goodness.

During Summer your fish are very active and need plenty of food. While it is warm you can feed 1 to 3 times per day but only as much as they can consume in about 2 minutes. A good rule of thumb is 2 to 3 mouth-fulls per fish at each feeding. If you experience an algae bloom cut back on feeding and allow the fish to eat some algae.

As the water cools in Autumn feed less often (once a day or once every second day) You should have a thermometer and if the water gets below 10°C stop feeding. The fish cannot metabolise food if the water is below 8°C and it can decay inside them causing bacterial infections. They will still eat algae and insects if they need to.

If the water gets below 7°C for a period of time your fish may go into hibernation. A fish that has had plenty to eat during Summer and is in good condition can hibernate for 8 to 10 weeks.

www.aquaticlifestyles.co.nz

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