

# Troubleshooting

## **What if I come in and many of the trout have died? What do I do?**

- Remove healthy fish first by putting them into in a reserve water bucket with the emergency ice blocks, no matter its temperature.
- Put a battery-operated aerator or tank's air stone in the bucket.
- Add Stress Zyme to the bucket—follow package instructions.
- Remove as much water from the tank as possible (80%).
- Leave filter intake covered.
- Clean tank with clean scrub sponge and gravel cleaner. Remove as much crud as possible.
- Refill tank with any water available (if using chlorinated tap, use a dechlorinating product).
- Cool water with ice or freeze packs.
- Drain the filter, clean the filter media and replace at least one charcoal filter.
- Add BioZyme, Stress Zyme, Tap Safe, etc. if on hand, or as soon as possible.
- Replace fish in tank.
- The next day, add more Stress Zyme.

## **What do I do if my chiller stops working?**

Using 1 or two of the frozen jugs of water on hand, float in the tank to maintain the temperature. Replace as necessary until your replacement chiller arrives. All labels and glue should be removed from jugs before use. Your chiller has a 5 year warranty. Please contact Tradewind Chillers (information listed on equipment list).

## **Can I keep eggs or fish in a household refrigerator?**

Refrigerators are not an acceptable substitute for the tank environment. Because most refrigerators operate between 35 and 40 degrees, they are far colder than the tank.

## **What do I do with my eggs or fish in an emergency?**

In an emergency, eggs can be preserved by placing the hatching basket in a container of water and putting that in a cooler in a cool dark place, with an ice pack and thermometer. Careful regulation in the amount of ice should make it possible to keep the eggs around 50 degrees. Do not add ice to the eggs directly; apply to the outside of the egg container. Ice water may be dirty, and the rapid melting from immersion would cause sudden temperature changes that might do more harm than good.

*Adapted with permission from "Trout In the Classroom: How to raise Virginia trout", Virginia Trout Unlimited, 2008.*

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With fish, particularly large fish, the only option in an emergency is to add ice to the tank. The best way to do this is to freeze large plastic containers of water, such as soda bottles with the labels removed, and add them to the tank. When creating these, do not fill them to the top as the ice that forms takes up more space than the liquid. Clean ice packs can also work, or sealed plastic bags of regular ice. It is possible to regulate temperature by adding or taking away ice in this way. Do not add regular tap water ice cubes directly to the tank unless there is no other option--this ice likely has chlorine in it, which can harm the fish. Some teachers create tank-water ice cubes, in anticipation of an emergency.

A 5 gallon bucket would be a good choice for holding fish in an emergency, if there is a problem with the tank.

It is best to prevent any such problems and carefully maintain the tank environment. The priority in an emergency is getting the tank environment back to normal, no emergency procedure can replace the stability of a working tank.

## **Do I need goldfish to start my nitrogen cycle? If I start late, should I use more goldfish?**

At this time, it is no longer recommended that goldfish be used to help “break in” the tank system. All systems should be installed with additives such as Biozyme or Stress Zyme which help create a suitable water environment.

## **Can I mix species of trout?**

No, the different trout species may not be compatible. The risk of cannibalism among young fish (under ½ year of age) is greatly increased with species mixing.

## **Why are so many of my eggs or fish dying?**

Death is a natural part of fish development. Everyone should expect to lose eggs and fish. The exact survival rate is highly variable and based on many factors. A sudden spike in mortality can indicate a tank problem. It is also worth noting that there are two naturally high-mortality periods, first during the egg stage and then again when the trout first learn to feed. Some fish never learn to feed and simply starve.

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## **What should I do if there is a serious leak while I am away, and the tank is almost empty when I return?**

If there is a serious leak, during the night or weekend, almost all of the tank water may be pumped out. It is unlikely for the tank system to fail on its own, but it is important to be ready in the event of such an accident. If the fish are in very shallow water, and the chiller is no longer working because the pump is running dry, it is important to carefully repair the tank system environment. First, you should find and fix the leak. Unplug the filter system. Next, add a dechlorinating solution to a container holding about 5 gallons of cold tap/well water (stir the tap water as you add a dechlorinating solution; for well water this step is not necessary). This should be enough to get the chiller working again; if it isn't, add another 5 gallons of cold dechlorinated/well water to the tank. Add this water slowly, and try to make this water around the same temperature as the tank water (which might be warmer by now). Make sure the air stone is working and putting bubbles into the water and that the UVS system is on.

Once there is enough water for the chiller to run, you should let the tank reach 50 degrees again. Open the filter and pour all the water out of it and rinse the filter media. Because there was no water circulation, the filter will be full of dead bacteria that will kill the fish.

At this point, use a dechlorinating solution to get as much tap water as possible (you don't need this solution if you are using well water) in every clean container you might have. Put your emergency ice packs into the containers to start lowering the temperature. Once the dechlorinated/well water has reached a temperature close to the tank's temperature, slowly add the water to the tank. If you can, it would be best to add only a few cups at a time, many times during the day. Continue to do this until the tank is about half full. Open the filter, refill it and add a dose of BioZyme, reconnect the filter system, and plug it in. Once the tank is half full, you can add the aged water a few gallons a day.

Continue to make new aged water as you use it until the tank is back up to normal levels. Then resume normal maintenance procedures including water changes.

The idea throughout this process is to make the changes for the trout as subtle as possible, once they're back at 50 degrees. Large swings in temperature and/or water quality can stress them out and increase mortality.

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## **How can I inform custodians, or other teachers, about what to do if there is an emergency while I am away?**

It is a good idea to give custodians some basic information about the requirements of your tank. For example, it is important that custodians know that your tank always needs electricity. It would be most helpful to place a sheet of paper (in a visible location) describing emergency procedures. This might include contact numbers, and basic advice on what to do to stabilize the tank if there is a chiller failure, leak, or power outage. You might want to prepare a frozen soda bottle of water to use in a chiller emergency, and then include the location of this ice and how to use it in your emergency procedure sheet. An example is below:

### **Tank Emergency Procedure:**

In the event of a power outage, leak, or refrigeration system failure, or any other tank problem, please contact me: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you cannot reach me, please try calling:

Contact: \_\_\_\_\_

Phone number: \_\_\_\_\_

**In the event of a power outage:** The trout in this tank need cold water to survive, and the chiller next to/under the tank maintains their temperature. If possible, the electricity to this tank should be turned on again. If the electricity must be off because of maintenance or construction for more than a few hours, please contact me as soon as possible. If I cannot be contacted in time, please place the frozen soda bottle of ice, located \_\_\_\_\_, in the tank to help keep it cool. Even with the ice, the tank needs electricity as soon as possible.

**In the event of a serious leak:** A serious leak can be stopped by turning off all electrical parts of the tank system, or unplugging them. Any leaking tubes should be placed back in the tank or in a bucket. After all the water is cleaned up, the source of the leak can be fixed. This will probably be loose tubes or tubes which fell out of the tank. If there are more than 4 inches of water left in the tank, the fish can survive. Please do not add any water to the tank if this is the case. Lots of tap water, or water that is too warm, can kill the fish. If there is very little water in the tank, please add only enough cold tap water to let the pump work again. If the leak is fixed, please turn on all devices before you leave.

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## **What is a normal death rate?**

Death rates are different from one stage to the next. With green eggs, a large percentage are expected to die. With eyed eggs, a higher survival rate is expected. The loss of most of your eyed eggs does suggest a problem. As the fish hatch, and age further, survival rates should improve. By the time fish are free swimming and have learned to eat, death should be an uncommon event. Losing many free swimming fish, above all else, is a sign that the tank environment is not healthy. As they grow, fish produce more waste, so cleaning and water changes may be needed more often.

## **Most of my fish died in the first month, is this common?**

One of the most common times for massive fish death is in the first month. Because eggs and young fish are more easily stressed, there is a high risk for death as a result of fungus, changes in water quality, or large swings in temperature. While the UVS will help with any fungus issues, it is important that water changes and cleaning be practiced before the fish arrive, and that this process is maintained on schedule. Most catastrophic die offs seem to start with a missed cleaning day or weekend. By the time cleaning resumes, the damage may have already been done.

## **What do I do with dead fish or dead eggs?**

It is very important that dead eggs, dead fish, and decaying waste matter (discarded food for example) are removed as soon as possible. This should be done at least once a day, and even more often during critical periods or as needed. This process alone is very important in keeping the remaining fish alive. Poor cleaning is very often the root cause of excessive fish death.

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## **Why are my fish or eggs dying at an abnormally high rate?**

Poor water quality, as a result of insufficient cleaning or water changes is among the most serious threats to fish health. It is essential that water changes of 10-20% per week (more as the trout get older and bigger) be maintained, with aged tap or well water. Other causes of fish death might be temperature fluctuations, lack of aeration, and chemical exposure. High ammonia concentrations can result in sudden fish death. Your daily water testing will show if you are having continually high ammonia concentrations. Dealing with ammonia spikes is covered a little further on.

## **How sensitive are the fish to temperature changes?**

For best results, the trout should be exposed to the most stable temperature possible, as close as possible to the ideal. Fish can handle small fluctuations of one or two degrees, but sudden changes of almost any scale will be stressful. Changes of 5 degrees or more are a serious threat to trout survival particularly if they are sudden.

## **How can I help keep a stable tank temperature?**

It is important that the chiller always be on and set to the appropriate temperature. Also, because water changes introduce warmer water into the tank, please limit these changes to 10% of your tank volume at any one time. The use of insulation will help the chiller maintain a stable temperature, but may not be needed. Larger tanks will also help protect fish because they have more water to buffer any changes.

## **Why is the air stone needed?**

Aeration of the tank is an important part of simulating a stream environment. The stream environment is not only cold, but also constantly moving and constantly mixed with air. Because of this, it is important that filters, air-stones, and the chiller pump all operate well. The pre filters on the chiller pump and the intake on the tank filter, as well as the surface of the air-stones should all be clean and free of debris.

## **Should students wash hands *before* touching tank water?**

Students may wish to clean their hands before working in or around the tank **without using soap**. Simply use warm tap water for this, and for cleaning of other objects like nets and the bucket. This will help keep chemicals and dirt from getting into the tank. Moisturizers and other skincare products might also harm fish. It is very important that no soap enter the tank environment, because soap may harm or kill fish even in small concentrations.

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## **Should students wash up *after* contact with tank water?**

Yes. While tank water is not particularly hazardous to students, they should clean their hands with soap and warm water. Please do not use soap until all tank work is done.

## **Some of my hatched fish are not eating - Some of my fish are deformed. Is this normal?**

Yes. During the growth process, some fish will die. Some fish may survive initially only to die later because they never begin to eat. Other fish will be deformed, and very often will also die as a result of this. This is a natural part of fish reproduction. It is not normal, however, for very many or most of the fish to die. If this is the case, there may be a problem with the tank environment.

## **My fish have hatched, what should I do with the eggs?**

The discarded egg shells will decompose naturally in time. If they appear to be hosting fungal growth, they should be removed and disposed of. Just as with living eggs, they might turn opaque white, or may take on a fuzzy appearance. If this is the case, please remove them.

## **When should the trout be allowed out of the hatching basket?**

It is generally agreed that trout should remain in the basket as long as possible, even after some start to jump out on their own. Once the trout are all able to swim freely, and are strong enough to navigate the currents of the tank, you can release them into the tank. After the trout have been actively feeding for a week or two, they should be nearly strong enough.

## **How do I let the trout out of the basket when it is time?**

You can gently remove the basket from the sides of the tank and slowly lower it to the bottom of the tank. You can let the trout swim out from here. This allows some trout to remain in the protection of the basket for a few days. You may also gently tip the basket as well to remove them, but it is best to be as gentle as possible. Please make sure that the basket is empty before removing it from the tank. Using the pre-filters on the intake lines of the filter and chiller will ensure that small fish are not sucked into these units as a result of the powerful suction these tank components generate.

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**My alevin are very active, and are pushing other fish into the corners of the basket.**

**What does this behavior suggest? Should I be feeding these fish more?**

This type of activity is normal in trout. In this stage, young trout prefer dark corners. It may be helpful to put some screen material over the basket to reduce the amount of light these fish are exposed to. UV light can be harmful to eggs and alevin. Fish at this age do not need food at all. When beginning to feed, at the end of the alevin stage, please start with small amounts.

**Trout are being sucked into the filter, how can I prevent this?**

Use a mesh stocking over the intake lines of the filter. This will ensure that small fish are not sucked into these units as a result of the powerful suction these tank components generate.

**What is an ammonia spike? What can I do about it?**

An ammonia spike is one example of a chemical imbalance in the tank environment. These are serious threats to fish health. The tank filter and its bacterial population help reduce problems like this, but they cannot work alone. The best way to prevent any chemical imbalances in the tank is to regularly clean the tank, and change the water. All debris such as food, waste, and dead fish should be removed as soon as possible. Water changes of 10-20% per week are required and should not be skipped. There is no replacement for regular cleaning and water changes.

**Can I use ammonia removal grains to prevent ammonia spikes?**

They may be used only in a dire emergency if a large water change did not reduce the ammonia. These chemicals tie up the ammonia in the water rendering it harmless to the fish. HOWEVER, by tying up the ammonia, it deprives your biological filter (the “good” bacteria) of the food it needs to live and grow. So in the long run, while you have reduced your ammonia, you are killing off your long-term ammonia reducer (your biological filter).

**My tank is coated with a green slime. What is this? What should I do?**

Green films or slime may indicate algal growth. This will not necessarily hurt your trout,

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and some teachers leave it growing. Many, however, choose to remove algal growth. It can be mechanically cleaned by using an aquarium (or soap free) sponge or similar tool. Also, to prevent further algal growth, it is best to limit the amount of light entering the tank. The use of foam or paper to cover the sides of the tank will help. The tank should never be in direct sunlight at any time.

## **I am using the same tank system I had last year, what do I need to do to make it ready this year?**

At the beginning of each year, to prepare for the next set of trout, you should clean all parts of the tank system with warm water. Please do not use soap on any part of the tank. You should also replace any disposable filter parts.

## **The water in my tank is cloudy. What should I do?**

Cloudy water probably indicates an excess in decaying matter. This may be from dead fish, leftover food, or a problem with the filtration. Carefully conducting regular water changes, as well as cleaning the tank of all solid material, is the best way to fight this. Make sure the filter is functioning properly, and that water is flowing out of it. Clean filter components if needed with aged water, but do not use soap or any chemical cleaners. Carbon filter packs should be replaced every year. If fish are not eating all provided food, you may reduce the amount given until they are able to eat it all. Excess food after 10 minutes should be removed and discarded.

## **How should I conduct water changes? What is the right amount of water to change?**

Water changes are an important part of tank maintenance. Improper water changes can cause fish stress or even death. It is best to change about 10-20% of tank volume every week with tap water aged for more than 48 hours (so that the chlorine in the water has had time to dissipate).

Using the gravel vacuum is an efficient way to clean both the tank and remove water at the same time. Twice a week cleaning will keep the tank clean as well as generate a 10%-20% water change.

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## **What happens to the fish next?**

The fish will be released into a watershed stream or river. Students can participate in the transportation of fish to their new habitat as well as the release process. It is hard to determine the survival rates for released trout, but full grown fish have been recovered and genetically linked to trout raised in the classroom. *However, in general, TIC is not a stocking program, but rather an educational program. The true value of raising and releasing trout lies in the process.*

## **How tight should plastic parts be?**

Plastic parts need to be tightened by hand. They should be as tight as possible without risking damage.

## **Is it safe to use metal tools on plastic parts?**

The use of metal tools is OK when great care is taken. It is more important that parts be screwed in place in the proper position; no amount of force can replace good alignment.

## **Does it matter where I put the chiller?**

Yes, the location of the chiller (above or below the tank) may alter the water pressure and flow rate in the system. While the pump can handle just about any arrangement, placing the chiller on the floor below an elevated tank will slightly reduce water flow and pressure. It is more important that tubes be free of kinks or excessive bends, so adding length to relax tubing is fine. The best place to put the chiller is directly below or to one side of the tank. It is best to put the chiller as close to level with the tank, but it is not required.

## **My tap water is discolored, is this ok?**

All water will have some color, most often a faint green or white color. Tap water that is not acceptable might appear very cloudy or may have a strong chemical smell. If this is the case, an alternate source of water should be considered.

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## **How do I know if my water is safe for trout?**

Most tap water will be acceptable for use in this tank system. Unless your water appears to be totally unacceptable, it is probably safe for trout. Always use “aged-water”.

## **How should I assemble the hatching basket?**

The hatching basket is designed to protect very young fish from physical harm. The plastic frame should be secure, and free of sharp edges or scrap plastic. The net is supposed to be placed loosely around the outside of the plastic frame. The net should be loose because this helps make the edges less prone to damage fish which become stuck. To avoid this problem entirely, some teachers prefer to place the net inside the frame and then secure it at each corner with needle and thread. Ensure that the net will not fall off, and is free from holes or damage.

## **Should the net be on the inside or outside of the hatching basket?**

While the manufacturer designed this net to be placed around the outside of the plastic frame, it can be improved by placing the net on the inside. This makes for an even safer environment for the young fish. Monofilament or twist ties can help secure the net to the inside. The net can be loose, but should not float up as this could let the eggs fall out of the basket.

## **What tools are needed for tank installation?**

The only tools needed for tank installation are a screwdriver, knife or pair of scissors, and pliers to tighten any connections if needed. You may also need a clean 5 gallon bucket to assist in filling the tank and water changes. This can be purchased at any hardware store. Please rinse the bucket first and then do not use this bucket for anything other than tank water.

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## **Do I need to age tank water before first filling the system?**

No, the break in period will age the water before fish are introduced.

## **The tubing is very hard to fit over the plastic tank parts, what should I do?**

If tubing doesn't fit over parts, it might help to dip the end of the tub in very hot water. This will momentarily soften the plastic allowing you to slide the tubing over the part.

Also, tubing can be carefully stretched by heating the ends, and then inserting a rigid object like a pair of scissors into the end. This applies pressure to the end and stretches it a small amount. Excessive force can break the tube end. Tight tubing generally will fit, but it might require some time and patience.

## **Should I get a lid for my tank?**

Yes, it is better to cover the tank with some material which can prevent objects from falling in, and provide the reduced light levels that fish prefer. Foam, screen, and plastic have all been used as lid materials with success. Purchased lids for the tank can also work, but because many of these include lights, it is important that the light feature not be used.

## **Does my tank need insulation?**

Many tank systems have worked without insulation. However, insulation will provide a darker, more stable environment for the fish. Insulation will reduce the amount of work needed to maintain the water temperature, saving electricity and limiting the amount of time the chiller will be operational. In addition, insulation will reduce condensation which could pose a problem in the summer.

## **What kind of insulation can I use?**

There are many materials which can help insulate the tank. The most popular is foam sheet material, available at any home repair - industrial hardware store. Two layers of bubble wrap, the shipping material, also would make a good insulator. For best results, cover the bottom of the tank as well. Many other materials can work including plastic, wood, or cardboard.

## **Where do I position the air stone?**

The air stone aeration system produces a large volume of bubbles. These bubbles can interfere with the filter operation by filling the motor with air and causing it to "air lock" and fail. For this reason, there should be at least 4 inches between the air stone and the filter.

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## **Can I fix leaks on my own?**

The assembly of the chiller system is straightforward, so fixing it is quite possible without assistance. Simply unscrew the connection, and make sure that it is not cracked or damaged in anyway. Next, reassemble the leaking connection carefully. You can use a tool to tighten any connection, but do not force any plastic parts as they will crack under excessive strain.

## **What happens if there is a power failure? How much time do I have?**

It is important that the fish have a stable a water temperature as possible. Short downtimes, of an hour or two at a time, probably will not harm the fish or change tank temperatures by any great amount. However, lost power during the night or over a weekend (or worse still, a long vacation) will likely be fatal to the fish.

## **What should I do if the power must be turned off?**

All individuals such as custodians, who may turn the power on and off, should be informed that the trout system needs constant power. If there is no way to prevent it, for construction for example, it would be best to cycle the power. This means running the chiller for two hours on, then two off. This is better than simply letting the tank sit all day without power. Have your frozen plastic bottles ready. Some schools have their equipment wired to the emergency power system.

## **I ran out of food. What do I do?**

Contact your ARPS and food will be sent to you.

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