Tips for Successful Transportation

- **Use of clean containers** (chemicals and fuels kill fish)
- **Use of large enough containers:**
  livestock watering tanks, various sizes of barrels with removable lids, plastic or metal garbage cans, 10 gallon milk cans, 5 or 7 gallon buckets, large coolers and large plastic or metal tubs are commonly used to haul fish short distances. Whatever you use, a lid or cover of some type is recommended, not only to keep the water in the container but also to keep fish from jumping out!!
- **Water:**
  We are unable to carry enough water to fill everyone's containers. To avoid unnecessary delays in searching for water near the purchase site, bring plenty of your own pond water.
    - Fill your containers with fresh pond/lake water, preferably the same water in which the fish will be stocked. Avoid leaving water in containers overnight; large fluctuations of water temperature may result.
    - Never use treated city water, chlorine kills fish
    - We do not recommend using well or cistern water, especially in late Spring or early Spring when well and pond/lake water temperatures can differ greatly. Well water contains very little oxygen. If it is absolutely necessary to use well water, we suggest using an adequate aeration device and be prepared to temper fish at the pick-up site and prior to releasing fish into your pond/lake. We haul our fish in pond water.
- **Ice:**
  Contrary to popular belief, ice does not put oxygen in water. Fish farmers use ice to lower the water temperature when hauling fish long distances, usually over eight hours. Lowering water temperatures is one way to reduce oxygen consumption because it reduces the metabolic rate of the fish and decreases fish activity. We do not recommend using ice to transport fish short distances because you will have to acclimate fish to the same temperature as the receiving water prior to releasing, which takes time, special effort and may cause stress if improperly done.

Remember! Water is very cheap when protecting your investment.

We recommend using the following amount of fresh (drawn just prior to picking up fish) pond/lake water to transport fish for 10 - 15 minutes. Longer hauling time requires more water or a suitable aeration device.

Grass Carp
5 Gallons Per 1 or 2 grass carp

1 - 4 inch fish
10 Gallons Per 100 count of 1-4 inch fish

4 - 8 inch fish
20 Gallons Per 100 count of 4-8 inch fish

8 - 12 inch fish
50 Gallons Per 100 count of 8-12 inch fish

Minnows
20 Gallons per 4 lbs. of minnows

Transport your fish to the pond/lake as quickly as possible!!!!!! If you intend to conduct other business when picking up fish, DO IT FIRST, avoid unnecessary stops.

TEMPERING FISH

Fish are extremely sensitive to sudden changes in water temperatures. As a rule-of-thumb, channel catfish can tolerate a 10 degree F change, however, other species of fish, especially smaller sized fish, can tolerate only a 5 degree F change.

Prior to placing fish in your container or stocking into the receiving water check the water temperature. If tempering is required, remove a portion of the water from the haul container and slowly refill with water from the receiving pond/lake. About 20 minutes of tempering are required for each 10 degree F adjustment in water temperature. Observe fish for unusual behavior, if noticed slow the tempering process. Aeration of the water may be necessary to prevent oxygen depletion while tempering.

ION SHOCK

Another consideration when using well water to haul fish is the possibility of ion shock. Ion shock can be particularly damaging when fish are cultured or hauled in hard water and stocked into extremely soft water. Occasionally, well water is harder than pond/lake water. Slowly exchanging the hard water for soft water reduces the stress. There is usually no problem when fish from soft water are stocked into hard receiving water. Use the same producers outlined for tempering fish for a 10 degree F change of water temperature.

OTHER CONSIDERATIONS

Placing fish into a container of water without supplemental aeration can be risky. It is much like placing fish in an air tight room; when the oxygen is used up, they will suffocate and die.

Water contains from 0 to approximately 20 parts per million (ppm) of oxygen, by comparison, the atmosphere contains about 210,000 ppm. The solubility of oxygen with water varies with temperature and altitude. For example: water in equilibrium with the atmosphere holds 7.6 ppm of dissolved oxygen at 86 degrees F and 9.2 ppm at 68 degrees F. At these concentrations and temperatures, the water is saturated or contains 100% dissolved oxygen. Depending on the size of fish, water temperature and other

water quality factors, oxygen levels below 5 ppm are considered stressful for most warm water fishes and concentrations below 2 ppm can be lethal to many species of fish. Signs of unusual behavior or piping (fish at the surface gasping for air) are indicators of low oxygen. If corrective actions to re-oxygenate the water are not "immediately" taken, fish will die.

When transporting fish in containers of water without aeration devices use plenty of pond/lake water (well water is low in oxygen), do not overcrowd fish and take the fish directly to the receiving site.

TYPES OF AERATION DEVICES

Aeration of water can be accomplished by mechanical agitators, various pumps that spray water or underwater diffusers. Agitators are the aeration devices most commonly used by fish farmers for hauling fish. They use a small motor (normally 12 volt) to spin a paddle which is in the water. The paddle splashes the water, adding oxygen and removing metabolic ammonia and carbon dioxide. 12 volt agitators can be powered by the vehicle's battery system or a supplemental battery like the ones used for trolling motors. 120 volt agitators are normally powered by gas generators.

Atmospheric oxygen can be added to water with common workshop tools. A 12 volt or 110 volt portable air compressor or portable pressurized air tank can be easily rigged. The trick is to make air bubbles as small as possible. Changing larger air bubbles into many smaller sized bubbles increases contact with water which transfers more oxygen and makes your system more effective. There are many air diffusers that create small bubbles. Ceramic type air diffusers called air stones are often used in aquariums and by fish farmers. Air stones come in many sizes for different applications. Common lawn/garden soaker hose is another option. Bubbles produced by running air through soaker hose are usually larger than those produced through air stones, but may be adequate for your application. Simply attach a short length, 1-3 foot, of soaker hose to the air line and plug the other end to prevent loss of air. Air passing through the soaker hose will form small bubbles. Soaker hose should be weighted to keep it in the bottom of the container of water.

Another option is the use of compressed (bottled) oxygen. You will have to use a regulator and/or flow meter to regulate the oxygen flow into the water. Diffusers (air stones or soaker hose) should be used to create small bubbles. If pure oxygen is used, care must be taken not to use too much, otherwise it may injure the gills of the fish. WARNING: Use of compressed bottled oxygen may result in serious injury or death if the bottle isn't properly secured and gauges are not protected. Consult the distributor for proper procedures.

There are many types of 12 volt pumps designed with spray systems to keep fish alive. Remember, some of these systems were designed only to keep a couple dozen of minnows alive and are not adequate for larger numbers of fish. If you choose to make your own system, ensure the water spray is as fine as possible. Producing smaller sized water droplets increases contact with the air and produces more oxygen in the water.

There are several types of garden/lawn water hose nozzles that could be adapted to create a desired spray pattern.

PLACING FISH INTO THE RECEIVING WATER

If possible, stock fish on the up-wind side of the pond/lake and in deeper water. Because of wave action the down-side of the pond/lake may be considerably warmer than the rest of the pond/lake. By placing fish in deeper water, they will be able to find a comfort zone until they acclimate.

Never throw or dump fish into the receiving water. If your hauling container is too large to manhandle, transfer fish to a smaller container with water. Place the container in the pond/lake, tilt it and let the fish swim out on their own.

CHECKLIST FOR TRANSPORTING FISH FROM A DELIVERY POINT TO YOUR POND/LAKE

- Check containers for leaks, prior to filling
- Ensure containers are clean, even if the container is new, rinse it out. Large plastic bags may be used to line containers.
- Use a lid or cover to prevent loss of water and/or fish while en-route.
- Fill containers with fresh pond/lake water.
- Secure containers to prevent them from tipping over.
- Have a thermometer handy
- Plan on how you're going to remove the fish from the haul containers. Containers with small holes make it more difficult when removing fish.
- If you plan to use dip nets, make sure the netting is not too large. Injury to fish can result if fish are caught in netting while transferring.
- Bring an extra bucket(s), in case you need to transfer water while en-route.

We can help! For a small extra charge we do offer plastic haul bags (18" x 32") pressurized with oxygen. Haul bags can only be used for smaller sized scaled fish and grass carp. We prefer not to bag catfish or our larger 4-5 inch hybrid bluegill. These fish may puncture the plastic bag, resulting in loss of fish. If you plan to use this service, please bring a container(s) to protect bags containing fish from direct sunlight and from being punctured during transport. Large coolers or cardboard boxes work well. Plastic bags with water and fish should not be stacked on top of each other. If fish are hauled in plastic bags, tempering for water temperature is done by floating the bag in the receiving water until the water temperatures are the same. After the temperature in the bag has reached the temperature of the receiving water, open the plastic bag and slowly add receiving water to the bagged water before releasing the fish. This step will help to reduce stresses caused by water quality differences.

Large order deliveries are also available through our fish day stores for an additional charge. Due to our schedule and size of some of our fish day vehicles, deliveries of large orders may have to be coordinated for another day. To qualify for this special service, the total order must be large enough to justify returning to the location at another time.

Since most every situation is different, please call us or contact the store with details. Additional charges may be incurred when stocking several ponds or locations, if the time spent at the location exceeds 30 minutes or fish have to be carried a long distance. We will deliver to your driveway, and if access to pond/lake is good (as determined by our driver), we will stock the fish into the pond/lake. If access is poor, you are responsible for transporting the fish from the driveway and stocking them yourself.

Another benefit to you is that if we stock the fish, **we guarantee the fish against major fish kills** for one week after delivery. Extra fish will be given at no extra charge to cover any minor loss and as a token of our appreciation for your business.