

Pet Fish and Dealing With a Power Outage

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Gregory A. Lewbart MS, VMD, Dipl. ACZM
greg_lewbart@ncsu.edu

(These notes were written after the 2002 Raleigh ice storm and have been updated.)

In December 2002 the numerous cracking boughs and fiery transformers awakened me to the importance of a contingency plan for pet fish, both indoors and outdoors, when electricity stops. Many of the points below will apply to an extended power outage, regardless of the cause. Please feel free to pass this document along to anyone that may benefit.

General Guidelines:

- 1. Food:** Do not feed your fish during a power outage (an exception would be an unfiltered bowl or aquarium containing a betta fish). In warmer months the act of eating and digesting will use valuable oxygen (there is less dissolved oxygen in water as the temperature rises). In winter your fish will likely have plenty of oxygen but will probably be uninterested in food with a slowed metabolism. Furthermore, uneaten food will only pollute the aquarium or pond with unnecessary nitrogen, further stressing the animals.

- 2. Temperature:** In winter, try and insulate your aquarium with a blanket, sleeping bag, or newspapers. In summer, remove anything from the water's surface in an effort to increase the free surface area, and hence gas exchange efficiency. Obtain an aquarium thermometer and have it handy to monitor the water temperature. Most tropical fish can tolerate temperatures in the low 60's (F) or even high 50's for several hours. Once temperatures dip to the mid-50's action should be taken to elevate the temperature. Here are some options:
 1. Obtain an alternate power supply to run the heater and pump/filter. This could be a generator or creatively used extension cord to a location with power.

 2. Obtain an alternate and safe external heat source such as a propane or kerosene heater.

 3. Physically transport the fish to a warmer location. Heavy-duty zip-lock bags work well for this purpose. Fill the bag with one-third water and two-thirds air. Pure oxygen is even better than room air. As long as the external temperature is adequate, sparsely packed fish (5 inches of fish per gallon) should survive for at least 36 hours packed in this manner. Alternatively, any secure vessel such as a bucket, tub, or large jar can be used to move fish to a safe location. While moving the entire aquarium is an option, it will usually present some logistical challenges. If one decides to move the

aquarium, then up to 70% of the water may be discarded before the move to make transport easier (remember, a gallon of water weighs 8 pounds).

4. In the case that the fish cannot be moved, and the water temperature reaches a critically low level, warm dechlorinated water can be added to the aquarium. A thermometer should be used to be certain that acute changes do not exceed 5 degrees F. Generally, a 10% water change with warm water every hour or two should safely increase an aquarium's temperature without endangering the fishes.

5. Temperate species such as goldfish, koi, and North Carolina native fishes should be fine without changing anything in the environment. If the power outage persists, and the surface of a pond freezes over, the ice can be mechanically broken to form an "air hole."

6. Only as an absolute last resort should fish from one aquarium or pond be mixed with fish from another aquatic system. This practice greatly increases the risk of spreading infectious viral, bacterial, fungal, and parasitic diseases. It may also lead to inter or intraspecific aggression.

3. Water Quality: The longer fish remain in unfiltered water the worse water quality parameters will become. Again, do not feed fish while there is no power and try and test the water for elevated ammonia levels. Most fish can survive days or even weeks without food. If ammonia levels increase above one (1.0) ppm then water changes (10-30%) are recommended.

4. Lighting: The least of your worries. Ornamental fish will survive indefinitely without fluorescent lighting.

Supplies to have available:

- A net (note: herding fish into a plastic bag using a net is a much safer way to capture fish than using a net on its own. Nets can damage the protective mucus layer and sensitive epidermis.)
- Bucket(s)
- Dechlorinating agent
- Propane or kerosene heater
- Rubber bands (to close bags in case zip-lock bags are unavailable)
- Salt (either as a tonic for freshwater fish or in case artificial seawater needs to be made for marine animals)
- Spare aquarium heater
- Telephone number and address of the nearest pet store
- Thermometer(s)
- Zip-lock bags (various sizes)