

Fish Kills in the NT

Reports of dead and dying fish in top end waterways of the Northern Territory occur almost every year. About 40 fish kills were reported from 1990 to 1999 with some reports involving thousands of fish. The sight of large numbers of dead fish is quite disturbing and most people assume the cause is pollution of some kind.

The fact is that, in the relatively unpolluted waters of the Territory, fish kills are usually a natural occurrence unrelated to human activities.

Where And When Do Fish Kills Occur?

Fish kills occur in rivers, creeks, pools, dams and billabongs of the NT. The majority of reports are from the coastal plains near Darwin. This is probably due to the large number of people, including scientists, visiting this area. It is likely many more fish kills occur than are reported especially in the more remote coastal plains and waterways.

Fish kills can occur at any time of the year but are most common during the beginning of the wet season (October to January) when waterways start to flow again after the dry season.

How Do The Fish Die?

There are three basic causes of natural fish kills:

- Lack of oxygen,
- Poisonous effects from natural toxins, and
- Pollution.

These can occur separately or act together to cause fish kills but the most common reason is lack of oxygen.

Lack Of Oxygen

Oxygen that is dissolved in water comes from the air, and the aquatic plants that produce it by photosynthesis. The amount of oxygen available in the water for fish to breathe is affected by:

- The temperature of the water – warm water holds less oxygen than cold water.
- The movement of the water and its exposure to wind that increases its ability to absorb oxygen.
- The number and variety of other organisms and chemical reactions that use oxygen.

For example - The break down of dead plants and animals by bacteria and other microscopic organisms have a high demand for oxygen. In some cases this can deplete the oxygen in water and fish will die.

Towards the end of the dry season, remanent pools from seasonally flowing creeks and rivers will dry up or become too small to support the number of fish trapped in them.

As the water becomes shallow and the water temperature rises, many fish will die from the lack of oxygen in the water. Decomposition of these dead fish further decreases the amount of oxygen in the water. Food

supplies also become scarce, but it is usually lack of oxygen that causes the fish kills as many fish can survive long periods without food.

During the wet season build up, storm runoff can cause large fish kills in waterways. The rain washes in accumulated animal faeces, dead plant and animal material. The decomposition of this huge 'slug' of organic material in the water, can cause severe oxygen depletion, resulting in massive fish kills.

A good example of this occurred in Donkey Camp Pool in the Katherine River in 1987. Runoff from two 'build up' storms over part of the river catchment produced a 'slug' of water rich in organic material, which flowed into Donkey Camp Pool. This water replaced the Donkey Camp Pool water, and the decomposition of the organic material significantly reduced the amount of oxygen in the water. This resulted in the death of approximately 5000 fish which had been trapped in the pool.

An interesting observation from the Donkey Camp fish kill, and one that has been observed in other fish kills, was that it was primarily the larger fish which were affected. This is probably due to the fact that the gill area of large fish is proportionally smaller to their body size than small fish, so that their gills have to work harder to get enough oxygen under very low oxygen conditions. Some species can get extra oxygen by gulping air at the surface, a survival technique of schools of small fish observed at Donkey Camp Pool. Another way in which oxygen levels in the water can be reduced to levels low enough to kill fish, is by the mixing of surface and bottom layers of water in deep lakes and billabongs. In deep water bodies, water tends to be layered with warm water at the surface and cool water at the bottom. When this layering persists, the bottom waters can become completely depleted of oxygen. If the layers are mixed rapidly by strong winds, the surface waters can become low in oxygen, causing fish to die.

Natural Toxins

Fish kills in the floodplain billabongs of Magela Creek in Kakadu have been caused by the inflow of natural acidic water with high aluminium concentrations. This results from the acid sulphate soils in the catchment. The high acidity mobilises naturally occurring aluminium which is absorbed onto the gills of fish, interfering with their ability to breathe. Other coastal plains with acid sulphate soils are likely to experience fish kills from this cause.

The bark and leaves of some tree species, when leached and decomposed in water can produce compounds which are known to be toxic to fish. Bark from *Owenia vernicosa*, also known as emu berry or marble tree, has been used by Aborigines to induce fish death, enabling the collection of the fish for food.

**Any queries or to report fish kills phone the Fisheries & Marine Pollution Response Line
Hotline 08 89 220819 Or 24 Hour Freecall – 1800 064 567**

