

IOWA'S WATER

Ambient Monitoring Program

Fish Kills in Iowa

In the past few years, fish kills have become a focus of public attention as more interest is placed on the quality and condition of Iowa's streams and rivers. The Integrated Report, which combines federal requirements for state Section 305(b) water quality assessments and Section 303(d) impaired waters listings, required the Iowa Dept. of Natural Resources (IDNR) Watershed Monitoring and Assessment section to begin tracking fish kills. A fish kill can affect the 305(b) water quality assessment of the waterbody and can potentially result in the waterbody being added to the 303(d) list of impaired waters.

The IDNR Fish Kill Database (<http://programs.iowadnr.gov/fishkill/fkindex.aspx>) stores the data for all fish kills in the state from 1995 to the present. Year to date information, historic records, and custom queries are available to the general public, as well as the ability to download the requested information.

Currently, there are 435 fish kills recorded in the Fish Kill Database. Human-caused kills comprise half of the fish kills, with 29% being of natural or environmental origin, and the remaining 21% of unknown cause.

Natural/Environmental fish kills include those caused by disease, spawning stress, and temperature related events, including extreme heat, ice-out conditions, and dissolved oxygen "sags." Typically, little follow-up is done on natural/environmental fish kills, as there is no responsible party that directly caused the kill. Non-point pollution sources may also present a chronic, poor water-quality condition that can lead to an increased likelihood of a natural/environmental kill, such as large algal blooms. For example, agricultural practices on the surrounding watershed may contribute excess nutrients, which in turn feed the algal bloom. When the algal bloom dies and decomposes, the dissolved oxygen levels drop severely and cause a fish kill.



Fish kill at Lotts Creek, Kossuth County, December 2001.

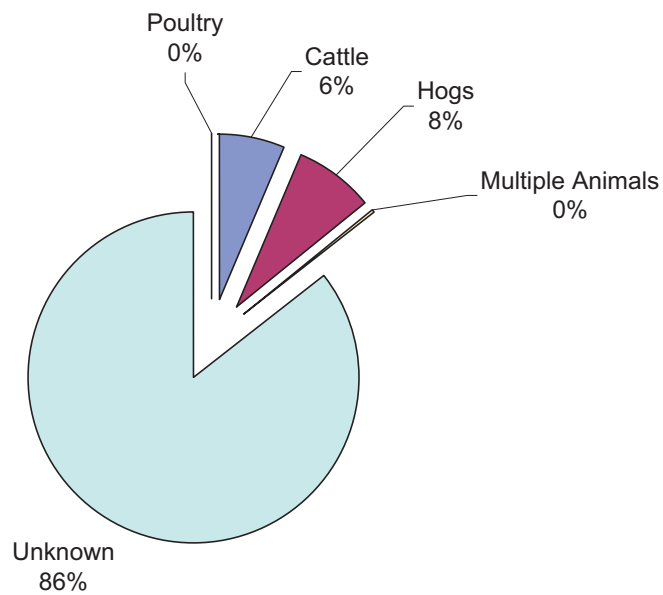


Figure 1. Animal waste kills – animal type.

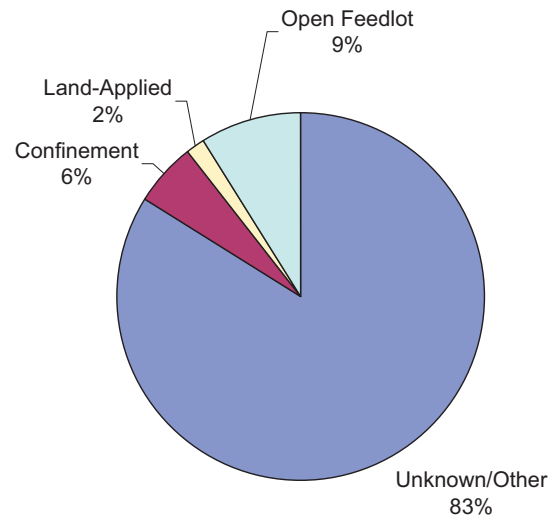


Figure 2. Animal waste kills – facility type.

Animal waste was responsible for over a quarter of fish kills in Iowa from 1995 to 2007. Animal waste can reach the stream and cause mortality through several pathways: run-off of field applied manure and open feedlots, confinement waste storage failures, and other accidental releases. There are a large number of unknown facility and animal types for animal waste kills, due largely to a lack of this type of information being provided in early data collection and record keeping. More recent fish kill data collection routinely records this data, when available, allowing the IDNR and other interested parties to determine trends and possible areas of improvement to reduce the number and impact of animal waste kills on waters of the state.

When no clear cause can be determined by IDNR staff investigating the kill, the cause is considered “unknown.” There are several factors that can make assessing a cause for a fish kill difficult. On-site conditions can impair the ability of investigators to determine a cause, such as flooding or difficult physical access to the location. Contaminants can also travel long distances through tile lines, well away from the source. Delays in reporting a fish kill lessen the likelihood of a cause being found. When a kill is reported several days or more after the actual event, the stream’s flow will continue to dilute and dissipate the responsible pollutant and the resulting dead fish, making the determination of an exact cause, the magnitude of the kill, and a responsible party a difficult or impossible task.

How does a fish kill affect water quality and water quality assessments?

Under IDNR’s current methodology for water quality assessments, the occurrence of a single pollutant-caused fish kill, or a fish kill of unknown origin, on a waterbody or portion of a waterbody during the most recent three-year period indicates an impairment of the aquatic life uses. This “once in three-year” frequency of criteria violation is designed to provide protection for ecological recovery from a severe stress and is consistent with U.S. Environmental Protection Agency recommendations.

Each report of a fish kill will be reviewed to determine whether development of a Total Maximum Daily Load (TMDL) is appropriate. In the absence of an ongoing source of a pollutant, TMDLs will not be

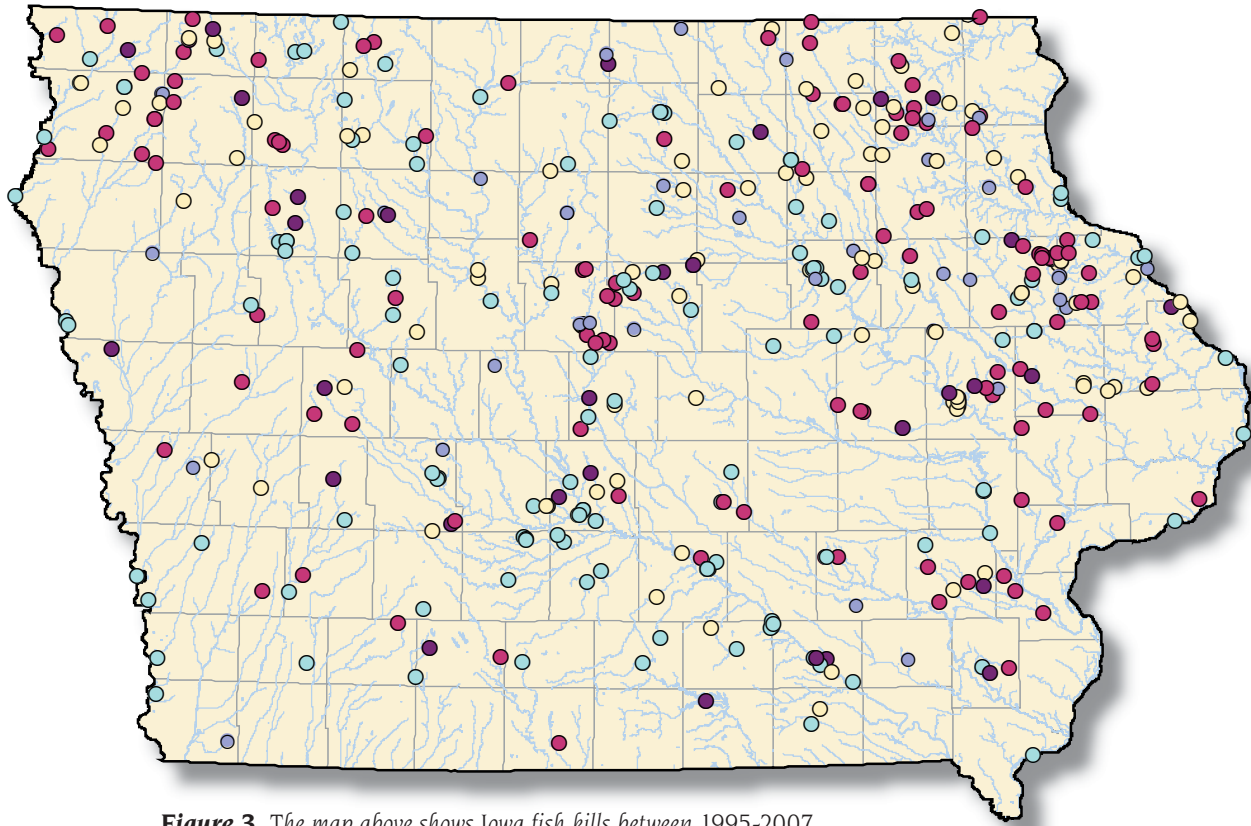
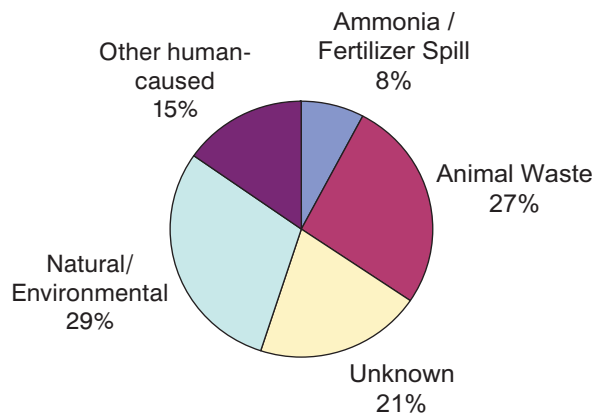


Figure 3. The map above shows Iowa fish kills between 1995-2007. Fish kill causes correspond by color to pie chart (lower right).

developed for kills caused by a one-time illegal or unauthorized release of manure or other toxic substance. Impacts from this type of fish kill are addressed through IDNR's enforcement procedures. Fish kills attributed to authorized discharges (i.e., a wastewater discharger meeting permit limits) are considered for impaired waters listing as the existing, required pollution control measures are not adequate to address the impairment.



How quickly do streams recover from fish kills?

The IDNR has completed a study on the impacts and recovery of fish kills on streams across the state (http://wqm.igsb.uiowa.edu/wqa/pdf/Stream_Fishkill_Followup.pdf). The impacts range from total kills to minor impacts on a few specific species, and recovery has been found to run the spectrum from severe impairment to full recovery. Streams that showed slow or no recovery were often associated with long-term water quality problems existing before the fish kill occurred and continuing after the fish kill event.



Contaminants often travel through tile lines into streams, resulting in fish kills.

Are there more fish kills now than before?

This is a difficult question to answer. It may appear there are more fish kills now than in years past, but it must also be noted that more attention is now being placed on fish kills. This increase in public awareness has resulted in citizens keeping a closer eye on local waters and reporting potential problems when discovered, rather than reporting them long after the event or not reporting them at all. The IDNR has also made a concentrated effort to improve the response time, data collection, and follow-up after a fish kill event, and to make the data collected available to the public.

How do I report a fish kill?

If you believe a fish kill has occurred, please immediately contact the nearest IDNR Field Office (www.iowadnr.gov/fo/fomap.html) or Fisheries Office (www.iowadnr.gov/fish/offices/offices.html). You should have available the name of the stream, the location of the kill, and any other conditions or observations that may aid in the investigation of the cause and source of the kill. Do not touch the water or remove any dead fish.

Acknowledgements

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Iowa Watershed Monitoring and Assessment Program Web Site – wqm.igsb.uiowa.edu



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