

CHAPTER 7. FISH KILL INVESTIGATIONS

INTRODUCTION

Fish kills occur for a variety of reasons. Some kills are natural and others are caused by the release or spill of a toxicant. Fish managers are responsible for assessing the fish loss and compiling reports.

1) Fish kills with a responsible party

Kills in which a responsible party is found, investigators should follow the guidelines outlined in the American Fisheries Society Special Publication 30 or the most current American Fisheries Society Publication available. Most kills will be investigated using the protocol *Streams Accessible at and Beyond and Crossings (Strata I, II, and III)* on page 21 of AFS Publication 30 (Southwick and Loftus 2003). Kills on lakes or ponds require making counts on randomly selected shoreline segments and expanding them for the entire shore length with dead fish..

Streams

Figure 1 is an example of a field sheet that fish counts can be recorded for each sample segment. Many fish species require a length to determine the fish value. This field sheet (Fig. 1) helps breakdown the length categories for common stream species.

Figure 1. Fish kill investigation sheet.

FISHKILL INVESTIGATION

DATE _____ STRATUM # _____
 WATER _____ SAMPLE LENGTH _____
 COUNTY _____ INVESTIGATORS _____
 LOCATION _____

	NUMBER
MINNOWS	
SHINERS	
CHUBS	
DACE	

SPECIES	INCH CLASS															>15 - LIST INDIVIDUAL LENGTHS	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
COMMON CARP																	
STONEROLLER																	
FATHEAD MINN.																	
REDHORSE																	
W SUCKER																	
N. HOGSUCKER																	
OTHER SUCKERS																	
C CATFISH																	
BULLHEADS																	
MADTOMS, ETC.																	
BUFFALOS																	
CARPSUCKERS																	
BLUEGILL																	
G. Sunfish																	
	1"			2"			3"										
DARTERS																	

Strata I segments usually include the distance of 50 yards above and 50 yards below the midpoint of each road crossing. All stratum I sites may be counted. On long kills, every other or every third crossing (Stratum I) may be counted to save time. The counts are expanded to include the entire length of Stratum I sites, if not all sites are counted.

Stratum II segments are usually 100 yard stream segment just outside the influence of road crossings (Stratum I segment) in both the upstream and downstream directions. Counts conducted on Stratum II sites are used for the expansion of fish killed in the Stratum III areas.

Stratum I and II count locations should be selected in a random or unbiased manner. The first order of business once on site is to determine the beginning and end of the kill. A contact to the Environmental Services Division field personnel will help in locating the start of the kill. Occasionally, the kill will still be extending downstream while on site. Under these circumstances, a sampling strategy can be started and expand the site selection as the kill proceeds downstream (Figure 2).

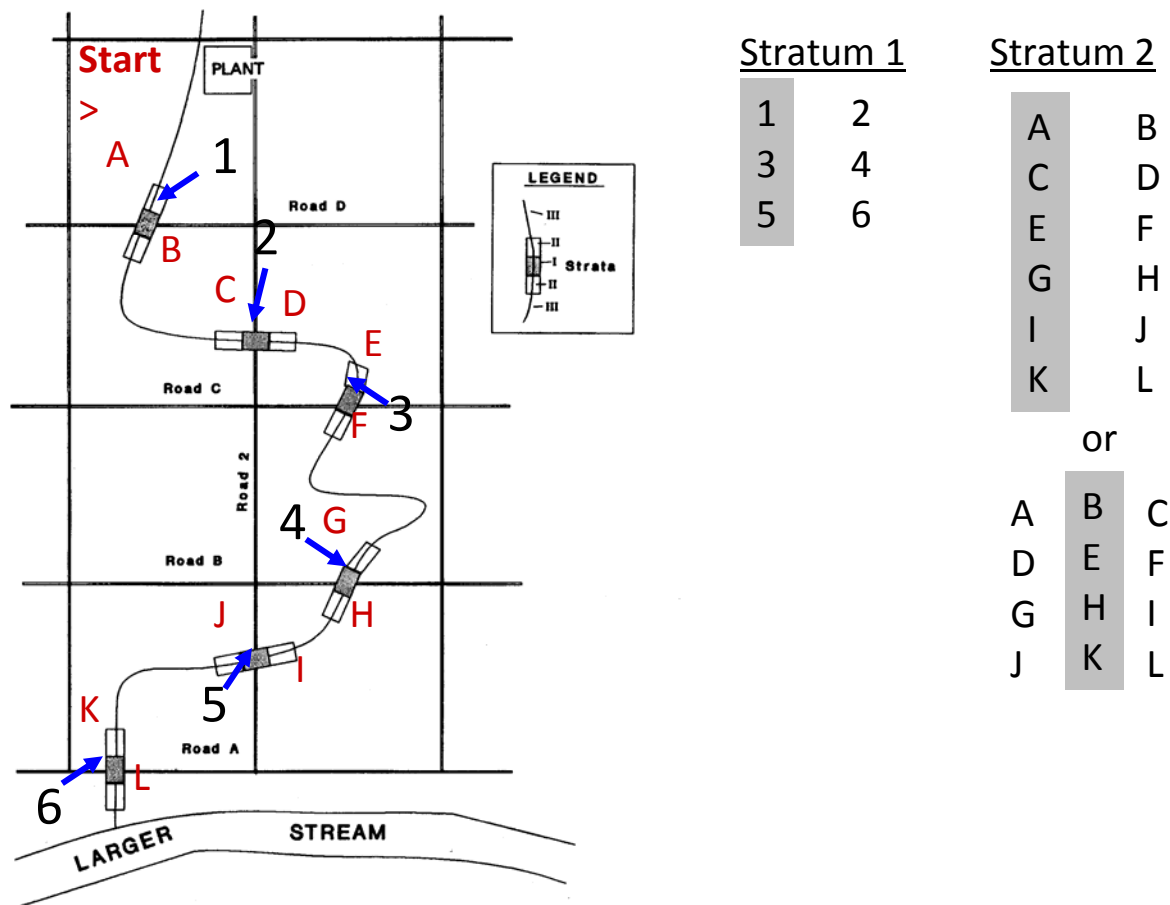


Figure 2. Sampling strategy for fish kill investigation.

Records should be kept for mileage, expenses, and time involved investigating and reporting. These items will be used for assigning a value for investigation costs. Current hourly wages should be used for biologist, technicians, and seasonal staff (Table 1) plus 12.8% overhead. The current vehicle mileage rate (Table 1) is used to get travel costs for the kill investigation. Additional field notes should include any odor, turbidity, ice coverage, and flow conditions. A GPS coordinate for the start and end of the kill, using Map Datum Nad 83, will be needed for the kill report. Digital photography should be used whenever possible to document fish loss and count locations.

Table 1. Wages and Expenses For Fish Kill Investigations (based on values as of 2007).

Hourly Wages

<https://www.iowaonline.state.ia.us/idopapptrack/ICPJobClassPrompt.asp>

- use an additional 12.8% overhead for benefits
- actual hourly wages should be used and can be located on your online warrant

Travel Expenses(2007)

- Lunch - \$8.00
- Dinner - \$15.00
- Mileage – \$0.34/mile

Fish values are based on those published in Southwick and Loftus (2003). The only exception is for game fish (catfish, bullhead, northern pike, muskellunge, trout, white bass, yellow bass, wipers, black bass, crappie, sunfish, rock bass, warmouth, yellow perch, walleye, sauger), which are valued at \$15 per fish, unless Southwick and Loftus (2003) establishes a higher value. For example, a 19 inch northern pike would have a value of \$48 using Southwick and Loftus (2003). These values give a total dollar amount for fish killed, based on the numbers expanded from the fish counts.

Reporting is required to several different people. The Fisheries Bureau Chief, immediate Supervisor, and the Environmental Services field staff should receive a report similar to Figure 3. The database manager (Jamie Mootz, 2007) should receive the summary report in Figure 4.

Figure 3. Fishkill report form.



STATE OF IOWA

CHESTER J. CULVER, GOVERNOR
 PATTY JUDGE, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
 RICHARD A. LEOPOLD, DIRECTOR

To: Marion Conover, Chief of Fisheries, Iowa DNR
 From: Scott Grummer, Fisheries Technician 2, Iowa DNR
 Date: March 3, 2007
 Subject: **Belly Up Creek Fish Kill**

Dates Investigated: March 1, 2007

Name of Water Body: Belly Up Creek

Investigators: James Wahl & Scott Grummer

Location: Kill traveled 11.2 miles from Section 5, Lincoln Township, Kill County, just east of Dead Fishville, to the south end of Section 12, Woolstock Township, Kill County.

Cause of Kill: Manure release from livestock confinement operation.

Responsible Party: Joe Oops, Sloppy Management Farms
 1 Hog Lane
 Dead Fishville, IA 50000

Methods: Enumeration and values of fish were derived from procedures outlined in American Fisheries Society, Special Publication 30 and Iowa Administrative Code Chapter 113.

Fish Killed:

SPECIES	NUMBER KILLED	MONETARY VALUE
Minnnows, shiners, chubs, and dace	158,049	\$12,643.92
Sunfish	23	\$345.00
Smallmouth bass	42	\$630.00
Darters	1,425	\$542.98
Stonerollers	468	\$47.66

Totals 160,007 \$14,209.56

Investigation Costs:

6 hour investigation * use current salary rates as these change
 Salaries w/ 12.8% overhead: *\$24.85 X 6 = \$149.10 X 1.128 = \$168.18
 *\$19.87 X 6 = \$119.22 X 1.128 = \$134.48
 Meals: \$12.00
 Mileage: 80 miles X **\$0.34 = \$27.20 ** use current mileage rate

Investigation Costs Total : \$341.86

KILL TOTAL = \$14,551.42

FISH AND WILDLIFE STATION, 1203 N. SHORE DRIVE, CLEAR LAKE, IA 641.357.3517

Figure 4. Fishkill database report form.

Iowa Department of Natural Resources

Fish Kill Report Form

DATE OF KILL:

Name of Waterbody:	UTM North:	UTM East:
Legal Location: T__ N R__ E/W Section ____	Nearest Town:	County:

Indicate Cause:

Natural Causes	Man-made Causes	Select if known.
<input type="checkbox"/> Unknown <input type="checkbox"/> Columnaris <input type="checkbox"/> Gas Bubble Disease <input type="checkbox"/> Bacteria/Parasite/Disease <input type="checkbox"/> Summerkill (general symptoms) <input type="checkbox"/> Winterkill <input type="checkbox"/> Low DO <input type="checkbox"/> Temperature <input type="checkbox"/> Spawning Stress	<input type="checkbox"/> Unknown <input type="checkbox"/> Animal Waste- Open Feedlot <input type="checkbox"/> Animal Waste- Confinement <input type="checkbox"/> Animal Waste- Land Applied <input type="checkbox"/> Animal Waste- Unknown/Other <input type="checkbox"/> Municipal Wastewater <input type="checkbox"/> Private Septic <input type="checkbox"/> Chlorinated Water <input type="checkbox"/> Petroleum <input type="checkbox"/> Soil Runoff <input type="checkbox"/> Pesticides <input type="checkbox"/> Fertilizer <input type="checkbox"/> Other Chemical/Industrial <input type="checkbox"/> Organic Waste (milk, silage, etc) <input type="checkbox"/> Ammonia- Nonpoint/unspecified	<input type="checkbox"/> Animal Type > <input type="checkbox"/> Cattle (Beef/Dairy) <input type="checkbox"/> Hogs <input type="checkbox"/> Poultry <input type="checkbox"/> Multiple Types

Waterbody Type:	Length/Area of Kill:
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FISH KILLED

Species	Size of Fish	Number Killed

Investigation Expenses:

Fish Total:	Investigation Total:	Grand Total:
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DNR Contact/Investigator:	Responsible Party:

Other Comments:

2) Fish kills with no responsible party, <3 miles in length (this includes natural kills)

Caution should be used! Verify that no responsible party will be found. Contact the ESD field staff to see if their investigation is complete.

Perform a minimum of one Stratum II count (100yds) near the middle of the killed stretch. Expand the count for the entire kill distance to get a rough estimate of the fish lost. Use AFS Publication 30 fish values and \$15 per game fish for a total kill value. Keep track of time and mileage for an investigation cost amount. Use current salary rates plus 12.8% overhead. Send summary reports to your immediate Supervisor and Environmental Services field staff (Figure 3). The database manager needs report form in Figure 4.

3) Fish kills with no responsible party, >3 miles in length (this includes natural kills)

Caution should be used! Verify that no responsible party will likely be found. Contact the ESD field staff to see if their investigation is complete.

Perform a minimum of two randomly selected Stratum II counts within the killed stretch. Expand these counts for the entire kill distance to get a rough estimate of fish lost. Use AFS Publication 30 fish values and \$15 per game fish for a total kill value. Keep track of time and mileage for an investigation cost amount. Use current salary rates plus 12.8% overhead. Send summary reports to Supervisor and Environmental Services field staff (Figure 3). The database manager needs report form in Figure 4.

REFERENCES

Southwick, R.I., and A.J. Loftus, editors. 2003. Investigation and monetary values of fish and freshwater mussel kills. American Fisheries Society, Special Publication 30, Bethesda, Maryland.