BRIEFING STATEMENT
U.S. Fish and Wildlife Service

TITLE: Wildlife Contaminant/Cleanup Planning Conflicts, Rocky Mountain Arsenal National Wildlife Refuge (Refuge)

ISSUE:
Recent Refuge contaminant investigations have documented bird mortalities, elevated contaminant levels in Kestrel eggs and nestlings, and failed reproduction in test populations of starlings. Preliminary data indicate that pesticide contaminated basins and former manufacturing facilities in the core of the Refuge are responsible for these impacts. Impacts to Fish and Wildlife Service (Service) trust resources will persist until contaminant exposure pathways are eliminated. Continuing debate over final cleanup solutions and cleanup strategies which prolong existing exposure, or potentially aggravate contaminant exposure and distribution (e.g. remedies involving direct soil handling, transportation, and thermal treatment), could result in unacceptably high and long-term losses of protected wildlife species.

STATUS:

- Although the Refuge supports generally healthy fish and wildlife populations, ongoing Service studies have documented localized avian mortalities, principally from dieldrin exposure.

- Over 1993 and 1994, 164 dead birds have been reported from the Building 111 complex (starlings, robins, doves, house finches and house sparrows).

- Preliminary telemetry data indicate that Building 111 bird mortalities are correlated with core area sources of contamination (i.e. exposed basins and manufacturing complexes). Contaminant loads and the frequency of mortalities were greater for those birds trapped at Building 111 that used contaminated core areas versus those that remained in the vicinity of Building 111.

- Dieldrin levels detected in the eggs and nestlings of American kestrels were significantly higher (up to 30 times higher) for nests located in core areas of the Refuge than areas of the Refuge outside the core.

- Preliminary information from a Clemson University study indicated that artificial populations of starlings established in the core area exhibited total reproductive failure, whereas similar populations located on the Refuge but away from contaminated areas reproduced normally.

SERVICE POSITION:

The Service contends that sufficient contaminant and environmental background data are available to develop sound cleanup solutions that are protective of both humans and fish and wildlife. The Service submits that additional delays in cleanup planning, or implementation of strategies that prolong physical exposure of existing contaminant sources, violate Service trust responsibilities and is contradictory to the purposes of the Refuge.

SUMMARY OF FORTUITOUS SPECIMEN PROGRAM AT RMANWR

** 98 of 111 dead birds recorded in 1993 were found at Building 111 (Army administration grounds), primarily robins, starlings, finches, doves, sparrows.

** 66 of 138 dead birds recorded in 1994 were found at Building 111, primarily robins, starlings, finches, sparrows. Many carcasses were unsuitable for examination due to decomposition/scavenging. Some results have not yet been received. **Necropsies of 22 1993 & 1994 Building 111 birds revealed undetermined cause of emaciation.**

** Other 1994 specimens included 27 raptors, and 28 deer or other mammals. Of 49 determined deaths, trauma was the cause in 47% of animals, disease 6%, electrocution 6%, and 41% were attributed as undetermined cause of emaciation and/or dieldrin poisoning. There have been few contaminants detected in deer.

** **Preliminary radio telemetry data on robins and starlings at Building 111 showed that birds ranging to the South Plants and contaminated basins died, others did not.** Recaptured birds that were recorded feeding mainly at Building 111 did not die. The Building 111 lawn is a source of contaminant exposure to species that feed there; however, some species found dead do not forage on the lawn.

** **Dieldrin causes animals to stop eating and lose weight, thus becoming emaciated. 60% of brain residue results from Building 111 birds fell into the 5-9 ppm or > 9 ppm categories. Two birds (great horned owl and magpie) found in the South Plants fell into the 5-9 ppm and >9 ppm category.** Birds with 1-5 ppm dieldrin were a starling from Section 36 and 4 raptors from Sections 6, 7, 19, 35.

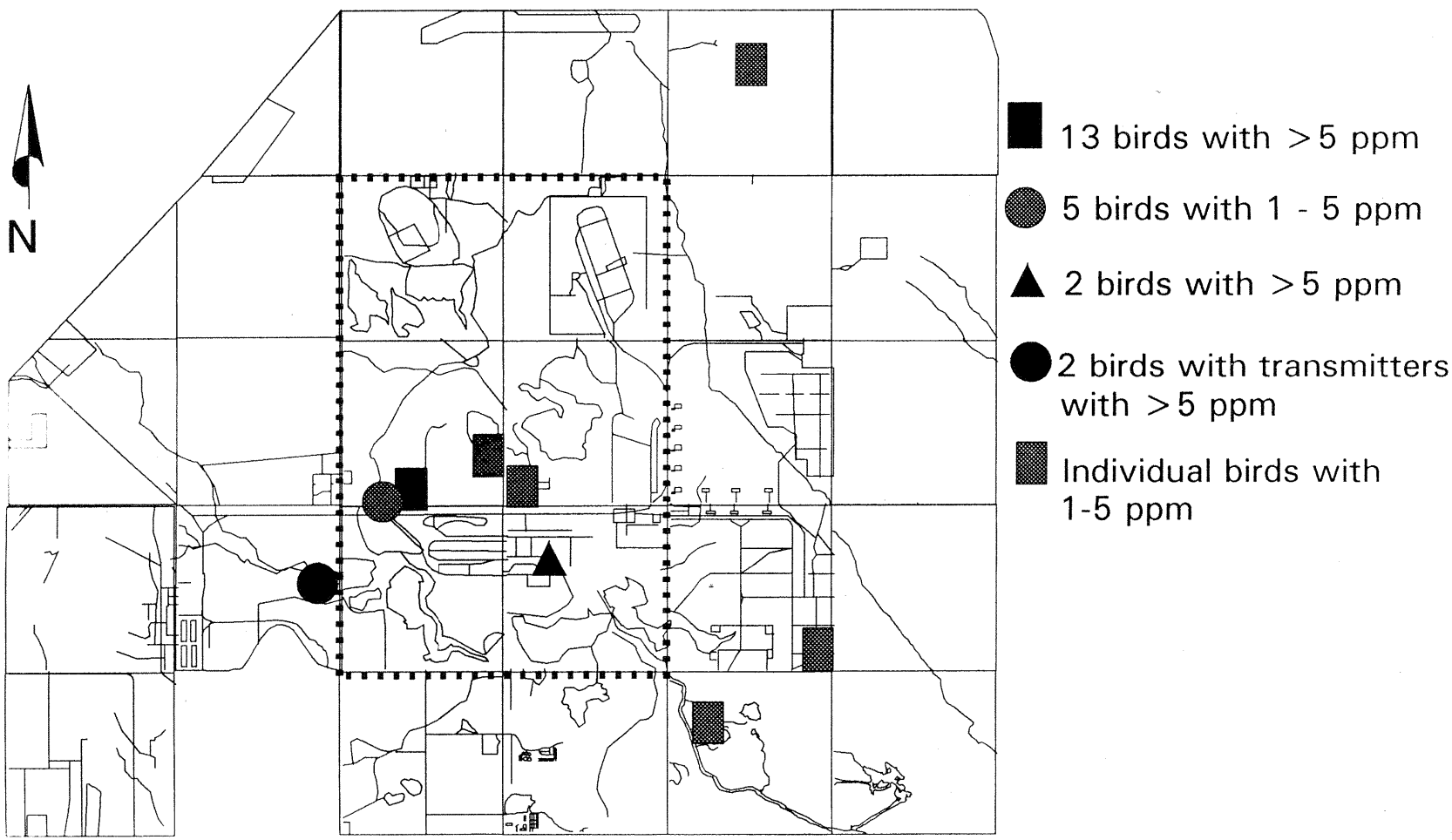
** **The Service developed guidelines for interpreting dieldrin impacts on birds based on laboratory studies and field studies reported in the literature:**

-- >9 ppm dieldrin in brain is indicative of death by dieldrin poisoning

-- 5-9 ppm dieldrin in brain with supporting necropsy results is indicative of death by dieldrin poisoning

-- 1-5 ppm dieldrin in brain constitutes health risk but animal probably died from other causes

***Locations of dead birds with lethal dieldrin or with dieldrin levels of concern in brain (1993-1994)***




***Core area (sections 1,2,35,36,25,26) outlined***

# SUMMARY OF AMERICAN KESTREL MONITORING AT RMANWR, 1993-1994

** During 1993-94, 70 kestrel nesting attempts were reported on RMANWR.

** Nest success was 72% in 1993 and 80% in 1994. This is within the "normal" range for artificial nest box populations.

** 45 kestrel nestlings (21 days old) were systematically collected from locations across the RMANWR in 1993-94.

** Five of the carcasses collected by the Service had dieldrin concentrations as high or higher than reported by DeWeese and McEwen in 1982/83 or 1986. In addition, two eggs collected in 1993 had dieldrin concentrations higher than concentrations reported in 1982/83 or 1986. These eggs were collected in 1993 from a nest box near Basin A.

** The average concentration of dieldrin in kestrel nestling carcasses on RMANWR for 1993-94 was 0.28 ppm wet weight. In 1986 the mean concentration was 0.309 ppm. Apparently then, the concentrations of dieldrin in kestrel nestlings has not dropped appreciably over the last 8 years.

** Typically, nest boxes that contained eggs with the highest dieldrin concentrations were from the central core. Only three eggs with elevated dieldrin concentrations (≥ 0.1 ppm) were from outside of the central core (Figure 2).

** Typically, nest boxes that contained kestrel nestlings with the highest concentrations of dieldrin were located within the central core of RMANWR (Sect's. 1, 2, 25, 26, 35, 36). Only one carcass that contained elevated dieldrin concentrations (≥ 0.1 ppm) was from outside of the central core (Figure 3).

** Although overall kestrel populations on the Refuge are not being appreciably affected by contamination, some individual kestrels are exposed to and potentially affected by dieldrin. The individuals that would most likely be affected are those that nest and/or feed in areas within the central core of the Refuge, especially, near Basin A, Basin F and the South Plants Complex.

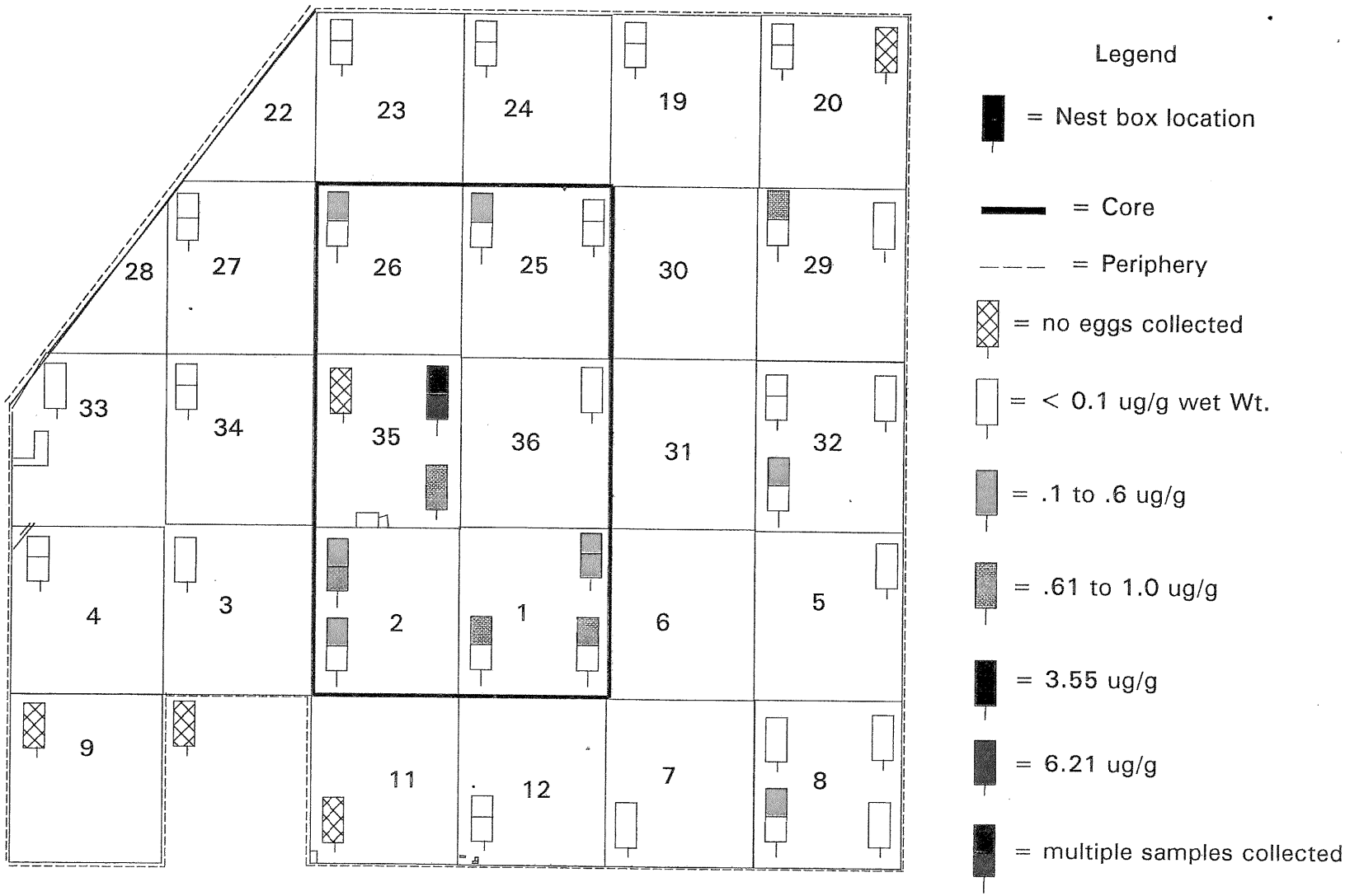



Figure 2. Distribution of dieldrin concentrations in kestrel eggs, 1993-94 (n = 66)

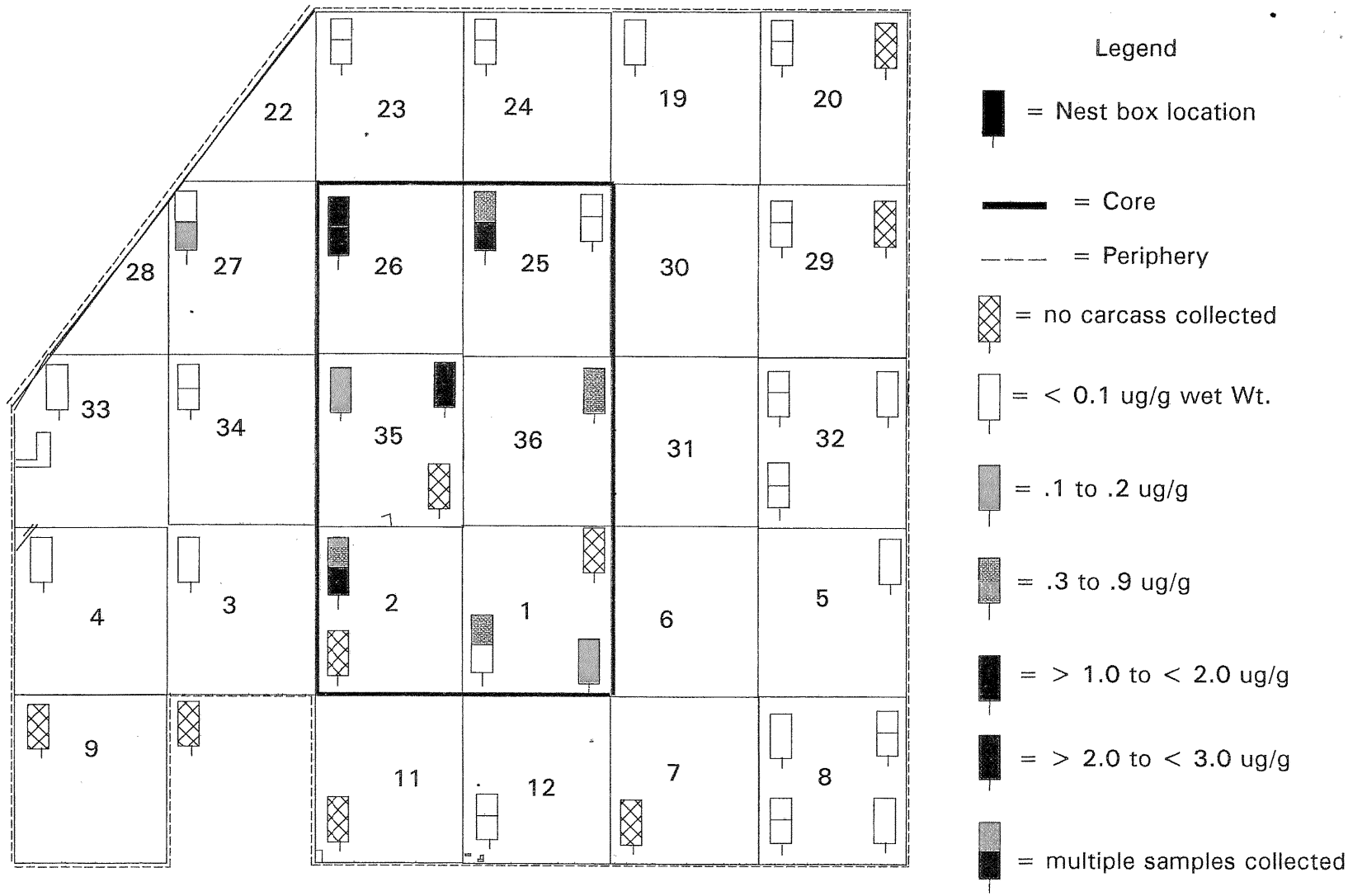
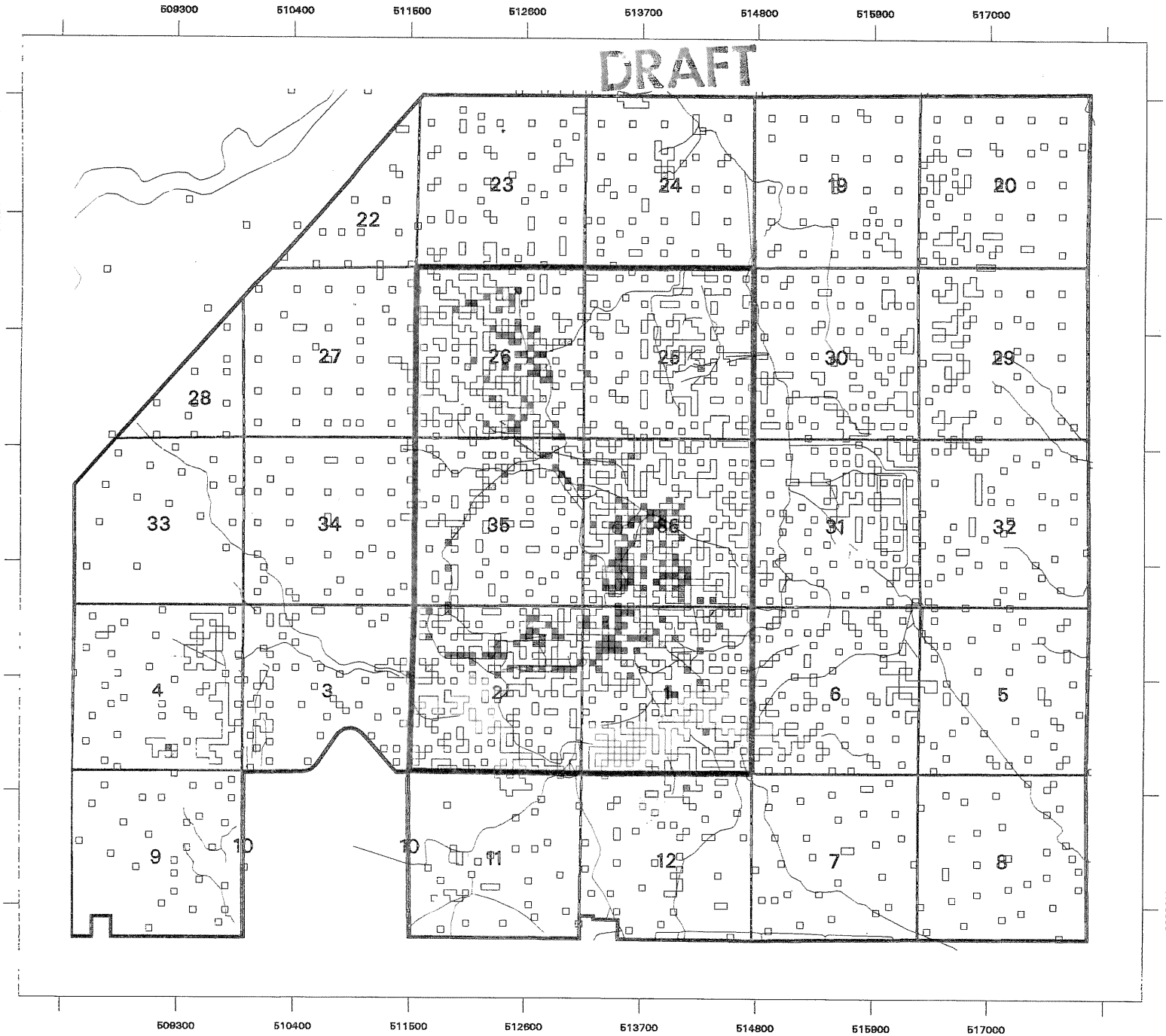



Figure 3. Distribution of dieldrin concentrations in kestrel carcasses., 1993-94 (n = 45).

# DIELDRIN IN SURFICIAL SOILS - 60 METER GRID CELLS




*LEGEND*

- < .5 ppm
- > .5 < = 1 ppm
- > 1 < = 3 ppm
- > 3 < = 6 ppm
- > 6 < = 18 ppm
- > 18 ppm
- Lakes
- Rivers

*SCALE: 1cm = 500 METERS*

*Source: Ingres database (RMAED) surface soil data was gridded with 60 meter cells around points.*
*-99 or blank indicates no data*
*Values less than the certified reporting limit converted to 0*
*DP Associates, 10/20/94.*

(a)