

**FROG CALL SURVEY OF THE  
WOONASQUATUCKET RIVER IN THE VICINITY  
OF THE CENTREDALE MANOR SUPERFUND SITE  
NORTH PROVIDENCE, RHODE ISLAND**

1. History

\* Folks living in the area of Centredale Manor indicated that calling populations of frogs seemed much lower than in years passed. EPA responded by asking USFWS to conduct a frog call survey.

2. Protocol

\* Based on North American Amphibian Monitoring Program (NAAMP) protocol which was developed to determine long-term trends in frog populations based on call counts conducted by volunteers. Study transects are chosen randomly by a computer. Surveys are conducted between ½ hour after sunset and 2 am. Participants listen at each station for 5 minutes and record a Calling Index Value for each species heard.

\* Each frog species has a different call just like bird species have different songs. Frogs call for the same reasons as birds sing; to attract mates and to establish territories. The different frog species call a different times during the season (end of March - early July). First hear spring peepers and wood frogs; then leopard frogs, pickerel frogs, and American toads; then gray treefrogs, green frogs, and Fowler's toads; and lastly bullfrogs. Therefore, surveys must be conducted numerous times during the season to pick up all of the possible species.

\* For the Centredale Manor study, 9 listening locations were chosen: 4 upstream of any contamination associated with the Site; 2 on Allendale Impoundment; 2 on Lymansville Impoundment; and 1 on Manton Impoundment. Sites chosen based on design (reference vs impacted locations), and presence of habitat (aquatic vegetation, standing water, little water current). Also, locations where could hear over large area was preferred. Purpose of study was to collect qualitative (rather than quantitative) information that will support whether the frog breeding populations have been impacted by the contamination released at Centredale Manor.

3. Results:

\* In 2001, heard a breeding population of frogs at all sites but the upper-most reference site and the two Allendale Impoundment sites. The reference site may have had too much current so that site has been replaced for 2002. Allendale is difficult to interpret because we did hear some Fowler's toads in the area, and since the dam breached, water was limited in the impoundment. Fowler's toads are terrestrial except for the brief breeding period, and young transform quickly (within several weeks versus 1-3 years for green frogs and bullfrogs) so they may be less sensitive to contamination. They also have dry warty toad skin which is less absorbent than wet, slimy aquatic frog skin.

\* We have surveyed twice in 2002 so far. We have begun to hear frogs in the Allendale Impoundment suggesting that the habitat was limited last year by lack of water. "If there is water they will come".

\* This study does not evaluate the success of the reproduction effort. Studies have shown that mid-stage tadpoles are the most sensitive to contaminants.



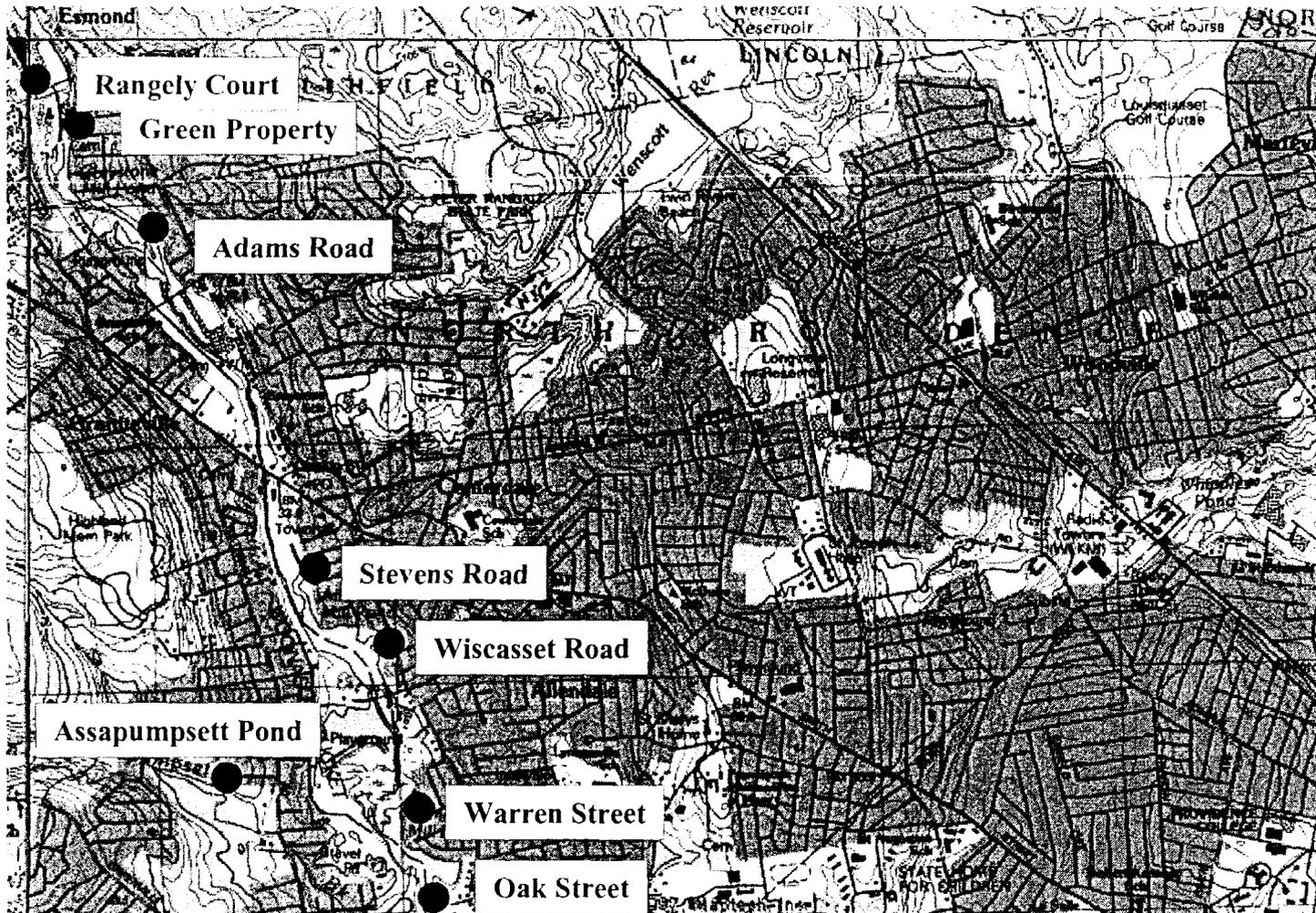


Figure 1. Locations of the frog call monitoring sites on the Woonasquatucket River in Providence, Rhode Island.

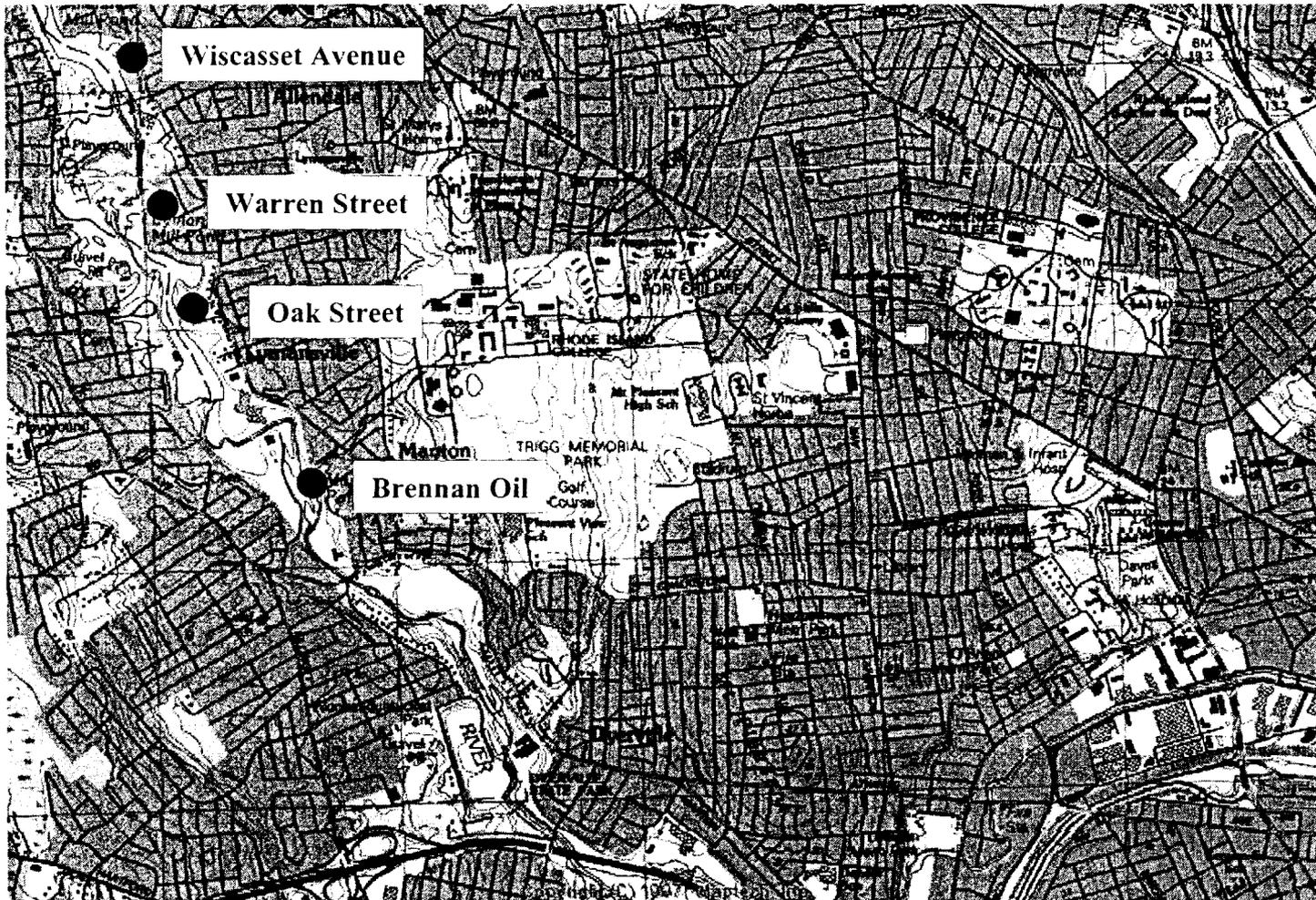


Figure 2. Location of the frog call monitoring sites on the Woonasquatucket River in North Providence, Rhode Island.

Table 1. Frog species heard (Call Index Value<sup>a</sup> with approximate number of individuals in parentheses) during a frog call survey on the Woonasquatucket River in North Providence, Rhode Island in the spring of 2001. The call survey was conducted as part of an assessment of the Centredale Manor Superfund Site. Values given are the maxima of four surveys.

Site	Species Heard (Call Index Value and Number of Individuals ( ))							
	Spring Peeper	Wood Frog	Pickereel Frog	American Toad	Fowler's Toad	Green Frog	Bullfrog	Gray Treefrog
Rangely Court	0	0	1(1)	0	0	1(1)	1(1)	0
Green Property	1( )	1(2)	1(5)	0	0	1(6)	1(1)	0
Adams Road	1(3)	0	1(4)	1(2)	0	2(8)	1(3)	0
Stevens Street	0	0	0	0	0	0	0	0
Wiscasset Street	0	0	0	0	2(4)	0	0	0
Warren Street	2( )	0	2(8)	1(2)	1(3)	2(6)	1(2)	0
Oak Street	0	0	1(3)	0	0	0	1(2)	0
Brennan Oil	0	0	1(3)	0	0	0	1(2)	0
Assapumpsett Pond	3( )	0	1(1)	2(4)	0	2(7)	1(2)	0

<sup>a</sup> Call Index Value: 1=Calls can be counted, no overlapping; 2=Calls can be distinguished, some overlapping; 3=Full chorus, calls continuous and overlapping.