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SUMMARY OF HUMAN HEALTH RISK SCREENS CONDUCTED FOR THE WOONASQUATUCKET RIVER, PROVIDENCE, RI

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Overview:

As part of its Urban Environmental Initiative, the Environmental Protection Agency (EPA) works in partnership to address the environmental concerns of several New England urban communities. As a result of this effort, EPA sampled and analyzed the sediment and fish tissue from the Woonasquatucket River in Providence, RI.

Fish Tissue Analysis:

In May, 1996, the EPA collected eighteen samples and analyzed sunfish and eel tissue samples from two locations on the Woonasquatucket River: Valley Street and Smith Street. The samples were analyzed for 15 contaminants including metals, PCBs, pesticides and dioxins. The analysis conducted by EPA's laboratory identified dioxins, PCBs, and mercury in the fish tissue. Since there were little data collected, EPA was only able to conduct a *risk screen* of the potential human health effects resulting from the ingestion of contaminated fish. A *risk screen* is usually performed when there is limited information about environmental concentrations, (e.g. in fish), or limited information about exposure, (e.g. who fishes in the river, how much fish do they eat, etc). A risk screen usually results in a conservative estimate of the potential human health risks which could occur.

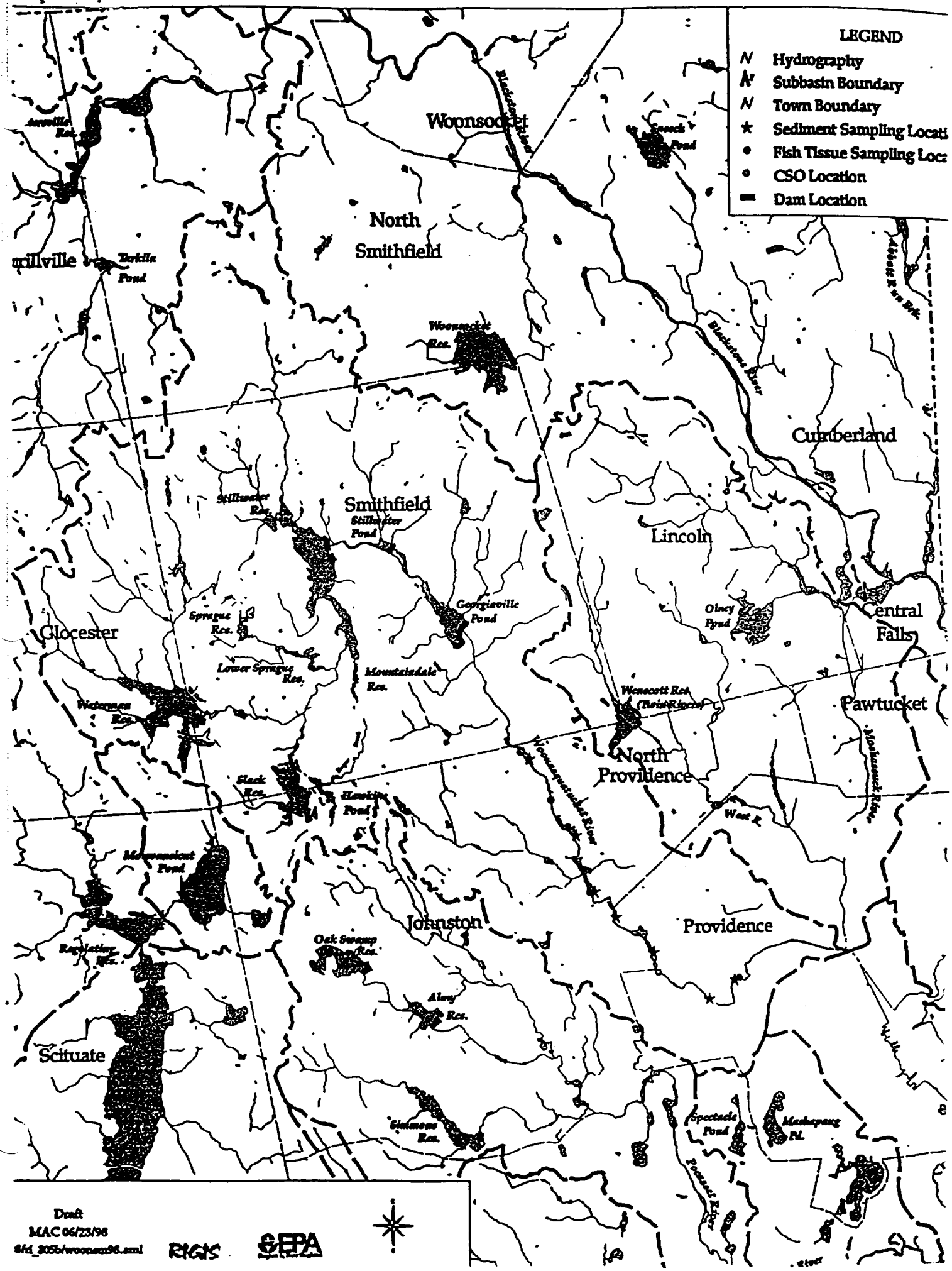
The risk screen for the Woonasquatucket River evaluated the potential risks to a hypothetical fisherman who would eat the fish caught from the river as a major food source. It was also assumed that the fisherman would consume the fillet, skin and organs of the fish. Results of the risk screen indicate that this type of exposure would result in a high likelihood of cancer, especially if the individual ate fish caught below the Smithfield Treatment Plant over his or her lifetime. In addition, several noncancer effects would likely increase, such as: adverse effects to the immune and reproductive systems, damage to the liver, kidney, thyroid and adrenal glands, and damage to the brain, kidneys and nervous system of the developing fetus. Although EPA did not evaluate the potential health effects to a fisherman who would consume a fillet of fish caught infrequently, there would still be a similar concern for adverse cancer and noncancer effects. Based on the EPA's risk screen and input from community groups, the RI Department of Health issued a health advisory in 1996 for the Woonasquatucket River. The health advisory recommended not eating any fish in the river caught below the Smithfield Treatment plant and urged a "catch and release" policy.

Sediment/Water Quality Analysis

As a follow-up to the fish tissue analysis, EPA conducted a preliminary evaluation of the sediment in the Woonasquatucket River in 1997. Seven soil samples were collected from behind dams located in a 7 mile stretch of the river. The samples were analyzed for metals, pesticides, PCBs, PAHs and Dioxins. Dioxins were confirmed at all 7 sampling sites, and the highest concentrations were located at the Allendale Dam and Lymansville Dam. These locations generally do not represent areas where individuals would be exposed. Since EPA wanted some understanding of the toxicity of these samples, however, it was conservatively assumed that these same concentrations existed on the banks, (where individuals could be exposed).

This risk screen evaluated exposure to an older child and adult, ages 7-31, who might occasionally use areas along the river to picnic, wade or walk. This analysis did not evaluate exposure to a child, (young or older), who might have more frequent exposures to the river, (e.g. if a beach or home existed along the river.) The risk screen indicates that adverse health effects from direct contact to sediments in the river during recreational exposures is unlikely for an older child or adult. Risks are expected to be low due to the low frequency of exposure assumed for this type of a scenario, (e.g. visits of 2 days/wk during the summer months of June through August, and 1 day/wk in May, September and October.) This is not the same type of exposure that would occur under a residential setting in which the existing level of contamination would be considered a health hazard.

Water Quality Conditions in the Woonasquatucket Watersh



Esmond Dam
Allendale Dam
Lymansville Dam
Manton Dam
Dyerville Dam
Lonigan Dam
Olneyville Dam