DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE
REGION 5

FY04 ENVIRONMENTAL CONTAMINANTS PROGRAM
OFF-REFUGE INVESTIGATIONS SUB-ACTIVITY

INTERIM REPORT

NH, VT, MA - Contaminant Sampling to Facilitate Dam Removals/Habitat Restoration in New England

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by

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Background and Justification

It is well documented that dams significantly change the physical, chemical, and biological properties of riverine ecosystems (Baxter 1977, Devine 1995, Ligon et al. 1995, Chatterjee 1997). Awareness of the ecological costs of impounded rivers combined with the diminished economic returns/liabilities of these aging structures has made dam removal a viable management option. The dams in New England being considered for removal are associated with known 19th and 20th century industrial sites, with the potential for the impounded sediments to contain contaminant levels high enough to pose a risk to aquatic life and its human consumers if re-mobilize following dam removal. Because of this concern, a contaminant survey of impounded sediments is usually required on all dams considered for removal. Although funds exist for the removal actions, it has been difficult to obtain funds for pre-removal assessment activities, with resultant delays of up to two years.

Scientific Objective(s)

Conduct a screening level environmental contaminant assessment of impounded sediments from dams in New England targeted for potential removal to ensure that contaminant levels are below thresholds that would harm aquatic life.

Results to Date

VERMONT

East Burke Dam

Waterbody: East Branch of the Passumpsic River
Date Sampled: 05/13/04

Selected Results (ug/g dry wt)

Metals	**Organics**
As: 0.5 – 0.7	tPCB: BDL – 0.005
Cd: BDL	BaP: BDL – 0.026
Cr: 11.0 – 18.0	p,p-DDE: BDL – 0.0003
Hg: BDL	
Pb: BDL – 5.0	

Comments:

Contaminant levels in sediments at East Burke are below those known to affect aquatic resources. A consulting firm has completed the engineering report for dam removal. A local land trust is the proponent of the removal action. The project continues forward.

Island Corp Dam

Waterbody: Saxtons River
Date Sampled: 09/29/04

Selected Results (ug/g dry wt)

Metals	**Organics**
As: 0.8 – 1.9	tPCB: BDL
Cd: 0.05 – 0.06	**BaP: 0.011 – 0.610**
Cr: 5.7 – 10.7	p,p-DDE: BDL
Hg: BDL	
Pb: 2.3 – 3.7	

Comments:

The Benzo(a)pyrene (BaP) level was above the Threshold Effect Concentration (TEC) of 0.108 ug/g but below the Probable Effect Concentration (PEC) of 1.45 ug/g (McDonald et al. 2000) in one of the samples from the Island Corps dam impoundment. Other PAH constituents were also elevated in the same sample. Before dam removal planning activities proceed, additional sampling will need to take place to better characterize the extent of the PAH contamination.

Lower Eaton Dam

Waterbody: First Branch , White River
Date Sampled: 10/12/04

Selected Results (ug/g dry wt)

Metals	**Organics**
As: 0.5 – 2.6	tPCB: BDL
Cd: 0.3 – 1.2	BaP: 0.016 – 0.033
Cr: 7.9 – 27.3	p,p-DDE: BDL
Hg: BDL	
Pb: 2.9 – 13.3	
Cu: 338 in one sample	

Comments:

The copper level was well above the PEC of 149 ug/g (McDonald et al. 2000) in one of the samples. We have asked the analytical lab to retest the sample to confirm the level.

If the Cu level is confirmed, additional sampling will need to take place to better characterize the extent of the contamination before dam removal planning activities proceed.

NEW HAMPSHIRE

Merrimack Village Dam

Waterbody: Souhegan River
Date Sampled: 10/10/03

Selected Results (ug/g dry wt)

Metals	**Organics**
As: 2.3 – 6.4	tPCB: BDL
Cd: BDL – 0.3	**BaP: 0.005 – 0.211**
Cr: 4.3 – 14.0	p,p-DDE: BDL – 0.0006
Hg: BDL	
Pb: BDL – 10.0	

Comments:

The Benzo(a)pyrene (BaP) level was above the Threshold Effect Concentration (TEC) of 0.108 ug/g but below the Probable Effect Concentration (PEC) of 1.45 ug/g (McDonald et al. 2000) in one of the samples at the head of the Merrimack Village Dam impoundment. Based on these results, sediment was collected for toxicity testing. A 10-day survival and growth test using the freshwater amphipod Hyalella azteca was performed using sediment collected from two sites in the impoundment. Mean survival rates were 86% and 94% as compared to the lab control of 88%. Growth rates were slightly higher as compared to the control organisms (Gomez and Sullivan 2004). Based on these results, the owner of the dam has notified the town that they will be moving forward with dam removal planning activities.

REFERENCES

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