



FINE SEDIMENT MONITORING IN THE BATTEN KILL BASIN

*Keith H. Nislow USDAFS-NERS Amherst, MA 01003
 Scott Wixsom, Steve Roy, Chris Alexopoulos USDAFS – GMNF



ABSTRACT

Excess amounts of fine sediment (silt and sand) in streambeds can negatively affect wild trout populations. In order to monitor current levels of fine sediment in the Batten Kill basin, we conducted a four-year study in which sediment accumulation was measured in sediment boxes over the duration of the brown trout spawning and incubation period (Late November through April) in locations throughout the river. We observed some locations that were characterized by consistently high fine sediment (>20% fine sediment threshold for impairment). However, many locations had consistently low fine sediment percentages, indicating good spawning and rearing habitat. Overall, our results do not strongly suggest that fine sediment in Batten Kill streambeds has a negative impact on trout populations.

BACKGROUND

- Excess fine sediment (silt and sand)
- Smothers developing trout eggs and sac fry in nests
 - Reduces sheltering habitat for older juveniles
 - Associated with land use impacts (riparian disturbance, roads) that increase soil erosion

Placing boxes in the streambed



Modified Whitlock-Vibert box used for sampling fine sediment



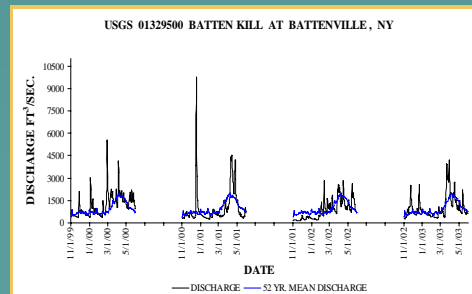
METHODS

- Whitlock-Vibert Boxes
- Placed in potential suitable spawning habitat in locations ranging from headwaters to NY – VT border
- Boxes placed in late October – early November
- removed in late April early May
- Bracket trout spawning, incubation, and emergence
- Dried and analyzed in laboratory using standard protocols and USGS sieves
- 20% fine sediment (by weight) used as a threshold for impairment of spawning gravels

QUESTIONS

- What percentage of potential spawning sites are 'impaired'?
- Are there consistent differences in fine sediment accumulation among years/among sites?

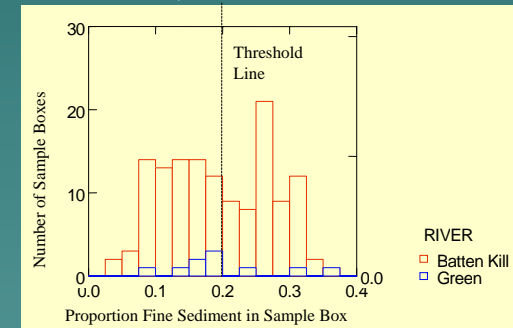
Streamflow conditions during sediment box implementation in the four study years, as measured at the USGS stream gage in Battenville NY.



RESULTS

- There is good spawning habitat available
- However, ~ 50% of samples over threshold for negative effects on hatching and incubation
- Significant differences among sites that were consistent across years
- No consistent variation among years in spite of differences in flow conditions
- No indication that Green River spawning gravels were of higher quality than Kill gravels

The distribution of sample boxes with respect to proportion fine sediment. The height of the bars indicates the number of boxes in each fine sediment category. Red bars indicate Batten Kill mainstem sites; blue bars indicate Green River sites



Number of Batten Kill monitoring sites in three impairment categories. 'Above Threshold' - all samples all years < 20% fine sediment; 'Below Threshold' - " " > 20%; 'Overlapping Threshold' - some samples > , some samples < 20%

Above Threshold	Overlapping Threshold	Below Threshold
9 Sites	9 Sites	8 Sites

CONCLUSION

Results do not indicate major spawning habitat, sheltering substrate limitation of brown trout in the Batten Kill basin associated with excess fine sediment infiltration into stream gravels

Table 1. Summary of numbers of Whitlock-Vibert box samples collected in the four years of the study

Collection Year	River	Number of Sites	Number of Boxes (recovered)
1999	Batten Kill	7	12
2000	"	13	28
2001	"	25	41
2002	Batten Kill and Green	33	63

Acknowledgements

- J. Sotiropoulos
- Green Mountain National Forest
- Batten Kill Technical Work Group