

CRITFC Lab 7 – Potential Toxic Effects of Pesticides, Especially in Lamprey and Salmon

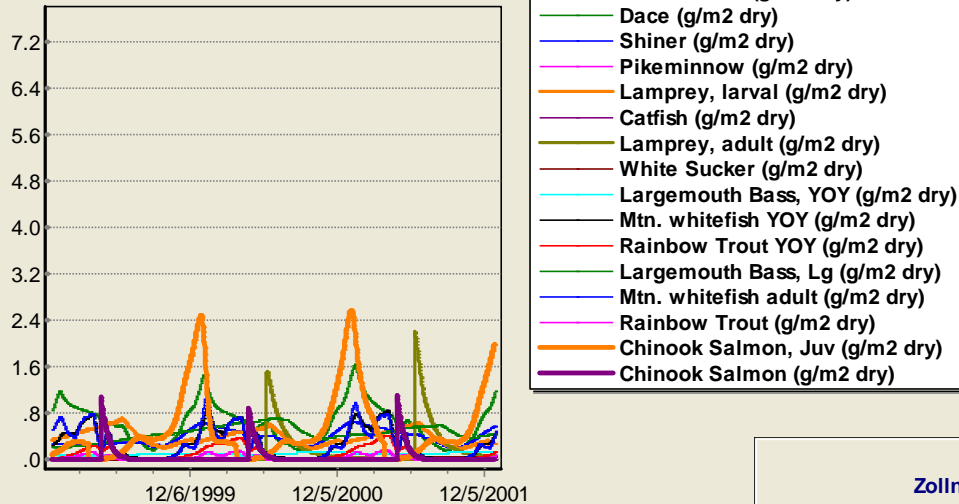


Lab will demonstrate analysis of ecotoxicity at several different levels

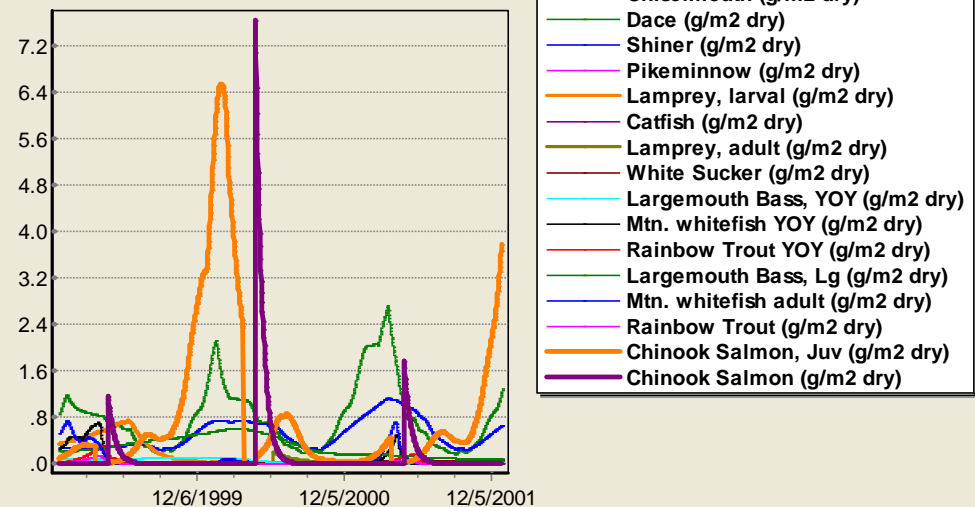
- Lethal toxicity
 - Internal or external concentration depending on mode
 - Length of exposure
- Sublethal toxicity, reduction in:
 - Photosynthesis
 - Growth (decrease in feeding, increase in defecation)
 - Reproduction
- Indirect (unique to AQUATOX)
 - Loss of forage base
 - Reduction in predation

Comparison of perturbed and control simulations with and without pesticides reveals large differences

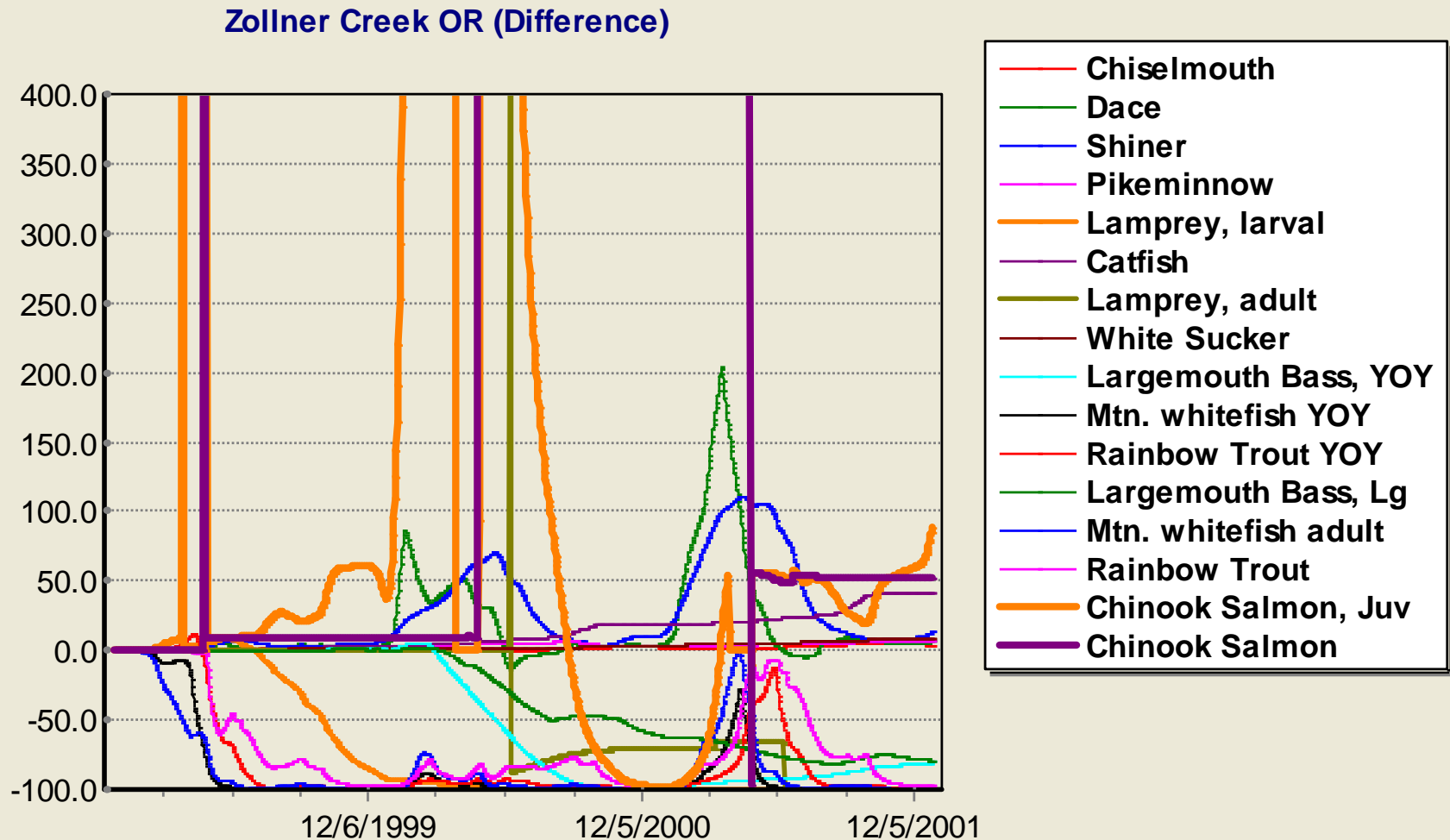
Zollner Creek OR (Control)
Run on 11-6-11 4:35 PM



Zollner Creek OR (PERTURBED)
Run on 11-7-11 8:19 AM

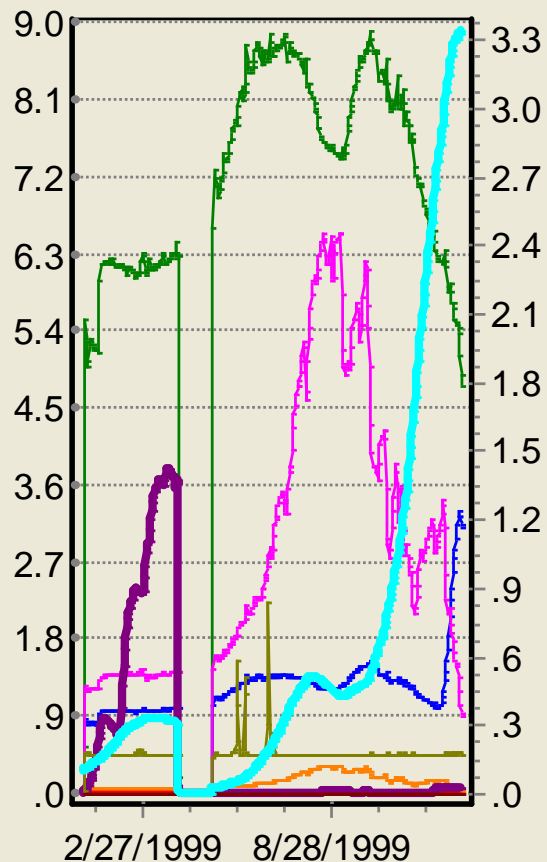


Plotting percent difference indicates loss of piscivorous fish early in the perturbed simulation



Does the decline of the top predators explain the initial success of juvenile salmon?

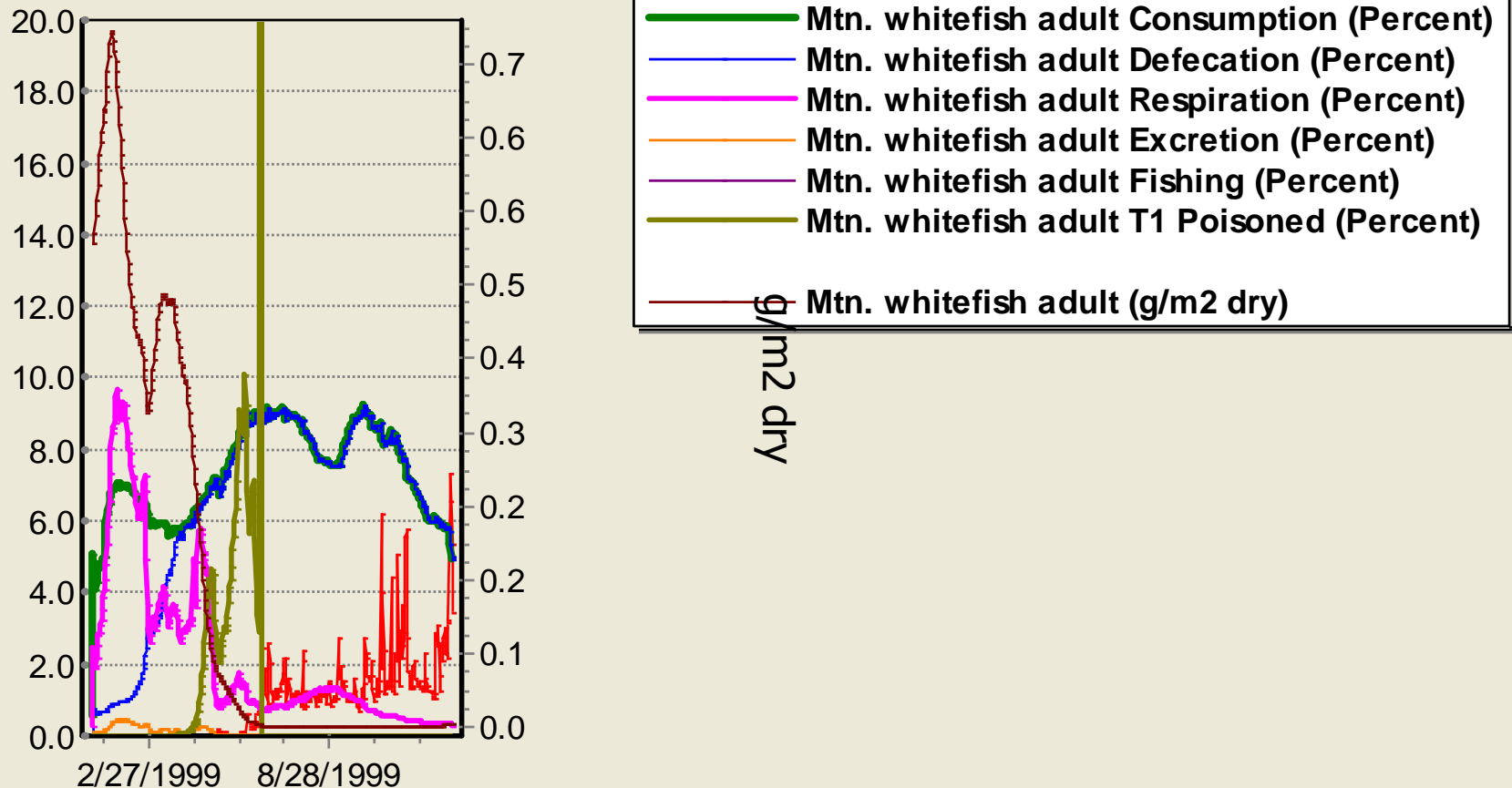
Zollner Creek OR (PERTURBED)
Run on 11-7-11 8:19 AM



- Chinook Salmon, Juv Load (Percent)
- Chinook Salmon, Juv Consumption (Percent)
- Chinook Salmon, Juv Defecation (Percent)
- Chinook Salmon, Juv Respiration (Percent)
- Chinook Salmon, Juv Excretion (Percent)
- Chinook Salmon, Juv Predation (Percent)
- Chinook Salmon, Juv Mortality (Percent)
- Chinook Salmon, Juv Recruit (Percent)
- Chinook Salmon, Juv (g/m² dry)

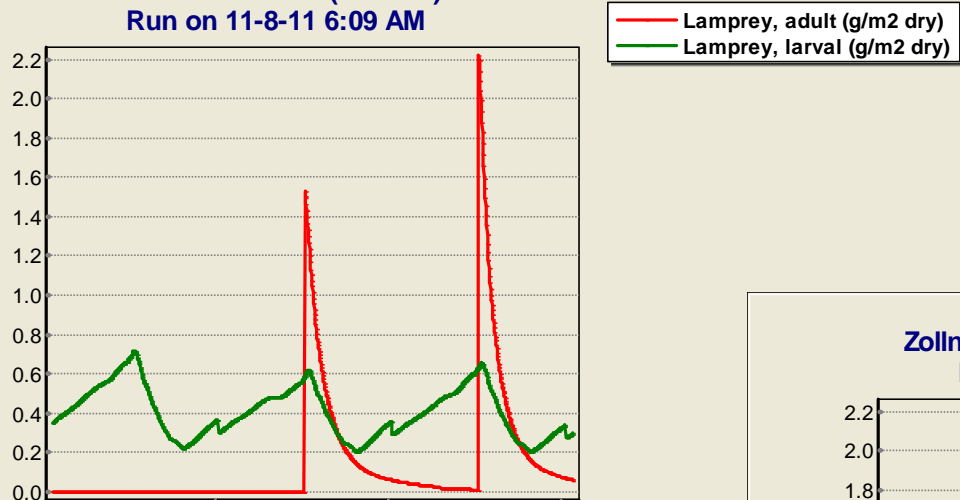
What accounts for the early decline of mountain whitefish? Sublethal and lethal effects.

Zollner Creek OR (PERTURBED)
Run on 11-7-11 8:19 AM

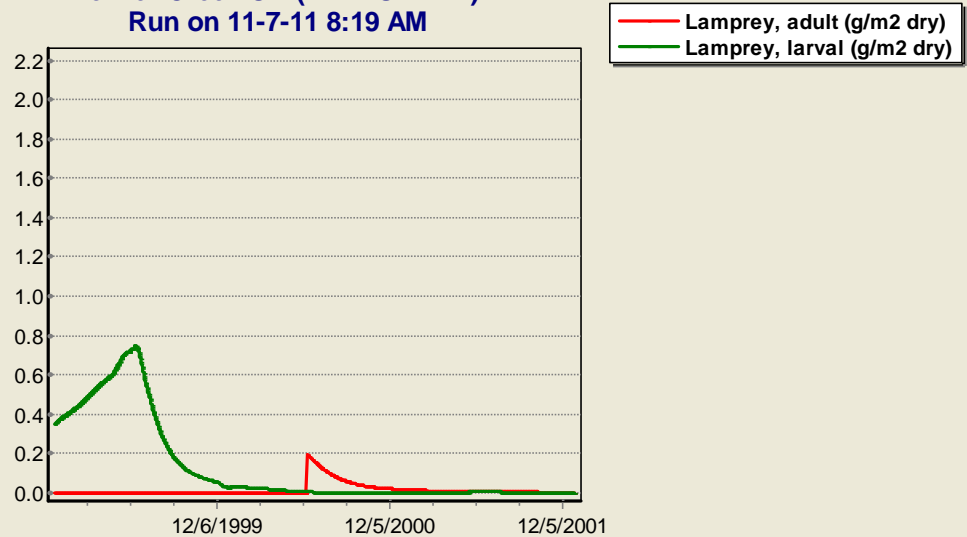


Lamprey also exhibit ecotoxicity

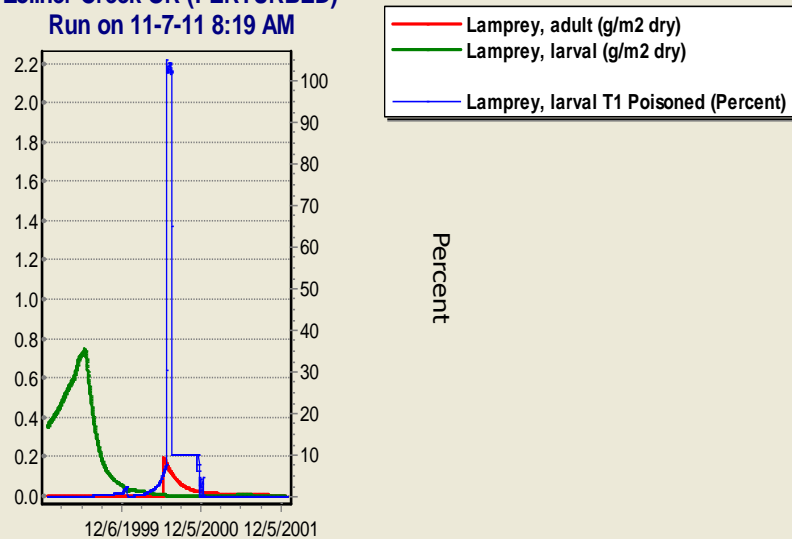
Zollner Creek OR (Control)
Run on 11-8-11 6:09 AM



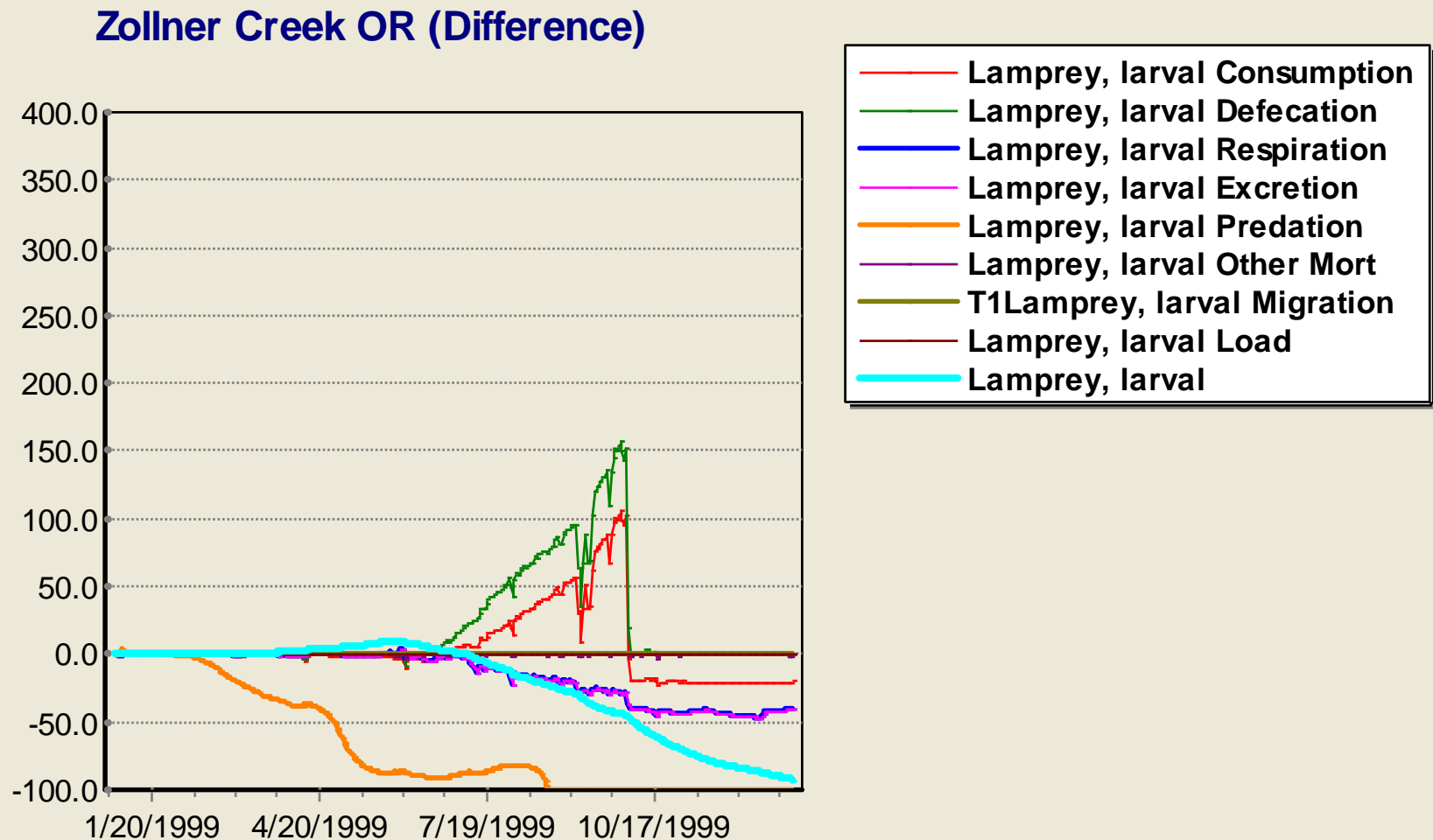
Zollner Creek OR (PERTURBED)
Run on 11-7-11 8:19 AM



Zollner Creek OR (PERTURBED)
Run on 11-7-11 8:19 AM

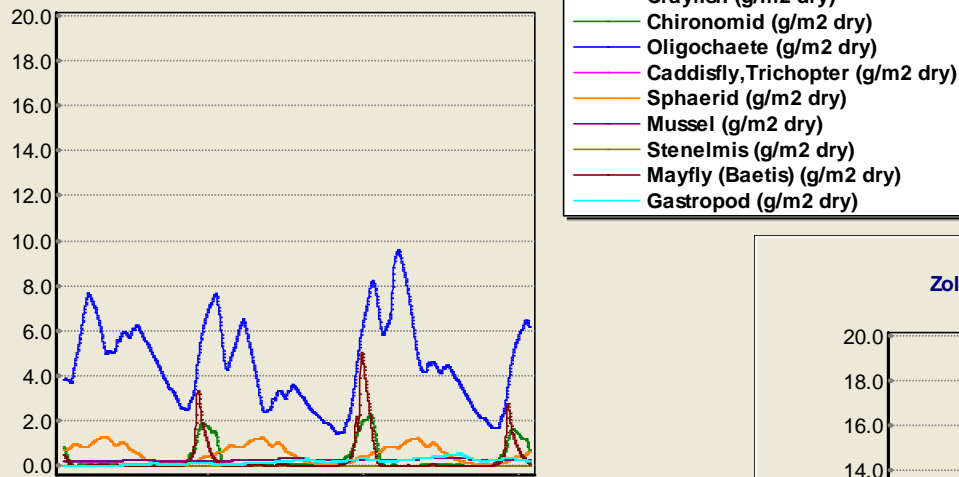


Release of predation pressure (indirect) is followed by increase in defecation (sublethal)

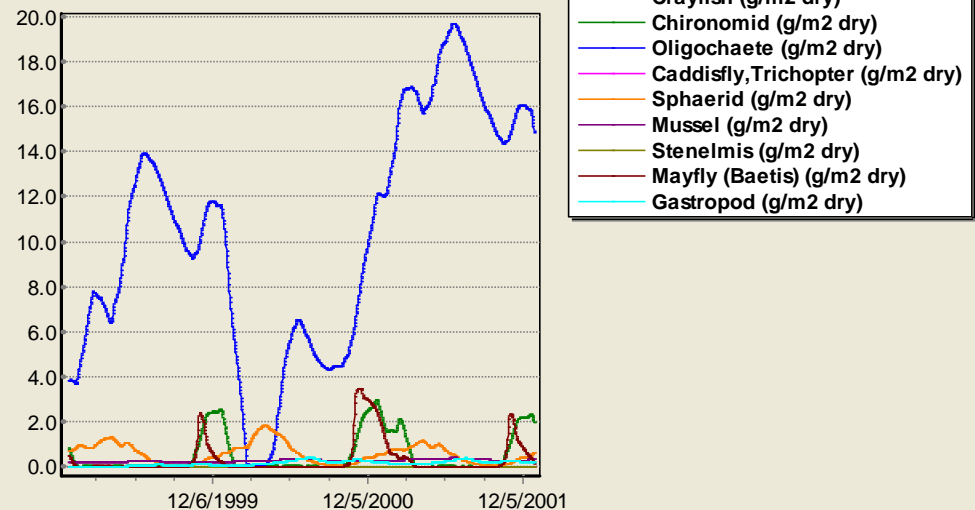


Pesticides removed predation of oligochaetes by fish and killed crayfish; eventually snails declined

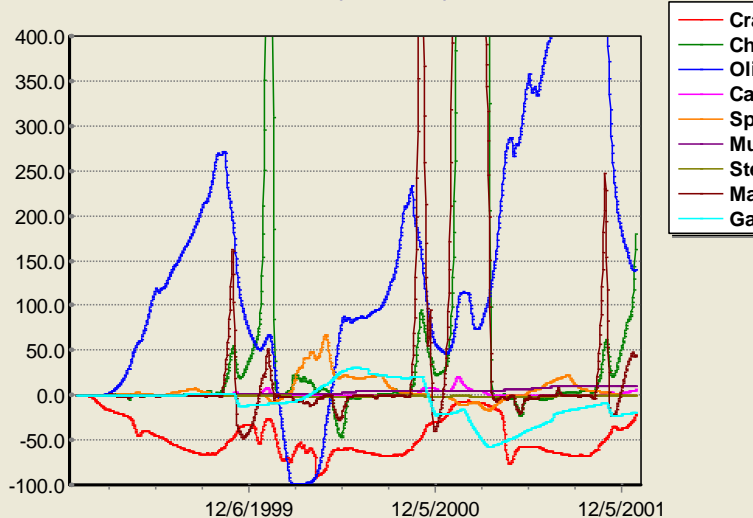
Zollner Creek OR (Control)
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Zollner Creek OR (PERTURBED)
Run on 11-7-11 8:19 AM

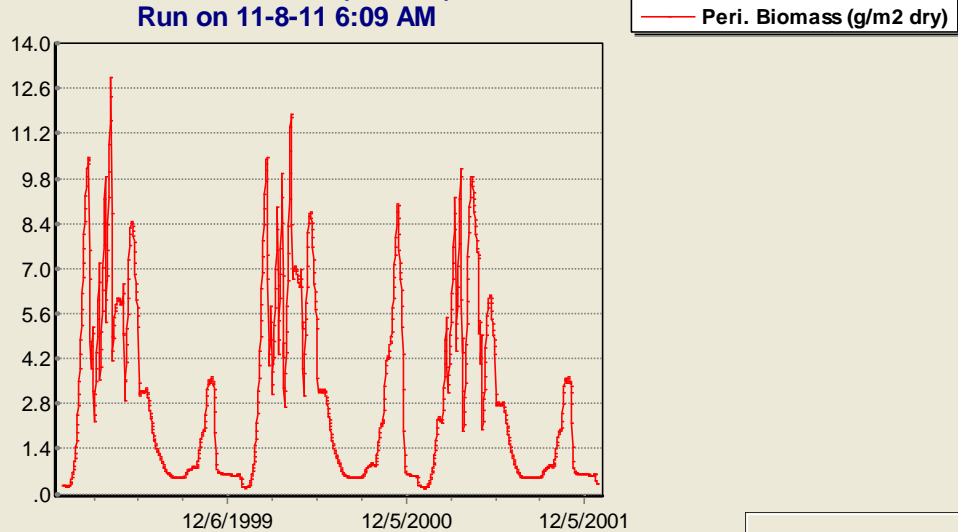


Zollner Creek OR (Difference)

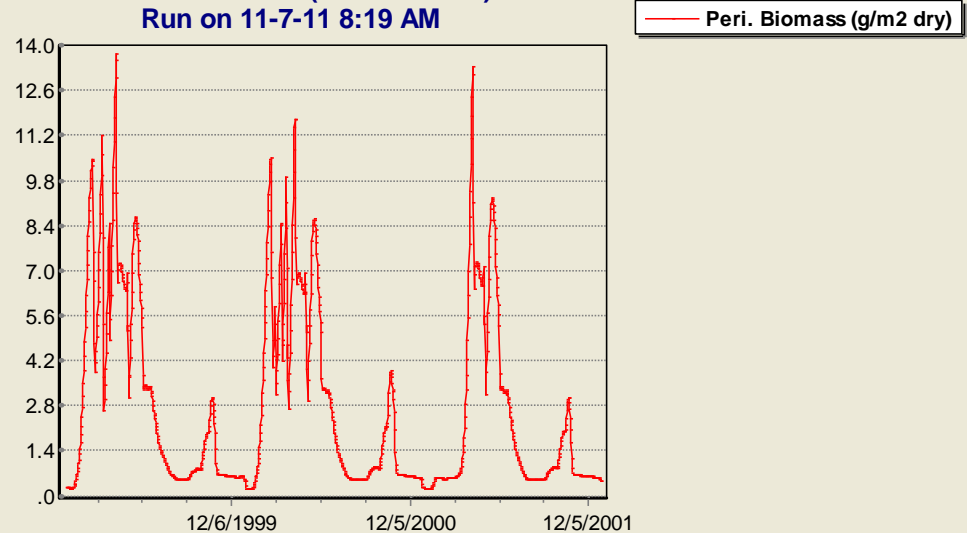


Effects on periphyton are minimal

Zollner Creek OR (Control)
Run on 11-8-11 6:09 AM

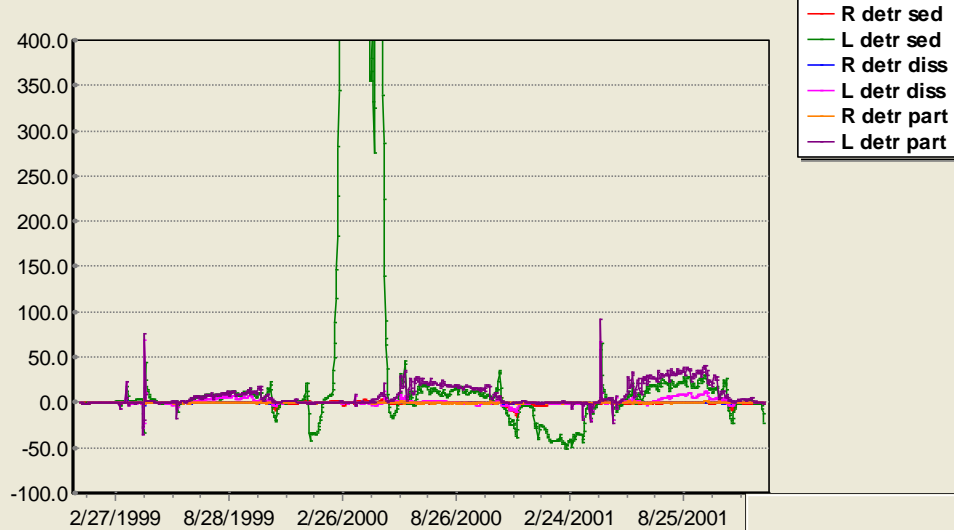


Zollner Creek OR (PERTURBED)
Run on 11-7-11 8:19 AM



Labile detritus increases considerably with large fish kill, but nutrients do not reflect that

Zollner Creek OR (Difference)



Zollner Creek OR (Difference)

