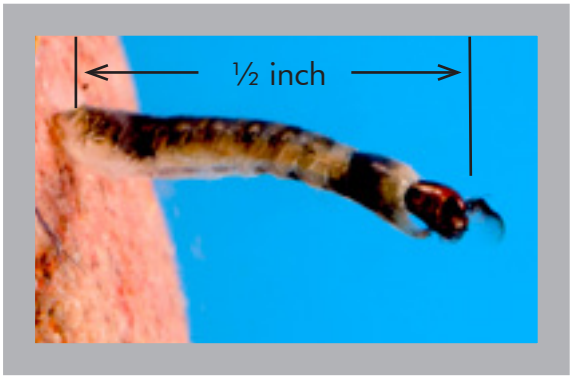
Wildlife Survey & Photo Service
2443 Fair Oaks Blvd. # 209 • Sacramento, CA 95825 • (916) 747-8537

# Report No: 3299-22CA
(Pickerel Weir)

Pickerel weir and injected gravel. Project completed August 4, 2009. Photo taken on 9/4/09.

Blackfly colony on rock in Putah Creek. The blackfly density begins to increase in early fall and continues through early winter.




Blackfly larvae are a preferred food source for small salmonids and other fish.

September 20, 2009

To: Rich Marovich
Putah Creek Streamkeeper

**Background**
*The Pickerel Weir and corresponding spawning gravel represent one of the most important sites for the restoration of the invertebrate community in Putah Creek.* Water velocity, water temperature, and benthic substrate are appropriate to support invertebrate recruitment from upstream tributaries including Miller Creek, a major reservoir of high-quality invertebrates.

Construction of the Pickerel Weir in Lower Putah Creek was completed on August 4, 2009. Within a few days, the weir boulders and the injected gravel were colonized by black flies (Simulidae). In less than one month, "tortoise-case" caddisflies were common in the gravel beds below the weir. I expect the invertebrate community at Pickerel to significantly increase in "species richness" and density.

**Blackflies**
Blackfly (*Simulium*) larvae are unattractive and might appear unimportant. They can be serious pests as some species inflict painful bites on humans. The common species in Putah Creek has not been a pest, in fact, just the opposite. According to Dr. Peter Moyle, blackfly larvae are the most common invertebrate found in salmon smolt stomachs. They are ideal size (¼ to ½ inch), plentiful when salmon are in Putah Creek, and easy prey for salmon fingerlings. They are typically one of first invertebrates to colonize new sites, often within a few days. Blackfly larvae prefer swift-moving water where they attach to rocks and filter food from the water column.

**Tortoise-shell caddisflies (*Glossosoma*)**
*Glossosoma* caddisflies were common at this site prior to the creek blockage caused by a fallen cottonwood below the Pickerel Property. The cottonwood essentially eliminated a significant spawning area and habitat for insects desired by native fish. The caddisflies have quickly colonized the site after the removal of the cottonwood and the construction of the weir.

**New Zealand Mudsnails:**
The New Zealand Mudsnail (NZMS) infestation at the Pickerel Weir is currently 91.6 % of the total invertebrate community. The results reflect the overall area, not the riffles. Mudsnails are especially dense in the aquatic weed beds.

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*Glossosoma* "Tortoise-shell" caddisfly larva in case. The larvae graze on algae.

*Glossosoma* that has formed a pupal case and cemented it to the rock. The adult will emerge underwater in about 20 days.

*Hydropsyche californica* "net-spinner" caddisfly was once very common in the Pickerel reach.

**_Hydropsyche_ caddisflies**

*Hydropsyche* or "net-spinner" caddisflies were common in the Pickerel Run prior to the fallen cottonwood. In areas where NZMS density is high, *Hydropsyche* caddisflies have essentially disappeared. I will closely monitor the NZMS / *Hydropsyche* relationship at the Pickerel Weir.

**Recommendation:**

1. Per Rick Fowler's suggestion, it will be helpful to move cobble/gravel from Dry Creek to the Pickerel Weir.

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**Invertebrate Collection - Pickerel Site - 9/16/09**

| Species | Number in collection | % Total |
|---|---|---|
| * New Zealand Mudsnails | 2927 | 91.6 |
| *Brachcentrus* (caddis) | 82 | 2.5 |
| *Stagnicola* (snail) | 76 | 2.3 |
| *Glossosoma* (caddis) | 29 | 0.90 |
| *Simulium* (blackfly) | 22 | 0.68 |
| *Hydropsyche* (caddis) | 20 | 0.62 |
| Water Boatmen | 8 | 0.25 |
| *Physa* (snail) | 8 | 0.25 |
| *Planorbis* (snail) | 8 | 0.25 |
| others | 23 | 0.71 |
| Total | 3195 | 100% |

* Reflects species collected in riffles, weedbeds, pools and runs.
WS&PS Collection Number: 3299-22CA

Submitted 9/21/09 via e-mail

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Adult caddisfly collected at the Pickerel Weir. Adult caddisflies are about ½ inch long from head to tip of wings.