

2. A few cages of Pomacea and Viviparus snails were maintained with an abundance of food and volume measurements before and after a month growth period. These estimates are underestimates since the snails used were already of moderate size and past the more rapid juvenile growth stages.

3. From the section G above on insect emergence the growth rate necessary to balance the emergence in steady state was determined using .002 gms dry per emerging individual. This figure should probably be added to the Tip-loss figure in method #1 above.

4. From the estimates of standing crop biomass of small invertebrate herbivores in previous reports one can obtain the total respiration using a rough figure for stream invertebrates of .8 cc/gm/hr. Then if growth of animals is about 10% one may get a rough figure for herbivore production.

With these methods some herbivore production estimates are given in Table 3. None of the estimates are entirely satisfactory although the order of magnitude is indicated.

Table 3. Some Estimates of Herbivore Production

Method	Measured Quantities	Production gms/M ² /Yr.
Blade Tip loss method (1)	22 gm ridge/M ² plant surface 25.5 M ² plant surface/M ² spring .26 M ² plant growth/M ² spring/day (1% blade growth/day)	2190
Snails in Cages method (2)	6% volume increase/Month Viviparus 1.7% volume increase/Month Viviparus 3.3% increase/month Pomacea Mean: 11.6%/month; 12 gm/M ² biomass	17
Insect emergence method (3)	7.8 individuals/229 cm ² /day .002 gms/individual	196
	Total of Insects and snails	2352 2403
Assumed ^{10%} efficiency and .8 cc/gm/hr (method #4)	32.4 gms/M ² herbivore standing crop	30.

I. Carnivore Production

In the fishery biology study described below a few recaptures give some minimal estimates of growth rates of fishes. The average growth rate is about 25%/yr. If the standing biomass is about 7.3 gms/m² fish the production is around 2 gms/m²/yr. This figure does not include the main stumpknocker populations. Satisfactory biomass estimates of these fish have not been completed. These estimates based on large tagged fish are probably much too low. If 7.3 gms/m² fish had a metabolic rate of about .07 cc/gm/hr and an efficiency of 10% the fish growth rate would be .6 gms/m²/yr. Considerably more work is required on the higher trophic levels to establish the approximate production and efficiency.