Headwater streams are important for the biological integrity of river systems because they represent most of the length of the hydrological network, and control the downstream flow of energy and nutrients to larger river systems. Headwater streams are culturally and economically important because they directly or indirectly support recreationally important anadromous and resident fisheries. Managing fish in these systems often requires time-consuming population counts but fish biomass might be related to overall stream productivity, which can be measured relatively easily using models to estimate stream metabolism. The goal of my study was to relate whole stream metabolism to fish biomass in 10 different headwater streams on the eastern slopes of the Cascade Mountains in Kittitas County, Washington. I estimated fish biomass on two occasions using a multiple pass removal population estimate multiplied by the average fish mass, and I estimated ecosystem metabolism on 3 occasions using the single station method with a diel oxygen curve and inverse modeling. I estimated the critically important air-water gas exchange values based on stream slope, using an empirical relationship from a previously published study. Gross primary production across sites and sampling periods ranged from 0.01 to 0.71 g O2 m-2 d-1, varied by sampling period, and increased with stream depth. Ecosystem respiration ranged from 4.55 to 24.29 g O2 m-2 d-1, and increased with stream depth and slope. Fish were mostly cutthroat trout (*Oncorhynchus clarkii lewisi*), and biomass ranged from 0 to 8.38 g m-2, increasing with colder water especially under more open canopies but there was no relationship with ecosystem metabolism. Overall stream metabolism predictors were limited to model inputs, owing in part to extremely limiting levels of photosynthetically active radiation and dissolved inorganic nitrogen, and the air water gas-exchange estimations were likely inaccurate. No relationships were found between metabolism metrics and trout biomass with photosynthetically active radiation, dissolved inorganic nitrogen, soluble reactive phosphorus, dissolved organic carbon, or other physical attributes of these streams. Unfortunately, with the methods I used, stream metabolism cannot be used as a proxy for trout biomass in headwater streams.