Headwater streams are the beginnings of stream networks and because of their high edge to area ratio a lot of allochthonous material often in the form of needles and leaves enters them where it is rapidly biogeochemically processed. This material regularly forms the base of a heterotrophic food chain that starts with fungi and bacteria which metabolize this organic matter and are eaten by aquatic invertebrates which are in turn eaten by fish which are regularly the top predator. The activity of virtually all of these organisms may be summed up with a measure of ecosystem metabolism. On the eastern slopes of the Cascade mountains in Kittitas County Washington I chose 10 sites on 10 different headwater streams and sampled them 3 times to see if ecosystem metabolism would relate to fish biomass. I used the single station method with a diel oxygen curve and inverse modeling to estimate ecosystem metabolism. A critical component in this modeling is an estimate of air-water gas exchange which I estimated based on stream slope because previous studies have found these to be closely linked. I did not find a relationship between ecosystem metabolism and fish biomass. I did find that stream slope and depth were important to ecosystem metabolism however these were model inputs and so no insights were gained. It also appears that metabolism values may have been too high and likely unreliable. These issues probably stem from inaccurate air-water gas exchange estimations. Fish biomass was most closely related to colder water and more open canopies which appears consistent with previous studies. No significant relationships were found with photosynthetically active radiation, dissolved inorganic nitrogen, soluble reactive phosphorus, dissolved organic carbon, or other physical attributes of the streams