

Biometric Indicator Research: Linking Salamander Occurrence to Hydrology in an Exceptional Value Watershed

The community of salamanders that inhabit an area is considered potentially useful as an indicator of ecosystem integrity. As with amphibians in general, salamander physiology, habitat preference, and reproductive strategy are factors that make salamander populations sensitive to habitat condition. Moreover, because many salamanders exhibit biphasic life histories (i.e. aquatic larval stage followed by terrestrial adult stage), they are especially well-suited for use as biometric indicators in certain wetlands and low-order stream catchments.

For two years, an intensive hydrology monitoring network was used to amass automated and manual measurements from part of the Exceptional Value (EV) designated Rapp Creek watershed in order to estimate deep aquifer recharge potential. A separate outcome of the hydrology study demonstrated that low-order streams and wetlands in the EV-status Rapp Creek watershed were dominated by shallow groundwater flow paths and therefore potentially vulnerable to land use changes.

Based on the hydrology investigation findings, three water flow status categories were designated and a series of replicate monitoring stations was established according to each category. Salamander occurrence, water flow status, and water quality indicator parameters are monitored routinely. The data set will be evaluated to elicit responses of individual species, as well as the overall salamander community, to hydrologic variables.

Ultimately, this pilot project is expected to shape field methodology. Through the expansion of study sites, it will facilitate the development of a biometric indicator index for low-order watershed integrity according to a human land use gradient.

