Woodland salamanders indicators of forest ecosystem recovery

August 28 2013

Woodland salamanders are a viable indicator of forest ecosystem recovery, according to researchers from the U.S. Forest Service's Pacific Southwest Research Station.

PSW Research Wildlife Biologist Dr. Hartwell Welsh and Garth Hodgson examined two species of woodland salamanders across four stages of tree development at Mill Creek—a disturbed old-growth redwood forest in northern California. They found that the numbers and body condition of two common species of salamander tracked closely with forest stand growth, development, and structural changes. Using salamander population numbers and physiological condition on adjacent, never harvested old-growth parkland to reference advancements along this developmental pathway, they demonstrated relationships between salamander counts and body condition and aspects of forest advancement including stand age, tree size, ambient moisture, canopy closure, and litter depth.

The case study established that when woodland salamanders are found in high abundance, it indicates a healthy forest, having undergone ecological advancement and ecosystem recovery.

There have been concerns about using indicator species as metrics of ecosystem conditions; however, amphibians are increasingly becoming accepted as researchers verify their applicability and usefulness. The woodland salamanders evaluated in Mill Creek were deemed credible due to their conservatism, trophic role, and high site fidelity, which tie

them closely to conditions of place.

The findings of this case study are important because old-growth forests are quickly diminishing, but they provide crucial environmental services to society. According to the researchers, this type of forest is a unique carbon sink containing the most abundant land carbon stocks on the planet. Old-growth forests sequester carbon pollution and support the world's most diverse ecosystems.

Mill Creek is an old-growth forest located in Del Norte, Calif. in a geographically limited coastal redwood forest bioregion, which has seen extensive commercial logging for more than 100 years. It has recently been acquired by the state park system, and is intended to have its logged-over areas restored to primary forest. If restored, it can provide migration corridors for rare, absent, and native wildlife.

More information: The full report can be found at: treesearch.fs.fed.us/pubs/43998

Provided by USDA Forest Service