

Amphibian Conservation in the US Pacific Northwest

By Deanna H. Olson, Co-Chair for the Pacific Northwest Working Group

The Pacific Northwest continues to be a very active region relative to amphibian conservation issues. Our understanding of the regional fauna has advanced considerably in the last decade, with application of new molecular techniques to explore biological diversity within taxa, and studies into effects of various agents on amphibian populations. Cooperative efforts among agencies, institutions, and societies have been pivotal for inventory and monitoring, concern-species management, and education.

Research: Both university and agency scientists are contributing new knowledge about our endemic fauna that is having direct bearing on their management. Genetic studies have broadened our understanding of the regional amphibian fauna; new taxa have been identified (*Rana luteiventris*, *Ascaphus montanus*, *Aneides vagrans*), while populations representing geographically structured divergent lineages are being detected in other species (*Rana cascadae*, *Batrachoseps wrighti*, *Plethodon larselli*, *P. stormi*, *P. elongatus*). Studies of land management effects on amphibians are ongoing in stream-, pond- and terrestrial-breeders. Key topics of 35 amphibian-related presentations at the recent 2003 annual meeting of the Society for Northwestern Vertebrate Biology (<http://www.snwvb.org/>) were species-habitat associations, movement patterns, riparian buffer zones, importance of forested headwaters, forest thinning, culvert passage, and fire. Research on potential contributors to amphibian declines are ongoing in Dr. Andrew Blaustein's lab at Oregon State University, including: lethal and sublethal effects of UV-B radiation; disease ecology (*Saprolegnia* fungi, chytrid fungi, nematode parasites); and contaminants.

Inventory & Monitoring: Several programs are advancing our knowledge of species' distributions, status, and trends. First, the federal Northwest Forest Plan covers about 10 million ha of forestlands west of the Cascade Range. Since 1994, surveys for 5 rare terrestrial plethodontid salamanders have been mandated under the Survey and Manage provision of this plan (protocols available at: <http://www.or.blm.gov/surveyandmanage/sp.htm>), resulting in considerable data on terrestrial herpetological assemblages on federal Forest Service and Bureau of Land Management lands, confirmation of rarity for 4 species, and reduced concern for one species (*Plethodon elongatus*), due to its relatively widespread occurrence on federal reserved lands. In 2003, strategic surveys are exploring distribution and validating habitat models for *Plethodon stormi*, *P. vandykei* and *P. larselli* (Dede Olson, Richard Nauman, and Charlie Crisafulli; US Forest Service). Second, Aquatic-Riparian Effectiveness Monitoring under the Northwest Forest Plan is compiling amphibian and fish occurrences in streams across 250 6th-field watersheds in their assessment of regional federal watershed conditions (<http://www.reo.gov/monitoring/watershed/aremp-compile.htm> and <http://www.reo.gov/monitoring/watershed/02fieldprotocol.pdf>). Third, the US Department of Interior has its own "ARMI", the Amphibian Research and Monitoring Initiative (<http://edc2.usgs.gov/armi>). In the US Pacific Northwest and adjacent arid-lands, Dr. Michael Adams (Principal Investigator, US Geological Survey) is coordinating a three-tiered monitoring approach and additional research projects: 1) Apex Monitoring Sites are selected populations for intensive monitoring; 2) Mid-Level Monitoring Areas assess amphibian occurrence and water quality over 6.7 million ha of Department of Interior lands; 3) Base Assessments provide snapshots of occurrences over broad areas (e.g., the Great Basin); and 4) research at focal study sites is being conducted with regard to non-native species, cattle grazing, and UV-B radiation. Fourth, an inventory and monitoring program is ongoing on US National Park Service lands. National parks in Washington State (Olympic National Park, North Cascades National Park, and Mount Rainier National Park) have completed the first inventory stage of the program. Lastly, Charlie Crisafulli (US Forest Service) and colleagues continue to monitor amphibian populations in the blast zone of Mt. St. Helens, which erupted in 1980 (<http://www.fs.fed.us/gpnm/mshnvm/research/faq.htm>).

Species Management: The rarest amphibian species in the US Pacific Northwest have a site-by-site conservation approach, for the maintenance of site-level persistence (e.g., *Rana pretiosa*). For uncommon to common species, current federal forest land management regulations (National Forest Management Act) require that stable, well-distributed populations be maintained across their ranges ("persistence"). Species "persistence" is a term undergoing scrutiny relative to US Pacific Northwest uncommon amphibians and other taxa. Dr. Steven Morey, conservation coordinator for the Survey and Manage program, is leading an

interagency group of species experts to better develop these concepts, criteria for species' persistence assessments and management guidelines. In April 2003, a symposium was held in Portland, Oregon, to more fully address the topic of rare and uncommon species management, with an eye to recent innovations from the national and international community (<http://outreach.cof.orst.edu/species/>). The developing conservation plan for *Plethodon stormi* relies on the maintenance of multiple sites at the intermediate scale of the 6th-field watershed, to achieve stable well-distributed populations across the population range (~20 6th-field watersheds).

Education: A new emphasis on amphibian and reptile education is developing in our region. Many individuals, institutions, and agencies have been playing key roles, providing instruction to public and school audiences, land managers and policy makers, and science professionals. The focus of these efforts has been on the importance of the regional fauna within ecosystems, species identification, status and trends, and methodologies for inventory and monitoring. A variety of communication tools have been used, including courses and workshops (e.g., March 2003, Stream amphibians: sampling, ecology, and management workshop, joint meeting of the Society for Northwestern Vertebrate Biology and the California North Coast Chapter of The Wildlife Society, Arcata, California), exhibits, publications (new: Maxell *et al.* 2003, Herpetology in Montana, Northwest Fauna 5; see <http://www.snwvb.org/>), and websites (e.g., digital atlas of Idaho; <http://imnh.isu.edu/digitalatlas/>). Dr. Charles R. Peterson of Idaho State University represented the Pacific Northwest region at the April 2003 herp-education conference in Gainesville, Florida (<http://www.parcplace.org/CurrentMeetings/SEPARC/Education-Fla2003.htm>). Collaboration between the US national Partners in Amphibian and Reptile Conservation (PARC) and members of the US-Canada Pacific Northwest Amphibian and Reptile Consortium (PNARC, subgroup of the Society for Northwestern Vertebrate Biology) has resulted in a working group that is intended to organize and focus future regional efforts.

Contact: Deanna Olson, Pacific Northwest Research Station, USDA Forest Service, 3200 SW Jefferson Way, Corvallis, OR 97333, USA.

deanna.olson@orst.edu

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