VIGNETTE

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Growing up in a southern Oregon timber town in a family strongly rooted in logging, the U.S. Forest Service (USFS) has always been part of my life. The conflicts which embroiled the USFS during my youth are etched in my memory. I vividly remember when the northern spotted owl *Strix occidentalis caurina* was listed as federally endangered. Mills closed and parades of coffins rolled down the streets with proclamations that the end of federal timber harvest would spell the end of towns like ours. In college, I learned more about public land management for natural resource sustainability. Recognizing the importance of economics in environmental issues, I studied both environmental science and economics. Graduate degrees in fisheries (Ph.D.) and geography (M.S.) honed my expertise on aquatic ecosystems and their spatial context. Yet, my timber-town roots still color how I relate to the world. Understanding the relationships among ecological and economic values of fish, forests, and watersheds—and trying to find a balance—is a recurring theme in my work.

As a graduate student, my research focused on improving our understanding of habitat occupancy by Pacific salmonids. I had previously worked for the Oregon Department of Fish and Wildlife and had noticed discrepancies between what we thought we knew about fish habitat and where fish were actually found in rivers. In my studies of Coho Salmon *Oncorhynchus kisutch*, I found that the proximity between important seasonal habitats may be more important than the quality of any individual habitat patch. Essentially, like any good realtor, Coho Salmon know that a good neighborhood is key to any house-buying decision. This insight informs new strategies for stream restoration that focus on habitat complementarity rather than development of particular types of habitats. Recently, I have used this perspective in my work with colleagues on national forests and our partners to identify ecologically-relevant restoration projects that will enhance habitat complementarity. I am also using this idea to study the effectiveness of large floodplain restoration projects designed to re-create anastomosing (i.e., intertwining) channels over hundreds of acres. Habitat complementarity metrics may improve our ability to evaluate how successful these designs are at producing a multitude of microhabitats in complex configurations as intended.

Now, as a research fish biologist with the USFS, my work sheds light on the role of natural processes in the maintenance of vital aquatic ecosystems across a complex spectrum of landownerships and seeks to apply this science-based knowledge to inform watershed management. Rivers and the fishes that use them are great unifiers of the landscape. Aquatic ecosystems, including their dynamic properties, have been heavily modified in the past century, with hydrological and riparian processes affected by upland disturbances such as timber harvest and roads construction as well as by the alteration of natural disturbance regimes through flow regulation and wildfire suppression. My research shows that reinvigorating and restoring natural processes in watersheds is key to avoiding watershed degradation and the loss of numerous benefits associated with healthy watersheds. For example, wildfire at appropriate intervals improves aquatic habitats by contributing sediment and wood to river channels. Furthermore, in a recent study, my collaborators and I found that different species of fish and even different life stages of the same species are differentially affected by fire. Demonstrating that wildfire plays a direct role in structuring both aquatic habitats and aquatic communities is a valuable scientific contribution to the discussion about the actual versus perceived effects of wildfire on aquatic ecosystems and the role of wildfire on the landscape.

New challenges are certain to emerge for the broad-scale management of public lands in the coming decades. As a USFS scientist, I will continue to conduct research to meet current and future information needs for effective aquatic stewardship. In particular, I believe it will be critical to develop and refine science-based tools to inform the management of complex anthropogenic and natural processes such as timber harvests, road construction and decomissioning, landslides, floods and drought, wood recruitment to streams, and wildfire. The research my colleagues and I are pursuing will improve our understanding of dynamic and heterogeneous aquatic-riparian environments and may help managers design restoration and management strategies to promote long-term resilience. As a girl, I witnessed and experienced first hand that ecological changes affect human communities. My goal is to conduct research and apply knowledge that contributes to the development of linked human-ecological systems that are resilient to change, fostering ecological health and human well being. AFS