

**BACTERIAL COLDWATER DISEASE:
HATCHERY EPIDEMIOLOGY AND CONTROL^{APS}**

Eileen K. N. Ryce
Montana Cooperative Fishery Research Unit
Department of Ecology, Montana State University
Bozeman, MT 59717
eryce@montana.edu

Alexander V. Zale
Montana Cooperative Fishery Research Unit, USGS
Department of Ecology, Montana State University
Bozeman, MT 59717
zale@montana.edu

Mark Sweeney and Jay Pravecek
Washoe Park State Fish Hatchery
Montana Fish, Wildlife and Parks
600 West Pennsylvania St., Anaconda, MT 59711
washoehatchery@hotmail.com

Bacterial coldwater disease, caused by the gram-negative bacterium (*Flavobacterium psychrophilum*), has caused significant losses of hatchery-reared salmonids worldwide. It is especially problematic at hatcheries rearing fish for native species restoration. Washoe Park State Fish Hatchery typically loses 30 to 45 percent of their annual westslope cutthroat trout (*Oncorhynchus clarki lewisi*) production to the disease. Using Washoe Park as a test case, our goal was to develop practical hatchery-management strategies to better control the pathogen and the disease. Our main objectives were to determine where the pathogen is, how it is transmitted, and what factors cause disease outbreaks. We found the bacterium in the hatchery water source, in water within the hatchery, and in production and broodstock fish. It was transmitted both horizontally and vertically, with both male and female adults passing the pathogen on to juveniles. Chronic stress and low levels of acute stress, such as a simulated planting event, did not result in disease outbreaks. However, a combination of acute stress events involved with moving fish to an outside environment, caused a disease outbreak. Measures have been implemented at Washoe Park to reduce horizontal transmission, and tactics to reduce vertical transmission will be tested in 2004. It is unlikely that the pathogen can be eradicated completely, but management to reduce the number of fish carrying the pathogen may minimize losses during outbreaks.