Montana Conservation Genetics Laboratory

Division of Biological Sciences * University of Montana * Missoula, MT 59812
(406)243-5503/6749 Fax (406)243-4184

September 26, 2005

Brad Shepard
Montana Department of Fish, Wildlife, and Parks
Montana State University
301 Lewis Hall
Bozeman, Montana 59717

Brad;

Following is my assessment of the high priority samples you wanted checked for accuracy of data interpretation:

Cabin Creek and Unnamed Tributary-Red Rock Drainage (#2124 and #684)

The most recent sample collected June 20, 2000 (2124) was reported as appearing to have come from a hybrid swarm containing about a 98% westslope cutthroat, 2% rainbow, and less than a 1% Yellowstone cutthroat trout genetic contribution. I generally concur with this interpretation. PINE fragments usually characteristic of rainbow trout were detected at three of the six diagnostic loci analyzed that usually distinguish rainbow from westslope cutthroat trout. Furthermore, the rainbow trout fragments appeared to be randomly distributed among the fish in the sample (Poisson distribution; chi-square $P>0.50$). These results are also highly concordant with the earlier sample collected August 19, 1992 (684) in which allozyme analysis indicated the population to be a hybrid swarm with about a 97.5% westslope cutthroat and a 2.5% rainbow trout genetic contribution. This population, therefore, is almost undoubtedly a westslope cutthroatXrainbow trout hybrid swarm.

I do somewhat question the conclusion the population contains a small Yellowstone cutthroat trout genetic contribution. A PINE fragment usually characteristic of Yellowstone cutthroat trout was detected in sample 2124 at one of the four diagnostic loci analyzed that usually distinguish Yellowstone from westslope cutthroat trout. The fragment was detected in only one fish in the sample. Thus, there are two possible interpretations of its presence. It could indicate a small amount of hybridization or it

could be westslope cutthroat trout PINE genetic variation that is electrophoretically identical to that usually characteristic of Yellowstone cutthroat trout. Since we know in this situation the population is hybridized with rainbow trout, attempting to better determine whether or not the population is also hybridized with Yellowstone cutthroat trout is probably moot.

Beefstraight Creek (#2390)

The interpretation of this sample collected July 26, 2002 in the initial report was vague at best. We can do better than this. PINE fragments usually characteristic of rainbow trout were detected at two of the six diagnostic loci analyzed that usually distinguish rainbow from westslope cutthroat trout. The PINE fragments characteristic of rainbow trout, however, were not randomly distributed among the fish in the sample ($P<0.01$). In contrast, one fish possessed rainbow trout fragments at two diagnostic loci and another at one. The remaining fish in the sample possessed PINE fragments characteristic of only westslope cutthroat trout. Thus, at the time of sampling this population may have been a mixture of hybridized and non-hybridized westslope cutthroat trout because it had only relatively recently become hybridized or the fish of hybrid origin were migrants from a hybridized population. I do not think it is overly important to attempt to better distinguish between these possibilities because conclusively determining that an individual is a non-hybridized westslope cutthroat trout in this situation will be extremely problematic. This will require a large number of markers because the hybrid individuals collected were definitely later than first generation hybrids. Thus, with a relatively small number of markers many hybrids will be indistinguishable from westslope cutthroat trout. From a management perspective, therefore, based on this sample the population should simply be considered to have been hybridized with rainbow trout.

Craver Creek (#2125 and #548)

In the sample collected July 19, 2000, PINE fragments characteristic of only westslope cutthroat trout were detected at all loci analyzed. Thus, the sample was correctly reported as having appeared to have come from a non-hybridized westslope cutthroat trout population.

These results are also concordant with the previous allozyme analysis (548 collected September 16, 1991) which indicated the population to be non-hybridized westslope cutthroat trout. Combining both samples yields a sample size of 20 (2125=14, 548=6). With this sample size, we have a 97% chance of detecting as little as a 1.5% rainbow or Yellowstone cutthroat trout genetic contribution to a hybrid swarm. This population, therefore, should certainly be considered non-hybridized westslope cutthroat trout.

Sincerely,

Robb Leary