Taseko Prosperity Gold-Copper Project

Appendix 3-8-A

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BRITISH COLUMBIA RAINBOW TROUT MICROSATELLITE DNA DATABASE NOTES

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June 27, 2008

Tom Watson
Triton Environmental Consultants Ltd
8971 Beckwith Rd.,
Richmond, BC V6X 1V4

Dear Tom:

Accompanying this letter you will find a summary of our efforts to characterize the Fish Lake rainbow trout population relative to other populations in BC in an effort to understand any possible impacts of the proposed Prosperity Lake mine development ("Prosperity Lake Project Fish Lake rainbow trout genetic assessment"). This letter will serve as an invoice for services rendered with respect to the brief analysis we performed on the Fish Lake rainbow trout genetic distinctiveness (sent by separate email).

We integrated all of our rainbow trout DNA work into a single analysis that compared Fish Lake trout to 54 other populations as detailed in the accompanying document.

If you have any questions, please let me know.

Yours truly,

Eric B. Taylor

Digitally signed by Eric B. Taylor
DN: CN = Eric B. Taylor, C = CA, O = UBC, OU = Dept. of Zoology
Date: 2008.06.27 11:49:29 -07'00'

Eric B. Taylor
Professor
etaylor@zoology.ubc.ca

British Columbia Rainbow Trout Microsatellite DNA Database Notes

E. Taylor, June 26th, 2008

1. The accompanying figures show the patterns of similarity between Fish Lake rainbow trout samples collected in 2002 and 54 other populations of BC rainbow trout/steelhead.

2. The genetic data are based on 10 microsatellite DNA loci and formed the core of the MSc thesis of Patrick Tamkee (2005) entitled: *The influence of post-glacial recolonization and contemporary stream networks on the evolution of microsatellite DNA variation in rainbow trout (Oncorhynchus mykiss).* UBC Zoology.

3. The first figure (1) shows the relationships of all 55 populations based on the mean position (from N = 30-> 100 fish per population) of each along three axes of microsatellite DNA variation.

4. The second figure (2) shows the range of genetic distinctiveness scores (GDS) for a subset of populations. The score summaries the degree to which each population deviates from the average genetic score for all populations along the first three axes.

5. From the GDS it can be seen that some populations (Deadman River drainages lakes 376, 409, 499) are highly distinctive and others (e.g., Blackwater River) not. The distinctiveness of the Deadman River drainage fish probably stems from their high degree of spatial isolation above barriers and very low levels of variation (about 30-50% of the average of all other populations) and the sensitivity of microsatellite measures of distinctiveness to level of within population variation.

6. The GDS illustrate distinctiveness in microsatellite DNA only, i.e., in terms of neutral genetic variation that is not a reflection of local adaptation which may have driven differences in life history, behaviour, etc. For instance, the Lardeau River fish had the second lowest GDS, yet nobody would argue that these fish, home of the largest rainbow trout in the world (the "Gerrard" rainbow trout of Kootenay Lake), are not highly distinctive.

7. In summary, these analyses suggest that the Fish Lake rainbow trout are not particularly distinctive in terms of one measure of genetic variation, microsatellite DNA, within the context of a large number of BC populations. Consequently, they are probably "typical" in terms of their close phylogenetic affinity to other interior BC populations.

Eric T.
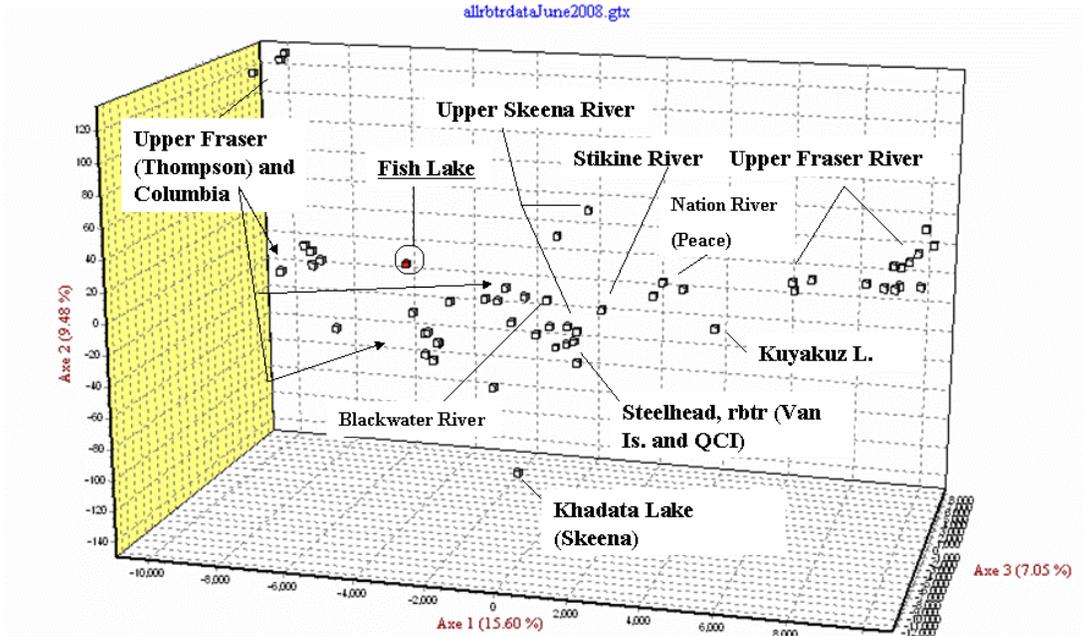
Fig. 1. Average position of Fish Lake samples compared to 55 other BC populations based on 2930 fish assayed at 10 microsatellite DNA loci
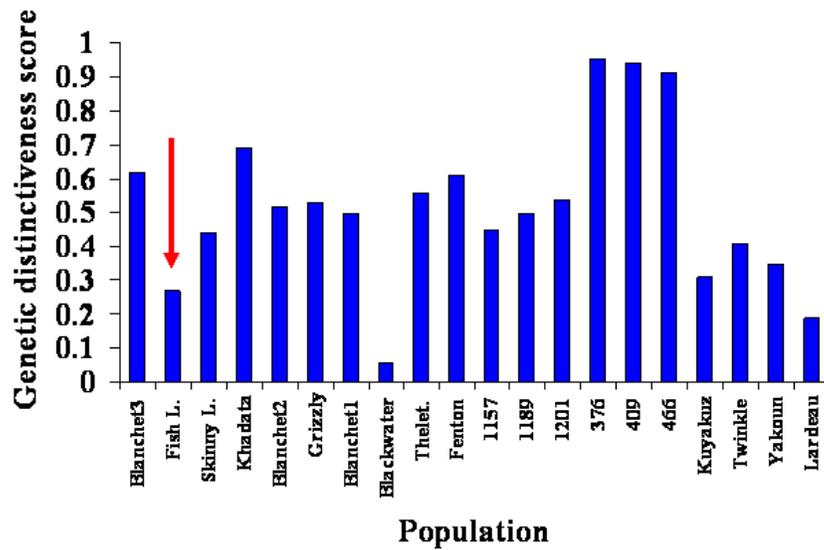
Fig. 2. Average genetic distinctiveness score (GDS) of 20 populations of rainbow trout assayed at 10 microsatellite loci. The GDS was calculated by taking the sum of the average of the absolute values of the deviation in position of each fish along each of the three axes in Fig. 1 (i.e., the average of the deviation from the overall mean position of 0 along each axis). This measures the extent to which each population deviates from the overall "typical" rainbow trout microsatellite profile. By this measure, Fish Lake and Blackwater River fish are very close to the average position. By contrast, fish from 0376, 0466, and 0409Dead lakes are very distinctive.