CZES Coastal Zone and Estuarine Studies

COLUMBIA RIVER STOCK IDENTIFICATION STUDY

by
George B. Milner
and
David J. Teel

Milner

October 1979

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INTRODUCTION

Stock identification has been a central problem in salmonid management and research for many years. Tagging studies have provided a wealth of information concerning the biology of salmonids, e.g., life cycles, timing and routes of migration, and homing behavior. Tagging has also been extremely useful in providing catch statistics. However, tagging has some serious limitations--limitations in long term studies in which rapid retrieval of information on the stock composition of daily catches are required, such as high cost, slow information retrieval time, and the requirement of marking (tagging) fish each year.

This study is concerned with a method of stock identification based on genetically controlled protein variation detected by starch gel electrophoresis coupled with histochemical staining (for details on the method see May 1975). The potential usefulness of this kind of genetic variation in fisheries research and management of salmonid stocks was recognized and developed mainly through the efforts of F. M. Utter of National Marine Fisheries Service (NMFS) and his associates over the last 15 years.

The "Columbia River Stock Identification Study Cooperative Agreement" between the U.S. Fish and Wildlife Service (USFWS) and NMFS was started in 1976 to survey and catalog genetic variation existing among chinook salmon and steelhead populations of the Columbia River and to develop a statistical method that uses biochemical genetic markers as the discriminating parameters for estimating the composition of mixed stock fisheries. Conforming with the objectives of the study, the body of this report consists of two major sections: 1) the survey of genetic variation and 2) the development of the statistical method. A third section presents conclusions and recommendations.

SURVEY OF GENETIC VARIATION

POPULATIONS

Samples from wild and hatchery populations of chinook salmon (Table 1) and steelhead (Table 2) from throughout the Columbia River system were provided by USFWS for electrophoretic analysis. The tables give the origin of the population. i.e., hatchery or wild, and its race, e.g., winter or summer run. Also included in these tables are remarks by sample collecting personnel that were noted on the collection cards accompanying each sample. Figure 1 shows the geographical distribution of chinook salmon populations (48) sampled. The general geographical distribution of steelhead populations (43) sampled was similar to that of chinook salmon.

ALLELE FREQUENCIES

Electrophoresis of 14 proteins representing 23 loci was performed on tissue extracts from whole fish samples. The proteins, number of associated loci, and abbreviations for the loci are listed in Table 3. Genetic variation was quantified by estimating the frequency of each allele at each locus for all the populations.

Allele frequency estimates (arranged in descending order) and sample sizes are listed by locus in the Tables of Appendix A and B. Chi-square confidence intervals (95%) for the common allele, i.e., the first allele, are also given in these tables. During the survey, new protein systems were developed and added to the survey, and as a consequence allele frequency data for the new systems were not obtained for all populations. In addition, lack of experience in proper field collecting and preservation techniques initially accounted for the loss of some frequency data.

TABLE 1.--Columbia River chinook salmon populations sampled.

Population	Origin[1/]	Race[2/]	Remarks
Abernathy Creek	H	F	
Bear Valley, Middle Fork Salmon	W	Sum	
Beaver Creek, Middle Fork Salmon	W	Sum	
Big Creek	H	F	
Bonneville	H	F	
Capehorn, Middle Fork Salmon	W	Sum	
Cowlitz	H	Spr	
Cowlitz	H	F	
Curtis Creek, So. Fork Salmon	W	Sum	IFG has planted McCall fish in So. Fork Salmon (smolt release Mar 78). This probably isn't the first time.
Carson, Wind	H	S	
Dexter, Willamette	?	Spr	
Eagle Creek, Clackamas	H	Spr	
Elk Creek, Middle Fork Salmon	W	Sum	
Elokomin	H	F	
Fisher Creek, Salmon	W	Sum	Taken at fish screen.
Grays	H	F	Some Washougal stock, possibly Big Creek with some Toutle River stock.
Hell Roaring, Salmon	W	Sum	
Ice Harbor	W	F	

TABLE 1.--Continued.

Population	Origin[1/]	Race[2/]	Remarks
Kalama	H	Spr	
Kalama	H	F	
Klickitat	H	Spr	Klickitat stock.
Kooskia	H	Spr	
Leavenworth, NFH	H	?	Either spring or sum-more likely Spr (Bob Adair)
Lewis (North Fork)	H	Spr	Carson stock. Speelyai Hatchery.
Lewis (North Fork)	H	F	Speelyai Hatchery.
Little White Salmon	H	F	
Lower Granite Dam	W/H	?	Mixture of Snake River stocks.
Marsh Creek, Middle Fork Salmon	W	Sum	
McKenzie, Willamette	H	Spr	Mixture of McKenzie Spr and fall. The fall stock was started years ago from Carson Hatchery.
McKenzie, Willamette	W	F	Lower 10 miles of main stem.
Middle Fork Clearwater	H	Spr	Egg stock-Rapid River
North Santiam	H	Spr	Some may be south Santiam stock due to manner of collecting eggs for this hatchery.
Pahsimeroi	H	Sum	
Priest Rapids	H	F	Same run since 1963.
Rapid River, Little Salmon	H/W	Spr	Returning for 10 yr.

TABLE 1.--Continued

Population	Origin[1/]	Race[2/]	Remarks
Round Butte, Deschutes	H	Spr	
Round Butte, Deschutes	H	Sum	
South Fork Salmon	W	Sum	Headwaters-Warm Lake Area.
South Fork Salmon	W	Sum	Headwaters.
South Santiam, Willamette	H	Spr	Same stock for 10 yr.
Spring Creek	H	F	
Toutle	H	F	
Wallowa/Lostine	W	F?	
Warm Springs, Deschutes	W	W/F	
Washougal	H	F	Parent stock Kalama or Toutle most likely Kalama egg. Washougal 1977 on.
Wells	H	Sum	
Willard	H	F	
Yakima	W	Spr	

1/ H = Hatchery
W = Wild

2/ F = Fall
Sum = Summer
Spr = Spring

TABLE 2.--Columbia River steelhead populations sampled.

Population	Origin[1/]	Race[2/]	Remarks
Beaver Creek, Elokomin	H	W	Same strain for over 10 yr.
Big Creek	H	W	
Chelan	H/W	Sum	
Chelan, 1974	H/W	Sum	Data from Allendorf.
Cowlitz	H	Sum	Data from Allendorf.
Cowlitz, 1973	H	W	
Cowlitz, 1976	H	W	
Deschutes	H	-	
Deschutes	W	-	
Deschutes, 1972	H	-	Data from Allendorf, 1977 brood.
Deschutes, 1978	H	Sum	
Dworshak	H	Sum	
Dworshak, 1974	H	Sum	
Eagle Creek, Clackamas	H	W	Fish taken as mort's.
Kalama	H	Sum	
Kalama	H	W	
Little Salmon	W	Sum	Some may be rainbow trout.
Little Salmon, Hazard Creek	W	Sum	Some may be rainbow trout.
Little Salmon, Boulder Creek	W	Sum	Some may be rainbow trout.
Little Salmon, Rapid	W	Sum	Some may be rainbow trout.
Marion Forks, North Santiam	-	W	

TABLE 2.--Continued

Population	Origin[1/]	Race[2/]	Remarks
Middle Fork Salmon, Beaver Valley Creek	W	Sum	
Middle Fork Salmon, Elk Creek	W	Sum	
Middle Fork Salmon, March	W	Sum	
Niagra Springs, Snake	H	Sum	Pahsimeroi summer run, Snake River below Oxbow Dam.
North Santiam	H	W	Fish taken as mort's.
Pahsimeroi	H	Sum	Data from Allendorf.
Salmon, Whitebird	W	Sum	
Salmon, Hell Roaring Creek	W	Sum	
Selway, Geaney	W	Sum	Some may be rainbow trout.
Skamania, Washougal	H	Sum	
Snake	H	Sum	
South Fork Salmon, headwaters #1	W	Sum	
South Fork Salmon, headwaters #2	W	Sum	Some may be rainbow trout.
South Fork Salmon, Buck Horn Creek	W	Sum	Some may be rainbow trout.
South Fork Salmon, Dollar Creek	W	Sum	Some may be rainbow trout.
South Santiam, Willamette	H	Sum	Same stock for more than 10 yr.
Tucannon	H	Sum	Skamania stock.
Squaw Creek, Umatilla	W	-	

TABLE 2.--Continued

Population	Origin[1/]	Race[2/]	Remarks
Umatilla	W	Sum	Westland trap (ODFW)
Wallowa	W	Sum	Spring spawner's Bear Creek, Lostine & Wallowa
Wells	H	Sum	
Wells, 1974	H	Sum	Data from Allendorf.

1/ W= Winter
H = Hatchery

2/ W = Winter
Sum = Summer

FIGURE 1.

Chinook salmon populations sampled

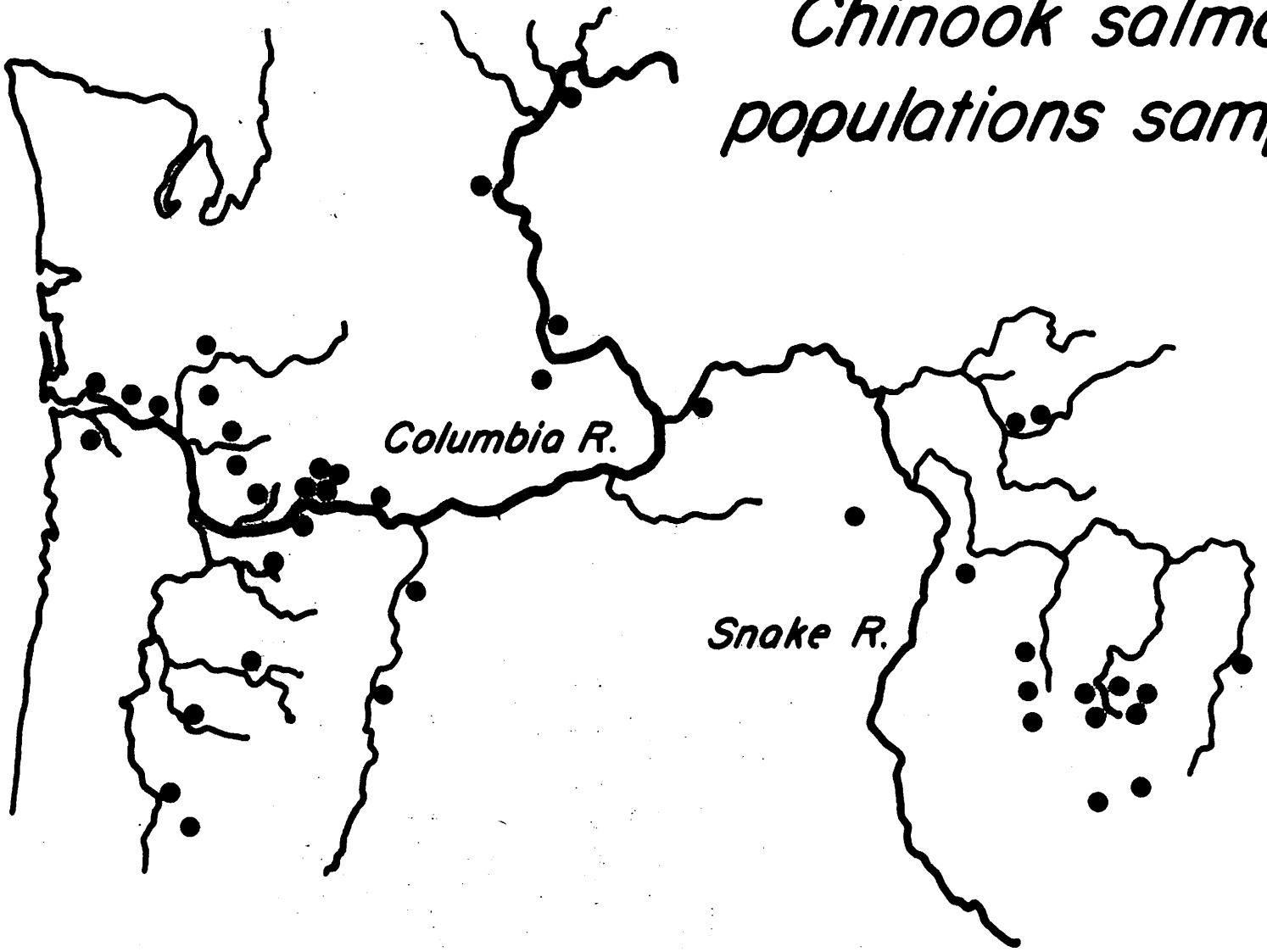

TABLE 3.--List of proteins and effective number of genetic loci surveyed.

Protein	Effective[1/] number of loci	Abbreviation
Alcohol dehydrogenase	1	ADH
Asparate aminotranferase	2	AAT
Creatine kinase	2	CK
Glycerol-3-phosphate dehydrogenase	2	AGP
Isocitrate dehydrogenase	1	IDH
Lactate dehydrogenase	3	LDH
Malate dehydrogenase	2	MDH
Peptidase (glycyl-leucine dipeptide)	2	GL
Peptidase (leucyl-glycyl-glycine tripeptide)	1	LGG
Phosphoglucomutase	1	PGM
6-Phosphogluconate dehydrogenase	1	6PG
Phosphoglucose isomerase	3	PGI
Phosphomannose isomerase	1	PMI
Tetrazolium oxidase	2	TO

[1/] For the purpose this table, if the gene products of 2 loci governing the amino acid makeup of the same protein were electrophoretically indistinguishable, they were counted as a single duplicated locus.

A genetic locus was considered polymorphic if more than one allele occurred at a frequency greater than 0.01 in at least one of the populations surveyed. Ten and thirteen polymorphic loci were identified for chinook salmon and steelhead, respectively. Tables 4 and 5 list these loci, the number of alleles identified for each locus, and the frequency range (over populations) for each allele. For example, among the 48 chinook salmon populations, the frequencies of the first allele at the PMI locus varied from 0.42 to 1.0.

DEVELOPMENT OF STATISTICAL METHODS

METHOD

A statistical method was developed that uses naturally occurring genetic differences among stocks to estimate the proportional stock composition of a mixed fishery. The method uses the EM algorithm (Dempster et al. 1977),

$$\theta_j^* = \sum_i^p \frac{Y_i \, X_{ij} \, \theta_j}{(\sum_i^p Y_i)(\sum_j^n X_{ij} \theta_j)}$$

to obtain maximum likelihood (ML) estimates of the composition of a mixed fishery. Terms of the algorithm were defined as follows:

Y_i = number of fish in mixed fishery sample having the ith genotype ($i = 1, 2, \ldots, p$ genotypes)

X_{ij} = estimated frequency of the ith genotype in the jth population

θ_j^* = estimated proportion of fish in the mixed fishery from the jth population ($j = 1, 2, \ldots, n$ populations).

TABLE 4.--Polymorphic loci, number of alleles, and range of allele frequencies among Columbia River chinook salmon populations.

Locus	Number of alleles	Range of allele frequency			
		1	2	3	4
ADH	3	0.79-1.0	0.0-0.21	0.0-0.03	-
IDH	4	0.83-1.0	0.0-0.11	0.0-0.17	0.0-0.05
LDH-4	2	0.96-1.0	0.0-0.04	-	-
LDH-5	2	0.96-1.0	0.0-0.04	-	-
MDH-B	4	0.91-1.0	0.0-0.09	0.0-0.01	0.0-0.01
GL-1	4	0.82-1.0	0.0-0.18	0.0-0.01	0.0-0.02
LGG	2	0.71-1.0	0.0-0.29	-	-
PMI	3	0.42-1.0	0.0-0.58	0.0-0.08	-
TO-1	3	0.50-1.0	0.0-0.52	0.0-0.01	-
TO-2	2	0.92-1.0	0.0-0.08	-	-

TABLE 5.--Polymorphic loci, number of alleles, and range of allele frequencies among Columbia River steelhead populations.

Locus	Number of alleles	Range of allele frequency			
		1	2	3	4
AAT,-1,2	2	0.97-1.0	0.0-0.03	-	-
ADH	2	0.93-1.0	0.0-0.07	-	-
AGP-1	2	0.77-1.0	0.0-0.23	-	-
PGI-3	3	0.89-1.0	0.0-0.10	0.0-0.02	-
IDH	4	0.57-1.0	0.0-0.26	0.0-0.06	0.0-0.27
LDH-4	3	0.15-0.99	0.01-0.85	-	0.0-0.04
MDH-B	4	0.87-1.0	0.0-0.13	0.0-0.05	0.0-0.07
PGM	2	0.94-1.0	0.0-0.06	-	-
PMI	3	0.81-1.0	0.0-0.19	0.0-0.02	-
TO	3	0.37-1.0	0.0-0.63	0.0-0.19	-
AGP-2	2	0.97-1.0	0.0-0.03	-	-
GL-1	3	0.47-1.0	0.0-0.52	0.0-0.08	-
LGG	2	0.82-1.0	0.0-0.18	-	-

The estimates are obtained by the following stepwise procedure:

(1) θ_j^* values are obtained through initially solving the equation by arbitrarily arranging equal values to θ_j.

(2) A new set of θ_j^* is then obtained by substituting the previously obtained θ_j^* values for θ_j - and again solving the equation.

(3) Steps 1 and 2 are repeated until the successive values of θ_j^* converge.

The formula used to calculate the variance (V) of the ML estimate was:

$$V_{\theta_j} = \sum_{i}^{p} \frac{\left(\sum_{j}^{n-1} X_{ij}\,\theta_j + X_{in}\left(1-\sum_{j}^{n-1}\theta_j\right)\right)^2}{Y_i\left(X_{ij}-X_{in}\right)^2}$$

where all terms of this expression are defined as above.

Baseline genotype frequencies (X_{ij}) were considered fixed constants. Therefore, variances calculated with the formula given above do not include variation associated with the estimates of baseline genotype frequencies. To include this source of variation in the calculations would be too difficult and costly to be practical. Rather, it is better to minimize this source of variation by using adequate sample sizes for estimating the baseline genotype frequencies.

EVALUATION

Results of initial evaluation through simulation using genetic data collected during this study from steelhead populations were very encouraging (Milner, 1977). Further testing was done to determine the effects of sample size and the number of genetic loci on the precision of the ML estimates. To do this, variances were calculated for the two cases that resulted from varying each of the two variables while holding the other constant. Sample sizes were varied from 100 to 1,539 fish, and the number of loci was varied from one to seven. All of the loci were assigned the same distribution of genotypes.

The results obtained are plotted on a log x log coordinate system in Figure 2. Increasing sample size by a factor, f, reduces the standard deviation of the ML estimate by a factor of $1/\sqrt{f}$. The effect of the number of loci used is more complicated and depends upon the distribution of genotype frequencies among the populations considered. In general, increasing the number of loci is an effective way to reduce the variance or standard deviation (SD) as can be seen in the example shown in Figure 2.

Another test of the method was done to determine whether or not the genetic differences found among stocks were sufficiently discriminating to obtain reasonable levels of precision of the ML estimates as measured by their SD's. Using a sample size of 1,000 fish, SD's were calculated for artificial mixed fishery estimates using genetic data collected during the study. The genetic data were limited to the three polymorphic loci for which complete data were available--TO, MDH-B, and PMI. This was done for the following hypothetical mixed stock fisheries:

1) Spring/summer chinook salmon zones 1-5 fishery.

2) Fall chinook salmon zones 1-5 fishery.

Stocks having indistinguishable genetic profiles (based on the three loci used) were pooled and considered one population unit. Results are presented in Tables 6 and 7.

In general, these results were very encouraging especially since only 3 of the 10 polymorphic loci were used. One exception was the Leavenworth hatchery stock, and discussions with Washington State Fisheries Management personnel indicated that the sample obtained might not have been representative of the Leavenworth stock.

FIGURE 2. Effect of varying sample size and number of genetic loci on standard deviation of estimate.

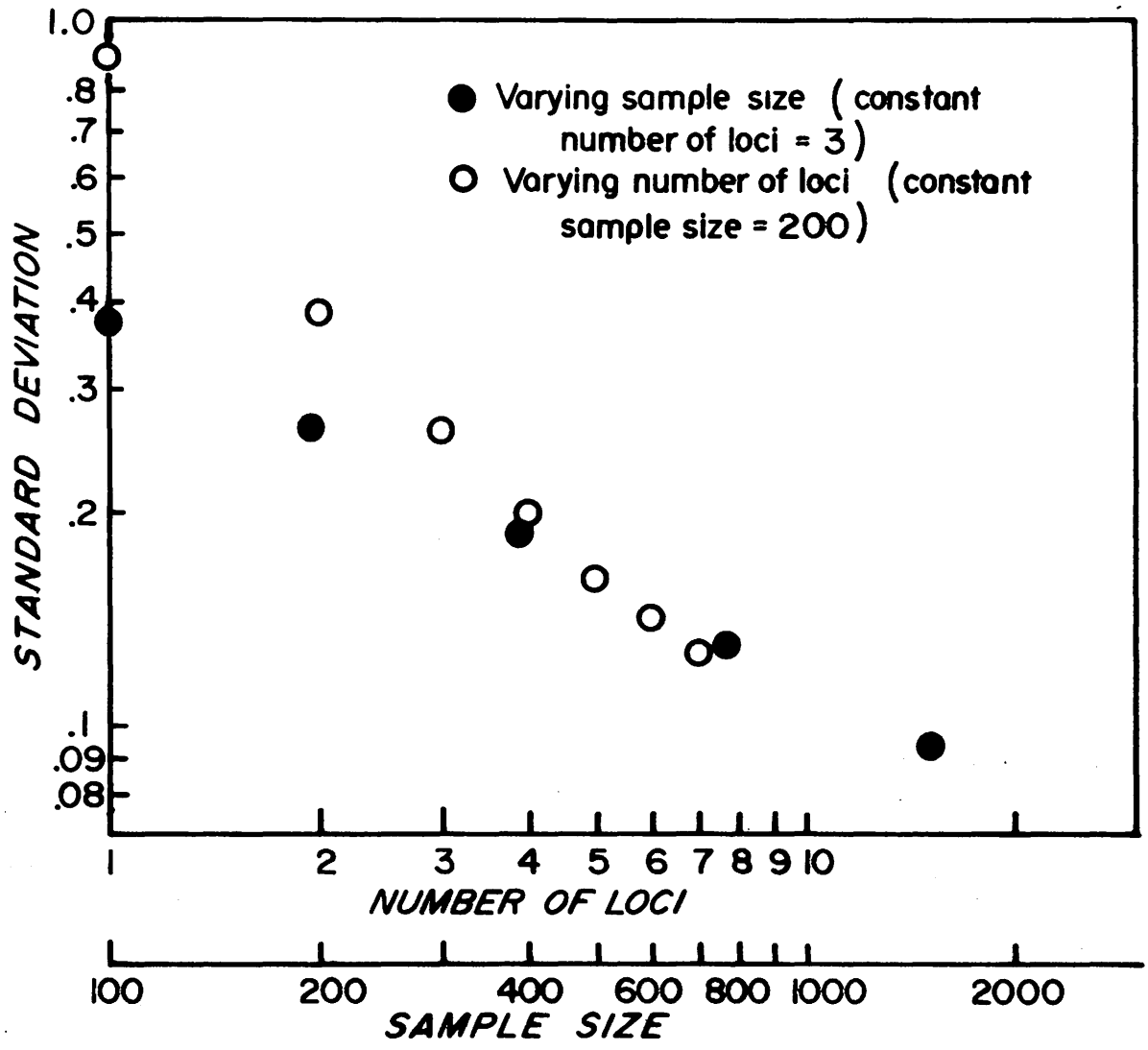

TABLE 6.--Columbia River spring/summer chinook salmon fishery (zones 1-5)-precision of ML estimates as measured by their standard deviations using a hypothetical sample of 1,000 fish.

Population unit	Description	Contribution to fishery	Standard deviation
1	Salmon R.-Hell Roaring Creek		
	" " -Fishery Creek		
	" "-Pahsimeroi		
	So. Fork Salmon R.-Headwaters		
	" " " " -Curtis Creek		
	Middle Fork Salmon R.-Capehorn Creek		
	" " " " -Elk Creek	0.14	0.07
	" " " " -Bear Creek		
	" " " " -Marsh Creek		
	" " " " -Beaver Creek		
	Rapid R.		
	Wallowa/Lostine		
	Kooskia		
	Middle Fork Clearwater R.		
	Deschutes R.-Round Butte (Spring run)		
	" " - " " (Summer run)		
	Klickitat		
	Wind-Carson		
2	Wenatchee R.-Leavenworth	0.02	0.26
3	Yakima	0.02	0.05
4	Wells	0.02	0.02
5	Willamette R.-Dexter		
	" " -McKenzie		
	" " -So. Santiam	0.40	0.11
6	" "-No. Santiam	0.10	0.05
7	Lewis R.	0.10	0.05
8	Kalama R.	0.10	0.13
9	Cowlitz R.	0.10	0.11

TABLE 7.--Columbia River fall chinook salmon fishery (zones 1-5)--precision of ML estimates as measured by their standard deviations using a hypothetical sample of 1,000 fish.

Population unit	Description	Contribution to fishery	Standard deviation
1	Ice Harbor	0.10	0.05
2	Priest Rapids	0.10	0.04
3	Deschutes-Warm Springs	0.10	0.05
4	Lewis	0.10	0.04
5	Willametee-McKenzie	0.10	0.03
6	Kalama Cowlitz Toutle Abernathy Elokomin Grays Big Creek Willard Spring Creek Little White Salmon Bonneville Washougal	0.50	0.05

CONCLUSIONS AND RECOMMENDATIONS

Wild and hatchery stocks of chinook salmon and steelhead from the Columbia River system were surveyed for biochemical genetic variation that could be used for estimating the composition of mixed stock fisheries. It was found that: (1) Considerable genetic differentiation suitable for this purpose existed among many of the stocks of both species. (2) Even better stock differentiation would result if missing genetic data were obtained and if new genetic data were added to the data bank. (3) A method for obtaining ML estimates for the composition of mixed stocks fisheries using biochemical genetic data is useful for analyzing the composition of mixed stock fisheries. (4) Both the appropriateness of the method and the sample size requirement for any specific mixed fishery problem will depend on: a) which stocks may contribute to the fishery, b) what their genetic profiles are, and c) which contributing stock(s) are of interest. (5) Both the increase of sample size and number of loci reduced the standard deviations of the estimates; however, an increase in sample size yielded minimal gain beyond a certain point. Significant gains in precision occurred with the addition of each highly polymorphic locus, which resulted in a reduced sample size requirement for a given level of precision. For example, in Figure 2 it can be seen that approximately the same level of precision may be obtained using three loci with a sample size of 765 or seven loci with a sample size of 200.

Recommended future goals for this study should include the following:

(1) Completion of baseline genetic data collection.

(2) Refinement of computer techniques.

(3) Evaluation of the overall method by further simulation work and a comprehensive field demonstration.

When these goals have been accomplished, the method developed during the study will provide fishery managers with the new tools for the analysis of mixed stock fisheries.

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APPENDIX A

CHINOOK SALMON ALLELE FREQUENCIES

TABLE 1. LOCUS: AAT-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
KALAMA-F	270	1.00	.00	.00	.00	1.00 -1.00
YAKIMA	231	1.00	.00	.00	.00	1.00 -1.00
CARSON	174	1.00	.00	.00	.00	1.00 -1.00
ABERNATHY	146	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	145	1.00	.00	.00	.00	.99 -1.00
COWLITZ-S	134	1.00	.00	.00	.00	.99 -1.00
WARM SPR	126	1.00	.00	.00	.00	.99 -1.00
ELOKOMIN	125	1.00	.00	.00	.00	.99 -1.00
WELLS	122	1.00	.00	.00	.00	.99 -1.00
EAGLE	120	1.00	.00	.00	.00	.99 -1.00
KALAMA-S	119	1.00	.00	.00	.00	.99 -1.00
GREYS	100	1.00	.00	.00	.00	.99 -1.00
L W SALMON	96	1.00	.00	.00	.00	.99 -1.00
S SANTIAM	80	1.00	.00	.00	.00	.99 -1.00
RAPID	79	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	53	1.00	.00	.00	.00	.99 -1.00
SF SALMON	50	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	49	1.00	.00	.00	.00	.98 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	42	1.00	.00	.00	.00	.98 -1.00
BIG CRK	40	1.00	.00	.00	.00	.98 -1.00
TOUTLE	40	1.00	.00	.00	.00	.98 -1.00
LOW GRANIT	20	1.00	.00	.00	.00	.96 -1.00
SF SALMON	50	1.00	.01	.00	.00	.95 -1.00
KLICKITAT	25	.99	.01	.00	.00	.91 -1.00
MFS ELK						
MF CLEARWA						
COWLITZ-F						
DEXTER						
SALMON HEL						
N SANTIAM						
WALLOWA						
RD BUT-SPR						
PAHSIMEROI						
LEWIS-S						
WASHOUGAL						
SALMON FIS						
RD BUT-SUM						
MFS MARCH						
LEWIS-F						
ICE HARBOR						
MFS BEAVER						
MFS CAPEHN						
PRIEST RAP						
BONNEVILLE						
WILLARD						
MFS BEAR V						
MCKENZIE-F						

TABLE 2. LOCUS: AAT-3

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
ABERNATHY	229	1.00	.00	.00	.00	.99 -1.00
RAPID	215	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	213	1.00	.00	.00	.00	.99 -1.00
YAKIMA	200	1.00	.00	.00	.00	.99 -1.00
WELLS	178	1.00	.00	.00	.00	.99 -1.00
KALAMA-S	160	1.00	.00	.00	.00	.99 -1.00
WARM SPR	150	1.00	.00	.00	.00	.99 -1.00
DEXTER	139	1.00	.00	.00	.00	.99 -1.00
GREYS	136	1.00	.00	.00	.00	.99 -1.00
COWLITZ-S	134	1.00	.00	.00	.00	.99 -1.00
ELCKOMIN	125	1.00	.00	.00	.00	.99 -1.00
EAGLE	120	1.00	.00	.00	.00	.99 -1.00
KALAMA-F	120	1.00	.00	.00	.00	.99 -1.00
BIG CRK	108	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	100	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	97	1.00	.00	.00	.00	.98 -1.00
L W SALMON	96	1.00	.00	.00	.00	.98 -1.00
LOW GRANIT	90	1.00	.00	.00	.00	.98 -1.00
TOUTLE	90	1.00	.00	.00	.00	.98 -1.00
CARSON	87	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
MFS CAPEHN	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
PRIEST RAP	49	1.00	.00	.00	.00	.97 -1.00
LEWIS-S	46	1.00	.00	.00	.00	.97 -1.00
S SANTIAM	40	1.00	.00	.00	.00	.96 -1.00
WASHOUGAL	37	1.00	.00	.00	.00	.96 -1.00
MFS BEAVER	26	1.00	.00	.00	.00	.94 -1.00
MF CLEARWA	82	.99	.00	.01	.00	.97 -1.00
MFS ELK						
KLICKITAT						
WALLOWA						
LEAVENWORT						
ICE HARBOR						
SF SAL CUR						
COWLITZ-F						
N SANTIAM						
MFS MARCH						
SALMON FIS						
MFS BEAR V						
PAHSIMEROI						
SALMON HEL						
SF SALMON						

TABLE 3. LOCUS: ADH

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
PAHSIMEROI	120	1.00	.00	.00	.00	.99 -1.00
RAPID	105	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	100	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.98 -1.00
MF CLEARWA	96	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
EAGLE	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	48	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
CARSON	43	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	42	1.00	.00	.00	.00	.96 -1.00
MFS MARCH	40	1.00	.00	.00	.00	.96 -1.00
MFS BEAVER	39	1.00	.00	.00	.00	.96 -1.00
MFS BEAR V	38	1.00	.00	.00	.00	.96 -1.00
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
WELLS	81	.99	.01	.00	.00	.97 -1.00
KALAMA-S	50	.99	.01	.00	.00	.95 -1.00
WALLOWA	15	.97	.00	.03	.00	.83 - .99
PRIEST RAP	96	.97	.03	.00	.00	.94 - .99
KOOSKIA	94	.97	.03	.00	.00	.94 - .99
COWLITZ-S	71	.94	.06	.00	.00	.88 - .97
COWLITZ-F	50	.92	.08	.00	.00	.85 - .96
TOUTLE	50	.92	.08	.00	.00	.85 - .96
KALAMA-F	44	.91	.09	.00	.00	.83 - .95
WASHOUGAL	88	.92	.08	.00	.00	.87 - .95
WILLARD	50	.91	.09	.00	.00	.84 - .95
BONNEVILLE	48	.83	.17	.00	.00	.75 - .89
LEWIS-S	50	.83	.17	.00	.00	.74 - .89
SPRING CRK	49	.82	.18	.00	.00	.73 - .88
L W SALMON	52	.79	.21	.00	.00	.70 - .86
YAKIMA						
LOW GRANIT						
BIG CRK						
MCKENZIE-S						
WARM SPR						
GREYS						
KLICKITAT						
DEXTER						
ICE HARBOR						
ABERNATHY						
S SANTIAM						
ELCKOMIN						

TABLE 4. LOCUS: AGP-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
RAPID	200	1.00	.00	.00	.00	.99 -1.00
CARSON	181	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	177	1.00	.00	.00	.00	.99 -1.00
WELLS	176	1.00	.00	.00	.00	.99 -1.00
WARM SPR	164	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	146	1.00	.00	.00	.00	.99 -1.00
DEXTER	139	1.00	.00	.00	.00	.99 -1.00
WASHOUGAL	120	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	112	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	100	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	99	1.00	.00	.00	.00	.98 -1.00
MF CLEARWA	99	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	96	1.00	.00	.00	.00	.98 -1.00
EAGLE	94	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
KALAMA-S	80	1.00	.00	.00	.00	.98 -1.00
SALMON HEL	79	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
YAKIMA	60	1.00	.00	.00	.00	.98 -1.00
LEWIS-S	50	1.00	.00	.00	.00	.97 -1.00
L W SALMON	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-S	50	1.00	.00	.00	.00	.97 -1.00
TOUTLE	50	1.00	.00	.00	.00	.97 -1.00
PRIEST RAP	50	1.00	.00	.00	.00	.97 -1.00
GREYS	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
KALAMA-F	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	47	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	46	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	45	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	40	1.00	.00	.00	.00	.96 -1.00
MFS BEAVER	38	1.00	.00	.00	.00	.96 -1.00
MFS ELK	24	1.00	.00	.00	.00	.94 -1.00
WALLOWA	13	1.00	.00	.00	.00	.89 -1.00
LOW GRANIT	281	1.00	.00	.00	.00	.99 -1.00
BIG CRK						
S SANTIAM						
KLICKITAT						
ELOKOMIN						

TABLE 5. LOCUS: AGP-2

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
LOW GRANIT	281	1.00	.00	.00	.00	.99 -1.00
RAPID	200	1.00	.00	.00	.00	.99 -1.00
CARSON	181	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	177	1.00	.00	.00	.00	.99 -1.00
WELLS	176	1.00	.00	.00	.00	.99 -1.00
WARM SPR	164	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	146	1.00	.00	.00	.00	.99 -1.00
DEXTER	139	1.00	.00	.00	.00	.99 -1.00
WASHOUGAL	120	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	112	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	100	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	99	1.00	.00	.00	.00	.98 -1.00
MF CLEARWA	99	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	96	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
EAGLE	94	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
KALAMA-S	80	1.00	.00	.00	.00	.98 -1.00
SALMON HEL	79	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
YAKIMA	60	1.00	.00	.00	.00	.98 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
GREYS	50	1.00	.00	.00	.00	.97 -1.00
L W SALMON	50	1.00	.00	.00	.00	.97 -1.00
KALAMA-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
PRIEST RAP	50	1.00	.00	.00	.00	.97 -1.00
TOUTLE	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-S	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-S	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	47	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	46	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	45	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	40	1.00	.00	.00	.00	.96 -1.00
MFS BEAVER	38	1.00	.00	.00	.00	.96 -1.00
MFS ELK	24	1.00	.00	.00	.00	.94 -1.00
WALLOWA	13	1.00	.00	.00	.00	.89 -1.00
BIG CRK						
S SANTIAM						
ELOKOMIN						
KLICKITAT						

TABLE 6. LOCUS: CK

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SPRING CRK	263	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	227	1.00	.00	.00	.00	.99 -1.00
RAPID	215	1.00	.00	.00	.00	.99 -1.00
CARSON	202	1.00	.00	.00	.00	.99 -1.00
KALAMA-S	200	1.00	.00	.00	.00	.99 -1.00
WARM SPR	197	1.00	.00	.00	.00	.99 -1.00
LOW GRANIT	174	1.00	.00	.00	.00	.99 -1.00
KALAMA-F	170	1.00	.00	.00	.00	.99 -1.00
EAGLE	170	1.00	.00	.00	.00	.99 -1.00
L W SALMON	148	1.00	.00	.00	.00	.99 -1.00
TOUTLE	144	1.00	.00	.00	.00	.99 -1.00
DEXTER	139	1.00	.00	.00	.00	.99 -1.00
COWLITZ-S	134	1.00	.00	.00	.00	.99 -1.00
PRIEST RAP	132	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	129	1.00	.00	.00	.00	.99 -1.00
ELOKOMIN	125	1.00	.00	.00	.00	.99 -1.00
KLICKITAT	113	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	100	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.98 -1.00
MF CLEARWA	97	1.00	.00	.00	.00	.98 -1.00
SALMON HEL	97	1.00	.00	.00	.00	.98 -1.00
GREYS	96	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
MCKENZIE-S	95	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
WASHOUGAL	63	1.00	.00	.00	.00	.98 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	44	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAVER	42	1.00	.00	.00	.00	.96 -1.00
SF SAL CUR	39	1.00	.00	.00	.00	.96 -1.00
LEWIS-S	27	1.00	.00	.00	.00	.95 -1.00
BIG CRK	24	1.00	.00	.00	.00	.94 -1.00
MFS ELK	24	1.00	.00	.00	.00	.94 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
WELLS	179	1.00	.00	.00	.00	.98 -1.00
WILLARD						
YAKIMA						
LEWIS-F						
S SANTIAM						
BONNEVILLE						

TABLE 7. LOCUS: GL-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
LOW GRANIT	281	1.00	.00	.00	.00	.99 -1.00
RAPID	215	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	118	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
MF CLEARWA	99	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
PRIEST RAP	96	1.00	.00	.00	.00	.98 -1.00
MCKENZIE-S	93	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
EAGLE	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	44	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAVER	42	1.00	.00	.00	.00	.96 -1.00
MFS ELK	24	1.00	.00	.00	.00	.94 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
RD BUT-SPR	50	.99	.00	.00	.01	.95 -1.00
RD BUT-SUM	50	.99	.00	.00	.01	.95 -1.00
KALAMA-S	50	.99	.01	.00	.00	.95 -1.00
BONNEVILLE	50	.99	.01	.00	.00	.95 -1.00
SALMON HEL	100	.99	.01	.00	.00	.96 -1.00
CARSON	130	.99	.00	.00	.01	.97 -1.00
WARM SPR	168	.99	.01	.00	.00	.97 -1.00
ABERNATHY	100	.98	.02	.00	.00	.96 - .99
L W SALMON	52	.98	.02	.00	.00	.93 - .99
WILLARD	45	.98	.00	.00	.02	.92 - .99
YAKIMA	220	.99	.01	.00	.00	.97 - .99
WELLS	42	.98	.02	.00	.00	.92 - .99
KOOSKIA	100	.98	.02	.00	.00	.95 - .99
WASHOUGAL	136	.98	.02	.00	.00	.96 - .99
ICE HARBOR	65	.98	.02	.01	.00	.93 - .99
SPRING CRK	100	.98	.03	.00	.00	.94 - .99
COWLITZ-S	67	.95	.05	.00	.00	.90 - .97
KALAMA-F	50	.91	.09	.00	.00	.84 - .95
COWLITZ-F	50	.88	.12	.00	.00	.80 - .93
TOUTLE	50	.87	.13	.00	.00	.79 - .92
LEWIS-S	49	.82	.18	.00	.00	.73 - .88
DEXTER						
BIG CRK						
S SANTIAM						
GREYS						
ELOKOMIN						
KLICKITAT						

TABLE 8. LOCUS: GL-2

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
CARSON	130	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	120	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	100	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	100	1.00	.00	.00	.00	.99 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
LOW GRANIT	70	1.00	.00	.00	.00	.98 -1.00
L W SALMON	52	1.00	.00	.00	.00	.97 -1.00
SPRING CRK	50	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
LEAVENWORT	50	1.00	.00	.00	.00	.97 -1.00
KALAMA-F	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
EAGLE	50	1.00	.00	.00	.00	.97 -1.00
KALAMA-S	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-S	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
TOUTLE	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	44	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAVER	41	1.00	.00	.00	.00	.96 -1.00
WASHOUGAL	29	1.00	.00	.00	.00	.95 -1.00
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
YAKIMA	20	1.00	.00	.00	.00	.93 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
WELLS						
S SANTIAM						
PRIEST RAP						
ELOKOMIN						
RD BUT-SUM						
KLICKITAT						
LEWIS-S						
RAPID						
MCKENZIE-F						
GREYS						
ICE HARBOR						
DEXTER						
COWLITZ-S						
RD BUT-SPR						
WARM SPR						
BIG CRK						
KOOSKIA						
MF CLEARWA						

TABLE 9. LOCUS: IDH

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
GREYS	66	1.00	.00	.00	.00	.99 -1.00
WILLARD	50	1.00	.00	.00	.00	.99 -1.00
L W SALMON	51	.99	.00	.00	.00	.95 -1.00
BONNEVILLE	50	.99	.01	.00	.00	.95 -1.00
KALAMA-F	82	.99	.01	.00	.00	.96 -1.00
SPRING CRK	46	.98	.02	.00	.00	.92 - .99
DEXTER	80	.98	.02	.01	.00	.94 - .99
COWLITZ-F	48	.97	.00	.03	.00	.91 - .99
MF CLEARWA	44	.96	.00	.04	.00	.90 - .99
MFS MARCH	41	.96	.00	.04	.00	.89 - .98
WASHOUGAL	77	.96	.01	.03	.00	.92 - .98
SALMON FIS	96	.96	.00	.04	.00	.92 - .98
MFS BEAVER	39	.94	.00	.06	.00	.87 - .98
LEWIS-S	49	.94	.04	.02	.00	.88 - .97
TOUTLE	49	.94	.02	.04	.00	.88 - .97
COWLITZ-S	66	.95	.02	.03	.00	.89 - .97
WALLOWA	15	.92	.00	.08	.00	.77 - .97
SALMON HEL	99	.95	.01	.05	.00	.91 - .97
RAPID	49	.93	.00	.07	.00	.87 - .97
WELLS	84	.94	.06	.00	.00	.89 - .97
CARSON	43	.92	.00	.08	.00	.85 - .96
SF SAL CUR	35	.91	.00	.09	.00	.83 - .96
MCKENZIE-F	45	.91	.09	.00	.00	.83 - .95
SF SALMON	68	.91	.00	.09	.00	.85 - .95
LEAVENWORT	84	.91	.00	.08	.00	.86 - .95
RD BUT-SUM	47	.90	.00	.10	.00	.82 - .95
MFS ELK	25	.87	.00	.13	.00	.75 - .94
SF SALMON	98	.90	.00	.10	.00	.85 - .93
PAHSIMEROI	45	.88	.00	.12	.00	.80 - .93
KALAMA-S	87	.89	.11	.00	.00	.84 - .93
LEWIS-F	46	.88	.00	.13	.00	.79 - .93
KOOSKIA	91	.89	.00	.11	.00	.84 - .93
YAKIMA	63	.88	.01	.11	.00	.81 - .93
PRIEST RAP	136	.89	.11	.00	.00	.85 - .92
MFS CAPEHN	86	.87	.01	.12	.00	.81 - .91
EAGLE	140	.87	.08	.00	.05	.83 - .91
MFS BEAR V	39	.83	.00	.17	.00	.74 - .90
RD BUT-SPR	49	.60	.24	.16	.00	.50 - .69
KLICKITAT						
S SANTIAM						
WARM SPR						
MCKENZIE-S						
ABERNATHY						
LOW GRANIT						
BIG CRK						
N SANTIAM						
ELOKOMIN						
ICE HARBOR						

TABLE 10. LOCUS: LDH-3

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
LOW GRANIT	276	1.00	.00	.00	.00	.99 -1.00
RAPID	200	1.00	.00	.00	.00	.99 -1.00
WARM SPR	168	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	150	1.00	.00	.00	.00	.99 -1.00
WASHOUGAL	148	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	146	1.00	.00	.00	.00	.99 -1.00
DEXTER	139	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	138	1.00	.00	.00	.00	.99 -1.00
WELLS	122	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	120	1.00	.00	.00	.00	.99 -1.00
TOUTLE	104	1.00	.00	.00	.00	.99 -1.00
CARSON	103	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	100	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	100	1.00	.00	.00	.00	.99 -1.00
EAGLE	100	1.00	.00	.00	.00	.99 -1.00
PRIEST RAP	100	1.00	.00	.00	.00	.99 -1.00
MF CLEARWA	99	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
KALAMA-S	90	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
YAKIMA	64	1.00	.00	.00	.00	.98 -1.00
L W SALMON	52	1.00	.00	.00	.00	.97 -1.00
COWLITZ-S	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
GREYS	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-S	50	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
KALAMA-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	44	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAVER	41	1.00	.00	.00	.00	.96 -1.00
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
BIG CRK						
ELOKOMIN						
KLICKITAT						
S SANTIAM						

TABLE 11. LOCUS: LDH-4

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
WARM SPR	203	1.00	.00	.00	.00	.99 -1.00
YAKIMA	160	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	150	1.00	.00	.00	.00	.99 -1.00
PRIEST RAP	149	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	146	1.00	.00	.00	.00	.99 -1.00
WASHOUGAL	138	1.00	.00	.00	.00	.99 -1.00
WELLS	122	1.00	.00	.00	.00	.99 -1.00
TOUTLE	104	1.00	.00	.00	.00	.99 -1.00
CARSON	103	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	100	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	100	1.00	.00	.00	.00	.99 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.98 -1.00
KALAMA-S	90	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
L W SALMON	52	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-S	50	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
KALAMA-F	50	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
GREYS	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-S	50	1.00	.00	.00	.00	.97 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
RAPID	205	1.00	.00	.00	.00	.99 -1.00
EAGLE	150	1.00	.00	.00	.00	.98 -1.00
MF CLEARWA	99	.99	.00	.01	.00	.97 -1.00
SF SALMON	73	.99	.01	.00	.00	.96 -1.00
KOOSKIA	197	.99	.00	.01	.00	.98 -1.00
MCKENZIE-F	50	.99	.01	.00	.00	.95 -1.00
MFS BEAR V	44	.99	.01	.00	.00	.94 -1.00
MFS BEAVER	42	.99	.01	.00	.00	.94 -1.00
LEAVENWORT	92	.99	.01	.00	.00	.96 -1.00
MFS ELK	25	.98	.02	.00	.00	.90 -1.00
MFS CAPEHN	96	.98	.02	.00	.00	.96 - .99
RD BUT-SUM	50	.98	.02	.00	.00	.93 - .99
SF SAL CUR	43	.98	.02	.00	.00	.92 - .99
SF SALMON	100	.98	.02	.00	.00	.95 - .99
LOW GRANIT	276	.98	.00	.02	.00	.97 - .99
PAHSIMEROI	120	.98	.03	.00	.00	.95 - .99
MFS MARCH	43	.97	.03	.00	.00	.90 - .99
LEWIS-F	50	.96	.04	.00	.00	.90 - .98
DEXTER						
BIG CRK						
ELOKOMIN						
S SANTIAM						
KLICKITAT						

TABLE 12. LOCUS: LDH-5

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
YAKIMA	235	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	143	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	141	1.00	.00	.00	.00	.99 -1.00
DEXTER	139	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	120	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	119	1.00	.00	.00	.00	.99 -1.00
CARSON	103	1.00	.00	.00	.00	.99 -1.00
EAGLE	100	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	100	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	100	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
MF CLEARWA	99	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
KALAMA-S	90	1.00	.00	.00	.00	.98 -1.00
L W SALMON	52	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
TOUTLE	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
KALAMA-F	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-S	47	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	44	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAVER	42	1.00	.00	.00	.00	.96 -1.00
S SANTIAM	40	1.00	.00	.00	.00	.96 -1.00
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
WARM SPR	203	1.00	.00	.00	.00	.99 -1.00
WASHOUGAL	138	1.00	.00	.00	.00	.98 -1.00
PRIEST RAP	94	.99	.01	.00	.00	.97 -1.00
RAPID	234	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	.99	.01	.00	.00	.96 -1.00
COWLITZ-S	111	.99	.01	.00	.00	.97 -1.00
LOW GRANIT	281	.99	.01	.00	.00	.98 -1.00
SF SALMON	73	.99	.01	.00	.00	.95 -1.00
RD BUT-SUM	50	.98	.02	.00	.00	.93 - .99
WELLS	98	.96	.04	.00	.00	.92 - .98
GREYS						
BIG CRK						
ELOKOMIN						
KLICKITAT						

TABLE 13. LOCUS: LGG

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
MFS BEAVER	42	.99	.01	.00	.00	.94 -1.00
SF SALMON	72	.98	.02	.00	.00	.94 - .99
MFS CAPEHN	96	.98	.02	.00	.00	.95 - .99
SALMON FIS	91	.98	.02	.00	.00	.94 - .99
MFS ELK	25	.96	.04	.00	.00	.87 - .99
EAGLE	45	.97	.03	.00	.00	.91 - .99
RD BUT-SUM	44	.97	.03	.00	.00	.90 - .99
SF SALMON	98	.97	.03	.00	.00	.93 - .99
LEAVENWORT	50	.96	.04	.00	.00	.90 - .98
LEWIS-F	46	.96	.04	.00	.00	.89 - .98
LOW GRANIT	116	.97	.03	.00	.00	.93 - .98
WARM SPR	71	.96	.04	.00	.00	.91 - .98
KALAMA-S	50	.95	.05	.00	.00	.89 - .98
COWLITZ-F	50	.94	.06	.00	.00	.88 - .97
LEWIS-S	50	.94	.06	.00	.00	.88 - .97
CARSON	50	.94	.06	.00	.00	.88 - .97
N SANTIAM	46	.92	.08	.00	.00	.85 - .96
MFS BEAR V	44	.92	.08	.00	.00	.84 - .96
SALMON HEL	85	.92	.08	.00	.00	.87 - .95
MFS MARCH	43	.91	.09	.00	.00	.83 - .95
TOUTLE	47	.90	.10	.00	.00	.83 - .95
MCKENZIE-F	48	.84	.16	.00	.00	.76 - .90
KALAMA-F	50	.84	.16	.00	.00	.76 - .90
BONNEVILLE	49	.84	.16	.00	.00	.75 - .90
WILLARD	48	.77	.23	.00	.00	.68 - .84
L W SALMON	52	.74	.26	.00	.00	.65 - .82
SPRING CRK	50	.71	.29	.00	.00	.61 - .79
MCKENZIE-S						
ELOKOMIN						
S SANTIAM						
YAKIMA						
DEXTER						
COWLITZ-S						
RAPID						
BIG CRK						
MF CLEARWA						
GREYS						
KOOSKIA						
WELLS						
RD BUT-SPR						
WASHOUGAL						
PRIEST RAP						
ABERNATHY						
PAHSIMEROI						
KLICKITAT						
ICE HARBOR						

TABLE 14. LOCUS: MDH-A

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
LOW GRANIT	281	1.00	.00	.00	.00	1.00 -1.00
RAPID	215	1.00	.00	.00	.00	1.00 -1.00
WARM SPR	202	1.00	.00	.00	.00	1.00 -1.00
KOOSKIA	194	1.00	.00	.00	.00	1.00 -1.00
SPRING CRK	150	1.00	.00	.00	.00	1.00 -1.00
MCKENZIE-S	146	1.00	.00	.00	.00	.99 -1.00
DEXTER	139	1.00	.00	.00	.00	.99 -1.00
WASHOUGAL	120	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	120	1.00	.00	.00	.00	.99 -1.00
MF CLEARWA	99	1.00	.00	.00	.00	.99 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	100	1.00	.00	.00	.00	.99 -1.00
WELLS	99	1.00	.00	.00	.00	.99 -1.00
EAGLE	100	1.00	.00	.00	.00	.99 -1.00
PRIEST RAP	97	1.00	.00	.00	.00	.99 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.99 -1.00
KALAMA-S	90	1.00	.00	.00	.00	.99 -1.00
SF SALMON	73	1.00	.00	.00	.00	.99 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.99 -1.00
L W SALMON	52	1.00	.00	.00	.00	.99 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.99 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.99 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.99 -1.00
KALAMA-F	50	1.00	.00	.00	.00	.99 -1.00
CARSON	50	1.00	.00	.00	.00	.99 -1.00
TOUTLE	50	1.00	.00	.00	.00	.99 -1.00
WILLARD	50	1.00	.00	.00	.00	.99 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.99 -1.00
COWLITZ-S	50	1.00	.00	.00	.00	.99 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.99 -1.00
LEAVENWORT	50	1.00	.00	.00	.00	.99 -1.00
LEWIS-S	48	1.00	.00	.00	.00	.98 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.98 -1.00
N SANTIAM	42	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	40	1.00	.00	.00	.00	.98 -1.00
MFS MARCH	36	1.00	.00	.00	.00	.98 -1.00
MFS BEAVER	35	1.00	.00	.00	.00	.98 -1.00
MFS ELK	23	1.00	.00	.00	.00	.97 -1.00
WALLOWA	4	1.00	.00	.00	.00	.83 -1.00
ABERNATHY	100	1.00	.00	.00	.00	.98 -1.00
YAKIMA	194	.98	.02	.00	.00	.96 - .99
KLICKITAT						
GREYS						
S SANTIAM						
ELOKOMIN						
BIG CRK						

TABLE 15. LOCUS: MDH-B

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
WARM SPR	236	1.00	.00	.00	.00	1.00 -1.00
S SANTIAM	80	1.00	.00	.00	.00	.99 -1.00
SF SALMON	73	1.00	.00	.00	.00	.99 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.99 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.98 -1.00
MFS BEAVER	42	1.00	.00	.00	.00	.98 -1.00
SF SALMON	100	1.00	.00	.00	.00	.98 -1.00
MF CLEARWA	99	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.96 -1.00
RAPID	294	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	120	.99	.01	.00	.00	.97 -1.00
WALLOWA	16	.98	.02	.00	.00	.87 -1.00
RD BUT-SUM	50	.99	.01	.00	.00	.95 -1.00
MFS CAPEHN	96	.99	.01	.00	.00	.96 -1.00
YAKIMA	240	.99	.00	.01	.00	.98 -1.00
LOW GRANIT	278	.99	.01	.00	.00	.98 - .99
COWLITZ-F	48	.98	.02	.00	.00	.93 - .99
COWLITZ-S	184	.99	.01	.00	.00	.97 - .99
MFS ELK	25	.97	.03	.00	.00	.88 - .99
PRIEST RAP	128	.98	.01	.01	.00	.96 - .99
KALAMA-S	200	.98	.02	.00	.00	.97 - .99
LEWIS-F	50	.98	.03	.00	.00	.92 - .99
LEAVENWORT	92	.98	.02	.00	.00	.95 - .99
KLICKITAT	113	.98	.02	.00	.00	.95 - .99
SALMON HEL	97	.97	.03	.00	.00	.94 - .99
MFS MARCH	43	.97	.03	.00	.00	.90 - .99
N SANTIAM	50	.96	.03	.00	.01	.91 - .99
WELLS	131	.97	.02	.01	.00	.94 - .99
TOUTLE	164	.97	.03	.00	.00	.95 - .98
CARSON	225	.97	.03	.00	.00	.95 - .98
MFS BEAR V	43	.95	.05	.00	.00	.89 - .98
MCKENZIE-S	143	.96	.03	.00	.00	.94 - .98
KOOSKIA	188	.97	.03	.00	.00	.94 - .98
KALAMA-F	377	.97	.03	.00	.00	.95 - .98
WILLARD	50	.95	.05	.00	.00	.89 - .98
SALMON FIS	99	.96	.04	.00	.00	.92 - .98
SPRING CRK	261	.95	.05	.00	.00	.91 - .98
LEWIS-S	50	.95	.05	.00	.00	.88 - .98
WASHOUGAL	192	.96	.04	.00	.00	.93 - .97
ABERNATHY	225	.95	.05	.00	.00	.93 - .97
DEXTER	139	.95	.05	.00	.00	.91 - .97
ELOKOMIN	125	.94	.06	.00	.00	.91 - .96
L W SALMON	191	.94	.06	.00	.00	.91 - .96
EAGLE	170	.94	.06	.00	.00	.91 - .96
BONNEVILLE	49	.92	.08	.00	.00	.85 - .96
BIG CRK	68	.92	.08	.00	.00	.87 - .96
GREYS	134	.93	.07	.00	.00	.89 - .96
MCKENZIE-F	50	.91	.09	.00	.00	.84 - .95

TABLE 16. LOCUS: 6PG

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
RAPID	205	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	190	1.00	.00	.00	.00	.99 -1.00
LOW GRANIT	189	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	146	1.00	.00	.00	.00	.99 -1.00
WARM SPR	125	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	120	1.00	.00	.00	.00	.99 -1.00
CARSON	103	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	100	1.00	.00	.00	.00	.99 -1.00
WASHOUGAL	100	1.00	.00	.00	.00	.99 -1.00
EAGLE	100	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	100	1.00	.00	.00	.00	.99 -1.00
MF CLEARWA	99	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
L W SALMON	52	1.00	.00	.00	.00	.97 -1.00
KALAMA-S	50	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-S	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-S	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
TOUTLE	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
KALAMA-F	50	1.00	.00	.00	.00	.97 -1.00
ABERNATHY	46	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	44	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	42	1.00	.00	.00	.00	.96 -1.00
MFS BEAVER	42	1.00	.00	.00	.00	.96 -1.00
MFS MARCH	41	1.00	.00	.00	.00	.96 -1.00
PRIEST RAP	35	1.00	.00	.00	.00	.96 -1.00
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
YAKIMA	20	1.00	.00	.00	.00	.93 -1.00
WALLOWA	13	1.00	.00	.00	.00	.89 -1.00
S SANTIAM						
BIG CRK						
WELLS						
ELOKOMIN						
DEXTER						
GREYS						
KLICKITAT						

TABLE 17. LOCUS: PGI-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
KALAMA-S	210	1.00	.00	.00	.00	.99 -1.00
KALAMA-F	170	1.00	.00	.00	.00	.99 -1.00
LOW GRANIT	129	1.00	.00	.00	.00	.99 -1.00
RAPID	105	1.00	.00	.00	.00	.99 -1.00
CARSON	103	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	100	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	97	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	94	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
WASHOUGAL	68	1.00	.00	.00	.00	.98 -1.00
L W SALMON	52	1.00	.00	.00	.00	.97 -1.00
MF CLEARWA	50	1.00	.00	.00	.00	.97 -1.00
PAHSIMEROI	50	1.00	.00	.00	.00	.97 -1.00
EAGLE	50	1.00	.00	.00	.00	.97 -1.00
TOUTLE	50	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
WARM SPR	50	1.00	.00	.00	.00	.97 -1.00
PRIEST RAP	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
SPRING CRK	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	44	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAVER	42	1.00	.00	.00	.00	.96 -1.00
WELLS	40	1.00	.00	.00	.00	.96 -1.00
GREYS	40	1.00	.00	.00	.00	.96 -1.00
COWLITZ-S	40	1.00	.00	.00	.00	.96 -1.00
KOOSKIA	36	1.00	.00	.00	.00	.96 -1.00
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
YAKIMA	24	1.00	.00	.00	.00	.94 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
S SANTIAM						
BIG CRK						
RD BUT-SPR						
LEWIS-S						
DEXTER						
KLICKITAT						
MCKENZIE-S						
ELOKOMIN						
ICE HARBOR						
LEWIS-F						

TABLE 18. LOCUS: PGI-2

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
WARM SPR	227	1.00	.00	.00	.00	.99 -1.00
LOW GRANIT	221	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	207	1.00	.00	.00	.00	.99 -1.00
RAPID	175	1.00	.00	.00	.00	.99 -1.00
EAGLE	170	1.00	.00	.00	.00	.99 -1.00
CARSON	152	1.00	.00	.00	.00	.99 -1.00
COWLITZ-S	134	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	133	1.00	.00	.00	.00	.99 -1.00
ELOKOMIN	125	1.00	.00	.00	.00	.99 -1.00
KLICKITAT	113	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
L W SALMON	99	1.00	.00	.00	.00	.98 -1.00
MF CLEARWA	99	1.00	.00	.00	.00	.98 -1.00
SALMON HEL	97	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
BIG CRK	84	1.00	.00	.00	.00	.98 -1.00
S SANTIAM	80	1.00	.00	.00	.00	.98 -1.00
DEXTER	79	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
WELLS	56	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
PAHSIMEROI	50	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	44	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	44	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAVER	42	1.00	.00	.00	.00	.96 -1.00
GREYS	40	1.00	.00	.00	.00	.96 -1.00
KOOSKIA	31	1.00	.00	.00	.00	.95 -1.00
YAKIMA	24	1.00	.00	.00	.00	.94 -1.00
SALMON FIS	93	.99	.01	.00	.00	.97 -1.00
KALAMA-S	210	.99	.01	.00	.00	.98 -1.00
PRIEST RAP	98	.98	.02	.00	.00	.96 - .99
WALLOWA	15	.97	.03	.00	.00	.83 - .99
MFS ELK	25	.96	.04	.00	.00	.87 - .99
LEAVENWORT	92	.97	.03	.00	.00	.94 - .99
TOUTLE	104	.97	.03	.00	.00	.94 - .99
LEWIS-F	50	.96	.04	.00	.00	.90 - .98
MCKENZIE-F	47	.96	.04	.00	.00	.90 - .98
KALAMA-F	170	.96	.04	.00	.00	.93 - .98
LEWIS-S	50	.94	.06	.00	.00	.88 - .97
WASHOUGAL	68	.93	.07	.00	.00	.87 - .96
RD BUT-SUM	47	.90	.10	.00	.00	.83 - .95
MCKENZIE-S						
N SANTIAM						

TABLE 19. LOCUS: PGI-3

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
LOW GRANIT	241	1.00	.00	.00	.00	.99 -1.00
WARM SPR	227	1.00	.00	.00	.00	.99 -1.00
KALAMA-S	210	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	207	1.00	.00	.00	.00	.99 -1.00
RAPID	208	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	195	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	187	1.00	.00	.00	.00	.99 -1.00
EAGLE	170	1.00	.00	.00	.00	.99 -1.00
KALAMA-F	170	1.00	.00	.00	.00	.99 -1.00
CARSON	152	1.00	.00	.00	.00	.99 -1.00
PRIEST RAP	144	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	145	1.00	.00	.00	.00	.99 -1.00
COWLITZ-S	134	1.00	.00	.00	.00	.99 -1.00
ELOKOMIN	125	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	120	1.00	.00	.00	.00	.99 -1.00
WASHOUGAL	114	1.00	.00	.00	.00	.99 -1.00
KLICKITAT	113	1.00	.00	.00	.00	.99 -1.00
TOUTLE	104	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	100	1.00	.00	.00	.00	.99 -1.00
DEXTER	99	1.00	.00	.00	.00	.98 -1.00
L W SALMON	99	1.00	.00	.00	.00	.98 -1.00
WELLS	98	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	96	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
BIG CRK	84	1.00	.00	.00	.00	.98 -1.00
YAKIMA	84	1.00	.00	.00	.00	.98 -1.00
S SANTIAM	80	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
MF CLEARWA	63	1.00	.00	.00	.00	.98 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-S	50	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SPR	47	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	44	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAVER	42	1.00	.00	.00	.00	.96 -1.00
GREYS	40	1.00	.00	.00	.00	.96 -1.00
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00

TABLE 20. LOCUS: PGM-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
CARSON	279	1.00	.00	.00	.00	.99 -1.00
LOW GRANIT	241	1.00	.00	.00	.00	.99 -1.00
WARM SPR	238	1.00	.00	.00	.00	.99 -1.00
RAPID	208	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	189	1.00	.00	.00	.00	.99 -1.00
WELLS	178	1.00	.00	.00	.00	.99 -1.00
KALAMA-F	170	1.00	.00	.00	.00	.99 -1.00
EAGLE	170	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	164	1.00	.00	.00	.00	.99 -1.00
KALAMA-S	160	1.00	.00	.00	.00	.99 -1.00
L W SALMON	149	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	145	1.00	.00	.00	.00	.99 -1.00
TOUTLE	144	1.00	.00	.00	.00	.99 -1.00
DEXTER	139	1.00	.00	.00	.00	.99 -1.00
COWLITZ-S	134	1.00	.00	.00	.00	.99 -1.00
ELOKOMIN	125	1.00	.00	.00	.00	.99 -1.00
PAHSIMEROI	120	1.00	.00	.00	.00	.99 -1.00
KLICKITAT	113	1.00	.00	.00	.00	.99 -1.00
BIG CRK	108	1.00	.00	.00	.00	.99 -1.00
SALMON HEL	100	1.00	.00	.00	.00	.99 -1.00
SF SALMON	100	1.00	.00	.00	.00	.99 -1.00
KOOSKIA	99	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	99	1.00	.00	.00	.00	.98 -1.00
MFS CAPEHN	96	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
PRIEST RAP	82	1.00	.00	.00	.00	.98 -1.00
S SANTIAM	80	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
RD BUT-SPR	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-F	50	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-F	50	1.00	.00	.00	.00	.97 -1.00
RD BUT-SUM	50	1.00	.00	.00	.00	.97 -1.00
LEWIS-S	50	1.00	.00	.00	.00	.97 -1.00
MCKENZIE-F	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	49	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
MFS MARCH	43	1.00	.00	.00	.00	.97 -1.00
MFS BEAVER	42	1.00	.00	.00	.00	.96 -1.00
MFS BEAR V	40	1.00	.00	.00	.00	.96 -1.00
GREYS	40	1.00	.00	.00	.00	.96 -1.00
MF CLEARWA	35	1.00	.00	.00	.00	.96 -1.00
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
YAKIMA	161	1.00	.00	.00	.00	.98 -1.00
WASHOUGAL	95	.99	.01	.00	.00	.97 -1.00

TABLE 21. LOCUS: PMI-2

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
SF SAL CUR	43	.99	.01	.00	.00	.94 -1.00
SF SALMON	69	.99	.01	.00	.00	.95 -1.00
SF SALMON	100	.98	.02	.00	.00	.96 - .99
LEWIS-F	50	.96	.04	.00	.00	.90 - .98
PAHSIMEROI	120	.95	.05	.00	.00	.91 - .97
MFS MARCH	43	.92	.08	.00	.00	.84 - .96
MFS BEAR V	44	.91	.09	.00	.00	.83 - .95
MF CLEARWA	84	.92	.08	.00	.00	.86 - .95
SALMON HEL	100	.91	.10	.00	.00	.86 - .94
SALMON FIS	99	.90	.10	.00	.00	.85 - .93
LOW GRANIT	275	.91	.09	.00	.00	.88 - .93
WARM SPR	224	.90	.10	.00	.00	.87 - .93
MFS CAPEHN	96	.89	.11	.00	.00	.84 - .93
RAPID	255	.90	.10	.00	.00	.87 - .92
LEAVENWORT	92	.88	.12	.00	.00	.83 - .92
CARSON	195	.89	.11	.00	.00	.86 - .92
RD BUT-SUM	50	.85	.15	.00	.00	.77 - .91
KOOSKIA	184	.86	.14	.00	.00	.83 - .90
MFS BEAVER	27	.80	.20	.00	.00	.67 - .88
WALLOWA	15	.77	.23	.00	.00	.59 - .88
RD BUT-SPR	50	.79	.21	.00	.00	.70 - .86
KLICKITAT	113	.76	.24	.00	.00	.70 - .81
ICE HARBOR	61	.74	.26	.00	.00	.65 - .81
YAKIMA	232	.75	.25	.00	.00	.71 - .79
ELOKOMIN	125	.68	.29	.03	.00	.62 - .73
PRIEST RAP	146	.67	.33	.00	.00	.61 - .72
WELLS	177	.67	.33	.00	.00	.62 - .71
WILLARD	50	.60	.39	.01	.00	.50 - .69
GREYS	133	.63	.36	.02	.00	.57 - .68
ABERNATHY	219	.62	.33	.05	.00	.57 - .66
S SANTIAM	77	.58	.42	.01	.00	.50 - .65
BIG CRK	102	.57	.41	.02	.00	.50 - .63
BONNEVILLE	50	.54	.40	.06	.00	.44 - .63
DEXTER	135	.56	.44	.00	.00	.50 - .62
MCKENZIE-F	50	.51	.49	.00	.00	.41 - .61
SPRING CRK	250	.55	.41	.03	.00	.51 - .60
L W SALMON	178	.54	.40	.05	.00	.49 - .60
TOUTLE	143	.54	.41	.05	.00	.48 - .60
KALAMA-F	165	.52	.44	.03	.00	.47 - .58
EAGLE	167	.52	.48	.00	.00	.46 - .57
WASHOUGAL	126	.51	.48	.01	.00	.45 - .57
LEWIS-S	50	.47	.45	.08	.00	.38 - .57
COWLITZ-S	184	.51	.46	.02	.00	.46 - .56
N SANTIAM	50	.46	.54	.00	.00	.37 - .56
MCKENZIE-S	141	.48	.52	.00	.00	.42 - .54
COWLITZ-F	50	.41	.53	.06	.00	.32 - .51
KALAMA-S	209	.42	.58	.00	.00	.37 - .47

TABLE 22. LOCUS: TO

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
MFS BEAVER	41	1.00	.00	.00	.00	.96 -1.00
MFS ELK	25	1.00	.00	.00	.00	.94 -1.00
MFS MARCH	43	.99	.01	.00	.00	.94 -1.00
SF SALMON	73	.97	.03	.00	.00	.93 - .99
SF SAL CUR	43	.97	.03	.00	.00	.90 - .99
S SANTIAM	40	.96	.04	.00	.00	.90 - .99
LOW GRANIT	234	.98	.02	.00	.00	.96 - .99
SF SALMON	100	.96	.03	.00	.00	.93 - .98
SALMON FIS	99	.96	.04	.00	.00	.93 - .98
PAHSIMEROI	120	.96	.04	.00	.00	.93 - .98
MFS CAPEHN	96	.95	.05	.00	.00	.91 - .98
SALMON HEL	100	.93	.06	.00	.00	.89 - .96
MF CLEARWA	99	.93	.07	.00	.00	.88 - .96
RAPID	294	.93	.07	.00	.00	.90 - .95
MFS BEAR V	44	.90	.10	.00	.00	.82 - .95
MCKENZIE-S	47	.89	.11	.00	.00	.82 - .94
RD BUT-SUM	50	.84	.16	.00	.00	.76 - .90
DEXTER	138	.84	.16	.00	.00	.80 - .88
WALLOWA	15	.77	.23	.00	.00	.59 - .88
N SANTIAM	50	.81	.19	.00	.00	.72 - .87
KOOSKIA	98	.82	.18	.00	.00	.76 - .87
CARSON	192	.83	.17	.00	.00	.79 - .86
KALAMA-S	206	.82	.18	.00	.00	.78 - .85
MCKENZIE-F	50	.77	.23	.00	.00	.68 - .84
LEWIS-F	46	.73	.27	.00	.00	.63 - .81
LEAVENWORT	92	.74	.26	.00	.00	.67 - .80
ICE HARBOR	63	.71	.28	.01	.00	.63 - .79
KLICKITAT	111	.73	.27	.00	.00	.67 - .78
YAKIMA	197	.73	.27	.00	.00	.69 - .77
EAGLE	167	.65	.35	.00	.00	.60 - .70
LEWIS-S	50	.61	.39	.00	.00	.51 - .70
COWLITZ-F	50	.60	.40	.00	.00	.50 - .69
BIG CRK	36	.58	.42	.00	.00	.47 - .69
COWLITZ-S	182	.62	.38	.00	.00	.57 - .67
RD BUT-SPR	50	.57	.43	.00	.00	.47 - .66
GREYS	71	.57	.43	.00	.00	.49 - .65
TOUTLE	117	.59	.41	.00	.00	.52 - .65
BONNEVILLE	48	.54	.46	.00	.00	.44 - .64
WELLS	171	.58	.41	.00	.00	.53 - .64
WASHOUGAL	171	.56	.44	.00	.00	.50 - .61
ABERNATHY	159	.55	.45	.00	.00	.50 - .61
WILLARD	50	.51	.49	.00	.00	.41 - .61
L W SALMON	187	.52	.48	.00	.00	.47 - .57
SPRING CRK	253	.53	.47	.00	.00	.48 - .57
WARM SPR	178	.52	.48	.00	.00	.47 - .57
PRIEST RAP	140	.49	.51	.00	.00	.43 - .55
ELOKOMIN	112	.48	.52	.00	.00	.42 - .55
KALAMA-F	343	.50	.49	.00	.00	.47 - .54

TABLE 23. LOCUS: TO-2

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
RAPID	200	1.00	.00	.00	.00	.99 -1.00
SPRING CRK	150	1.00	.00	.00	.00	.99 -1.00
DEXTER	139	1.00	.00	.00	.00	.99 -1.00
MCKENZIE-S	100	1.00	.00	.00	.00	.99 -1.00
EAGLE	100	1.00	.00	.00	.00	.99 -1.00
ABERNATHY	100	1.00	.00	.00	.00	.99 -1.00
WELLS	99	1.00	.00	.00	.00	.98 -1.00
SALMON FIS	96	1.00	.00	.00	.00	.98 -1.00
LEAVENWORT	92	1.00	.00	.00	.00	.98 -1.00
SF SALMON	73	1.00	.00	.00	.00	.98 -1.00
ICE HARBOR	65	1.00	.00	.00	.00	.98 -1.00
L W SALMON	52	1.00	.00	.00	.00	.97 -1.00
KOOSKIA	50	1.00	.00	.00	.00	.97 -1.00
COWLITZ-S	50	1.00	.00	.00	.00	.97 -1.00
N SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
WILLARD	50	1.00	.00	.00	.00	.97 -1.00
PRIEST RAP	50	1.00	.00	.00	.00	.97 -1.00
MFS CAPEHN	46	1.00	.00	.00	.00	.97 -1.00
SF SAL CUR	43	1.00	.00	.00	.00	.97 -1.00
BONNEVILLE	28	1.00	.00	.00	.00	.95 -1.00
YAKIMA	20	1.00	.00	.00	.00	.93 -1.00
WALLOWA	15	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	100	1.00	.01	.00	.00	.97 -1.00
LOW GRANIT	281	.99	.01	.00	.00	.98 -1.00
MFS MARCH	43	.99	.01	.00	.00	.94 -1.00
SF SALMON	100	.99	.01	.00	.00	.96 -1.00
CARSON	101	.98	.02	.00	.00	.95 - .99
MFS ELK	25	.96	.04	.00	.00	.87 - .99
MFS BEAR V	44	.97	.03	.00	.00	.90 - .99
PAHSIMEROI	78	.96	.04	.00	.00	.92 - .98
MFS BEAVER	41	.94	.06	.00	.00	.87 - .97
WARM SPR	203	.92	.08	.00	.00	.89 - .94
MF CLEARWA						
KALAMA-F						
BIG CRK						
ELOKOMIN						
MCKENZIE-F						
LEWIS-F						
LEWIS-S						
GREYS						
KLICKITAT						
COWLITZ-F						
RD BUT-SUM						
S SANTIAM						
WASHOUGAL						
KALAMA-S						
TOUTLE						
RD BUT-SPR						

APPENDIX B

STEELHEAD ALLELE FREQUENCIES

TABLE 1. LOCUS: AAT-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SKAMANIA	693	1.00	.00	.00	.00	1.00 -1.00
KALAMA-W	241	1.00	.00	.00	.00	1.00 -1.00
CHELAN	109	1.00	.00	.00	.00	.99 -1.00
TUCANNON	100	1.00	.00	.00	.00	.99 -1.00
BIG CRK	88	1.00	.00	.00	.00	.99 -1.00
COWLITZ-73	79	1.00	.00	.00	.00	.99 -1.00
DWORSHA-74	72	1.00	.00	.00	.00	.99 -1.00
SF SAL HW1	51	1.00	.00	.00	.00	.99 -1.00
MARION FRK	50	1.00	.00	.00	.00	.99 -1.00
SNAKE	40	1.00	.00	.00	.00	.98 -1.00
DESCHU-72	40	1.00	.00	.00	.00	.98 -1.00
CHELAN-74	40	1.00	.00	.00	.00	.98 -1.00
PAHSIMEROI	40	1.00	.00	.00	.00	.98 -1.00
WELLS	40	1.00	.00	.00	.00	.98 -1.00
COWLITZ-S	39	1.00	.00	.00	.00	.98 -1.00
DESCHU-W*W	38	1.00	.00	.00	.00	.98 -1.00
UMATILLA	27	1.00	.00	.00	.00	.97 -1.00
EAGLE	21	1.00	.00	.00	.00	.96 -1.00
KALAMA-S	537	1.00	.00	.00	.00	.99 -1.00
WELLS-74	40	.99	.01	.00	.00	.94 -1.00
COWLITZ-76	100	1.00	.01	.00	.00	.97 -1.00
UMATILLA S	21	.98	.02	.00	.00	.88 -1.00
DWORSHAK	39	.97	.03	.00	.00	.91 - .99
SF SAL DOL						
SF SAL BUC						
MFS MARCH						
DESCHU-H*H						
L SAL						
MFS ELK CR						
L SAL RAPI						
WALLOWA						
L SAL HAZA						
NIAGRA						
L SAL BOUL						
BEAVER CRK						
SF SAL HW2						
NO SANTIAM						
SALMON HEL						
DESCHU-78						
SALMON WHI						
SO SANTIAM						
SELWAY GED						
MFS BEAR V						

TABLE 2. LOCUS: AAT-3

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
COWLITZ-76	99	1.00	.00	.00	.00	.98 -1.00
TUCANNON	94	1.00	.00	.00	.00	.98 -1.00
WELLS	80	1.00	.00	.00	.00	.98 -1.00
EAGLE	62	1.00	.00	.00	.00	.98 -1.00
DWORSHAK	50	1.00	.00	.00	.00	.97 -1.00
SF SAL HW2	50	1.00	.00	.00	.00	.97 -1.00
MARION FRK	50	1.00	.00	.00	.00	.97 -1.00
BIG CRK	48	1.00	.00	.00	.00	.97 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.96 -1.00
DESCHU-W*W	38	1.00	.00	.00	.00	.96 -1.00
UMATILLA	27	1.00	.00	.00	.00	.95 -1.00
SF SAL HW1	44	.99	.01	.00	.00	.94 -1.00
CHELAN	187	.99	.01	.00	.00	.97 -1.00
NO SANTIAM						
KALAMA-S						
MFS ELK CR						
SF SAL DOL						
L SAL						
COWLITZ-S						
L SAL HAZA						
KALAMA-W						
NIAGRA						
DESCHU-72						
WALLOWA						
SF SAL BUC						
DESCHU-78						
L SAL BOUL						
SO SANTIAM						
BEAVER CRK						
UMATILLA S						
COWLITZ-73						
WELLS-74						
SALMON WHI						
CHELAN-74						
SKAMANIA						
SNAKE						
SELWAY GED						
PAHSIMEROI						
DWORSHA-74						
MFS MARCH						
L SAL RAPI						
MFS BEAR V						
SALMON HEL						

TABLE 3. LOCUS: ADH

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
DWORSHAK	202	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
COWLITZ-76	92	1.00	.00	.00	.00	.98 -1.00
CHELAN	83	1.00	.00	.00	.00	.98 -1.00
COWLITZ-73	79	1.00	.00	.00	.00	.98 -1.00
BIG CRK	72	1.00	.00	.00	.00	.98 -1.00
DWORSHA-74	72	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	60	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
SO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	50	1.00	.00	.00	.00	.97 -1.00
MARION FRK	50	1.00	.00	.00	.00	.97 -1.00
TUCANNON	50	1.00	.00	.00	.00	.97 -1.00
BEAVER CRK	49	1.00	.00	.00	.00	.97 -1.00
DESCHU-72	40	1.00	.00	.00	.00	.96 -1.00
L SAL HAZA	40	1.00	.00	.00	.00	.96 -1.00
SNAKE	40	1.00	.00	.00	.00	.96 -1.00
WELLS	40	1.00	.00	.00	.00	.96 -1.00
PAHSIMEROI	40	1.00	.00	.00	.00	.96 -1.00
WELLS-74	40	1.00	.00	.00	.00	.96 -1.00
CHELAN-74	40	1.00	.00	.00	.00	.96 -1.00
COWLITZ-S	39	1.00	.00	.00	.00	.96 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
DESCHU-W*W	38	1.00	.00	.00	.00	.96 -1.00
EAGLE	32	1.00	.00	.00	.00	.95 -1.00
WALLOWA	31	1.00	.00	.00	.00	.95 -1.00
UMATILLA	27	1.00	.00	.00	.00	.95 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	11	1.00	.00	.00	.00	.87 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
NIAGRA	100	1.00	.01	.00	.00	.97 -1.00
SF SAL HW1	86	.99	.01	.00	.00	.97 -1.00
DESCHU-78	50	.99	.01	.00	.00	.95 -1.00
DESCHU-H*H	40	.95	.05	.00	.00	.88 - .98
UMATILLA S	21	.93	.07	.00	.00	.81 - .98
SKAMANIA						
KALAMA-S						
KALAMA-W						
MFS ELK CR						

TABLE 4. LOCUS: AGP-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
DWORSHAK	231	1.00	.00	.00	.00	.99 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	76	1.00	.00	.00	.00	.98 -1.00
DWORSHA-74	72	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	60	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	50	1.00	.00	.00	.00	.97 -1.00
DESCHU-78	47	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
DESCHU-72	40	1.00	.00	.00	.00	.96 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.96 -1.00
CHELAN-74	40	1.00	.00	.00	.00	.96 -1.00
SNAKE	40	1.00	.00	.00	.00	.96 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
DESCHU-W*W	38	1.00	.00	.00	.00	.96 -1.00
BEAVER CRK	37	1.00	.00	.00	.00	.96 -1.00
MFS ELK CR	25	1.00	.00	.00	.00	.94 -1.00
UMATILLA S	21	1.00	.00	.00	.00	.93 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
SALMON HEL	9	1.00	.00	.00	.00	.85 -1.00
WELLS	89	.99	.01	.00	.00	.97 -1.00
EAGLE	62	.99	.01	.00	.00	.96 -1.00
BIG CRK	138	.99	.01	.00	.00	.97 -1.00
PAHSIMEROI	40	.99	.01	.00	.00	.93 -1.00
WALLOWA	36	.99	.01	.00	.00	.93 -1.00
COWLITZ-76	136	.98	.02	.00	.00	.96 - .99
COWLITZ-73	79	.97	.03	.00	.00	.94 - .99
KALAMA-W	357	.98	.02	.00	.00	.96 - .99
CHELAN	194	.97	.03	.00	.00	.95 - .98
WELLS-74	40	.95	.05	.00	.00	.88 - .98
NO SANTIAM	46	.92	.08	.00	.00	.85 - .96
KALAMA-S	871	.94	.06	.00	.00	.93 - .95
COWLITZ-S	39	.90	.10	.00	.00	.81 - .95
SO SANTIAM	51	.90	.10	.00	.00	.83 - .95
MARION FRK	50	.87	.13	.00	.00	.79 - .92
SKAMANIA	995	.86	.14	.00	.00	.84 - .88
TUCANNON	94	.77	.23	.00	.00	.71 - .83
UMATILLA						

TABLE 5. LOCUS: AGP-2

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
KALAMA-S	641	1.00	.00	.00	.00	1.00 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	76	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
KALAMA-W	63	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
SO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	50	1.00	.00	.00	.00	.97 -1.00
BIG CRK	50	1.00	.00	.00	.00	.97 -1.00
TUCANNON	50	1.00	.00	.00	.00	.97 -1.00
CHELAN	50	1.00	.00	.00	.00	.97 -1.00
WELLS	49	1.00	.00	.00	.00	.97 -1.00
DESCHU-78	47	1.00	.00	.00	.00	.97 -1.00
BEAVER CRK	44	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
SALMON HEL	9	1.00	.00	.00	.00	.85 -1.00
DWORSHAK	33	.97	.03	.00	.00	.90 - .99
COWLITZ-73						
DWORSHA-74						
SNAKE						
UMATILLA						
DESCHU-W*W						
WELLS-74						
PAHSIMEROI						
MFS ELK CR						
COWLITZ-S						
DESCHU-72						
COWLITZ-76						
CHELAN-74						
MARION FRK						
EAGLE						
SKAMANIA						
UMATILLA S						
DESCHU-H*H						

TABLE 6. LOCUS: CK

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SKAMANIA	822	1.00	.00	.00	.00	1.00 -1.00
KALAMA-W	357	1.00	.00	.00	.00	1.00 -1.00
DWORSHAK	206	1.00	.00	.00	.00	.99 -1.00
CHELAN	123	1.00	.00	.00	.00	.99 -1.00
COWLITZ-76	118	1.00	.00	.00	.00	.99 -1.00
TUCANNON	100	1.00	.00	.00	.00	.99 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	86	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
BIG CRK	54	1.00	.00	.00	.00	.97 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
MARION FRK	50	1.00	.00	.00	.00	.97 -1.00
SO SANTIAM	47	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.96 -1.00
WELLS	40	1.00	.00	.00	.00	.96 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
DESCHU-W*W	38	1.00	.00	.00	.00	.96 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
EAGLE	32	1.00	.00	.00	.00	.95 -1.00
UMATILLA	27	1.00	.00	.00	.00	.95 -1.00
UMATILLA S	21	1.00	.00	.00	.00	.93 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
SALMON HEL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
MFS ELK CR	3	1.00	.00	.00	.00	.61 -1.00
KALAMA-S	463	1.00	.00	.00	.00	.99 -1.00
DESCHU-78						
BEAVER CRK						
CHELAN-74						
DESCHU-72						
COWLITZ-73						
DWORSHA-74						
WELLS-74						
PAHSIMEROI						
COWLITZ-S						
SNAKE						

TABLE 7. LOCUS: GL-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
MFS BEAR V	89	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
BIG CRK	50	1.00	.00	.00	.00	.97 -1.00
BEAVER CRK	49	1.00	.00	.00	.00	.97 -1.00
EAGLE	40	1.00	.00	.00	.00	.96 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
KALAMA-W	342	1.00	.00	.00	.00	.99 -1.00
SO SANTIAM	51	.99	.01	.00	.00	.95 -1.00
L SAL HAZA	43	.99	.01	.00	.00	.94 -1.00
SF SAL BUC	39	.99	.01	.00	.00	.93 -1.00
KALAMA-S	612	.99	.01	.00	.00	.98 - .99
DESCHU-H*H	40	.98	.03	.00	.00	.91 - .99
SALMON WHI	68	.97	.03	.00	.00	.93 - .99
SKAMANIA	956	.97	.02	.01	.00	.97 - .98
L SAL RAPI	10	.90	.10	.00	.00	.70 - .97
WALLOWA	36	.93	.07	.00	.00	.85 - .97
TUCANNON	49	.93	.05	.02	.00	.86 - .96
UMATILLA	27	.91	.09	.00	.00	.80 - .96
WELLS	84	.92	.08	.00	.00	.86 - .95
COWLITZ-76	40	.90	.10	.00	.00	.81 - .95
UMATILLA S	21	.88	.10	.02	.00	.75 - .95
MARION FRK	39	.90	.10	.00	.00	.81 - .95
CHELAN	90	.91	.09	.00	.00	.86 - .94
DESCHU-W*W	32	.83	.09	.08	.00	.72 - .90
NIAGRA	100	.84	.16	.01	.00	.78 - .88
SELWAY GED	89	.84	.16	.01	.00	.78 - .88
SF SAL HW1	84	.83	.17	.00	.00	.76 - .88
SF SAL HW2	66	.77	.23	.00	.00	.69 - .83
SALMON HEL	11	.64	.36	.00	.00	.43 - .80
DWORSHAK	241	.47	.52	.00	.00	.43 - .52
NO SANTIAM						
DWORSHA-74						
DESCHU-78						
DESCHU-72						
SNAKE						
PAHSIMEROI						
WELLS-74						
CHELAN-74						
COWLITZ-S						
COWLITZ-73						

TABLE 8. LOCUS: GL-2

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	89	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	80	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
BEAVER CRK	49	1.00	.00	.00	.00	.97 -1.00
BIG CRK	44	1.00	.00	.00	.00	.97 -1.00
DESCHU-78	44	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.89 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
SKAMANIA						
CHELAN						
COWLITZ-73						
NO SANTIAM						
COWLITZ-S						
SO SANTIAM						
EAGLE						
KALAMA-W						
WELLS						
DWORSHAK						
COWLITZ-76						
SNAKE						
UMATILLA						
KALAMA-S						
PAHSIMEROI						
TUCANNON						
DESCHU-H*H						
WELLS-74						
CHELAN-74						
DESCHU-72						
UMATILLA S						
DWORSHA-74						
DESCHU-W*W						
MARION FRK						

TABLE 9. LOCUS: IDH

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
DWORSHAK	50	1.00	.00	.00	.00	.99 -1.00
WELLS-74	32	.68	.19	.00	.13	.56 - .78
COWLITZ-S	36	.67	.16	.01	.16	.56 - .77
BIG CRK	40	.68	.11	.01	.20	.57 - .77
DESCHU-H*H	36	.66	.16	.00	.18	.54 - .76
COWLITZ-73	78	.67	.17	.04	.13	.59 - .74
PAHSIMEROI	37	.64	.14	.00	.22	.52 - .74
CHELAN-74	38	.62	.26	.00	.12	.51 - .72
UMATILLA S	20	.57	.17	.01	.24	.42 - .71
DESCHU-72	27	.58	.21	.06	.14	.45 - .70
CHELAN	69	.62	.24	.00	.14	.54 - .70
SNAKE	38	.59	.14	.00	.27	.48 - .70
EAGLE						
MARION FRK						
MFS BEAR V						
BEAVER CRK						
DWORSHA-74						
COWLITZ-76						
SF SAL HW2						
DESCHU-78						
KALAMA-S						
WELLS						
L SAL RAPI						
SF SAL BUC						
SO SANTIAM						
DESCHU-W*W						
TUCANNON						
MFS ELK CR						
SKAMANIA						
KALAMA-W						
NO SANTIAM						
SF SAL DOL						
UMATILLA						
WALLOWA						
NIAGRA						
L SAL HAZA						
SELWAY GED						
SALMON HEL						
SALMON WHI						
L SAL						
MFS MARCH						
SF SAL HW1						
L SAL BOUL						

TABLE 10. LOCUS: LGG

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SKAMANIA	500	1.00	.00	.00	.00	1.00 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	79	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	74	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
BIG CRK	50	1.00	.00	.00	.00	.97 -1.00
CHELAN	50	1.00	.00	.00	.00	.97 -1.00
SO SANTIAM	46	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
DWORSHAK	39	1.00	.00	.00	.00	.96 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
WELLS	49	.98	.02	.00	.00	.93 - .99
SALMON HEL	13	.96	.04	.00	.00	.81 - .99
L SAL RAPI	8	.94	.06	.00	.00	.72 - .99
SALMON WHI	71	.94	.06	.00	.00	.89 - .97
TUCANNON	48	.82	.18	.00	.00	.73 - .89
COWLITZ-76						
MARION FRK						
BEAVER CRK						
WELLS-74						
KALAMA-S						
KALAMA-W						
CHELAN-74						
EAGLE						
DWORSHA-74						
COWLITZ-S						
DESCHU-H*H						
DESCHU-72						
SNAKE						
COWLITZ-73						
UMATILLA						
UMATILLA S						
DESCHU-W*W						
PAHSIMEROI						
DESCHU-78						

TABLE 11. LOCUS: LDH-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
CHELAN	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
WELLS	80	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	50	1.00	.00	.00	.00	.97 -1.00
TUCANNON	50	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.96 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
EAGLE	21	1.00	.00	.00	.00	.93 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
SKAMANIA						
BEAVER CRK						
DESCHU-72						
DWORSHAK						
UMATILLA S						
KALAMA-S						
DESCHU-W*W						
COWLITZ-76						
KALAMA-W						
BIG CRK						
COWLITZ-S						
SNAKE						
SO SANTIAM						
UMATILLA						
CHELAN-74						
COWLITZ-73						
PAHSIMEROI						
MARION FRK						
SALMON HEL						
WELLS-74						
DESCHU-78						
MFS MARCH						
WALLOWA						
MFS ELK CR						
DWORSHA-74						

TABLE 12. LOCUS: LDH-3

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
KALAMA-S	640	1.00	.00	.00	.00	1.00 -1.00
WELLS	130	1.00	.00	.00	.00	.99 -1.00
TUCANNON	100	1.00	.00	.00	.00	.99 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
CHELAN	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
KALAMA-W	63	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
SO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
BIG CRK	50	1.00	.00	.00	.00	.97 -1.00
DESCHU-78	50	1.00	.00	.00	.00	.97 -1.00
DWORSHAK	50	1.00	.00	.00	.00	.97 -1.00
BEAVER CRK	49	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	47	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.96 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
UMATILLA S	21	1.00	.00	.00	.00	.93 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
MFS MARCH	15	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.89 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
DWORSHA-74						
EAGLE						
MARION FRK						
COWLITZ-76						
COWLITZ-73						
UMATILLA						
DESCHU-72						
CHELAN-74						
PAHSIMEROI						
SNAKE						
SKAMANIA						
WELLS-74						
COWLITZ-S						
DESCHU-W*W						

TABLE 13. LOCUS: LDH-4

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
BIG CRK	137	.99	.01	.00	.00	.96 - .99
BEAVER CRK	49	.86	.14	.00	.00	.77 - .91
COWLITZ-76	134	.87	.13	.00	.00	.82 - .90
SC SANTIAM	51	.84	.16	.00	.00	.76 - .90
COWLITZ-73	79	.85	.15	.00	.00	.78 - .90
TUCANNON	99	.85	.15	.00	.00	.79 - .89
SKAMANIA	978	.86	.14	.00	.00	.84 - .87
KALAMA-W	341	.84	.16	.00	.00	.81 - .87
EAGLE	62	.81	.19	.00	.00	.73 - .87
COWLITZ-S	39	.78	.22	.00	.00	.68 - .86
KALAMA-S	833	.83	.17	.00	.00	.82 - .85
MARION FRK	50	.63	.37	.00	.00	.53 - .72
L SAL RAPI	10	.45	.55	.00	.00	.26 - .66
WELLS-74	40	.55	.45	.00	.00	.44 - .65
SF SAL DOL	11	.45	.55	.00	.00	.27 - .65
WALLOWA	35	.53	.47	.00	.00	.41 - .64
MFS MARCH	16	.47	.53	.00	.00	.31 - .64
NO SANTIAM	51	.53	.47	.00	.00	.43 - .62
CHELAN-74	40	.51	.49	.00	.00	.40 - .62
DESCHU-78	50	.52	.44	.00	.04	.42 - .62
DESCHU-W*W	38	.47	.53	.00	.00	.37 - .58
SNAKE	40	.46	.54	.00	.00	.36 - .57
WELLS	108	.50	.50	.00	.00	.44 - .57
UMATILLA S	21	.38	.62	.00	.00	.25 - .53
UMATILLA	27	.39	.61	.00	.00	.27 - .52
DESCHU-72	40	.40	.60	.00	.00	.30 - .51
L SAL HAZA	43	.40	.60	.00	.00	.30 - .50
PAHSIMEROI	40	.39	.61	.00	.00	.29 - .50
SF SAL HW2	66	.39	.61	.00	.00	.31 - .48
DESCHU-H*H	33	.33	.67	.00	.00	.23 - .45
CHELAN	211	.38	.62	.00	.00	.33 - .43
SF SAL BUC	39	.28	.72	.00	.00	.19 - .39
NIAGRA	99	.31	.69	.00	.00	.25 - .38
DWORSHA-74	72	.29	.71	.00	.00	.22 - .37
DWORSHAK	253	.31	.69	.00	.00	.28 - .36
SELWAY GED	97	.28	.72	.00	.00	.22 - .35
SALMON WHI	71	.27	.73	.00	.00	.20 - .35
MFS ELK CR	28	.21	.79	.00	.00	.13 - .34
L SAL BOUL	15	.17	.83	.00	.00	.07 - .34
SALMON HEL	13	.15	.85	.00	.00	.06 - .34
SF SAL HW1	86	.26	.74	.00	.00	.20 - .33
MFS BEAR V	57	.24	.76	.00	.00	.17 - .32
L SAL	54	.18	.82	.00	.00	.12 - .26

TABLE 14. LOCUS: LDH-5

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
CHELAN	160	1.00	.00	.00	.00	.99 -1.00
WELLS	123	1.00	.00	.00	.00	.99 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
TUCANNON	93	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	86	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
EAGLE	62	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
MARION FRK	50	1.00	.00	.00	.00	.97 -1.00
DWORSHAK	50	1.00	.00	.00	.00	.97 -1.00
BEAVER CRK	49	1.00	.00	.00	.00	.97 -1.00
BIG CRK	48	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	48	1.00	.00	.00	.00	.97 -1.00
DESCHU-78	47	1.00	.00	.00	.00	.97 -1.00
SC SANTIAM	45	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.96 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
UMATILLA S	21	1.00	.00	.00	.00	.93 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.89 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
UMATILLA						
KALAMA-S						
COWLITZ-S						
COWLITZ-76						
SKAMANIA						
COWLITZ-73						
PAHSIMEROI						
WELLS-74						
DWORSHA-74						
SNAKE						
DESCHU-72						
KALAMA-W						
CHELAN-74						
DESCHU-W*W						

TABLE 15. LOCUS: MDH-A

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SKAMANIA	310	1.00	.00	.00	.00	1.00 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.99 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.99 -1.00
COWLITZ-73	79	1.00	.00	.00	.00	.99 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.99 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.99 -1.00
MFS BEAR V	60	1.00	.00	.00	.00	.99 -1.00
L SAL	54	1.00	.00	.00	.00	.99 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.99 -1.00
TUCANNON	50	1.00	.00	.00	.00	.99 -1.00
DESCHU-78	50	1.00	.00	.00	.00	.99 -1.00
DESCHU-72	40	1.00	.00	.00	.00	.98 -1.00
EAGLE	40	1.00	.00	.00	.00	.98 -1.00
L SAL HAZA	40	1.00	.00	.00	.00	.98 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.98 -1.00
CHELAN-74	40	1.00	.00	.00	.00	.98 -1.00
SNAKE	40	1.00	.00	.00	.00	.98 -1.00
BIG CRK	40	1.00	.00	.00	.00	.98 -1.00
COWLITZ-S	39	1.00	.00	.00	.00	.98 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.98 -1.00
MARION FRK	39	1.00	.00	.00	.00	.98 -1.00
DESCHU-W*W	38	1.00	.00	.00	.00	.98 -1.00
WALLOWA	33	1.00	.00	.00	.00	.98 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.97 -1.00
WELLS	26	1.00	.00	.00	.00	.97 -1.00
UMATILLA S	21	1.00	.00	.00	.00	.96 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.95 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.95 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.94 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.93 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.93 -1.00
KALAMA-S	443	1.00	.00	.00	.00	.99 -1.00
SO SANTIAM	51	1.00	.00	.00	.00	.95 -1.00
KALAMA-W	275	1.00	.00	.00	.00	.99 -1.00
COWLITZ-76	139	1.00	.00	.00	.00	.98 -1.00
CHELAN	127	1.00	.00	.00	.00	.98 -1.00
PAHSIMEROI	40	.99	.01	.00	.00	.94 -1.00
WELLS-74	40	.99	.01	.00	.00	.94 -1.00
DWORSHAK	258	1.00	.00	.00	.00	.98 -1.00
DWORSHA-74	72	.99	.01	.00	.00	.96 -1.00
UMATILLA						
BEAVER CRK						

TABLE 16. LOCUS: MDH-B

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SF SAL HW1	86	1.00	.00	.00	.00	.99 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.99 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.98 -1.00
SNAKE	40	1.00	.00	.00	.00	.98 -1.00
MFS ELK CR	23	1.00	.00	.00	.00	.97 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.95 -1.00
SALMON HEL	11	1.00	.00	.00	.00	.93 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.93 -1.00
NIAGRA	100	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	76	1.00	.00	.00	.00	.97 -1.00
L SAL	54	1.00	.00	.00	.00	.96 -1.00
PAHSIMEROI	40	.99	.00	.01	.00	.94 -1.00
SF SAL BUC	39	.99	.00	.01	.00	.94 -1.00
MARION FRK	39	.99	.01	.00	.00	.94 -1.00
MFS MARCH	16	.98	.00	.02	.00	.87 -1.00
DESCHU-72	40	.99	.01	.00	.00	.93 -1.00
DWORSHA-74	72	.99	.01	.00	.00	.96 -1.00
DWORSHAK	219	.99	.00	.01	.00	.98 -1.00
UMATILLA	27	.98	.00	.00	.02	.90 -1.00
DESCHU-78	47	.98	.02	.00	.00	.93 -1.00
WALLOWA	35	.98	.01	.01	.00	.91 -1.00
NO SANTIAM	49	.97	.03	.00	.00	.92 - .99
UMATILLA S	21	.96	.02	.01	.00	.86 - .99
L SAL RAPI	10	.95	.00	.05	.00	.76 - .99
SELWAY GED	97	.97	.00	.03	.00	.94 - .99
WELLS	90	.97	.03	.01	.00	.93 - .98
CHELAN	204	.97	.01	.02	.00	.95 - .98
SF SAL HW2	66	.96	.00	.03	.01	.91 - .98
WELLS-74	40	.95	.04	.01	.00	.88 - .98
DESCHU-H*H	40	.94	.03	.03	.00	.87 - .98
DESCHU-W*W	38	.94	.06	.00	.00	.86 - .98
COWLITZ-S	39	.94	.06	.00	.00	.86 - .97
SO SANTIAM	50	.93	.06	.01	.01	.86 - .97
EAGLE	62	.93	.06	.00	.01	.87 - .96
COWLITZ-73	79	.93	.07	.00	.00	.88 - .96
TUCANNON	95	.93	.00	.00	.07	.88 - .96
BEAVER CRK	43	.90	.10	.00	.00	.82 - .95
COWLITZ-76	139	.91	.08	.00	.01	.87 - .94
BIG CRK	138	.90	.09	.00	.01	.86 - .93
KALAMA-W	354	.91	.08	.01	.00	.88 - .93
CHELAN-74	40	.87	.13	.01	.00	.78 - .93
SKAMANIA	958	.91	.08	.00	.01	.90 - .93
KALAMA-S	840	.90	.08	.01	.00	.89 - .92

TABLE 17. LOCUS: 6PG

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
KALAMA-S	175	1.00	.00	.00	.00	.99 -1.00
DWORSHAK	102	1.00	.00	.00	.00	.99 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
TUCANNON	100	1.00	.00	.00	.00	.99 -1.00
CHELAN	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	75	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
NC SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
SC SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
WELLS	50	1.00	.00	.00	.00	.97 -1.00
DESCHU-78	50	1.00	.00	.00	.00	.97 -1.00
BIG CRK	50	1.00	.00	.00	.00	.97 -1.00
BEAVER CRK	49	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	40	1.00	.00	.00	.00	.96 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
WALLOWA	22	1.00	.00	.00	.00	.93 -1.00
KALAMA-W	17	1.00	.00	.00	.00	.92 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
MFS MARCH	14	1.00	.00	.00	.00	.90 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.89 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
MARION FRK						
COWLITZ-S						
SKAMANIA						
COWLITZ-76						
COWLITZ-73						
UMATILLA						
SNAKE						
WELLS-74						
PAHSIMEROI						
UMATILLA S						
DESCHU-H*H						
CHELAN-74						
DESCHU-W*W						
DESCHU-72						
EAGLE						
DWORSHA-74						

TABLE 18. LOCUS: PGI-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SKAMANIA	600	1.00	.00	.00	.00	1.00 -1.00
DWORSHAK	250	1.00	.00	.00	.00	.99 -1.00
COWLITZ-76	139	1.00	.00	.00	.00	.99 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
BIG CRK	98	1.00	.00	.00	.00	.98 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
WELLS	90	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	89	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
SC SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
CHELAN	50	1.00	.00	.00	.00	.97 -1.00
TUCANNON	47	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.96 -1.00
MARION FRK	40	1.00	.00	.00	.00	.96 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
DESCHU-W*W	38	1.00	.00	.00	.00	.96 -1.00
DESCHU-78	36	1.00	.00	.00	.00	.96 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
EAGLE	32	1.00	.00	.00	.00	.95 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
UMATILLA S	21	1.00	.00	.00	.00	.93 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.89 -1.00
SF SAL DCL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
BEAVER CRK	6	1.00	.00	.00	.00	.78 -1.00
KALAMA-S	302	1.00	.00	.00	.00	.99 -1.00
KALAMA-W	229	.99	.00	.00	.01	.98 -1.00
COWLITZ-S						
DESCHU-72						
WELLS-74						
COWLITZ-73						
UMATILLA						
PAHSIMEROI						
SNAKE						
CHELAN-74						
DWORSHA-74						

TABLE 19. LOCUS: PGI-2

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
KALAMA-S	212	1.00	.00	.00	.00	.99 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	89	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
SO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
WELLS	50	1.00	.00	.00	.00	.97 -1.00
BIG CRK	50	1.00	.00	.00	.00	.97 -1.00
CHELAN	50	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
BEAVER CRK	39	1.00	.00	.00	.00	.96 -1.00
DWORSHAK	37	1.00	.00	.00	.00	.96 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
DESCHU-78	36	1.00	.00	.00	.00	.96 -1.00
EAGLE	32	1.00	.00	.00	.00	.95 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
KALAMA-W	25	1.00	.00	.00	.00	.94 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.89 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
PAHSIMEROI						
COWLITZ-73						
DESCHU-H*H						
COWLITZ-76						
MARION FRK						
WELLS-74						
SKAMANIA						
COWLITZ-S						
DWORSHA-74						
SNAKE						
DESCHU-72						
UMATILLA						
UMATILLA S						
TUCANNON						
CHELAN-74						
DESCHU-W*W						

TABLE 20. LOCUS: PGI-3

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
BIG CRK	98	1.00	.00	.00	.00	.98 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
DWORSHAK	250	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	89	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	71	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
DESCHU-78	50	1.00	.00	.00	.00	.97 -1.00
MARION FRK	50	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.96 -1.00
BEAVER CRK	39	1.00	.00	.00	.00	.96 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.96 -1.00
DESCHU-W*W	38	1.00	.00	.00	.00	.96 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
EAGLE	32	1.00	.00	.00	.00	.95 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
UMATILLA	27	1.00	.00	.00	.00	.95 -1.00
UMATILLA S	21	1.00	.00	.00	.00	.93 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.89 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
COWLITZ-76	139	.99	.01	.00	.00	.96 - .99
WELLS	90	.97	.03	.01	.00	.93 - .98
CHELAN	173	.96	.01	.02	.00	.94 - .98
SO SANTIAM	46	.93	.07	.00	.00	.86 - .97
KALAMA-S	618	.96	.04	.00	.00	.94 - .97
KALAMA-W	356	.95	.04	.00	.00	.93 - .97
TUCANNON	100	.89	.10	.00	.00	.84 - .93
SKAMANIA	954	.92	.08	.00	.00	.90 - .93
DWORSHA-74						
CHELAN-74						
SNAKE						
PAHSIMEROI						
WELLS-74						
DESCHU-72						
COWLITZ-S						
COWLITZ-73						

TABLE 21. LOCUS: PGM-1

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SKAMANIA	604	1.00	.00	.00	.00	1.00 -1.00
KALAMA-S	512	1.00	.00	.00	.00	1.00 -1.00
KALAMA-W	311	1.00	.00	.00	.00	1.00 -1.00
CHELAN	173	1.00	.00	.00	.00	.99 -1.00
BIG CRK	138	1.00	.00	.00	.00	.99 -1.00
COWLITZ-76	133	1.00	.00	.00	.00	.99 -1.00
TUCANNON	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
WELLS	90	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
COWLITZ-73	79	1.00	.00	.00	.00	.98 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.98 -1.00
SALMON WHI	74	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
EAGLE	62	1.00	.00	.00	.00	.98 -1.00
MFS BEAR V	60	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
DESCHU-78	50	1.00	.00	.00	.00	.97 -1.00
BEAVER CRK	49	1.00	.00	.00	.00	.97 -1.00
SO SANTIAM	46	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
DESCHU-H*H	40	1.00	.00	.00	.00	.96 -1.00
MARION FRK	40	1.00	.00	.00	.00	.96 -1.00
WELLS-74	40	1.00	.00	.00	.00	.96 -1.00
SNAKE	40	1.00	.00	.00	.00	.96 -1.00
CHELAN-74	40	1.00	.00	.00	.00	.96 -1.00
DESCHU-72	40	1.00	.00	.00	.00	.96 -1.00
PAHSIMERCI	40	1.00	.00	.00	.00	.96 -1.00
DESCHU-W*W	38	1.00	.00	.00	.00	.96 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
UMATILLA	27	1.00	.00	.00	.00	.95 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.93 -1.00
UMATILLA S	21	1.00	.00	.00	.00	.93 -1.00
MFS MARCH	16	1.00	.00	.00	.00	.91 -1.00
L SAL BULL	16	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.89 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
NIAGRA	100	1.00	.01	.00	.00	.97 -1.00
DWORSHA-74	72	.99	.01	.00	.00	.96 -1.00
DWORSHAK	256	.99	.01	.00	.00	.98 -1.00
WALLOWA	36	.99	.01	.00	.00	.93 -1.00
COWLITZ-S	39	.94	.06	.00	.00	.86 - .97

TABLE 22. LOCUS: PMI-2

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
SKAMANIA	351	1.00	.00	.00	.00	1.00 -1.00
DWORSHAK	164	1.00	.00	.00	.00	.99 -1.00
CHELAN	154	1.00	.00	.00	.00	.99 -1.00
COWLITZ-76	119	1.00	.00	.00	.00	.99 -1.00
NIAGRA	100	1.00	.00	.00	.00	.99 -1.00
TUCANNON	100	1.00	.00	.00	.00	.99 -1.00
SELWAY GED	97	1.00	.00	.00	.00	.98 -1.00
SF SAL HW1	86	1.00	.00	.00	.00	.98 -1.00
SF SAL BUC	39	1.00	.00	.00	.00	.98 -1.00
SF SAL HW2	66	1.00	.00	.00	.00	.98 -1.00
L SAL	54	1.00	.00	.00	.00	.97 -1.00
NO SANTIAM	51	1.00	.00	.00	.00	.97 -1.00
MARION FRK	50	1.00	.00	.00	.00	.97 -1.00
MFS BEAR V	50	1.00	.00	.00	.00	.97 -1.00
BEAVER CRK	49	1.00	.00	.00	.00	.97 -1.00
BIG CRK	48	1.00	.00	.00	.00	.97 -1.00
DESCHU-78	46	1.00	.00	.00	.00	.97 -1.00
L SAL HAZA	43	1.00	.00	.00	.00	.97 -1.00
WALLOWA	36	1.00	.00	.00	.00	.96 -1.00
EAGLE	30	1.00	.00	.00	.00	.95 -1.00
MFS ELK CR	28	1.00	.00	.00	.00	.95 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.93 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
SALMON HEL	13	1.00	.00	.00	.00	.89 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
MFS MARCH	5	1.00	.00	.00	.00	.74 -1.00
WELLS	130	1.00	.00	.00	.00	.98 -1.00
KALAMA-S	246	1.00	.00	.00	.00	.99 -1.00
KALAMA-W	79	.99	.01	.00	.00	.96 -1.00
DESCHU-W*W	38	.99	.01	.00	.00	.93 -1.00
DESCHU-H*H	40	.96	.04	.00	.00	.90 - .99
SALMON WHI	71	.94	.04	.02	.00	.89 - .97
UMATILLA	27	.83	.17	.00	.00	.71 - .91
UMATILLA S	21	.81	.19	.00	.00	.67 - .90
WELLS-74						
COWLITZ-73						
CHELAN-74						
DESCHU-72						
DWORSHA-74						
SNAKE						
PAHSIMEROI						
COWLITZ-S						
SO SANTIAM						

TABLE 23. LOCUS: TO

POPULATION	SAMPLE SIZE	ALLELE FREQUENCIES 1	2	3	4	CONFIDENCE INTERVAL
DWORSHAK	258	1.00	.00	.00	.00	.99 -1.00
DWORSHA-74	23	1.00	.00	.00	.00	.94 -1.00
L SAL BOUL	16	1.00	.00	.00	.00	.91 -1.00
SF SAL DOL	11	1.00	.00	.00	.00	.87 -1.00
L SAL RAPI	10	1.00	.00	.00	.00	.86 -1.00
SALMON HEL	8	1.00	.00	.00	.00	.83 -1.00
L SAL HAZA	37	.99	.00	.01	.00	.93 -1.00
NIAGRA	100	.99	.01	.00	.00	.96 -1.00
SELWAY GED	97	.98	.01	.01	.00	.96 - .99
DESCHU-W*W	38	.97	.03	.00	.00	.91 - .99
L SAL	50	.97	.01	.02	.00	.92 - .99
SF SAL HW2	66	.97	.00	.03	.00	.92 - .99
DESCHU-72	40	.96	.04	.00	.00	.90 - .99
MFS MARCH	16	.94	.06	.00	.00	.80 - .98
UMATILLA	27	.94	.06	.00	.00	.85 - .98
PAHSIMEROI	40	.94	.01	.05	.00	.86 - .97
SNAKE	40	.94	.06	.00	.00	.86 - .97
DESCHU-H*H	40	.93	.08	.00	.00	.85 - .97
WELLS	118	.94	.05	.01	.00	.90 - .96
UMATILLA S	21	.90	.00	.10	.00	.78 - .96
SALMON WHI	64	.92	.00	.08	.00	.86 - .96
WALLOWA	36	.90	.04	.06	.00	.81 - .95
CHELAN-74	40	.90	.08	.03	.00	.81 - .95
CHELAN	205	.92	.06	.02	.00	.89 - .94
MFS BEAR V	45	.89	.00	.11	.00	.81 - .94
SF SAL BUC	39	.88	.00	.12	.00	.80 - .94
DESCHU-78	50	.89	.09	.02	.00	.81 - .94
COWLITZ-S	39	.85	.15	.00	.00	.75 - .91
WELLS-74	40	.84	.13	.04	.00	.74 - .90
SF SAL HW1	81	.80	.01	.19	.00	.73 - .86
TUCANNON	91	.80	.20	.00	.00	.73 - .85
EAGLE	61	.78	.22	.00	.00	.70 - .84
COWLITZ-73	79	.75	.25	.00	.00	.68 - .81
NO SANTIAM	51	.69	.31	.00	.00	.59 - .77
SO SANTIAM	51	.67	.33	.00	.00	.57 - .75
SKAMANIA	961	.70	.30	.00	.00	.68 - .72
KALAMA-S	707	.69	.31	.00	.00	.66 - .71
KALAMA-W	353	.67	.33	.00	.00	.64 - .71
COWLITZ-76	138	.64	.36	.00	.00	.58 - .69
BEAVER CRK	49	.58	.42	.00	.00	.48 - .67
BIG CRK	138	.48	.52	.00	.00	.42 - .54
MARION FRK	50	.37	.63	.00	.00	.28 - .47
MFS ELK CR						