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MEMORANDUM

TO: FPAC

Michele DeHart

FROM: Michele DeHart

DATE: August 6, 2003

RE: Ice Harbor Survival Test

FPAC has discussed the Ice Harbor spill for fish passage operations since the summer studies concluded on July 13. The Ice Harbor project is presently being constrained from implementing the Biological Opinion Spill Program based on preliminary information and data, combined with assumptions on turbine passage survival that suggested survival through the spillway was lower than survival through the turbine units at this project. The fishery agencies and tribes have previously documented concern regarding these applications of preliminary research data (memo from Joint Technical Staffs dated July 21, 2003) and concerns regarding the use of controversial research results as a basis for in-season management decisions.

A decision was made by NOAA Fisheries to alter spill at Ice Harbor Dam from the end of the summer study until the results from the summer spill studies were analyzed, assuring the agencies and tribes that study results would be available the following week. Subsequent spill for fish passage operations were to be determined based on this information. A considerable amount of time has lapsed since the end of the study, and NOAA Fisheries' has not provided the study results for review. The most recent assurance by NOAA Fisheries was to provide the survival data analyses on July 31, in order to consider short-range operations at Ice Harbor. The potential for increased mortality to subyearling migrants from the implementation of less than the BIOP spill measures by reduction in spill, and the delay in providing the data prompted the following review of the publicly available data from the Ice Harbor studies.

PIT-tag data were downloaded from PTAGIS. Tag groups were identified based on release site, and release date information in tag files. There were three tag release sites that we identified as follows; IHRSP – Ice Harbor Spillway, IHRTAL – Ice Harbor Tailwater control releases, and IHRTRB – Ice Harbor Turbine releases. Based on the release dates in the tagging files, for each date and time of day listed in Table 1 there were usually 3 spillway releases, and/or 1 turbine release coupled with 1 to 2 tailwater control releases. Again, based on the tag

file information releases were either in the morning between 700 and 1100 hours, or evening between 1700 and 1900 hours. Data were grouped by release site and time of day into treatment and control groups. Survival estimates from release to McNary Dam tailrace were calculated for each group using Cormack-Jolly-Seber mark-recapture survival rate estimation methodology using program MARK v 4.0.

The resulting survival estimates are provided in Tables 1 and 2. Table 1 shows direct survivals for each release group, as well as relative survivals for turbine and spill treatment groups. Table 2 summarizes those survivals using different methods for grouping results, including average relative survivals, and calculated relative survivals from averages of direct survival estimates. Careful consideration should be given to interpreting the direct survival estimates since these estimates incorporate the mortality due to experimental manipulation (e.g. handling, tagging, etc).

The point estimates of survival indicate that survival through the spillway is higher than survival through the turbine units. This is a preliminary analysis and confidence intervals around the estimates have not been calculated. However, the point estimate suggest that the operations at Ice Harbor warrant review to reduce the number of fish exposed to passage through the turbines. The point estimates presented here, are at least as strong as the information NOAA used to reduce the spill for fish passage measure at Ice Harbor from BIOP levels.

The present situation at Ice Harbor illustrates the concerns discussed in the July 21 letter to NOAA fisheries from the agencies and tribes, particularly the use of preliminary and controversial research results as a basis for in-season management decisions. The summer study results certainly highlight the difficulty of making management decisions based on in -season interpretations of research data combined with survival assumptions. The low estimates of survival through the turbine adds validity to the concerns expressed in the state and tribal fish and wildlife managers letter dates July 21, regarding the Ice Harbor study design and the appropriate use of preliminary data. The Ice Harbor operations should be considered as recommended in the agencies and tribes' letter of July 21.

Table 1. Ice Harbor Release to McNary Dam tailrace Survivals for 2003 release groups (Preliminary results from FPC).

	Direct Survival			Relative Survival	
	Tailwater	Spillway	Turbine	Spillway	Turbine
06/24/03 Morning	0.888	0.847	0.874	0.954	0.985
Evening	0.928	0.783		0.845	
06/25/03 Morning	0.880	0.858	0.813	0.975	0.925
Evening		0.839			
06/26/03 Morning	0.865		0.748		0.864
Evening	0.862		0.735		0.852
06/27/03 Morning	0.874		0.781		0.893
Evening	0.801		0.831		1.038
06/28/03 Morning	1.024	0.894	0.790	0.873	0.771
Evening	0.839	0.963		1.147	
06/29/03 Morning	0.900	0.845	0.757	0.939	0.841
Evening	0.856	0.818		0.956	
06/30/03 Morning	0.893		0.746		0.835
Evening	0.893		0.732		0.820
07/01/03 Morning	0.777		0.705		0.908
Evening	0.799		0.759		0.951
07/02/03 Morning	0.733	0.889		1.212	
Evening					
07/03/03 Morning	0.780	0.690	0.725	0.885	0.930
Evening	0.776	0.690		0.889	
07/04/03 Morning	0.701		0.745		1.064
Evening					
07/09/03 Morning	0.690	0.795		1.152	
Evening					
07/10/03 Morning	1.011	0.928		0.918	
Evening					
07/12/03 Morning					
Evening	0.800	0.788		0.985	
07/13/03 Morning					
Evening	0.766	0.785		1.025	

Table2. Ice Harbor Summer PIT Survival Study (2003) Preliminary Results (FPC).

		Direct Survival			Relative Survival	
		Tailwater	Spillway	Turbine	Spillway	Turbine
Simultaneous tests*	avg	0.894	0.827	0.792	0.925	0.890
	calc rel_surv				0.925	0.886
*5 occasions both turbine and spillway treatments with tailwater release						
All tests average	avg ^a	0.841	0.828	0.767	0.983	0.906
	calc rel_surv ^b				0.984	0.913
Before July 9	avg	0.846	0.829	0.767	0.968	0.906
	calc rel_surv				0.980	0.926
July 9 and later	avg	0.817	0.824	na	1.020	na
	calc rel_surv				1.009	na
All tests with h control survival	avg	0.871	0.814	0.764	0.922	0.881
	calc rel_surv				0.935	0.877
Before July 9	avg	0.866	0.803	0.764	0.915	0.881
	calc rel_surv				0.927	0.882
July 9 and later	avg	0.906	0.858	na	0.951	na
	calc rel_surv				0.947	na

^a Average calculated from all survival tests

^b Relative survivals calculated from averages of direct survivals