

From: Hilts, Derek <derek_hilts@fws.gov>
Sent: Friday, March 1, 2019 9:08 AM
To: Cathy.Marcinkevage@noaa.gov; Jim Smith
Cc: Craig Anderson; Matt Nobriga
Subject: Re-initiation of Consultation on Long Term Operations Proposed Action - Keswick operations in Decembers

To whom it may concern,
 Highlighted below are some years (I should have highlighted 1922 also) in which Fall Run would presumably suffer significant redd dewatering under the ROC on LTO proposed action - assuming (b)(2) is somehow obfuscated, which I hope is a BAD assumption.

LTO-Proposed Operations: Sacramento River Below Keswick (in average CFS equivalent of monthly volume released)

WY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1922	7852	4893	3250	3250	3250	3250	7445	11233	10853	12245	10755
1923	5142	4963	4689	3250	3937	3250	3250	10858	10336	12432	11190
1924	6666	5218	4932	3250	3250	7166	5557	8595	9585	9755	7826
1925	4034	3250	3250	3250	3250	3250	3250	6058	10764	13410	9745
1926	5826	4596	3433	3250	3250	6432	3250	7440	11119	11625	8165
1927	4995	3250	3250	5968	34742	4099	9795	7714	8989	16000	10821
1928	7887	3250	3572	3250	4357	18845	3250	9316	13634	16000	11435
1929	6092	4000	3250	3250	3250	3250	3326	9023	10121	11388	8531
1930	5551	4636	3250	3250	3250	3250	3250	5507	9016	9501	7883
1931	5692	4247	3507	3250	3250	3250	5712	7982	8357	9581	7957
1932	5114	3277	3250	3250	3250	3250	3250	4965	7219	8644	7295
1933	4629	3599	3250	3250	3250	3250	3250	6555	7409	10005	7947
1934	5252	3957	3250	3250	3250	3250	3250	7792	9414	10390	7354
1935	2553	3250	3250	3250	3250	3250	3250	3813	8187	9585	8259
1936	3758	3395	3250	3250	3250	3250	3250	5754	7169	9809	9684
1937	4758	4997	3533	3250	3250	3250	3250	5056	7493	10726	9609
1938	4536	8134	18968	4102	37636	35340	11215	8563	7903	10627	10470
1939	8876	6100	3602	3250	3250	3250	7877	10920	14348	16000	16000
1940	5907	6374	3250	3250	26450	21912	3250	5858	10472	15988	12238
1941	5987	4058	13084	27204	24622	14015	13347	11197	7962	13779	11450
1942	8553	4264	19728	19439	30876	3250	3250	10224	7712	12253	10765
1943	8215	5467	6898	14002	8457	10984	3751	7166	9279	16000	11521
1944	8006	6188	3926	3250	3250	3250	3250	6576	10486	11662	8679
1945	5818	3704	3250	3250	5184	3250	3250	6799	10876	14359	10210
1946	5116	8073	31540	8941	3250	3250	4076	8694	10354	16000	11874
1947	8476	4970	3250	3250	3250	3250	3250	10133	11605	13900	9181
1948	4819	4000	4000	3250	4000	3250	3250	10823	8323	12242	10273
1949	6408	5000	3250	3250	3250	10352	3250	8617	10696	13949	9527
1950	6110	6100	4515	3250	3250	3250	3250	6387	8067	9564	9138
1951	7149	11360	15823	8993	17767	3250	3250	6537	12245	16000	11290
1952	7744	3273	17431	12036	21603	12226	16481	7205	6688	9811	11809
1953	7959	4936	12576	31940	3250	3250	5436	9501	8764	14925	10264
1954	9668	6712	7003	14455	17874	10674	10967	9713	10261	16000	11062
1955	6501	3250	4971	3250	4470	3250	3674	7150	12559	12881	8992
1956	5967	3391	29492	34001	24136	4171	3250	9877	7544	11819	9517
1957	9657	6663	5000	3250	9606	12172	3250	10384	10397	16000	10127
1958	9077	7055	12114	15333	29837	44228	11542	6985	8232	11706	12706
1959	8464	4267	3573	12461	15684	3250	5394	8619	15267	16000	11308
1960	7125	5700	4853	3250	3250	3250	3250	6549	14075	12529	9193
1961	6287	3250	3250	3250	6988	6304	3989	8828	12726	15029	9932
1962	6947	4663	3250	4089	20507	3250	3754	8577	9908	16000	10119
1963	5978	5563	9093	3250	10770	6279	30893	4724	7911	15890	10450
1964	5714	8846	4288	5072	3250	3250	7393	7919	11301	13112	8911
1965	5533	3250	21731	24981	3250	3250	6748	6971	8250	16000	9056
1966	7552	7279	4172	8774	6637	10676	4293	10017	14765	16000	10898
1967	6865	3250	9556	10612	8074	14069	10210	12507	8492	11559	10114

1968	8564	4232	4067	3250	18821	3250	3250	7319	14552	17015	8195
1969	4348	3467	3250	23232	25682	6466	9670	9805	8022	11045	10466
1970	8513	4360	20401	58978	13491	3250	3250	10463	11970	16000	10588
1971	4000	3250	14782	16862	3250	17475	3250	8957	7962	15602	9943
1972	8074	8082	3250	3414	5279	12813	5842	7904	15201	14841	9095
1973	5090	3250	6849	15146	20652	7591	3250	6366	13917	16000	8863
1974	3250	33970	23948	39202	5399	34994	5857	5639	8127	12919	9605
1975	8432	6096	3506	6525	8698	28273	3250	9954	8889	13937	9760
1976	9780	5676	3668	3250	3804	3250	3743	11119	11262	13037	7291
1977	8109	6989	5796	4662	5769	7526	6818	5874	12542	13424	7816
1978	3913	3370	3250	3712	15574	14030	5367	8296	9562	13209	9685
1979	7775	4245	3588	3250	3250	3250	3250	6197	13261	10983	8823
1980	5010	5584	4274	19629	32212	3250	3250	6646	9233	11298	9312
1981	6438	6283	3250	3250	3250	6899	3250	8313	15437	15805	8688
1982	3780	9855	25089	9282	24094	13234	24914	3468	6369	10048	9688
1983	8756	6975	15233	20026	41920	38805	21287	9426	12852	13465	13370
1984	9042	13822	33201	9873	4289	9136	3742	7333	12104	16000	8711
1985	4435	7260	6088	3250	3250	3250	3250	9701	14086	16000	11905
1986	5175	3677	3250	3250	45940	19852	3250	6426	8752	11320	10031
1987	4774	5095	3250	3930	3250	3250	6731	10187	14183	13371	8776
1988	6750	4804	3250	3250	3250	3250	3250	7587	12081	10924	7427
1989	6290	3250	3250	3250	4000	8136	3250	13072	9600	13103	9132
1990	3402	4281	4000	3250	3250	3250	3658	5643	9873	11209	7943
1991	5838	5060	3712	3250	3250	3250	3250	6745	7647	8277	6706
1992	4306	4849	3250	3250	3250	3250	3250	9005	10302	10145	7586
1993	5624	5041	3250	3250	3250	8188	4510	9189	8367	15475	9423
1994	5207	5837	3250	3250	3250	3250	3572	5808	12202	12026	8453
1995	4770	4187	3250	28609	7113	47351	7634	10510	8447	9700	12255
1996	8231	6123	8287	6158	37081	12339	3250	10559	7582	14802	9344
1997	9200	4946	34395	36776	3606	3250	3250	10471	9350	15327	10949
1998	6014	3927	3250	26587	51790	19128	3250	14101	16776	14362	13530
1999	9259	11516	12205	8054	27798	13660	3438	8437	8417	16000	9711
2000	5719	6076	6203	10339	39558	8688	3250	7785	13848	16000	10892
2001	9428	6686	4156	3250	3250	3250	3250	10265	14480	12389	8012
2002	8811	3250	8935	12199	3292	3250	3790	8219	12499	14340	8075
2003	6918	6156	11395	16751	3250	3913	10745	12829	8312	16000	9512

Just FYI

Derek Hiltz M.S., P.E.
 US Fish and Wildlife Service
 650 Capitol Mall Room 8-300
 Sacramento, California 95814
 Work desk phone 916.930.5633