ATTACHMENT C

Review of December 18, 2002 Final Biological Opinion (BO) on Reclamation's Proposed Section 7(a)(1) Conservation Measures for Listed Species in the Imperial Irrigation District (IID)/Salton Sea Areas in Light of Revised Colorado River Water Delivery Agreement, and U.S. Fish and Wildlife Service Letter of Concurrence dated October 7, 2003

United States Department of the Interior

BUREAU OF RECLAMATION
Phoenix Area Office
PO Box 81169
Phoenix, Arizona 85069-1169

IN REPLY REFER TO:
PXAO-1500
ENV-7.00

OCT -6 2003

MEMORANDUM

To: Files

From: Bruce D. Ellis
Chief, Environmental Resource Management Division

Subject: Review of December 18, 2002, Final Biological Opinion (BO) on Reclamation's Proposed Section 7(a)(1) Conservation Measures for Listed Species in the Imperial Irrigation District (IID)/Salton Sea Areas in Light of Revised Colorado River Water Delivery Agreement (Draft Dated September 22, 2003)

Reclamation staff reviewed the subject BO and Draft Water Delivery Agreement, as well as Reclamation's biological assessment (BA) (dated July 23, 2002), BA Errata (dated October 23, 2002), and other correspondence relevant to the Section 7 consultation. The purpose of our review was to determine whether the terms of the revised Water Delivery Agreement would affect the description of the Project Action (voluntary fish and wildlife conservation measures) or analysis of impacts in the BA and BO.

Based on our review of the Water Delivery Agreement, we determined there was only one new component that potentially affected the BA and BO - IID's agreement to provide up to a total of 145 thousand acre-feet (kaf), if necessary, to meet agricultural water use reduction benchmarks in the years 2006, 2009, and 2012. The maximum amounts for transfer of this water, if needed, would be 25 kaf in 2006, 50 kaf plus the unused amounts from 2006 in 2009, and 70 kaf plus the unused amounts from 2006 and 2009 in 2012 (from Exhibit B, Draft Water Delivery Agreement). IID also committed that the maximum inflow reduction to the Salton Sea from conservation and transfer of the 145 kaf would be 72.5 kaf. Since this water conservation and transfer was new, and in addition to the water transfers (and inflow reductions) considered in the 2002 BO, we determined that the new schedule of water transfers, including the additional 145 kaf of "benchmark water," should be reviewed for two possible changes to the BA/BO: (1) additional salinity impacts to the Salton Sea, which could require revision to the brown pelican conservation measures, and (2) possible additional impacts to drain water quality, which could require revisions to the Desert pupfish and Yuma Clapper rail conservation measures.

Salinity Impacts to Salton Sea From Provision of "Benchmark Water"

Reclamation made three new model runs of its Salton Sea model to determine if the additional reduction in inflow during 2006, 2009, and 2012 would accelerate the increase in salinity levels in the Salton Sea, thereby, accelerating impacts on fish and brown pelicans. Three scenarios

were modeled. The first assumed reduced inflows to the Salton Sea of 12.5 kaf in 2006, 25 kaf in 2009, and 35 kaf in 2012, for a total reduced inflow of 72.5 kaf. The second scenario attempted to create a worst-case analysis for salinity impacts by increasing the impacts in the earlier benchmark years. It assumed all efficiency conservation in 2006, and all fallowing in 2012, with the remaining reductions to inflow occurring in 2009. The resulting reductions to inflow modeled would be 25 kaf in 2006, 24.17 kaf in 2009, and 23.33 kaf in 2012. The third scenario assumed no transfers in 2006 or 2009, will all reductions in inflow to occur in 2012. Tables and figures depicting these three new model runs are attached (e-mails from Paul Weghorst to Bruce Ellis dated 9/25/2003, and 9/26/2003). The original model run (which was the basis for the BO) is also attached, as well as pelican impact calculations for the original, and these three new scenarios (see faxogram from Carol Roberts to Bruce Ellis dated 9/25/2003, and e-mail from Bruce Ellis to Laura Harnish dated 9/26/03)). The result of the analysis is that total pelican impacts would increase very slightly as a result of the additional reductions in inflow (12,383 pelican user-years in the 2002 BO vs. either 12,428 pelican user-years for the first and third scenarios described, and 12,406 pelican user-years for the second (worst-case) scenario described). The Brown pelican conservation measure identified in the BA and BO produced a benefit (number of gained pelican-years of roosting and foraging) of 13,607 pelican use-years. We conclude no additional Brown pelican conservation measures are required; and no modification of the BA or BO is necessary.

Possible Drain Water Impacts from "Benchmark Water"

The analysis of drain water quality impacts (increases in salinity and selenium concentrations) in the BA and BO was based on IID's analysis carried out for the 2002 IID Water Conservation and Transfer Project EIR/EIS and Habitat Conservation Plan. The analysis was based on the original Quantification Settlement Agreement (QSA) schedule of conservation and transfers, and evaluated a worst-case impact scenario on drain water quality (i.e., that all transferred water would be produced by efficiency improvements with resulting 1:1 reductions in tail-water). By comparing the current, slower ramp-up rate for the water transfers (including the addition of the new benchmark water) to the original transfer schedule, Reclamation concludes there are no new drain water impacts from the "benchmark water," because the total reduction in tail-water is less (even with the added benchmark water) than originally analyzed (Table 1).

Table 1. Imperial Irrigation District Transfers[1]

	Original QSA transfer Schedule[2]				Current Transfer Schedule				
Benchmark Yr	IID to SD	IID to MWD	IID to CVWD	Total Transfer	IID to SD	IID to MWD	IID to CVWD	Bench-mark	Total Transfer
2006	82.50	2.50	0	**85**	40	0	0	25.00	**65.00**
2009	140.00	0.00	15	**155**	60	0	8	24.17	**92.17**
2012	200.00	0.00	30	**230**	90	0	21	23.33	**134.33**

[1] For analysis of impacts to the drains, the worst case would also assume all water transferred would be conserved through efficiency improvements.

[2] Analyzed in the IID EIR/EIS and Biological Opinion drain analysis.

Further, the IID modeling of drain impacts assumed all reductions in tail-water would occur beginning in Year 1, which also means the "benchmark water" would be irrelevant to the analysis, since transfer of the benchmark water would never increase the total reduction in tail-water above that modeled (personal communication with John Eckhardt of CH2MHill, 9/24/2003). We conclude the analysis of impacts on Desert pupfish and Yuma Clapper rail from drain water quality declines is still accurate, and no modification needs to be made to the proposed conservation measures for these two species, and no modification to the BA or BO is needed.

Attachments 4

From: Paul Weghorst
To: Bruce Ellis; carol_a_roberts@fws.gov; Jayne Harkins; John Eckhardt; Laura Harnish; Sandy Eto; Shields, Tina Anderholt
Date: 9/25/03 9:37AM
Subject: Salton Sea With IID Conditional ISG Deliveries

Attached are three excel files containing Salton Sea Model Results as per the following:

Summary_Charts_CA_Series_Obj2_December02.xls:
From December 2002

Summary_Charts_CA_Series_Obj2_092403_ISG_25_24.17_23.33.xls:
With IID Condition Impacts:
2006 25,000 af
2009 24,170 af
2012 23,330 af

Summary_Charts_CA_Series_Obj2_092403_ISG_12.5_25_35.xls
With IID Condition Impacts:
2006 12,500 af
2009 25,000 af
2012 35,000 af

These tables and charts are for mean salinity, elevation, and surface area. I am working on the band graphs. These will follow soon.

The salinity values are a bit higher in the 12.5, 25, and 35 case rather than in the worst case. This is because the diiferences in impacts are trivial between the two scenarios and because of the stochastic nature of the model. It does not matter which we use.

Paul A. Weghorst, PE
Bureau of Reclamation
Mail Stop: D-8520
PO Box 25007
Denver, CO 80225
pweghorst@do.usbr.gov
(303)-445-2534 (Phone)
(720)-544-0271 (Fax)

Year	Baseline Salinity (mg/l)	IID to SD By Fallowing With No Effect and 33.3% OF CVWD Water Derived From System/On-Farm Returning to the Sea and IID Conditional ISG Backfill Salinity (mg/l)
2000	44000	44000
2001	44816	44799
2002	45657	45561
2003	46467	46405
2004	47277	47183
2005	48029	47976
2006	48769	48689
2007	49501	49522
2008	50222	50215
2009	50929	50966
2010	51653	51891
2011	52349	52632
2012	53047	53407
2013	53756	54495
2014	54455	55230
2015	55107	56036
2016	55796	56851
2017	56448	57644
2018	57123	58514
2019	57709	60892
2020	58359	63756
2021	58984	67116
2022	59560	70845
2023	60189	74569
2024	60797	78456
2025	61389	82417
2026	61923	86581
2027	62512	90639
2028	63075	94567
2029	63632	98401
2030	64200	102130
2031	64746	105577
2032	65254	109035
2033	65742	112163

Scenario 1

Benchmark Water Inflow Reductions

2006 12,500af

2009 25,000 af

2012 35,000 af

2034	66242	114797
2035	66716	117211
2036	67213	119756
2037	67714	122122
2038	68221	124156
2039	68664	126157
2040	69183	128259
2041	69665	130091
2042	70112	131483
2043	70582	133032
2044	71116	134329
2045	71601	135997
2046	72068	137221
2047	72531	138642
2048	72990	137278
2049	73470	136496
2050	73905	135591
2051	74378	135214
2052	74855	134760
2053	75333	134551
2054	75734	134393
2055	76215	134396
2056	76713	134301
2057	77270	134424
2058	77703	134587
2059	78134	134783
2060	78584	135111
2061	79119	135354
2062	79598	135870
2063	80122	136338
2064	80535	136826
2065	80949	137117
2066	81354	137695
2067	81785	138227
2068	82166	139009
2069	82559	139391
2070	83007	139749
2071	83424	140328
2072	83941	141019
2073	84458	141541
2074	84953	142442

Scenario 1 (cont)
Salinity

Year	Baseline Elevation (feet)	IID to SD By Fallowing With No Effect and 33.3% OF CVWD Water Derived From System/On-Farm Returning to the Sea and IID Conditional ISG Backfill Elevation (feet)
2000	-227.0	-227.0
2001	-227.4	-227.4
2002	-227.8	-227.7
2003	-228.1	-228.1
2004	-228.5	-228.4
2005	-228.8	-228.8
2006	-229.1	-229.0
2007	-229.3	-229.4
2008	-229.6	-229.6
2009	-229.8	-229.9
2010	-230.1	-230.2
2011	-230.3	-230.5
2012	-230.5	-230.7
2013	-230.7	-231.2
2014	-230.9	-231.4
2015	-231.1	-231.6
2016	-231.3	-231.9
2017	-231.5	-232.1
2018	-231.6	-232.4
2019	-231.8	-233.4
2020	-231.9	-234.5
2021	-232.1	-235.7
2022	-232.2	-237.0
2023	-232.3	-238.2
2024	-232.4	-239.3
2025	-232.5	-240.3
2026	-232.6	-241.3
2027	-232.7	-242.3
2028	-232.8	-243.1
2029	-232.9	-243.8
2030	-233.0	-244.5
2031	-233.1	-245.1
2032	-233.2	-245.7
2033	-233.2	-246.1

Scenario 1
elevation

2034	-233.3	-246.5
2035	-233.3	-246.8
2036	-233.4	-247.2
2037	-233.5	-247.5
2038	-233.5	-247.7
2039	-233.6	-247.9
2040	-233.6	-248.1
2041	-233.7	-248.3
2042	-233.8	-248.4
2043	-233.8	-248.6
2044	-233.9	-248.7
2045	-233.9	-248.8
2046	-234.0	-248.9
2047	-234.0	-249.0
2048	-234.1	-248.8
2049	-234.1	-248.6
2050	-234.2	-248.4
2051	-234.2	-248.3
2052	-234.3	-248.1
2053	-234.3	-248.0
2054	-234.3	-247.9
2055	-234.4	-247.8
2056	-234.4	-247.7
2057	-234.5	-247.7
2058	-234.6	-247.6
2059	-234.6	-247.6
2060	-234.6	-247.6
2061	-234.7	-247.5
2062	-234.7	-247.5
2063	-234.8	-247.5
2064	-234.8	-247.5
2065	-234.8	-247.5
2066	-234.9	-247.5
2067	-234.9	-247.5
2068	-234.9	-247.5
2069	-235.0	-247.5
2070	-235.0	-247.5
2071	-235.0	-247.5
2072	-235.1	-247.5
2073	-235.1	-247.5
2074	-235.2	-247.5

Scenario 1 (cont.)

elevation

Year	Baseline Salinity (mg/l)	IID to SD By Fallowing With No Effect and 33.3% OF CVWD Water Derived From System/On-Farm Returning to the Sea and IID Conditional ISG Backfill Salinity (mg/l)
2000	44000	44000
2001	44816	44801
2002	45657	45613
2003	46467	46382
2004	47277	47185
2005	48029	47930
2006	48769	48689
2007	49501	49570
2008	50222	50267
2009	50929	50998
2010	51653	51914
2011	52349	52605
2012	53047	53368
2013	53756	54359
2014	54455	55137
2015	55107	55931
2016	55796	56761
2017	56448	57624
2018	57123	58472
2019	57709	60874
2020	58359	63671
2021	58984	66984
2022	59560	70643
2023	60189	74480
2024	60797	78315
2025	61389	82210
2026	61923	86208
2027	62512	90310
2028	63075	94317
2029	63632	98310
2030	64200	102080
2031	64746	105538
2032	65254	108701
2033	65742	111743

Scenario 2

Benchmark Water Inflow Reductions

2006 25,000 af

2009 24,170 af

2012 23,330 af

2034	66242	114611
2035	66716	117173
2036	67213	119565
2037	67714	122080
2038	68221	124173
2039	68664	126183
2040	69183	128144
2041	69665	129755
2042	70112	131525
2043	70582	132934
2044	71116	134512
2045	71601	135781
2046	72068	137206
2047	72531	138401
2048	72990	137327
2049	73470	136414
2050	73905	135681
2051	74378	135046
2052	74855	134686
2053	75333	134404
2054	75734	134110
2055	76215	134122
2056	76713	134168
2057	77270	134436
2058	77703	134574
2059	78134	134786
2060	78584	135103
2061	79119	135514
2062	79598	135727
2063	80122	136149
2064	80535	136677
2065	80949	137264
2066	81354	137709
2067	81785	138135
2068	82166	138635
2069	82559	139171
2070	83007	139784
2071	83424	140538
2072	83941	141074
2073	84458	141648
2074	84953	142077

Scenario 2 (cont)

Salinity

Year	Baseline Elevation (feet)	IID to SD By Fallowing With No Effect and 33.3% OF CVWD Water Derived From System/On-Farm Returning to the Sea and IID Conditional ISG Backfill Elevation (feet)
2000	-227.0	-227.0
2001	-227.4	-227.4
2002	-227.8	-227.8
2003	-228.1	-228.1
2004	-228.5	-228.4
2005	-228.8	-228.7
2006	-229.1	-229.0
2007	-229.3	-229.4
2008	-229.6	-229.6
2009	-229.8	-229.9
2010	-230.1	-230.2
2011	-230.3	-230.5
2012	-230.5	-230.7
2013	-230.7	-231.1
2014	-230.9	-231.3
2015	-231.1	-231.6
2016	-231.3	-231.8
2017	-231.5	-232.1
2018	-231.6	-232.4
2019	-231.8	-233.4
2020	-231.9	-234.5
2021	-232.1	-235.7
2022	-232.2	-236.9
2023	-232.3	-238.1
2024	-232.4	-239.2
2025	-232.5	-240.3
2026	-232.6	-241.2
2027	-232.7	-242.2
2028	-232.8	-243.0
2029	-232.9	-243.8
2030	-233.0	-244.5
2031	-233.1	-245.1
2032	-233.2	-245.6
2033	-233.2	-246.1

Scenario 2 Elevation

2034	-233.3	-246.5
2035	-233.3	-246.8
2036	-233.4	-247.1
2037	-233.5	-247.5
2038	-233.5	-247.7
2039	-233.6	-247.9
2040	-233.6	-248.1
2041	-233.7	-248.3
2042	-233.8	-248.4
2043	-233.8	-248.6
2044	-233.9	-248.7
2045	-233.9	-248.8
2046	-234.0	-248.9
2047	-234.0	-249.0
2048	-234.1	-248.8
2049	-234.1	-248.6
2050	-234.2	-248.4
2051	-234.2	-248.2
2052	-234.3	-248.1
2053	-234.3	-248.0
2054	-234.3	-247.9
2055	-234.4	-247.8
2056	-234.4	-247.7
2057	-234.5	-247.7
2058	-234.6	-247.6
2059	-234.6	-247.6
2060	-234.6	-247.5
2061	-234.7	-247.5
2062	-234.7	-247.5
2063	-234.8	-247.5
2064	-234.8	-247.5
2065	-234.8	-247.5
2066	-234.9	-247.5
2067	-234.9	-247.5
2068	-234.9	-247.5
2069	-235.0	-247.5
2070	-235.0	-247.5
2071	-235.0	-247.5
2072	-235.1	-247.5
2073	-235.1	-247.5
2074	-235.2	-247.5

Scenario 2 (cont.)

Elevation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92009

FACSIMILE TRANSMITTAL FORM

Date Sent: 9/25/03

No. of Pages: 9

Time Sent: (Pacific Time) 1:25pm

TO: Bruce Ellis
Glenn Black

Fax No.: 602-216-4006
909-597-0067

FROM: Carol Roberts

Fax No: (760) 431-~~9618~~ 5902
Phone No.: (760) 431-9440 ext. 271

SUBJECT:

New Pelican analyses

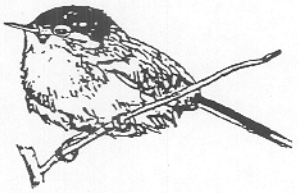
COMMENTS:

Please call me if you have any questions, or if you can't read the FAX!

Carol

If you have any have problems receiving this fax, please call (760) 431-9440, extension ~~213~~ 271. Thank you.

California Gnatcatcher



The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.

Salinity

10/28/2002 Version

	-5% Perc	-1SD	Mean	+1SD, -1SI	+95% Perc, -5% Perc
2000	44	0	44	0	0
2001	43.80323	0.526276	44.81101	0.963005	0.202709
2002	44.33734	0.555965	45.59743	1.408241	0.359577
2003	44.8688	0.644108	46.37966	1.733494	0.478931
2004	45.46626	0.700588	47.17473	2.015766	0.690468
2005	45.98151	0.800591	47.93143	2.298664	0.797539
2006	46.57252	0.859726	48.67988	2.495262	0.79134
2007	47.12042	0.904465	49.38308	2.716381	0.862709
2008	47.66833	1.002281	50.12304	2.90485	0.977077
2009	48.28267	1.072155	50.89809	3.086548	1.046459
2010	48.82439	1.184742	51.63837	3.258457	1.078381
2011	49.36854	1.317104	52.39022	3.409153	1.029118
2012	50.18817	1.224812	53.17611	3.526257	1.082306
2013	50.90559	1.247364	54.00018	3.694435	1.176014
2014	51.63098	1.244007	54.79805	3.846134	1.136868
2015	52.33263	1.25536	55.57249	3.968998	1.1493
2016	53.08912	1.276924	56.40066	4.069225	1.345074
2017	53.63992	1.477211	57.24607	4.257885	1.339851
2018	54.48177	1.446293	58.1039	4.351669	1.316833
2019	56.42456	1.613419	60.41287	4.74979	1.310387
2020	58.87045	1.727577	63.1309	5.06575	1.422951
2021	61.50288	1.936832	66.26638	5.653339	1.631996
2022	64.69161	1.97541	69.7489	6.16375	2.053635
2023	67.90646	2.139496	73.40192	6.711937	2.172371
2024	71.01977	2.320122	77.02318	7.36657	2.285561
2025	74.21829	2.679909	80.82606	7.855705	2.380508
2026	77.75047	2.709045	84.62518	8.331306	2.509193
2027	81.43132	2.849129	88.59821	8.635513	2.927109
2028	85.24606	2.825851	92.55421	8.964584	2.642166
2029	88.57182	3.117691	96.3616	9.3442	2.699883
2030	92.09425	3.310661	100.2125	9.615242	2.620041
2031	95.02973	3.54068	103.6304	10.12006	3.261848
2032	98.3969	3.472771	107.0201	10.30089	3.178787
2033	101.2519	3.618256	110.0902	10.44006	3.450844
2034	104.0918	3.405891	112.979	10.96258	3.557564
2035	106.2311	3.947197	115.7568	11.15694	3.569656
2036	108.8032	3.804642	118.2938	11.37193	3.936188
2037	111.4109	3.503555	120.6974	11.5659	4.065277
2038	113.9109	3.188744	123.0295	11.8596	3.806778
2039	115.7152	3.363617	125.0773	11.99698	4.282913
2040	117.6515	3.437981	127.2093	12.23968	3.901688
2041	119.1063	3.696991	128.8662	12.12565	4.288712
2042	121.0027	3.367271	130.5165	12.29311	3.908127
2043	122.3423	3.469299	132.0968	12.57032	4.542496
2044	123.3499	3.828392	133.6266	12.89648	4.277802
2045	125.2151	3.347229	135.1916	13.25865	5.078369
2046	126.2356	3.859032	136.752	13.31467	4.732468
2047	127.4669	3.791138	138.102	13.68799	5.045898
2048	125.7399	4.361504	136.8622	13.52144	4.343842
2049	125.3908	3.963661	135.9341	13.15926	4.798294
2050	124.6953	4.023674	135.1473	12.8566	4.030167
2051	124.0121	4.290337	134.5243	12.44376	3.624222
2052	123.4863	4.440796	134.1785	12.50286	3.658142

Pelican numbers

3295
3262
3229
3196
3163
3163
3130
3097
3064
3031
2965
1201
25

33/ppt

588/ppt

25/24.17/23.33
scenario

Year	Baseline Salinity (mg/l)	IID to SD By Fallowing With No Effect and 33.3% OF CVWD Water Derived From System/On-Farm Returning to the Sea and IID Conditional ISG Backfill Salinity (mg/l)	
2000	44000	44000	
2001	44816	44801	
2002	45657	45613	
2003	46467	46382	Pelican Numbers
2004	47277	47185	
2005	48029	47930	
2006	48769	48689	
2007	49501	49570	
2008	50222	50267	
2009	50929	50998	3295
2010	51653	51914	3262
2011	52349	52605	3229
2012	53047	53368	3196
2013	53756	54359	3163
2014	54455	55137	3130
2015	55107	55931	3130
2016	55796	56761	3097
2017	56448	57624	3064
2018	57123	58472	3031
2019	57709	60874	2965
2020	58359	63671	1201
2021	58984	66984	25
2022	59560	70643	
2023	60189	74480	
2024	60797	78315	
2025	61389	82210	
2026	61923	86208	
2027	62512	90310	
2028	63075	94317	
2029	63632	98310	
2030	64200	102080	
2031	64746	105538	
2032	65254	108701	
2033	65742	111743	
2034	66242	114611	
2035	66716	117173	
2036	67213	119565	
2037	67714	122080	
2038	68221	124173	
2039	68664	126183	
2040	69183	126144	
2041	69665	129755	
2042	70112	131525	
2043	70582	132934	
2044	71116	134512	
2045	71601	135781	
2046	72068	137206	
2047	72531	138401	
2048	72990	137327	
2049	73470	136414	
2050	73905	135681	
2051	74378	135046	
2052	74855	134686	
2053	75333	134404	
2054	75734	134110	
2055	76215	134122	
2056	76713	134168	
2057	77270	134436	
2058	77703	134574	
2059	78134	134786	
2060	78584	135103	
2061	79119	135514	
2062	79598	135727	
2063	80122	136149	
2064	80535	136677	
2065	80949	137264	
2066	81354	137709	
2067	81785	138135	
2068	82166	138635	
2069	82559	139171	
2070	83007	139784	
2071	83424	140538	
2072	83941	141074	
2073	84458	141648	
2074	84953	142077	

1.25/1.25/1.35 Scenario

Year	Baseline Salinity (mg/l)	IID to SD By Fallowing With No Effect and 33.3% OF CVWD Water Derived From System/On-Farm Returning to the Sea and IID Conditional ISG Backfill Salinity (mg/l)	
2000	44000	44000	
2001	44816	44799	
2002	45657	45561	
2003	46467	46405	Pelican numbers
2004	47277	47183	
2005	48029	47976	
2006	48769	48689	
2007	49501	49522	
2008	50222	50215	
2009	50929	50966	3295
2010	51653	51891	3262
2011	52349	52632	3229
2012	53047	53407	3196
2013	53756	54495	3163
2014	54455	55230	3130
2015	55107	56036	3097
2016	55796	56851	3097
2017	56448	57644	3064
2018	57123	58514	3031
2019	57709	60892	2965
2020	58359	63756	1201
2021	58984	67116	25
2022	59560	70845	
2023	60189	74569	
2024	60797	78456	
2025	61389	82417	
2026	61923	86581	
2027	62512	90639	
2028	63075	94567	
2029	63632	98401	
2030	64200	102130	
2031	64746	105577	
2032	65254	109035	
2033	65742	112163	
2034	66242	114797	
2035	66716	117211	
2036	67213	119756	
2037	67714	122122	
2038	68221	124156	
2039	68664	126157	
2040	69183	128259	
2041	69665	130091	
2042	70112	131483	
2043	70582	133032	
2044	71116	134329	
2045	71601	135997	
2046	72068	137221	
2047	72531	138642	
2048	72990	137278	
2049	73470	136496	
2050	73905	135591	
2051	74378	135214	
2052	74855	134760	
2053	75333	134551	
2054	75734	134393	
2055	76215	134396	
2056	76713	134301	
2057	77270	134424	
2058	77703	134587	
2059	78134	134783	
2060	78584	135111	
2061	79119	135354	
2062	79598	135870	
2063	80122	136338	
2064	80535	136826	
2065	80949	137117	
2066	81354	137695	
2067	81785	138227	
2068	82166	139009	
2069	82559	139391	
2070	83007	139749	
2071	83424	140328	
2072	83941	141019	
2073	84458	141541	
2074	84953	142442	

Original injury calculation

[redacted]

Brown Pelican roosting and foraging opportunities

In this calculation, 5,000 pelicans are present (max in summer) each years until 2030, when conditions cause the number to fall to zero. However, when the Sea is altered, the number falls to zero in the year 2018. Here, we simply calculate the difference in terms of lost/displaced pelican user-years between the unaltered and altered states. Note that each year in the future is discounted at 3%, in keeping with federal regs regarding natural resource damage assessment.

INJURY CALCULATION

	UNALTERED		ALTERED		
year	birds	birds discounted	birds	birds discounted	
2002	3295	3295	3295	3295	
2003	3295	3199	3295	3199	
2004	3295	3106	3295	3106	
2005	3295	3015	3295	3015	
2006	3295	2928	3295	2928	
2007	3295	2842	3295	2842	
2008	3295	2760	3295	2760	
2009	3295	2679	3295	2679	
2010	3262	2575	3262	2575	
2011	3229	2475	3229	2475	
2012	3196	2378	3196	2378	
2013	3196	2309	3163	2285	24
2014	3163	2218	3163	2218	
2015	3130	2131	3130	2131	
2016	3130	2069	3097	2047	22
2017	3097	1988	3064	1967	21
2018	3064	1909	3031	1889	20
2019	3064	1854	2965	1794	87
2020	3031	1780	1201	705	
2021	3031	1729	25	14	
2022	2998	1660	25	14	
2023	2965	1594	25	13	
2024	2965	1547	25	13	
2025	2377	1204	25	13	
2026	2377	1169	25	12	
2027	1789	854	25	12	
2028	1201	557	25	12	
2029	1201	541	25	11	
2030	613	268	25	11	
2031	613	260.12432	25	10.608659	
2032	25	10.299669	25	10.299669	

PELICAN COUNTS AT SALTON

peak in 2000	2600
peak in 2001	3990
average:	**3295**

Without Benchmark transfers

(original #s used in BO analysis)

Total Bird User-Years (discounted)	
58895	**46425**

TOTAL LOSS DUE TO ALTERATION OF SALTON SEA: 12470 pelican user-years

− 87 (disregarded as not "material")

12,383

↳ figure used in B.D.

25/24.17/23.33 Scenario

[redacted]

Brown Pelican roosting and foraging opportunities

In this calculation, 5,000 pelicans are present (max in summer) each years until 2030, when conditions cause the number to fall to zero. However, when the Sea is altered, the number falls to zero in the year 2018. Here, we simply calculate the difference in terms of lost/displaced pelican user-years between the unaltered and altered states. Note that each year in the future is discounted at 3%, in keeping with federal regs regarding natural resource damage assessment.

INJURY CALCULATION

	UNALTERED		ALTERED	
year	birds	birds discounted	birds	birds discounted
2002	3295	3295	3295	3295
2003	3295	3199	3295	3199
2004	3295	3106	3295	3106
2005	3295	3015	3295	3015
2006	3295	2928	3295	2928
2007	3295	2842	3295	2842
2008	3295	2760	3295	2760
2009	3295	2679	3295	2679
2010	3262	2575	3262	2575
2011	3229	2475	3229	2475
2012	3196	2378	3196	2378
2013	3196	2309	3163	2285
2014	3163	2218	3130	2195
2015	3130	2131	3130	2131
2016	3130	2069	3097	2047
2017	3097	1988	3064	1967
2018	3064	1909	3031	1889
2019	3064	1854	2965	1794
2020	3031	1780	1201	705
2021	3031	1729	25	14
2022	2998	1660	25	14
2023	2965	1594	25	13
2024	2965	1547	25	13
2025	2377	1204	25	13
2026	2377	1169	25	12
2027	1789	854	25	12
2028	1201	557	25	12
2029	1201	541	25	11
2030	613	268	25	11
2031	613	260.12432	25	10.608659
2032	25	10.299669	25	10.299669

PELICAN COUNTS AT SALTON

peak in 2000	2600
peak in 2001	3990
average:	**3295**

Injury Calculation With Benchmark Water (25/24.17/23.33)

Total Bird User-Years (discounted)

58895 **46402**

TOTAL LOSS DUE TO ALTERATION OF SALTON SEA: 12493 pelican user-years

-87 (previously discounted as not a material impact)

12,406

12.5/25/35 Scenario

[redacted]

Brown Pelican roosting and foraging opportunities

In this calculation, 5,000 pelicans are present (max in summer) each years until 2030, when conditions cause the number to fall to zero. However, when the Sea is altered, the number falls to zero in the year 2018. Here, we simply calculate the difference in terms of lost/displaced pelican user-years between the unaltered and altered states. Note that each year in the future is discounted at 3%, in keeping with federal regs regarding natural resource damage assessment.

INJURY CALCULATION

	UNALTERED		ALTERED	
year	birds	birds discounted	birds	birds discounted
2002	3295	3295	3295	3295
2003	3295	3199	3295	3199
2004	3295	3106	3295	3106
2005	3295	3015	3295	3015
2006	3295	2928	3295	2928
2007	3295	2842	3295	2842
2008	3295	2760	3295	2760
2009	3295	2679	3295	2679
2010	3262	2575	3262	2575
2011	3229	2475	3229	2475
2012	3196	2378	3196	2378
2013	3196	2309	3163	2285
2014	3163	2218	3130	2195
2015	3130	2131	3097	2109
2016	3130	2069	3097	2047
2017	3097	1988	3064	1967
2018	3064	1909	3031	1889
2019	3064	1854	2965	1794
2020	3031	1780	1201	705
2021	3031	1729	25	14
2022	2998	1660	25	14
2023	2965	1594	25	13
2024	2965	1547	25	13
2025	2377	1204	25	13
2026	2377	1169	25	12
2027	1789	854	25	12
2028	1201	557	25	12
2029	1201	541	25	11
2030	613	268	25	11
2031	613	260.12432	25	10.608659
2032	25	10.299669	25	10.299669
Total Bird User-Years (discounted)		**58895**		**46379**

PELICAN COUNTS AT SALTON

peak in 2000	2600
peak in 2001	3990
average:	3295

Injury Calculation With Benchmark Water (12.5/25/35)

TOTAL LOSS DUE TO ALTERATION OF SALTON SEA: 12515 pelican user-years

− 87 (discounted previously as not material)

12,428

[redacted]

Brown Pelican roosting and foraging opportunities

Number of lost pelican-years of roosting and foraging: 12470

Here, we attempt to scale the size of project we need to compensate/mitigate for the loss of pelican foraging and roosting opportunities calculated under the injury. We assume that the project will be long-lasting, and thus will provide roosting and foraging for 100 years, beginning in the year 2005.

Size of project (# of birds it must provide for each year): 1200
Benefit of project (# of gained pelican-years of roosting and foraging): 13607 (should approx. equal t

RESTORATION CREDIT CALCULATION

year	birds	birds discounted
2002	0	0
2003	0	0
2004	0	0
2005	0	0
2006	0	0
2007	0	0
2008	0	0
2009	0	0
2010	0	0
2011	0	0
2012	0	0
2013	0	0
2014	0	0
2015	0	0
2016	0	0
2017	0	0
2018	200	125
2019	400	242
2020	600	352
2021	800	456
2022	1000	554
2023	1200	645
2024	1200	626
2025	1200	608
2026	1200	590
2027	1200	573
2028	1200	556
2029	1200	540
2030	1200	524
2031	1200	509
2032	1200	494
2033	1200	480
2034	1200	466
2035	1200	452
2036	1200	439
2037	1200	426

Credit based on conservation measure requirements
1,200 pelicans provided with roosts
full success to be achieved by 2023 through 2048
(ramp up 2018 - 2022)

2038	1200	414
2039	1200	402
2040	1200	390
2041	1200	379
2042	1200	368
2043	1200	357
2044	1200	347
2045	1200	337
2046	1200	327
2047	1200	317
2048	1200	308
2049		0
2050		0
2051		0
2052		0
2053		0
2054		0
2055		0
2056		0
2057		0
2058		0
2059		0
2060		0
2061		0
2062		0
2063		0
2064		0
2065		0
2066		0
2067		0
2068		0
2069		0
2070		0
2071		0
2072		0
2073		0
2074		0
2075		0
2076		0
2077		0
2078		0
2079		0
2080		0

Total Benefit (bird user-years discounted):
13607

From: Paul Weghorst
To: Bruce Ellis; carol_a_roberts@fws.gov; Jayne Harkins; John_Eckhardt@msn.com; Laura Harnish; Sandy Eto; Shields, Tina Anderholt
Date: 9/26/03 1:22PM
Subject: Another IID ISG Backfill Simulation of the Salton Sea

Laura Harnish and John Eckhardt asked me to run another ISG backfill simulation of the Salton Sea assuming that the full 72.5 kaf impact occurs in 2012. I have run this and the attached files contain the mean salinity, elevation, and surface area simulation results as well as a stochastic band graph for salinity. It looks to me like none of our conclusions change with this scenario.

If anyone has any questions... please give me a call.

Paul A. Weghorst, PE
Bureau of Reclamation
Mail Stop: D-8520
PO Box 25007
Denver, CO 80225
pweghorst@do.usbr.gov
(303)-445-2534 (Phone)
(720)-544-0271 (Fax)

Year	Baseline Salinity (mg/l)	IID to SD By Fallowing With No Effect and 33.3% OF CVWD Water Derived From System/On-Farm Returning to the Sea and IID Conditional ISG Backfill Salinity (mg/l)
2000	44000	44000
2001	44816	44799
2002	45657	45600
2003	46467	46403
2004	47277	47202
2005	48029	47962
2006	48769	48663
2007	49501	49379
2008	50222	50081
2009	50929	50819
2010	51653	51579
2011	52349	52299
2012	53047	53112
2013	53756	54496
2014	54455	55298
2015	55107	56098
2016	55796	56910
2017	56448	57715
2018	57123	58586
2019	57709	60961
2020	58359	63757
2021	58984	67019
2022	59560	70692
2023	60189	74433
2024	60797	78330
2025	61389	82330
2026	61923	86308
2027	62512	90403
2028	63075	94371
2029	63632	98238
2030	64200	101723
2031	64746	105255
2032	65254	108578
2033	65742	111579

Scenario 3

Benchmark Water Inflow Reductions

2006 - Ø

2009 Ø

2012 72.5 KAF

2034	66242	114373
2035	66716	116883
2036	67213	119313
2037	67714	121472
2038	68221	123559
2039	68664	125767
2040	69183	127728
2041	69665	129470
2042	70112	131103
2043	70582	132573
2044	71116	134094
2045	71601	135380
2046	72068	136557
2047	72531	137829
2048	72990	136808
2049	73470	135966
2050	73905	135275
2051	74378	134702
2052	74855	134249
2053	75333	134130
2054	75734	133880
2055	76215	133789
2056	76713	133774
2057	77270	134014
2058	77703	134188
2059	78134	134342
2060	78584	134635
2061	79119	135069
2062	79598	135514
2063	80122	136000
2064	80535	136365
2065	80949	136890
2066	81354	137327
2067	81785	137806
2068	82166	138237
2069	82559	138774
2070	83007	139392
2071	83424	139909
2072	83941	140332
2073	84458	140848
2074	84953	141415

Scenario 3 (cont.)

Salinity

Year	Baseline Elevation (feet)	IID to SD By Fallowing With No Effect and 33.3% OF CVWD Water Derived From System/On-Farm Returning to the Sea and IID Conditional ISG Backfill Elevation (feet)
2000	-227.0	-227.0
2001	-227.4	-227.4
2002	-227.8	-227.8
2003	-228.1	-228.1
2004	-228.5	-228.4
2005	-228.8	-228.7
2006	-229.1	-229.0
2007	-229.3	-229.3
2008	-229.6	-229.5
2009	-229.8	-229.8
2010	-230.1	-230.0
2011	-230.3	-230.3
2012	-230.5	-230.6
2013	-230.7	-231.2
2014	-230.9	-231.4
2015	-231.1	-231.7
2016	-231.3	-231.9
2017	-231.5	-232.2
2018	-231.6	-232.4
2019	-231.8	-233.4
2020	-231.9	-234.5
2021	-232.1	-235.7
2022	-232.2	-236.9
2023	-232.3	-238.1
2024	-232.4	-239.2
2025	-232.5	-240.3
2026	-232.6	-241.3
2027	-232.7	-242.2
2028	-232.8	-243.0
2029	-232.9	-243.8
2030	-233.0	-244.4
2031	-233.1	-245.0
2032	-233.2	-245.6
2033	-233.2	-246.0

Scenario 3

Elevation

2034	-233.3	-246.4
2035	-233.3	-246.8
2036	-233.4	-247.1
2037	-233.5	-247.4
2038	-233.5	-247.6
2039	-233.6	-247.8
2040	-233.6	-248.1
2041	-233.7	-248.2
2042	-233.8	-248.4
2043	-233.8	-248.5
2044	-233.9	-248.6
2045	-233.9	-248.7
2046	-234.0	-248.8
2047	-234.0	-248.9
2048	-234.1	-248.7
2049	-234.1	-248.5
2050	-234.2	-248.3
2051	-234.2	-248.2
2052	-234.3	-248.0
2053	-234.3	-247.9
2054	-234.3	-247.8
2055	-234.4	-247.7
2056	-234.4	-247.7
2057	-234.5	-247.6
2058	-234.6	-247.6
2059	-234.6	-247.5
2060	-234.6	-247.5
2061	-234.7	-247.5
2062	-234.7	-247.5
2063	-234.8	-247.5
2064	-234.8	-247.4
2065	-234.8	-247.4
2066	-234.9	-247.4
2067	-234.9	-247.4
2068	-234.9	-247.4
2069	-235.0	-247.4
2070	-235.0	-247.4
2071	-235.0	-247.4
2072	-235.1	-247.4
2073	-235.1	-247.4
2074	-235.2	-247.4

Scenario 3 (cont.)

Elevation

From: Bruce Ellis
To: Harnish', 'Laura
Date: 9/26/03 4:02PM
Subject: For your records

I spoke to Carol Roberts (FWS) about the new scenario you asked Paul Weghorst to run, which put all of the impacts of the benchmark water (72.5 KAF) in 2012. Paul had already provided the model runs to Carol, and she had already reviewed the results. She advised me that she did not need to do a new REA analysis to calculate brown pelican impacts, since all the salinity thresholds (every 1000 ppm between 50K and 65K) were crossed in the same years as the earlier run for 12.5,25, 35. Therefore the results in pelican years lost would be identical to the pro-rata run (12,428 pelican use-years). I hope this message is adequate for your files to document the results of this last scenario. bde

CC: carol.a.roberts@fws.gov; Eto, Sandy; Weghorst, Paul

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92009

In Reply Refer To:
FWS-IMP-2628.12

OCT 07 2003

Memorandum

To: Regional Director, Lower Colorado Region
Bureau of Reclamation, Boulder City, Nevada

From: Assistant Field Supervisor, Carlsbad Fish and Wildlife Office
Fish and Wildlife Service, Carlsbad, California

Subject: Review of the December 18, 2002, Final Biological Opinion on the Bureau of Reclamation's Proposed Section 7(a)(1) Conservation Measures for Listed Species in the Imperial Irrigation District/Salton Sea Areas in light of the Revised Colorado River Water Delivery Agreement (Draft Dated September 22, 2003)

The Fish and Wildlife Service (Service) has received your review of the above biological opinion (BO) relative to the revised Colorado River Water Delivery Agreement (in draft) that was developed as a result of recently completed negotiations on the Quantification Settlement Agreement (QSA). We concur with your findings that the analysis provided in the Bureau of Reclamation's (Reclamation) Biological Assessment (BA) and our BO adequately address the additional conservation and transfer of a cumulative total of 145 thousand acre-feet (KAF), with a maximum cumulative reduction of inflows to the Salton Sea of 72.5 KAF, from Imperial Irrigation District (IID) for the benefit of the Metropolitan Water District of Southern California (MWD) and/or the San Diego County Water Authority (SDCWA). This additional component may be necessary to meet the benchmark requirements in the Interim Surplus Guidelines (ISG). The analysis of the effects indicates that the conservation measures as described in the BA and BO adequately offset the impacts to the California brown pelican (*Pelecanus occidentalis*), Yuma clapper rail (*Rallus longirostris yumanensis*), and desert pupfish (*Cyprinodon macularius*) even with the additional reduction in drain flows and inflows to the Salton Sea associated with the conservation and transfer of this "benchmark" water. Although this was the only new water transfer component requiring approval from the Department of the Interior, the Colorado River Water Delivery Agreement does not preclude, and the QSA and associated legislation recently passed by the State of California call for, additional activities that have not been addressed in this consultation. These are discussed below.

Your letter indicates that there are two blocks of water that may also be conserved and transferred as part of the revised agreements. The 800 KAF block referred to in the negotiations

as mitigation water is the functional equivalent of the 15-year Minimization Plan described in the BA/BO (i.e., water for the Salton Sea to replace inflow reductions resulting from water conservation). However, the State legislation allows for the possible transfer of this water out of the Salton Sea basin if compatible with a Salton Sea restoration plan to be developed by the State. The use of this water for anything other than the 15-year Minimization Plan as described in the BA/BO has not been analyzed as part of the consultation, nor has incidental take of listed species been exempted for this activity. Similarly, your letter notes that there is an additional block of 800 KAF that may be conserved for sale to the California Department of Water Resources and ultimate resale to the MWD. Details regarding the implementation of this component are not available at this time. The conservation and transfer of this water out of the Salton Sea basin has not been analyzed in the BA/BO, and incidental take of listed species has not been exempted for these activities. Re-initiation of the consultation would be required prior to either of these changes in water use being implemented, and additional conservation measures may be required to offset the impacts associated with these activities.

The revised agreements do not preclude the conservation and transfer of water from IID to SDCWA earlier or at greater volumes than called for in the current schedule. However, the analysis in the BA and BO used the specific volumes of conservation and transfer on the specific schedule described in the 15-year Minimization Plan to complete the resource equivalency analysis. Any increase in the volume or rate of water transfer would go beyond scope of the BA/BO analysis. Re-initiation of the consultation would be required prior to such increases in the rate or volume of the water transfer. This also would be the case if the volume of water conserved and transferred to meet the ISG (benchmark water), or the associated reductions in Salton Sea inflows, were to exceed the volumes described above (145 KAF and 72.5 KAF, respectively).

The QSA allows for the use of East Mesa groundwater as a substitute for IID conserved water in the 15-year Minimization Plan. This approach was not analyzed in the BA and the BO, nor was it included in the Environmental Impact Report/Environmental Impact Statement completed for the project. Re-initiation of the consultation would be necessary prior to the implementation of this activity to determine if there are additional impacts to the listed species addressed in the BO and/or impacts to additional listed species that were not included in the BO. No incidental take has been exempted for this activity.

We would like to reiterate that the receipt and use of conserved and transferred water by MWD, SDCWA and Coachella Valley Water District (CVWD) is not addressed in the BO. CVWD currently is pursuing Endangered Species Act compliance for this use through the Coachella Valley Multiple Species Habitat Conservation Plan.

Reclamation previously consulted on the ISG and the Secretarial Implementation Agreements with the Service's Arizona Fish and Wildlife Office (AESO/SE 2-21-00-F-273 dated January 12, 2001). That consultation analyzed the effects on listed species of a change in the point of diversion of 400 KAF of Colorado River water per year from Imperial Dam to Lake Havasu. The

revised agreements allow for additional blocks of water to be conserved and transferred by IID to MWD and/or SDCWA. If the cumulative volume of these transfers would result in the change in point of diversion for a volume of water greater than 400 KAF in one or more years during the term of the agreements, then Reclamation would need to re-initiate that consultation so that the impacts of the increased volume of diversion can be analyzed.

We continue to appreciate the exceptional support provided by Reclamation staff in addressing issues related to the water transfer. We look forward to working with you and your staff to implement the conservation measures included in your program once the QSA has been signed. If you have any questions about our concurrence or comments, or would like to discuss any other aspects of the IID water transfer, please contact Carol Roberts of my staff at (760) 431-9440 ext. 271.