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**EFFECTS OF INTERIM FLOWS FROM GLEN CANYON DAM ON
THE AQUATIC RESOURCES OF THE LOWER COLORADO
RIVER FROM NATIONAL CANYON TO LAKE MEAD**

Trip No. 95-01: April 11 - April 29, 1995

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I. INTRODUCTION:

This report summarizes activities and preliminary results of Trip No. 95-01 lead by the Hualapai Department of Natural Resources. Personnel, types of data collected, general observations, recommendations for future trips and summary of fish species captured are presented here to provide timely information for other research and management activities.

II. LOGISTICS, RESEARCH SCHEDULE AND PERSONNEL

Trip No. 95-01 launched from Lee's Ferry on April 9, 1995 and continued to Havasu Creek where the Hualapai Aquatic Team was deployed on April 11, 1995. The focus of the study reach began at National Canyon (RM 164.4) and continue to Pearce Ferry (RM 280). Reach 3 of the study area includes National Canyon (RM 165.4) to Diamond Creek and Reach 4 from Diamond Creek (RM 226.0) to Pearce Ferry. Trip No. 95-01 concluded on April 29, 1995, taking out at Pearce Ferry, (See Table 1 for participating personnel).

III. DATA COLLECTED:

Data collected within Trip No. 95-01 consisted of aquatic resources found within the confines of the Hualapai Indian Reservation. Below you will find preliminary information on data collected for Trip No. 95-01, 1995.

A. Native Fish Captured:

Within Reach 3 a total of 85 flannelmouth (FM) suckers were captured consisting of 19 Young of Year (YOY), 27 juveniles (Juv), and 39 adults. Reach 4 produced 19 flannelmouths consisting of 6 YOY, 1 juv, and 12 adults. For both reach 3 and 4 forty-eight (48) flannelmouths were implanted with PIT-Tags which includes seven (7) recaptures, (See Tables 4 and 5).

Bluehead sucker (BH) captured within Trip. No. 95-01 nine with 9 fish consisting of 3 YOY, 2 juv, and 4 adults. Five (5) of these nine (9) fish were implanted with PIT-Tags with no recaptures, (See Table 4). No blueheads were captured within Reach 4.

We captured 149 speckled dace (SD) were captured in reach 3; 1 juv, and 148 adults. Reach 4 produced a total of 61 adults.

**** Note See Tables 3 and 4 for totals.**

B. Water Quality:

Water quality data was collected throughout the study reach. A total of 10 areas were sampled for temperature, conductivity, dissolved oxygen, and pH. Nine of these sites were sampled within the mainstem. A low of 11.33 degrees celsius at RM 208.9 and a high of 15.51 degrees celsius at RM 273.5 was observed. Spencer Creek was also sampled with a high of 23.08 degrees celsius and a low of 16.18 degrees, (See Table 6 for further details).

C. Primary/Secondary Productivity:

Twelve (12) drift sites were sampled throughout the trip measuring the rising, falling, steady low and high hydrographs. Analysis and quantification of these samples will be presented in the final report.

Hess samples were collected throughout the trip consisting of three (3) sites within reach 3 and three (3) sites within reach 4.

Surber samples were collected in Spencer Creek located approximately .5 mile from the mainstem.

D. River Stage Monitoring:

A total of six (6) mainstem sites were monitored for river stage levels. Three (3) of these sites were located in reach 3 and three (3) sites within reach 4. Monitoring sites were as follows: Cove Canyon RM 174.3, RM 182.8, Granite Park RM 208.9, Travertine Falls RM 230.4, Spencer Creek RM 245.9, and Boundary Canyon RM 273.3. The maximum stage change for the entire trip was 66 cm within a 12 hour period, located at RM 208.9, Granite Park, April 16-17, 1995.

E. Mapping of GIS Sites:

All fish sampling efforts, and drift net sampling efforts were placed upon mylar overlays using aerial photographs for GIS sites 10, 11, 12, and 13. This information will be transferred to the Hualapai GIS coordinator who will enter this data into the GCES Database.

F. Diet analysis of striped bass and channel catfish:

Stomachs of striped bass (SB) and channel catfish (CC) were taken for analysis on every other fish captured. For the remaining specimens FLOY-Tags were implanted. A total of 36 tags were implanted for both reach 3 and 4, 18 tags for the channel catfish and 18 for the striped bass, (Refer to Table 4 and 5).

G. Water Discharge Measurements:

Discharge measurements taken within Spencer Creek, .75 of a mile from the mainstem, calculated to be 1.12 cubic meters per second on April 23, 1995.

IV. OBSERVATIONS:

- * Adult flannelmouth suckers were common in net sets in Reach 3.
- * YOY and juvenile flannelmouth suckers were commonly captured in nearshore habitats in reach 3.
- * One striped bass was captured at RM 208. This male fish weighed about 13 pounds and taken for diet analysis. The stomach contained only algae.
- * Three flannelmouth suckers in Reach 3 were recaptured from previous sampling trips. Small movements of about 2 - 7 miles were observed. All fish grew in both length and weight.
- * The side channel at RM 209 has been cut-off from the main channel by a debris flow in March 1995. A small trickle of water forms several pools that did not contain observable fish. Deep silt precluded effective sampling efforts.
- * All samples within the GIS sites were mapped on Mylar overlays of aerial photographs and numbered. These sample locations will be entered into the GIS long-term database.
- * Threadfin shad were captured as far upstream as Separation Canyon. This is the furthest upstream observations in recent years.
- * Cladophora glomerata was observed throughout Reach 4. Usually this alga declines dramatically below Reach 3. Nets required cleaning more often than usual.
- * Recent extensive flooding in Spencer Creek changed channel structure and bottom substrates. Pools present in past trips were filled in with gravel and cobble.
- * Spencer Creek Tempmentor was replaced. The previous Tempmentor was lost during recent flooding.
- * Tempmentor was deployed near Emery Falls in mainstem.
- * Striped bass were commonly observed below RM 238.
- * YOY and juvenile flannelmouth suckers were observed in mainstem river near RM 266 and 273.

- * One YOY carp was captured in the mainstem near RM 273.
- * Spencer Creek discharge and channel morphology precluded depletion sampling for population estimates.
- * Common carp were observed above chute falls barrier in Spencer Creek. In the past this chute was thought to be barrier to upstream movement. High discharge may have allowed fish to move above this point.
- * Larval fish were observed in side pools and isolated pools throughout Spencer Creek.
- * Tributaries and side canyons throughout the study reach left substantial debris fans: Prospect Canyon, Spencer and Surprise Creeks.
- * Channel catfish and striped bass were easily captured by angling using live red shiners; 5 fish captured within 20 minutes at Spencer Camp.

V. RECOMMENDATIONS:

- * Continue to collect gape measurements for channel catfish and striped bass.
- * Monitor isolated side channel and pools at RM 209.
- * Collect benthic samples using Hess sampler to monitor fish food resources.
- * Continue larval light trapping in both Reach 3 and 4.

Table 1. Participating Personnel for Trip No. 95-01, Hualapai Aquatic Studies

Personnel	Affiliation	Dates	Comments
Bill Leibfried	SWCA, Inc.	April 11-18, 1995	Project Leader, Reach 3
Gloria Hardwick	SWCA, Inc.	April 18-29, 1995	Project Leader, Reach 4
Ben Zimmerman	Hualapai	April 11-18, 22-29, 1995	Biologist Reach 3 and 4
Mike Vaughn	Hualapai	April 11-17, 18-29, 1995	Biologist Reach 3 and 4
Richard Beecher	Hualapai	April 11-29, 1995	Biologist Reach 3 and 4
Connie Graham	SWCA, Inc.	April 11-29, 1995	Biologist Reach 3 and 4
Scott Crozier	Hualapai	April 18-29, 1995	Boatmen\Cook Reach 4
Jimmy Hall	OARS	April 11-29, 1995	Boatmen\Cook Reach 3 and 4
David Brown	OARS	April 11-18, 1995	Boatmen\Cook Reach 3
Bill Ellwanger	SWCA, Inc.	April 11-18, 1995	Electrofishing Boatmen Reach 3
Steve Bledesio	SWCA, Inc.	April 18-29, 1995	Electrofishing Boatmen Reach 4

Table 2. Summary of Fish Captured with Reach 3, Trip NO. 95-01, Hualapai Indian Reservation. April 11-18, 1995.

		MINNOW	LIGHT	NETTING	SEINING	ELECTRO-	ELECTRO-	TOTALS
		TRAPS	TRAPPING			BOAT	BACKPACK	
COMMON	YOY							0
CARP	JUV					3		3
	ADULT			7		73		80
CHANNEL	YOY							0
CATFISH	JUV							0
	ADULT			4				4
STRIPED	YOY							0
BASS	JUV							0
	ADULT			1				1
SPECKLED	YOY							0
DACE	JUV					1		1
	ADULT	2			139	7		148
RED SHINER	YOY							0
	JUV							0
	ADULT							0
FATHEAD	YOY				2			2
MINNOW	JUV					1		1
	ADULT	4			117	16		137
FLANNEL-	YOY	1			8			19
MOUTH	JUV	1			17	9		27
	ADULT			27		12		39
RAINBOW	YOY					1		1
TROUT	JUV							0
	ADULT							0
BLUEHEAD	YOY				2	1		3
	JUV				1	1		2
	ADULT			4				4
PLAINS KILLI-	YOY							0
FISH	JUV							0
	ADULT				3			3
TOTALS		8	0	43	300	124	0	

Table 3. Summary of Fish Captured in Reach 4, Trip NO. 95-01, Hualapai Indian Reservation.
April 18-29, 1995

		MINNOW	LIGHT	NETTING	SEINING	ELECTRO-	ELECTRO-	TOTALS
		TRAPS	TRAPPING			BOAT	BACKPACK	
COMMON	YOY				1			1
CARP	JUV					5		5
	ADULT			79		8	3	90
CHANNEL	YOY							0
CATFISH	JUV					1		1
	ADULT			20		1	3	24
STRIPED	YOY							0
BASS	JUV					7		7
	ADULT			31		23		54
SPECKLED	YOY							0
DACE	JUV							0
	ADULT	2			1		58	61
RED SHINER	YOY					1		1
	JUV							0
	ADULT	152	2		1792	94	29	2069
FATHEAD	YOY							0
MINNOW	JUV							0
	ADULT	16			12	1		29
FLANNEL-	YOY				6			6
MOUTH	JUV	1						1
	ADULT			6	3	3		12
RAINBOW	YOY							0
TROUT	JUV							0
	ADULT							0
BLUEHEAD	YOY							0
	JUV							0
	ADULT							0
PLAINS KILLI-	YOY							0
FISH	JUV							0
	ADULT						1	1
GREEN	YOY							0
SUNFISH	JUV							0
	ADULT					1		1
THREADFIN	YOY							0
SHAD	JUV							0
	ADULT			1		7		8
BLUEGILL	YOY							0
	JUV							0
	ADULT			1				1
LARGEMOUTH	YOY							0
BASS	JUV							0
	ADULT			1				1
MOSQUITO-	YOY				1			1
FISH	JUV							0
	ADULT				13			13
TOTALS		171	2	139	1829	152	94	

TABLE 4. SUMMARY OF PIT AND FLOY TAGS FOR TRIP NO. 95-01, HUALAPAI AQUATIC STUDIES, REACH 3

SPECIES	DATE	TAG #	RECAPTURE	TL (mm)	SL (mm)	WT (g)	RM (CAPTURED)	SEX
BH	12-Apr-95	1F776581C	N	213	176	112	185.1	U
BH	12-Apr-95	1F7B5E4444	N	235	202	125	173.1	M
BH	17-Apr-95	1F7B50791D	N	241	210	166	207.3	F
BH	12-Apr-95	1F783E2B00	N	252	217	166	172.8	M
BH	12-Apr-95	1F7B16646C	N	264	226	169	172.8	F
CC	14-Apr-95	02729FLAGY	N	281	212	227	180.9	U
CC	13-Apr-95	02728FLAGY	N	333	265	-	182.2	U
CC	15-Apr-95	02730FLAGY	N	358	285	340	180.9	U
FM	17-Apr-95	1F7B5A325A	N	189	153	75	208.9	U
FM	13-Apr-95	1F7B601274	N	193	165	70	183.3	U
FM	14-Apr-95	1F7B520A0A	N	207	179	88	181.4	M
FM	16-Apr-95	1F78117464	N	213	180	110	207.4	M
FM	15-Apr-95	1F7A357042	N	221	189	110	208.6	M
FM	13-Apr-95	1F7A3A2805	N	221	187	113	183.3	M
FM	16-Apr-95	1F78342D08	N	222	187	120	207.4	F
FM	13-Apr-95	1F7820526A	N	230	203	113	183.3	M
FM	17-Apr-95	1F781C2A23	N	248	211	146	208.9	M
FM	16-Apr-95	1F7A33753F	N	264	222	178	208.6	M
FM	13-Apr-95	1F782C023B	N	264	222	188	172.9	M
FM	12-Apr-95	1F14325843	Y	280	230	249	173.5	M
FM	13-Apr-95	1F7B5F4245	N	283	245	230	183.3	M
FM	14-Apr-95	1F7878155C	N	285	243	491	182.3	M
FM	15-Apr-95	1F7A7E5B0E	N	287	243	256	208.6	M
FM	13-Apr-95	1F78205178	N	297	252	260	183.3	M
FM	16-Apr-95	1F7B140B47	N	305	262	301	208.9	M
FM	15-Apr-95	1F7B647B07	N	307	257	303	208.9	M
FM	12-Apr-95	1F7A3C3279	N	314	268	382	172.9	U
FM	14-Apr-95	1F7A1C1734	N	322	277	311	182.6	M
FM	12-Apr-95	1F7B69017C	N	324	270	311	172.8	M
FM	13-Apr-95	1F7B08104E	N	326	283	360	180.9	M
FM	16-Apr-95	1F7A7E4128	N	351	296	555	208.0	M
FM	12-Apr-95	1F7B074916	N	355	310	430	172.8	M
FM	13-Apr-95	1F78250828	N	361	304	494	184.1	M
FM	16-Apr-95	1F78707405	N	365	313	493	208.1	M
FM	16-Apr-95	1F78707405	Y	369	315	496	208.2	M
FM	14-Apr-95	1F7B065010	N	370	315	609	182.6	F
FM	14-Apr-95	1F78364F64	N	370	316	533	182.3	M
FM	13-Apr-95	1F7A7A7A73	N	379	330	502	183.3	M
FM	17-Apr-95	1F780F0F4B	N	381	329	654	208.0	M
FM	14-Apr-95	1F1F780842	Y	391	333	625	180.9	M
FM	15-Apr-95	7F7D1E1C6D	N	410	355	734	180.9	F
FM	12-Apr-95	1F7BG11C69	N	414	354	617	172.8	M

(TABLE 4 CONT.)

SPECIES	DATE	TAG #	RECAPTURE	TL		SL	WT	RM	SEX
				(mm)	(mm)				
FM	14-Apr-95	1F7775462F	Y	416	346	699	180.9	F	
FM	14-Apr-95	177775462F	Y	417	350	697	180.9	F	
FM	14-Apr-95	1F7775462F	Y	419	354	694	180.9	F	
FM	13-Apr-95	1F7B16420E	N	421	355	609	173.1	F	
FM	16-Apr-95	1F78086B76	N	430	366	798	208.6	M	
FM	13-Apr-95	1F7A38250A	N	442	375	888	182.3	F	
FM	14-Apr-95	1F78301524	N	444	375	767	182.8	M	
FM	14-Apr-95	1F7B0F1245	N	452	385	907	180.9	F	

TABLE 5. SUMMARY OF PIT AND FLOY TAGS FOR TRIP NO. 95-01, HUALAPAI AQUATIC STUDIES, REACH 4										
SPECIES	DATE	TAG #	RECAPTURE	TL (mm)	SL (mm)	WT (g)	RM (CAPTURED)	SEX		
CC	26-Apr-95	02900FLAGY	N	172	130	57	275.5	U		
CC	21-Apr-95	02737FLAGY	N	237	187	100	240.8	U		
CC	26-Apr-95	02166FLAGY	N	249	199	170	272.1	U		
CC	26-Apr-95	02170FLAGY	N	269	211	170	272.2	U		
CC	26-Apr-95	02170FLAGY	N	269	211	170	272.2	U		
CC	27-Apr-95	02175FLAGY	N	278	225	227	274.4	U		
CC	27-Apr-95	02172FLAGY	N	316	256	794	274.4	U		
CC	25-Apr-95	02158FLAGY	N	327	264	340	274.2	U		
CC	24-Apr-95	02748FLAGY	N	330	258	255	248.0	U		
CC	26-Apr-95	02167FLAGY	N	330	259	284	273.1	U		
CC	19-Apr-95	02731FLAGY	N	332	262	340	228.9	U		
CC	28-Apr-95	02895FLAGY	N	340	281	312	280.5	U		
CC	20-Apr-95	02461FLAGY	N	350	280	482	274.1	U		
CC	21-Apr-95	02738FLAGY	N	365	291	397	240.9	U		
CC	22-Apr-95	02744FLAGY	N	365	283	397	246.0	U		
FM	24-Apr-95	1F7B03243F	N	272	228	154	260.1	U		
FM	21-Apr-95	1F2F384D2D	Y	287	235	212	245.8	U		
FM	21-Apr-95	1F7753243	N	318	260	293	240.8	M		
FM	26-Apr-95	1F7815163E	N	374	315	491	274.7	U		
FM	24-Apr-95	7F7D400379	Y	402	340	598	247.9	F		
FM	28-Apr-95	1F777E7379	N	449	378	961	280.5	M		
LB	28-Apr-95	02893FLAGY	N	435	363	1247	280.5	F		
SB	27-Apr-95	02174FLAGY	N	222	174	113	274.4	U		
SB	22-Apr-95	02467FLAGY	N	240	222	142	249.6	U		
SB	24-Apr-95	02154FLAGY	N	303	239	227	249.8	U		
SB	21-Apr-95	02740FLAGY	N	314	250	227	240.8	U		
SB	21-Apr-95	02742FLAGY	N	342	273	369	245.5	U		
SB	20-Apr-95	02734FLAGY	N	346	277	348	242.0	U		
SB	24-Apr-95	02747FLAGY	N	367	295	311	248.0	U		
SB	23-Apr-95	02470FLAGY	N	370	345	907	246.0	U		
SB	27-Apr-95	02171FLAGY	N	376	350	567	274.7	U		
SB	26-Apr-95	02168FLAGY	N	382	304	680	272.1	U		
SB	26-Apr-95	02899FLAGY	N	386	309	454	275.8	U		
SB	28-Apr-95	02169FLAGY	N	401	316	567	280.5	U		
SB	24-Apr-95	02155FLAGY	N	420	335	510	260.2	U		
SB	28-Apr-95	02897FLAGY	N	433	335	964	280.5	U		
SB	28-Apr-95	02894FLAGY	N	435	356	652	280.5	U		
SB	28-Apr-95	02896FLAGY	N	441	363	737	280.5	U		
SB	28-Apr-95	02898FLAGY	N	446	358	964	280.5	U		
SB	20-Apr-95	02464FLAGY	N	500	408	936	274.1	U		

