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Hualapai Tribe - Glen Canyon Environmental Studies
Quarterly Report: October - December 1994

GLEN CANYON ENVIRONMENTAL
STUDIES OFFICE

Submitted to: Mr. Dave Wegner
Bureau of Reclamation, GCES
P.O. Box 22459
Flagstaff, Arizona 86002-4312

1995

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FLAGSTAFF, AZ

Prepared by: Hualapai Tribe, Hualapai Natural Resource Department
P.O. Box 300
Peach Springs, Arizona 86434

Hualapai Administration and Coordination Program

In the first quarter of Fiscal year 1995, the Hualapai Tribe via The Natural Resource Department played a key role in the finalization of the GCDEIS and continued interim monitoring until the Adaptive management and longterm monitoring are implemented. Specific activities undertaken in the first quarter were as follows:

October

1. Completion of PL 93-638 budgets and contracts for FY1995.
2. The assistant director of the HNRD attended RAAC meeting in Phoenix, Az..
3. Cooperators Agency meeting/Programmatic meeting for Cultural Resources, attended by Loretta Jackson, Ben Zimmerman, and Don Bay.
4. Challenges to Natural Resources and Protection of the Colorado River Basin Meeting, Las Vegas, attended by Kerry Christensen, and Don Bay.
5. Final revisions to GCDEIS were completed.
6. EIS Team Meeting in Flagstaff was represented by the Tribe.
7. Review of FWS Reasonable and Prudent Alternative was completed.
8. Selective Withdrawal Meeting, Phoenix was attended by Bill Leibfried.
9. Natural Resource Staff presented GCES update and job responsibilities to Tribal Council on 10/14.
10. Survey Crew Trip departed from Pearce Ferry, by Brice H., Samatha A., and Chris B..

November

1. GIS Training was held in Denver and attended by Samatha Arundel.
2. Loretta Jackson attended EIS meeting in Flagstaff.
3. EPA meeting in San Francisco was represented by Don Bay and Clay Bravo.
4. Prepared and gathered information for Tribal Auditor.
5. Worked with staff on goals and objectives detailed in Cooperative Agreement.
6. Natural Resource staff attended a scheduled meeting to discuss Tribes needs to BOR Administration, Flagstaff.

December

1. Non-use Value Meeting was attended by Don Bay on December 5.
2. Reports and documents received from SWCA and Biowest were reviewed.
3. Evaluations for staff were completed.
4. Attendance of GCES Colorado River Workshop.
5. Staff received First Aid and CPR Training.
6. Equipment maintenance was preformed on boats, vehicles and related equipment.
7. Posted job announcement for administrative assistant position.
8. Cooperators Agency Meeting 12/29/95 represented Clay Bravo, Don Bay, and Loretta Jackson.

Hualapai Recreation Resources Program

The Recreation studies program in the first quarter of FY95 continued to preform surveys and compile data as detailed in the goals and objectives of the program. We worked one on one with SWCA on gathering and analyzing the data for the program in addition to making plans for the transition between SWCA and the Tribe.

Specific activities and surveys were as follows:

1. Biannual Beach measurement survey preformed by Ben Zimmerman, Amis Holm, Morris Samson, and Bob Manygoats 10/24/95-10/26/95.
2. Follow up Beach measurement survey preformed by Brice Hoskin, Morris Samson, and Bob Manygoats 11/10/95.
3. Collection of 1 and 2 day rivertrip data from HRR.
4. Received and reviewed recreation report from SWCA.
5. Remote camera changes were preformed monthly.
6. Labeled slides for remote cameras.
7. Various meetings were held with SWCA over current and future studies.
8. Computer Training took place presenting Lotus 123, Wordperfect and Windows for preparation of reports.

Hualapai Colorado River Fisheries Resource Program

The fisheries program continued to collect baseline data and provide valuable information for the management of the Colorado River. With the help of Biowest and GCES, we completed the fall survey running into the first quarter of FY95. The Hualapai Tribe took the lead of the Fisheries program after the winter survey in January, 1995. Once again, a transition will take place between the Hualapai Tribe and Biowest to insure continuity of data collection. Specific activities accomplished throughout this quarter were as follows:

1. The Fall Survey Trip 9/18/95 through 10/6/95 was preformed in association with Biowest.
2. Review of various reports and documents.
3. Planning and pricing of equipment needed for upcoming fisheries surveys, detailed by staff.
4. Preparation of trip reports by each of the technicians for the fall survey was submitted.

Hualapai Riparian Studies

Beginning fiscal year 1995, the Hualapai Department of Natural Resources assumed responsibility for riparian studies (bird, mammal, reptile and vegetation community studies) in lower Grand Canyon from National Canyon to Lake Mead within the Glen Canyon Dam Environmental Studies Program. That the Tribe was able to assume these duties attests to the successful training provided by the GCES Program Manager, other GCES staff and SWCA employees. The Tribe greatly appreciates these unselfish efforts.

During the first quarter of FY 1995, activities of the Hualapai riparian studies program consisted of the following tasks or actions:

1. Review of the draft final FY 1994 Riparian Studies Report prepared by SWCA.
2. Preparation of a proposal for FY 1995 riparian studies in lower Grand Canyon.
3. Development of a Tribal herbarium with catalogued specimens from lower Grand Canyon.
4. Acquisition of, and education in the use of, statistical software (Statistix) for use on FY 1995 data.
5. Training in the use of dBase IV for compilation of FY 1995 data.
6. Maintenance of equipment such as small mammal traps, boats and motors, field guides etc.
7. Education in the identification of birds by their song using tape recordings.
8. Education in the identification of various plant species using herbaria sheets.
9. Preparation of a proposal to the Arizona Game and Fish Department's Heritage Grant-in-Aid program to supplement mammal studies in lower Grand Canyon.

Hualapai Cultural Resources Program

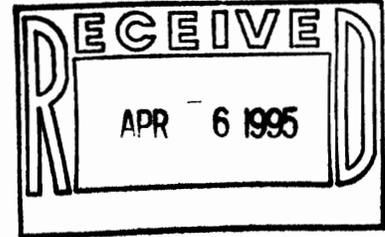
Report will be submitted separately by Loretta Jackson.

We expect to significantly increase our level of activity over the next two quarters as we perform the duties outlined in the scope of work for this program.

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Hualapai Tribe - Glen Canyon Environmental Studies
Quarterly Report: January - March 1995
Agreement NO. 5-FC-40 17170

Submitted to: Mr. Dave Wegner
Bureau of Reclamation, GCES
P.O. Box 22459
Flagstaff, Arizona 86002-4312



Prepared by: Hualapai Tribe
Hualapai Department of Natural Resources
P.O. Box 300
Peach Springs, Arizona 86434

Hualapai Administration and Coordination Program

In the second quarter of Fiscal year 1995, the Hualapai Tribe via Department of Natural Resources continued to play a key role in the finalization of the GCDEIS. Specific activities undertaken in the second quarter were as follows:

1. Administrative staff met with accounting and BOR personnel to finalize 1994 funds and modify funds for FY95.
2. The final EIS was received in March and is currently being reviewed.
3. Natural Resource personnel have continued to secure funds from other sources to supplement GCES efforts.
4. On January 20, 1995 Clay Bravo attended a Cooperators meeting in Phoenix, Arizona.
5. On January 26-27, 1995 Clay Bravo attended a EIS Team Meeting in Phoenix, Arizona.
6. On January 10-12, 1995 Dr. Kerry Christensen attended a Technical Work Group Meeting in Phoenix, Arizona.
7. On January 23, 1995 Clay Bravo, Loretta Jackson, Monza Honga, and Kerry Christensen attended a Transition Work Group Meeting in Phoenix, Arizona.
8. Technical support for the recreation, riparian and fisheries studies was negotiated and worked out with SWCA Environmental Consultants.
9. The Cultural Resource GCES Archival Program was attended by Loretta Jackson, and Ronald Susanyatame.
10. The GIS staff has continued to compile data on GIS site 13.
11. Ronnie and Deshane Quasula received a two training in Arc Infor at the GCES office.
12. A map of "PAI" Affiliated Ancestral Clan/Band Territorial Homelands was created by the GIS staff in Flagstaff.
13. Plans to move Ronnie and Deshane Quasula to Peach Springs were developed. Towards the end of April Deshane and Ronnie are planning the move to Peach Springs with Samantha Arundel travelling from Flagstaff three times a week to assist in there work efforts.

Hualapai Recreation Resources Program

The Recreation studies program in the second quarter of FY95 continued to compile data from the River Running Department and plan surveys for the upcoming year.

Specific activities and surveys were as follows:

1. Compiled data from Hualapai River Running in the month of March.
2. Planned the bi-annual camping beach survey to take place April 12-14, 1995.
3. Lilly Smith, Recreation Technician I, created a survey schedule for the peak and shoulder seasons.
4. Remote cameras were changed monthly in January, February and March.

Hualapai Colorado River Fisheries Resource Program

During the second quarter of FY95 the Natural Resource staff continued to plan and purchased equipment for the upcoming survey trips.

Specific activities and surveys were as follows:

1. The survey schedule was completed for FY95.
2. Comments were submitted to SWCA for the 1995 Study Plan.
3. Purchasing of equipment needed for upcoming fisheries surveys, was preformed by fisheries technicians Mike Vaughn and Scott Crozier.
4. Scientific collecting permits were submitted to Grand Canyon National Park, Arizona Game and Fish, U.S. Fish and Wildlife Service, and Lead Mead National Recreation Area.
5. Clay Bravo, Ben Zimmerman, Mike Vaughn, Bill Leibfried and Rich Valdez met in Flagstaff to discuss the 1995 Study.
6. The spring fisheries survey is planned to launch April 9 from Lees Ferry and take out at Pearce Ferry April 29, 1995.

Hualapai Riparian Studies Program

During the second quarter, the riparian research team has primarily been involved with preparation for upcoming wildlife and vegetation monitoring activities. Below, we describe specific activities that were accomplished during this period.

1. From March 28-31, program staff performed avian reconnaissance work along the Colorado River where trails that are used for avian surveys were cleared and prepared for upcoming surveys.
2. Much of the quarter focused on planning this year's bird, mammal, reptile and vegetation monitoring trips. This planning included the preparation of equipment, scheduling of personnel, organizing logistical support and refining methodologies and statistical procedures for the data to be collected.

3. The program began to work with the Hualapai herbarium during this quarter. Here, we received mounted specimens from SWCA and cataloged them in our cabinet. We created a list of the specimens and made labels for each folder and shelf. In addition, program personnel have begun to familiarize themselves with the taxa and learn plant identification techniques.

4. According to our upcoming schedule, we will soon begin an ambitious research schedule and expect to provide a lengthy report at the end of the next quarter.

Hualapai Cultural Resources Program

Report will be submitted separately by Loretta Jackson.

We expect to significantly increase our level of activity over the next two quarters as we perform the duties outlined in the scope of work.

If there are any questions or concerns please contact Clay Bravo, Dr. Kerry Christensen or Ben Zimmerman.

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Hualapai Tribe - Glen Canyon Environmental Studies
Quarterly Report: April - June 1995
Agreement NO. 5-FC-40 17170

Submitted to: Mr. Dave Wegner
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Hualapai Administration and Coordination Program

In the third quarter of Fiscal year 1995, the Hualapai Tribe via Department of Natural Resources continued to execute the needs of the contract. Specific activities undertaken in the third quarter were as follows:

1. March 3, 1995 Clay Bravo attended the Colorado Plateau Town Hall Meeting in Moab, Utah.
2. March 23, 1995 Kerry Christensen and Clay Bravo attended the GCES Transition Work Group Meeting.
3. April 24, 1995 Clay Bravo attended a meeting among the Native American Tribes, National Research Council, BOR and NPS.
4. The 1995 Secretaries Conference was attended by Vickie Matuck in Phoenix, Arizona.
5. April 26, 1995 Kerry Christensen attended a Nonuse Meeting in Denver, Colorado.
6. May 2, 1995 Kerry Christensen attended a Transitional Monitoring Meeting in Phoenix, Arizona.
7. We held a meeting with staff from the Grand Canyon Area Office, Lower BOR on May 3, 1995 in Boulder City, Nevada. Clay Bravo, Delbert Havatone, Ben Zimmerman, Kerry Christensen, Charile Vaughn and Jim Duffield were in attendance.
8. The GIS staff worked on compiling data and summarizing reach reports for GIS site 12.
10. Ronnie and Deshane Quasula moved the GIS operation to Peach Springs.
11. Samantha Arundel periodically travelled to Peach Springs to assist GIS staff with set up and direction.
12. The GIS program purchased a personal computer and digitizer.
13. June 21, 1995 Kerry Christensen and Bill Leidfried attended the Transitional Monitoring Meeting in Phoenix, Arizona.
14. Cisney Havatone, Clay Bravo and Allene Cabillo met with Dave Wegner on June 29, 1995 to discuss various issues regarding the Hualapai Tribe's GCES involvement.

Hualapai Recreation Resources Program

Specific activities and surveys were as follows:

1. The bi-annual camping beach survey took April 12-14, 1995 with assistance of Amis Holms and volunteers Tamera and Taylor Ross.
2. We completed attraction site surveys for Spencer and Separation beaches by Hualapai Technicians in May.
3. We continued to change remote cameras during this quarter.

Hualapai Colorado River Fisheries Resource Program

Specific activities and surveys were as follows:

1. We successfully completed the spring fisheries survey, trip #95-01, April 9-29, 1995 from National Canyon to Pearce Ferry.
2. Hualapai Technicians received D-base IV training under the direction of Bill Leibfried.
3. Trip report # 95-01 was completed and sent to various cooperating agencies, May 26, 1995. The report is enclosed for your consideration.
4. Data from Trip # 95-01 was entered into Dbase IV by Hualapai Technicians.
5. The summer survey Trip # 95-02 launched from Lees Ferry June 11, 1995 and concluded July 1, 1995 at Pearce Ferry.

Hualapai Riparian Studies Program

Introduction/Methods

This quarter, the Hualapai Riparian Program focused on assessing the abundances of nesting birds along the Colorado River from National Canyon to Pearce Ferry. We conducted four trips where birds were censused four times at eight locations (Table 1). These surveys were performed April 19-30, May 16-27, May 29-June 2 and June 6-11. Dr. Brian Brown and Mr. Manuel Bravo performed the censuses and began training additional observers, Johnny Matuck and Melanie Powskie.

In addition to counting numbers of the various bird species, we also searched for bird nests. When found, the nests were identified as to species, and we recorded the status of the nest (e.g., eggs, nestlings, abandoned etc.), plant species the nest was in, height from ground, habitat (NHWZ or OHWZ) and the presence of cowbird eggs. Each trip, we returned to known nests and assessed their progression.

During the first two trips, we recorded vegetation volume measurements at the eight sites for use in assessing the relationship between bird density and habitat characteristics. We used the modified vertical line-intercept technique developed by Mills et al. (1991) to estimate vegetation volumes at up to

ten, sixty-meter transects located haphazardly in the various vegetation types within each site. The plant species comprising those volumes was also recorded to assess the importance of native versus exotic vegetation to bird abundances.

Table 1. Avian survey site locations for the Hualapai studies in FY 1995.

SITE	LOCATION	RIVER MILE	ELEVATION (m)	SIZE (ha)
1	National Canyon	166.1-167.0L	532	4.6
2	Parashant Canyon	198.0-198.1R	465	3.0
3	Granite Park	208.4-209.0L	442	11.6
4	Above Spencer Canyon	243.2-243.4L	372	2.3
5	Spencer Canyon	246.0L	372	2.2
6	Quartrmstr Canyon	260.1-260.3L	372	7.1
7	Waterfall Rapids	260.1-260.3R	372	3.4
8	Tincanebits Canyon	263.8-265.1L	372	47.1

Results and Discussion:

The nest search and vegetation data will be summarized in the next quarterly report. A summary of the bird abundance data is presented below in Table 2. In general, there was an average decline in bird abundances of 20.2% in 1995 relative to 1993 and 1994 across all sites (Table 3). Interestingly, the largest declines, 32.8% and 29.7% at sites 8 and 5 respectively, occurred where avian abundances were greatest. At site 5, bird density has historically been the highest of the sites at approximately 1,800 birds per 40 ha, while Site 8 historically has had the greatest absolute numbers of birds (1,265 in 1995). While we cannot determine the cause for these declines, we can say that fluctuations in bird abundances as seen in 1995 point to the necessity of continuous monitoring so we can understand the natural level of variation in the system. Only with this information can we begin to assess how operation of Glen Canyon Dam influences these important and sensitive resources.

Table 2. Site summaries giving the mean number of each species counted per survey along with a density estimate. The overall numbers of birds counted and the average number counted per survey are also given for each site.

SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
1	LUCY WARB	8.6	1.86
	H FINCH	3.0	0.66
	BG GNATCT	1.6	0.34
	AT FLYCTR	2.0	0.44
	C RAVEN	1.0	0.22
	HUMMER SP	2.0	0.44
	N ORIOLE	0.6	0.14
	BC HUMMR	1.0	0.22
	L GOLDFCH	1.0	0.22
	H THRUSH	0.6	0.14
Total number of individuals 86			
Mean number per survey		21.5	
Average bird density		4.68/ha	
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
2	BELL VIRE	22.6	7.53
	LUCY WARB	11.6	3.86
	H FINCH	8.0	2.67
	BG GNATCT	7.6	2.53
	B WREN	5.0	1.67
	CY THROAT	4.6	1.53
	YB CHAT	4.6	1.53
	BC HUMMER	3.6	1.20
	AT FLYCTR	3.0	1.00
	L GOLDFCH	1.6	0.53
	SONG SPAR	1.0	0.33

SITE 2	CONTINUED		
	N MOCKINB	0.6	0.20
	H ORIOLE	0.6	0.20
	M DOVE	0.6	0.20
Total number of individuals		300	
Mean number per survey		75.0	
Average bird density		17.43/ha	
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
3	BELL VIRE	18.6	1.6
	BG GNATCR	7.0	0.60
	LUCY WARB	6.0	0.52
	HUMM SP.	4.6	0.40
	BC HUMMR	3.6	0.31
	M DOVE	3.0	0.26
	L GOLDFCH	2.6	0.22
	YB CHAT	2.6	0.22
	AT FLYCTR	2.0	0.17
	INDGO BNT	2.0	0.17
	CY THROAT	1.6	0.14
	H FINCH	1.0	0.09
	C RAVEN	1.0	0.09
	BLU GRSBK	0.6	0.05
Total number of individuals		227	
Mean number per survey		56.8	
Average bird density		4.89/ha	
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
4	LUCY WARB	10.0	4.35
	BELL VIRE	8.6	3.73
	BG GNATCR	7.0	3.04
	B WREN	4.6	2.00

SITE 4	CONTINUED		
	SONG SPAR	4.6	2.00
	YB CHAT	4.6	2.00
	Y WARBLR	3.6	1.56
	HUMM SP.	3.6	1.56
	CY THROAT	3.0	1.30
	BC HUMMR	2.0	0.86
	AT FLYCTR	1.0	0.43
	BLU GRSBK	1.0	0.43
	GRN TOWHE	1.0	0.43
	SNW EGRET	0.8	0.35
	CSTA HUM	0.6	0.26
Total number of individuals		242	
Mean number per survey		60.4	
Average bird density		26.21/ha	
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
5	BELL VIRE	15.6	7.09
	Y WARBLR	13.6	6.18
	CY THROAT	9.6	4.36
	YB CHAT	8.6	3.91
	LUCY WARB	8.0	3.64
	SONG SPAR	8.0	3.64
	B WREN	4.6	2.09
	L GOLDFCH	3.0	1.36
	HUMM SP.	2.6	1.18
	BG GNATCR	2.0	0.91
	BC HUMMR	2.0	0.91
	S TANANGR	1.0	0.45
	H ORIOLE	0.6	0.27

SITE 5 CONTINUED:			
Total number of individuals		317	
Mean number per survey		79.2	
Average bird density		31.63/ha	
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
6	BELL VIRE	30.0	4.23
	CY THROAT	22.7	3.19
	YB CHAT	17.4	2.45
	SONG SPAR	15.4	2.17
	B WREN	12.0	1.69
	Y WRBLR	9.4	1.32
	BG GNATCR	8.6	1.21
	LUCY WARB	7.4	1.04
	HUMM SP.	4.0	0.56
	AT FLYCTR	2.0	0.28
	LAZ BUNTG	1.4	0.20
	S TANANGR	1.4	0.20
	H ORIOLE	1.4	0.20
	C WREN	1.4	0.20
	PHAINPLA	0.6	0.08
	BC HUMMR	0.6	0.08
	L GOLDFCH	0.6	0.08
	LB WDPKR	0.6	0.08
	C RAVEN	0.6	0.08
	BH CWBRD	0.6	0.08
Total number of individuals		414	
Mean number per survey		138.1	
Average bird density		19.34/ha	

SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
7	BELL VIRE	11.4	3.35
	YB CHAT	6.6	1.94
	CY THROAT	6.6	1.94
	SONG SPAR	6.0	1.76
	BG GNATCR	4.0	1.18
	B WREN	3.4	1.00
	LUCY WARB	3.4	1.00
	H FINCH	2.6	0.76
	LAZ BUNTG	1.4	0.41
	AT FLYCTR	1.4	0.41
	HUMM SP.	1.4	0.41
	BH CWBRD	1.4	0.41
	C WREN	1.4	0.41
	LB WDPKR	0.6	0.18
	Y WRBLR	0.6	0.18
Total number of individuals			157
Mean number per survey			52.2
Average bird density			15.34/ha
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
8	BELL VIRE	84.6	1.80
	SONG SPAR	55.0	1.17
	YB CHAT	49.6	1.05
	CY THROAT	31.0	0.66
	Y WRBLR	17.0	0.36
	BG GNATCR	16.6	0.35
	B WREN	12.6	0.27
	LUCY WARB	11.6	0.25
	BH CWBRD	7.6	0.16
	H FINCH	6.0	0.12

SITE 8 CONTINUED:			
	HUMM SP.	5.6	0.12
	LB WDPKR	3.6	0.08
	AT FLYCTR	3.0	0.06
	BC HUMMR	3.0	0.06
	L GOLDFCH	2.6	0.06
	BLU GRSBK	2.6	0.06
	C WREN	1.0	0.02
	LAZ BUNTG	1.0	0.02
	GRN TOWHE	0.6	0.01
	CSTA HUMM	0.6	0.01
	S TANANGR	0.6	0.01
	M DOVE	0.6	0.01
	PHAINPLA	0.6	0.01
Total number of individuals		1,268	
Mean number per survey		317.0	
Average bird density		6.72/ha	

Table 3. A comparison of bird abundances across the eight Hualapai sites between 1995 and the average of 1993 and 1994 abundances.

SITE	1995 BIRD DENSITY/40 ha	1993-94 AVE. MEAN DENSITY /40 ha	DIFFERENCE	% DIFFERENCE
1	187.2	250	-62.8	-25.0
2	697.2	875	-177.8	-20.3
3	195.6	225	-29.4	-13.1
4	1,048.4	1,225	-176.6	-14.4
5	1,265.2	1,800	-534.8	-29.7
6	773.6	975	-201.4	-20.6
7	613.6	650	-36.4	-5.6
8	268.8	400	-131.2	-32.8

Hualapai Cultural Resources Program
Report will be submitted separately by Loretta Jackson.



HUALAPAI DEPARTMENT OF NATURAL RESOURCES

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June 30, 1995

Mr. Dave Wegner, Program Manager
Glen Canyon Environmental Studies
P.O. Box 22459
Flagstaff, AZ 86002-4312

Dear Dave,

Please consider the enclosed Third Quarterly Reports from the Hualapai Tribe's administration, recreation, fisheries and riparian programs. We accomplished a significant amount of work during this quarter and continue to work towards satisfying our contractual obligations.

Please contact myself, Clay Bravo or any principal investigator if we can be of further assistance.

Sincerely,

C. Havatone

Cisney Havatone, Director
Hualapai Department of Natural Resources

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Hualapai Administration and Coordination Program

In the fourth quarter of Fiscal year 1995, the Hualapai Tribe's Department of Natural Resources continued to fulfill its contractual obligations. Specific activities undertaken in the fourth quarter were as follows:

1. The Administrative Secretary received secretary recording training July 7-14, 1995.
2. Met with the GCES Program Manager to discuss Hualapai program progress and future operations.
3. Attended GCES transitional monitoring workgroup meetings in Phoenix.
4. Attended Grand Canyon Visibility Transport Commission meetings, and while not directly related to the GCES program, these meetings are an important link between the Tribe and Grand Canyon studies and environmental conditions.
5. Attended a Grand Canyon Trust meeting.
6. Met with Hualapai Department of Natural Resources staff to plan and evaluate 1995-96 aquatic, recreational, riparian and GIS programs.
7. Attended Management Objectives workgroup meeting in Phoenix.
8. Prepared 1996-7 transitional monitoring proposal for Hualapai aquatic, riparian, cultural and administrative proposals for GCES.
9. Met with Grand Canyon National Park regarding their science center and future cooperative GCES studies.
10. Met with NAU, Arizona Game and Fish Department and park service personnel to discuss and coordinate 1996 transitional monitoring.

Hualapai Recreation Resources Program

Specific activities and surveys were as follows:

1. The bi-annual camping beach survey to take place October 9-11, 1995 with assistance of Amis Holms and volunteers Tamera and Taylor Ross.
2. We completed attraction site surveys for Diamond Creek and Pearce Ferry using Hualapai Technicians.
3. We continued to change remote cameras during this quarter.
4. We worked with Hualapai River Running Enterprise to compile rafting data for 1995.

Hualapai Colorado River Fisheries Resource Program

Specific activities and surveys were as follows:

1. We successfully completed the spring fisheries survey, trip #95-02, June 11 through July 1, 1995 from National Canyon to Pearce Ferry.
2. Hualapai Technicians entered Trip #95-02 data into D-base IV.
3. Trip report # 95-02 was completed and sent to various cooperating agencies, August 2, 1995.
4. The fall survey Trip # 95-03 launched from Lees Ferry September 13, 1995 and will conclude October 5, 1995 at Pearce Ferry.

Hualapai Riparian Studies Program

During the fourth quarter of FY 1995, the Hualapai Riparian Studies Program for GCES was very busy with surveys of mammal and reptile communities, avian data entry and analysis, report writing and with attendance at appropriate GCES meetings. Below, we describe in greater detail the work associated with these activities.

MAMMAL STUDIES

On July 11-14 and August 6-9, three Hualapai biologists censused Bridge, Spencer and Quartermaster Canyon's riparian, transitional and upland areas for small mammal species. Each night, fifty Tomahawk live traps were set approximately 6-10 meters apart along each transect, baited with rolled oats and checked the following morning. The species captured and location was noted on data sheets and the animals were released. The transects ran parallel to the river except at Quartermaster Canyon where they generally ran perpendicular to the river. We trapped at each site on one night each trip.

Results

Within Site Comparisons:

At Bridge Canyon, more small mammals were captured on average at the upland transect compared to the transitional and riparian transects but not significantly so (Table 1; Kruskal-Wallis test, $T= 4.1$, $p= 0.129$). The three species captured, the cactus mouse (*Peromyscus eremicus*), rock pocket mouse (*Perognathus intermedius*) and the desert woodrat (*Neotoma lepida*) were all found at the upland and transitional transects while the riparian transect lacked desert woodrats. Overall, rock pocket mice and cactus mice were relatively more abundant than woodrats (Table 2). These three species were the only ones captured in 1994 also (Hualapai Tribe and SWCA Inc. 1994).

Capture success increased appreciably between the two study periods at the riparian transect where 11 animals were caught in September compared to four in July. Both rock pocket mice and cactus mice increased in abundance during this period. This increase may reflect the emergence of young of the year. In contrast, the number of animals at the upland transect declined from 17 in July to 10 in September. Reasons for this decline are unknown. There was also a slight increase in the number of animals captured at the transitional transect from five to eight.

While the abundance of small mammals at the three transects at Spencer Canyon were not significantly different ($T= 3.38$, $p = 0.184$) there were more small mammals captured at the upland transect compared to the transitional and riparian transects (Table 1). The three species were found at each of the transects although woodrats were more common at the upland site compared to the other two transects (Table 2). Rock pocket mice and cactus mice were again more abundant than woodrats (Table 2). Additionally, rock pocket mice were the most abundant small mammal at each of the transects.

Capture success at the Spencer riparian and transition transects increased appreciably between July and September while the number of animals captured at the upland site declined slightly (20 to 19). Again, these increases may reflect emergence of young of the year.

At Quartermaster, there were appreciably more small mammals caught at the transition and upland transects compared to the riparian transect although not significantly so (Table 1; $T = 0.22$; $p= 0.894$). Woodrats were again found to be absent from the riparian transect where cactus mice were the most common small mammal. Rock pocket mice were the most abundant species at the transition transect and were co-dominant with cactus mice at the upland site (Table 2).

Across all three sites, the average abundances of the three species varied significantly ($T = 6.006$, $p = 0.0496$; Figure 2). Rock pocket mice were the most abundant species at all three sites while cactus mice were next most abundant and woodrats were the least abundant species (Table 3). Potentially, these habitats may favor species with cheek pouches versus those without.

Between Site Comparisons

We found Quartermaster Canyon to support appreciably more small mammals than Bridge or Spencer Canyons although not significantly so (Figure 1; Kruskal-Wallis test, $T = 1.59$, $p = 0.339$). Part of this difference was the large number of rock pocket mice that were found there (Table 2). The transition transect supported more animals and in particular rock pocket mice compared to the transition transects at the other two sites. We are unsure why more small mammals were found at Quartermaster although the adjacent wetland may have some influence.

Table 1. Summary of small mammal capture data for both trips across transects and sites.

SITE	TRANSECT	SPECIES	TRIP 1 CAPTURED	TRIP 2 CAPTURED
BRIDGE CANYON	RIPARIAN	CACTUS	2	4
		ROCK POCKET	2	7
		WOODRAT	0	1
	TRANSITION	CACTUS	4	3
		ROCK POCKET	1	4
		WOODRAT	0	1
	UPLAND	CACTUS	4	2
		ROCK POCKET	6	4
		WOODRAT	6	4
TOTAL		25	29	
SPENCER CANYON	RIPARIAN	CACTUS	3	1
		ROCK POCKET	0	6
		WOODRAT	1	1
	TRANSITION	CACTUS	0	2
		ROCK POCKET	4	6
		WOODRAT	0	1
	UPLAND	CACTUS	9	4
		ROCK POCKET	7	14
		WOODRAT	4	1
TOTAL		28	36	
QUARTERMASTER	RIPARIAN	CACTUS	4	8
		ROCK POCKET	1	6
	TRANSITION	CACTUS	5	7
		ROCK POCKET	9	12
		WOODRAT	1	1

Table 1 Small Mammal Census Continued:

SITE	TRANSECT	SPECIES	TRIP 1 CAPTURED	TRIP 2 CAPTURED
QUARTERMASTER	UPLAND	CACTUS	5	12
		ROCK POCKET	8	9
		WOODRAT	2	1
		TOTAL	35	56
ALL SITES	RIPARIAN	CACTUS	9	13
		ROCK POCKET	3	19
		WOODRAT	1	1
		TOTAL	13	33
	TRANSITION	CACTUS	9	12
		ROCK POCKET	13	22
		WOODRAT	2	3
		TOTAL	24	37
	UPLAND	CACTUS	18	18
		ROCK POCKET	21	27
		WOODRAT	12	6
		TOTAL	51	51

Table 2. Mean number and percentage of animals captured across transects and sites across the two study periods.

SITE	TRANSECT	SPECIES	X NUMBER	X %
BRIDGE CANYON	RIPARIAN	CACTUS	3.0	43.2
		ROCK POCKET	4.5	56.8
		WOODRAT	1.0	16.3
	TRANSITION	CACTUS	3.5	58.8
		ROCK	2.0	25.0
		WOODRAT	1.0	16.3
	UPLAND	CACTUS	3.0	22.5
		ROCK POCKET	5.0	38.8
		WOODRAT	5.0	38.8
SITE TOTALS	ALL	CACTUS	9.5	35.5
		ROCK POCKET	11.5	41.9
		WOODRAT	6.0	22.7
SPENCER CANYON	RIPARIAN	CACTUS	2.0	43.8
		ROCK POCKET	3.0	37.5
		WOODRAT	1.0	18.8
	TRANSITION	CACTUS	1.0	11.1
		ROCK POCKET	5.0	83.3
		WOODRAT	0.5	5.6
	UPLAND	CACTUS	6.5	33.0
		ROCK POCKET	10.5	54.4
		WOODRAT	2.5	12.7
SITE TOTALS	ALL	CACTUS	9.5	35.8
		ROCK POCKET	13.0	49.1
		WOODRAT	4.0	15.1

Across-site Comparisons:

Across the three sites, almost twice as many animals were captured at upland transects compared to transition and riparian transects (Table 3). As described below, small mammal abundances may be negatively affected by abundant riparian vegetation.

Across-transect Comparisons:

Across transects, the number of small mammals captured at the three sites were fairly similar where slightly more were captured at Quartermaster Canyon compared to Bridge and Spencer Canyons (Table 3). Again, we feel that the marsh habitat at Quartermaster may positively influence the small mammal community there.

Table 3. Mean number and percentage of animals captured between transects across sites and between sites across transects.

SITE	TRANSECT	MEAN # CAPTURED	MEAN % CAPTURED
ALL THREE (3) SITES	RIPARIAN	7.7	22.1
	TRANSITION	10.2	29.3
	UPLAND	16.8	48.6
BRIDGE CANYON	ALL	27.5	26.2
SPENCER CANYON	ALL	32.0	30.5
QUARTEMASTER CYN.	ALL	45.5	43.3

Discussion

In general, riparian zones were found to support fewer small mammals than transition and upland zones. Potentially, the abundant tamarisk and other vegetation at Spencer and Quartermaster riparian zones may have affected small mammal use of those areas through their effects on grass, forb and shrub species. If so, in that interim flows have favored the invasion and expansion of tamarisk and other plants, they may indirectly have affected small mammal abundance. Additionally, human disturbance of the riparian areas may also influence small mammal abundances and distributions.

REPTILE STUDIES

We censused reptile species along the same transects as we did small mammal species as described above. A team of two biologists slowly walked along each transect in mid morning and recorded all reptile species observed. Because of the small number of animals recorded, no statistical comparisons were attempted.

Results

Tree, whiptail, side-blotched and desert spiny lizards were the reptile species identified during the Hualapai Tribe's 1995 reptile studies in lower Grand Canyon (Table 1). Tree lizards were by far the most common species observed (Table 2) with whiptails being observed in intermediate numbers and side-blotched and desert spiny lizards being relatively rare.

There was an overall decline in the total number of reptiles observed between the two study periods (Table 3). This decline could be a result of weather conditions as the temperatures during the September trip were significantly lower than the July trip and the crew experienced rain on each day of the trip.

Between sites, reptiles were relatively more abundant at Bridge and Spencer Canyons compared to Quartermaster Canyon (Table 4). This is in contrast to small mammal abundances where there are typically more individuals found at Quartermaster compared to the other two sites (as described above). These data show that different taxa may respond in different ways to vegetation characteristics as influenced by interim flows.

There was little difference among the three transect types in the overall number of reptiles observed across the three sites (Table 5). These data suggest that interim flows have little impact on reptile populations.

Table 1. Mean number of reptile species observed during the two study periods.

SITE	TRANSECT	SPECIES	MEAN #	MEAN %
BRIDGE CANYON	RIPARIAN	TREE LIZARD	3.5	53.8
		WHIPTAIL	3.0	46.2
	TRANSITION	TREE LIZARD	3.5	53.8
		WHIPTAIL	3.0	46.2
	UPLAND	TREE LIZARD	4.5	75.0
		WHIPTAIL	1.5	25.0
SITE TOTALS	ALL	TREE LIZARD	11.5	60.5
		WHIPTAIL	7.5	39.5
SPENCER CANYON	RIPARIAN	TREE LIZARD	4.5	75.0
		WHIPTAIL	1.5	25.0

Table 1; Reptile census results continued:				
SITE	TRANSECT	SPECIES	MEAN #	MEAN%
	TRANSITION	TREE LIZARD	5.0	58.8
		WHIPTAIL	2.5	29.4
		SIDE-BLOTCHED	1.0	11.8
	UPLAND	TREE LIZARD	4.0	66.6
		WHIPTAIL	1.0	16.7
		SIDE-BLOTCHED	1.0	16.7
SITE TOTALS	ALL	TREE LIZARD	13.5	65.8
		WHIPTAIL	5.0	24.4
		SIDE-BLOTCHED	2.0	9.8
QUARTERMASTER	RIPARIAN	TREE LIZARD	2.0	66.6
		WHIPTAIL	0.5	16.7
		DESERT SPINY	0.5	16.7
	TRANSITION	TREE LIZARD	2.5	100.0
	UPLAND	TREE LIZARD	3.5	100.0
SITE TOTALS	ALL	TREE LIZARD	8.0	88.8
		WHIPTAIL	0.5	5.6
		DESERT SPINY	0.5	5.6

Table 2. Summary of species' abundance across sites.

SPECIES	BRIDGE CYN.	SPENCER CYN.	QUARTERMASTER CYN.
TREE LIZARD	11.5	13.5	8.0
WHIPTAIL	7.5	5.0	0.5
SIDE-BLOTCHED	0.0	2.0	0.0
SPINY LIZARD	0.0	0.0	0.5

Table 3. A comparison of the number of reptiles observed between the two study periods (July 11-14, September 20-24).

SITE	TRANSECT	SPECIES	TRIP 1	TRIP 2	
BRIDGE CANYON	RIPARIAN	TREE LIZARD	2	5	
		WHIPTAIL	4	2	
	TRANSITION	TREE LIZARD	5	2	
		WHIPTAIL	1	5	
	UPLAND	TREE LIZARD	3	5	
		WHIPTAIL	3	0	
SPENCER CANYON	RIPARIAN	TREE LIZARD	5	4	
		WHIPTAIL	3	0	
	TRANSITION	SIDE-BLOTCHED	0	0	
		TREE LIZARD	6	4	
		WHIPTAIL	3	2	
		SIDE-BLOTCHED	2	0	
	UPLAND	TREE LIZARD	4	4	
		WHIPTAIL	1	1	
		SIDE-BLOTCHED	1	1	
	QUARTERMASTER	RIPARIAN	TREE LIZARD	2	2
			WHIPTAIL	1	0
TRANSITION		DESERT SPINY	1	0	
		TREE LIZARD	2	3	
		UPLAND	TREE LIZARD	4	3
ALL SITES	RIPARIAN	TREE LIZARD	9	11	
		WHIPTAIL	8	2	
	DESERT SPINY	1	0		
	TRANSITION	TREE LIZARD	13	9	
		WHIPTAIL	4	7	
		SIDE-BLOTCHED	2	0	
	UPLAND	TREE LIZARD	11	13	

Table 3 Continued:				
SITE	TRANSECT	SPECIES	TRIP 1	TRIP 2
ALL SITES	UPLAND	WHIPTAIL	4	1
		SIDE-BLOTCHED	1	1
		TOTAL	53	41

Table 4. Summary of reptile abundance across sites.

SITE	MEAN NUMBER/SURVEY	MEAN %/SURVEY
BRIDGE CYN.	19.0	39.2
SPENCER CYN.	20.5	42.2
QUARTERMASTER CYN.	9.0	18.6

Table 5. Comparison of reptile abundances among transects across sites.

TRANSECT	TOTAL # OF REPTILES
RIPARIAN	31
TRANSITION	35
UPLAND	31

DRAFT 1995 HUALAPAI AVIAN REPORT

Introduction

Studies of avian communities in lower Grand Canyon on the Hualapai Reservation were initiated in 1993 and continued in 1994 and 1995. The objectives of these studies were to describe avian abundances, distributions and diversities in lower Grand Canyon where relatively few studies had been previously done (Brown et al. 1987) and to determine, where possible, the effects of interim flows from Glen Canyon Dam on nesting birds. Since these studies were initiated, riparian vegetation at sites above Separation Canyon have remained relatively stable while sites below have exhibited a significant increase in basal area and vegetation volume (Hualapai Tribe and SWCA, 1994). Associated with this increase in riparian habitat, there has generally been an increase in bird densities (Hualapai Tribe and SWCA, 1994).

To determine whether these trends have continued and to continue to assess the effects of interim flows on these resources, the Hualapai Tribe with assistance from SWCA Inc. performed censuses of bird populations at the same eight sites in 1995 that were previously sampled in 1993 and 1994. We used the same methodologies as described in Brown et al. (1987) and that were used in previous Hualapai studies so that the data will be comparable.

The purposes of this study were twofold: 1) to estimate the abundance and species richness of birds nesting in the riparian zone of the Colorado River through the Hualapai Reservation, and 2) assess, where possible, the influence of interim flows from Glen Canyon Dam on these nesting birds.

BACKGROUND

Periodic fluctuations in the level of Lake Mead since the 1930s have strongly influenced the substrate and vegetation of the Colorado River corridor from Separation Canyon to the Grand Wash Cliffs (Carothers and Brown 1991) and are suspected to have caused several cycles of episodic change in the associated riparian bird communities. A single cycle of change would likely involve two phases: 1) avian colonization of emergent riparian vegetation as lake levels receded and flow fluctuations decreased, followed by 2) displacement of the resulting nesting bird community as lake levels increased. At present, the nesting bird community of the river corridor from Separation Canyon to the Grand Wash Cliffs is approximately 10-12 years into the first phase of change. Changing lake levels and/or flow regimes will likely cause future changes in nesting bird use of the river corridor. For example, the current flow regime of steady high

flows and rising lake levels may inundate a portion of lower riparian areas causing trees to die thereby reducing the availability of nesting vegetation in 1996.

METHODS

Surveys for nesting birds were conducted at eight sites (Table 1) along the Colorado River corridor between National Canyon and Pearce Ferry from April 22 to June 8, 1995 using the absolute count method (Kendeigh 1944, Emlen 1971), where we counted all detectable birds at each site 3-4 times during the spring nesting season. This method was used in baseline studies of nesting riparian birds along the river corridor in the 1980's (Brown and Johnson 1987, Brown 1987a, Brown 1987b, Brown 1988, Brown 1989). The linear nature of the study sites, the relative homogeneity of vegetation, and sample size considerations imposed by the limits of time and field work scheduling made the use of this method preferable to techniques such as the variable circular plot method, fixed or variable-strip census, or the spot-map method (Ralph and Scott 1981).

Table 1. Avian survey site locations for the Hualapai studies in FY 1995.

<u>SITE</u>	<u>LOCATION</u>	<u>RIVER MILE</u>	<u>ELEVATION (m)</u>	<u>SIZE (ha)</u>
1	National Canyon	166.1-167.0L	532	4.6
2	Parashant Canyon	198.0-198.1R	465	3.0
3	Granite Park	208.4-209.0L	442	11.6
4	Above Spencer Canyon	243.2-243.4L	372	2.3
5	Spencer Canyon	246.0L	372	2.2
6	Quartrmstr Canyon	260.1-260.3L	372	7.1
7	Waterfall Rapids	260.1-260.3R	372	3.4
8	Tincanebits Canyon	263.8-265.1L	372	47.1

Bird Surveys

A single observer conducted bird surveys between 05:00 and 09:30 AM by walking slowly through pre-cleared transects within each study site. The survey objective was to detect and record singing males for those species that were primarily monogamous and exhibited type-A territories, and to detect and record all individuals for those species that were either polygamous, did not exhibit type-A territories, or did not exhibit vocal or visual sexual dimorphism. These surveys were performed April 19-30, May 16-27, May 29-June 2 and June 6-11. Dr. Brian Brown and Mr. Manuel Bravo performed the censuses and began training additional observers, Johnny Matuck and Melanie Powskie.

A type-A territory is an all-purpose area, used for nesting and feeding by the pair, that is vocally advertised, physically defended, and from which all other individuals of the same species are assumed to be excluded. Therefore, monogamous type-A species were most easily censused by recording detections of singing males (Mayfield 1981), with the assumption that each male represented a nesting pair and that all singing males were detected during the survey periods. For a discussion of avian territoriality, see Perrins and Birkhead (1983). Species that were either primarily monogamous or maintained type-A territories included: Western Screech-Owl, Ladder-backed Woodpecker, kingbird, Bewick's Wren, Marsh Wren, Blue-gray Gnatcatcher, Phainopepla, Northern Mockingbird, Crissal Thrasher, Bell's Vireo, Lucy's Warbler, Yellow Warbler, Common Yellowthroat, Yellow-breasted Chat, Summer Tanager, Blue Grosbeak, Lazuli Bunting, Indigo Bunting, Song Sparrow, and Hooded Oriole.

Species that did not maintain type-A territories included: Gambel's Quail, Mourning Dove, Black-chinned Hummingbird, Costa's Hummingbird, Great-tailed Grackle, Brown-headed Cowbird, House Finch, and Lesser Goldfinch. Ash-throated Flycatchers maintained type-A territories but did not exhibit visual or vocal sexual dimorphism, so that detections could not be assigned to a male or female. For this reason, Ash-throated Flycatcher detections were recorded as individuals.

Species that were detected during surveys but were either known not to nest at the eight study sites or were assumed to be wanderers from nearby nesting areas were not reported in the survey results. These species included: herons, ducks, swifts, Black Phoebe, Say's Phoebe, swallows, Canyon Wren, Rock Wren, and Red-winged Blackbird, Snowy Egret.

This conservative technique likely underestimated actual bird density, and other techniques may provide a more accurate density estimate for some species, particularly hummingbirds (Brown 1992). Nest searches were conducted before and after most

surveys during two weeks in late spring to provide supplemental information on habitat relationships with nesting birds.

Nest Searches

Nest searches were conducted from May 19 to June 7, 1995 by four trained observers. We recorded species, number of eggs or young if applicable and the presence of cowbird eggs or young. On a subsequent trip, we revisited located nests and, where possible, determined whether there had been any egg or young mortality.

Vegetation Mapping and Measurement

Vegetation at each of the eight study sites was mapped using 1993 aerial photos, and these data were analyzed with GIS to show the proportions of vegetation types (Figures 1-8). The size of each study site was measured with a compensating polar planimeter from 1:4800 scale aerial photographs taken on 31 May 1993.

During the first two trips of 1995, we also recorded vegetation volume measurements at the eight sites for use in assessing the relationship between bird density and habitat characteristics. We used the modified vertical line-intercept technique developed by Mills et al. (1991) to estimate vegetation volumes at up to ten, sixty-meter transects located haphazardly in the various vegetation types within each site. The plant species comprising those volumes was also recorded to assess the importance of native versus exotic vegetation to bird abundances.

RESULTS

Across sites, patterns of bird abundance were qualitatively similar to patterns observed in 1993 and 1994. Thus, sites where birds were very abundant in the past continued to support more birds than areas with fewer birds in the past. In fact, the relationship between bird density in 1995 with that of the average of 1993 and 1994 at the same sites was particularly strong ($r = 0.984$, $p < 0.0001$).

Quantitatively, however, there was an average decline in bird abundances of 20.2% in 1995 relative to 1993 and 1994 across all sites (Table 3). Interestingly, the largest declines, 32.8% and 29.7% at sites 8 and 5 respectively, occurred where avian abundances were typically greatest. At site 5, bird density has historically been the highest of the sites at approximately 1,800 birds per 40 ha, while Site 8 historically has had the greatest absolute numbers of birds (1,265 in 1995). While we cannot determine the cause for these declines, we can say that fluctuations in bird abundances as seen in 1995 point to the necessity of continuous monitoring so we can understand the

natural level of variation in the system. Only with this information can we begin to assess how operation of Glen Canyon Dam influences these important and sensitive resources.

Table 2. Site summaries giving the mean number of each species counted per survey along with a density estimate. The overall numbers of birds counted and the average number counted per survey are also given for each site.

SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
1	LUCY WARB	8.6	1.86
	H FINCH	3.0	0.66
	BG GNATCT	1.6	0.34
	AT FLYCTR	2.0	0.44
	C RAVEN	1.0	0.22
	HUMMER SP	2.0	0.44
	N ORIOLE	0.6	0.14
	BC HUMMR	1.0	0.22
	L GOLDFCH	1.0	0.22
	H THRUSH	0.6	0.14
Total number of individuals 86 Mean number per survey 21.5 Average bird density 4.68/ha			
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
2	BELL VIRE	22.6	7.53
	LUCY WARB	11.6	3.86
	H FINCH	8.0	2.67
	BG GNATCT	7.6	2.53
	B WREN	5.0	1.67
	CY THROAT	4.6	1.53
	YB CHAT	4.6	1.53

SITE 2	CONTINUED		
	BC HUMMER	3.6	1.20
	AT FLYCTR	3.0	1.00
	L GOLDFCH	1.6	0.53
	SONG SPAR	1.0	0.33
	N MOCKINB	0.6	0.20
	H ORIOLE	0.6	0.20
	M DOVE	0.6	0.20
Total number of individuals		300	
Mean number per survey		75.0	
Average bird density		17.43/ha	
SITE	SPECIES	MEAN #/SURVEY	DENSITY (#/HA)
3	BELL VIRE	18.6	1.6
	BG GNATCR	7.0	0.60
	LUCY WARB	6.0	0.52
	HUMM SP.	4.6	0.40
	BC HUMMR	3.6	0.31
	M DOVE	3.0	0.26
	L GOLDFCH	2.6	0.22
	YB CHAT	2.6	0.22
	AT FLYCTR	2.0	0.17
	INDGO BNT	2.0	0.17
	CY THROAT	1.6	0.14
	H FINCH	1.0	0.09
	C RAVEN	1.0	0.09
	BLU GRSBK	0.6	0.05
Total number of individuals		227	
Mean number per survey		56.8	
Average bird density		4.89/ha	

SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
4	LUCY WARB	10.0	4.35
	BELL VIRE	8.6	3.73
	BG GNATCR	7.0	3.04
	B WREN	4.6	2.00
	SONG SPAR	4.6	2.00
	YB CHAT	4.6	2.00
	Y WARBLR	3.6	1.56
	HUMM SP.	3.6	1.56
	CY THROAT	3.0	1.30
	BC HUMMR	2.0	0.86
	AT FLYCTR	1.0	0.43
	BLU GRSBK	1.0	0.43
	GRN TOWHE	1.0	0.43
	SNW EGRET	0.8	0.35
	CSTA HUM	0.6	0.26
Total number of individuals			242
Mean number per survey			60.4
Average bird density			26.21/ha
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
5	BELL VIRE	15.6	7.09
	Y WARBLR	13.6	6.18
	CY THROAT	9.6	4.36
	YB CHAT	8.6	3.91
	LUCY WARB	8.0	3.64
	SONG SPAR	8.0	3.64
	B WREN	4.6	2.09
	L GOLDFCH	3.0	1.36

SITE 5 CONTINUED:			
	HUMM SP.	2.6	1.18
	BG GNATCR	2.0	0.91
	BC HUMMR	2.0	0.91
	S TANANGR	1.0	0.45
	H ORIOLE	0.6	0.27
Total number of individuals		317	
Mean number per survey		79.2	
Average bird density		31.63/ha	
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
6	BELL VIRE	30.0	4.23
	CY THROAT	22.7	3.19
	YB CHAT	17.4	2.45
	SONG SPAR	15.4	2.17
	B WREN	12.0	1.69
	Y WRBLR	9.4	1.32
	BG GNATCR	8.6	1.21
	LUCY WARB	7.4	1.04
	HUMM SP.	4.0	0.56
	AT FLYCTR	2.0	0.28
	LAZ BUNTG	1.4	0.20
	S TANANGR	1.4	0.20
	H ORIOLE	1.4	0.20
	C WREN	1.4	0.20
	PHAINPLA	0.6	0.08
	BC HUMMR	0.6	0.08
	L GOLDFCH	0.6	0.08
	LB WDPKR	0.6	0.08
	C RAVEN	0.6	0.08
	BH CWBRD	0.6	0.08

Site 6 Continued:			
Total number of individuals		414	
Mean number per survey		138.1	
Average bird density		19.34/ha	
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
7	BELL VIRE	11.4	3.35
	YB CHAT	6.6	1.94
	CY THROAT	6.6	1.94
	SONG SPAR	6.0	1.76
	BG GNATCR	4.0	1.18
	B WREN	3.4	1.00
	LUCY WARB	3.4	1.00
	H FINCH	2.6	0.76
	LAZ BUNTG	1.4	0.41
	AT FLYCTR	1.4	0.41
	HUMM SP.	1.4	0.41
	BH CWBRD	1.4	0.41
	C WREN	1.4	0.41
	LB WDPKR	0.6	0.18
	Y WRBLR	0.6	0.18
Total number of individuals		157	
Mean number per survey		52.2	
Average bird density		15.34/ha	
SITE	SPECIES	MEAN #/SURVEY	DENSITY (/HA)
8	BELL VIRE	84.6	1.80
	SONG SPAR	55.0	1.17
	YB CHAT	49.6	1.05
	CY THROAT	31.0	0.66
	Y WRBLR	17.0	0.36
	BG GNATCR	16.6	0.35
	B WREN	12.6	0.27

SITE 8 CONTINUED:			
	LUCY WARB	11.6	0.25
	BH CWBRD	7.6	0.16
	H FINCH	6.0	0.12
	HUMM SP.	5.6	0.12
	LB WDPKR	3.6	0.08
	AT FLYCTR	3.0	0.06
	BC HUMMR	3.0	0.06
	L GOLDFCH	2.6	0.06
	BLU GRSBK	2.6	0.06
	C WREN	1.0	0.02
	LAZ BUNTG	1.0	0.02
	GRN TOWHE	0.6	0.01
	CSTA HUMM	0.6	0.01
	S TANANGR	0.6	0.01
	M DOVE	0.6	0.01
	PHAINPLA	0.6	0.01
Total number of individuals		1,268	
Mean number per survey		317.0	
Average bird density		6.72/ha	

Table 3. A comparison of bird abundances across the eight Hualapai sites between 1995 and the average of 1993 and 1994 abundances.

SITE	1995 BIRD DENSITY/40 ha	1993-94 AVE. MEAN DENSITY /40 ha	DIFFERENCE	% DIFFERENCE
1	187.2	250	-62.8	-25.0
2	697.2	875	-177.8	-20.3
3	195.6	225	-29.4	-13.1
4	1,048.4	1,225	-176.6	-14.4
5	1,265.2	1,800	-534.8	-29.7
6	773.6	975	-201.4	-20.6
7	613.6	650	-36.4	-5.6
8	268.8	400	-131.2	-32.8

Species' Abundance

Bell's Vireo was the most common bird found among the eight study sites as it was counted at seven of the eight sites and comprised 24.4 percent of all the birds counted (Tables 4 and 5). While Yellow-breasted Chats were found at only three of the eight sites, they were fairly abundant where found with an average of 11.8 individuals counted per survey. Song Sparrows were found at five of the eight sites and were also fairly abundant with an average of 11.3 individuals counted per survey (Table 5). Common Yellowthroats, Blue-gray Gnatcatchers, Lesser Goldfinches, hummingbirds (including Black-chinned Hummingbirds) and Ash-Throated Flycatchers were less abundant but very widespread as they were found at seven of the eight sites. Northern Orioles, Mockingbirds, Canyon Wrens and Hermit Thrushes were relatively rare as they were only counted at one of the eight sites and were found to be in low abundances.

Vegetation Associations

The vegetation volume data have yet to be analyzed, but will be included in the Final Avian Report.

Table 4. Species' abundances across the eight sites.

SPECIES	MEAN/SITE/SURV	% OF SITES	% OF TOTAL
BELL'S VIREO	23.9	87.5	24.4
YB CHAT	11.8	37.5	9.6
SONG SPARROW	11.3	62.5	13.5
BEWICK'S WREN	5.3	62.5	5.1
CY THROAT	9.9	87.5	9.6
LUCY'S WARBLR	7.3	75.0	8.5
BG GNATCATCHER	6.8	87.5	6.9
HOUSE FINCH	2.6	50.0	2.4
LESSER GOLDFCH	1.9	87.5	1.8
MOURNING DOVE	0.5	37.5	0.7
COMMON RAVEN	0.3	37.5	0.3
HUMMINGBIRD SP	3.0	87.5	3.1
BLK-CHIN HUMMR	2.0	87.5	1.8
HOODED ORIOLE	0.3	37.5	0.2
SUMMER TANANGR	0.4	37.5	0.5
BH COWBIRD	1.3	50.0	1.0
AT FLYCATCHER	1.8	87.5	1.9
MOCKINGBIRD	0.1	12.5	0.1
HERMIT THRUSH	0.1	12.5	0.1
YELLOW WARBLER	5.5	25.0	5.5
LAZULI BUNTING	0.5	37.5	0.5
INDIGO BUNTING	0.3	12.5	0.2
GREEN TOWHEE	0.1	25.0	0.1
LADDR-BACK PKR	0.2	37.5	0.6
COSTA'S HUMMER	0.2	25.0	0.1
BLUE GROSBEAK	0.5	37.5	0.5
PHAINOPEPLA	0.2	25.0	0.1
N. ORIOLE	0.1	12.5	0.1
CANYON WREN	0.5	12.5	0.4

Table 5. Mean number of each species counted across sites.

SPECIES	Sites: 1	2	3	4	5	6	7	8
Bell's Vireo	0	22.6	18.6	8.6	15.6	30.0	11.4	85
Yel Br Chat	0	4.6	2.6	4.6	8.6	17.4	6.6	50
Song Sparrow	0	1.0	0	4.6	8.0	15.4	6.0	55
Bewick's Wrn	0	5.0	0	4.6	4.6	12.0	3.4	13
C Yellowthro	0	4.6	1.6	3.0	9.6	22.7	6.6	31
Lucy's Wrblr	8.6	11.6	6.0	10.0	8.0	7.4	3.4	12
BG Gnatcatcher	1.6	7.6	7.0	7.0	2.0	8.6	4.0	17
House Finch	3.0	8.0	1.0	0	0	0	2.6	6.0
Lssr Gldfnch	1.0	1.6	2.6	3.6	3.0	0.6	0	2.6
Mourning Dove	0	0.6	3.0	0	0	0	0	0.6
Common Raven	1.0	0	1.0	0	0	0.6	0	0
Hummbrd Spp	2.0	0	4.6	3.6	2.6	4.0	1.4	5.6
BC Hummbrd	1.0	3.6	3.6	2.0	2.0	0.6	0	3.0
H. Oriole	0	0.6	0	0	0.6	1.4	0	0
Smmr Tanangr	0	0	0	0	1.0	1.4	0	0.6
BH Cowbird	0	0	0.6	0	0	0.6	1.4	7.6
AT Flycatcher	2.0	3.0	2.0	1.0	0	2.0	1.4	3.0
N. Mckingbrd	0	0.6	0	0	0	0	0	0
Hermit Thrsh	0.6	0	0	0	0	0	0	0
Yllw Warbler	0	0	0	3.6	13.6	9.4	0.6	17
Lazli Buntng	0	0	0	0	0	1.4	1.4	1.0
Indgo Buntng	0	0	2.0	0	0	0	0	0
Green Towhee	0	0	0	1.0	0	0	0	0.6
LB Woodpcker	0	0	0	0	0	0.6	0.6	3.6
Cstas Hmbrd	0	0	0	0.6	0	0	0	0.6
Blue Grsbeak	0	0	0.6	1.0	0	0	0	2.6
Phainopepla	0	0	0	0	0	0.6	0	0.6
N. Oriole	0.6	0	0	0	0	0	0	0
Canyon Wren	0	0	0	0	0	1.4	1.4	1.0

Nest Searches

Nests of seven bird species were located during four nest-search efforts in 1995 at five sites (Table 6). The greatest number of nests were located at Spencer Canyon and the fewest at RM 243L. Each nest typically had three or four eggs and the young ususally fledged or were removed by predators prior to our follow-up visit.

Table 6. Results of nest searches during Spring, 1995 show that the number and diversity of nests located varied greatly across sites.

DATE	SITE	SPECIES	EGGS	OUTCOME
5/19/95	PARASHANT	YB CHAT	4	FLEDGE
		BELL VIREO	3	FLEDGE
		BELL VIREO	3	FLEDGE
		BC HUMMER	3	FLEDGE
5/21/95	GRANITE PRK	BC HUMMER	3	FLEDGE
		BC HUMMER	3	FLEDGE
		BC HUMMER	3	FLEDGE
		BC HUMMER	3	FLEDGE
5/28/95	RM 243L	LUCY WRBLR	3	FLEDGE
		SONG SPAR	1	DEAD
		BELL VIREO	4	FLEDGE
5/29/95	SPENCER	YB CHAT	4 YOUNG	FLEDGE
		YB CHAT	4	FLEDGE
		YB CHAT	4	FLEDGE
		CY THROAT	4	FLEDGE
		CY THROAT	4	FLEDGE
		CY THROAT	4	FLEDGE
		BELL VIREO	4	FLEDGE
		BELL VIREO	4	FLEDGE
		BELL VIREO	4	FLEDGE
		BELL VIREO	4	FLEDGE

Table 6; Nest Search Data Continued:				
6/07/95	RM 243L	LUCY WRBLR	3	FLEDGE
		YB CHAT	4	FLEDGE
		BG GNATCHR	2	FLEDGE

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Hualapai Cultural Resources Program

Report will be submitted separately by the Hualapai Department of Cultural Resources.



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HUALAPAI DEPARTMENT OF NATURAL RESOURCES

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GLEN CANYON ENVIRONMENTAL
STUDIES OFFICE

October 2, 1995

OCT 12 1995

Mr. Dave Wegner, Program Manager
Glen Canyon Environmental Studies
U.S. Bureau of Reclamation
P.O. Box 22459
Flagstaff, AZ 86002

RECEIVED
FLAGSTAFF, AZ

Dear Dave,

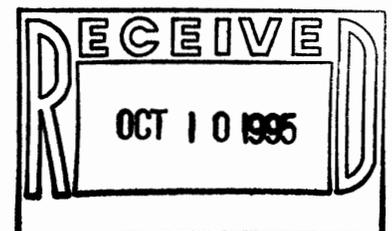
Please consider the enclosed fourth quarterly report for the Hualapai Tribe's administrative, aquatic and riparian resources monitoring programs under GCES. We continue to perform the duties of our contract and look forward to another successful year of studies in lower Grand Canyon.

Please contact myself or Mr. Clay Bravo if we can provide further information.

Sincerely,

C. Havatone

Cisney Havatone, Director
Hualapai Department of Natural Resources



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NOV 17 1995

**HUALAPAI TRIBE GLEN CANYON ENVIRONMENTAL STUDIES FY1995
DRAFT ANNUAL REPORT
Agreement NO. 5-FC-40 17170**

**RECEIVED
FLAGSTAFF, AZ**

Submitted to: Mr. David L. Wegner
Bureau of Reclamation, GCES
P.O. Box 22459
Flagstaff, Arizona 86002-4312

Prepared by: Hualapai Tribe
Department of Natural Resources
P.O. Box 300
Peach Springs, AZ 86434

Introduction

In fiscal year 1995, the Hualapai Tribe was again a very active participant in research, administration and planning for Glen Canyon Environmental Studies programs. As we begin to move toward long-term monitoring and adaptive management, we are focused on using what we have learned from interim flow research over the past four years to direct our efforts in the upcoming FY 1996 transitional monitoring program. Our programs have continued to improve in their technical expertise through experience, training and personnel improvements and we are very confident as we move into new areas that we will continue to cooperate and coordinate with other program entities to best understand and manage the natural resources of lower Grand Canyon. Below, we describe activities and accomplishments associated with the administration, recreation, fisheries and riparian programs of the Hualapai Tribe.

Hualapai Administration and Coordination Program

In the first quarter of Fiscal year 1995, the Hualapai Tribe via The Natural Resource Department played a key role in the finalization of the GCDEIS and continued interim monitoring until the Adaptive management and longterm monitoring are implemented. Specific activities undertaken in the first quarter were as follows:

October

1. Completion of PL 93-638 budgets and contracts for FY1995.
2. The assistant director of the HNRD attended RAAC meeting in Phoenix, Az..
3. Cooperators Agency meeting/Programmatic meeting for Cultural Resources, attended by Loretta Jackson, Ben Zimmerman, and Don Bay.

4. Challenges to Natural Resources and Protection of the Colorado River Basin Meeting, Las Vegas, attended by Kerry Christensen, and Don Bay.
5. Final revisions to GCDEIS were completed.
6. EIS Team Meeting in Flagstaff was represented by the Tribe.
7. Review of FWS Reasonable and Prudent Alternative was completed.
8. Selective Withdrawal Meeting, Phoenix was attended by Bill Leibfried.
9. Natural Resource Staff presented GCES update and job responsibilities to Tribal Council on 10/14.
10. Survey Crew Trip departed from Pearce Ferry, by Brice H., Samatha A., and Chris B..

November

1. GIS Training was held in Denver and attended by Samatha Arundel.
2. Loretta Jackson attended EIS meeting in Flagstaff.
3. EPA meeting in San Francisco was represented by Don Bay and Clay Bravo.
4. Prepared and gathered information for Tribal Auditor.
5. Worked with staff on goals and objectives detailed in Cooperative Agreement.
6. Natural Resource staff attended a scheduled meeting to discuss Tribes needs to BOR Administration, Flagstaff.

December

1. Non-use Value Meeting was attended by Don Bay on December 5.
2. Reports and documents received from SWCA and Biowest were reviewed.
3. Evaluations for staff were completed.
4. Attendance of GCES Colorado River Workshop.
5. Staff received First Aid and CPR Training.
6. Equipment maintenance was preformed on boats, vehicles and related equipment.
7. Posted job announcement for administrative assistant position.
8. Cooperators Agency Meeting 12/29/94 represented by Clay Bravo, Don Bay, and Loretta Jackson.

In the second quarter of Fiscal year 1995, the Hualapai Tribe via Department of Natural Resources continued to provide input into GCES programs and work with program staff to initiate the FY 1995 field season. Specific activities undertaken in the second quarter were as follows:

1. Administrative staff met with accounting and BOR personnel to finalize 1994 funds and modify funds for FY95.
2. The final EIS was received in March and is currently being reviewed.
3. Natural Resource personnel have continued to secure funds from other sources to supplement GCES efforts.

4. On January 20, 1995 Clay Bravo attended a Cooperators meeting in Phoenix, Arizona.
5. On January 26-27, 1995 Clay Bravo attended a EIS Team Meeting in Phoenix, Arizona.
6. On January 10-12, 1995 Dr. Kerry Christensen attended a Technical Work Group Meeting in Phoenix, Arizona.
7. On January 23, 1995 Clay Bravo, Loretta Jackson, Monza Honga, and Kerry Christensen attended a Transition Work Group Meeting in Phoenix, Arizona.
8. Technical support for the recreation, riparian and fisheries studies was negotiated and worked out with SWCA Environmental Consultants.
9. The Cultural Resource GCES Archival Program was attended by Loretta Jackson, and Ronald Susanyatame.
10. The GIS staff has continued to compile data on GIS site 13.
11. Ronnie and Deshane Quasula received a two training in Arc Info at the GCES office.
12. A map of "PAI" Affiliated Ancestral Clan/Band Territorial Homelands was created by the GIS staff in Flagstaff.
13. Plans to move Ronnie and Deshane Quasula to Peach Springs were developed. Towards the end of April Deshane and Ronnie are planning the move to Peach Springs with Samantha Arundel travelling from Flagstaff three times a week to assist in there work efforts.

In the third quarter of Fiscal year 1995, the Hualapai Tribe via Department of Natural Resources continued to execute the needs of the contract. Specific activities undertaken in the third quarter were as follows:

1. March 3, 1995 Clay Bravo attended the Colorado Plateau Town Hall Meeting in Moab, Utah.
2. March 23, 1995 Kerry Christensen and Clay Bravo attended the GCES Transition Work Group Meeting.
3. April 24, 1995 Clay Bravo attended a meeting among the Native American Tribes, National Research Council, BOR and NPS.
4. The 1995 Secretaries Conference was attended by Vickie Matuck in Phoenix, Arizona.
5. April 26, 1995 Kerry Christensen attended a Nonuse Meeting in Denver, Colorado.
6. May 2, 1995 Kerry Christensen attended a Transitional Monitoring Meeting in Phoenix, Arizona.
7. We held a meeting with staff from the Grand Canyon Area Office, Lower BOR on May 3, 1995 in Boulder City, Nevada. Clay Bravo, Delbert Havatone, Ben Zimmerman, Kerry Christensen, Charile Vaughn and Jim Duffield were in attendance.
8. The GIS staff worked on compiling data and summarizing reach reports for GIS site 12.

10. Ronnie and Deshane Quasula moved the GIS operation to Peach Springs.
11. Samantha Arundel periodically travelled to Peach Springs to assist GIS staff with set up and direction.
12. The GIS program purchased a personal computer and digitizer.
13. June 21, 1995 Kerry Christensen and Bill Leidfried attended the Transitional Monitoring Meeting in Phoenix, Arizona.
14. Cisney Havatone, Clay Bravo and Allene Cabillo met with Dave Wegner on June 29, 1995 to discuss various issues regarding the Hualapai Tribe's GCES involvement.

In the fourth quarter of Fiscal year 1995, the Hualapai Tribe's Department of Natural Resources continued to fulfill its contractual obligations. Specific activities undertaken in the fourth quarter were as follows:

1. The Administrative Secretary received secretary recording training July 7-14, 1995.
2. Met with the GCES Program Manager to discuss Hualapai program progress and future operations.
3. Attended GCES transitional monitoring workgroup meetings in Phoenix.
4. Attended Grand Canyon Visibility Transport Commission meetings, and while not directly related to the GCES program, these meetings are an important link between the Tribe and Grand Canyon studies and environmental conditions.
5. Attended a Grand Canyon Trust meeting.
6. Met with Hualapai Department of Natural Resources staff to plan and evaluate 1995-96 aquatic, recreational, riparian and GIS programs.
7. Attended Management Objectives workgroup meeting in Phoenix.
8. Prepared 1996-7 transitional monitoring proposal for Hualapai aquatic, riparian, cultural and administrative proposals for GCES.
9. Met with Grand Canyon National Park regarding their science center and future cooperative GCES studies.
10. Met with NAU, Arizona Game and Fish Department and park service personnel to discuss and coordinate 1996 transitional monitoring.

Hualapai Recreation Resources Program

The Recreation Studies program in the first quarter of FY95 continued to perform surveys and compile data as detailed in the goals and objectives of the program. We worked one on one with SWCA on gathering and analyzing the data for the program in addition to making plans for the transition between SWCA and the Tribe. Specific activities and surveys were as follows:

1. Biannual Beach measurement survey performed by Ben Zimmerman, Amis Holm, Morris Samson, and Bob Manygoats 10/24/95-10/26/95.

2. Follow up Beach measurement survey preformed by Brice Hoskin, Morris Samson, and Bob Manygoats 11/10/95.
3. Collection of 1 and 2 day rivertrip data from HRR.
4. Received and reviewed recreation report from SWCA.
5. Remote camera changes were preformed monthly.
6. Labeled slides for remote cameras.
7. Various meetings were held with SWCA over current and future studies.
8. Computer Training took place presenting Lotus 123, Wordperfect and Windows for preparation of reports.

The Recreation studies program in the second quarter of FY95 continued to compile data from the River Running Department and plan surveys for the upcoming year. Specific activities and surveys were as follows:

1. Compiled data from Hualapai River Running in the month of March.
2. Planned the bi-annual camping beach survey to take place April 12-14, 1995.
3. Lilly Smith, Recreation Technician I, created a survey schedule for the peak and shoulder seasons.
4. Remote cameras were changed monthly in January, February and March.

Third quarter of FY 1995, we continued to monitor camping beaches and perform attraction site surveys. Specific activities and surveys were as follows:

1. The bi-annual camping beach survey took April 12-14, 1995 with assistance of Amis Holms and volunteers Tamera and Taylor Ross.
2. We completed attraction site surveys for Spencer and Separation beaches by Hualapai Technicians in May.
3. We continued to change remote cameras during this quarter.

During the fourth quarter of FY1995, we continued camping beach and attraction site surveys as well as changing remote cameras and compiling rafting data. Specific activities and surveys were as follows:

1. The bi-annual camping beach survey to take place October 9-11, 1995 with assistance of Amis Holms and volunteers Tamera and Taylor Ross.
2. We completed attraction site surveys for Diamond Creek and Pearce Ferry using Hualapai Technicians.
3. We continued to change remote cameras during this quarter.
4. We worked with Hualapai River Running Enterprise to compile rafting data for 1995.

Hualapai Colorado River Fisheries Resource Program

The fisheries program continued to collect baseline data and provide valuable information for the management of Colorado River fishes. With the help of Biowest and GCES, we completed the fall survey running into the first quarter of FY95. The Hualapai Tribe took the lead of the Fisheries program after the winter survey in January, 1995. Once again, a transition will take place between the Hualapai Tribe and Biowest to insure continuity of data collection. Specific activities accomplished throughout this quarter were as follows:

1. The Fall Survey Trip 9/18/95 through 10/6/95 was preformed in association with Biowest.
2. Review of various reports and documents.
3. We planned and priced equipment needed for upcoming fisheries surveys, detailed by staff.
4. We Prepared and submitted trip reports by each of the technicians for the fall survey.

During the second quarter of FY95 the Natural Resource staff continued to plan and purchase equipment for the upcoming survey trips. Specific activities and surveys were as follows:

1. The survey schedule was completed for FY95.
2. Comments were submitted to SWCA for the 1995 Study Plan.
3. Purchasing of equipment needed for upcoming fisheries surveys, was preformed by fisheries technicians Mike Vaughn and Scott Crozier.
4. Scientific collecting permits were submitted to Grand Canyon National Park, Arizona Game and Fish, U.S. Fish and Wildlife Service, and Lead Mead National Recreation Area.
5. Clay Bravo, Ben Zimmerman, Mike Vaughn, Bill Leibfried and Rich Valdez met in Flagstaff to discuss the 1995 Study.
6. The spring fisheries survey launched April 9 from Lee's Ferry and took out at Pearce Ferry April 29, 1995.

During the third quarter of FY 1995, we continued our fisheries studies including data collection, input and analysis. Specific activities and surveys as follows:

1. We successfully completed the spring fisheries survey, trip #95-01, April 9-29, 1995 from National Canyon to Pearce Ferry.
2. Hualapai Technicians received D-base IV training under the direction of Bill Leibfried.
3. Trip report # 95-01 was completed and sent to various cooperating agencies, May 26, 1995.
4. Data from Trip # 95-01 was entered into Dbase IV by Hualapai Technicians.
5. The summer survey Trip # 95-02 launched from Lees Ferry June 11, 1995 and concluded July 1, 1995 at Pearce Ferry.

During the fourth quarter of FY 1995, we continued many of the same duties that were initiated in the third quarter. Specific activities and surveys were as follows:

1. We successfully completed the spring fisheries survey, trip #95-02, June 11 through July 1, 1995 from National Canyon to Pearce Ferry.
2. Hualapai Technicians entered Trip #95-02 data into D-base IV.
3. Trip report # 95-02 was completed and sent to various cooperating agencies, August 2, 1995.
4. The fall survey Trip # 95-03 launched from Lees Ferry September 13, 1995 and will conclude October 5, 1995 at Pearce Ferry.

Hualapai Riparian Studies

Beginning fiscal year 1995, the Hualapai Department of Natural Resources assumed responsibility for riparian studies (bird, mammal, reptile and vegetation community studies) in lower Grand Canyon from National Canyon to Lake Mead within the Glen Canyon Dam Environmental Studies Program. The focus of this year's activities were to continue research concerning interim flow effects on riparian resources and to plan upcoming transitional and spike flow programs. Below, we describe specific activities associated with each quarter's programs.

During the first quarter of FY 1995, activities of the Hualapai riparian studies program consisted of the following tasks or actions:

1. Review of the draft final FY 1994 Riparian Studies Report prepared by SWCA.
2. Preparation of a proposal for FY 1995 riparian studies in lower Grand Canyon.
3. Development of a Tribal herbarium with catalogued specimens from lower Grand Canyon.
4. Acquisition of, and education in the use of, statistical software (Statistix) for use on FY 1995 data.
5. Training in the use of dBase IV for compilation of FY 1995 data.
6. Maintenance of equipment such as small mammal traps, boats and motors, field guides etc.
7. Education in the identification of birds by their song using tape recordings.
8. Education in the identification of various plant species using herbaria sheets.
9. Preparation of a proposal to the Arizona Game and Fish Department's Heritage Grant-in-Aid program to supplement mammal studies in lower Grand Canyon.

During the second quarter, the riparian research team was primarily involved with preparation for upcoming wildlife and vegetation monitoring activities. Below, we describe specific activities that were accomplished during this period.

1. From March 28-31, program staff performed avian reconnaissance work along the Colorado River where trails that are used for avian surveys were cleared and prepared for upcoming surveys.
2. Much of the quarter focused on planning this year's bird, mammal, reptile and vegetation monitoring trips. This planning included the preparation of equipment, scheduling of personnel, organizing logistical support and refining methodologies and statistical procedures for the data to be collected.
3. The program began to work with the Hualapai herbarium during this quarter. Here, we received mounted specimens from SWCA and cataloged them in our cabinet. We created a list of the specimens and made labels for each folder and shelf. In addition, program personnel have begun to familiarize themselves with the taxa and learn plant identification techniques.

During the third quarter of FY 1995, we completed avian community studies and prepared for fourth quarter mammal-reptile studies. Below is a list of specific activities performed this quarter.

1. On April 19-30, May 16-27, May 29-June 2 and June 6-11 we performed total count censuses of breeding birds at eight sites between National Canyon and Pearce Ferry. On average there were 20.2% fewer birds in 1995 compared to 1993 and 1994.
2. Attended Management Objectives workgroup meeting, Phoenix, AZ.
3. Attended a Non-use value committee meeting.
4. Prepared a third quarterly report.

During the fourth quarter of FY 1995, we focused on performing studies of small mammals and reptiles at three sites between Diamond Creek and Pearce Ferry. We also completed a draft final report for the avian studies. Below, we describe the specific activities performed this quarter.

1. We entered and analyzed the avian studies data including the vegetation volume data, prepared tables and completed a draft final report for avian studies in FY 1995.
2. We prepared the fourth quarterly report.
3. We completed two censuses of small mammals and reptiles at three sites between Diamond Creek and Pearce Ferry.
4. We analyzed the mammal reptile data and prepared tables.
5. We prepared proposals for FY 1996 GCES riparian, aquatic and administrative programs.

Upcoming Studies:

1. We performed vegetation community studies in lower Grand Canyon on October 15-18.
2. We have begun vegetation data entry and analysis.
3. We will produce final reports for the avian, mammal/reptile and vegetation community studies in the first quarter of FY 1996.



GLEN CANYON ENVIRONMENTAL
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FLAGSTAFF, AZ

HUALAPAI DEPARTMENT OF NATURAL RESOURCES

P.O. BOX 300 • PEACH SPRINGS, ARIZONA 86434 • 520 769-2254 • 520 769-2255 • FAX 520 769-2309

November 2, 1995

Mr. David L. Wegner, Program Manager
Glen Canyon Environmental Studies
U.S. Bureau of Reclamation
P.O. Box 22459
Flagstaff, AZ 86002-4312

Dear Dave,

Please consider the enclosed annual report for the Hualapai Tribe's administrative, aquatic, recreation and riparian programs within GCES for FY 1995. In FY 1995, the Tribe assumed more responsibility for these programs and feel we have been very successful at performing the work and fulfilling the obligations of our contract. Final reports on our aquatic and riparian studies will be forwarded upon their completion. The Cultural Resources annual report will be provided separately. Please contact our department if we can provide further information.

Sincerely,

Clay Bravo, Assistant Director
Hualapai Department of Natural Resources

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Hualapai Tribe - Glen Canyon Environmental Studies
Quarterly Report: October - December 1995
Agreement NO. 5-FC-40 17170

GLEN CANYON ENVIRONMENTAL
STUDIES OFFICE

Submitted to: Mr. Dave Wegner
Bureau of Reclamation, GCES
P.O. Box 22459
Flagstaff, Arizona 86002-4312

JAN 02 1996

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FLAGSTAFF, AZ

Prepared by: Hualapai Tribe
Hualapai Department of Natural Resources
P.O. Box 300
Peach Springs, Arizona 86434

Hualapai Administration and Coordination Program

In the third quarter of Fiscal year 1995, the Hualapai Tribe via Department of Natural Resources continued to execute the needs of the contract. Specific activities undertaken in the first quarter were as follows:

1. The HDNR via the Hualapai Tribe submitted a letter to Charles Calhoun appealing the amount of funds made available from BOR for 1996 work, see attached.
2. We attended spike flow meetings in Flagstaff and Phoenix.
3. We attended the BOR managers meeting in Laughlin, NV.
4. We supervised preparation of spike flow proposals for the aquatic and riparian resources programs.
5. We attended a meeting in Las Vegas, NV regarding PL 93-638 contracts as it relates to the contracts currently in place with the Hualapai Tribe to study cultural, riparian, recreation and aquatic resources as part of GCES.
6. We attended Transitional Monitoring Workshop meetings.
7. We attended Management Objectives Workgroup meetings.

Hualapai Recreation Resources Program

Specific activities were as follows:

1. During this quarter we began writing the Draft annual report to be submitted for comments on January 15, 1995.
3. We continued to change remote cameras during this quarter.
4. We continued to work with Hualapai River Running in compiling data for 1995 river season.

5. SWCA forwarded all data and information to the HDNR from previous studies.

Hualapai Colorado River Fisheries Resource Program

Specific activities and surveys were as follows:

1. During this quarter we begun Draft annual report to be submitted January 15, 1996 for comments and review.
2. The 1996 Scope of work for Transition Monitoring was prepared and submitted.
3. A status report for trips 95-01 and 95-02 was submitted, see attached.
4. Data collected from GIS sites 10, 11, 12 and 13 was dititized into the system.
5. Proposals for the uncoming experimental flood were submitted in cooperation with the Arizona Game and Fish Department.
6. Hualapai technicians maintained and repaired equipment in preparation for upcoming field season.
7. Dbase IV files were scanned and cleaned up for mistakes.

Hualapai Riparian Studies Program

During the first quarter of FY 1996, the Hualapai Riparian Studies Program for GCES was very busy with vegetation community studies including data entry and analysis, avian data entry and analysis, report writing, spike flow proposal preparation and with attendance at appropriate GCES meetings. Below, we describe in greater detail the work associated with these activities.

1. Mid October, we performed our annual vegetation analyses where basal diameters were determined in various quadrats at permanent plots and along marsh and vegetation zone transects. These studies were performed at 24 sites in lower Grand Canyon.
2. We summarized the vegetation data to some degree and entered it into Quattro Pro format.
3. We continued to edit and improve the avian and mammal/reptile final reports.
4. We attended several experimental flood GCES meetings in Flagstaff and Phoenix.

5. We prepared initial one-page experimental flood proposals for work with vegetation and avian communities before and after the flood.

6. We prepared and submitted the final riparian experimental flood proposal.

7. We attended a management objectives workgroup meeting in Phoenix.

8. We attended transitional monitoring workgroup meetings in Phoenix.

9. We prepared and submitted transitional monitoring proposals in cooperation with NAU and Grand Canyon National Park.

Hualapai Cultural Resources Program

Report will be submitted separately by the Hualapai Department of Cultural Resources.



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HUALAPAI DEPARTMENT OF NATURAL RESOURCES

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December 27, 1995

GLEN CANYON ENVIRONMENTAL
STUDIES OFFICE

Mr. Dave Wegner, Program Manager
Glen Canyon Environmental Studies
U.S. Bureau of Reclamation
P.O. Box 22459
Flagstaff, AZ 86002

JAN 02 1996

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FLAGSTAFF, AZ

Dear Dave,

Please consider the enclosed FY 1996 first quarterly report for the Hualapai Tribe's administrative, aquatic and riparian resources monitoring programs under GCES. We continue to perform the duties of our contract and look forward to another successful year of studies in lower Grand Canyon. We are enclosing a draft copy of a status report for our 1995 aquatic resources studies for your comments.

Please contact myself or Mr. Clay Bravo if we can provide further information.

Sincerely,

c. Havatone

Cisney Havatone, Director
Hualapai Department of Natural Resources