HUALAPAI TRIBE

Department of Cultural Resources

EVALUATING HUALAPAI CULTURAL RESOURCES ALONG THE COLORADO RIVER MAY AND AUGUST 2012

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INTRODUCTION

The Hualapai Tribe has a special interest in the Grand Canyon and the Colorado River because Hualapai traditional lands begin at the Little Colorado River and continue downstream through the entire Grand Canyon. For the Hualapai people the cultural link to the Grand Canyon and the Colorado River Corridor is both ancestral and contemporary, through geographical affinity and origins in the Hualapai creation history. The current Hualapai Reservation includes the lower 108 miles of the Colorado River and Grand Canyon from River Mile (RM) 165 to RM 273. The annual Hualapai monitoring program, takes into consideration the length of the Colorado River Corridor from Lee's Ferry at RM0.0 through to Pierce Ferry (RM280.5) at the Lake Mead Recreation Area. Protecting and enhancing the natural, cultural, and economic interests of the Hualapai Tribe in this area is an issue to which the Tribe attaches extremely high importance.

Traditional Cultural Properties (TCPs) located within the traditional Hualapai lands of the Colorado River Corridor (reference Table 1, below) play a particularly significant role in the tribe's cultural ties to the Grand Canyon area. According to the National Register Bulletin 38, a TCP is associated with "cultural practices or beliefs of a living community that are rooted in that community's history, and are important in maintaining the continual cultural identity of the community" (Parker and King 1990). Examples of Hualapai TCPs include plant and paint gathering areas, sacred sites, historic and prehistoric archeological sites, historic travel routes and areas where rock images are present. Not all sites have received the TCP nomenclature, and as Hualapai complete annual monitoring trips, areas not previously given TCP numbers, will be monitored and entered into the Hualapai Data Base as the sites are visited. For Hualapai, a Colorado River Corridor TCP is temporally unbounded, and includes water and springs, rocks, plant and animal life, and all material culture encompassed in the Grand Canyon, from the river to associated side canyons and tributaries to the rim and surrounding area. All of these are believed by the Hualapai people to be inherently linked, and they regard their traditional lands in the Colorado River Corridor with the highest esteem and most profound respect (HDCR et. al 1993).

The biological and cultural resources of the Canyon have always been integral to the culture of the Hualapai (Kroeber, 1935; Mapatis, 1982). Formal studies undertaken in the mid-1990s focused on the ethnobotanical resources of the Canyon. During ethnobotanical river trips conducted in the lower Grand Canyon from 1993-95, a total of 46 species of plants were recognized as having cultural significance to the Hualapai people (Phillips, 1994, 1995; Hogan, 1993, 1995). Since then, intensive studies have been undertaken to document archeological

resources and establish monitoring programs in portions of the Colorado River corridor located on the Hualapai Reservation (Balsom and Fairley, 1992; Hualapai Tribe, 1994). Studies were also undertaken to identify, document and establish management plans to maintain the integrity of Hualapai TCPs (HDCR 1998). Since the 1990's, the Hualapai Department of Cultural Resources (HDCR) has continued to identify and document Hualapai TCPs along traditional lands in the Colorado River Corridor.

Table 1. ***Partial List of Hualapai Traditional Cultural Properties along Colorado River Corrido***

TCP 001	National Canyon	166.5L	TCP 020	Spencer Canyon & Lava Cliff	246 L
TCP 002	Mohawk Canyon	171.5 L	TCP 021	Travertine Canyon	229 L
TCP 003	Vulcan's Anvil	178	TCP 022	Travertine Falls	230.5 L
TCP 004	Medicine Springs	179.2 L	TCP 023	Burnt Springs	259 R
TCP 005	Artesian Springs	194 L	TCP 024	Shinumo Canyon	108.7 R
TCP 006	Roasting Complex	197.3 L	TCP 025	Whitmore Helipad	186 L
TCP 007	Whitmore Canyon	188 L	TCP 026	Separation Canyon	240 R
TCP 008	Hematite Mine	200.0 R	TCP 027	Columbine Falls	274.3 L
TCP 009	205 Mile Canyon	205 L	TCP 028	Hotauta Canyon	107.5 L
TCP 010	Granite Park	209 L	TCP029	AZ:A:16:004	189.7L
TCP 011	Pumpkin Springs	212 L	TCP030	Vassey's Paradise	31.7 R
TCP 012	Three Springs Canyon	215.6 L	TCP031	Buck Canyon	41.0 R
TCP 013	AZ:G:3:80	223 L	TCP032	Salt Mine	63.0 L
TCP 014	Little Colorado River	61.5 L	TCP033	Elves Chasm	116.5 L
TCP 015	Cardenas Marsh	71 L	TCP034	Stone Creek	132.4 R
TCP 016	Deer Creek Canyon	136 R	TCP035	Forester Canyon	122.7L
TCP 017	Havasu Creek Canyon	156.9 L	TCP036	Olo Canyon	145.6L
TCP 018	Diamond Creek	225.5 L	TCP037	Tapeat's Creek	134.5
TCP 019	Bridge Canyon	235 L			

HUALAPAI CULTURAL BELIEFS AND TRADITIONAL ECOLOGICAL KNOWLEDGE

The Hualapai people regard the Colorado River and the entire River Corridor as a living entity infused with conscious spirit. This belief is inter-related with Traditional Ecological Knowledge (TEK) which pertains to "all types of knowledge about the environment derived from the experience and traditions of a particular group of people," (Usher 2000:185) and as such, can be used as a method for applying scientific methodology and for incorporating Native American perspectives imbued with traditional views, thought, beliefs, and values into environmental management. TEK has also been defined in several ways, depending on the interpretation of the terms "traditional" and "ecological." The following definition is given by Berkes (1993:3):

> TEK is a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. Further, TEK is an attribute of societies with historical continuity in resource use practices; by and large, these are non-industrial or less technologically advanced societies, many of them Indigenous and tribal.

TEK, as a construct focuses on a "local culture's conceptualization and interactions with their biotic and a-biotic environment," (Becker and Ghimire 2003:1 [online], http://www.consecol.org/vol18/iss1/art1). Loretta Jackson-Kelly, Principal Investigator, notes that TEK "is based on careful empirical observations that are accumulated over a sequence of generations which allows a long term view that is often missing from the data sets collected

through experimentation and systematic deliberate accumulation of facts," (Jackson-Kelly, 2007:10). All of the physical elements in and around the Corridor are accorded powers of observation and awareness. These elements include the water, air, rocks, plants, insects, fish and wildlife. Thus, the Hualapai people consider them sacred. All are believed to be inherently linked to one another, through conscious awareness and in unique and specific ways. For Hualapai people, these components of cultural information equate to TEK and are compared with cultural information from the past and present experience of Elders, community members, and river trip participants to communicate, preserve, and cultivate the linked nature of traditional cultural properties. Thus, TCP's become cultural landscapes where, as the Advisory on Historic Preservation states, "These large scale properties are often comprised of multiple, linked features that form a cohesive "landscape," " (www.achp.gov/news10102011.html, ACHP Native American Traditional Cultural Landscapes Action Plan November 23, 2011; Suagee and Bungart, 2012, unpublished manuscript). TEK embodies nature, land, family, community, reciprocity, balance, thought, and Spirit. These concepts incorporate communal cultural change with ancestral-nature forces. Life experiences are conceptualized and reciprocated through social traditions placing the past into the context of the present and future. Oral histories and ceremonialism shape and 'move' time and space into values and ethical lessons for social and political cohesion.

Hualapai Elders incorporate elements of TEK into their conversations regarding cultural landscapes, TCPs and archaeological sites and feel that, (Jackson and Stevens, 1996:7-8),

> …all archaeological sites are sacred places – places to be treated with respect. It has always been essential to protect ancestral sacred sites and to maintain the integrity of these sites. It is felt that physical contact with Hualapai ancestral cultural materials requires prayers and offerings to offset or reduce the prospect of dangerous consequences for intruding into the places of strong spirits. ..Ancestral and sacred sites in Hualapai traditional lifeways have tangible and intangible qualities that make management and protection appear to be in conflict…

The conflict mainly centers on 1), interpretation of diverse types of data; 2), how interpretations fit or do not fit into existing scientific paradigms, and 3), how the needs of tribes and agency are met in the context of management. However, interpretations and needs also remain dependent upon how heritage and resources are perceived by Indigenous and non-Indigenous communities. For the Hualapai Department of Cultural Resources, addressing these issues can in part be met by incorporating TEK into the annual P.A. BOR Monitoring River Trip. TEK in this regard is in the beginning stages with the HDCR monitoring program, which is striving to meet three important goals:

> 1) Integrating Hualapai Traditional Ecological Knowledge (TEK) into the monitoring methodology, and
>
> 2) Contributing comprehensive information of the effects of Glen Canyon Dam management on cultural as well as biological resources to the Bureau of Reclamation (BOR) evaluation and monitoring programs.

3) Balancing tribal use of shared natural resources with agency multiple-use approaches in regards to public access (Usher, 2000; Becker and Ghimire, 2003; Moller et al. 2004).

Three methods of incorporating TEK into a monitoring program can be approached which are qualitative in nature. One is a way of measuring population assessment by feel, sight, touch, smell, hearing, and taste, with a second approach describing presence or absence of desirable or undesirable conditions, and a third in which environmental change is noted through extremes. In our previous report, *Evaluating Hualapai Cultural Resources Along the Colorado River FY 2011,* it was mentioned that 'Needs' and 'Condition' assessments could be introduced into our monitoring program. After completing the 2012 monitoring season HDCR is considering incorporating the above mentioned methodologies in future monitoring field seasons through interview questions generated around the three methodologies mentioned above.

In regards to collecting data that is qualitative in nature, HDCR proposes possibly incorporating QDA, or Qualitative Data Analysis into future monitoring seasons. QDA is a methodology that analyses interview text resulting in quantitative information. Through computer software, QDA allows the user to collect text referenced by codes facilitating analysis for comparisons and diversity within thematic issues in order to extrapolate value and meaning. It is known that cconversations contain different segments referring to different ideas, hence with QDA conversational sections can be categorized across several value categories or frames. Framing coded text as semantic relationships generates specific quantified value ratios relating to key words and phrases encompassed within cultural themes. Ratios can be quantified and illustrated through data graphs. These relationships can then be perceived as conversational maps, linking cognitive perceptions to social process indicative of behavioural trends (Hubbs 2002). It is through this type of analysis that TEK and cultural values could possibly be conceptually understood.

It is evident that the riparian environment along the Colorado River has offered Hualapai people successful living in the region that is a rich resource base for hunting, gardening, plant, root, and mineral gathering, amongst geologic formations of river and springs. Native plants include desert tobacco, cane reed, bear grass, various cacti, and edible grass seeds. In the past, seasonal migrations for hunting and gathering of sustenance resulted in acquiring a variety of foods that extended through different elevations and geographic locations. Spiritual and life skills were conveyed partially during these migration events with Hualapai teaching their children traditional knowledge through hunting and gathering, song and oration, and environmental stewardship. With migration traditions each successive Hualapai generation passed on cultural truths and lessons which today, connect Hualapai to their elders, their community, their lands, their past, present and future.

The long expanse of the River through the canyon and the riparian eco-systems makes a life-way connection that flows through the hearts of the Hualapai people. The Hualapai maintain this connection through ties of sacredness to the Colorado River. Hualapai believe that they were created from the sediment and clay of the River. The Hualapai, as do other Yuman cultural groups of the Colorado Region, share similar beliefs and teachings regarding their creation. Through emergence, survival, subsistence and struggle, the Hualapai have sought to maintain

and protect their ancestral homelands since time immemorial. Traditional Hualapai beliefs address the ecology and knowledge about Hualapai Cultural landscapes. These belief systems address the following, but are not limited to:

Health and welfare of the Hualapai People
Economic values through traditional trade and trade routes.
Spiritual and religious beliefs tied to the land and water.
Oral traditions regarding non-humans and phenomena
Events of creation, such as fire, animals, plants, and humans.

Elements in and around the canyon are filled with significant symbolism, powers of observation and awareness. The springs, seeps, tributaries and the river itself comprise a vital life force believed to be absolutely and unequivocally essential to the well being of the Hualapai people. The entire system is a conscious Living Being. As such, it feels and is expressive of calmness and anger; it also offers happiness, sadness, strength, life, sustenance, and the threat of death. According to Hualapai cultural beliefs, these elements of consciousness can be observed through the nature of the river's ebb and flow at different points in time and at various locations. Thus, the Hualapai people regard the river with the highest esteem and most profound respect. In the Hualapai language the Colorado River is considered Ha'yi' đađa – the "Backbone of the River" – without the backbone the Hualapai people believe they cannot survive.

For Hualapai, contemporary oral and ceremonial traditions are perceived as pivotal cultural concepts relating to responsibilities for the land and community. These responsibilities incorporate nature, spirit, stories, song, and dance as active balancing components within conservation and cultural identity. TEK and other Indigenous perceptual systems for Native Americans living within the Colorado River corridor, serve as cognitive guides communicating the various lessons essential for dealing with reciprocity, balance and social cohesion (Stanner 1987; Rose 1991; Bourke and Cox 1994; Edwards 1994).

As a reflection, Hualapai Elders who have been able to take river trips, remember oral stories, places, ceremonies, plant usage, hunting, foods, and most importantly, how they felt. The following is from 1993:

> *On July 30, 1993 we left for Marble Canyon and Lee's Ferry…[The] Canyon was beautiful. We slept at river mile 22 our first night in little tents... Everyone enjoyed the rapids…The second night was at Red Wall Cavern, it was about 200 degrees, no air, hard to sleep. We were up at 5:00a.m., ate breakfast and left at 6:00 a.m., ready to go and get in the water where it was cold. We saw a lot of granaries on the walls where the old ones stored their food for winter. The old home sites and ledges where grindings stones were and the matađ were pointed out. Ronnie Beecher pulled our raft up to springs that flowed from the canyon walls, Clay filled everyone's jugs with fresh water. It was delicious.*
>
> *It is indescribable how beautiful the river and the canyon walls are, they are wild and rugged. It was a once in a life time trip for the elders, they all had fun and enjoyed the wonders. We saw areas where the cooking pits were about 60-feet or 80-feet in one area; homes were high caves on shelves where they were concealed. You stand in wonder, you can feel the spirituality and sacredness of the old ones, you wish you could see them and talk with them, you try to visualize our long past ancestors and the people. We went through Crystal Rapids like a breeze, we were soaked -screaming and laughing. Crystal, we learned has*

claimed thirteen lives. We made it! We came to the Salt Walls…Where is Lava? …Came to Anvil Rock. …Lava just below us, the first boat went through, they were swell. It was our turn, we were thrown around all over, Mazzie (deceased 2012) broke her leg. Every morning before departure and before we went to our tents we had our blessings…If anyone has a chance to make a trip like we did. Take it.You will never regret it, (L. Bravo, 1993, deceased 2011).

GRANITE PARK TCP010 HDCR BOR RIVER TRIP 2002
VIEW EAST (AERIAL PHOTO ON FILE HDCR 02-010_6)

METHODS, SITES AND ANALYSIS

In 2001, the HDCR, in consultation with the Bureau of Reclamation (BOR) expanded the evaluation and monitoring protocol of Hualapai archaeology, ethnobotany and TCPs in the Colorado River Corridor. As a result, the Hualapai Colorado River Corridor TCP Evaluation Database was developed in order to further incorporate Hualapai TCP analysis in evaluation and monitoring procedures. The database was created in conjunction with in-field evaluation forms used by HDCR during the evaluation and monitoring process of river corridor TCPs. The form was designed for the evaluation/monitoring of natural and human impacts (effects) at each designated Hualapai TCP for archaeology, ethnobotany and TCPs. Impacts monitored are listed below on Table 2. Some archaeological sites monitored by the Southern Paiute Consortium and or the, NPS are not evaluated.

Table 2. Monitoring Impact Attributes

Impact Attributes							
Archaeology	*Natural*	Erosion	Deposition	Flooding	Slumping	Arroyo Cutting	Turbation
	Human	Trailing	Camping	Collection Piles	GC Dam	Vandalism	
Ethnobotany	*Natural*	Erosion	Deposition	Flooding	Drought	Competition	Turbation
	Human	Trailing	Camping	Picking	GC Dam	Veg Clearing	
TCPs	*Natural*	Erosion	Deposition	Flooding	Drought	Competition	Turbation
	Human	Trailing	Camping	Vandalism	GC Dam	Visual	Noise

The impacts are then quantified and recorded in-field, on an agreed 5-point scale, from 0 (absent) to 4 (severe). Evaluations are compared with the previous year's data to ensure ranking rates are consistent. For example, if a trail has been ranked with a rating of 2 from the previous year, the preceding year's monitoring photos and data sheets are reviewed in comparison to current conditions. If no significant change has occurred, then the ranking remains the same as the previous year. If there has been improvement (positive) within a particular category, the rating decreases. If there has been a negative impact in relation to the previous year, then the rating increases. The forms and database also include comment sections to record qualitative data used for cross-year impact comparisons.

Additionally, qualitative data are recorded through interviews with trip participants. The questionnaire survey includes questions regarding Hualapai perspectives in relation to TCPs in the area relating to:

1. Cultural Significance of Fauna
2. Cultural Affiliation
3. Ethnobotany
4. Early Material Culture
5. Ancestral Cremations and Burials
6. Recreation and Tourism / Uses of Hualapai Lands

Hualapai perspectives include oral traditions in which stories about spirituality and the inter-relationship with the cultural significance of plants, animals, clans, materialism and the treatment of human remains, are communicated to trip participants. Hualapai perspectives on recreation and tourism are included within the results of this report. Dissemination of this particular information to a wider non-Hualapai public is at the discretion of the Hualapai Tribe.

Notes from the River

Reflections from Hualapai Department of Cultural Resources Loretta Jackson-Kelly, Principal Investigator:

We're monitoring this area because it's our traditional cultural property. It's also a sacred site. And we are looking at the impacts and assessing these impacts. We're comparing what we see today from what we recorded years prior, or the year before. Each river trip that we do, we stop and evaluate and assess the overall condition of TCP's that we have listed that we visit. We have over 45 TCP's that are on the active list. But we have close to a hundred TCP's that we have identified along the river, and that's not including the archaeology sites. There are over 400 archaeology sites that have been recorded previously, in the past by the National Park Service and also the Hualapai Tribe. We recorded some archaeology sites below Spencer Canyon and Pierce Ferry. So, we look at all of these areas and see, the natural erosions, and also the man-made impacts to these sites. And that could be through the operations of the Glen Canyon Dam and the fluctuating flows. And it could also be caused by side-canyon flash flooding and seasonal floods. (13.10.53 DVD 7, Day 5, August 17th 2010).

RESULTS AND DISCUSSION

HDCR coordinated the 20th PA BOR River Trip from May 17th - 29th, and August 3rd-10th, 2012. Between the two river trips, HDCR visited twenty-four monitoring sites (reference Table 3 below) with 17 participants and 8 boat experts (Table 4, below).

Table 3. ***Monitored TCPs 2012 Hualapai PA River Trips***

TCP 001 National Canyon, RM 166.5 L	TCP 024 Shinumo Canyon, RM 108.7/R
TCP 002 Mohawk Canyon. RM 171.5/L	TCP 025 Whitmore Helipad, RM 186L
TCP 003 Vulcan's Anvil, RM 178	TCP 028 Hotauta Canyon, RM 107.8R
TCP 007 Whitmore Canyon, RM 188/R	TCP 029 AZ:A:16:004, RM189.7L
TCP 008 Hematite Mine, RM 200.2/R	TCP 030 Vassey's Paradise, RM 31.8R
TCP 010 Granite Park, RM 209/L	TCP 031 Buck Farm Canyon, RM 31.7R
TCP 011 Pumpkin Springs, RM 212 L	TCP 032 Salt Mine, RM63 L
TCP 012 Three Springs Canyon, RM 215.6 L	TCP 033 Elves Chasm, RM 116.5L
TCP 013 AZ:G:380, RM 223/L	TCP 034 Stone Creek, RM 131.7R
TCP 014 Little Colorado River, RM 61.5/L	TCP 035 Forester, RM 122.7L
TCP 016 Deer Creek, RM 136/L	TCP 036 Olo Canyon, RM145.6L
TCP 017 Havasu Creek, RM 156.9/L	TCP 037 Tapeat's Creek, RM 133.8L

Table 4. ***HDCR May and August 2012 P.A. River Trip Participants***

Participant	***Position***	***Representing***	***2012 Trips***
Loretta Jackson-Kelly	Principal Investigator	HDCR	May
Dawn Hubbs, M.A.	Co-Principal Investigator	HDCR	May and August
Carrie Cannon, M.A.	Cultural Specialist-Ethnobotanist	HDCR	May and August
Marcie Craynon	Logistics Assistant	HDCR	August
Bennett Jackson	Cultural Resource Technician I	HDCR	May and August
Morris Sampson	Hualapai Consultant	HDCR	May
Jason Nez	Archaeologist	NPS	May
Helen Fairley	Socio-Economist	USGS	May
Brandon Siewiyumptewa	Hualapai Consultant	HDCR	August
Arthur M. Phillips III, Ph.D.	Consulting Botanist	HDCR	August
Wynona Sinyella	Hualapai Consultant	HDCR	August
Carrie Imus	Hualapai Consultant	HDCR	August
Lance Jones	Hualapai Youth	HDCR	August
Juan Sinyella	Hualapai Youth	HDCR	August
Sonwai Jackson	Hualapai Youth	HDCR	August
Charley Bulletts	Director	S.Paiute Consortium	August
Travis Hamilton	Videographer Holt-Hamilton	HDCR	August
Carol Fritzinger	Boatperson	GCMRC	May
Jeff Behan	Boatperson	GCMRC	May
Sarah Baden	Boatperson	GCMRC	May
Bryant Bergot	Swamper	GCMRC	May
Lynn Roeder	Boatperson	Ceiba Adventures	August
Carolyn Alvord	Boatperson	Ceiba Adventures	August
Nancy Pistole	Swamper	Ceiba Adventures	August
Matt Oliphant	Swamper	Ceiba Adventures	August

For the 2012 HDCR PA BOR river trips, participants joined the HDCR team in combined May and August trips, with boatpersons, and swampers from the Grand Canyon Monitoring and Research Center (GCMRC) and Ceiba Adventures (Reference Table 4, above). We thank participants and boat crew for their dedication and hard work

HDCR May and August 2012 P.A. River Trip Participants




















Top Row, Left to Right*: Carol Friztinger, Bennett Jackson, Morris Sampson, Loretta Jackson-Kelly, Carrie Cannon, Wynona Sinyella, Juan Sinyella*

Second to the Top*: Art Phillips III Ph.D, Jeff Behan, Sarah Baden, Bryant Bergot, Lynn Roeder*

Third to the Top*: Jason Nez, Lance Jones, Dawn Hubbs, Nancy Pistole, Sonwai Jackson , Travis Hamilton*

Bottom Row*: Carrie Imus, Marcie Craynon, Helen Fairley, Matt Oliphant, Carolyn Alvord, Charley Bulletts, Brandon Siewiyumptewa*

For the August 2012 PA River Trips, both qualitative and quantitative data were collected at each of the TCPs listed above and recorded in-field. In this report, we present our analysis of natural and human impacts to Hualapai TCPs, associated features and ethnobotanical resources located within the traditional Hualapai lands of the Colorado River Corridor. Qualitative data were gathered through interviews using the Hualapai TEK based surveys. These data were subsequently transferred to the Hualapai Colorado River Corridor TCP Evaluation database and analyzed.

Management Summary

Although river flow fluctuations impact TCPs located nearest the river in a variety of ways, (both beneficial and detrimental), human impacts such as trailing, collection piles and vandalism are most responsible for the declining integrity of several culturally significant areas located along the river, side canyons, high terraces and benches, natural springs, and historic travel routes. Impact attributes from 2008 through 2012 (total of 88 sites) are noted on Figures 1 through 3 and Table 5, below.

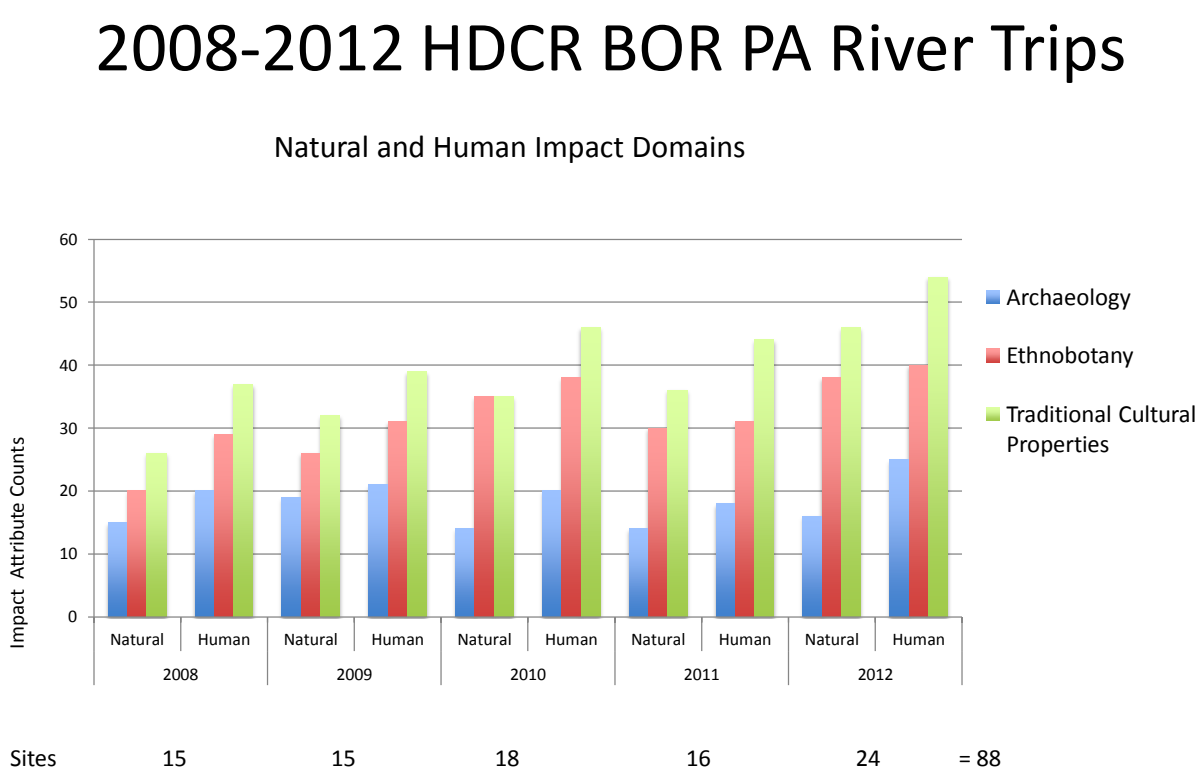


Figure 1. Natural and Human Impact Domains for Archaeology, Ethnobotany, and TCPs: 2008-2012 Totals.

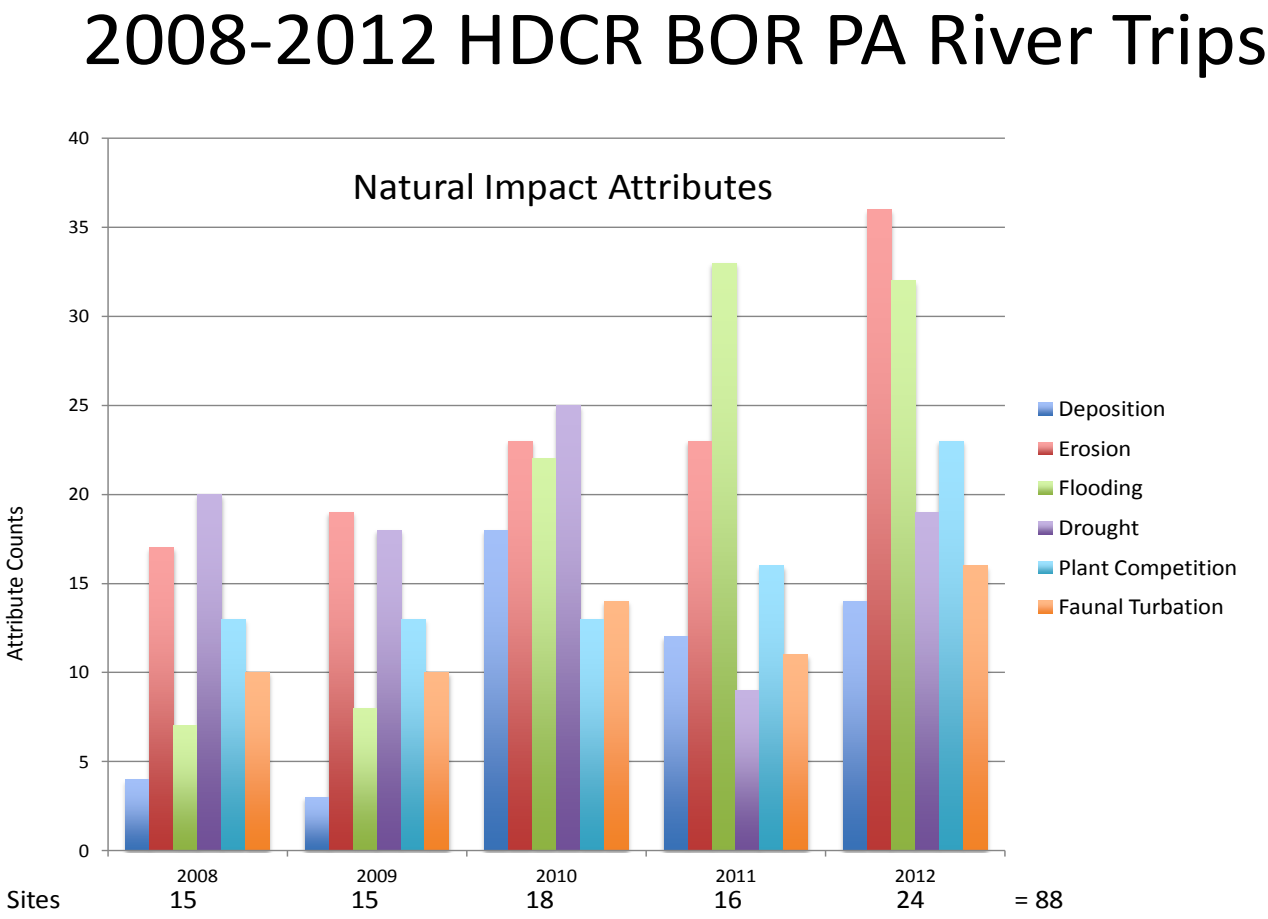


Figure 2. *Cultural Ethnobotany*: Natural Impact Attribute 2008-2012 Totals

Figure 1, page 12 above, reflects quantitative results for natural and human impact domains of Archaeology, Ethnobotany, and TCPs from 2008-2012. Figures 2 above and 3 below, reflect quantitative totals from 2008 through 2012 for natural and human impact attributes to cultural ethnobotanical areas of importance to the Hualapai. It should be noted that for 2012, twenty-four sites were visited which occurred over two river trips, that of May and August 2012. This has inflated the attribute counts for 2012 on all three figures. Figure 1 above reflects that from Hualapai's perspectives TCPs are being impacted above ethnobotany and archaeological resources. Figure 2, as seen above, reflects that erosion, flooding and drought are the three main impact attributes affecting cultural ethnobotanical resources of importance for the Hualapai. Drought conditions appear to have improved slightly from 2010, however in 2012, drought conditions appear to increase. The high-flows of 2011 could have had a positive effect on plant communities along the lower river corridors in 2011. It is possible that the steady flows in 2012 were not high enough (csf capacity) to continue eliminating drought-like conditions along the lower river corridors as seen in 2011.

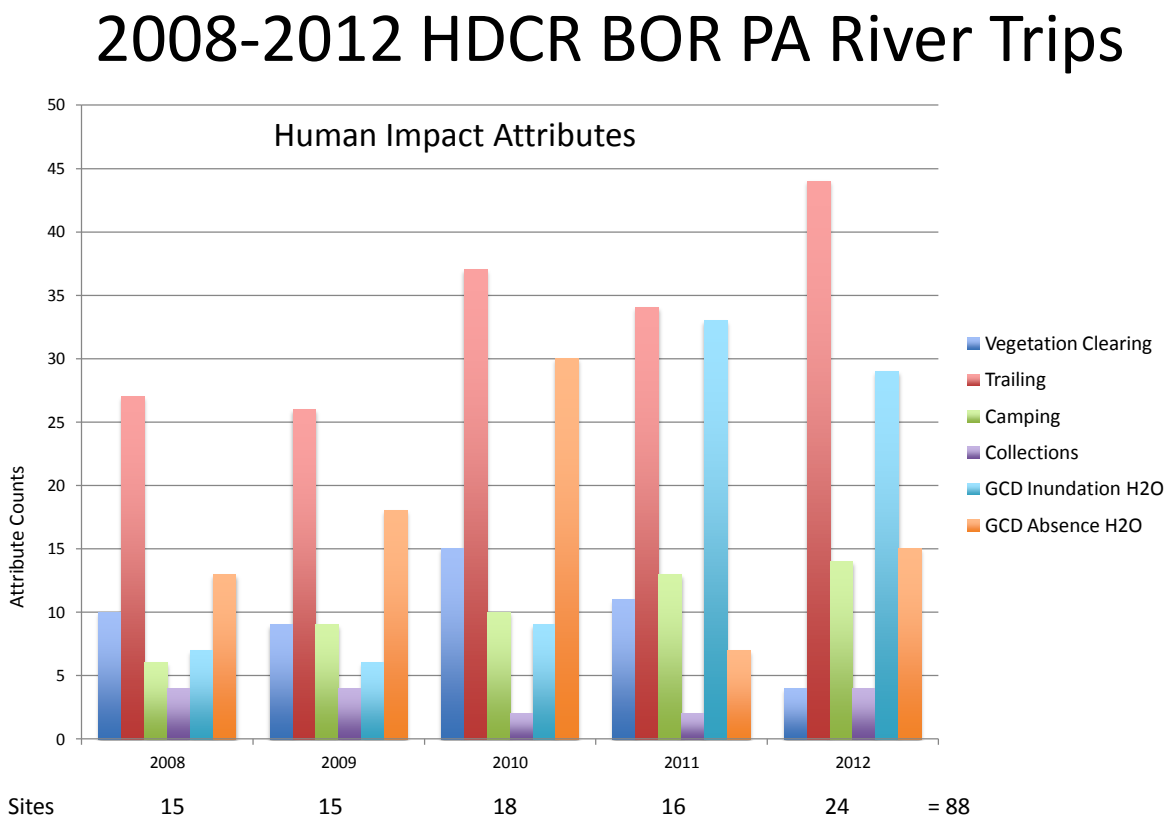


Figure 3. *Cultural Ethnobotany*: Human Impact Attribute 2008-2012 Totals.

Figure 3, above, reflects quantitative attributes reflecting human impacts to cultural ethnobotanical areas of importance to the Hualapai. Again, 2012 is inflated due to visiting 24 sites rather than the average of 15-18 sites. Trailing appears to be the prevailing impact attribute, followed by vegetation clearing. High flows in 2011 appears to be a third impact however, inundations are also considered a positive impact as reflected at Pumpkin Springs which was completely submerged. This created a "cleansing" environment for the mineral springs, allowing algae build-up from 2008-2010 to be flushed out of the Pumpkin. What is lacking in the Human attribute graph is behavioral attributes, for example, visitors standing and jumping off the Pumpkin into the River. Most likely they do not realize that their behavior is disrespectful to Hualapai belief that Pumpkin Springs is a sacred traditional place, and that their actions are creating a disturbance within the area and also damaging the delicate Pumpkin feature.

Table 5. ***TCP Impact Evaluation Summary for Monitored 2012***
Ratings: 0 (absent), 1(slight), 2(moderate), 3(heavy), 4(severe)

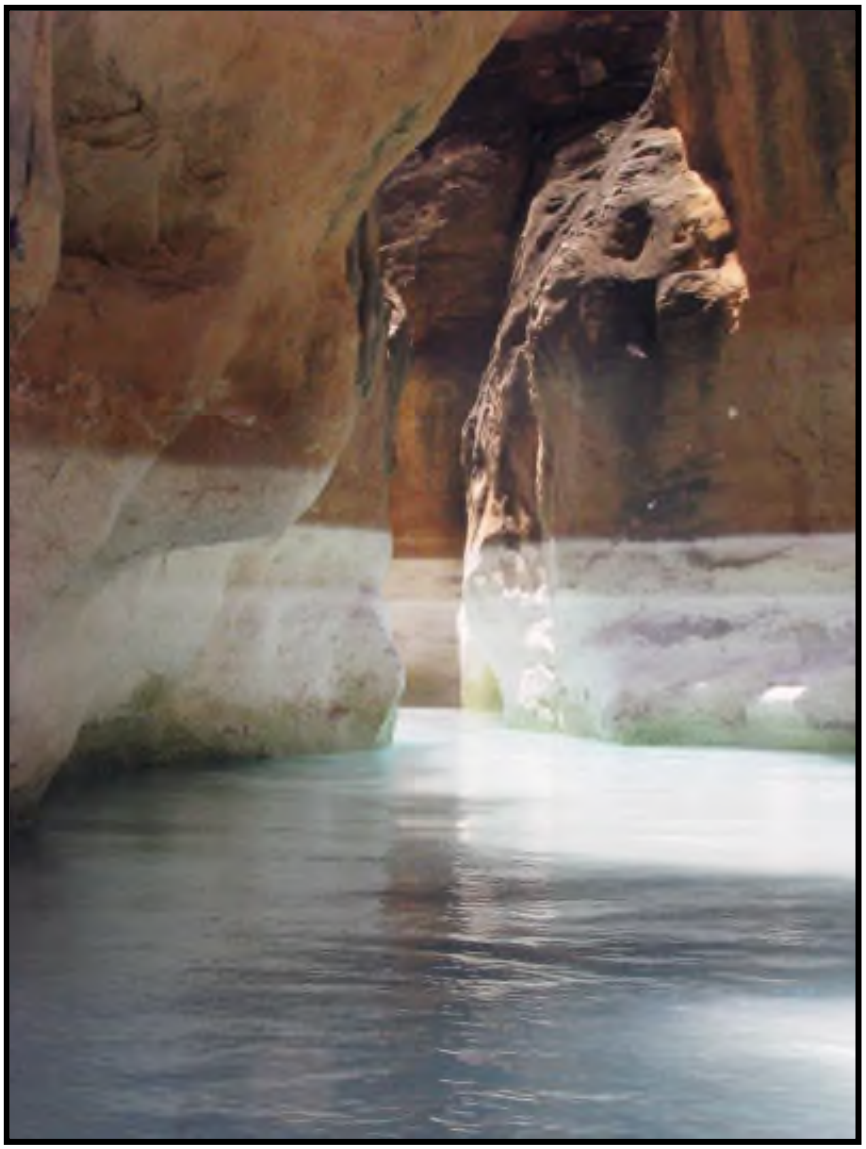
TCP	Natural Impacts	Human Impacts	Comments
TCP 001 National Canyon	3	1	Flash Floods
TCP 002 Mohawk Canyon	3	1	Flash Floods
TCP 003 Vulcan's Anvil	1	1	Minimal impacts: (Public education is very positive)
TCP 007 Whitmore Canyon,	3	3	Trails-erosion /visitor activity conflicts w/tribal values
TCP 008 Hematite Mine	3	3	Erosion-gullying/Tribal Trailing
TCP 010 Granite Park	2	4	Goodding Willow; Erosion - Rock shelter-Vandalism
TCP 011 Pumpkin Springs	1	4	Diving from Pumpkin /visitor activity conflicts w/tribal values
TCP 012 Three Springs Canyon	2	2	Trailing/moving artifacts
TCP 013 AZ:G:380	1	3	Moderate trailing/picking
TCP 014 Little Colorado River	1	3	Visitors activity conflicts w/tribal values
TCP 016 Deer Creek	1	3	Trailing erosion/visitor activity conflicts w/tribal values
TCP 017 Havasu Creek	1	3	Trailing/visitor activity conflicts w/tribal values
TCP 024 Shinumo Canyon	1	3	Trailing/visitor activity conflicts w/tribal values /pools
TCP 025 Whitmore Helipad	1	3	Trailing/graffiti/helicopters-normal activities
TCP 028 Hotauta Canyon	1	1	Minimal impacts
TCP 029 AZ:A:16:004	1	1	Minimal impacts
TCP 030 Vassey's Paradise	1	1	Minimal impacts
TCP 031 Buck Farm Canyon	1	1	Minimal impacts
TCP 032 Salt Mine	3	3	Tribal Visitors-trailing / erosion, drought
TCP 033 Elves Chasm	1	3	Visitor activity conflicts w/tribal values. Human-constructed pools
TCP 034 Stone Creek	1	2	Human-constructed Pools
TCP 035 Forester	1	1	Minimal impacts
TCP036 Olo	1	1	Minimal impacts
TCP037 Tapeat's Creek	1	1	Minimal impacts
Total Ratings:	**36**	**52**	

As reflected in the above Table 5, HDCR monitors noted for 2012, that four TCPs were heavily impacted these being Whitmore Canyon Heli-pad -TCP 025; Granite Park -TCP 010; Pumpkin Springs - TCP 011; and Three Springs Canyon -TCP 012. Natural impacts such as deposition and or erosion to TCPs in general, seem to be most prevalent where high flow or lack of recharge (low flow) impacts, affect the integrity (can be positive or negative) of the environment. Flash flooding occurred in July 2012 affecting National Canyon (TCP001 RM166.5 L) and Mohawk Canyon (TCP002 RM171.5 L) with beaches and side-canyon's being flooded. The Salt and Hematite mines are impacted both through tribal activities, gullying, erosion and also negative impacts to vegetation through drought and river fluctuation.

Human impacts are evident at Granite Park due to new graffiti vandalism within the rock shelter. At Pumpkin Springs, impacts of scuffing/abrasion marks on the top of the rind caused by persons jumping off the Pumpkin into the River were noted. This is a great concern and an impact to Hualapai spiritual practices. Whitmore heli-pad area impacts are due to visitor, graffiti, and helicopter activities. Rock alignments to hold water creating "pools" are also prevalent in water-fall areas such as Deer Creek, Havasu, Shinamu, and Elves Cavern. Rock-writings at TCP012 and TCP013 are relatively stable. TCP's with minimal natural and human impacts are less accessible, or have restricted access. TCPs with minimal natural impacts but have high human impacts appear to be sites with heavy visitor access. Over-all, Hualapai were not able to complete traditional ceremonies at several sites due to the lack of access because of visitor numbers and visitor activities conflicting with tribal values.

Notes from the River
Reflections from Hualapai Department of Cultural Resources Ethnobotanist and Monitor Carrie Cannon:

This River Trip: … is a mix between culture and anthropological science and plant science. I enjoy it a lot because it blends both worlds. You're doing some monitoring of cultural sites, botanical sites and you're also doing some traditional practices, visiting areas, and doing prayer offerings. And in the previous trips they've sung the bird songs for the different places. And so I really enjoy it. It's a nice blend of science and culture. And it manifests itself in not just looking at these "arch" sites as something of the past, which they are, but us going here, particularly the Hualapai Tribal members, it's kind of bringing the past into a living tradition, and so the culture is not gone. So being here is just a continuation of that long thread of history (DVD 14, 1.54.36, RM. 246 - Day 12, August 24, 2010).



HAVASU CREEK AT RIVER LEVEL, MAY 2012 (PHOTO BY DAWN HUBBS, HDCR ©2012)

2012 HDCR MONITORING TRIP: TCP EVALUATION AND RECOMMENDATIONS

TCP 001 – NATIONAL CANYON, RM 166.5 L

Features

Hualapai site monitors visited TCP001 on May 25th, 2012. On August 8th 2012, Hualapai monitors completed three plant transects in the general area. A rock cairn located on a talus slope at Tuckup Canyon (RM 165 L), about 70 meters above the river bank marks the northeast boundary line of the Hualapai Reservation lands. A roasting complex (AZ:B:09:317), located at RM 166.4L and TCP 001 (National Canyon) are the farthest upstream TCP located on Hualapai Reservation lands in the Colorado River Corridor. The site consists of a large roasting pit with associated lithic scatter, and some miscellaneous stone tools. TCP 001 and the roasting complex were evaluated and analyzed for natural and human impacts in December 2005, in 2009, 2010, and 2011. In 2011 HDCR monitors noted that the blockage of the trail (blocked in 2008) to the upper bench archaeological site appeared to be a successful deterrent to visitation (Reference Figure 1, Photos A-B). In 2012, however, the branches obscuring the trail to the upper bench had been cleared, so HDCR monitors replaced them. Other trailing along the roasting complex appears to be non-existent, with no artifact piling noted (Reference Figures 4-8, below).

A-6539-2010 B-2353-M2012

Figure 4. TCP 001, National Canyon, view east. Photo A: 2010; Photo B: May 2012.

C-9577-2011

D-2365-M2012

Figure 5. TCP 001, National Canyon, looking east, trail to upper bench site. Photo C: 2011; Photo D, May 2012.

E-9578-2011

F-2368-M2012

Figure 6. TCP 001, National Canyon, View east at upper bench site. Photo E: 2011. Photo F, May 2012.

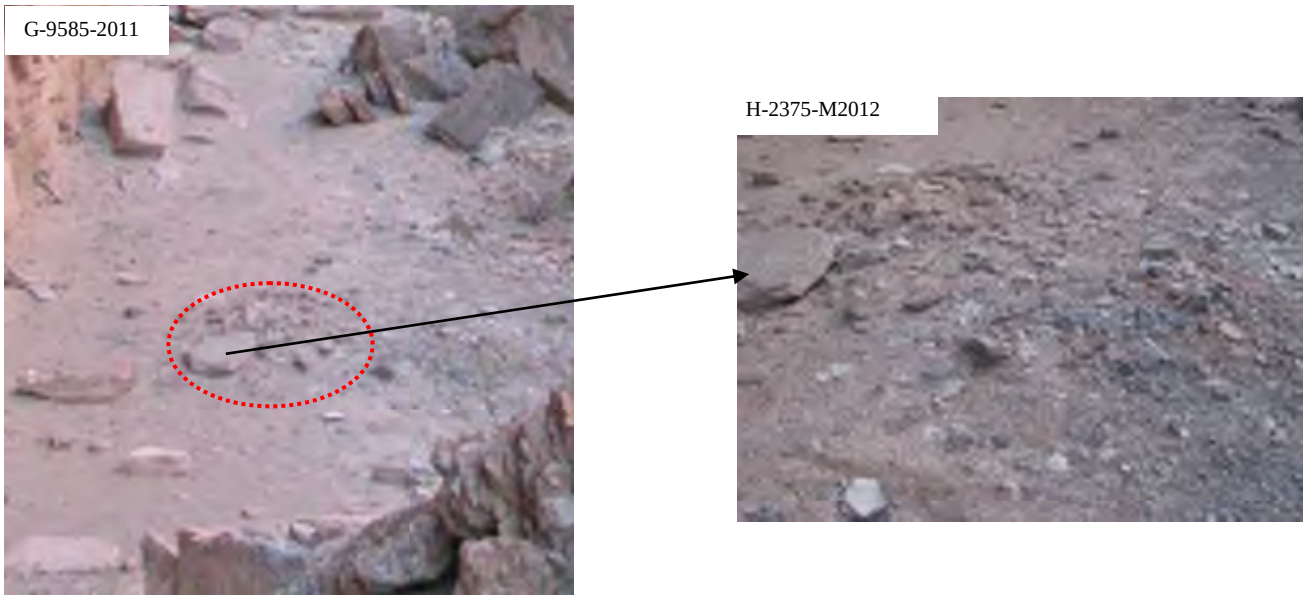


Figure 7. TCP001, National Canyon, Photo G taken in 2011, view of roaster on upper bench site. Photo H, roaster close-up May 2012.

The roaster on the upper bench, as seen in Photos G:9585-2011 and H-2375-M2012 above, shows little evidence of recent human impact. Natural impacts to the archaeological complex include slight to moderate gullying along the slope on the river side of the roaster, due to rain and slight surface alluvial erosion along the top of the slope. A significant natural impact to National Canyon was the flood event that took place in July 2012. Figure 8, Photo I (below, view south) was taken as a composite in August 2012.

Figure 8. TCP001, National Canyon, Photo I as a composite taken in August 2012 while passing the site.

Ethnobotany

Three plant transects were completed on May 25th, 2012. Results are discussed in the Ethnobotanical Results section below.

Recommendation :

HDRC recommends an annual evaluation of TCP 001 to monitor and obliterate any new access trails to the roasting complex, if evident, in order to deter tourist visitation. As vegetation returns, HDCR will continue monitoring vegetation transects.

TCP 002 – MOHAWK CANYON, RM 171.5 L

Features

TCP 002 contains a multi-component roasting feature complex (AZ:B:13:2), including four or five roasting features, middens, artifacts and a rock overhang/shelter. Associated ethnobotanical resources at TCP 002 include creosotebush, wolfberry, Nevada Indian-tea, mesquite, globemallow, and California barrel cactus. Archaeological monitoring did not occur in 2012, however, plant transects were completed on August 9th, 2012. This TCP was initially evaluated by HDCR in 2001 and revisited by monitors in February 2003, 2004, 2005, 2009, and 2011. (Reference Figures 9-10, below).

A-9608-2011.

Figure 9. Left. TCP002 Mohawk Canyon, looking west. Photo A-9608-2011. On approach from the Colorado River.

B-3518-A2012

Figure 10. Right, Photo B, TCP002, Mohawk Canyon at right, shows impacts from the July 2012 flood event. Red arrow on Photo B at right, indicates approximate beach location on Photo A above.

Ethnobotany

C--9615-2011

TCP 002 contains typical lower canyon desert and riparian plants and most of the site is located above the influence of fluctuations in Glen Canyon dam releases. A plant species list for TCP 002, originally compiled in April 1995, was updated in December 2005, and 2009. The list was entered into the Hualapai Colorado River Corridor TCP Evaluation database in 2009 and will be updated as needed. Once again, participants of the August HDCR PA 2012 River Trip were able to hike to the middle-rocky terrace and gather prickly pear fruit (*Opuntia phaeacantha; photo right*) which can be eaten fresh or cooked. Further discussion is in the Ethnobotany Evaluation of this report.

Recommendations

HDCR recommends monitoring of TCP 002 every two years.

TCP 003 – VULCAN'S ANVIL, RM 178

Features
TCP 003 is a designated Hualapai Sacred Site, and includes a large, flat lava anvil located in the middle of the Colorado River at RM 178. *Wi-Nya-Ta-Lupa* (Flat Black Rock) is known as 'Vulcan's Anvil.' This place is said to have always been referred to in Hualapai language as the *Wi-Geth-Yea'a,* or the 'Medicine Rock.' This TCP also includes Lava Falls and an associated multi-component archaeological site (AZ:A:16:163), which consists of 2-3 structures, a rock shelter, lithic scatter, artifacts and a rock art panel. TCP 003 was evaluated by HDCR monitors in 2008, 2009, 2010, 2011, and May 25th and August 9th, 2012. HDCR monitors noted little change in the integrity of the site. During previous years' visits to TCP 003, HDCR has observed the presence of "offerings" left at the base of the rock by passing river trips. In 2012 HDCR monitors noticed that no items appeared on the cultural site.

It is maintained in Hualapai TEK and belief that medicine people receive their special power in and from the area around this rock, and from the rock itself. Hualapai oral traditions also recount that the creation of fire is associated with Vulcan's Anvil. For Hualapai, the entire Lava Falls area is regarded with reverence, due to the profound respect for the sacred powers residing in the environment of the canyons and the waters.

Recommendations
HDCR recommends continuing preservation options at TCP 003 that include public outreach and education to discourage tourist "offerings," and to provide insight into the Hualapai concept of sacred sites. HDCR recommends an annual evaluation of this TCP.

TCP 004 – MEDICINE SPRINGS, RM 179.2 L

Features
TCP 004 includes a multi-component archaeological site (AZ:A:16:157), which consists of a rock shelter, roasting features and artifacts. TCP 004 has an artesian spring, known to have been traditionally visited by the Hualapai people. The site itself was not visited, in 2011 or 2012 however, water from the spring along the river-bank was collected on August 9th 2012. The spring had changed course in 2009, creating drought-like conditions on the south end of the site which in 2011 have persisted. The marsh plants in that area were drying up due to the water-course change.

Ethnobotany
Medicine Spring supports a perennial pond on the lower bench, which is surrounded by dense thickets of marsh plants (Photo-2001, right). Important cultural plants present at TCP 004 include giant reed, arrow-weed, gray-thorn, Indian-tobacco, and coyote willow. Some of these have medicinal and other cultural significance. A plant species list of TCP 004

A-2001

was compiled in March 1998. The list was entered into the Hualapai Colorado River Corridor TCP Evaluation database in 2001 and 2009.

Recommendations
HDCR recommends monitoring of TCP 004 every two years if fluctuating river and spring channel changes permit access.

TCP 005 – ARTESIAN SPRINGS, RM 196 L

Features
TCP 005 includes an artesian spring discharging directly into the Colorado River. At water releases higher than about 10,000 cfs it is covered by the river. It is known to have been traditionally visited by the Hualapai people. Associated ethnobotanical resources at TCP 005 include mesquite, giant reed, and coyote willow. The outlet of Artesian Spring is at the edge of the river, (Figure 12 below) and is flooded at all but the lowest releases from the dam. In June 2001 (about 11,000 cfs) the outlet was barely visible. The spring was not located during the 2012 season due to the site being under water.

A-Taken in 2001.

TCP005 Left. Photo A-taken in 2001 as seen along the riverbank. This TCP was accessible in 2001 due to low flows.

Recommendations
HDCR recommends an annual evaluation of TCP 005. If it is visited at a water level low enough that the outlet is visible, photos should be taken for the HDCR site files.

TCP 006 – RM 197.2 L ROASTING COMPLEX

Features
TCP 006 (RM 197.2 L) includes an a-ceramic archaeological site (AZ:A:15:19), which consists of two roasting features, lithic scatter and basketry artifacts located at the base of an overhanging Bright Angel cliff face. This TCP is on a steep, shaded north-facing talus slope that receives little direct sun and consequently supports dense, shade-loving vegetation because of its cooler, moister conditions. Significant plants present at TCP 006 include creosotebush, Arizona cotton, Whipple yucca, globemallow, and Nevada Indian-tea. TCP 006 was not visited in 2012.

Recommendations
HDCR recommends an evaluation of TCP 006 during the 2013 field season, if the site is accessible.

TCP 007 – WHITMORE WASH, RM 188 L

Features

TCP 007 includes a side canyon multi-component archaeological site (AZ:A:16:159), which consists of a rock shelter, artifacts and pictographs (including a map of trails to the Colorado River to and from Prospect, Mohawk and National Canyons). HDCR did not monitor this site for photo matching in May 2012, but did monitor the trails on August 9th, 2012. This site is a pathway for visitors who arrive or hike in from up top, passing the rock-writing panel, on their way down to the river to wait for boat passage. Hualapai's concern is that these visitors are possibly not receiving cultural sensitivity /education information about what it is they are seeing or how important it is to not touch the rock writing elements.

In August, Hualapai monitors noted erosion occurring on the trail in front of the rock-writing panels, and further down along the visitor's trail leading to and from the river, (Reference Figures 11-12 below). An additional impact noted is bank erosion and slight gullying along the lower trail to and from the River due to rain run-off. Due to high visitation, both from below at the boat-docking area, and from above, the entire site is being heavily impacted with visitors as they hike and gather along the rock-writing panels. We do not know if the erosion from the rain would occur or be noticeable if the trail did not exist.

Figure 11. TCP007, Whitmore Canyon. Photo A, view north-east. Over-view of rock-writing panel, August 9, 2012. Photo B, view north-east. Trail erosion from rain run-off.

Photo C-3541 A2012

Photo D-3542 A2012

Photo E-3545 A2012

Photo F-3546 A2012, view south

Photo G-3547 A2012, view east

Figure 12. Photo C, view north, trail erosion, just north of the rock-writing panel. Photo D, view north, trail erosion, just below the trail to the rock-writing panel. Photos E-G, trail erosion along the path to the rock-writing panel.

Ethnobotany
Important ethnobotanical resources at TCP 007 include creosotebush, mesquite, arrow-weed, California barrel cactus, and four-wing saltbush. The Hualapai Tribe does not carry out formal ethnobotanical evaluation at this site; however, it is a regular plant monitoring site for the Southern Paiute Consortium.

Recommendations
Due to heavy visitor impacts, Hualapai are recommending that this TCP be closed to visitors. If closure is not an option, a public education program should be implemented for visitors. The eroding trails need to be repaired as soon as possible. HDCR recommends an annual evaluation of TCP 007.

TCP 008 – HEMATITE MINE CANYON, RM 200.2 R

Features
TCP 008 is a traditional Hualapai paint gathering and processing area and includes an archaeological site (AZ:A:15:25), which consists of a hematite cave/mine and associated artifacts. This TCP is quite rich in ethnobotanical resources, mostly in the small basin below the cave and along the dry wash that leads to the river. Important culturally significant plants include creosotebush, prickly pear, snakeweed, mesquite, globemallow, and brittlebush. Hualapai monitors visited TCP008 on May 27th, 2012, noting that there is evidence of side-gully erosion on the eastern and western side of the upper bench. Archaeological materials, located on the upper bench, but below the mine, appear to be un-torched (Reference Figures 13-14, below) and are not in eminent danger of eroding out.

A- 2773-M2012

B- 2775-M2012

Figure 13. TCP008, Hematite Mine. Photo A, view southwest; Photo-B, view southeast. Recent rain activity has caused some gullying on the eastern and western side of the upper bench.

C-2798-M2012, view south

D-2813-M2012, view west

Figure 14. Photos C above and-D at left. Archaeological materials on upper bench, just below the mine.

Traditional knowledge regarding the mineral Hematite as recorded in 1996, *"is highly valued as a sacred mineral, not only by the Hualapai, but by all other neighboring tribes surrounding the Hualapai Ancestral Territories … religious beliefs…require that Hualapai Tribe fulfill its sacred stewardship of the site, in continued maintenance of traditional cultural practice at this TCP…It is said that great caution, stamina, and humility are required of those who might extract a measure of the mineral substance from the mine," (Jackson and Stevens, 1994:13).*

Ethnobotany

This site is quite rich in ethnobotanical

resources, mostly in the small basin below the cave and along the dry wash that leads to the river. One area of concern are that flash floods could remove plants in the basin (which is at the base of a waterfall) causing scouring, erosion, and sediment deposition along the drainage. A plant species list of TCP 008 was compiled in March 1998, and updated and entered into the Hualapai Colorado River Corridor TCP Evaluation database in 2009. It will continue to be updated as needed.

Recommendations
HDCR recommends the obliteration of visitor trails other than the main access trail. There is a trail forming on the first ridge to the north of the wash which needs to be blocked off. The gullying needs to be monitored, and if necessary, water run-off deterrents that slow run-off, may need to be placed in the gullies. On the upper bench where the archaeological materials are located, it is recommended that erosion deterrents be put in place as a precautionary measure against archaeological materials eroding out. HDCR to continue annual monitoring of TCP 008.

TCP 009 – 205 MILE CANYON, RM 205 L

Features
TCP 009 includes an archaeological site (AZ:A:15:4), located at the mouth of the first alluvial terrace above the river, which consists of roasting features, lithic scatter, artifacts and a historic travel route. Perhaps the most important cultural feature of TCP 009 is a midden, located along the side canyon. Several other side canyon archaeological sites are located farther away from the river. Associated ethnobotanical resources include Whipple yucca, globemallow, Nevada Indian-tea, and creosotebush. This TCP was not evaluated by HDCR monitors in 2012.

Recommendations
HDCR to monitor of TCP 009 in the 2013 season, if feasible.

TCP 010 – GRANITE PARK, RM 209 L

Features
TCP 010 includes an archaeological site (AZ:G:03:3), which consists of a rock shelter, roasting features, lithic scatters, artifacts and a historic travel route. In this area within a two mile radius, there are several associated archaeological sites (AZ:G:3:2, AZ:G:3:24, AZ:G:3:25, AZ:G:3:26, and AZ:G:3:28), consisting of another rock shelter, roasting features, lithic scatter, artifacts, middens, and wickiup depressions. A full evaluation of this TCP (including archaeology and roasting features) was conducted by HDCR in March 2003 and June 2004. The site was not monitored for impacts to the TCP in May 2012 due to the presence of visitors. TCP010 was visited again by Hualapai monitors on August 10th, 2012. Results are noted in the ethnobotanical results section of this report. In this discussion regarding TCP010 –Granite Park, there are two parts recorded in August 2012. The first will discuss a vandalism event at the rock shelter, and the second portion will discuss other human and natural impacts at TCP010. Plant transects completed in May and August 2012 are discussed in the ethnobotanical results portion of this report.

On August 9th 2012, the HDCR Staff monitoring team arrived at Granite Park (RM 209, Reference Figures 15-17, below) in the late afternoon of August 9, 2012. Mr. Bennett Jackson Cultural Resource monitor began preliminary data collection for TCP10 and returned to camp to inform Ms. Dawn Hubbs, Archaeologist and Co-Principal Investigator, that he had found several elements of graffiti on the rock walls of the rock shelter at AZ:G:03:03, located on the farthest downstream finger of Granite Park delta. The site, originally recorded by G. Gumerman and R. Euler in September 1969, is the cliff/rock shelter noted as Feature 1, on IMACS SITE FORM, Intermountain Antiquities Computer System, Agency GRCA/HUAL, recorded January 31, 1991. As the light began to fade, it was mutually decided to record the vandalism as soon as possible the next morning. On August 10th, at 7:50 a.m., HDCR monitors recorded 9 elements of graffiti vandalism on the rock face of the cliff/rock shelter. The incident was documented and subsequently submitted to the National Park Service on September 5th, 2012.[1]

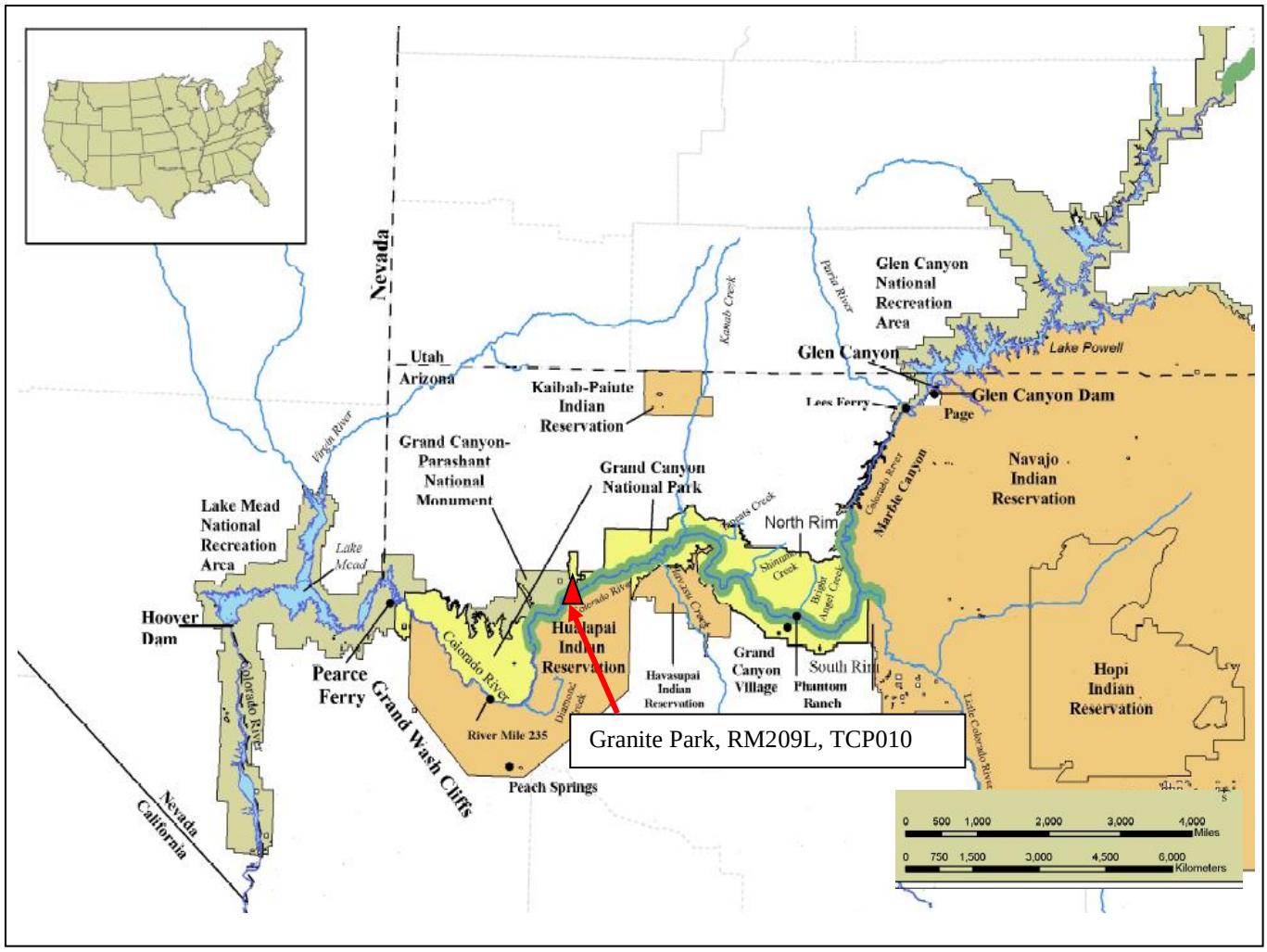


Figure 15. Location Map[2]: Granite Park, RM 209, Colorado River

[1] Submitted September 5, 2012, to: National Park Service, Grand Canyon National Park, P.O. Box 129Grand Canyon National Park, Arizona reference HDCR File: 2012-144

[2] Map from: Bureau of Reclamation Biological Assessment Regarding Non-native Fish Control Downstream From Glen Canyon Dam, January 28, 2011http://www.usbr.gov/uc/envdocs/ea/gc/nnfc/Appdx-C.pdf

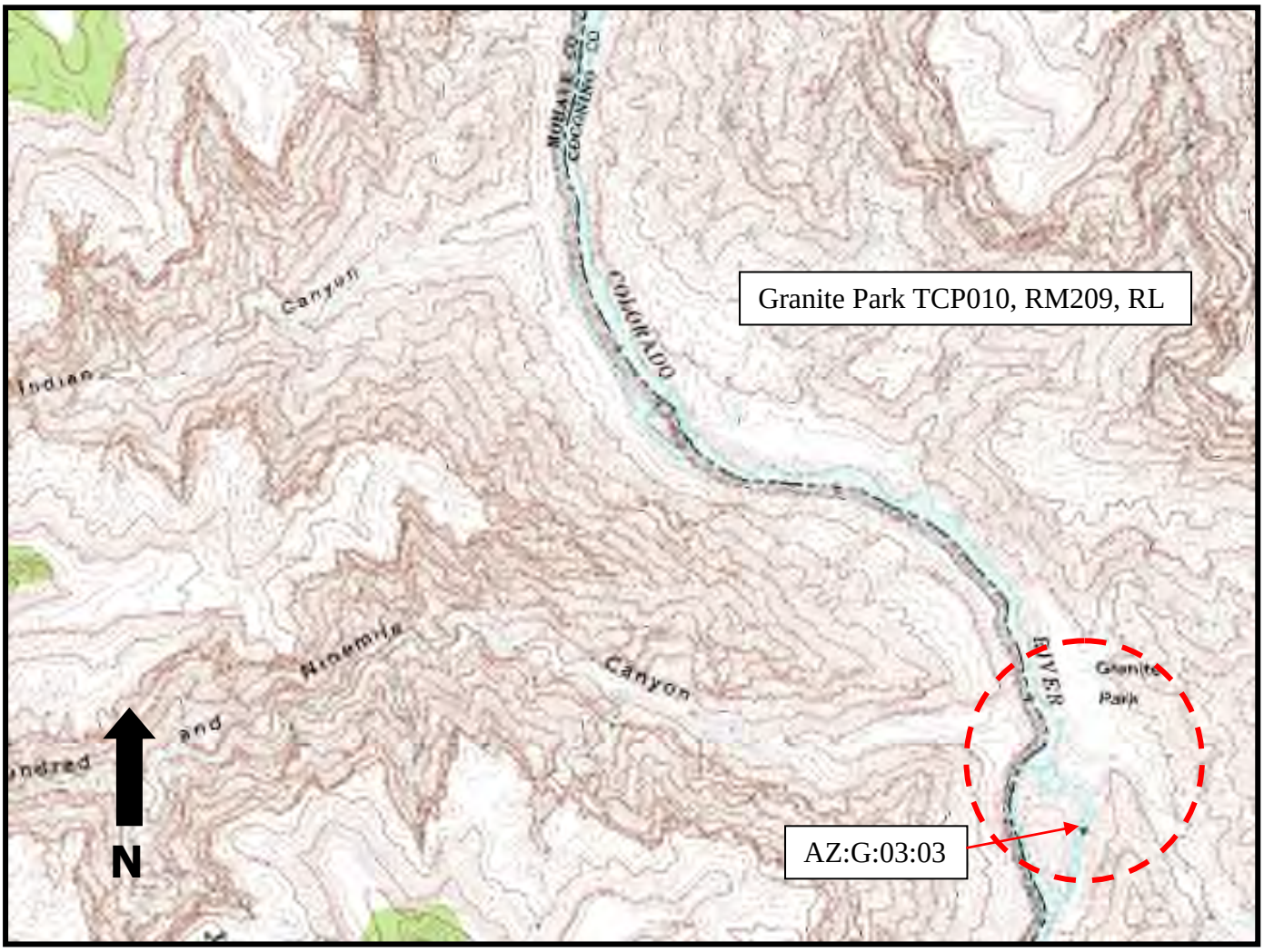


Figure 16. Site Vicinity Map Granite Park Quadrangle, 1:2400 7.5 1967
UTM 12S 291 280E 3982 337N NAD27

Photo A-3573-82012. Granite Park TCP 010, AZ:G:03:03. Entrance to the Cliff/Rock shelter, view east.

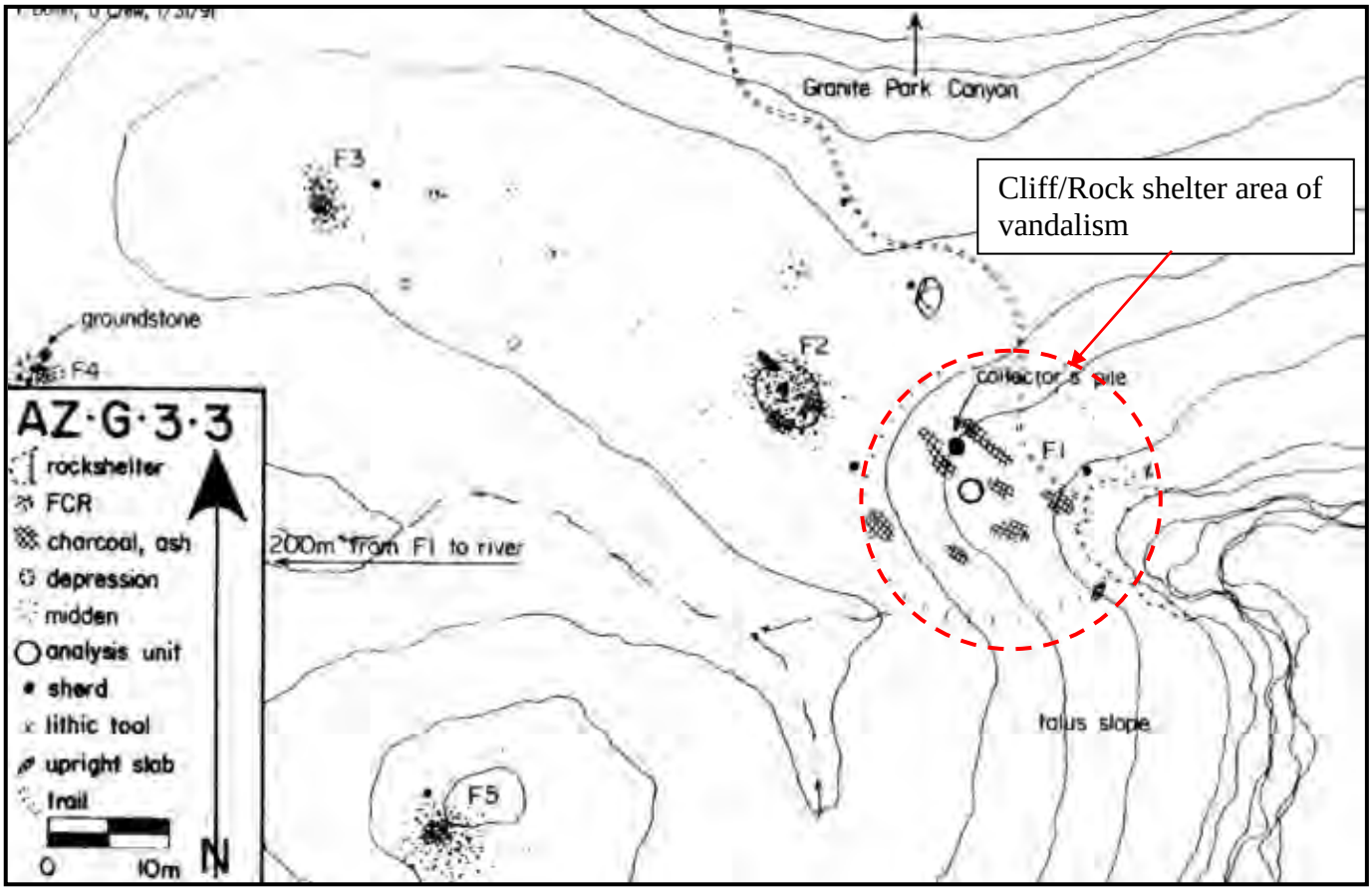


Figure 17. Archaeological Site AZ: G: 03: 03 Location Map. Granite Park, TCP 010 RM 209L. (IMACS Site Form Map from 1991 site recording T. Dolan, and D. Crew)

The site is approximately 150 meters from the river and about 33 meters above the 28,000 CFS level. Feature 1, as noted on the IMACS SITE FORM, (Intermountain Antiquities Computer System, Agency GRCA/HUAL, recorded January 31, 1991) consists of a shallow overhang rock shelter, with a base of ashy soil. The vandalized area consists of 9 scratched elements (Reference Figures 18-27, below) which are located on the rock face, immediately above and adjacent to the "ceiling" area of the rock shelter, with one element actually on the "ceiling" of the rock shelter. As far as can be ascertained, the vandalism occurred between February 2012 and August 2012, (personal communication Ms. Ellen Brenan, Cultural Resources Program Manager, Grand Canyon National Park, September 20, 2012). Investigations by the National Park Service provided no additional leads or information. The incident is still considered an on-going investigation by the Hualapai Tribal Police. The Grand Canyon National Park Service is working in co-operation with the Hualapai Tribal Police and the Bureau of Indian Affairs (Phoenix Area Office) to investigate further and will develop a mutual managed remediation plan to address the vandalism at the rock shelter (Hualapai Tribal Council, January 4, 2013).

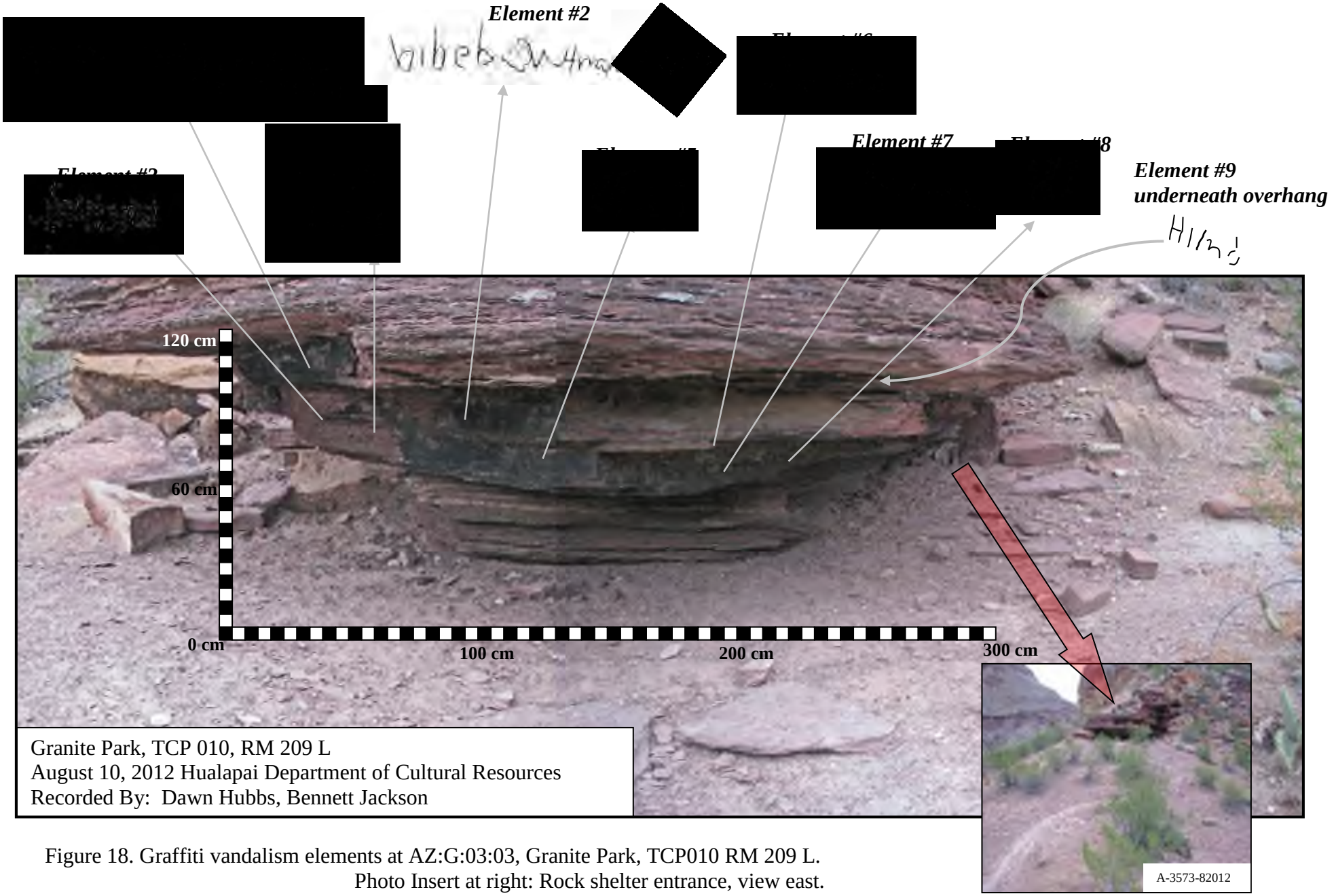


Figure 18. Graffiti vandalism elements at AZ:G:03:03, Granite Park, TCP010 RM 209 L.
Photo Insert at right: Rock shelter entrance, view east.

E1-3665-081012

Figure 19. Element #1-3665-081012.

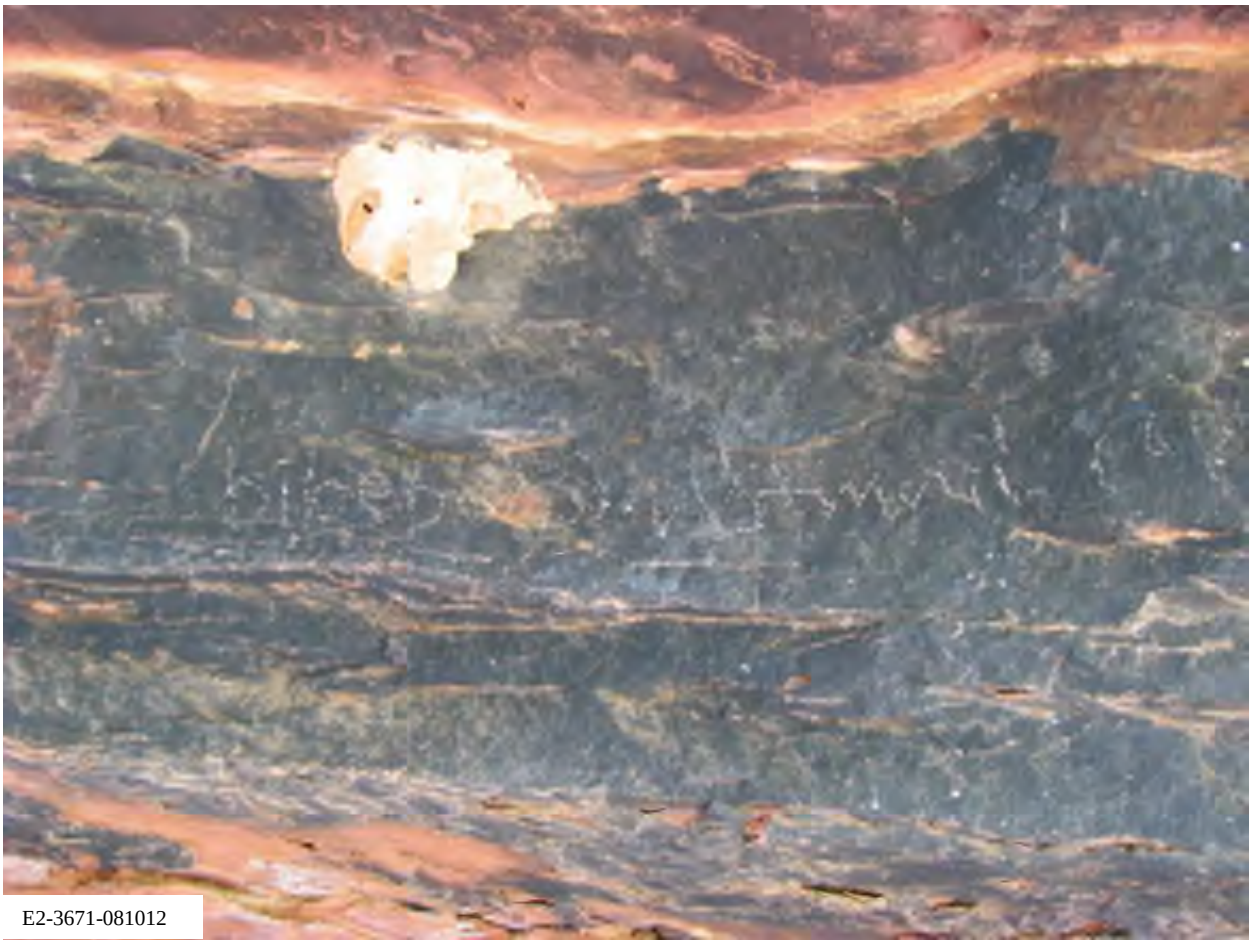


Figure 20. Element #2-3671-081012.

Figure 21. Element #3-3649-081012

Figure 22. Element #4-3661-081012

E5-3657-081012

[redacted]

Figure 23. Element# 5-3657-081012

E6-3652-081012

[redacted]

Figure 24. Element #6-3652-081012

-3653-081012

Figure 25. Element #7-3653-08

E8-3685-081012

Figure 26. Element# 8-3685-081012.

E9-3651-081012

Figure 27. Element #9-3651-081012, on ceiling of overhang.

With other impacts at Granite Park, Figure 28, below shows composite photos of the rock shelter, AZ:G:03:03 previously discussed. Photo E taken in August 2010; Photo F, taken August 2012. The artifacts noted in 2008-2010 in the rock shelter are no longer on site in August 2012. Photos of the artifacts were taken in 2008 by HDCR monitors, as seen in a collection "pile," Photo G-1865 at bottom left.

E- 6880 & 6882-2010

F-3574-3576-3577-8/2012

G-1865-2008

Figure 28. Composite photos of the rock shelter, above top taken in 2010. Center taken in 2012. At left, photo G taken in 2008, illustrates a "collection pile," of artifacts from the rock shelter.

Near the rockshelter, other natural impacts, such as erosion and arroyo cutting, were recorded by HDCR monitors as slight to moderate, but dune slumping along the middle bench has increased from previous years' visits, (Reference figures 29-31).


G-3561-8/2012

Figure 29. Photo Right, G-3561-8/2012. View west just below the rock shelter. Dune slumping on the edge of the ridge trail.


B-9748-2011


H-3591-8/2012

Figure 30. TCP010, Granite Park. Left Photo B-9748 from 2011, view east towards the rock shelter AZ:G:03:03. Main trail runs through the middle, upper ridge-line (Ridge Trail), across debitage towards the rock shelter. Photo Right: H-3591 taken in August 2012.

I-3584,3585,3587,3588,3589-8/2012

Figure 31. Composite Photo I, above. View west towards Colorado River from AZ:G:03:03 showing modern-day trail system. The southwest trail is not as popular as the main ridge trail leading directly to the rock shelter, thus there are less use impacts.

Trailing from the side canyon to the rock shelter was noted with heavy trailing recorded along the middle of the upper ridge-line center to the rock shelter, i.e. --trails getting deeper, with very loose soil. Less trailing impacts were noted on the south side of the upper ridge-line indicating that visitors are not leaving the main middle ridge-trail leading to the rock shelter, however it may be that numbers of visitors are having an impact on the depth and width of the existing main trail further west where the soil is powdered and loose, (Reference Figures 32-33 below).

Figure 32. Photos Left: H-9782-2011, shows trailing to upper bench area becoming wider and deeper over time. Photo J-3556 (same location as H) was taken in August 2012.

Elsewhere at Granite Park, as noted from 2010 through 2012, trailing impacts continue on the upper bench area near the roasters and going east away from the Colorado River (Figure 27, Photo G). Trailing impacts to the roaster can be seen here from 2010.

Figure 33. TCP 010, Granite Park, Photo upper left: G-6874 taken in 2010, view south.

Figure 34. TCP010, Granite Park, Photo K above taken in August 2012. Upper bench area of roasters, view north showing various trails in the forefront and background.

For Hualapai, (Figure 34) impacts to Granite Park; --vandalism, trailing, and visitors- are disconcerting. Hualapai monitors note that over the last 20 years, there have been trails crossing through the roaster areas. Several Hualapai Elders in the early 1990s commented that "…activities have caused deleterious impacts to the natural environment and its cultural and historic properties. Trails that criss-cross over the dunes are highly visible and erosive, causing detrimental effects to the archaeological sites," (Jackson and Stevens 1994, p.14). The Elders at that time had asked that "all Cooperating Agencies …make protection, preservation, and restoration of the Granite Park site one of the highest priorities for urgently needed programmatic action and enforcement," (ibid).

From oral accounts (ibid), Granite Park is considered the *Heartland* of extensive, as a long-term Hualapai residence and occupancy site within the Grand Canyon. Granite Park also served as a meeting, trading, and ceremonial place for the Ghost Dance. It is understood that natural impacts, such as flash flooding, can be a positive influence creating new habitat for plants and animals, however, trailing in some areas over time, is creating negative impacts as seen below in Figure 35.

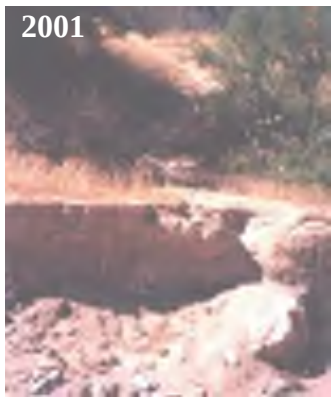


Figure 35. Photo V3-149, above left was taken in 2008 by HDCR monitors; Photo L-3549, above right is from August 2012. Together, the top and bottom row show environmental change since 2001 and how flash flooding (2005 & 2012) has cut the bank with slumping occurring due not only from flooding but also from persistent trailing.

The persistent trailing as indicated above in Figure 35 is on a trail that is not an intended access trail to the rock shelter above. This is an example of a side-trail that should be closed off and

rehabilitated with vegetation. In 2011, Hualapai monitors noted natural impacts to the check dam system at TCP010 Granite Park have progressed and in 2012 are considered severe in certain areas with bank slumping occurring along the edges above check dams creating patches of bare soil where vegetation has disappeared. A positive impact of course, is the alluvium from rains within the gullies settling below each check dam, in essence, creating soil compacted areas that promote plant growth. The concern for Hualapai, is the top sections above the check dam stones that are slumping causing a widening of the gullies, (Reference Figure 36, below).

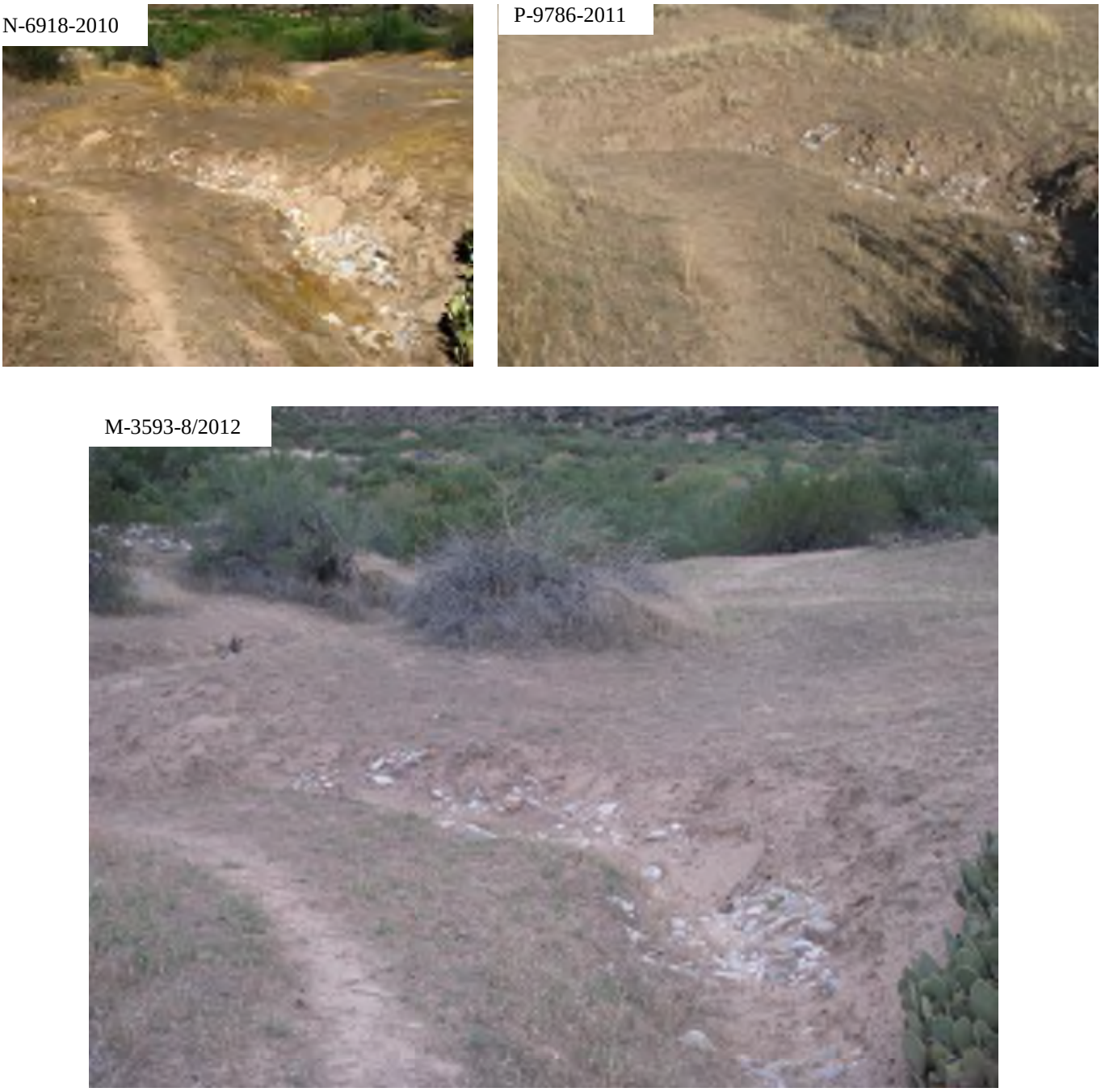


Figure 36. TCP010 Granite Park. Photos of same check dam location, view south 2010-2012.

Regarding the historic Goodding Willow (*Salix gooddingii)* --previously in 2010, Hualapai monitors noted that near the Goodding Willow general dispersed trailing was noted on all sides of the Goodding willow, which resulted in soil compaction at the outer edge, sand instability, and some loss along the back and upstream sides of tree. In contrast, 2011 high flows of 27,000 cfs, caused inundation of river water around the Goodding Willow causing water-logging of the roots and trunk. In 2012, moderate flows of 11,000 cfs revealed that the Gooding Willow appears stable, however there is concern regarding the general health of the tree due to fluctuating flows and the impacts to the tree's root system (Reference Figure 31-32, below, and also refer to the following ethnobotanical discussion).

N-267-2005

Figure 37. TCP010, Granite Park, view south. Photo of the Gooding Willow area from the 2005 HDCR BOR River Trip, (Photo by Art M. Philips, III, Ph.D.).

O-3693-08/2012

Figure 38. TCP010, Granite Park, Photo O, 2012, view south of the Gooding Willow. The boat docking area is completely obscured by tree growth.

Notes from The River

Reflections from Hualapai Department of Cultural Resources Loretta Jackson-Kelly, Principal Investigator:

[On Granite Park]… our traditional viewpoint of this river is that we share this canyon with the Shivwits band of Paiutes. They used to come down here and we used to gather over here on this delta and converge and have our get-togethers here. We call it a "heartland". This is our heartland, a place of gathering and socializing. There was a tree that was really huge that used to be at the bank called the Goodding Willow. It's a Goodding willow tree. And in the 1800's when John Wesley Powell came through, he took a photograph standing underneath that tree, and that's the tree that's by our little snack station. Back in the nineties, the root was rotting out and we had to go and do stabilization work around the root. There's actually rebar at the base of that root, and we stacked boulders to stabilize the ground that the Goodding willow roots were sitting on. When they started doing these experimental flows from the Glen Canyon Dam, it was cutting into the root system and eroding the soil away… so the Goodding willow looked like it was going to die. But through our efforts of preservation for the tree, it's still here, even though it's not in the same condition as it was prior to the 1990's. And there was a beaver that was chewing on the tree, and we thought that was a bad thing. But actually, it was a good thing because when he was chewing on the tree, there were new sprouts coming out off the trunks of the tree… off the branches. So it did a little bit of good for the tree itself. We regard that tree as a heritage site for us, and the white people also regard it as that, too, because of John Wesley Powell. This area is heavily visited. It's been studied and studied by geo-morphologists and I have spent many, many, many hours and days and weeks and months here helping to preserve some of the sites that looked like they were in danger of erosion. We have check dams over there at the higher dune, the path that goes up to the rock shelter. (DVD 10, 18.12.35 RM. 209 - Day 8, August 20th, 2010).

But this is what we're trying… this is historic in white man's term, but then also for Hualapai and Paiute ancestrally. This whole place is important to us. I think the difference is when we work with the archaeologists; and with the Park --they really emphasize protecting historic sites. They look at the archaeology as well, as preserving and protecting that. But, I recognize it more so that they hold historic places in very high esteem. And the Goodding Willow, no one ever thought about it until Paiute and Hualapai started making an issue out of it, saying that this Goodding Willow Tree was part of the history of the Grand Canyon, but also ancestrally important. When we used to come here and gather, that was probably a place where we got our shade and what-not.

We did a lot of activities here. So, to me, the Goodding Willow is important to me culturally. We produce cradleboards from it. We produce basketry, make those waterproof pitch jars…We just had a lot of uses for the native plants along this river. So when I hear about Granite Park, in terms of it being important because of John Wesley Powell, I appreciate the fact that people are willing to protect it. We got a lot of help to stabilize it back in the Nineties. It is what it is right now. I don't know what the future of this tree's going be, you know if it continues to deteriorate. Right now it looks pretty good. Will it ever look like the tree it once was? I don't know... So I just see it as what it is right now, and I hope that in the future, there are people who continue to care for it in whatever terms they want to take care of it in their mind and their thinking about their

ties to this area…So there's differences in points of view about that. But I just wanted to reassure all of you that preserving and protecting doesn't mean putting it in a sterile environment and leaving it alone. What we're looking for, as Indigenous people, is long-sustainable use of the areas, of the plants, of our mineral collecting, of our hunting rights, our fishing rights and so on and so forth. And we need continue on with our cultural practices. (20.45.30, RM212 DVD 11, Day 9, August 21, 2010).

In summarizing impacts at Granite Park, data from earlier Hualapai PA River trips, infer that high flows, droughts, flash flooding, and human visitations can have either negative or positive affects depending upon circumstances. As an example the Goodding Willow had been slowly stabilizing as far as exhibiting vigorous stem and branch growth. This growth was due to a protective embankment placed in front of the tree, causing less impact from fluctuating flows. Additionally, beaver-caused damage to lower branches is virtually non-existent due to beaver management controls. Beavers can also be beneficial for clearing of tree-materials thus allowing new stem growth as mentioned above. However, there is still concern for the root system of the tree.

Visitors and boatmen are being educated regarding the historic significance of the tree and are not using the tree as an anchor as much as had been done in the past. Trailing continues to be an impact with visitors mainly staying on trails however the trails are growing deeper and wider. Check dams at Granite Park are being covered by alluvium at the bottom of the gullies that assist with plant stabilization, whereas up on the edges, patches of bare soil are present causing the gullies to widen. Trails are evident higher up along the far upper benches going away from the roasting features indicating visitor hiking activities further in-land. All of the artifacts noted in 2008 within the rock shelter are now gone and there is severe graffiti vandalism on the rock shelter walls, which was reported to NPS in September 2012 as mentioned above. Finally, natural bank slumping and beach blow-outs have occurred from flash-flooding.

Ethnobotany

Three plant transects were installed at Granite Park in 1996, and are read annually to monitor and evaluate the condition of ethnobotanical resources at the TCP. Details are presented further in the Ethnobotanical section of this report.

Recommendations

HDCR recommends the obliteration of visitor trailing, the re-establishment of NPS trail blockades to discourage continued use. A botanical analysis of the Goodding Willow should be under taken for verifying the health status of the tree. Annual monitoring of TCP010 should continue. HDCR recommends that the rock shelter be permanently closed to visitors, and that a joint task force between Hualapai and the NPS be established to manage and restore the rock shelter.

P-3648-8/2012

Figure 39. TCP010, Granite Park Rock Shelter, AZ:G:03:03, photo P taken in August 2012. River Trip participant Juan Sinyella assisting HDCR monitors with identifying graffiti elements, August 10th 2012.

Bedrock Mortar at Granite Park, TCP 010

TCP 011 – PUMPKIN SPRINGS, RM 212 L

Features

TCP 011 includes natural hot springs that are known to have been traditionally utilized by the Hualapai people (Reference Figures 40-47 below). HDCR did not stop at Pumpkin Springs during the May 2012 trip due to the lack of privacy to conduct ceremonies or monitoring. Photos in May were taken as we floated by, however HDCR monitors were able to monitor in August 2012 and noted that human impacts on TCP 011 are moderate to heavy. The larger beach appears to have encouraged larger tour group visits, negatively impacting the integrity of the entire TCP. The Pumpkin itself, suffering from the lack of recharge evident in 2010, was completely inundated during our 2011 visit due to Glen Canyon Dam releases of 25-27,000 cfs beginning in May. High flows at Pumpkin Springs in 2011, are an excellent example of a specific positive impact on the spring itself. The, the river had completely flushed all the algae and cumulative minerals out of the Pumpkin, creating an opportunity for spring renewal. In 2012, the Pumpkin had re-filled.

Figure 40. Photos A-C above, TCP 0011, Pumpkin Springs, view south. 2008-2010.

Figure 41. Photos D and Q, both taken in 2011 shows high-flow completing covering the pumpkin. Photo Q Left, taken in August 2012 shows the pumpkin re-filled with only a small amount of algae in the lower left corner.

Figure 42. TCP 011, Pumpkin Springs. Photo E (left) taken in 2011 has an insert photo (from 2001) held at the same time as E-9860 was taken during high flow of 25-27,000 cfs in 2011. Photo R (right) taken in August of 2012 shows the Pumpkin at lower flow (7-11,000 cfs).

In August of 2012 HDCR monitors noted a black marking on the side of the pumpkin. This impact may be from a boat nudging up to the pumpkin, (Reference Figure 43, below).

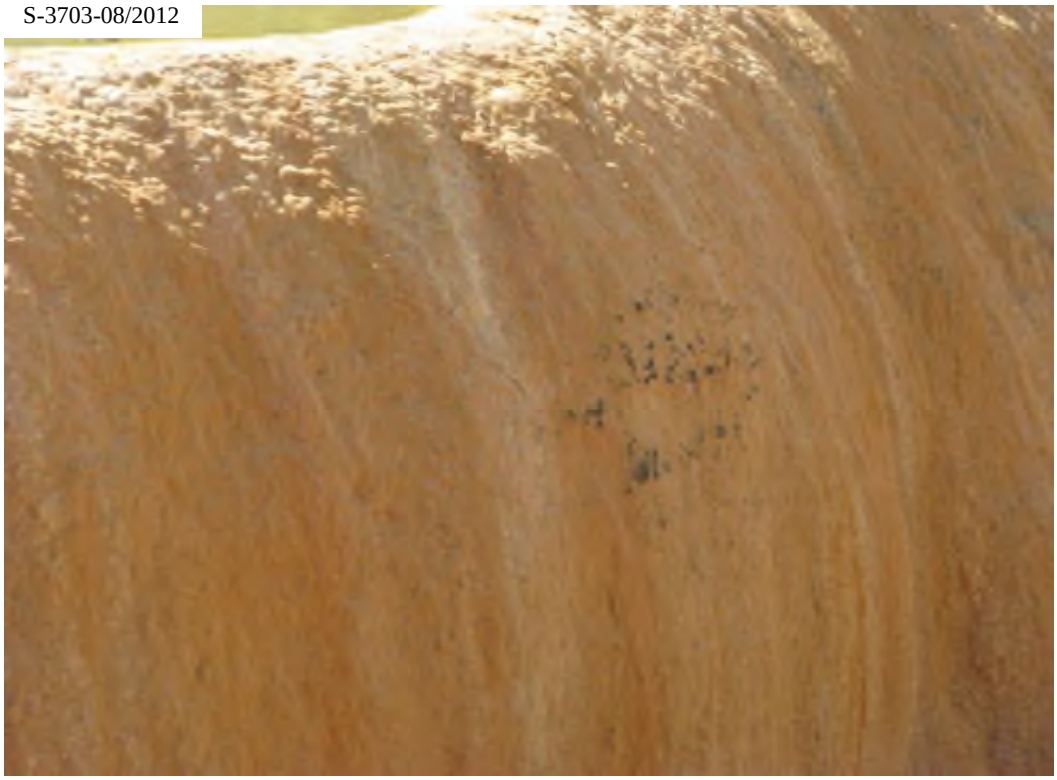


Figure 43. TCP 011, Pumpkin Springs. Photo S taken in August of 2012 showing markings on side of pumpkin.

T-2878-5/2012

U-2869-5/2012

Figure 44. TCP 011, Pumpkin Springs. Photos T-U, taken in May 2012. Visitors jumping off the side (top) and standing on edge of the Pumpkin, (bottom).

Human impacts in 2012 can be seen in Figure 44 above. Visitors are jumping and standing on the Pumpkin itself which are viewed as serious impacts affecting Hualapai spirituality revealing a lack of respect or understanding for the importance of this TCP.

Figure 45. TCP 011, Pumpkin Springs. Due to visitor numbers on May 27th, 2012 it was decided not to stop at TCP 011, which prevented Hualapai from completing on-land monitoring and ceremonial activities. Photos were taken as we floated by.

Notes from The River
Reflections from Hualapai Department of Cultural Resources Loretta Jackson-Kelly, Principal Investigator:

[On Pumpkin Springs]…Pumpkin Springs is a TCP. It's a travertine pool and, it's rather like a mineral spring. They did some testing on it in the Seventies and said there were high levels of arsenic in there. So I would not suggest going into it. But, being that it's kind of close to where Diamond Creek is, there could have been a trail that came down to that area where I would say the Hualapai people knew where this was and came to heal themselves. 'Cause every hot springs, sulfur springs, mineral springs… they're all different… They're healing waters. When we see these springs we consider them to be sacred springs (20.38.7, RM212, Day 9, August 21st, 2010).

Hualapai Elders mention during a 1993 river trip, that Pumpkin Springs was regarded as "…a significant sacred site, utilized for medicinal purposes. The Hualapai people would travel many miles to be healed by this sulfuric water…" (Jackson and Stevens 1994:15).

F-9863-2011

W-3711-8/2012

X-3714-8/2012

Figure 46. TCP 011, Pumpkin Springs. Photo F (top left) above, taken in 2011 compared with Photo W (top right) taken in August 2012. Low water in 2012 reveals vegetation along river's edge, and abundant sand.

Photo X at left, taken in August 2012 shows a camping area rimmed with rocks.

Visitation continues to be high at Pumpkin Springs with negative impacts to the Pumpkin as evidenced above with standing and jumping. Spiritual impacts for Hualapai are significant in this regard. For Hualapai Elders even in 1992, "springs were and still are sacred today. You don't just go to a spring and drink water. You have to pray first. That water is there for a purpose…The purity of the springs is sacred. The use of the water is sacred…It was life-giving…" (HCRD December 1992:72).

Y-3721-8/2012

Figure 47. TCP 011 Pumpkin Springs, Photo Y-Z, August 2012. Visitation of Pumpkin Springs continues to be high.

Z-3723-8/2012

Recommendations

HDCR recommends annual monitoring of TCP 011, along with public outreach and education about the significance of Hualapai sacred sites. Education is required regarding the negative impacts boats have on the Pumpkin at this TCP. Jumping and standing on the Pumpkin should not be allowed. A plant species list has not yet been prepared for this TCP; this should be done when feasible.

TCP 012 – THREE SPRINGS CANYON, RM 215.6 L

Features

TCP 012 includes an archaeological site (AZ:G:3:78), which consists of structural walls (possibly wickiup foundations), roasting features, lithic scatter, artifacts, rock art and a historic travel route. The TCP also includes a natural spring, which is known to have been traditionally visited by the Hualapai people. Associated ethnobotanical resources include giant reed, seep-willow, coyote willow, prickly pear, and cat-tail. TCP 012 evaluated by HDCR on May 28th, 2012 (Figure 48 below). For Hualapai, the Elders have said (Jackson and Stevens 1994:15) that Three Springs is a "natural spring, stemming from the main water source of the Pine Springs area, on the northeastern portion of the Hualapai Reservation. The Pine Springs Band of Hualapai traditionally utilized this as a main water source. The Three Springs area contains pictographs that are considered sacred to the Hualapai people."

B-9882-2011

Figure 48. TCP012 Three Springs, photo left taken in 2011, view south as over-view of trail entering from the side canyon.

Photo A, below taken in 2012. within the same vicinity. There may be side trailing on the west side of the main trail. To be confirmed.

A-2900-5/2012

For TCP012, there is a slight amount of trailing off the main upper trail that leads to the spring area. Photo A-2900 above, taken in August 2012 shows that there appears to be a bit of clearing on the west side which will be confirmed during the 2013 field season. If that clearing is indeed trailing, HDCR will take the effort to place brush on this trail to prevent further trailing.

C-9880-2011

B-2933-5/2012

Figure 49. TCP012, Three Springs. Photo C, left, taken in 2011, view west, looking down side canyon towards the river. Photo B, right, taken in May 2012, view west.

HDCR monitors noted in 2012 that trailing remained moderate and on the same trails throughout the site, other than the possible side trailing mentioned above. Hiking trails to the spring and canyon are still evident. Hiking in the upper stream/spring area was noted as hikers follow an existing trail to the spring. Flash floods in 2011 caused the creek area to blow-out, scouring the side canyon. HDCR monitors noted that in May 2012, the creek was flowing and plants are making a vigorous come-back as evidenced in Photo B above.

D-300-2008

E-7034-2010

F-9888-2011

C-194-5/2012 V2

Figure 50. TCP 012 Three Springs. Photos D and E show pool constructed of rocks placed across the wash. By August 9th 2011, however, the pool no longer exists (Photo F, below) as flash flooding scoured out the side canyon where the pool had been. Hualapai monitors noted in May 2012, the pool still had not been re-constructed (Photo C).

G-7055-2010

H-9888-2011

D-2931-5/2012

Figure 51. TCP012, Three Springs. Photo G, above left (view east), taken in August 2010 shows dense vegetation. Photo H, right taken in 2011, showing flash-flooding impacts to vegetation below the previous "pool" area.

Photo D, left, taken in May 2012, shows vigorous plant growth after 2011 flash flooding.

Three Springs has an archaeological assemblage containing grinding slicks, bed-rock mortars, hand tools, and rock art panels. The artifacts have been moved, replaced, and taken. The following photos illustrate this impact. In 2009 a mano, recorded in 2008, was missing from the upper bench grinding slick assemblage as noted in Figure 52 below.

Figure 52. Photo I, on left, taken in 2008 shows mano lying on top of a stone block. Photo J, on the right, taken in 2009, shows the mano removed.

In August 2010, (Figure 53, Photo K, below) artifacts have been removed altogether from the grinding slick assemblage, including the two white cobble-style stones noticed in the 2008-2009 photograph (Figure 52 above).

Figure 53. Photo K-7043-2010 above. The stone arrangements on the north and right side of the photo are now re-arranged.

L-9904-2011

Figure 54. In 2011, a white stone and a piece of tapeats have been placed into the assemblage, and the northern stone assemblage portion completely re-arranged (Photo L below).

F-198-5/2012 V2

Figure. 55. Photo F taken in May 2012 shows the removal of the small tapeats stone and the white stone. The middle stone has been moved. The small mano evident in 2008 (Photo I above) has never been recovered.

Figure 56. For TCP012, Three Springs, Hualapai monitors note that the rock art panel appears relatively stable from 2008 through 2012.

Figure 57. Photo H left, visitors going off trail and climbing down rocks at Three Springs, May 2012.

Ethnobotany
A plant list for Three Springs has not been completed. This is an ethnobotanically interesting site, with well-developed desert vegetation on the bench above the upstream side of the canyon and dense side canyon riparian vegetation along the canyon floor. The trail passes through a dense marsh as it crosses the stream, with cat-tail, crimson monkey flower, and giant reed. Except for this crossing, visitor access is above the creek on rock outcrops.

Recommendations
HDCR recommends that a botanical survey be completed when feasible. HDCR recommends checking the trail system during the 2013 field season for any evidence of side trailing. Visitors are going off the main trail to reach the spring area (Photo H above). The area from the boat dock to the upper side-canyon area will be monitored annually for any new trailing across the higher terraces. At the archaeological assemblage near the creek, visitors climbing up onto the upper bench ledge only do so if they are aware of the artifact assemblage because it cannot be seen from below. Public education is needed to inform visitors about staying on the trails, archaeological laws, and the consequences of removing artifacts.

TCP 013 – RM 223 L

Features
TCP 013 is divided into two loci. Locus A contains numerous lithics, sherds, hand tools, and extensive rock art. The National Park Service surveyed this area in 1991, and TCP013 includes an overhang shelter recorded as AZ:G:3:80. Locus B consists of at least eight structural and roasting features, rock art and artifacts on a sand dune on the up-stream site of 222-mile Canyon. This site was visited by Hualapai in 2010, 2011 and on May 28, 2012. HDCR monitors visited Locus A and not Locus B. This site is a frequently visited site. This area is regarded as highly significant for Hualapai due to the rock writing. Hualapai Elders declared, "…that the writings indicate travel routes, and represent events occurring in the canyon. These writings are also written with the hematite of Hualapai cultural and geographical affiliation," (Jackson and Stevens, 1994:15). Human impacts are evident with camping areas on the down-stream beach area with vegetation cleared to accommodate boat docking. Wind deflation and gullying in the lower beach dunes have impacted this area. In 2012 the rock writing panels appear to be in relatively stable condition.

Ethnobotany
Associated ethnobotanical resources at TCP 013 include Fremont wolfberry, mesquite, prickly-pear, and globemallow. A plant species list was originally compiled in 2001.

Recommendations
HDCR recommends an annual evaluation of TCP 013 and suggests that a botanical survey be completed when feasible.

TCP 014 – LITTLE COLORADO RIVER, RM 61.5 L

Features

TCP014 includes an archaeological site, which consists of structures and roasting features, middens, rock art, artifacts and a historic travel route. TCP014 is heavily visited by rafters and passengers who come to swim in the Little Colorado River. NPS will continue to monitor the archaeology at TCP 014. Hualapai monitors visited the site on May 20th and August 5th, 2012. Slight to moderate side canyon erosion, gullying, arroyo cutting and bank slumping has been recorded. In 2011, high flows impacted the LCR submerging the river banks which caused visitors to seek higher ground creating additional trails. In 2012 it was the opposite with low flows, with the tendency for visitors to hike along the lower steeps.

B-9396-2011

Figure 58. TCP 014, Little Colorado River. Photo B left (view east) taken in 2011 with high water level in Colorado River.

Photo bottom left, taken in May 2012 in same vicinity, with lower water levels.

A-1431-5/2012

B-1457-05/2012

Figure 59. TCP 014, Little Colorado River. Photo B, at left taken in May 2012. Tourists and HDCR monitors at Little Colorado docking area.

C-1360-05/2012

Figure 60. Photo C at left, taken in May 2012 showing trail through lower sand area. This is a site with high numbers of visitors who stop here and "float" (Photo D below) down the LCR when the waters are brilliant turquoise blue.

D-1417-5/2012

D-9384-2011

E-1346-5/2012

Figure 61. TCP 014, Little Colorado River. Photo D-9384-2011, left, view west. Bank slumping occurring in 2011 due to high flows of +27,000 cfs. Photo E, right taken in same vicinity in May 2012 with lower water levels.

For Hualapai, "this river –a major tributary to the Colorado River…and its surroundings comprise a large significant traditional cultural area for the Hualapai, Havasupai, and Hopi Tribes, and more recently, for the Navajo Nation…this area is the conceptual boundary line between the Pai Tribes and the Hopi. Everything west of the Little Colorado to the Mohave Valley is called *Ko Ho Nin'* a Hopi term referring to 'the People that live to the West:' the Hualapai and the Havasupai. The main routes in this vicinity have been used by Pai Bands for trading wares, minerals and food resources with Hopi," (Jackson and Stevens 1994:7-8).

Ethnobotany

HDCR monitors have not completed a botany survey for TCP 014.

Recommendations

HDCR recommends an annual evaluation of TCP 014 and continued public education. A botany survey could be completed when feasible.

TCP 015 – CARDENAS MARSH, RM 71 L

Features
NPS continues to monitor the archaeology at this site. TCP 015 includes an archaeological site, which consists of a roasting feature and a historic travel route. The largest marsh in the Grand Canyon is located at the downstream end of this TCP. This is very important for both migratory and nesting birds. Several culturally significant plants, including large Goodding willows, cat-tails, and giant reed, dominate the marsh. In addition to those listed above for the marsh, important culturally significant plants present at TCP 015 include mesquite, arrow-weed, coyote willow, and seep-willow. HDCR monitors did not visit TCP 015 in 2012.

Ethnobotany
The largest marsh in the Grand Canyon is located at the downstream end of the Cardenas TCP. This is very important for both migratory and nesting birds. It is impacted from lack of recharge, which is necessary to clean out vegetation debris and renew water and nutrients. The marsh is dominated by large Goodding willows, cat-tails, and giant reed.

Recommendations
HDCR recommends an evaluation of TCP 015 for human impacts every other year, if feasible. A botany survey could be completed when feasible.

TCP 016 – DEER CREEK, RM 136 R

Features
TCP 016 is a heavily visited site and includes an archaeological site, which consists of structural/irrigation walls, roasting features, rock art panels and a historic travel route. HDCR monitors inspected TCP016 in May and August 2012. Deer Creek Valley, above the falls, was used as a farming area until relatively recent times. Visitors continue to be the largest impact factor for TCP 016. Many of the visitors go further up beyond the rock art panel area, and hike up to the spring. The spring is a sacred area for Hualapai and if possible, HDCR monitors will take back water for the Elder participants of any given river trip.

Notes from the River
Reflections from Hualapai Department of Cultural Resources, Principal Investigator, Loretta Jackson-Kelly:
[On Deer Creek]: There's a difference in what you're going to be seeing there. This is truly a unique place, not only for the Paiute, but for the Hualapai and for the different Native American tribes that come through here. The Origin Stories, associate our connection to the Canyon. And that also includes the Zuni and the Hopi people as well. And I know that the Navajo's claim some connection to the Grand Canyon, so these places are also important for them, too. Another thing is the overlaying cultural importance that we've been saying about this area being sacred. And we see a lot of tourists come and they play, they yell around, they scream, they run up and down these

pathways. Our pathways are very important to our culture and our prayers and our thoughts that go into this, to these areas, these special areas. And it creates a disturbance when we see tourists act disrespectful. But they're doing it because they don't know. And they don't know this because somebody else is not relaying the information to them. And so that's part of our efforts…to do public education back to the guides so that the guides, when they come and bring their clientele down, that, you know, this gets shared with them (12.00.32 DVD 7, Day 5, August 17th 2010).

Trees and water make this part of Deer Creek a visitor's paradise (Figure 56, below). The valley is accessible by trail from the North Rim. Many hikers are coming into Deer Creek from up above at Thunder River and taking the trail that cuts across the creek, bringing them down into Deer Valley. As visitors come through this area, from the upper Thunder River Trail, or from down below, visitors walk in the creek and rinse themselves here (See Figure 63 below). Trailing and visitor related impacts are present both at the base of the falls near the River and in Deer Creek Valley.

In the recent past, NPS cleared small campsites in the upper Deer Creek Valley area, put in toilets, and re-worked the trail mostly in the winter of 2010-2011. There have been three major human-caused fires in the valley in the past 25 years; these have burned large cottonwood trees and other vegetation.

Figure 62. TCP016, Deer Creek. Entrance to primary falls, year 2011 on left, with 2012 on right.

B-3849-2009

C-3852-2009

B-1996-5/2012

Figure 63. TCP016 Deer Creek. Crossing at upper Deer Creek Valley. Photo B, left taken of the trail in 2012. Photo C below, trail slumping on trail to upper Deer Creek Valley.

C-2080-5/2012

G-9498-2011

D-2067-5/2012

Figure 64. TCP 016, trail going to upper Deer Creek Valley. Photos G taken in 2011, photo D taken in 2012.trailing going towards upper creek area.

Trailing continues to be moderate at TCP 016. Trails are slumping out from the hill-side as evident in Figures 63-64 above.

Ethnobotany

Ethnobotanical resources present at TCP 016 include cottonwood, giant reed, Deer Creek agave, coyote willow, Indian-tobacco, Goodding willow, and four-wing saltbush among many others. Heavy trailing was once again noted in August 2010 and was evident throughout the TCP, along with severe deterioration of the river bank due to high levels of boat and tourist activity. NPS will continue to monitor the archaeology at TCP 016. A plant species list for TCP 016 was compiled in 1993 and updated in 2010. It has been entered into the Hualapai Colorado River Corridor TCP Evaluation database, and will be updated as needed.

Recommendations

HDCR recommends an annual evaluation of TCP 016. NPS to continue monitoring archaeology at TCP 016. HDCR recommends that trail slumping in the upper Deer Creek area be repaired.

TCP 017 – HAVASU CREEK, RM 156.5 L

Features

TCP 017 is a side canyon based creek that is traditionally visited by the Hualapai people. Prayers for the creek are offered here. Havasu Creek is a historic travel route, with access to the rim through Supai Village. In 2012 HDCR monitors noted consistent trailing evident throughout the TCP, (Figure 65).

C-9547-2011

A-3438-8/2012

Figure 65. TCP 017, Havasu Creek, view south, left photo C-9547 taken in August 2011. Photo A-3438 on the right, was taken in August 2012. Overview of trail towards mid-falls. Flow fluctuations do cause visitors to seek alternate routes if the flows are too high, at which point the river covers the lower terraces where visitors normally hike up to the creek. August 2012 was a steady flow period, thus visitors used the regular route from the boat-dock following the trail towards the upper terraces.

Ethnobotany

The area is rich in ethnobotanical resources. A well-developed side canyon riparian flora is found along the banks of Havasu Creek, which supports canyon grape, velvet ash, cat-

tails, prickly-pear, and many other plants important to the Hualapai people. No ethnobotanical monitoring program has been established at Havasu Creek by HDCR.

Recommendations
HDCR recommends public education and annual monitoring of TCP 017 for human impacts.

TCP 018 – DIAMOND CREEK, RM 225.5 L

Features
TCP 018 includes an archaeological site (AZ:G:3:1), which consists of lithic scatter, artifacts and a historic travel route. It also includes important ethnobotanical resources and a side canyon creek. TCP 018 is an important historical and current ethnobotanical gathering area, with easy road access from the rim. It is an important traditional site for the Hualapai people. Over the years, this TCP has been impacted through camping, side-canyon flash-flooding, boat launch and take-out activities.

Ethnobotany
The main ethnobotanical resources at TCP 018 are along Diamond Creek, a perennial stream the rises at a large spring about 7 miles from the Colorado River. Usually this creek has a steady, small flow of clear, cold water; however, it is subject to severe flash flooding from the creek's drainage and from the larger but normally dry tributary Peach Springs Wash. These floods can periodically have a devastating effect on plants along the canyon floor. Floods may deposit a debris fan of gravels and cobbles into the Colorado River.

A plant species list of TCP 018 was compiled in August 2002, and is updated as needed. An ethnobotanical TCP evaluation program was established at Diamond Creek by HDCR in 1996.

Recommendations
HDCR recommends monitoring every year at TCP 018 to check the beach area for trash, campfires and other visitor impacts.

TCP 019 – BRIDGE CANYON, RM 235 L

Features
TCP 019 includes important ethnobotanical resources, a side canyon perennial creek, trails and a waterfall known to have been traditionally visited by the Hualapai people. Important ethnobotanical resources located at TCP 019 include arrow-weed, cat-tails, Indian-tobacco, lemonade-bush, and seep-willow. TCP 019 was not visited in 2012.

Ethnobotany
An ethnobotanical evaluation program consisting of three plant transects was established at Bridge Canyon in 1996 and monitored for the three transects in 2010.

Recommendations
HDCR recommends monitoring every other year at TCP 019 to check the beach area for visitor impacts.

TCP 020 – SPENCER CANYON, RM 246 L

Features
TCP 020, Spencer Canyon, is an area of high traditional cultural importance. An important cultural feature of TCP 020 is a lithic scatter located across the river from Spencer Canyon, at Lava Cliff (AZ: G:2:001). The permanent stream at Spencer Canyon arises at a number of springs several miles upstream, some of which are sacred sites of great significance. The transition from the Colorado River to Lake Mead occurs between Bridge Canyon, RM 235, and Spencer Canyon. TCP 020 includes important ethnobotanical resources, such as cottonwood, Goodding willow, cattails, coyote willow, and mesquite, and is known to have been traditionally visited by the Hualapai people. TCP 020 was not visited in 2012.

Ethnobotany
Ethnobotanical resources at TCP 020 are mostly along the creek; a perennial stream arising from springs up to several miles upstream. The canyon floor is wider than the normal flow, reflecting its propensity for occasional major flash floods. These floods can profoundly affect plants along the canyon floor which, however, recover within a few years after a major scouring flood.

Recommendations
HDCR recommends monitoring every other year at TCP 020 to check the beach area for human impacts.

TCP 021 – TRAVERTINE CANYON, RM 229 L

Features
Travertine Canyon contains a spring and waterfall that hold important cultural significance to the Hualapai people. Ethnobotanical resources at Travertine Canyon include Indian tobacco and coyote willow. TCP 021 was not scheduled for evaluation in 2012.

Ethnobotany
The area at the base of Travertine Canyon receives heavy visitor use, and trailing and trampling of cultural plants has been noted. Some riparian species grow along the creek, but they are frequently washed out by flash floods. Cultural plants are mainly found along the creek and include seep-willow, coyote willow, and arrow-weed. Indian-tobacco and mesquite are also found at the site.

Recommendations
HDCR recommends monitoring every other year at TCP 021 to check the canyon area for human impacts.

TCP 022 – TRAVERTINE FALLS, RM 230.5 L

Features
Travertine Falls contains a waterfall that holds cultural significance to the Hualapai tribe. Important ethnobotanical resources include mesquite and cattails. Travertine Falls is also subject to heavy visitor impact, so in August 2002, HDCR designated it a TCP and conducted a baseline evaluation of its features. The falls are a popular area with trailing evident in the lower beach area leading up to the falls. TCP 022 was not visited in 2012.

Ethnobotany
TCP 022 has two areas of particular interest: a riparian zone with some cultural plants along the shore, and a small wetland at the base of the falls. Visitor impacts and trailing have occurred in the area near the falls.

Recommendations
HDCR recommends monitoring every year at TCP 022 to monitor for human impacts.

TCP 023 – BURNT SPRINGS, RM 259 R

Features
Burnt Springs Canyon contains a historic structure of unknown origin (AZ:G:2:009). Other features present in the area include a slab fire pit, a rock wall and a natural rock "table." TCP 023 was not scheduled for evaluation in 2012.

Recommendations
HDCR recommends monitoring every year at TCP 022 to monitor for human impacts.

TCP 024 - SHINUMO CANYON, RM 108.7 R

Features
Shinumo Canyon contains an archaeological site (AZ: B: 15:1) consisting of several structures, low walls, lithic scatter and pot sherds. The structures are in the desert just above the old high water line. HDCR monitors visited the water-fall area in August 2010, 2011, and 2012. Human impacts to TCP 024 are mainly due to high visitation of this popular side-canyon creek and fall area. In 2012, HDCR monitors noted that generally, the water-fall area remains in a stable condition with vegetative growth appearing slightly less than in 2010. This may be due to drought conditions in the upper reaches of the Canyon that affects the water flow into Shinumo.

Ethnobotany
Ethnobotanical resources include reeds, willow, and brittlebush.

Recommendations
HDCR recommends monitoring every year at TCP 024 to monitor for human impacts.

TCP 025 – WHITMORE HELIPAD, RM 187 L

Features

The Whitmore Helipad contains an archaeological feature consisting of metates and lithic scatters. This site may have also been part of the inner canyon trail system. Culturally significant plants at Whitmore Helipad include Indian tobacco, Whipple yucca, Indian-tea, and barrel cactus. HDCR designated Whitmore helipad a Hualapai TCP in 2003, and conducted a baseline evaluation of impacts to its features. TCP 025 was monitored in May 2012.

In 2010 and in 2011, HDCR monitors noted heavy bank slump and arroyo cutting on the sides of the heli-pad area from alternating floods, droughts, and water being sprayed onto the heli-pad. Human impacts to this TCP are heavy to severe, including moderate to heavy bank slumping from alternating cfs flow rates. As in previous years, photos from 2009 through 2012 illustrate the presence of a generator, oil and assorted litter next to the river at water level and above on the heli-pad area (Figure 66 below).

Figure 66. TCP 025, Whitmore Pad. Upper row photos from 2009 through 2011 showing erosion and arroyo cutting on banks below the heli-pad. Erosion continues to be problematic. Lower row photos also from 2010 through 2012 showing generator. Vegetative growth in 2012 appears to be intermittent, yet not as patchy as 2010. TCP 025 was visited in the month of August for both 2010 and 2011. Trailing in the upper bench areas along the cliffs is also evident, however impacts are slightly less due to visitors

generally not hiking in this area. High flows in 2011 also caused bank slumping along the boat-docking area on the beach.

I-9680-2011

Figure 67. Photo I-9680-2011 at left. Exposed surface area due to impacts from arriving and departing visitors. This area is just below the heli-pad.

B-2509-5/2012

Figure 68. Just below Whitmore heli-pad. Photo taken in 2012.

J-9685-2011

Figure 69. TCP 025 Whitmore Pad. Photo J-9685-2011 taken in 2011. Heli-pad surface area. Wash is noted in the background where the hose-water is discharged after spraying down the heli-pad.

C-2511-5/2012

Figure 70. Whitmore heli-pad. Photo taken in May 201

Ethnobotany

The helipad was constructed on a shaded slope dominated by creosotebush, ocotillo, Indian-tea, and several cacti. The area around the helipad, the trail leading to it from the beach, and the immediate beach area receive heavy use by river trips doing exchanges, with people flying in and out daily by helicopter to the Whitmore Wash area on the north rim. Cultural plants along the shoreline receive severe impact from this concentrated activity, but the slopes away from the helipad and beach are rarely visited.

Recommendations

It is recommended that TCP 025 be monitored annually. As in previous years, HDCR recommends evaluation and documentation of the archeological features at TCP 025 and formulation of a management plan on the operation of helipad activities to assist with minimization of impacts to the site. Oil and fuel spills from the generator running the water-pump have been maintained and there is no evidence of oil spills. The graffiti needs to be removed.

Notes from the River

Reflections from Hualapai Department of Cultural Resources Consulting Botanist, Ethnobotanist Dr. Art Phillips III on TCP 025, Whitmore Heli-Pad:

What happens here is there are several river companies that end their trips here, as far as the passengers go. So they bring a helicopter in from up on the Arizona strip, there's a ranch up there. And they have flown the people in there the night before with a small plane and they stayed there overnight. Then they helicopter them down to this helipad in the morning, and they join the trip, and then take out the people that have been on the trip. So you have some people starting a trip here and going down to Pearce Ferry. The helipad is a concession of the Hualapai Tribe. So it's their responsibility to monitor this and make sure there aren't environmental concerns that go along with this. One of the problems we've had in the past is that generator spilling oil and fuel and stuff around from the generator itself onto the sand. And since some of the people coming in here are kind [of] new at this whole river thing, sometimes there's problems here with papers and trash on the beach. But generally it's kept pretty good.

…you know, you've got a whole new bunch of people coming in, packing their bags and getting their dry bags and learning how to hang onto the boat. So there's going to be quite a bit of random activity here at times. Nobody's here this morning, so we're lucky. It's pretty hard to monitor this place when there are helicopters coming and going, people all over the beach. But it's a busy place at times. I don't how many times a week, maybe two or three, there are takeouts here, but it's pretty busy when they do. So we're just going to look around here and check out the generator and the pad itself around the edges to see… to make sure the disturbances aren't spilling off the pad and onto the environment behind it. And, just a general environmental check that the place is being kept clean and no irreparable unnecessary damage is occurring, (DVD 9, 16.59.21 August 19, 2010).

TCP 026 – SEPARATION CANYON, RM 240 R

Features
Separation Canyon is a historical site related to the Powell expedition, and is significant to the Hualapai people for culturally significant plants. It is also known as a historic travel route. HDCR designated Separation Canyon a Hualapai TCP in 2004 and conducted a baseline evaluation of the site in June 2004. In 2004, natural impacts to TCP 026 included evidence of moderate flash flooding from the side canyon and some scouring of vegetation. At that time, human impacts included heavy trailing upstream of the upper bench; also, heavy trailing and evidence of on-site camping on both the lower and upper beaches. Ethnobotanical resources at TCP 025 include cat-tails, seep-willow, and arrow-weed along the shore, and Indian-tea, creosotebush, and mesquite on slopes above the beach. This TCP was not monitored in 2012.

Recommendations
HDCR recommends monitoring of TCP 026 every two years.

TCP 027 – COLUMBINE FALLS, RM 274.3 L

Features
Columbine Falls is a culturally important site to the Hualapai people, and comprises part of the Salt Migration route, which included traditional ceremonies and Salt Songs. Significant ethnobotanical resources at TCP 027 include Goodding willow, cat-tail, seep-willow, and Indian-tobacco growing on the silt and gravels between the base of the falls and the lakeshore. At high water this inlet is flooded to the base of the falls. At the top of the falls there are a number of net-leaf hackberry trees. In 2004 HDCR designated Columbine Falls a Hualapai TCP and conducted a baseline evaluation of the site in June 2004. The site was again visited by HDCR monitors in August of 2010. At that time HDCR monitors noted that impacts to TCP 027 included extremely low river levels, which limited access to the falls and hanging garden. TCP 027 was not visited in 2012.

Ethnobotany
The inlet below the falls is a changeable habitat that is flooded when lake Mead water level is high. Goodding willows have become established in the inlet, probably during times of receding lake waters. Trailing from the shore to the falls has impacted some stands of cat-tail; the trails are somewhat precarious due to periodic flash flooding events creating mounds of deposition. Several large hanging gardens are present on the walls to the right of the falls; these have numerous seep plants including golden columbine and rock-mat but few cultural plants. These hanging gardens receive little impact from visitors or the lake; they are above the highest level of Lake Mead.

Recommendations
HDCR recommends monitoring of TCP 027 every two years.

TCP 028 – HOTAUTA CANYON, RM 107.5 L

Features
Hotauta Canyon is a historical site for the Hualapai and Havasupai people. Hotauta was a Havasupai man who lived during historic times and worked as a guide for Anglos who came into the canyon on mining expeditions. His descendents and relatives are the Hualapai and Havasupai people. His Havasupai name was Ka-datha-ah ("Porcupine"), and he was the son of Chief Navajo of the Havasupai. His legacy is tied to Anglo historical events in the Colorado River Corridor. This site also comprises a significant pre-historic travel route. This is the site of the Ross Wheeler boat, built by Bert Loper in 1914 and abandoned by river runners in 1915. Hotauta Canyon is a popular tourist stop, A baseline evaluation was conducted by HDCR in September 2004. HDCR monitors visited the site again in 2012 noting minimal impacts to this area.

Ethnobotany
When feasible, complete an ethnobotanical survey.

Recommendations
HDCR recommends monitoring of TCP 028 every two years.

TCP 029 – AZ:16:004, RM 189.7 L

The site consists of numerous roasting pits, shelters with alignments and / or artifacts and a diverse and dense scatter of artifacts. HDCR monitors visited this site on May 19, 2012. There are several features including shelters that contain groundstone remnants. Hualapai elders commenting on artifacts in general, mention that groundstone "were left in order so the owners could come back to use them When the people who go there with the season to gather, to plant, or dry things, they work with that and come back to that place; and when the leave the metate they turn it upside down…" (Jackson and Stevens 1994, p. 17). Rock shelters were also used as sanctuaries by "Hualapai people seeking refuge from the soldiers of the United States Cavalry," (ibid, p. 18). Ancestral Hualapai also lived in rock shelters, as "they didn't make their home with sticks and wood. They made their homes with rock," (ibid). HDCR monitors noted minimal impacts to this area. Camp sites were noted along the beach area, with minimal trailing up to the higher bench area.

Ethnobotany
When feasible, complete an ethnobotanical survey.

Recommendations
HDCR recommends monitoring of TCP 029 every two years.

TCP 030 – VASSEY'S PARADISE, RM 32.2 R

For Hualapai, all springs, seepages, and tributaries leading into the Colorado River are considered sacred and Traditional Cultural Places. HDCR monitors visited this site on May 18, 2012. Near this location is a burial. Culturally significant plants are located here and water is collected for ceremonial purposes.

Ethnobotany

When feasible, complete an ethnobotanical survey.

Recommendations

HDCR recommends monitoring of TCP 030 every year.

TCP 031 – BUCK CANYON, RM 41.0 R

Buck Canyon is a popular beach camping and hiking area. HDCR monitors visited this site on May 19, 2013. The area was divided into three monitoring zones, (Reference Figure 71, below):

1) Beach: lower beach area (Photo A-1252)
2) Access: middle canyon with access to upper bench area (Photo B-1248)
3) Upper: upper bench area where seepage occurs (Photo C-1207)

A-1252-5/2013

B-1248-5/2013

C-1207-5/2013

Figure 71. Photos A-C, TCP 031, Buck Canyon.

Monitors noted that in the upper and access sections of Buck Canyon, seepage and vegetation appeared healthy, and human impacts such as trailing were at a minimum. Camping on the beach area is minimal. Hualapai Elders who have visited these areas in the past spoke about the sacredness of these canyons that supported, animal and plant gathering, and also the "Little People." Hualapai Elders have been concerned with the little people who take care of the canyon. This is an intangible idea, however this is a cultural belief connected to giving to the canyon. The spirits including the little people protect the canyon, and these beliefs are tied to Hualapai traditional practices. Buck Canyon is perceived as a vital part of these traditions.

Ethnobotany
When feasible, complete an ethnobotanical survey.

Recommendations
HDCR recommends monitoring of TCP 031 every year.

TCP 032 – SALT MINE, RM 63.0 L
This is a very sacred traditional cultural property for Hualapai. HDCR monitors visited this site on May 20, 2012. For Hualapai, mineral deposits are very culturally significant. For Hualapai traditional practitioners, this site is part of the beliefs and lifeway's that are taught to Hualapai by Elders. Monitors have concerns regarding the integrity of the salt mine due to low water and the lack of high water to replenish the natural process of salt re-generation. River fluctuations have also affected vegetation, with trees dying and bank cutting occurring in what seems to be more frequent episodes.

Recommendations
HDCR recommends monitoring of TCP 032 every year.

TCP 033 – ELVES CHASM, RM 116.5 L
This is a traditional cultural property for Hualapai. HDCR monitors visited this site on May 20, 2012. Because there is a spring system at this site, Hualapai consider Elves Chasm to be a significant place for Hualapai Traditional Practitioners. For Hualapai "The springs are sacred. The use of the water is sacred," (1992 (a) p.72). Stewardship and protection of the waters has always been paramount for Hualapai, "for its culture, religion, physical survival, and economic viability…the Pine Springs Band, Milkweed Band, Grass Springs Band, Cerbat Band and Clay Springs Band…are responsible to protect and care for the water resources of the Hualapai Tribe," (ibid p. 73). This is also a popular place for visitors. Monitors noted that the trail to the falls is minimally impacted as it is mostly rock. There is no evidence of any camping.

Ethnobotany
When feasible, complete an ethnobotanical survey.

Recommendations
HDCR recommends monitoring of TCP 033 every year.

This is a traditional cultural property for Hualapai. HDCR monitors visited this site on May 24, 2012. Because there is a spring system at this site, with a trail system Hualapai consider Stone Creek to be a significant place for Hualapai Traditional Practitioners. This is also a popular visitors' site due to the ease of reaching the water-fall. Trailing is minimal with visitors staying on one main trail that starts on the beach near the camping areas. Camping is more evident with some camp pads being cleared. Vegetation appears healthy, although slightly stressed perhaps due to drought. Fluctuations from the river for this trip do not appear to have affected the site. The falls may be low due to drought in the upper canyons. Hualapai monitors will re-visit Stone Creek in the near future to better establish a monitoring TCP protocol base-line.

Ethnobotany
A partial ethnobotanical list was completed during the visit. When feasible, complete an ethnobotanical survey.

Recommendations
HDCR recommends monitoring of TCP 033 every year.

TCP 035 – FORESTER CANYON, RM 122.7 L
This is a traditional cultural property for Hualapai. HDCR monitors visited this site on May 24, 2012. According to Jason Nez, this site is also AZ:B:14:00:95 (number ?) with archaeological attributes. Hualapai monitors will re-visit Forester Canyon in the near future, to better establish a monitoring TCP protocol base-line.

Ethnobotany
When feasible, complete an ethnobotanical survey.

Recommendations
HDCR recommends monitoring of TCP 035 every two years.

TCP 036 – OLO CANYON, RM 145.6 L
This is a traditional cultural property for Hualapai. HDCR monitors visited this site on May 24, 2012. Hualapai monitors will re-visit Olo Canyon in the near future, to better establish a monitoring TCP protocol base-line. There is a spring at this site which for Hualapai is culturally important and a significant place for Hualapai Traditional Practitioners. Drought was evident at this site, as the falls were minimal, with algae growing at the foot of the falls. The "pond" had no outlet. Lack of high-flow is evident at this site.

Ethnobotany
When feasible, complete an ethnobotanical survey.

Recommendations
HDCR recommends monitoring of TCP 035 every two years.

TCP 037 – TAPEAT'S CREEK – RM 134.5
This is a traditional cultural property for Hualapai. HDCR monitors visited this site on May 24, 2012. Hualapai monitors will re-visit Tapeat's Creek in the near future, to better establish a monitoring TCP protocol base-line.

Ethnobotany
When feasible, complete an ethnobotanical survey.

Recommendations
HDCR recommends monitoring of TCP 035 every two years.

ETHNOBOTANICAL EVALUATION */ RESULTS AND DISCUSSION*

TCP 001 – NATIONAL CANYON, RM 166.5 L

Three plant transects were originally established in March, 1996, just prior to the first experimental flood in late March-early April of that year. The high flows in the Colorado River (ca. 48,000 cfs) reached to the upper end of the transects, and the main event was one of deposition, with mechanical scouring of much of the vegetation. In contrast, a major side-canyon flood event occurring on July 16, 2012 originated as a flash flood in National Canyon, and was mainly an event of severe perturbation and scouring. Much of the sediment (sand) remaining from 1996 was removed, and rocks and boulders were moved around to the point where most appearing in pre-flood photos could not be found. Nearly all vegetation was removed. In 1996 aboveground portions of trees and shrubs (arrowweed, tamarisk, and desert-broom) were removed, but root systems remained in place and quickly re-sprouted, meaning the recovery was from existing plants, not from seeds brought in by wind and water from elsewhere. In 2012, it appears that entire plants were removed, so re-vegetation will have to be accomplished as new propagules are brought in. Verifying if this is true will be one of the major aspects to be followed during future monitoring trips.

Features
A rock cairn located on a talus slope at across from the mouth of Tuckup Canyon (RM 165 L), about 70 meters above the river bank, marks the northeast boundary line of the Hualapai Reservation lands. Important culturally significant plants at National Canyon include Arizona cotton, gray-thorn, Indian tobacco, bear-grass, Fremont wolfberry, arrowweed, and seep-willow. TCP 001 and the roasting complex were evaluated and analyzed for natural and human impacts in May 2012.

Ethnobotany

National Canyon delta, Mile 166.5L, is at the mouth of National Canyon, a long side canyon that drains a large area along the eastern boundary of the Hualapai Reservation. Three line intercept plant transects were established at National Canyon in 1996. Two of these are located in the upper beach area, extending from points on the delta to the river, and the third is on the steep talus slope above the lower camp. Transects 1 and 2, the beach sites, were read during the HDCR research trip in May, 2012.

The entire aspect of National Canyon Delta changed as a result of a major side-canyon flash flood on July 16, 2012. An intense summer "monsoon" storm on the Hualapai Reservation in the upper drainage of National Canyon created a flood of epic proportions that washed over nearly the entire delta, moving sand, rocks and boulders and scouring out most of the vegetation. When we visited on August 8th, little recovery had occurred and only the lower portion of the beach on the side of the old drainage next to the cliff had escaped without much damage. The two transects along the upper beach (1 and 2) were severely affected, and even the boulders that had marked the endpoints were gone. We were able to relocate both transects using other rocks along and beyond the original alignment, and re-set them using photos taken along the original alignment.

Cover along transect 1 decreased during 2011 due to drought conditions and an extended period of 25,000 cfs releases in the summer of 2011. Readings were stable between August 2011 and May 2012 (Fig. 72), and decreased another 10% after the flood in July, to about 5%. Most of this was due to post-flood recovery of Bermuda grass, which had quickly invaded the wet soils between rocks. In addition, there were three individual shrubs that survived, a saltcedar *Tamarix ramosissima)*, a desert-broom *(Baccharis sarothroides)*, and a seepwillow *(Baccharis salicifolia).*

Transect 1

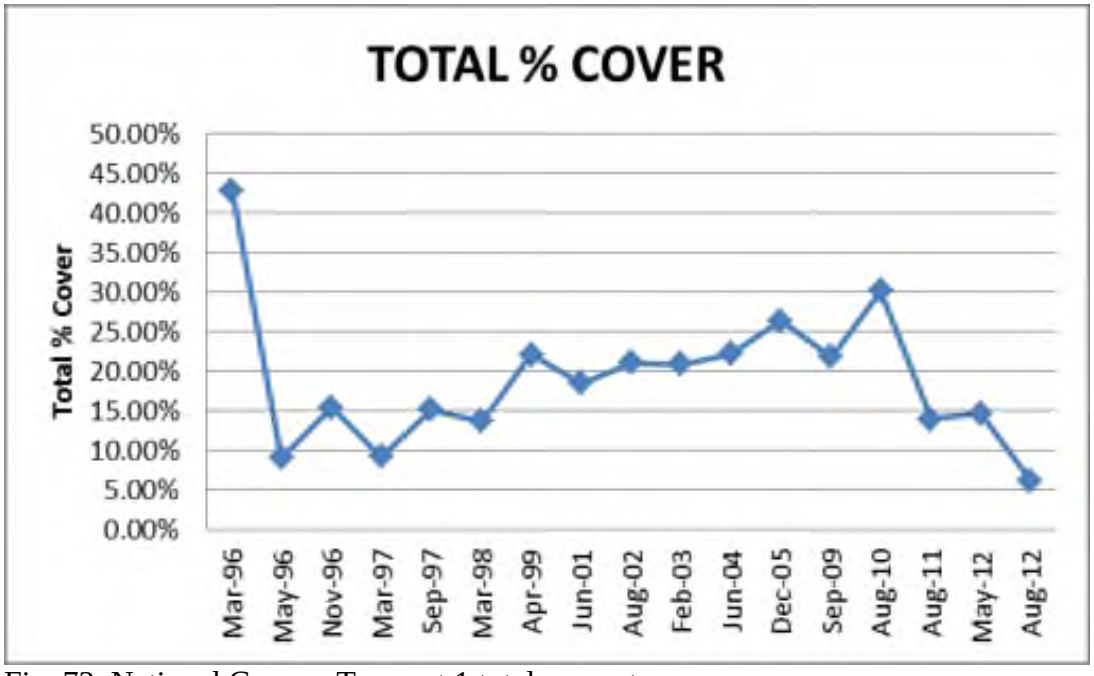


Fig. 72. National Canyon Transect 1 total percent cover.

Figure 73. National Canyon Transect 1, upper portion, May 25, 2012. The dominant shrub is desert-broom *(Baccharis sarothroides).*

Fig. 74. National Canyon delta, general area of Transects 1 & 2, showing effects of flash flood of July 16, 2012

Transect 2

Cover along Transect 2 decreased slightly between August 2011 and May 2012, then decreased to 0 following the flash flood in July. There were no living plants remaining when we visited the site in August. Using photos from May 2012 we were able to locate a large boulder above where Transect 2 had existed. This was used to determine the alignment of the transect, and matching the alignment with features in the background on both sides of the river we were able to relocate the approximate original position of Transect 2. The line was placed and photos were taken but no plants were recorded along the transect.

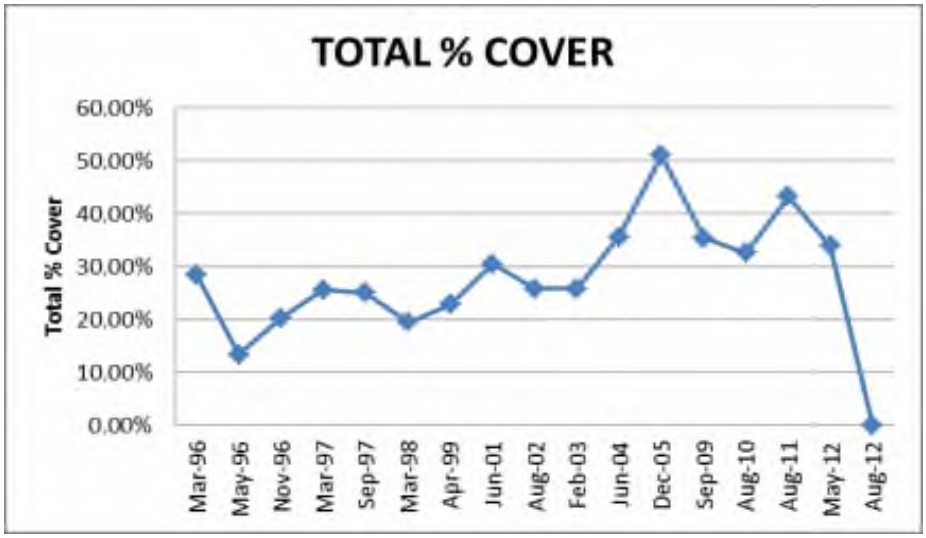


Fig. 75. National Canyon Transect 2 total percent cover.


Fig. 76. National Canyon Transect 2, May 2012, lower portion looking toward river with arrowweed and Bermuda grass in foreground. All of the vegetation in the photo was removed by the flood in July. Over the past 10 years desert-broom has replaced arrowweed as the dominant shrub on Transct 2.

Transect 3

Transect 3 was not run in 2012. Its location on the talus slope placed it above the effects of the July flash flood.

TCP 002 – MOHAWK CANYON, RM 171.5 L

Ethnobotany

An ethnobotanical monitoring program consisting of two elements was initiated in August 2012 at Mohawk Canyon. The establishment follows several years of discussion with HDCR staff and Tribal members, and closely follows ideas that were presented in the 2011 report.

The first element involves the installation of a line-intercept transect through a small stand of tamarisk on the south bank of Mohawk Canyon about 150 m up the creek from its confluence with the Colorado River (Fig. 77). This isolated stand is dying from the effects of the tamarisk beetle, but the original trees remain standing. Although it is along the bank of the creek instead of the Colorado River shoreline, it is close enough to the river to be under its influence at high flows (probably >40,000 but not 25,000 cfs). The purpose is to monitor what vegetation replaces the tamarisk as it dies and releases its habitat. Unlike most riparian areas along the river, which already have an understory of such shrubs as Emory seepwillow *(Baccharis emoryi),* coyote willow *(Salix exigua),* desert-broom *(Baccharis sarothroides)* and other shrubs primed to fill the tamarisk's niche, this stretch along Mohawk Creek is essentially a tamarisk monoculture. It thus provides an opportunity to assess from the beginning what species invade the habitat once the tamarisk is gone in a setting (side canyon) that will probably be less studied than the main river channel. Mohawk is also a site rarely utilized by river runners because there is no camping beach at its mouth, so the study will not be affected by human-influenced factors.

During our visit on August 8, 2012 we installed a single transect through the center of the tamarisk stand. The stand is approximately 3-5 m wide and some 50 m long. The transect is 25 m long and can be read in three parts (upstream, middle, downstream) to provide comparative data and assess any position variability. As closely as possible the line was placed in the middle of the stand. It was marked by rebar and photographed at six locations. The standard line-intercept transect methodology used for existing sites was employed.

The cultural site at the mouth of the canyon sits above the high water line at the top of a slope at the mouth of the canyon. An interesting plant community occurs downslope toward the creek bed, dominated by wolfberry *(Lycium andersonii).* As the small, succulent fruits of this plant were an important food source in prehistoric times, it is

likely that people using the site and eating the fruit discarded the pits on the slope and the plants subsequently grew.

We decided to utilize repeat photography to monitor the site as a less invasive monitoring method than line-intercept transects. The slope is steep and unstable and considerable erosion could be caused by researchers setting transects at each visit. A photo point was established at top of the slope on the opposite side of Mohawk Canyon from which initial photos; this will be relocated for subsequent photos. A measurement was made between two horizontal and vertical fixed points, marked with measuring tapes for the initial photos (Fig. 78). Using the photographs an area was delimited on the slope and a rough estimate of the density of wolfberry (and other shrubs) was made, as well as documenting any gradual shift in species present. It would also serve to document any disturbance to the site, such as trailing by visitors or bank erosion from flash floods in Mohawk Canyon. On furure visits photos will allow us to track the life history of individual shrubs and note any increase or decrease in density, as well as track the invasion of other species.

Fig. 77. Saltcedar stand near mouth of Mohawk Canyon. Transect was established here in August 2012 to monitor vegetation establishment after death of saltcedar due to Tamarisk beetles.

Fig. 78. Grid lines placed on slope below archeological site at Mohawk Canyon. Bright green shrubs are Anderson wolfberry, an ethnobotanical species, which will be monitored using repeat photography of site.

TCP 010 – GRANITE PARK, RM 209 L

Ethnobotany

The three plant transects at Granite Park are spread out over a large area of the shoreline of this large, fault-controlled area. The first transect is in the upstream portion of the Park, near the mouth of the upper side canyon and well above any visitor-use areas. The second transect is at the upstream corner of the embayment that attracts most recreational use. The third site is just upstream from the mouth of Granite Park Canyon, in an area that sees light recreational and camping use.

Transect 1

Vegetation cover took a slight dip in 2012 for the first time in a decade. Nonetheless, total cover is the highest of any of our transects, due primarily to vigorous growth of mesquite in

the lower half of the transect. Some of the shrubs in the upper portion have stagnated, probably due to persistent drought conditions, and there has been some loss of available habitat along the shoreline as a result of continuing high water releases from Glen Canyon Dam.

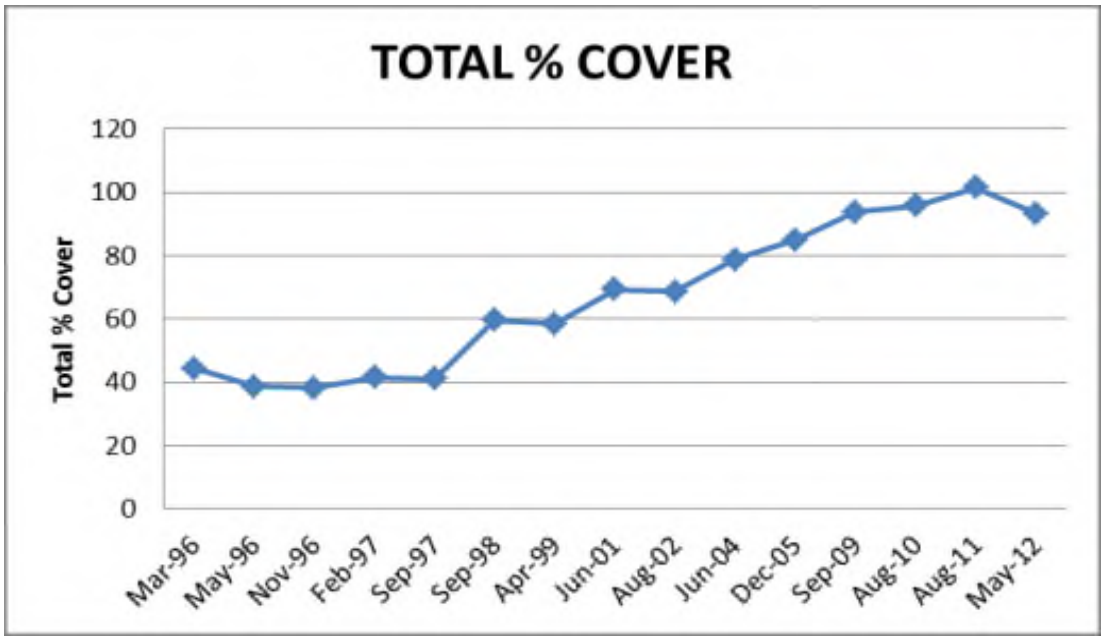


Fig. 79. Granite Park Transect 1 total percent cover, May 2012

Fig. 80. Granite Park Transect 1, dense vegetation in upper part of transect, *Isocoma acradenius* in foreground. Photo taken 2010.

Transect 2

There was little change in Transect 2 in May 2012, which has stabilized with mesquite growth in the upper part, senescing arrowweed in the center, and dense dry marsh species below a steep bank in the lower portion. There was a dip in total cover in 2011 due to flooding of the lower end as a result of high river flows (25,000 cfs). Somewhat lower flows (18,000 cfs) in 2012 exposed a slightly larger area at the river's edge, allowing some of the area that was flooded in 2011 to re-vegetate (Figs. 81 and 82).

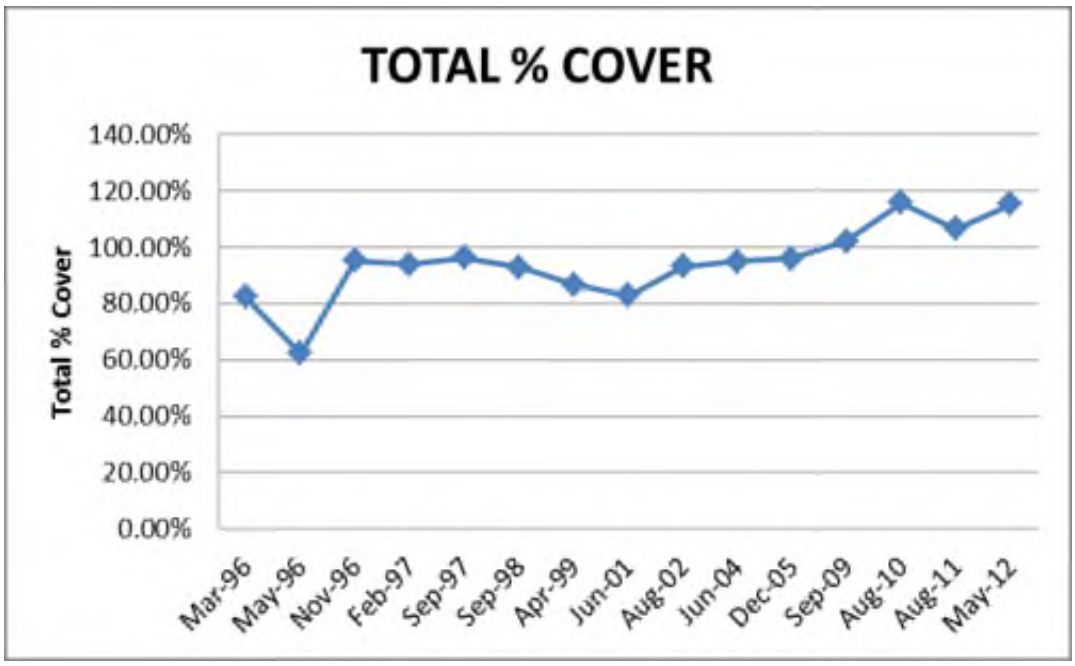


Fig. 81. Granite Park Transect 2 total percent cover.

Fig. 82. Overview of Granite Park transect 2 with mesquite in foreground, thinning arrowweed behind mesquite, and dense, stabilizing shrubby riparian vegetation along shore. Photo taken Aug. 2011.

Transect 3

Transect 3 showed a decrease in cover over 2011, although it continues to have about 140% total cover, indicating dense, overlapping vegetation. The decrease in 2012 was in the portions of the transect away from the river, where seasonal variation and some senescence of shrubs was noted. Vegetation remains dense at the lower end, where a well-developed dry marsh dominated by horsetails is present.

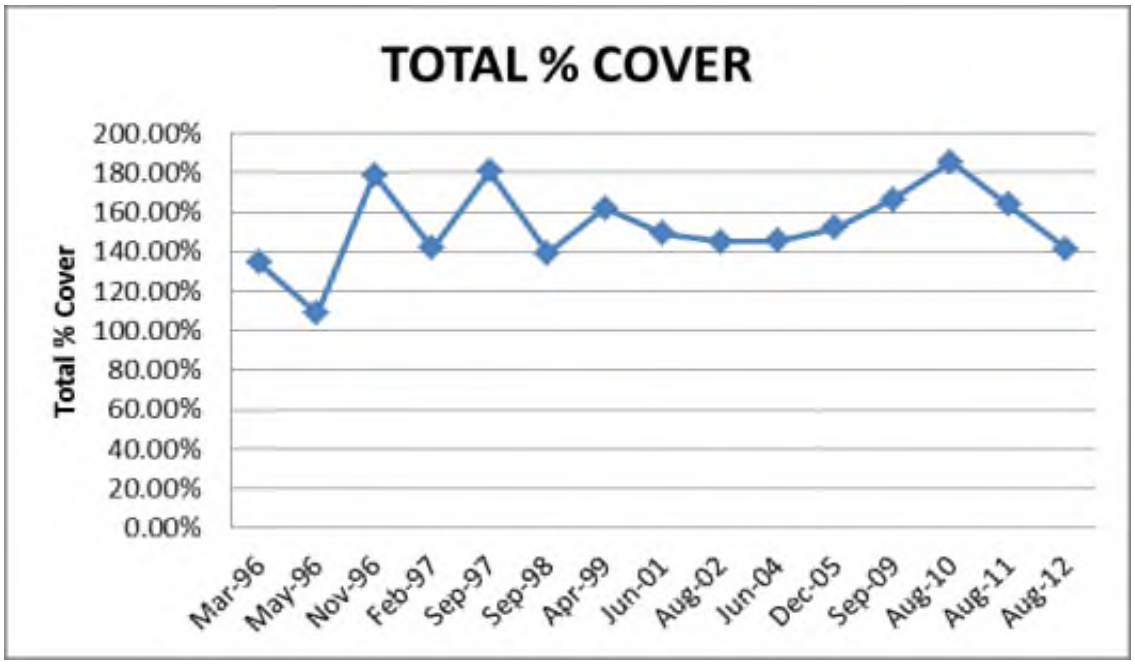


Fig. 83. Granite Park Transect 3 total percent cover.

Fig. 84. Granite Park Transect 3 showing dense shoreline vegetation with dense marsh of horsetails, desert-broom, seepwillow and camelthorn, August 9, 2012

SUMMARY AND CONCLUSSIONS

In this report, we presented our analysis of natural and human impacts to twenty-four Hualapai TCPs; associated features, and ethnobotanical resources located within the traditional Hualapai lands of the Colorado River Corridor for the 2012 monitoring season. Of the twenty-four TCO's, evaluations were minimal for four TCP's (TCP 034, 035, 036, and 037) due to time constraints. HDCR would like to re-visit those sites in order to better establish baseline TCP protocols sometime in the near future. Monitoring culturally significant sites and TCPs for Hualapai is an opportunity in determining the extent of change in the Colorado River Corridor and to assess whether these changes are negative or positive in relation to tribal concerns and sustainable corridor management. With this data and collected interview materials, the HDCR monitoring program strives to meet two important goals:

1) Integrating Hualapai Traditional Ecological Knowledge (TEK) into the monitoring methodology, and

2) From the Hualapai perspective, to better understand the effects of the Glen Canyon Dam on cultural and biological resources and how to contribute comprehensive information to the Bureau of Reclamation

The outcome of these goals allows Hualapai to perform monitoring in a way that is meaningful to the Tribe beyond quantitative means. The process of integrating aspects of TEK into the HDCR monitoring program means that Hualapai Elders who are the keepers and scholars of TEK are able to pass on Hualapai cultural TEK regarding the Colorado River Corridor to the next generation. This directly enhances future Hualapai monitors who will become the keepers and care takers of the *Ha'yi' đađa – the "Backbone of the River."*

Amalgamating Hualapai TEK into Hualapai's monitoring methodologies and consequently contributing comprehensive information towards understanding change within the Colorado River Corridor is a process that requires time, continuity, and consistent communication between Hualapai monitors and agency stakeholders. Determining the extent of change can be evaluated through a possible *Needs and Conditions Assessment* with the objective of obtaining specific information in order to help decide how much and what type of management intervention could be suggested to Hualapai and agency stakeholders. Needs and Condition assessments can also evaluate the capacity of particular treatment plans in relation to impact prevalence, creating a relative priority system for treatment management strategies. Integrating applicable and appropriate TEK data with needs and condition data identified at multiple TCP sites and locations of cultural significance could lead to early intervention and prevention in areas of continued cumulative negative impacts. It is also just as important to inquire whether specific intervention is socially desired. This particular line of research could be approached in the near future.

HDCR monitors noted in August of 2012, that four TCPs: TCP 007 – Whitmore Canyon, (erosion); TCP 010 – Granite Park, (vandalism impact); TCP 011 – Pumpkin Springs, (human intrusions); TCP 012 – Three Springs Canyon (artifact loss). At Three Springs, artifacts have been removed and others replaced in the small upper bench area where the metates are located. It is recommended that photo monitoring continue at yearly intervals at these TCP sites.

RECOMMENDATIONS

Recommendations (Reference Table 6, below) for the 2013 season mainly concern HDCR. Public education, however, could become a joint effort between all concerned agencies, specifically in regards to vandalism, and archaeological site preservation. For trail maintenance, or closure, HDCR is suggesting that NPS take the lead. In general, HDCR will continue to monitor for human and natural impacts as discussed above in this report, specifically in reference to Table 2. HDCR will continue to perform photo matching and will also continue with ethnobotanical transects. Insights into additional monitoring methodologies are always welcomed. Continuing interviews will be conducted regarding specific Hualapai Elders and their perspectives for Hualapai youth and community members.

For Hualapai traditional practitioners, it is essential that religious cultural traditions and practice continue along the Colorado River Corridor and HDCR will continue to improve upon TEK methodologies and eventually be able to better incorporate TEK for consideration into management planning. Contributing comprehensive data derived from natural and human impact observations will provide a better understanding of the effects of Glen Canyon Dam operations on the nature of the River and will assist in responsible management decisions for future planning and nurturing of the Colorado River Corridor.

Table 6. 2013 River Trip Season: HDCR recommendations for treatment of Hualapai TCPs in the Colorado River Corridor

TCP	*Name*	*Agency*	*Recommended Treatment*
001	National	HDCR	Annual monitoring; photo matching
002	Mohawk	HDCR	Monitoring every two years; photo matching
003	Vulcan's	Multiple	Annual monitoring; public outreach & education; photo matching
004	Medicine	HDCR	Monitoring every two year; photo matching
005	Artesian	HDCR	Monitoring every two years if accessible; photo matching
006	AZ:A:15:19	HDCR	Monitoring every two years; photo matching
007	Whitmore C.	HDCR/NPS	Annual monitoring for visitor impacts; photo matching; recommend trail closure
008	Hematite	HDCR/NPS	Trail work; annual monitoring; photo matching
009	205 Mile	HDCR	Monitoring every two years; photo matching
010	Granite	Multiple	Annual monitoring to evaluate for potential human impacts ; trail work; photos
011	Pumpkin	Multiple	Annual monitoring; public outreach & education; photo matching
012	3 Springs	HDCR/NPS	Annual monitoring; trail work; photo matching
013	AZ:G:3:80	HDCR/NPS	Annual monitoring; trail work; photo matching
014	LCR	HDCR/NPS	Annual monitoring; trail work; photo matching
015	Cardenas	HDCR/NPS	Monitoring every two years; photo matching --NPS to monitor archaeology
016	Deer Ck	HDCR/NPS	Annual monitoring; NPS to monitor archaeology; recommend closure of upper trail system
017	Havasu Ck	HDCR/NPS	Annual monitoring; trail work; photo matching
018	Diamond	HDCR	Annual monitoring; photo matching
019	Bridge	HDCR	Annual monitoring; photo matching
020	Spencer	HDCR	Annual monitoring; photo matching; trail work
021	Travertine C.	HDCR	Monitoring every two years: photo matching
022	Travertine F	HDCR	Annual monitoring, photo matching; evaluate for potential human impacts
023	Burnt Sp.	HDCR	Monitoring every two years: photo matching
024	Shinumo C.	HDCR	Annual monitoring: photo matching
025	Whitmore P.	HDCR	Annual monitoring, photo matching to evaluate for potential human impacts
026	Separation C.	HDCR	Monitoring every two years; photo matching
027	Columbine	HDCR	Annual monitoring; photo matching
028	Hotauta C.	HDCR	Monitoring every two years; photo matching
029	AZ:A:16:004	HDCR	Monitoring every two years; photo matching
030	Vassey's	HDCR	Annual monitoring; photo matching
031	Buck Can.	HDCR	Annual monitoring; photo matching
032	Salt Mine	HDCR	Annual monitoring; photo matching
033	Elves Chasm	HDCR	Annual monitoring; photo matching
034	Stone Creek	HDCR	Annual monitoring; photo matching
035	Forester	HDCR	Monitoring every two years; photo matching
036	Olo Canyon	HDCR	Monitoring every two years; photo matching
037	Tapeat's CK	HDCR	Monitoring every two years; photo matching

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