

**COMBINED CRMP CAMPSITE MONITORING AND VEGETATION RIVER TRIP
MARCH 31-APRIL 17, 2015
TRIP REPORT**

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Trip Objectives

This trip was a Colorado River Management Plan (CRMP) monitoring trip combined with a general vegetation management trip. The primary objective for the CRMP portion of the trip was to test and implement the draft CRMP Rapid Assessment Monitoring Protocol. The secondary objectives were to refine the electronic data collection components, to integrate on-site mitigation with the monitoring program, and to determine whether the draft attraction site monitoring protocols are feasible to implement. The primary objectives for the vegetation portion of the trip were to treat high priority invasive plants in the river corridor, to provide on-river training to vegetation program staff, to monitor select rare plant populations, and provide the database manager with field experience in data collection to help refine the program's database. All trip objectives were met and we now have a very solid foundation to move forward with CRMP monitoring and mitigation.

Logistics and Personnel

OARS provided the support for this trip through the Cooperative Resource Conservation Program (CRCP) agreement. NPS staff signed out rain gear and dry bags from the NPS. Project leader Lori Makarick met with the OARS trip leader, operations manager, and food packer a few weeks in advance of the trip to line out project needs and trip details. Four of the OARS boatmen departed Flagstaff on March 30 to rig the trip at Lees Ferry. Prior to departure, both Linda Jalbert and Lori Makarick attended the OARS pre-trip briefing and provided the group with the project equipment and gear. The trip leader, Heather Solee, met the remaining project participants at the Coconino Building NPS Office at 8:30 on March 31 to load the personal gear. All trip participants attended the pre-trip meeting at Lees Ferry, which was held during lunch and prior to launch. The pre-trip meeting included a review and discussion on park policies, trip expectations, white water and camp safety, and project goals and objectives. All participants received a copy of the itinerary. The trip departed the boat beach around 12:30 pm. The take-out from Diamond Creek was scheduled for April 17, camping at Diamond Creek the night before. Because we were a slight bit ahead of schedule, OARS sent the driver and trucks down that afternoon and the trip was back to Flagstaff the night of April 16.

The OARS boatmen were very enthusiastic about the trip and the trip leader, Heather, was exceptional. She kept the trip very well organized and was very amenable to changes to meet trip objectives. She helped foster a great atmosphere for communication and worked very closely with the project leaders on a daily basis to keep the trip on track. She served as a mentor and leader for the boatmen and was very good at working with interpersonal dynamics of the crew. The boatmen were all excellent and did a great job with both on-river safety and camp set up and cooking. They did not request or require assistance in the kitchen, which was actually extremely beneficial to the trip because it allowed the NPS staff time to key out plants, plant for

the next day, maintain the data collection equipment, and have some personal time after the work day. In exchange, the boatmen were very infrequently asked to participate in the campsite work, which gave them down time at each of the stops.

Table 1: Trip Participants

Role	Upper Half	Lower Half
Boatman and Trip Leader	Heather Solee	Heather Solee
Boatman	Ryan Lyndsey	Ryan Lyndsey
Boatman	Elise Otto	Elise Otto
Boatman	Sean Bothman	Sean Bothman
Boatman	Michele Lohman	Michele Lohman
Project Leader - Veg	Lori Makarick	Lori Makarick
Project leader - CRMP	Linda Jalbert	Linda Jalbert
Veg Field Leader	Dan Boughter	Dan Boughter
Veg Field Leader	Katie Sandbom	Katie Sandbom
Veg Field Leader	Sarah Sterner	Sarah Sterner
Veg Field Leader	Shahed Dowlatshahi	Ahsa Jensen
Botanist	Amy Prince	Amy Prince
CRMP Guru / Veg Field Leader	Mike Kearsley	Mike Wolcott
Data Guru & Physical Scientist	Santiago Garcia	Ed Schenk
CRMP crew	Ronda Newton	Chris Kerr

The trip itinerary (Table 2) was ambitious due to the uncertainty of the time and complexity of the river corridor invasive plant removal stops. However, the trip stayed more or less on itinerary and very few changes should be made for future trips.

Table 2: Trip Itinerary

Day	Date	Camp Goal	Mile	Monitor sites	Mile	Veg Stops	Attraction/ Hydro
1	3/31	6 Mile	5.9 R	6 Mile	5.9 R	ELAANG 1.8L, 2R, 2.5R, 3.2L, 4.4L SACRAV 1.7R	
2	4/1	20 Mile	20.2 L	Jackass Canyon Camp	8.1 L	ELAANG 8.3R, 103R, 11.3R, and 14L ULMPUL 12.6R TRITER 8.1L	
				Soap Creek Camp	11.3 R		
				Hot Na Na Camp	16.6 L		
				18 Mile Wash Camp	18.4 L		
				20 Mile Camp	20.2 L		
3	4/2	Nautiloid	35.1 L	Fence Fault Camp	30.6R	TRITER & BRATOU North Canyon BRATOU & LEPLAT Nautiloid	North Canyon
				South Canyon Camp	31.9R		
				Nautiloid Camp	35.1L		
4	4/3	Saddle Area	47.5 R	Buck Farm Camp	41.2 R	LEPLAT & SOLELA - Tatahatso and Martha's BRATOU Saddle camp and trail SACRAV - Buckfarm, 42.4L, 45.2L, 46.9R, 51.7R, 52.5R, 52.8L, 54.5L, 56.4L	
				Duck N Quack Camp	47.2 L		
				Upper Saddle Camp	47.5 R		
5	4/4	60 Mile	60.2 R	Little Nankoweap	52.1R	CORSEL - 55.8L	
				Main Nankoweap	53.4R		
				Kwagunt Camp	56.6R		
				Opposite Malgosa	58.1L		
6	4/5	Nevills Camp	76.1L	Lava Canyon Camp	65.9R	ELAANG 61.9L, 65.2L, and 70.2R SACRAV 68.6R, 69.1R, 71.5L, 73.3L, 73.5L Cardenas riparian restoration review Unkar trail pruning	Unkar delta trail review <i>Drop off Mike to hike out Tanner Trail</i>
				Palisades Camp	66.1L		
				Cardenas Camp	71.6L		
				Unkar Left Camp	72.7L		
				Upper Nevills Camp	75.7L		
				Nevills Camp	76.1L		
7	4/6	Granite Camp	93.8L	Hance Camp	77.1L		<i>Ed, Chris, Ahsa, Mike hike in and meet us by 4pm</i>
				Salt Creek Camp	93.2L		
				Granite Camp	93.8L		
8	4/7	Granite Camp	93.8L			Planting & Transects	
9	4/8	110 Mile Camp	110R	Boucher Camp	97.2L	SACRAV 98.8R	Shinumo above falls and change out dye receptor – <i>Santiago, Ronda, Shahed hike out from Granite</i>
				Crystal Camp	98.7R		
				103 Mile Camp	103.7R		
				Ross Wheeler Camp	108.3L		
				110 Mile Camp	110R		
10	4/9	122 Mile area	122.0	121.2 Mile Camp	121.2R	SOLEA - Blacktail	Elves Chasm
				122 Mile Canyon	122.8L		
11	4/10	Owl Eyes	135.2R	Fossil Camp	125.4R	Veg planning and leadership meeting at Stone Creek	Stone Creek
12	4/11	Backeddy	137.8R	Across Deer Creek	136.8R	AGAPHI monitor – Deer; Exotics – Deer Creek	Tapeats hydro? Deer Falls and Patio
				Football Field Camp	137.7R		
				Backeddy Camp	137.8R		

13	4/12	Upset Hotel	150.7R	Above Olo Camp	145.9R	FLAMAC monitor - Matkat SOLELA 162.9R, 163.6R	Matkat
				Upset Hotel Camp	150.7R		
14	4/13	Stairway	171.6L	158.7 Mile Camp	158.7R	Tuckup Exotics	Havasu? Fern Glen?
15	4/14	Fat City	192.3L	Lower Chevron Camp	183	CORSEL - 177.2 side unk. FLAMAC - Cove	Cove
				Upper 185 Mile Camp	185.9		
				Lower 185 Mile Camp	186		
16	4/15	Indian Canyon	207.0R	Fat City Camp	192.3L	SACRAV 192 R & 204.3R	
				Hualapai Acres Camp	194.6L		
				Parashant Camp	198.9R		
				Indian Canyon Camp	207 R		
17	4/16	Diamond Creek	225.9L	214 Mile Camp	214.5		
				Opposite 3 Springs Camp	216.1		
				217 Mile Rapid Camp	218		
18	4/17	TAKE OUT DIAMOND CREEK EARLY MORNING –BACK TO OARS AND THEN TO HOME LOCATIONS					

Results and Observations

Campsite Monitoring

The CRMP Campsite Rapid Assessment Protocol (RAP) required data collection for the following components:

- Human Impacts
- Barren Core
- Vegetation, including tamarisk beetle monitoring

The RAP document contains the data collection protocols for each category. The goal of the trip was to complete the RAP data collection at the full list of campsites selected for long-term monitoring. However, the sampling design allows for the opportunistic addition of other sites and for missing sites if the circumstances require that.

We implemented full or partial CRMP RAP at 54 campsites. We completed 50 barren core assessments, 51 vegetation assessments (including tamarisk monitoring), and 50 human impact assessments. We did not collect the full suite of data at a few campsites due to a noncommercial or commercial trip occupying the site when we arrived or because of opportunistic sampling.

The following campsites are missing data components:

- Hot Na Na Camp – Impact data missing
- South Canyon Camp – Impact data missing
- Hotauta Camp – Impact data missing
- Upper Matkat Hotel Camp – Vegetation and barren core data missing
- Matkat Hotel Camp – Vegetation and barren core data missing
- 158.7 Mile Camp – Barren core data missing

Parashant Camp – Impact data missing

At each campsite, we updated the campsite maps that included campable area and campsite boundary for each site. We documented the following totals for RAP human impact categories:

- Surface litter – 351 incidents total for all camps monitored
- Human waste – 12 incidents total for all camps monitored
- Noncompliant campfire indicators at 39 campsites
- Noncompliant Firewood indicators at 18 campsites
- OHWZ Trails – 37 trails for all campsites monitored
- OHWZ Barren Core - 20 cores for all campsites monitored

Additional documentation for campsite condition including notes on HFE effects and potential mitigations or management actions is included as Appendix B.

We documented a total of 192 unique plant species. There was an average of 33 plant species per campsite. The most common species are included in Table 3.

Table 3. Common Plant Species Documented at Campsites

Species Code	Scientific Name	Common Name	# Occurrences
TAMRAM	<i>Tamarix ramosissima</i>	Tamarisk	51
BRORUB	<i>Bromus rubens</i>	Red brome	50
SPOCRY	<i>Sporobulus cryptandrus</i>	Sand dropseed	39
BACEMO	<i>Baccharis emoryi</i>	Emory’s baccharis	39
BRODIA	<i>Bromus diandrus</i>	Ripgut brome	37
STPAU	<i>Stephanomeria pauciflora</i>	Wire lettuce	37
GUTSAR	<i>Gutierrezia sarothrae</i>	Snakeweed	37
ENCFAR	<i>Encelia farinosa</i>	Brittlebush	35
CRYPTSPP	<i>Cryptantha species</i>	Cryptantha	33
ACAGRE	<i>Acacia greggii</i>	Catclaw acacia	32

Invasive Plant Species Treatment

One of the priorities of the trip was to treat high priority invasive plant species. We updated the invasive plant identification guide to include all of the species of concern and provided that to trip participants. We specifically scanned for Russian olive (*Elaeagnus angustifolia*) and Ravenna grass (*Saccharum ravennae*) along both sides of the river, with known locations listed on the itinerary. We also removed high priority invasive plants from campsite locations as time allowed. We managed for 13 different plant species and removed 3,150 exotic plants (Table 4).

Table 4. Invasives Plant Species Treated

BRATOU	<i>Brassica tournefortii</i>	Sahara mustard	463
BRORUB	<i>Bromus rubens</i>	Red brome	505
CHOTEN	<i>Chorispora tenella</i>	Blue mustard	215
ELAANG	<i>Elaeagnus angustifolia</i>	Russian olive	16

HORMUR	<i>Hordeum murinum</i>	Mouse barley	30
MALAFR	<i>Malcolmia africana</i>	African mustard	1266
RUMCRI	<i>Rumex crispus</i>	Curly dock	3
SACRAV	<i>Saccharum ravennae</i>	Ravenna grass	10
SALTRA	<i>Salsola tragus</i>	Russian thistle	244
SETGLA	<i>Setaria glauca</i>	Yellow foxtail	12
SISIRI	<i>Sisymbrium irio</i>	London rocket	130
SONASP	<i>Sonchus asper</i>	Spiny sow-thistle	179
SONOLE	<i>Sonchus oleraceus</i>	Common sow-thistle	77

There are known locations of silverleaf nightshade (*Solanum elaeagnifolium*) and perennial pepperweed (*Lepidium latifolium*), several of which were listed on the itinerary to assess and discuss treatment options for. There was insufficient time to thoroughly complete those assessments, so that work was dropped from the trip but should be included in future planning. We did not find or treat puncturevine (*Tribulus terrestris*) at the locations on the itinerary, but that species needs to remain on the high priority list for removal as it is encountered in the future. There was a report of a Siberian elm (*Ulmus pumila*) at 12.6R, but we did not find that tree.

Rare Plant Monitoring

The focal species for rare plant monitoring were Grand Canyon agave (*Agave phillipsiana*) and McDougall's yellowtops (*Flaveria macdougalii*). We monitored the two agave sites up Deer Creek, and both sites had more plants than during the previous monitoring, with many young pups at each location. We monitored McDougall's yellowtops at Matkatimiba Canyon, Cove Canyon, and a river corridor spring at 151.6 mile, and all 3 of those sites looked healthy. We installed permanent photopoints at each of the rare plant locations visited.

Granite Camp Restoration

We spent nearly 2 days at Granite Camp to work on the restoration site and monitoring. We re-read four transects associated with the restoration project, but we decided not to re-read the two transects that were installed in the Monument Creek drainage. We re-took the transect photopoints and the overall project photopoints, and we updated the photopoint data and directions to make them easier to revisit and retake in the future. The Guides Training Seminar (GTS) river trip met up with us at Granite Camp on April 7 and delivered 3 Goodding's willow, 3 boxelder and 3 cottonwood trees for us to plant. They also brought caging material and stakes to protect the trees. Martha Hahn, Science and Resource Management Division Chief, was on the GTS trip and helped with the daily care and nurturing of the plants until they arrived. The plants were wrapped in burlap and kept wet until they arrived. We planted the willow in 5-6' deep holes, so their root balls would be as close to the water table as possible, burying much of the stem for each willow. Only the root balls of the cottonwoods and boxelders were buried, as is typical for planting such trees. Crews installed solid berms and cages around each tree. In the old planting areas, the team re-secured cages, removed exotic plants from within berms, fixed berms so they would hold more water, and updated the site information in the ammo can. We also collected GPS data for each of the new trees planted and used this data to update the site map.

Other Projects

We stopped at Unkar Delta to evaluate the trail work that was completed in February 2014. The trail work was conducted in concert with the revision of the Unkar Delta brochure. The trail work involved delineation of the main trail at two of the sites along the interpretive trail. The work conducted was a drastic change from original character of the trail. A follow up visit by the Park Archeologist and tribal consultants is scheduled for June, and recommendations would result from that visit. We documented artifact collection piles and then re-distributed the artifacts as instructed. Before departing the site, we did a short recon of the scout trail, and trimmed the vegetation to make the trail junction more evident.

In addition to rare plant monitoring at Deer Creek, we obliterated some social trails near the Deer Creek toilet, and pruned some torn trees and shrubs along the trail from the designated camp to the creek.

We stopped at the Whitmore rock art panel to re-take the photographs that were taken after the trail work was completed in April 2014.

We completed trail pruning at the following locations:

- Upper Unkar camp down to the Unkar Delta pull-in
- Access trails to Unkar Left Camp
- Little Nankoweap Camp to the main Nankoweap Camp

We also corrected and cleaned up past pruning at several different locations.

Linda, Lori, Dan, and Katie reviewed and discussed the CRMP Campsite Assessment and Restoration forms, and agreed that they need to be simplified. We made notes and will update those forms and database interface prior to the next trip.

Attraction Site Monitoring

We did not fully implement the attraction site monitoring vegetation protocols because they still need to be finalized and after on-site discussion, we felt they would not provide data that would be readily usable for monitoring. We made complete plant species lists along the trails at the following attraction sites:

- Stone Creek
- Matkatamiba Canyon
- Elves Chasm
- Cove Canyon

Those lists cannot be entered into the database at this time because that component has not been developed.

Problems Encountered and Solutions

This trip was very successful and went according to plan, with work being completed slightly ahead of schedule. We suggest having a similar itinerary for future trips and combining this work with other vegetation program needs due to the expertise already on the trip. The group size could be slightly smaller as crew members become more familiar with the RAP task requirements. We could also manage with four boats on future trips. If we intend to truly

accomplish mitigation tasks (i.e. invasive plant removal, vegetation pruning) during the monitoring stops, we might need to lengthen the trip by 1-2 days and have 2 people assigned directly to those tasks or consider more efficient ways to add that to the time required at each stop.

The tablets and Trimble GPS unit were very easy to use and store. There were some glitches that were worked out while Santiago Garcia was still on the trip. There were a few campsites where we could not get a GPS reading, so we just had to put the locations on the printed maps. Having a side silver box dedicated to storage of those items and their accessories made the loading and unloading at each campsite easy and the boatman was able to assist with the process.

Prior to the trip, we had work sessions to select the final campsites for inclusion in this long-term monitoring program. As we implemented the work in the field, we encountered three sites (103 Mile, 121.2 Mile and 214 Mile camps) that did not meet the overall criteria for campsite size category or campable area due to changes since the last mapping efforts. We had the full list of campsites and categories with us on the trip and were able to make substitutions for those sites. We selected Hotauta Camp, Enfilade Camp, and 221 Mile Camp as the replacements camps for the long-term monitoring because they were within the same reach and in the same size category. We now have the final list of campsites that will be used for the long-term CRMP campsite monitoring program. The campsite list was updated (V:\Science\CRMP\CRMP Campsite Monitoring 2015\CRMP_CampsiteSummary_20150618) and the data were provided to both Mark Nebel and Santiago Garcia.

We were unable to complete the assessments at Indian Canyon Camp (207R) because it was occupied by a group who was doing a layover and were very established at the site. We also did not do an assessment at 214 Mile Camp because it was occupied by an Oars/Dories trip, but that site was actually removed from the list and substituted with 221 Mile Camp.

Because there are varying levels of experience with boatmen and some of the campsites on the full list are not commonly used, it would be beneficial to have all of the campsites loaded into a GPS unit so trip participants can help navigate to the more obscure campsites. It would also be beneficial to have the previous ELAANG and SACRAV sites loaded into GPS units so that we can revisit the sites and also know whether “new” individuals are actually at a previously documented site. In an ideal world, the GPS units would have the map layers on them and we would be able to see many overlapping raster and vector files as needed.

For future plant transport on river trips, it is recommended that the soil in pots be stabilized by wrapping all pots in a reemay-type cloth to prevent soil from falling out of the pots. Additionally, it would be a benefit if the plants were first staked before being wrapped with burlap. This would give the plants more support while they are being loaded and unloaded each day.

Follow- up Actions

The following is a list of follow-up actions that need to occur:

1. Finalize the full CRMP Rapid Assessment Monitoring protocol document using the Inventory and Monitoring program’s protocol format. (Suggested deadline January 2016).

2. Update the CRMP_CampsiteSummary document to incorporate the added and removed campsites along with the documentation of those decisions.
3. Determine the future schedule for CRMP monitoring and mitigation trips and plan for 2016 and 2017 needs.
4. Schedule fall 2015 CRMP planning meeting. There are a few action items to complete prior to the next trip:
5. Finalize the CRMP RAP document to include the notes, suggestions, and edits from the trip participants and add procedures for the daily data backup and battery charging.
6. Fix any final quirks with the interface on each of the tablets.
7. Put the tamarisk data on the barren core datasheet and tablet rather than the vegetation tablet.
8. Purchase a new bag for the Abney rod.
9. Purchase dry bags for the plant presses.
10. Simplify the CRMP campsite assessment and mitigation documentation forms and ensure database components and interface are updated as changes are made.
11. Finalize attraction site monitoring protocols and develop the tablet and database interface prior to future trips.

APPENDIX A: PHOTOGRAPHS



Figure 1. Upper half trip participants.



Figure 2. Lower half trip participants.



Figure 3. Sarah Sterner and Shahed Dowlatshahi perfecting the use of the Abney level.



Figure 4. Ronda Newton and Linda Jalbert collecting campsite data on the tablet and documenting campable area on the hard copy map.



Figure 5. Katie Sandbom, Ronda Newton, and Linda Jalbert documenting collection piles at Unkar Delta site.



Figure 6. Santiago Garcia pruning access trail to campsite at Unkar Left Camp.



Figure 7. This is what happens to boatmen when the winds rule the day.

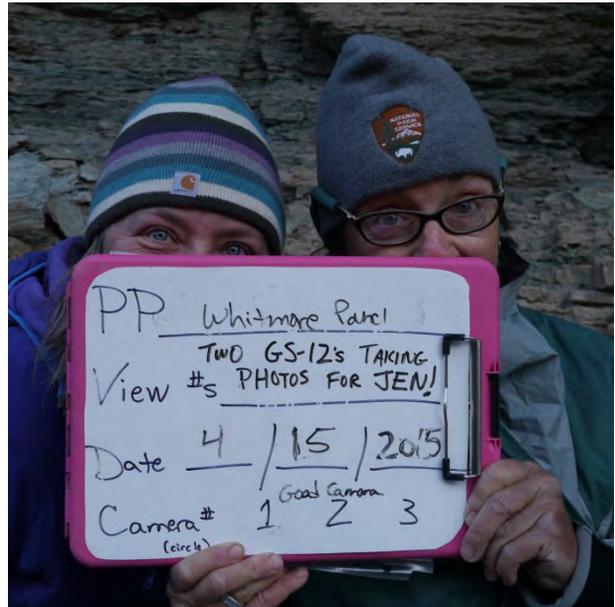


Figure 8. Lori Makarick and Linda Jalbert completed photo-documentation at Whitmore Panel.



Figure 9. The famous twister mat which is used to guide barren core measurements.



Figure 10. The twister template in edible form thanks to boatman Sean!



Figure 11. Ahsa Jensen getting plants out of their travelling armor and ready to be planted in the ground at Granite Camp.



Figure 12. Katie Sandbom entering barren core data into the tablet.



Figure 13. Katie Sandbom and Amy Prince reviewing campsite boundary prior to completing plant inventory.

APPENDIX B: CAMPSITE MONITORING NOTES

Date	Camp Name	RM	RAP?	MAP?	NOTES
3/31	6 Mile Camp	5.9 R	Y	Y	Very small camp overall – lots of overgrowth in tammy cove; this could be trimmed and opened a bit. Small kitchen. Probably gets used on very windy days. Fairly good camping at upstream end near/on wash.
4/1	Jackass Canyon Camp	8.1 L	Y	Y	There's still a lot of fire evidence - hiker destination. Trash and human waste not as bad as seen in the past, but stayed w/in NHWZ area for search.
	Soap Creek	11.3 R	Y	Y	Multi-trailing and camping in OHWZ terrace persists. Vertical mulching seems to be used for campfire kindling. Most of "helipad" reveg holding -- probably need to block these trails as well, or post as "restoration area". We have signs. Need a new plan.
	Hot Na Na	16.6 L	N	N	Upstream camp has VERY steep beach face, limited campable area. Dories group at main camp. Did not do the RAP or map.
4/2	18 Mile Wash Camp	18.4 L	Y	Y	HFE makes access very difficult -- very steep. Some loss in camp area due to slope.
	20 Mile Camp	20.2 L	Y	Y	This camp doesn't seem to change too much. Beach front area is very steep and most of camping is in back on gravel pads. This could be improved by moving some rocks and defining camp pads a little better.
	North Canyon	20.7 R	Y	Y	Rap and Map for Upper and Lower North while crew was hiking, and doing invasives work.
	Fence Fault Camp	30.6 R	Y	Y	
	South Canyon Camp	31.9 R	Y	Y	Major wash out in main camp (date?); large loss of camp area. However, "strip area" receiving sand from HFEs and some wash-out of driftwood piles. Some work could be done here to move wood and open up these areas. Access to upper area is difficult-did not appear to be receiving use by river users. Old campfire piles/scars that we worked on for years are washed out.
	Little Redwall	34.2 L	N	N	Very, very steep access - difficult to access, but we camped here.
4/3	Nautiloid Camp	35.1 L	Y	Y	Good camping in main and upstream area. Some tammy trimming to widen access trail to main camp. Minor tammy trimming around camp pads on upstream "high camps".
	Buck Farm Camp	41.2 R	Y	Y	Seems to be holding. Good camping; steepish access, not really a good kitchen near boats; otherwise good screening. Access to canyon still visible, but washed out some.
	Duck N Quack Camp	47.2 L	Y	Y	Trail at upper end of camp became overgrown; no loss of campable.
	Upper Saddle Camp	47.5 R	Y	Y	Not much change - campsite proliferation into mesquite groves. Good veg cover on downstream end of camp (near toilet) - some overgrowth, fewer trails in this area.
	Lower Saddle	47.6 R	Y	Y	A lot of stumpy willows - beaver city? Poor access at beachfront due to slope.
4/4	Little Nankoweap Camp	52.1 R	Y	y	Hooray for sandverbena. There are a few OHWZ campsites on perimeter of main camp that have been rehabbed multiple times; and continue to get re-used. Consider leaving/allowing, and focus on obliterating trailing on slope above camps and "old camp" area adjacent to trail on terrace above main camp enroute to side canyon.

	Main Nankoweap Camp	53.4 R	Y	Y	We hiked from Little to Main and did some trimming: mostly in the mesquite area west of Little Nanko drainage. Some trail confusion to east of Main camp area, but made sense if you come from the Main camp.
	Lower Nankoweap - Point Camp	53.5 R	Y	Y	Had time to check out trails and map camp. Some confusion and OHWZ trailing from Lower to Main. Consider defining better trail - maybe even "go behind" main camp area? Main camp seems to be growing, especially at upstream area.
	Kwagunt Camp	56.6 R	Y	Y	PRIV layover. Not much change to downstream end of camp. Upstream end w/ arrowweed, seems to have gained sediment, made it more campable. Steep, but low cutbank at upstream end. OHWZ camps same. Some of the rehab worked.
	Opposite Malgosa Camp	58.1 R	Y	Y	Slight change in campable area due to HFE and steep cutbank.
	60 Mile Camp	60.2 R	Y	Y	Some improvement to landing, slightly more campable area due to HFE.
	Crash Canyon	62.9 R	N	Y	We could move some rocks to create camp pads. Lots of little spots on rocky slope, good social area near kitchen.
4/5	Lava Canyon Camp	65.9 R	Y	Y	Happy Easter! Some OHWZ camps under mesquites persist - probably better to focus on obliterating trailing onto terrace. Need to ensure that "trail" from drainage is blocked.
	Palisades Camp	66.1 L	Y	Y	Where we monitored is most likely used by backpackers. River peeps are more likely to use sand deposits just downstream; although likely covered at 15kcs.
	Cardenas Camp	71.6 L	Y	Y	Geez. Rehabbed camps near dunes are back. This needs a major plan. Also found small collector's pile near dunes along trail to Cardenas Fort. Dissatisfied in how the resource damage continues to reappear. Campsite boundaries redrawn on map.
	Unkar Delta	72.6 L			Most of crew dropped off at Upper Unkar camp (mapped) and trimmed to Unkar Delta. LJ, RN, LM, KS, HS did tour of Unkar and discussed trailwork completed in Feb 2014. Ellen and Arch crew will be revisiting in June. We also delineated a short portion of the "scout trail" at the junction near steps to delta. Made it more apparent.
	Unkar Left Camp	72.7 R	Y	Y	Heavily vegetated access, cutbank made access difficult. Would be much easier for large motorboat. We cleared new trail ~15m x 3m wide.
4/6	Upper Nevills Camp	75.7 L	N	Y	PRIV camped here.
	Nevills Camp	76.1 L	Y	y	Steep cutbank / beachfront at downstream end, otherwise good landing at base of rapid.
	Hance Camp	77.1 L	Y	Y	Work on slope at river camp is holding! Hooray. Some trailing above large scout rock but limited to main area.
	Salt Creek Camp	93.2 L	Y	Y	This camp is smaller due to slope and some veg overgrowth.
4/7	Granite Camp	93.8 L	Y	Y	Layover camp. Shared camp with 2 backpacking groups 1st night and 1 the 2nd night. It was cozy. It would be interesting to see if/how that would work with a larger group, especially if the hikers were there first. I went up to Monument to monitor campsites, check out toilet. Returned and helped with planting and clearing. Follow-up question to veg team: would/should we consider burning dead and down arrowweed? The piles are getting big!
4/8	Boucher Camp	97.2 L	Y	Y	
	Crystal Camp	98.7 R	Y	Y	No notable changes to camp area; loss of upstream toilet area. Could use some veg trimming on lower trail from camp

					to delta scout area.
	103 Mile Camp	103.7 R			REMOVED FROM CAMPSITE LIST. Not really useable as a camp; steep slope.
	Hotautau	108.1 R	Y	Y	ADDED. Increase in campable area from HFE. PRIV group here.
	Ross Wheeler Camp	108.3 L	Y	Y	Some loss of campable area from veg growth - may benefit from some careful trimming to define trail/camp in center and to avoid vegetation damage from trampling, ripping, etc.
4/9	110 Mile Camp	110 R	Y	Y	Some increase in campable area. Not much change otherwise.
	Elves Chasm				Short visit to check out trail, water, loveliness, etc.
	121.2 Mile Camp	121.2 L			REMOVED FROM CAMPSITE LIST. Not really useable as a camp.
	122 Mile Canyon Camp	122.8 R	Y	Y	Some loss of campable area from slope, especially in upstream end where kitchen would normally be located. Higher section of camp area is stable by access is difficult due to steep slope.
4/10	Enfilade	124.2 L	Y	Y	ADDED to replace 121.2. Long narrow, open camp. Does not fit description of Martin guide.
	Fossil Camp	125.4 L	Y	Y	Large open area with few campable sites. Some camp high on dunes. Definite campable area gain since last mapped pre-HFE
	Galloway	132.2 R	N	Y	Not on veg RAP list, took advantage of time at Stone.
	Stone	132.4 R	N	Y	" "
	Talking Heads	133.7 L	N	Y	Beneficial effects from HFE.
4/11	Across Deer Creek Camp	136.8 L	Y	Y	No change in campable area noted. Trim veg in arrowweed island.
	Deer Creek	136.9 R			Check out trail, campsites and toilet. Toilet volume seemed okay, recent maintenance. No poo piles found, but social trailing noted further west on trail - this short section was obliterated. See veg report form exotics removed.
	Football Field Camp	137.7 L	Y	Y	No notable changes.
	Backeddy Camp	137.8 L	Y	y	Major wash-out of drainage a upper section of camp. This is not accessible. Accessible at lower/downstream end near overhang area. Camp still useable, but not as inviting. Overall loss of campable area due to wash out and slope.
4/12	Above Olo Camp	145.9 L	Y	Y	Steepness of slope at access/mooring has increased. Slight loss of campable area as a result.
	Matkat Hotels	148.9 L	Y	Y	I mapped and rapped when veg team was up in Matkatamiba. This is almost like one large camp, but is divided by a rock pile that can separate groups. Some improvement, especially the access in the upper camp. Lower camp has rocky access, but good campable area and shade.
	Upset Hotel Camp	150.7 L	Y	Y	New campsite area ~10x6 m on downstream end, although it is not accessible from shore.
4/13	158.7 Mile Camp	158.7 R	Y	Y	Ledge camp with some additional sand/campable area at upstream end outside of campable area boundary. Cleaned up spilled wine and other liquids on ledges. Should be noted in RAP.
	Upper Tuckup	165 R	Y	N	Did not have maps. ADDED to Veg RAP
	Tuckup	165.1 R	Y	N	Did not have maps. ADDED to Veg RAP
4/14	Cove	174.8 R	N	Y	Mapped the upper and main camps. Upper has some change due to gullying; some campable area loss. Not much change to main, some veg growth mid camp.
	Lower Chevron Camp	183 R	Y	Y	Many camps in arrowweed field. Steep access but does not affect campable area.

	Upper 185 Mile Camp	185.9 R	Y	Y	Some campable area loss due to steep access at downstream end of camp. Good campable area in vegetation, but a long way to schlep gear.
	Lower 185 Mile Camp	186 R	Y	Y	Steep, steep entry, but doable. Main camp area changes due to veg growth. This camp should be routinely trimmed - it is popular for WHI exchange. We did not do this due to time constraints -- very, very windy day.
4/15	Whitmore Panel				Repeat photos of trailwork done in 2014.
	Fat City Camp	192.3 L	y	y	Good access to camp. Obliterated one trail and barren core in OHWZ.
	Hualapai Acres Camp	194.6 L	Y	Y	Not a good camp. Steep access (some low water kitchen area) and thick vegetation growth.
	Parashant Camp	198.9 R	N	Y	Not much change in camp over time. PRIV was camped here but allowed us to work. Problems w/ trailing on slope persist.
	Indian Canyon Camp	207	N	N	Did not do this camp. Occupied by happy PRIV that did not welcome us. Looked for alternative at Big Cedar, which is really not a camp.
4/16	214 Mile Camp	214.5	N	N	Did not do this camp. Occupied by Dories.
	Opposite 3 Springs Camp	216.1	Y	Y	Not much change over time.
	217 Mile Rapid Camp	218			
	221 Mile	221.6	Y	Y	ADDED to replace 214. Good camping in large, open dune. Two access areas (downstream is steep). Camping is separated from main kitchen area.