

Respect the Rio Annual Report 2003

Dispersed Recreation Component



**Santa Fe National Forest
November 2003**



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Introduction

What is Respect the Rio?

Respect the Rio is a multi-faceted restoration and education program designed to balance the need for preservation of riparian and flood-prone areas with needs of the public. It seeks to do this by accomplishing the following goals:

1. Identifying and addressing water quality issues that have developed from recreational use
2. Educating the public about habitat, habitat needs and on-going restoration projects
3. Creating a program and materials that are easily adaptable to other forests and agencies
4. Creating community partnerships

Where did Respect the Rio come from and where is it going?

Respect the River originated in the USDA Forest Service Pacific Northwest Region on Methow Valley Ranger District, Okanogan National Forest in 1993. In Methow Valley Ranger District, over one hundred degraded and “unofficial” or dispersed campsites were scattered near prime salmon spawning habitat in the headwaters of Columbia River. Many had been used by generations of locals and visitors. Recognizing that closing well-loved areas would be both unpopular and unfortunate, the USDA Forest Service searched for an alternative. The result was Respect the River, a program begun to improve fish habitat and protect endangered fish species while reducing the impacts of recreation in riparian areas but still providing recreational experiences.

Friendly to both fish and people, Respect the River works on two fronts: education and restoration. It uses Contact Rangers, newspaper and radio ads, brochures, and interpretive signs in combination with restoration treatments such as fence and boulder barriers, scarification, and re-vegetation. Only through education will recreationists understand the importance of protecting riparian and riverine habitats and take ownership in conserving and restoring those areas across the region. No new illegal roads, user trails, or dispersed campsites have developed in Pacific Northwest Respect the River focus areas since the programs inception. Quality of camping has improved; sites are better defined, smaller and more vegetated. Less trash and human waste is found. Soil and vegetation damage caused by illegal motorized vehicle use has dramatically decreased. Bank erosion and illegal firewood cutting have decreased. Recreationists are parking their vehicles and RVs away from the stream banks and helping water re-vegetated sites. Most importantly, campsites have remained open and recreationists are receiving a consistent message.

Today, the program has expanded to include Okanogan-Wenatchee National Forest, Umatilla National Forest, Mount Baker-Snoqualmie National Forest, Lewis and Clark National Forest, and now Santa Fe National Forest in the Southwestern Region, where it's called Respect the Rio. Other agencies such as the National Park Service (in Glen Canyon National Recreation Area) and the Washington Department of Fish and Wildlife are starting Respect the River programs, and interest in this award-winning program continues to increase internationally.

Santa Fe National Forest and Guadalupe Watershed

Santa Fe National Forest includes 1.6 million acres in the heart of north-central New Mexico. Within the forest's borders are lush meadows, miles of mixed conifer and aspen trees, and a dormant volcano with a 15-mile wide crater (Valles Caldera National Preserve). Visitors enjoy camping, fishing, hiking and many other outdoor recreation activities while residents maintain their traditional and cultural uses of the national forest and forest products. Santa Fe National Forest varies in altitude from 6,000 feet above sea level to the summit of Truchas Peak, located in Pecos Wilderness, at 13,103 feet. The Forest includes 291,669 acres of designated wilderness and miles of intermittent and perennial streams and rivers, waters responsible for the abundant wildlife and human habitation to be found in the area.

Guadalupe Watershed drains the south Jemez Mountains, is fully contained within Cuba and Jemez Ranger Districts, and includes Rio de las Vacas, Rio Cebolla, and Rio Guadalupe. Over 50 miles of perennial streams in Guadalupe Watershed eventually flow into Jemez River and then into Rio Grande. Rio de las Vacas begins as a tiny channel high in San Pedro Parks Wilderness Area, within Cuba District, and flows south until it meets the narrow Rio Cebolla at the Porter area to form the larger Rio Guadalupe, within Jemez District. Guadalupe Watershed starts as high mountain meadow habitat draining snow and rain of the Jemez Mountains to flow south through mixed conifer and aspen forests. This river system slowly drops into ponderosa pine and then is channeled into piñon-juniper habitat of semi-arid canyon systems before its confluence with Jemez River beyond the boundary of Santa Fe National Forest. Guadalupe Watershed is a 5th code watershed within the 4th code Jemez Watershed (see Figure 1). Of the 171,195 acres within Guadalupe Watershed, the Santa Fe National Forest manages 99.4% (170,241 acres).

Impairments to Guadalupe Watershed

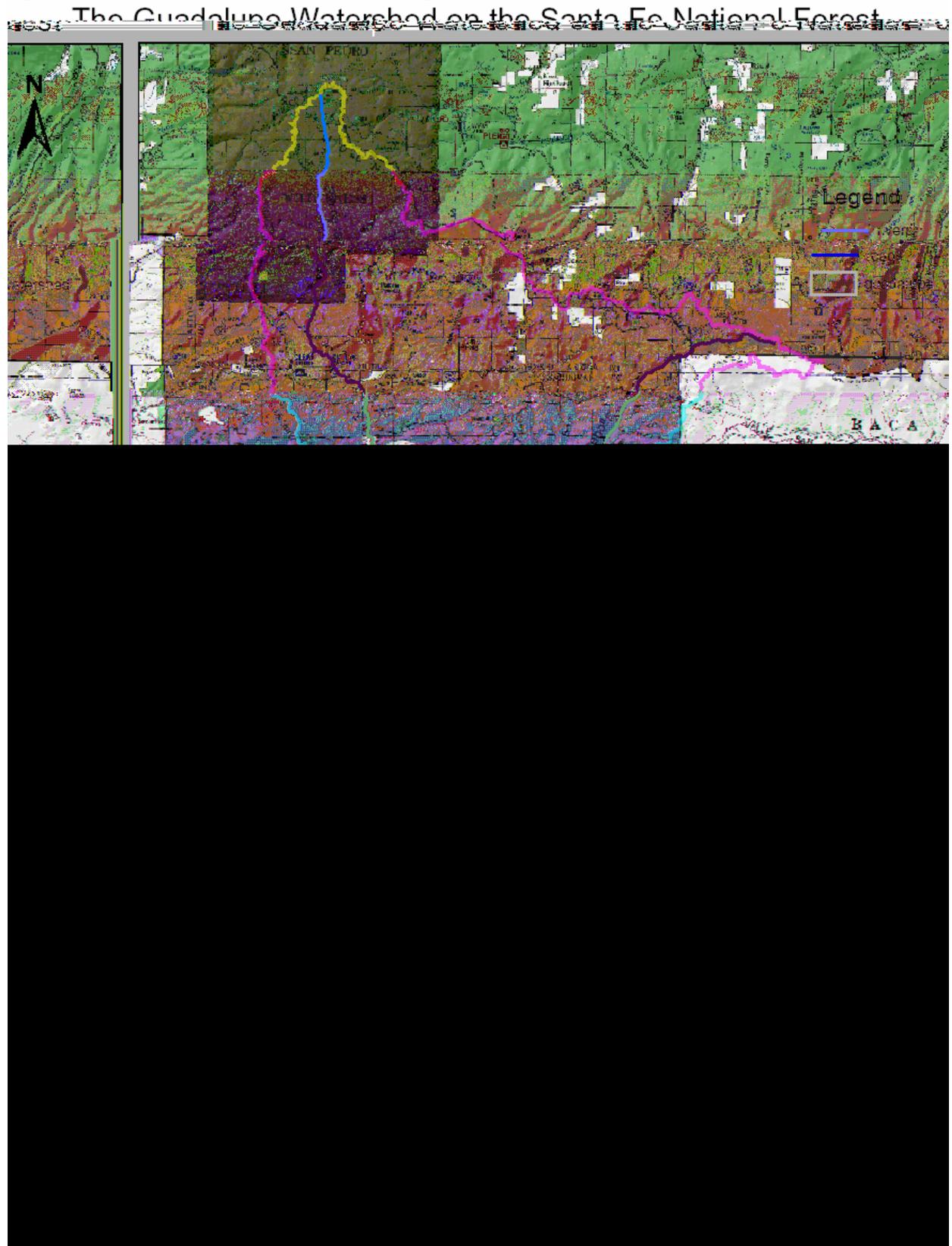
Guadalupe Watershed is designated as an impaired watershed by New Mexico Environment Department, Surface Water Quality Bureau (NMED-SWQB) through regulations established by the Clean Water Act (Section 303), 1977. The Clean Water Act makes states responsible for testing and monitoring watersheds using a Total Maximum Daily Load or "TMDL" system. According to Environmental Protection Agency (EPA), the entity responsible for enforcing the Clean Water Act, "A TMDL...is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources."¹ In short, a TMDL is a kind of water-safety budget in which only a certain number of pollutants can be deemed acceptable in a certain stream, lake, or bay, and if some pollutant exceeds the budgeted amount, action must be taken to lower it.

Under New Mexico's TMDL system, Guadalupe Watershed has shown the following impairments within Respect the Rio's project area:

- Rio Guadalupe has exceeded 14030 12 174.95y71a6pppc2.68546

Santa Fe National Forest manages over 99% of Guadalupe Watershed and must respond to these water quality impairments. Two NMED-SWQB/EPA grants were procured for this watershed to begin addressing impairments. Since all but chronic aluminum impairments can be linked to dispersed recreational use along this watershed, Respect the Rio began laying the groundwork for watershed restoration and education that began this summer and will continue in future years.

Figure 1. Map of Guadalupe Watershed with inset showing location within Santa Fe National Forest.



Executive Summary

With critical funding provided by New Mexico Environment Department, Surface Water Quality Bureau, the Forest Fish and Education program set forward to complete an inventory of dispersed recreation sites in the Guadalupe Watershed. Three stream corridors were targeted: Rio Guadalupe, Rio Cebolla and Rio de las Vacas. This inventory established baseline data for future monitoring of these sites as Cuba and Jemez Ranger Districts make mechanical and regulatory changes in these areas. The inventory also established a means for monitoring social behavior. Contact Rangers began to visit each dispersed site complex throughout the summer on weekends to deliver educational messages, collect social information, provide updates to restoration projects and gather comments regarding these proposed changes.

The dispersed campsite inventory measured ecological damage and assessed the type of recreational activity associated with that site. Data was then tabulated (see Table 1) to determine high impact areas and restoration recommendations were offered.

Table 1. Summary of Dispersed Campsite Inventory

Corridor	# Complexes	# Individual Sites	# Fire Rings	Total Acres Disturbed	Acres/ Complex	Total Acres Exposed Soil (denuded of veg)	Trees Damaged	Unstable Banks (ft)	Toilet Proximity to Steam (ft)
Rio Guadalupe	22	127	265	123.4	5.6	43	435	420	130
Rio Cebolla	29	130	226	131.9	4.5	45	710	822	9
Rio de las Vacas	33	72	113	39.0	1.2	11	324	1,269	21
Total	84	329	604	294.3	-	99	1,469	2,511	-

The contact ranger program learned about intensity of use, where visitors resided, changes they witnessed (for repeat visitors), and suggestions for improving the experience. In addition visitors were asked if they would pay a fee to visit the area to pay for the improvements. A highlight of the findings suggest different types of users in different corridors, a growth in visitors and sites, that most visitors resided in Albuquerque area, and a willingness to pay a minimal fee:

- Individuals contacted - 1,488;
- Visitors had been visiting area on average for the last 9 years;
- Mostly weekend visitors (Friday and Saturday night);
- 3:1 ratio of overnight campers to day users; most day use was along Rio Guadalupe;
- 83% of visitors were from Albuquerque area; 5% were from out-of-state;
- ATV use has grown over last ten years; while fishing and swimming remained the most popular recreation activities;
- More people and more trash were the most popular response for changes noticed;
- Trash bins and toilets were the most suggested improvements;
- Common concern regarded ATV use and that non-ATV users would like to see ATV users regulated or offered an alternative area;
- Overall, there was a willingness to pay a nightly fee of about \$5 per night.

Occupancy rate of sites were consistently high from Memorial to Labor Day. Rio Guadalupe and Rio Cebolla had over 70% occupancy rate of complexes on the weekends; while Rio de las Vacas averaged around 40%. Occupancy rate, intensity of impact, and proximity to stream should all be considered when designing dispersed campsite modifications.

The dispersed campsite inventory can be used to monitor change. It is suggested that the rate of the inventory be done on a 10-year rotation. Meanwhile, the Contact Ranger Program should continue to be utilized annually to assist in assuring compliance with these changes through educational messages and keeping the public informed of change. It was clear that the public appreciated the Forest Service showing an interest in their opinions and generally making an appearance.

Overview of Methods and Terms

Methods

Santa Fe National Forest's Respect the Rio crew conducted a Dispersed Campsite Inventory and Contact Ranger Program within the Guadalupe Watershed from May 18th to September 13th, 2003.

Dispersed Campsite Inventory data was collected on a Respect the River data sheet revised to gather data pertinent to semi-arid southwestern landscapes (see Appendix A, Figure 1a). This summer's inventory was separated into three sections representing the streams of Guadalupe Watershed, including Rio de las Vacas, Rio Cebolla, and Rio Guadalupe.

The Contact Ranger Program was the first of its kind on the Santa Fe National Forest. The Contact Ranger Program created a social survey form for both social data collection and as a guide to educate Forest campers, anglers, all-terrain vehicle (ATV) users, and other recreationists about river-friendly camping methods (see Appendix A, Figure 2a). Social survey questions were developed by Jemez Ranger District Recreation Staff in order to plan visitor-friendly riparian restoration projects within the Guadalupe Watershed. These questions led to discussions of how the Forest may be changing management in the area, pulling vehicles off rivers, getting trash out of the corridor, keeping human waste out of river systems, minimizing campfire impacts, and other watershed health issues. A river-friendly camping flyer was passed out to most groups contacted throughout the summer (see Appendix A, Figure 3a).

Definitions

In order to easily describe what was learned by Respect the Rio staff this summer, some definitions of terms are necessary. Terms are labeled on a map of dispersed camping area *Boulder Bench* for reference (see Figure 2).

Dispersed Camping

Throughout National Forests all over the country, campers make their own primitive "dispersed" camping areas. "Dispersed" areas are not developed or heavily managed and do not have such facilities as toilets, picnic tables, water pumps, RV hookups, hosts, and pavement normally associated with a "campground."

Access Road

An "access" road is a route that Forest visitors have created off a designated Forest Road that accesses a user-made campsite or series of campsites.

Dispersed Campsite

A dispersed "campsite" is a de-vegetated spot off an access road where a single family, or small group, will camp for the night. Usually, a dispersed "campsite" is marked by a fire ring, though heavily used sites may contain multiple fire rings. Dispersed campsites in close proximity may also be connected by a small, user-created road. Surveyors designated each campsite with its own inventory letter (example: "A").

Social Road

“Social” roads are small, user-created roads that connect neighboring individual campsites or act as ATV routes. Social roads do not connect to designated Forest Roads.

Dispersed Complex

A dispersed camping “complex” is a series of campsites accessed by the same access road(s) and connected by a system of social roads and/or wide trails. The term “complex” is used in this report to define distinct areas of dispersed camping, which usually consist of multiple campsites. In rare cases, a “complex” may also refer to a single dispersed campsite with a distinct location. Surveyors designated each complex with its own inventory number and name.

Figure 2. *Boulder Bench*, a dispersed camping complex along Rio de las Vacas. Campsites are labeled with letters.



Dispersed Campsite Inventory

Inventory Results

Dispersed campsite inventories were conducted throughout the summer to document current watershed conditions and quantify resource damage related to dispersed recreation. 84 dispersed camping complexes were found along Rio Guadalupe, Rio Cebolla, and Rio de las Vacas, with 329 individual campsites within these complexes. 604 individual fire rings were found as well; many campsites had multiple fire rings in close proximity. Heavily used fire rings indicate often-used individual campsites (see Photo 1).



Photo 1. Example of heavily used fire ring. *Cebollita Springs East, Rio Cebolla.* (10 Aug. 2003)

Figure 3 compares numbers of complexes, campsites, and fire rings to show general differences of use in each river system in the Guadalupe Watershed. Impacts from dispersed campsites often affect these streams in different ways. For instance, Rio Guadalupe shows the fewest number of camping complexes (22), a large number of individual campsites (127), but the largest number of fire rings (265). These fire rings contribute to river pollution every time it rains and the detritus not fully burned within them is also delivered into the river. Conversely, Rio de las Vacas contains the largest number of camping complexes (33), but the smallest number of individual campsites (72) and fire rings (113), but were closer to the stream, indicating more direct impacts to the stream. Impacts along Rio Cebolla are the most evenly distributed with a large number of camping complexes (29), the largest number of individual campsites (130), and many fire rings (226) generally situated close to the river and within a 3-mile confined area, increasing the intensity of impacts.

Figure 3. General dispersed camping information, with numbers of complexes, campsites, and fire rings for each river.

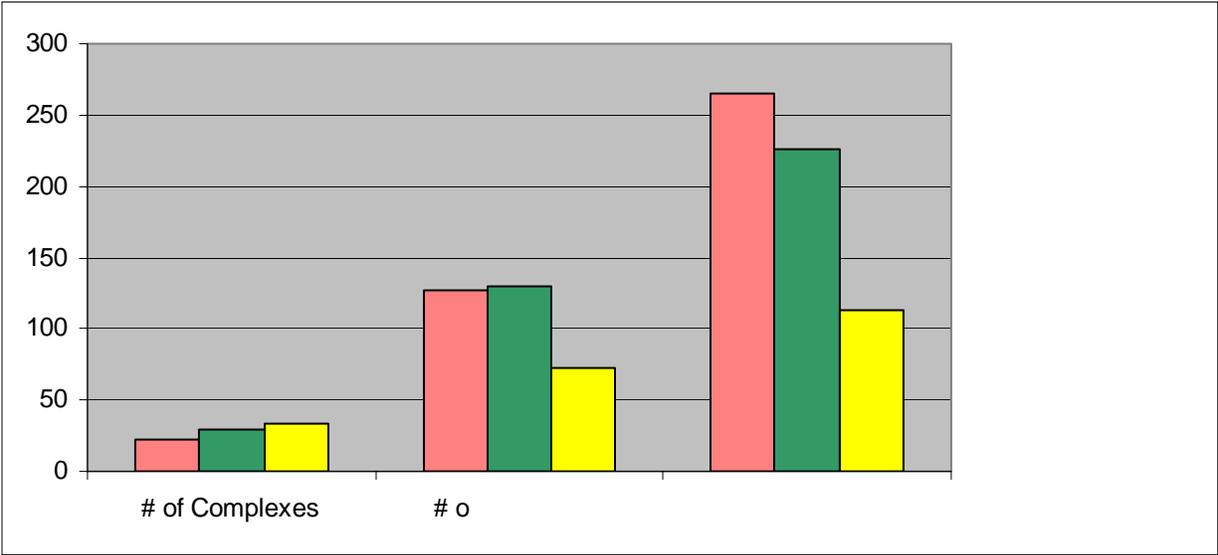




Photo 2. Access road (right) to *The Long Haul*, along Rio Guadalupe. Length runs parallel to FR 376 (left). (10 July 2003)

Complex size (see Figure 4) affects the amount of sediment dumped into rivers with each rainstorm. Most complexes along Rio de las Vacas are relatively small (averaging 1.2 acres), especially compared to extensive complexes along Rio Cebolla (4.5 acres) and Rio Guadalupe (5.6 acres). When looking at length versus width, Rio Guadalupe shows a lower length-to-width ratio since many complexes located in the middle of this river corridor are forced 100-250 feet above the canyon by the ruggedness of its natural geography and are oriented more perpendicular to the road and river with lengthy trails leading to the water. Impacts to Rio Cebolla are highest with both a large length and a mid-sized width, often oriented very close to the river itself.

Overall, there are approximately 294 acres of ground disturbance associated with dispersed camping areas in the Guadalupe Watershed.

- Rio Guadalupe: 123.4 acres
- Rio Cebolla: 131.9 acres
- Rio de las Vacas: 39.0 acres

Surface Damage

Smaller-scale surface damage caused by both camping complexes and individual campsites was analyzed through a variety of data. This data includes average percent of “brown-out,” or de-vegetated banks and sites; number of access roads to camping complexes from a main road (such as FR 376); and number of social roads within the complex. Average brown-out was determined by a simple visual sweep of the camping complex to determine how much of the area was de-vegetated (including access and social roads between campsites). Brown-out percentages were determined by each surveyor independently and discussed to come to an agreed-upon, collective average percentage. Photo 3 shows an example of a site with 50% brown-out.



Photo 3. *Tiny Turnout*, along Rio Cebolla, determined to be 50% brown-out. (1 Aug. 2003)

Access and social roads were counted at each complex and mapped. These roads were usually navigable by 4-wheel drive highway vehicles, such as SUV's and trucks, and sometimes 2-wheel-drive cars or RV's. “ATV roads,” or visitor-created roads often used for ATV recreation, were included in totals if they were very browned-out and within the camping complex or were navigable by highway vehicles (see Photo 4). ATV roads not navigable by other vehicles and clearly used only by ATV recreationists were noted on maps but not officially counted.

Brown-out within camping complexes along Rio Guadalupe and Rio Cebolla both averaged around 35% with Rio de las Vacas at a slightly less 28% (see Figure 5). In essence, all three rivers show, overall, that 32% of the area used for dispersed camping is dead and brown, hastening erosion problems within Guadalupe Watershed.

In all, approximately 99 acres of ground have exposed raw or compacted soil associated with dispersed recreation.

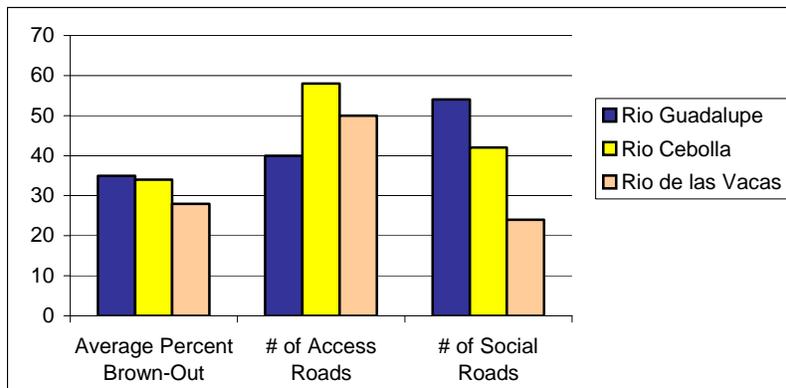
- Rio Guadalupe: 43 acres
- Rio Cebolla: 45 acres
- Rio de las Vacas: 11 acres



Photo 4. Access road (foreground, with Jeep) curves right, then hooks left to campsite behind berm. ATV-type social road (middle-ground) creates shortcut over berm to campsite. Hook complex, Rio de las Vacas. (15 Aug. 2003)

Both access and social roads increase erosion and stream bottom deposits. Numerous access roads exist throughout all three river systems: Rio Guadalupe (40), Rio Cebolla (58), and Rio de las Vacas (50). However, Rio de las Vacas shows a much smaller number of social roads (24) compared to Rio Guadalupe (54) and Rio Cebolla (42), probably due to the generally smaller size of each complex in Rio de las Vacas, disallowing many social road creation opportunities. Generally speaking in Rio de las Vacas, there is one-way in and one-way out with very little room to grow, keeping campsites small.

Figure 5. Comparison of general recreation-related surface damage to campsites by corridor.



Recreation-Related Ecological Damage

Impacts to individual campsites were enumerated by counting trees that were scarred, damaged, or with exposed roots, and by pacing length of stream banks made unstable, browned out, and/or slumped. While unstable banks can be caused by a variety of sources including human recreational use, wildlife use, grazing, etc., only unstable banks clearly associated with dispersed camping areas were included in these campsite inventories (see Photo 5). Slumped banks often occur across the river from dispersed camping areas and were thought to have a different source of impairment; such areas were not counted but are described in Santa Fe National Forest “Stream Inventory Reports” available through the Forest’s Fisheries Program.

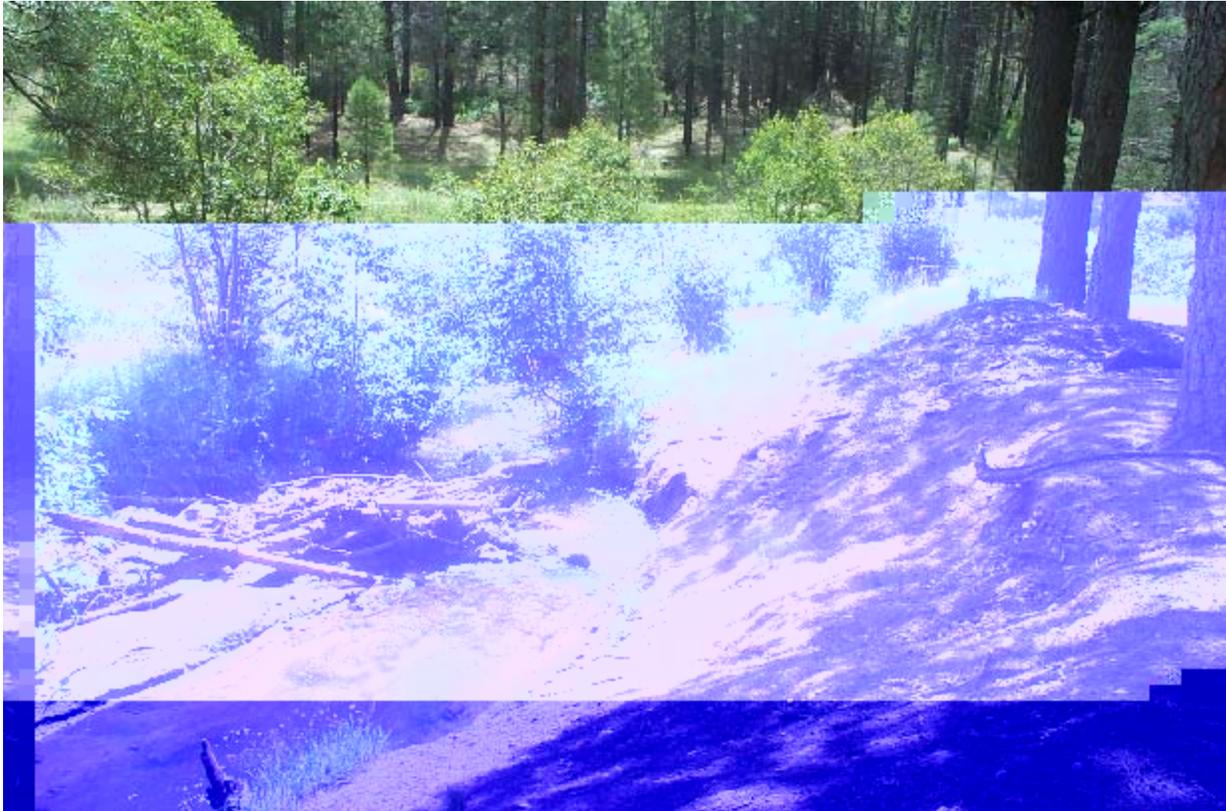


Photo 5. Unstable bank at *The Dumbell*, Rio Cebolla. Fire ring of campsite (to right) is disintegrating down to river.

Tree “scarring” includes chop marks, graffiti, peeled bark, large nails, and other superficial, but often still fatal, marring. Tree “damage” mostly involved completely chopped down or broken-off trees within camping complexes (see Photo 6).

Root exposure included root edges uncovered and root ends completely exposed to air, particularly along browned-out or slumped stream banks (see Photo 7). Root exposure can weaken a tree’s ability to stand during windstorms, and generally causes stress leading to a higher susceptibility to disease.



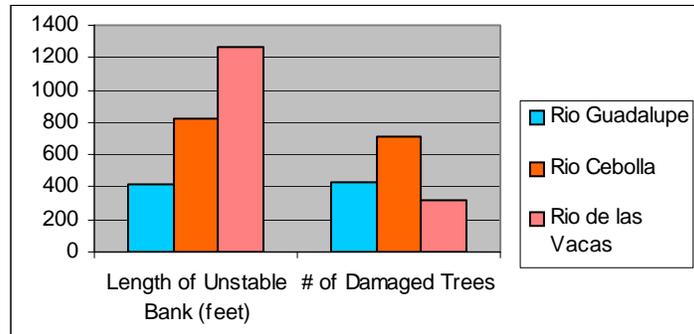
Photo 6. Typical chop-mark tree scarring (center) and tree damage (lower right, with shoes), Rio de las Vacas. (4 Jul. 2001)



Photo 7. Root ends exposed at *All-in-One*, Rio Cebolla. (8 Aug. 2003)

Numbers representing tree scarring, damage, and root exposure were summed to describe number of “damaged trees” (see Figure 6).

Figure 6. Recreation-related ecological damage at campsites, including total length of unstable bank and number of damaged trees.



Altogether, Rio Guadalupe had 435 scarred and damaged trees and root exposure (19.8 per complex), Rio de las Vacas had 324 (9.8 per complex), and Rio Cebolla showed the most heavily damaged arboreal systems at 710 (24.5 per complex).

Total length of unstable bank along Rio de las Vacas (1,269 feet; 39.7 feet per complex) was much larger than Rio Cebolla (822 feet; 37.4 feet per complex) and Rio Guadalupe (420 feet; 19.1 feet per complex). Unstable bank along Rio de las Vacas is concentrated at the junction of FR 539, 20, and 152A, where main roads encroach on the stream and make banks more susceptible to slumping. Longer unstable banks for Rio de las Vacas and Rio Cebolla are also probably due to general proximity of camping to these streams: Rio de las Vacas complexes averaged 18.8 feet from stream, Rio Cebolla 9.8 feet, and Rio Guadalupe 134.9 feet.

Human Waste

Human excrement impacts are often difficult to quantify with wildlife removing and rainstorms washing away evidence. However, toilet paper pieces were counted at each camping complex to give a sense of amount of human excrement obvious on the surface. Occasionally, aboveground piles of human excrement were also found at campsites. Surveyors also discovered full informal “toilets,” some which had bottom-holding containers and some which leaked human waste directly into nearby rivers (see Photos 8 and 9). Each pile or toilet was counted as a piece of toilet paper.

Figure 7 compares average number toilet paper pieces per complex along each river. Rio Guadalupe (averaging 13 pieces of toilet paper per camping complex) and Rio Cebolla (14 pieces per complex) showed the largest human waste impacts. Rio de las Vacas (7 pieces per complex) showed about half the impacts (though the complexes are also smaller in size, so this should also be considered when looking at the data gathered).

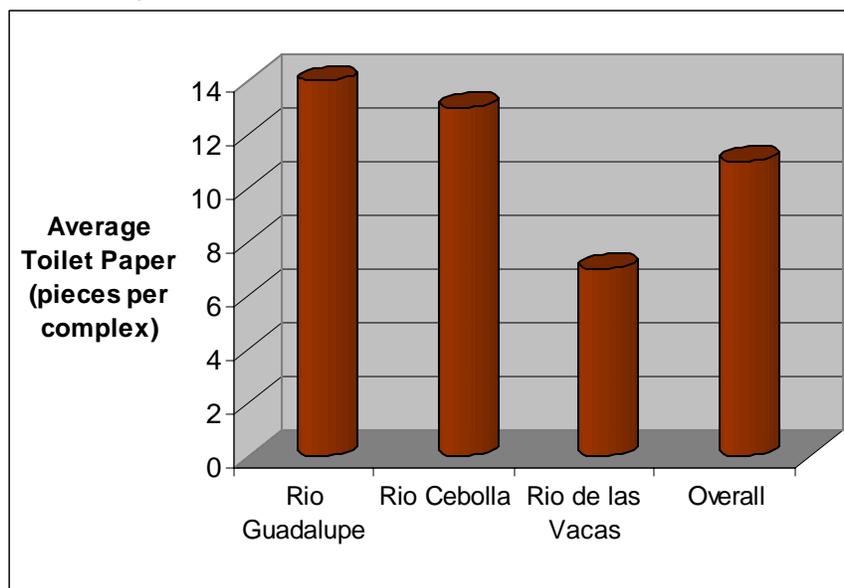


Photo 8. Barrel "toilet" (no bottom, 5' from river) at *Cebolla Arc*, Rio Cebolla. (8 Aug. 2003)



Photo 9. Chair "toilet" at *Aspen Meadows*, Rio Cebolla. (28 Aug. 2003)

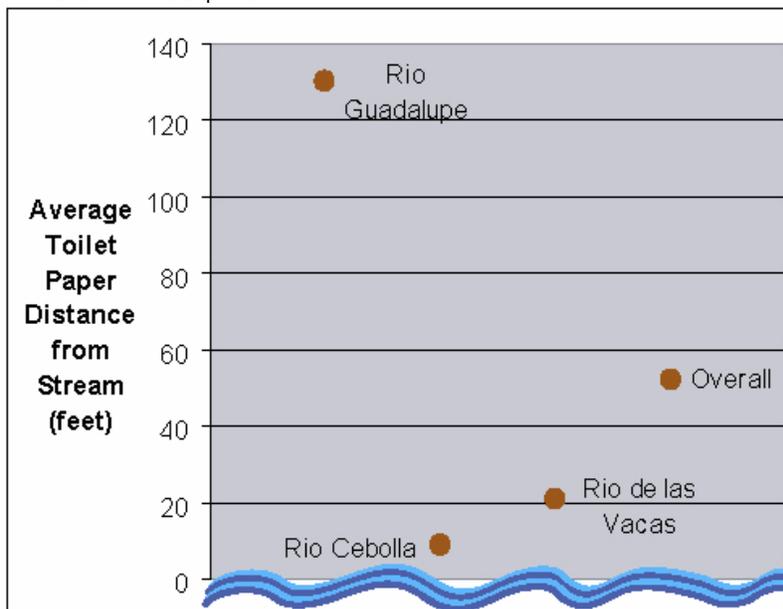
Figure 7. Average number toilet paper pieces per complex, indicating extent of human excrement impacts.



Surveyors noted that as campsite inventory wore on, they learned where to explore at edges of individual campsites for “restroom” areas, often just a few feet from the river, hidden by willow. Thus, amount of human excrement is probably even higher on Rio Cebolla and Rio Guadalupe than noted here because surveyors learned exploration techniques along the way.

Besides sheer numbers of toilet paper pieces, even more indicative of water-quality impact is proximity of toilet paper or human waste to rivers. Average distance of toilet paper pieces to the three rivers is illustrated in Figure 8.

Figure 8. Average distance of toilet paper from streams, indicating extent of human excrement impacts.



Results indicate that Rio Cebolla (average distance of toilet paper, 8.7 feet from water) and Rio de las Vacas (average 20.9 feet from water) receive the greatest impacts from human waste dumping into these river systems. Rio Guadalupe toilet paper averages 130.3 feet from the water, due to many complexes throughout the middle of the corridor being far from the river's edge. Considering only the 8 camping complexes within 80 feet of Rio Guadalupe, distance averages 19.5 feet from water.

High-Impact Complexes

Certain camping complexes can also be deemed higher impact than others. Some complexes, particularly along Rio de las Vacas, clearly hold only one or two vehicles. Access roads to certain complexes, particularly along Rio Guadalupe, were too bumpy, twisted, or steep to allow RV's or large groups to enter. However, many sites could, and do, accommodate groups as large as 70. Several complexes also showed evidence of ATV use (see Photos 10, 11 and 12) or actually had ATV's at campsites where visitors were contacted. ATV's included 3-wheelers, 4-wheelers, dune buggies, and other strictly off-road small vehicles.



Photo 10. ATV damage evidence on *ATV Hill*, Rio Cebolla. Site not included in analyses but illustrative of characteristic ATV impacts (8 Aug. 2003)

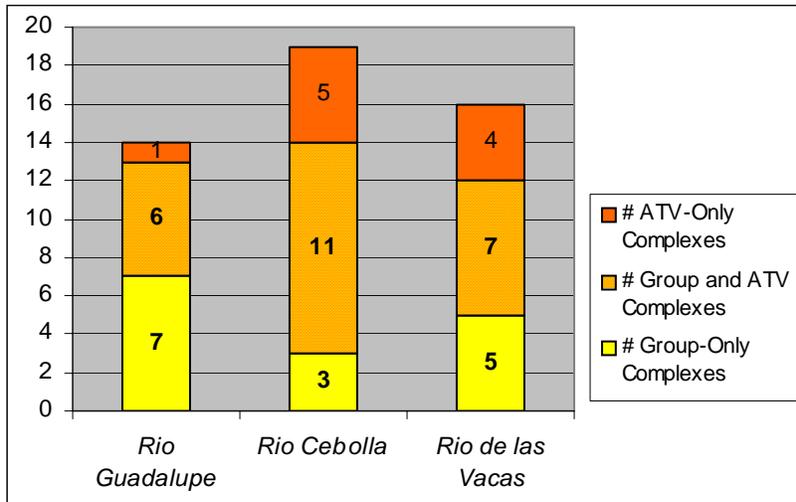


Photo 11. ATV damage in fragile meadow within *Lakes Fire*, Rio Cebolla. (28 Aug. 2003)



Photo 12. ATV damage at *Party Place*, Rio Cebolla. ATV road crosses river to more ATV trails (background). (1 Aug. 2003)

Figure 9. Distribution of high-impact camping complexes.



Higher impact ATV and group get-together complexes are compared in Figure 9.

14 of 22 complexes (64%) along Rio Guadalupe were noted as high impact. In Rio de las Vacas, 48% of 33 complexes are considered high impact. The most serious impacts were along Rio Cebolla with 66% of 29 complexes rated as high impact. In addition, Rio Cebolla shows the greatest percentage (38%) of complexes with the double impact of both group *and* ATV use. ATV use is also particularly high on Rio Cebolla with 55% of all complexes showing use, and, in some cases, significant resource damage.

Excluded from Analyses

Two recreation sites inventoried this summer were not included in our analyses because they were not recognizable user-created camping areas. *ATV Hill*, on Rio Cebolla, is a popular ATV recreation area but shows no campsites or fire rings. *River Crossing*, on Rio de las Vacas, was excluded because the survey crew could not determine its primary uses: motorized vehicles were clearly impacting the river but the site lacked camping space or fire rings. While these areas were excluded from numerical analyses, they were inventoried because of their proximity to rivers and obvious recreation use that could evolve into camping in future years.

Eight camping complexes were excluded from unstable bank analyses because they were on the non-stream side of the main Forest Road or were up to 1 mile from the stream in general (and thus could not have unstable banks). *Off River* on Rio Cebolla and *Underground Shelter* on Rio de las Vacas are both on the non-stream side of the main road, while *Rock Wall*, *Lakes Fire*, *Boulder End*, *Aspen Meadows*, *Mixed Conifer North*, and *604 Access* are located in Lake Fork Canyon, where FR 376 veers away from Rio Cebolla. These same 8 were considered outliers in distance analyses and were thus excluded from calculations. Although these complexes impact rivers less directly than those between the river and road, they are located in heavily traveled corridors and should continue to be monitored as camping is directed away from rivers and possibly towards these complexes.

Contact Ranger Program

Program Results

In its inaugural year, Respect the Rio education was focused not only on beginning the long process of educating Forest visitors on low-impact recreation techniques, but also on gathering information from visitors themselves to set the stage for future restoration and education. Baseline social data gathering is vital to future success of Respect the Rio, since restoration should weigh visitor wants with river needs. This is a delicate balance with eliminating watershed impairments, many of which are related to recreation. Such contact also provides an opportunity for visitors to learn about future changes coming to the area so they can voice their opinions and become empowered in the process. This does not assume that their suggestions are followed if they are not in the best interest of natural resources. However, those who visit and love these dispersed camping areas most voiced many good ideas, and this summer's Respect the Rio crew was able to gather a sense of what visitors generally want.

Respect the Rio crew consisted of three Student Conservation Association interns and their supervisor, the Forest Education Coordinator. Respect the Rio crew contacted visitors at least some portion of every Friday afternoon, Saturday, and Sunday from Memorial Day to Labor Day in order to educate them about river-friendly camping and gather social data. Contact Rangers were trained not only in how to gather campsite inventory and social data, but also in how to approach people and make them comfortable enough to openly discuss their opinions of Guadalupe Watershed's future (see Photo 13).



Photo 13. Contact Rangers with visitors at *Braided Trails (Deer Creek)* swimming hole, Rio Guadalupe. (9 Aug. 2003)

Visitor Statistics

Social surveys were done for each campsite group (not each individual), which usually had one or two unofficial “spokespersons.” Data gathered was not weighted by number of people in each group. Numbers in this report are based on information visitors provided or on observations made by Contact Rangers. When sites were occupied but visitors were absent, Contact Rangers had to rely solely on observation. Also, Rio Cebolla was a predetermined area of concern for Respect the Rio and was surveyed every other weekend, or twice as often as Rio Guadalupe and Rio de las Vacas. This should be noted when considering total numbers in charts.

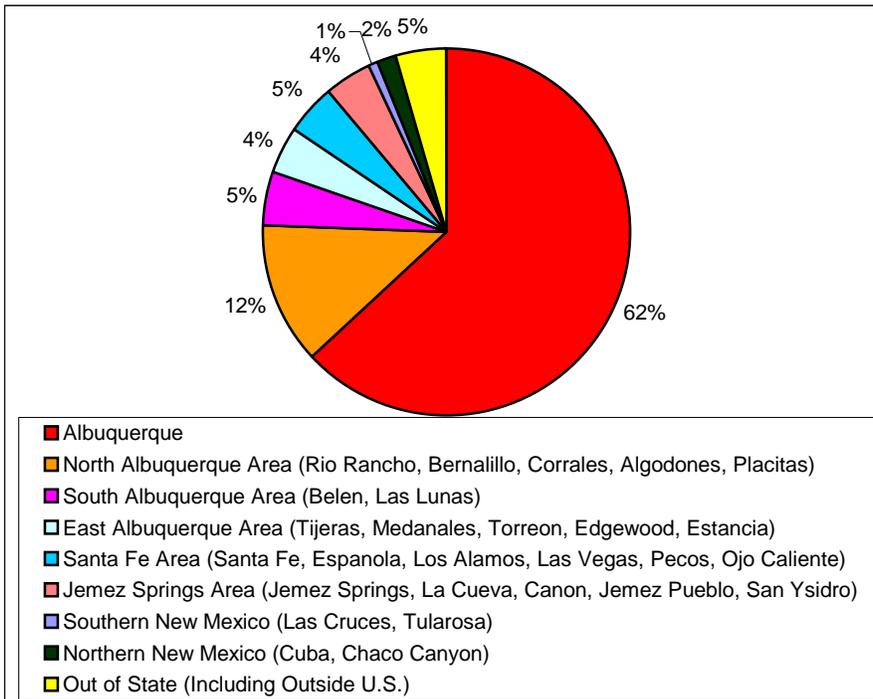
Some general use statistics help paint a picture of visitors to Guadalupe Watershed.

- Total number of individuals contacted during the summer’s Respect the Rio Contact Ranger program was 1,488;
- An average of 4.1 people per site was noted with a maximum of 70 and minimum of 0;
- Average number of years campers had been visiting the area was 9.4. 54 years was the longest any group had been visiting, with 1 year being the least;
- Average number of nights stayed when a group was confirmed as camping overnight was 2.2. Longest stay was 14 nights; shortest was 1;
- 54 groups were confirmed day users with 155 confirmed overnight camper groups.

Visitors to Guadalupe Watershed were asked where they were from in order to determine target audiences for future Respect the Rio education outreach. If visitors answered “Albuquerque,” they were also asked what zip code they lived within. Most visitors were comfortable giving out zip code information. Answers that were another town in New Mexico, state, or another country, were noted as names, with zip codes for New Mexican towns looked up later by the crew.

Figure 10 shows the breakdown of visitors’ hometowns.

Figure 10. Residential demographics of visitors to Guadalupe Watershed.

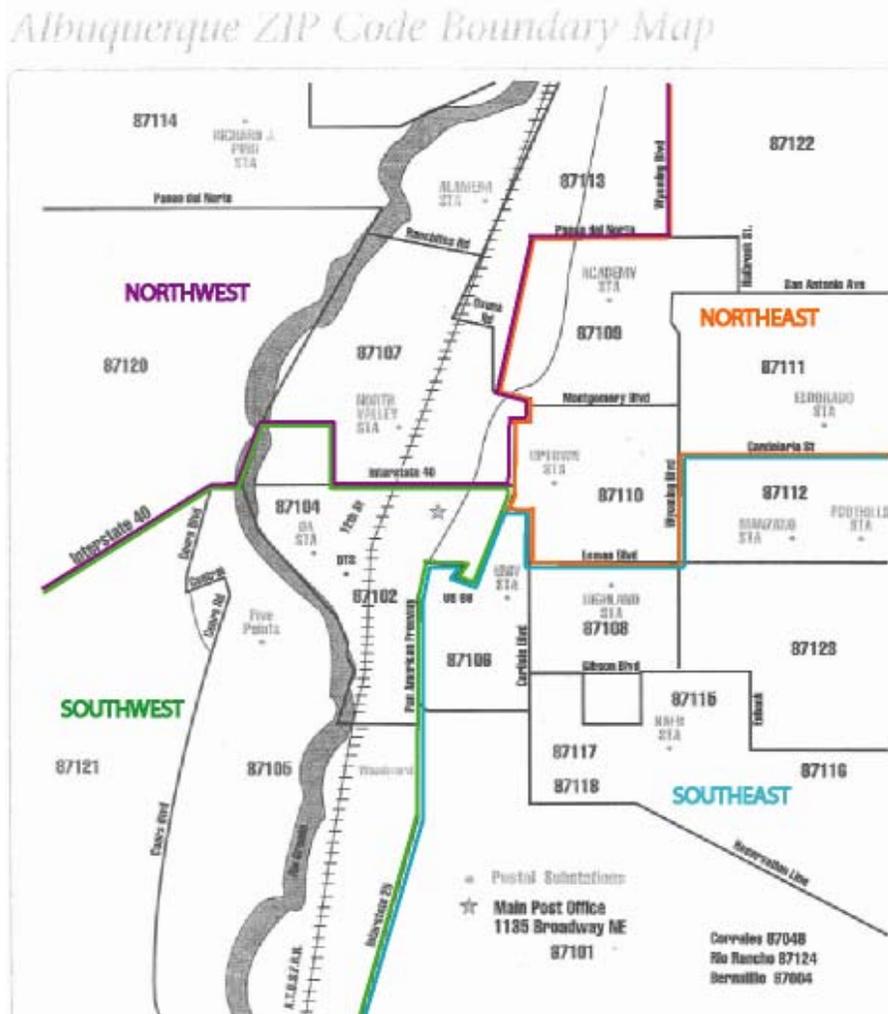


The smallest percentages of visitors to Guadalupe Watershed (each less than 5%) were from northern New Mexico (4 groups of visitors), southern New Mexico (2 groups), and Jemez Springs area (11 groups).

About 5% each of visitors came from Santa Fe area (12 groups) and out of state (12 groups). Out-of-state visitors often came in conjunction with groups from other New Mexican towns. These visitors came from cities such as Denver, CO; Reno, NV; San Diego, CA; New York, NY; Kingman, AZ; Seattle, WA; and Ft. Collins, CO. Other states represented include Florida and Missouri. Out-of-the-country visitors hailed from Chile and Germany.

The largest portion of visitors to Guadalupe Watershed came from Albuquerque (165 groups) and north Albuquerque area (33 groups). In all, the Albuquerque Area (including Albuquerque proper) represented 83% of all Guadalupe Watershed visitation. Albuquerque residents are broken down further into zip codes representing northeast, northwest, southeast, and southwest areas of the city. These geographic divisions are roughly defined by north-south running I-25 and east-west I-40 (see Figure 11).

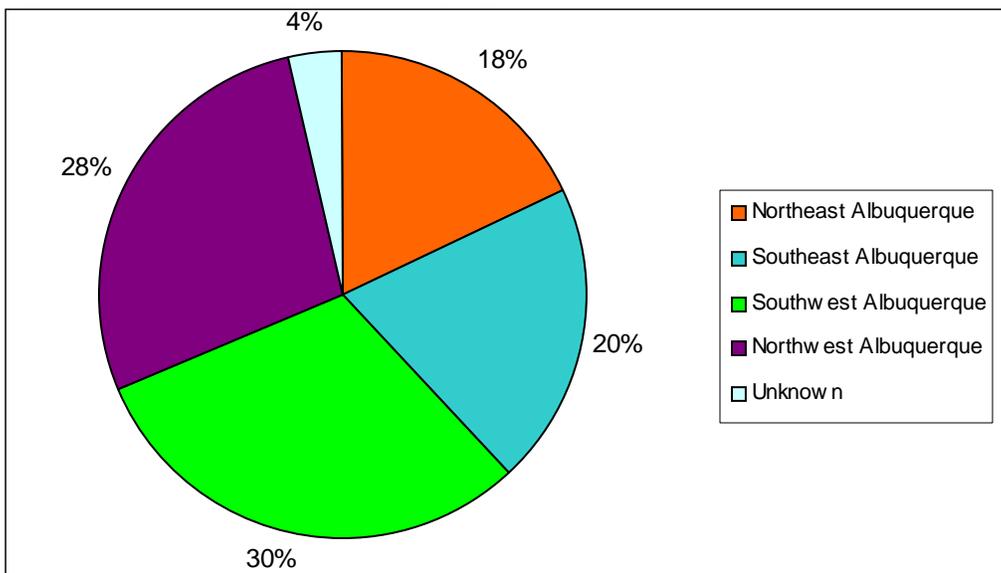
Figure 11. U.S. Postal Service Albuquerque zip code map (taken from City of Albuquerque Phonebook) with general northeast, northwest, southeast, and southwest divisions.



Zip codes representing northeast Albuquerque include 87109, 87111, 87122, and 87110; northwest include 87114, 87120, 87107, and 87113; southeast include 87112, 87108, 87123, 87115, 87116, 87117, 87118, and 87106; southwest include 87104, 87102, 87121, and 87105. Several zip codes were from unknown regions of Albuquerque since they are for postal boxes only including 87193, 87101, and 87154.

Most Albuquerque residents visiting Guadalupe Watershed hail from the west side; southwest and northwest areas account for 58% of visitors coming from the city (see Figure 12). In contrast, the east side accounts for only 38% of this urban Rio Guadalupe visitation. Future education outreach should consider these visitor demographics.

Figure 12. Residential demographics of Albuquerque visitors.



Camping Type

Contact Rangers noted visitors’ camping type as either “tent” or “RV,” or sometimes as both. Many camping complexes accommodated both types of camping throughout the summer. “RV” camping included self-contained units such as motor homes, and trailer units such as pop-ups and trailer-campers. Type of camping seen in the corridor is important since tents and RV’s affect campsites differently. For instance, RV campers need a large, flat space for entering with large vehicles and for turning around (see Photo 14 vs. Photo 15). Many dispersed campsites have a U-shaped drive with one way in and another way out, often to allow RV access. Thus, parking and sedimentation impacts may be higher for RV-popular complexes. RV’s often contain a toilet that can be flushed clean at a proper sanitation site while tent campers rarely use portable toilets for camping. Tent camping may impact fecal coliform counts in rivers. We don’t assume that RV’s are not dumping their septic or gray water in the river.

In all, 94 groups were camping in RV’s and 120 were camping in tents (see Figure 13). Rio de las Vacas campers showed an even split between RV and tent camping. However, Rio Cebolla camping was mostly in RV’s, while Rio Guadalupe camping was mostly with tents. Several groups, especially along Rio Cebolla, camped in both RV’s and tents. Because groups often had

more than one RV or tent at a campsite, actual number of RV's and tents in the corridor is probably much higher.



Photo 14. Wide, flat, typically RV campsite, *Private Landing*, Rio Cebolla. (8 Aug. 2003)

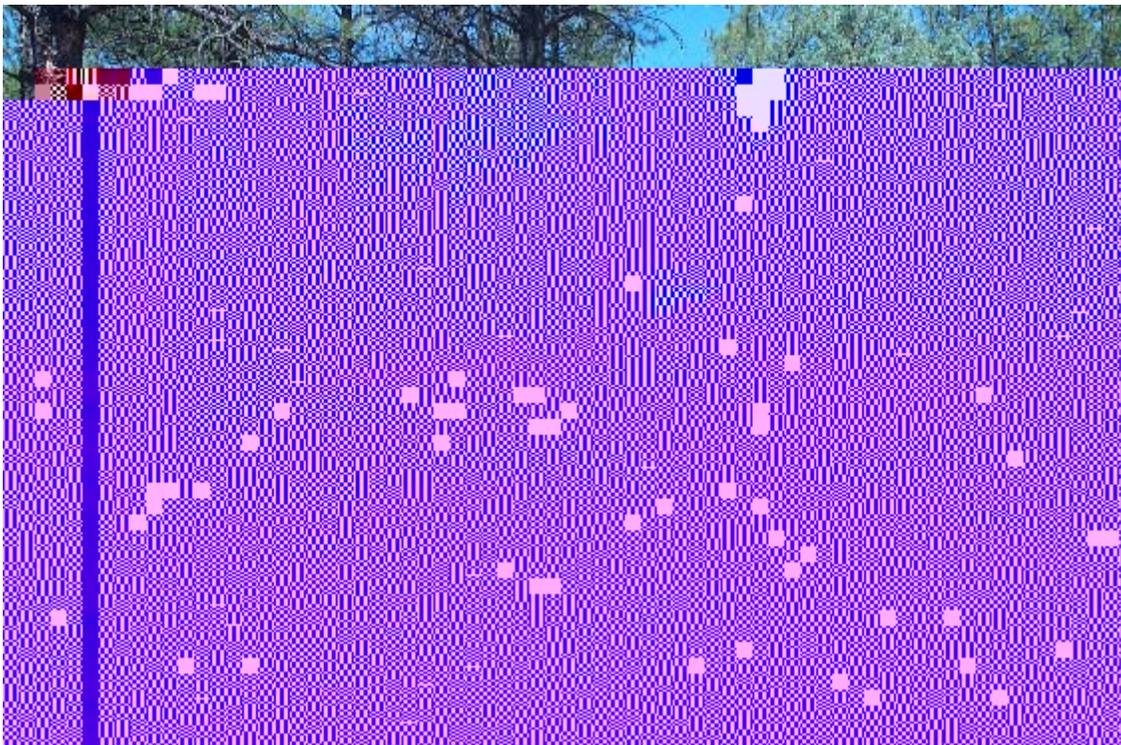
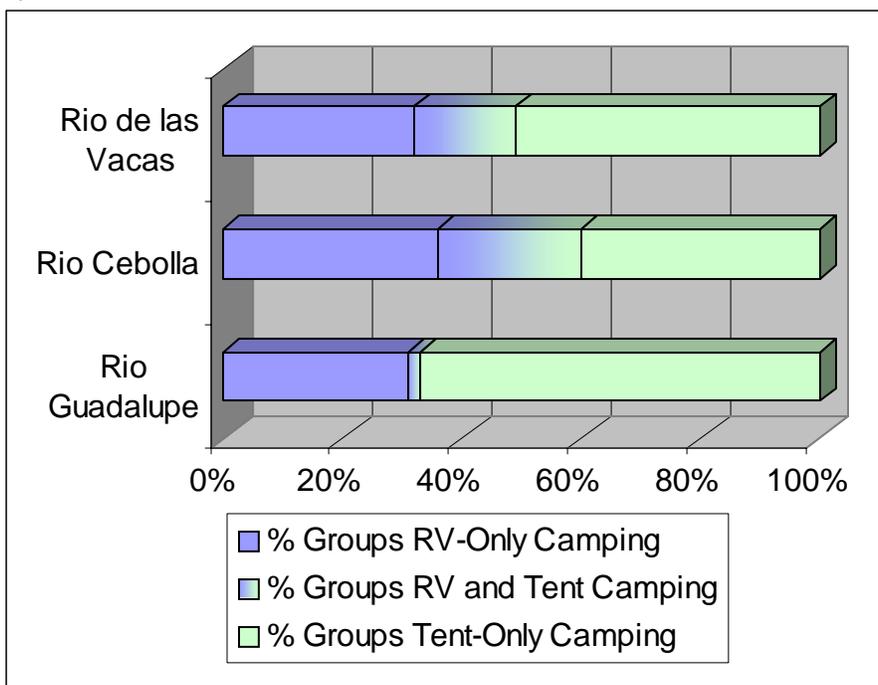


Photo 15. Smaller, sloped, typically tent-only campsite, *Rocky Road*, Rio Guadalupe. (11 Jul. 2003)

Figure 13. Number of groups RV-only, RV and tent, and tent-only camping in each river system.



Rio Cebolla includes the largest number of camping groups visited within the watershed at 102 (note: Rio Cebolla was visited twice as often as Guadalupe and Rio de las Vacas). RV and tent camping are fairly evenly distributed throughout Rio Cebolla. Rio Guadalupe, with a total of 39 camping groups visited, shows heavier tent-only camping. RV camping in this corridor seems to be concentrated at a few flatter sites closer to Rio Guadalupe. Rio de las Vacas had 41 camping groups visited, which were fairly even between tent and RV camping and evenly distributed throughout the corridor.

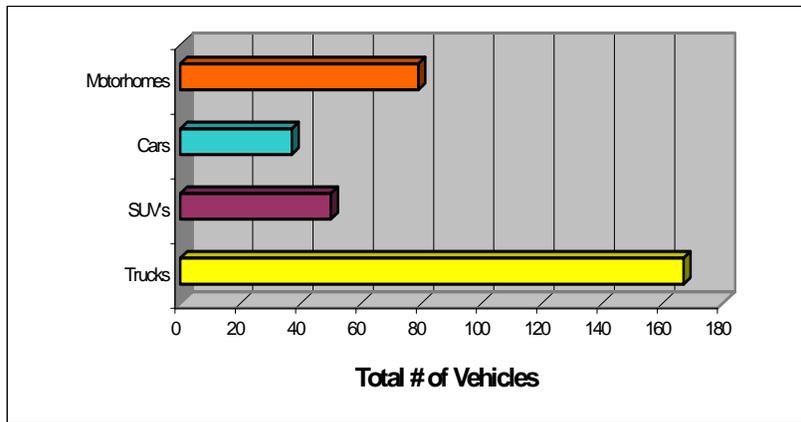
Many Rio Guadalupe and Rio de las Vacas campers vocalized interest in keeping areas tent-camping only, complaining of generator noise and citing RV campers' lack of contact with "real nature." In contrast, Rio Cebolla campers often desired such RV-compatible changes as smoother access roads and designated trailer parking.

Vehicle Use

Numbers and types of vehicles were also noted on the social survey form (see Figure 14). Vehicle types included cars, SUV's, trucks, and "motor homes," or RV's that were a single self-contained unit. Trucks and SUV's were both seen pulling pop-up campers and trailer-campers. Cars are usually associated with tent camping, as can be trucks and SUV's.

333 total vehicles were counted with 167 trucks, 50 SUV's, 79 motor homes, and 37 cars transporting visitors to Guadalupe Watershed. The large proportion of trucks and SUV's confirms that either Guadalupe Watershed dispersed camping mostly requires use of a 4-wheel drive vehicle or visitors prefer larger vehicles.

Figure 14. Total numbers of each vehicle type noted in corridor.



Average number of vehicles per individual campsite was 1.7, showing that most campers are part of a group larger than one family unit. The highest number of cars at any one campsite was 8 and the least was 0 (for camping complexes that were unoccupied or occupied people were absent).

Visitor Activities

Overall, 74% of visitors contacted were camping overnight (see Figure 15). Rio Cebolla and Rio de las Vacas had a similar proportion of camping groups. Rio Guadalupe, in contrast, had a relatively larger proportion of day users (43% of visitors).

Figure 15. Proportion of camping and day-use groups by river system.

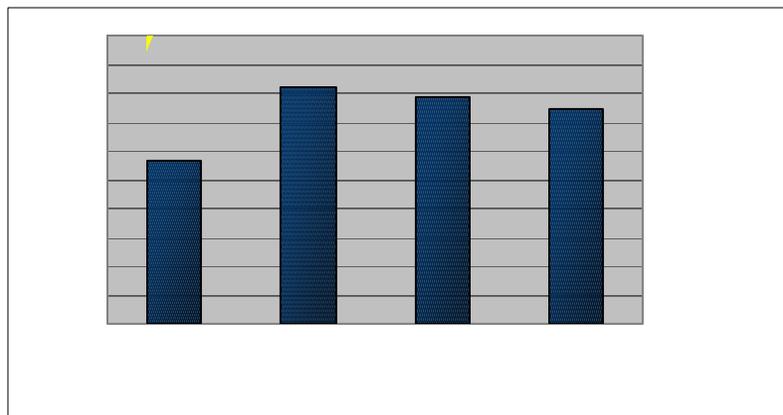
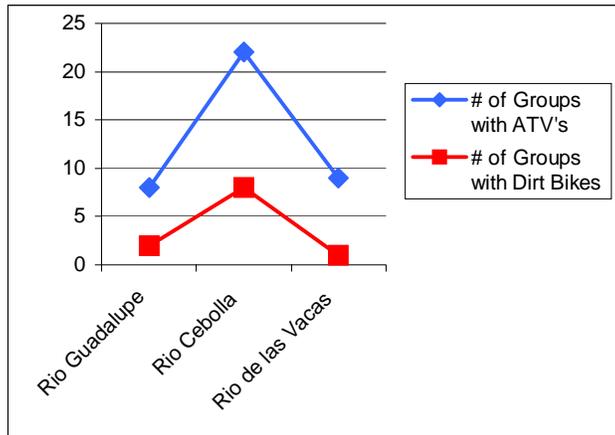


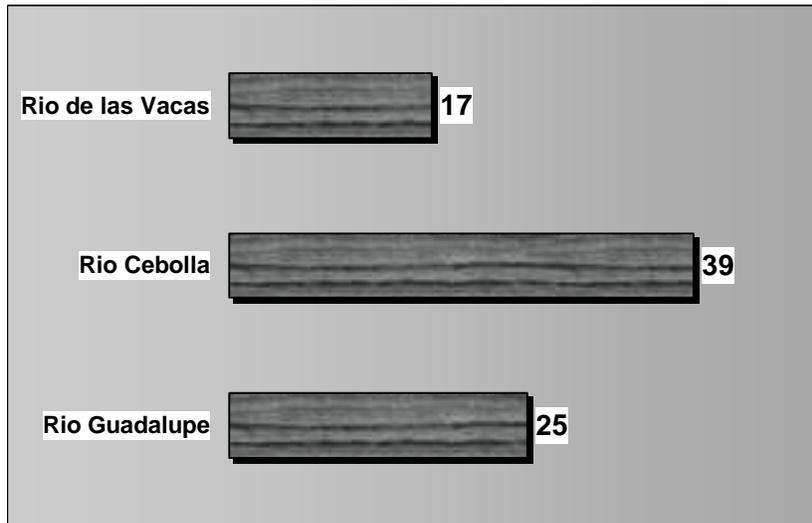
Figure 16. Off-road vehicle use in Guadalupe Watershed, including ATV's and dirt bikes.



Rio Cebolla showed the greatest amount of ATV and dirt bike usage compared to the other two river systems. Evidence of highest ATV and dirt bike use is clustered in the Porter area, confluence of Rio de las Vacas and Rio Cebolla, forming Rio Guadalupe. The Porter area is also a major historical and prehistorical archaeological area, which should be taken into consideration alongside this popular recreational activity. Conflicts between those who use off-road vehicles and those who do not can be summed up through two quotations gleaned from social surveys: Those who use off-road vehicles generally stated, “I like it the way it is, [with] open roads for cruising;” and those who deeply dislike off-road vehicles believed that “ATV’s have taken over.”

Another popular activity, particularly for day users, is fishing (see Figure 17). Guadalupe Watershed contains New Mexico Game and Fish-designated “Special Waters” that seem to draw many anglers to the corridor. Rio Cebolla is the most popular part of the watershed for fishing (39 groups). However, Rio Guadalupe is very close behind with 25 anglers coming to fish the “Special Waters.”

Figure 17. Number of groups fishing in Guadalupe Watershed.



Rio de las Vacas lags behind the other two, but surveyors noted active beaver ponds near the junction of FR 20, 539, and 152A, obvious evidence of great fishing upstream. However, many anglers described “terrible fishing” they encountered, and long-time area visitors often expressed that fishing had been declining in the area for years.

Water-based pastimes, including fishing and swimming, accounted for over 50% of day users’ activities (see Figure 18). Picnicking and relaxing were also popular day user activities. Water play and the coolness of higher elevation riparian corridors of the Forest were regularly described as the draw of the area.

Figure 18. Proportion of water-based day activities in Guadalupe Watershed.

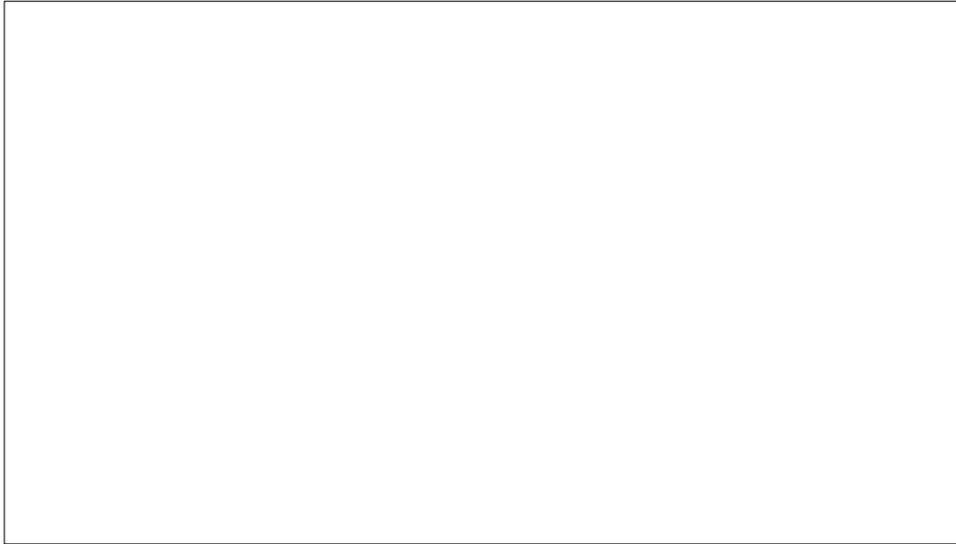
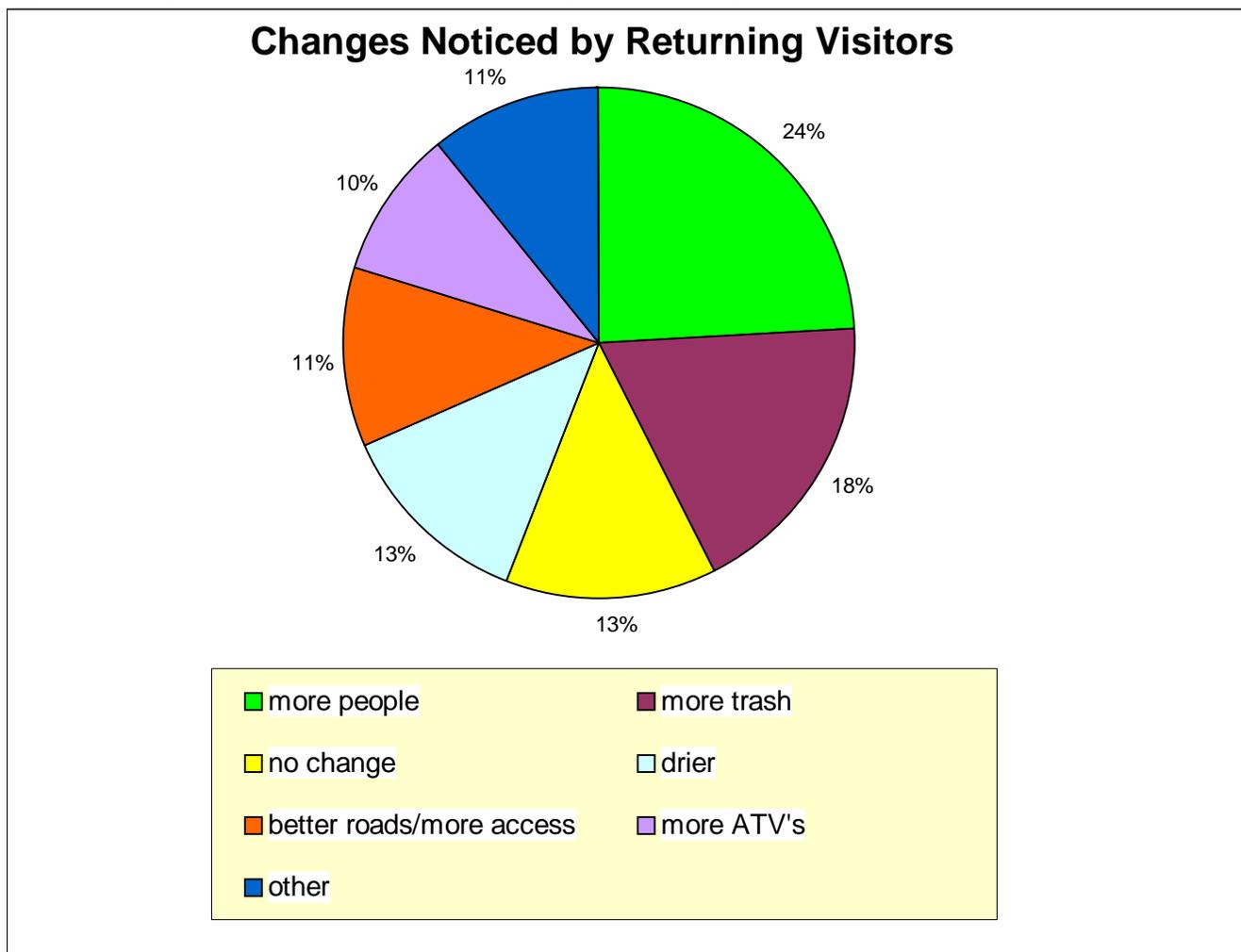


Figure 19. Changes noticed in Guadalupe Watershed camping areas by returning visitors.



Other: 6% noticed more road restrictions, 5% noticed effects of fires (especially Lakes), and 3% noticed fewer fish
 Sample size: 294 substantive comments

More trash was a very common theme throughout the summer with visitors telling Contact Rangers what their experience was like: “toilet paper everywhere,” “we haul out more trash than we create,” “more pollution in river,” “people don’t clean up after themselves (it’s frustrating),” “Cebolla was trashed,” and “filthier” (see Photo 16).

Most visitors noticed drier conditions than in the past. Mainly visitors who had been coming to the area for 5 years or less responded that they had noticed “no changes” to the area over time. These visitors described the area in such terms as “nice and quiet” and a “pretty area.”

Many visitors noted better main roads, though plenty complained of the washboard nature of main roads and the condition of access roads (particularly those camping with cumbersome RV’s). Improved road access in Guadalupe Watershed brought out such thoughts from visitors as, “more dirt with overuse,” “vegetation disappearing, more erosion,” “smaller roads being used more,” “more pressure on the sites,” “worn out, real trampled on,” “closures good for plants to re-grow,” and the “decline of this area.”



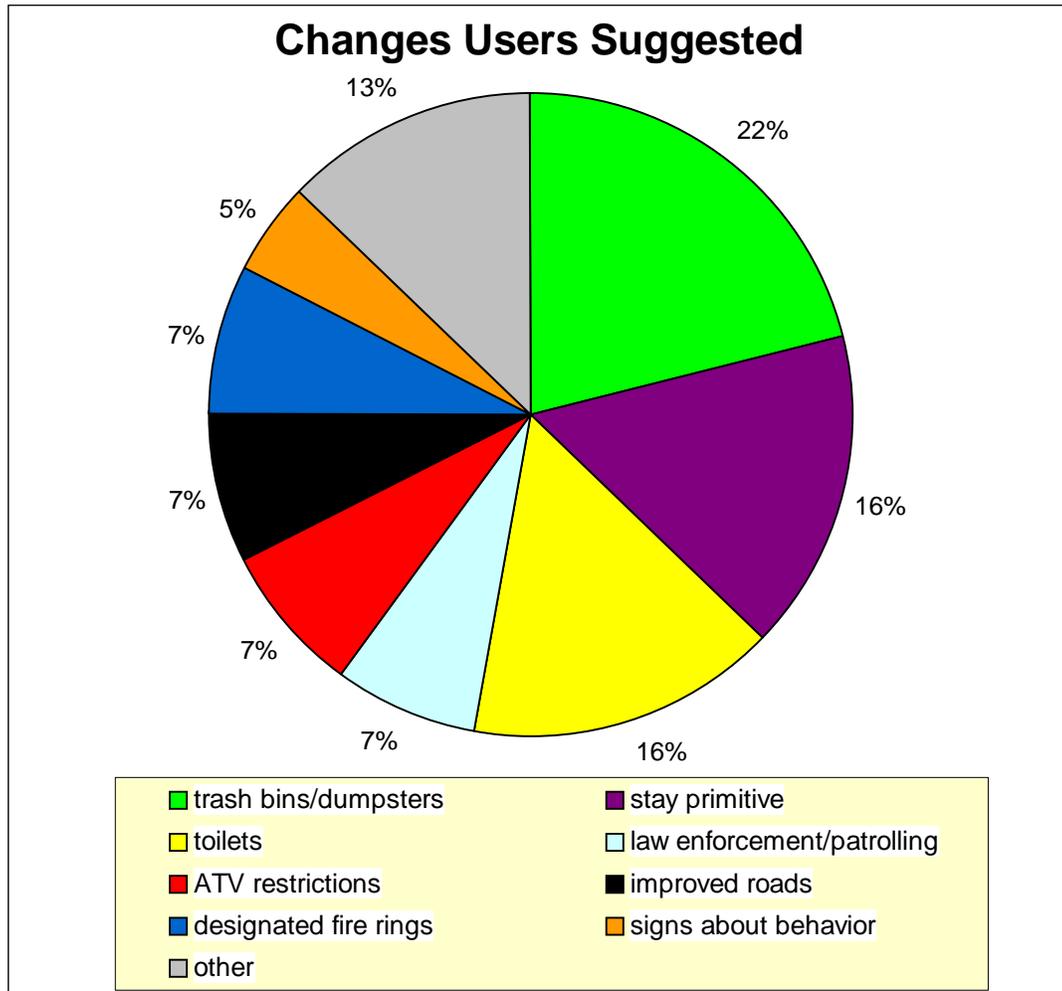
Photo 16. User-made sign on fire ring at *The Stairs*, Rio Cebolla. Sign originally said, “Clean up after yourself, we did.” Later in summer, sign was changed to, “Don’t clean up after yourself, we did not.”

Certainly the most divisive issue in the corridor was presence or absence of ATV’s and dirt bikes. While most visitors seem to find common ground in their love of the river, forest, and nature while using it each in their own ways, people commented in the extreme about off-road vehicle issues. 6% of visitors complained of road closures, specifically to ATV and dirt bike use. Most visitors who use ATV’s and dirt bikes would like to maintain open off-road vehicle areas and see trails built to create more riding opportunities (though some off-road vehicle users did complain of other users’ habits, including early morning riding and resource destruction). On the opposite side are the 13% of visitors who complained of noise, destruction of resources, and safety issues surrounding ATV and dirt bike use. Surveyors often heard, “ATV’s tear everything up” and “4-wheelers are a pain in the ass,” and many visitors suggested an all-out ban on the machines in the area.

Changes Desired In Watershed Area

Knowing now what visitors noticed as changes in the area and what visitors did not want, Contact Rangers also asked people how they would like to see the area change for the better (see Figure 20). Most suggestions were spontaneous; however, it should be noted that some visitors asked what others had responded with on this question. When several common answers, such as “providing dumpsters and portapotties,” were offered, many visitors agreed that these were good ideas that they had not thought of. While their lack of spontaneity may change the quality of the following data in some minds, visitors who were given examples still had the opportunity to either agree or disagree, and they did both.

Figure 20. Changes desired by visitors in Guadalupe Watershed camping areas.



Other: 9% want limits to use, “less people”, designated sites, or permits to camp; 7% want picnic tables; 5% want designated trails (especially to river); 4% want drinking water pumps; 2% want showers or a community shower facility; and 1% want emergency telephone boxes along corridor.
 Sample size: 483 substantive comments.

Most items are self-explanatory with a few additions. First, “primitive camping” (16.1%) was described in many different ways by people, with Respect the Rio crew lumping together suggestions that described this overall idea. Those who wanted primitive camping often described what they did *not* want to see changed: items such as no paving, no campground hosts, no picnic tables, and no rules about dogs-off-leash were described along with positively themed ideas such as keeping the area more “natural” with few to no facilities. People talked about enjoying “roughing it” and liking an area that did not look managed.

The issue of more law enforcement, enforcement of rules, and patrolling by Forest Service “Rangers” (7.2%) was also described with certain activities in mind. Many visitors were fearful of recreational shooting that goes on, particularly at night, in the corridor and wanted law enforcement to protect families. Concerns related to ATV and dirt bike noise and speeding brought about suggestions for more law enforcement. Fire was another issue, since those who followed fire restriction rules were irked at no enforcement of fire bans after 6 p.m., with

campsite neighbors often flouting restrictions once fire engines were done for the evening. And finally, on the opposite side of those who wanted to have their dogs off-leash, some visitors wanted enforcement of leash laws as they had been menaced or attacked by neighboring campsite pets.

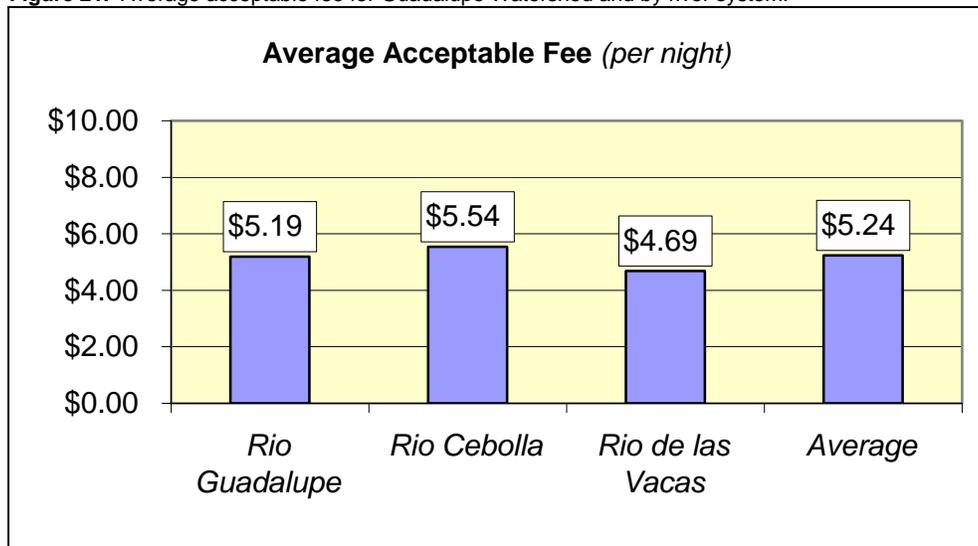
When numbers and quality of Contact Ranger social data are analyzed, the connection between changes to the area and changes desired comes down to a few items: numbers of people, quality of roads, beauty of nature, dealing with trash, use of toilets, and regulation of off-road vehicles. While visitors rarely described their direct connections to rivers in the area when noticing or suggesting change, the dispersed camping complex data exemplifies this relationship along with the common theme described by nearly all visitors to the Guadalupe Watershed, namely that this natural area is “always beautiful,” which is really why they come.

Opinions on Potential Camping Fees

Finally, visitors were asked if they were willing to pay a fee should the area become managed (providing certain amenities, such as toilets and/or trash dumpsters). Visitors sometimes answered that they were not willing to pay a fee for the area, many citing the fee-less nature of Guadalupe Watershed as the reason they camp there at all.

Out of 1,463 potential answers, 82% (1,206) were willing to pay a fee (see Figure 21). It was assumed that a group’s “spokesperson” represented the entire group’s willingness to pay a certain amount. Visitors who answered in the affirmative when asked if they were willing to pay a fee were then asked how much they thought would be reasonable. Answers given as a dollar amount per night or day, but not specifying per site or per car, were assumed per site. For those who were for willing to pay a fee, the average fee was \$5.24/night per site per night with an average annual fee of \$65.24.

Figure 21. Average acceptable fee for Guadalupe Watershed and by river system.



However, average fee visitors were, in general, willing to pay definitely differed by river system. Not surprisingly, visitors to Rio Cebolla, who showed more affluence with a larger proportion of

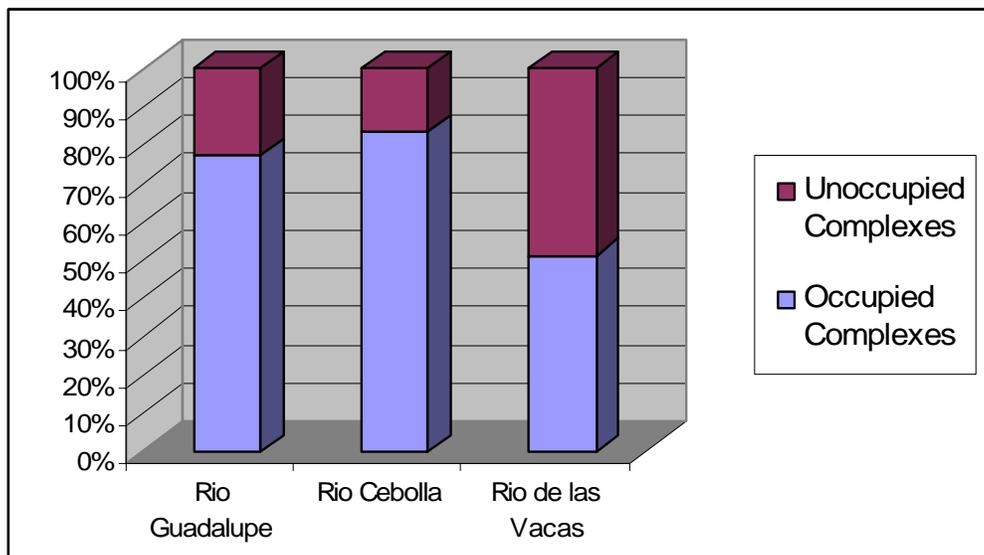
RV camping, were willing to pay an average of \$5.54 per night. Visitors to Rio Guadalupe were willing to pay at nearly the level of Rio Cebolla visitors at \$5.19 per site per night. Rio de las Vacas visitors, mostly tent campers in a more remote area of the watershed, were still willing to pay \$4.69 per site per night.

It should also be noted that many visitors were more willing to pay a fee should the Forest Service provide amenities that were visible, such as toilets. Some visitors complained of paying fees at areas where no visible changes occurred in the area, except more fee collection officers. Others complained of fees that introduced heavy development (primarily in the form of paving) and more restrictive regulations (such as road closures for ATV's).

Heavily Used Camping Areas

Overall occupation of dispersed camping complexes indicates both resource impact and social connections to specific complexes. Before campsite inventories were finished, Contact Rangers could not identify unoccupied complexes accurately. This camping complex occupation comparison data actually represents the last half of the summer season (see Figure 22). However, Respect the Rio crew agrees that, informally, this data is representative of the entire camping season.

Figure 22. Overall camping complex occupation by river system.



Note: Rio Cebolla was visited twice as much as Rio Guadalupe and Rio de las Vacas.

Clearly, Rio Cebolla and Rio Guadalupe show the highest occupation rates, while Rio de las Vacas shows the lowest. In general terms, this also describes overall impacts of recreation use being highest on Rio Cebolla, second highest on Rio Guadalupe, and lowest on Rio de las Vacas. However, specific camping complex data also shows that certain geographic areas are being impacted most by heavy use, regardless of the river system they might be found along. Identifying high-use complexes will help direct initial restoration and education efforts.

Most heavily used camping complexes along Rio Guadalupe were found directly along the river, with a few notable exceptions (see Table 2). Six complexes (*Juniper Junction, Rocky Road,*

Chutes and Ladders, Concrete Pad, Cul-de-Sac, and Steep Ponderosa; about 40% of the most heavily used complexes) are well off Rio Guadalupe, high above the canyon. However, visitors contacted in these complexes chose them for their rough access roads (e.g. *Rocky Road*) and lower visitation by large groups. Most campers used these complexes to avoid other people, and, to accomplish that, they also had to give up easy access to the river.

Table 2. Percent of occupancy during Contact Ranger Program for Rio Guadalupe camping complexes.

Rio Guadalupe		
<i>High (67-100%)</i>	<i>Medium (34-66%)</i>	<i>Low (0-33%)</i>
Braided Trails (Deer Creek)* Oak Landing Powerline* Corrals Shady Grove* The Long Haul* Juniper Junction* Rocky Road* Concrete Pad (Llano Loco) Chutes and Ladders* Cul-de-Sac Pull Through Porter* Porter Landing	Closure Gate The Berm Site Steep Ponderosa	Logging Camp Gilman Peak Roundabout Peak Hell Hill Odd Angle

* 100% occupation

Several complexes contain unique benefits for campers. For instance, *Braided Trails (Deer Creek)*, is not only the first large dispersed camping complex found north of Gilman Tunnels (and the shortest driving distance from Albuquerque) but it also has a deep swimming hole with cliff sides perfect for jumping into the river. This swimming hole makes *Braided Trails* not only a popular camping spot but also one of the most popular day use areas in the entire Guadalupe Watershed. In October 2003, this site was modified into a parking area away from the stream, allowing for day and walk-in camping only.

Three other examples include a well-used, forested trail system noted at *Shady Grove*, “Special Waters” signage bringing anglers to *Concrete Pad (Llano Loco)*, and easy access to what seems to be the most popular ATV and dirt bike road system in the corridor near three complexes (*Porter, Pull Through, and Porter Landing*; see Photo 17).

The junction of Rio Cebolla, Rio de las Vacas, and Rio Guadalupe in the Porter area shows heavy bank and off-road vehicle impacts (especially noise impacts regularly complained about by campers not involved with ATV and dirt bike activities).



Photo 17. Access to *Porter Landing*, a 3.7-mile-long camping/ATV complex along Rio Guadalupe. (31 July 2003)

All heavily used complexes along Rio Cebolla, with the exception of *Off River*, *Aspen Meadows* and *604 Access*, are directly along the river (see Table 3). 12 complexes are smaller, single to small group sites with easy RV access (*Fence*, *Ponderosa Group*, *Circle of Trees*, *Birdcage Drive*, *Private Landing*, *Mixed Conifer*, *Double Horseshoe*, *The Dumbell*, *The Stairs*, *Eroded Vista*, *Dirt Dropoff*, and *Cebolla Arc*).

Table 3. Percent of occupancy during Contact Ranger Program for Rio Cebolla camping complexes.

Rio Cebolla		
<i>High (67-100%)</i>	<i>Medium (34-66%)</i>	<i>Low (0-33%)</i>
Fence*	Meadow Fork	Cebolla Confluence
Ponderosa Group*	Ponderosa Group West	Tiny Turnout
Mixed Conifer	Dirt Dropoff	Sloping L
Circle of Trees*		Rock Wall
Double Horseshoe		Lakes Fire
Ponderosa Cluster*		Boulder End
The Dumbell		Mixed Conifer North
The Stairs		
Eroded Vista		
Party Place		
Cebolla Arc		
Birdcage Drive*		
Meadow Turn-Off		
All-in-One*		
Off River*		
Private Landing*		
Cebollita Springs East*		
Aspen Meadows*		
604 Access*		

* 100% occupation

Longer, more complicated complexes often held large groups having reunions, parties, etc. Large parties along this river system were most often seen at *All-in-One* and *Party Place* (see Photo 18). By far the most heavily used and constantly occupied complexes are *All-in-One* and *Cebollita Springs East*. *Cebollita Springs East* follows a long access road on the east side of Rio Cebolla at the Lake Fork confluence. Bank erosion, river crossings, fire rings too close to the river, and toilets abound in complexes along Rio Cebolla, making it the most heavily impacted and heavily visited of the three river systems.



Photo 18. *Party Place*, named for large parties often found within this 7-site complex. Rio Cebolla. (1 Aug. 2003)

Rio de las Vacas showed far less regular occupancy at camping complexes (see Table 4); however, much like along Rio Cebolla, all heavily used complexes are directly along the river. Most heavily used complexes include three RV-accessible sites south of Rancho del Chaparral Girl Scout Camp (*Grassy Circle*, *Alder*, and *GS East*). Three individual sites (*Vacas East*, *Hook*, and *Narrowleaf Cottonwood*) seem more popular for tent camping and ATV/dirt bike use. *Vacas East*, for example, is reached by crossing the river in an off-road vehicle.

North of the Girl Scout Camp, five primarily small complexes (*GS North*, *Stumps*, *Vacas U*, *Anvil*, and *Boulder Bench*) are for tent or small RV campers. Near the junction of FR 20, 539, and 152A is a heavily used RV area where 3 complexes (*Open Camp*, *Vacas West*, and *Vacas North*) exemplify some of the worst slumping and eroded banks in the Guadalupe Watershed (see Photo 19).

Table 4. Percent of occupancy during Contact Ranger Program for Rio de las Vacas camping complexes.

Rio de las Vacas		
<i>High (67-100%)</i>	<i>Medium (34-67%)</i>	<i>Low (0-33%)</i>
Grassy Circle Hook Alder GS North* Stumps Vacas U Vacas West Road 20L* Open Camp Vacas North Fenceline*	Oak Arch Spruce Hill Narrowleaf Cottonwood Vacas East GS East Anvil	Vacas Tributary Vacas Tributary North Vacas View Riverbank Boulder Pile Grassy Circle North Slumping Bank Stumps North Dogwood Underground Shelter Boulder Bench Beaver Dam Road 152A Split Fishing Pullout Vacas Flats Vacas Overlook

* 100% occupation

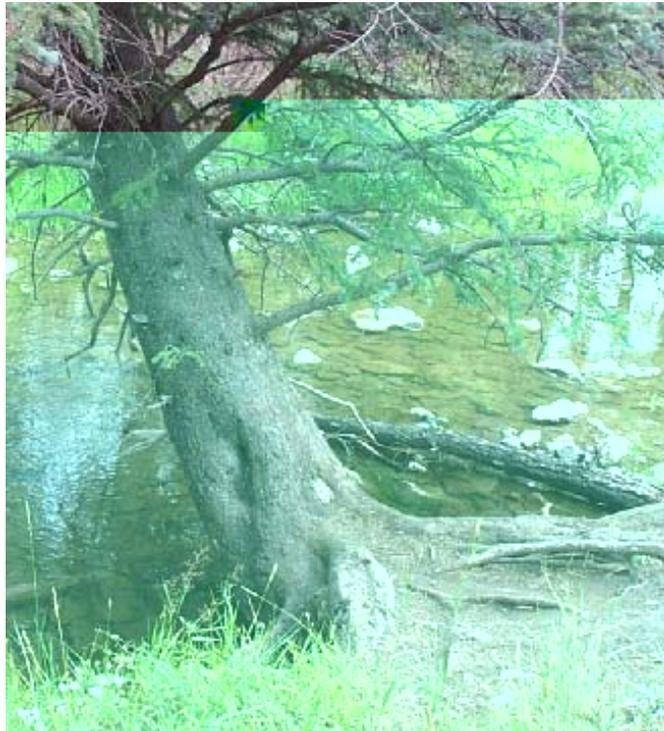


Photo 19. Tree falling into Rio de las Vacas from eroded bank at Open Camp. (27 Aug. 2003)

Education Recommendations

After this initial summer program of gathering baseline data and delivering educational messages, the future of Respect the Rio should continue to include a full, formal education program. The main areas that need to be addressed include the following:

- Contact Ranger Program
- Interpretive Programs
- Signage
- Public Outreach

Contact Ranger Program

Students from the Student Conservation Association program were an excellent choice and did a great job. This organization should be tapped again for crew members with some added emphasis placed on local university recruitment as well. Training should include not only the elements included this year, such as interpersonal skills, but also a more formal handbook about fire and what to do in emergency situations.

Most importantly, Contact Ranger Program should transition from a baseline data gathering situation to one where interns more formally educate Guadalupe Watershed campers about how they can specifically help improve the water quality of the area through behavior change. New off-road closures will provide the opportunity for the crew to specifically address visitors why changes have been made.

Interpretive Programs

Experimental interpretive programs were delivered this summer at developed campgrounds. Visitors raved, as did campground hosts, as many area users learned how they could help our rivers stay healthy. The issue of which campgrounds are handicapped-accessible to allow for this programming to continue should be dealt with this winter so planning for programs will be a success for next year. It would also be good to begin extending the reach of the interpretive programs to Cuba Ranger District at the newly renovated Rio las Vacas and Clear Creek campgrounds. It should be noted here that the interpretive programming would not have been a success without the very generous support of Santa Fe National Forest's Heritage Program, which supplied wonderful speakers for all holiday weekends.

Interpretive programs averaged about 22 visitors per talk with as few as 5 attending and as many as 45. Topics covered during the Respect the Rio's interpretive program included: birds of the riparian southwest, aquatic insects, the importance of riparian vegetation, coyotes, geology of the Jemez Mountains, the importance of beavers, the state of endangered species in the Jemez, elk, and tarantulas.

Signage

Experimental Respect the Rio signage seemed to survive the summer's visitation well. Next season the addition of southwestern region Respect the Rio signage will address issues specific to the area including human waste disposal, native fish assemblages and protection, archaeological site protection, willow restoration, fencing protection, tree damage, importance of

beavers, trash disposal, vehicle damage to riverbanks, using designated trails, exotic species, and arid environment protection. Sign artwork is complete and text is currently available for review. These signs should be placed at the very beginning of the camping season. To expedite appropriate placement, recreation staff could stake sign post locations prior to field season for field crews. Coordination between recreation and education could help with what sign topics should be placed at specific locations.

Public Outreach

Now that it is very clearly known where our visitors are originating from, it is to the best advantage of the Forest for the Respect the Rio Education Coordinator to focus heavily on public outreach in north Albuquerque suburbs and western city area.

This outreach should include reaching K-12 students in the classroom, placement of ads in Albuquerque journals (including in Spanish), targeting involvement in community events, and airtime on local radio and TV. During school years in the future, the Education Coordinator should identify schools in the target area of the city and suburbs and begin presenting to students how they can be better stewards of their public lands and waterways as a vital outreach for Respect the Rio.

Restoration Recommendations

Restoration recommendations for each camping complex can be found in the 2003 Dispersed Campsite Inventory. The following recommendations cover areas where initial restoration efforts should be targeted. In general, public outreach coupled with enforcement of a road-to-river motor vehicle closure will greatly improve the chances of riparian recovery in Guadalupe Watershed.

High Priority

Porter Landing Area (Rio Cebolla, Rio Guadalupe)

One of the most problematic recreation areas is Porter Landing, where Rio Cebolla joins Rio de las Vacas to form Rio Guadalupe. Major concerns in this heavily used area include camping-related bank erosion, impacts on archeological sites, human waste, and off-road vehicle use. Porter Landing is probably the most popular ATV-use area throughout Guadalupe Watershed: ATV roads crisscross Rio Guadalupe and Rio Cebolla throughout the FR 376 corridor. *Porter Landing*, a 3.7-mile long ATV/camping complex, possibly goes as far south as the Gilman Tunnels area. Considering the immense ecological and archeological resource damage of the Porter Landing area, the Forest should at least close camping complexes that cross the river to vehicles and possibly create small “bridges” to access footpaths across rivers. *Porter Landing*, in particular, should be closed to camping and ATV use. Any “sacrifice areas” that might be decided upon later for ATV’s could be farther from riparian habitat. Unstable banks at river crossings can then be revegetated with road closures and delineated parking.

Junction of FR 20, FR 539, and FR 152A (Rio de las Vacas)

This area, on the north end of the Rio de las Vacas inventory, houses most of the popular RV-accessible complexes of Rio de las Vacas, which contribute to extensive stream bank erosion in close proximity to active beaver ponds. Entire banks need to be revegetated, which may be possible if these complexes are pulled back from the river by delineation of parking and single access roads. ATV roads should also be closed. *Beaver Dam*, a small, infrequently used single-site area, can be closed entirely.

Medium Priority

South End of Rio Guadalupe Corridor (Rio Guadalupe)

Many large complexes throughout Rio Guadalupe show major brown-out and human waste impacts from heavy camping and day use. Most of these complexes are concentrated between *Braided Trails (Deer Creek)* and *The Long Haul* (7 complexes). All of these complexes would benefit from delineation of access and social roads, as well as parking. ATV use is moderate in this area and can be directed away from riparian areas. Restroom facilities might help eradicate human waste problems in this stretch of Rio Guadalupe.

Rio Cebolla FR 376 Crossing (Rio Cebolla)

Many sites along Rio Cebolla are extremely close to the river (less than 5 feet away). Particularly degraded sites are near the FR 376 crossing just north of Porter Landing. Sites at this area need to be closed or pulled back from the river with delineated parking. ATV/4x4 river crossings (and associated individual campsites) should be closed. Areas near the river can then be revegetated.

Lowe

Acknowledgements

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Appendix A

Figure 1a. 2003 Dispersed Campsite Inventory form. "ORV" will be changed to "ATV" for consistency on future forms.

Dispersed Campsite Inventory

Date: _____ Surveyors: _____
 Watershed: _____
 Complex Number: _____ Complex Name: _____
 General Description: _____

GPS 1. Begin-point of access road: N _____ E _____
 2. End-point of access road: N _____ E _____
 3. _____: N _____ E _____

Photo Documentation:

#	Direction photo faces	Photo Description	At GPS point?
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Size:
 Number of sites: _____ Number of fire rings: _____
 Approximate Length _____ Width: _____

IMPACTS:

___ Access Roads	Number: _____
___ Social Roads	Number: _____
___ Scarred trees	Number: _____
___ Damaged trees	Number: _____
___ Root exposure	Number: _____
___ Structures	Number: _____
___ Unstable/eroding banks	Length: _____
___ Invasive plants	Describe: _____
___ Brown-out	Percent of site: _____
___ Human excrement/TP	Number: _____
___ Other	Closest distance to water: _____ Describe: _____

Closest Water Source:
 Distance: _____ Type: _____ Name: _____

Primary use for site:
 Day Use ___ General Overnight ___ Group Get-Togethers ___ ORV ___ Hunting Camp ___

Restoration Recommendations and Comments:

___ Relocation _____
 ___ Delineation _____
 ___ Re-vegetation _____
 ___ Surfacing _____
 ___ Post Signs (*What Message?*) _____
 ___ Add rocks or fences as barriers _____
 ___ Closure _____

Transplant material available nearby? Y/N
 Describe: _____
 Comments: _____

MAP ON BACKSIDE

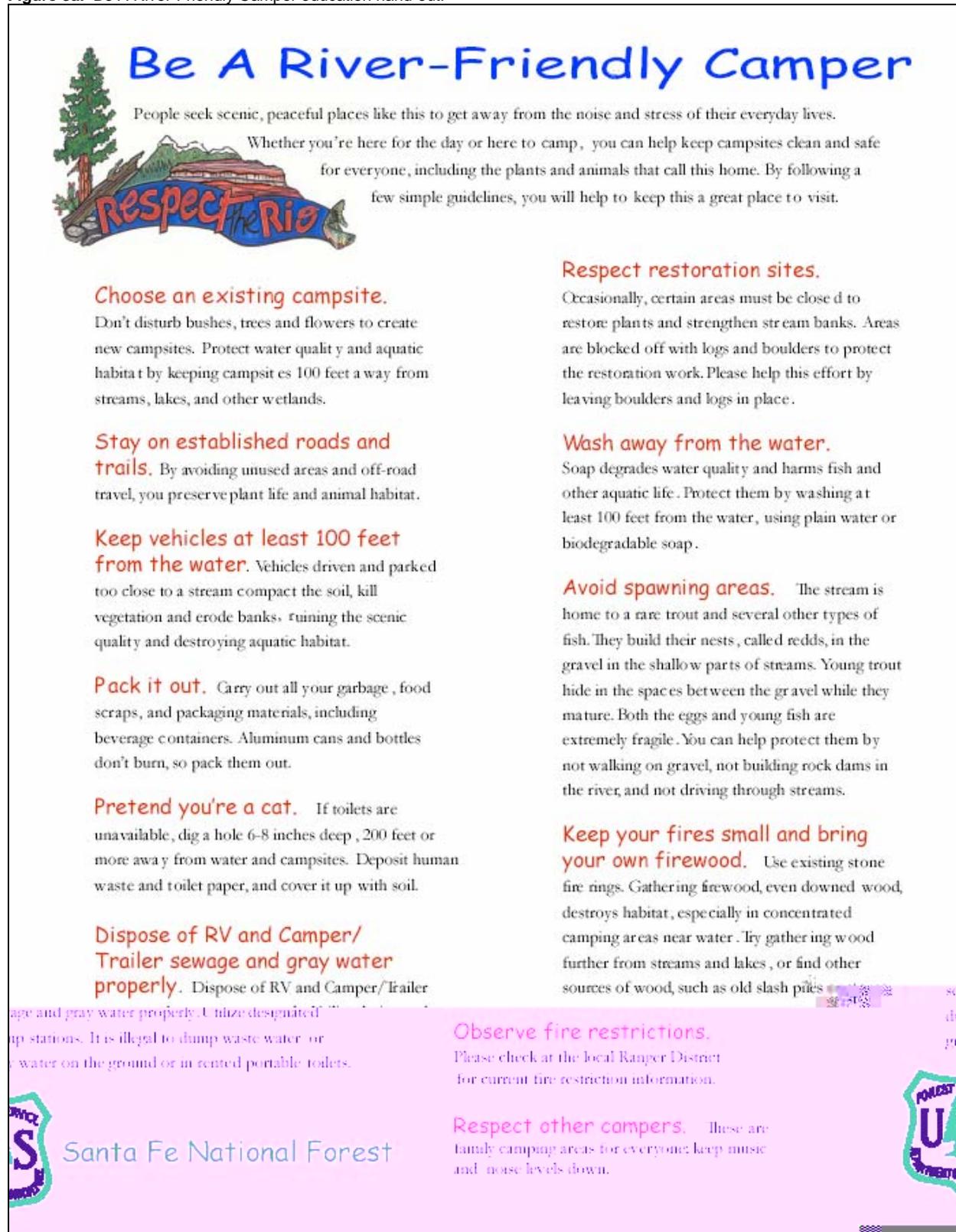
Figure 2a. 2003 Contact Ranger Social Survey form.

Contact Ranger Social Survey

Date: _____ Time: _____ Weather: _____
 Watershed: _____ Complex: _____ Site Numbers: _____
 City and State or Zip Codes: _____ Group Size: _____
 Length of Visit: _____ Activity: _____
 Vehicles: _____ Camping Type: _____
 Other Equipment: _____
 How long coming to area? _____

Site Condition Trash/Fire Pits	
How has it changed?	
How would you like to see it changed?	
How would you feel about paying a fee?	
How much? A Day/A Year	

Figure 3a. Be A River-Friendly Camper education hand-out.



The graphic is a hand-out titled "Be A River-Friendly Camper" in blue text. At the top left is an illustration of a river scene with a tree, a campsite, and a fish. Below the title, there is introductory text about enjoying scenic places and the importance of following guidelines. The main content is organized into two columns of guidelines, each with a bold heading and a descriptive paragraph. The bottom of the hand-out features the Santa Fe National Forest logo on the left and a "POLICE U" logo on the right. The background is light blue with a subtle pattern.

Be A River-Friendly Camper

People seek scenic, peaceful places like this to get away from the noise and stress of their everyday lives. Whether you're here for the day or here to camp, you can help keep campsites clean and safe for everyone, including the plants and animals that call this home. By following a few simple guidelines, you will help to keep this a great place to visit.

Choose an existing campsite. Don't disturb bushes, trees and flowers to create new campsites. Protect water quality and aquatic habitat by keeping campsites 100 feet away from streams, lakes, and other wetlands.

Stay on established roads and trails. By avoiding unused areas and off-road travel, you preserve plant life and animal habitat.

Keep vehicles at least 100 feet from the water. Vehicles driven and parked too close to a stream compact the soil, kill vegetation and erode banks, ruining the scenic quality and destroying aquatic habitat.

Pack it out. Carry out all your garbage, food scraps, and packaging materials, including beverage containers. Aluminum cans and bottles don't burn, so pack them out.

Pretend you're a cat. If toilets are unavailable, dig a hole 6-8 inches deep, 200 feet or more away from water and campsites. Deposit human waste and toilet paper, and cover it up with soil.

Dispose of RV and Camper/Trailer sewage and gray water properly. Dispose of RV and Camper/Trailer sewage and gray water properly. Utilize designated dump stations. It is illegal to dump waste water or gray water on the ground or in rented portable toilets.

Respect restoration sites. Occasionally, certain areas must be closed to restore plants and strengthen stream banks. Areas are blocked off with logs and boulders to protect the restoration work. Please help this effort by leaving boulders and logs in place.

Wash away from the water. Soap degrades water quality and harms fish and other aquatic life. Protect them by washing at least 100 feet from the water, using plain water or biodegradable soap.

Avoid spawning areas. The stream is home to a rare trout and several other types of fish. They build their nests, called redds, in the gravel in the shallow parts of streams. Young trout hide in the spaces between the gravel while they mature. Both the eggs and young fish are extremely fragile. You can help protect them by not walking on gravel, not building rock dams in the river, and not driving through streams.

Keep your fires small and bring your own firewood. Use existing stone fire rings. Gathering firewood, even downed wood, destroys habitat, especially in concentrated camping areas near water. Try gathering wood further from streams and lakes, or find other sources of wood, such as old slash piles.

Observe fire restrictions. Please check at the local Ranger District for current fire restriction information.

Respect other campers. These are family camping areas for everyone; keep music and noise levels down.

 Santa Fe National Forest 

Appendix B

Ecological Repercussions of Guadalupe Watershed Impairments

Temperature Impairment

Rio de las Vacas and Rio Cebolla are both impaired due to water temperature. New Mexico Environment Department, Surface Water Quality Bureau (NMED-SWQB) states that “temperature shall not exceed 20°C (68°F)” (NMED Rio Guadalupe Watershed TMDL Report) for an extended period of time (3-7 days). Coldwater salmonids, such as native Rio Grande cutthroat trout, and other river life need cold, well-oxygenated water to survive. If a river exceeds 20°C (68°F) for 3 days or more, oxygen decreases dramatically, and fish are in danger of dying. Temperature impairment is often linked to decreased amounts of vegetation, such as overhanging willow, grasses, and other trees, that naturally cools stream waters. In addition, temperature increases are associated with stream widening caused by slumping banks and vehicle crossings.

Total Organic Carbon (TOC) Impairment

Rio de las Vacas carries too large a Total Organic Carbon (TOC) load. TOC refers to total amount of suspended and dissolved organic matter found in a stream, including dead vegetation, animal (including human) detritus, and chemical compounds possibly introduced by humans in pesticides and fertilizers. Effects that TOC can have on the system include “decreased light penetration and depletion of oxygen” (NMED Report). Decreased light penetration in the stream limits plant growth and depleted oxygen inhibits breathing for gilled-animals.

Stream Bottom Deposit Impairment

Rio Cebolla is affected by stream bottom deposit impairment, defined as “water contaminants from other than natural causes that will settle and damage or impair the normal growth, function, or reproduction of aquatic life or significantly alter the physical or chemical properties of the bottom” (NMED Report). Fine silty sediments, in particular, that build up along a naturally gravelly stream bottom severely reduce available habitat for macroinvertebrate insects and fish during various life stages. Such deposits limit available spawning areas for fish and block gill surfaces of macroinvertebrates such as mayflies and stoneflies, lowering amount of oxygen insects can absorb and limiting their ability to see prey. Fine silt also limits light penetration to the stream bottom, affecting natural plant growth, and can change healthy hydrological movement of stream deposits in general. Roads, trails, and browned-out stream banks are often sources of fine sediment. Monsoon season often finds southwestern streams running reddish-brown with silty road and campsite runoff.

Metals Impairment

Rio Guadalupe has exceeded state standards for metals (chronic aluminum). NMED-SWQB has described this impairment as “indicative of a landscape source” (NMED Report), meaning this chronic aluminum is likely a naturally occurring impairment not caused by human impacts. Volcanic rocks of Rio Guadalupe canyon contain over 14% aluminum oxide naturally, nearly twice the normal occurrence of aluminum in non-volcanic geological formations. While human activities probably are not causing chronic aluminum in Rio Guadalupe, NMED-SWQB needs to continue monitoring this impairment, which is toxic to fish, bottom-dwelling insects, and some plants.