



## Evaluation of SHRUB Education Program: Full Report

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## Executive Summary: Evaluation of SHRUB Education Program

Educational program evaluation specialists in the School of Education at the University of California, Davis were contracted to develop and test survey instruments for the Santa Monica Mountains National Recreation Area (SAMO) to evaluate the impact of their K-12 student outreach programs. This report focuses on the evaluation of the SHRUB program which provides local 5<sup>th</sup> grade students and their teachers with a series of field trips that provide hands-on experience in habitat restoration and environmental education. Three elementary schools participated in the full pilot test of these instruments, the results of which are discussed below.

Following preliminary tests for effective wording, three surveys were developed: a pre-program and post-program survey of students and a post-survey of teachers. The post-program student survey was further refined into three separate surveys tailored to fit the individual schools' particular field trip activities. Surveys were administered via a web-based survey platform to and by classroom teachers. The resulting individual responses were provided to the UC Davis team for analysis. The full report details these results; key findings are summarized below.

### *Key findings*

- Two-thirds of the participating teachers responded to the post-program survey. They were uniformly positive about their students' experiences in the SHRUB program.
- Teachers report that the program reinforced what they teach in the classroom, supports students in achieving specific learning goals, and contributes to student proficiency in science.
- Teachers report that through their participation, students gained appreciation for the importance of native plants and natural habitats and enthusiasm for learning about national parks in general, and SAMO in particular.
- Students were ethnically and linguistically diverse across the schools. However, there were only minor variations in students' reported program participation outcomes across the schools.
- Students indicated in the pre-survey that they were interested in and had experience visiting natural areas and parks, although not all had visited SAMO prior to the SHRUB field trips.
- Students expressed fairly high levels of interest in nature and ecology prior to their participation and most reported increased levels of interest and knowledge as a result of their program participation.
- Nearly all students (98%) reported on the post-program survey that they enjoyed their SHRUB experience. Experiences they mentioned as "most liked" or "most

memorable” in open-ended questions indicate they particularly enjoyed the planting activities, hiking, and seeing/learning about wild animals and native plants.

- Most students (95%) reported at post survey that they understand why it is important to protect national parks and most (86%) were interested in exploring other national parks.
- Student ratings of individual program components also reflected high levels of interest in and appreciation for both ranger presentations and restoration activities.
- While responses were quite positive across the survey items, answers to open-ended questions specifically about what they did not like or wanted to change suggest, not surprisingly, that not all students enjoyed all aspects of the program. Some objected to specific activities (finding them “boring”) while others were uncomfortable with the outdoor setting (e.g. dirt, heat, animal droppings) or the physical demands of hiking.

Overall, teacher and student survey results suggest that the SHRUB program is successfully supporting teachers’ efforts to enhance the learning of 5<sup>th</sup> grade science content standards through hands-on experience. The majority of students indicated enjoying the program, gaining specific content knowledge about natural systems and habitat restoration, and increased enthusiasm for ecology, the preservation of natural resources, and national parks.

Recommendations are provided in the report for further refinement of survey items and administration protocols to facilitate continued monitoring of program outcomes.

## Evaluation of SHRUB Education Program: Full Report

### *Introduction*

Commencing in 2010, evaluators at the University of California Davis' School of Education have collaborated with the staff at Santa Monica Mountains National Recreation Area (SAMO) to develop a set of surveys to solicit feedback from participants in several of the parks' youth outreach and education programs. This report focuses on the SHRUB program which engages 5<sup>th</sup> grade classes in a multiple day program at SAMO including habitat restoration activities and learning about local ecology and natural history. A full pilot of the survey instruments and administrative protocols occurred during the 2012-13 school year; those results are reported below.

During the 2012-13 school year, three elementary schools participated in the SHRUB program: Earths' Magnet School, Third Street Elementary, and Conejos Elementary. There were slight variations in program activities as well as the number of site visits to SAMO between the three 5<sup>th</sup> grade classes. These variations were reflected in the survey questions provided to each group.

### *Methods*

Students were administered a pre-survey (pre-SHRUB) via a web-based survey platform prior to their program participation and a post-survey (post-SHRUB) soon after completing the program. Surveys were administered during the school day under the supervision of the classroom teachers. Teachers were surveyed, again using a web-based survey, at the end of the school year.

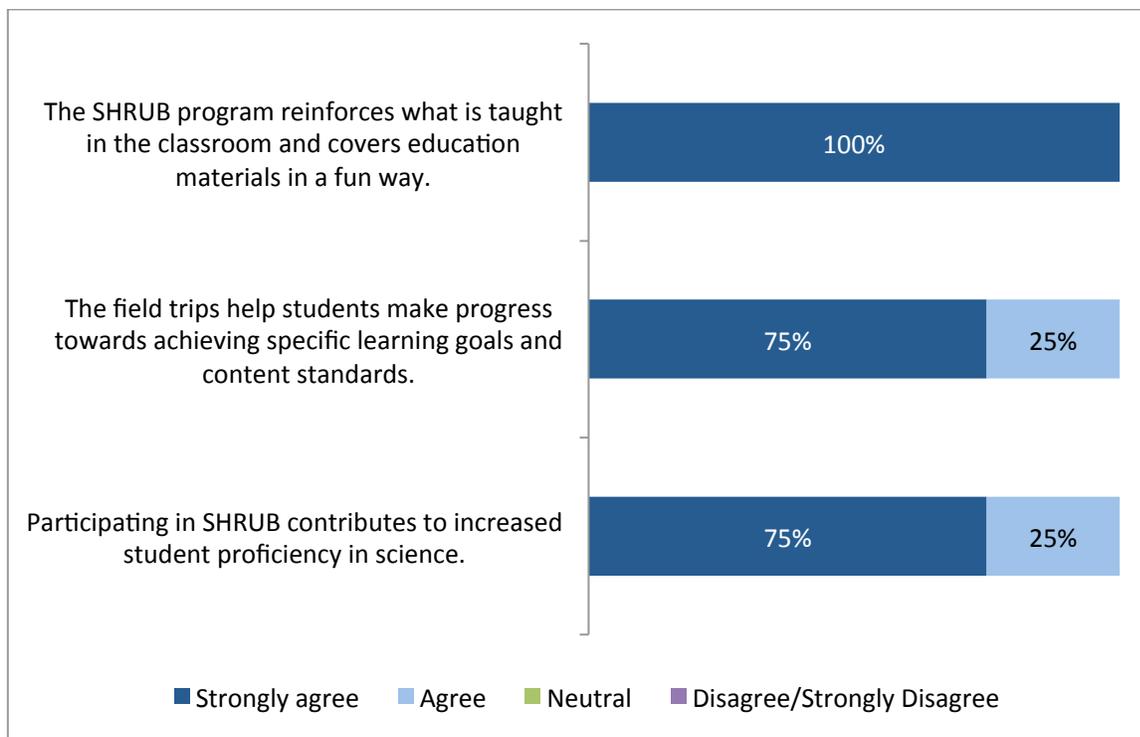
The content of each survey was developed in collaboration with SAMO staff and tested with small groups of students and teachers in 2011 in order to fine-tune wording. Survey instruments and administration protocols were then submitted to the federal Office of Management and Budget (OMB) for review and approval. After making additional adjustments in response to OMB feedback, the surveys were administered to the full population of the three 5<sup>th</sup> grade classes and their teachers in 2012-13. This administration constitutes a full pilot test of the survey instruments. Recommendations for additional revisions are included in this report.

## Teacher Survey Results

Four of the six participating teachers responded to the end of the year survey (66% response rate). All of these teachers had participated in the SHRUB program for at least two years (three have participated for three or more years). All responded that they will continue to participate in the program. None reported any barriers to their class' participation.

The responding teachers were uniformly positive about the educational value of having their students participate in SHRUB activities. They all agreed that SHRUB participation contributes to increased student proficiency in science, reinforces what is taught in the classroom, covers educational material in a fun way, and helps students progress toward achieving specific learning goals and content standards (Figure 1). In response to the question "How would you rate the educational value of the SHRUB field trips?" all four teachers rated it "extremely valuable" on a four point scale from "not at all valuable" to "extremely valuable."

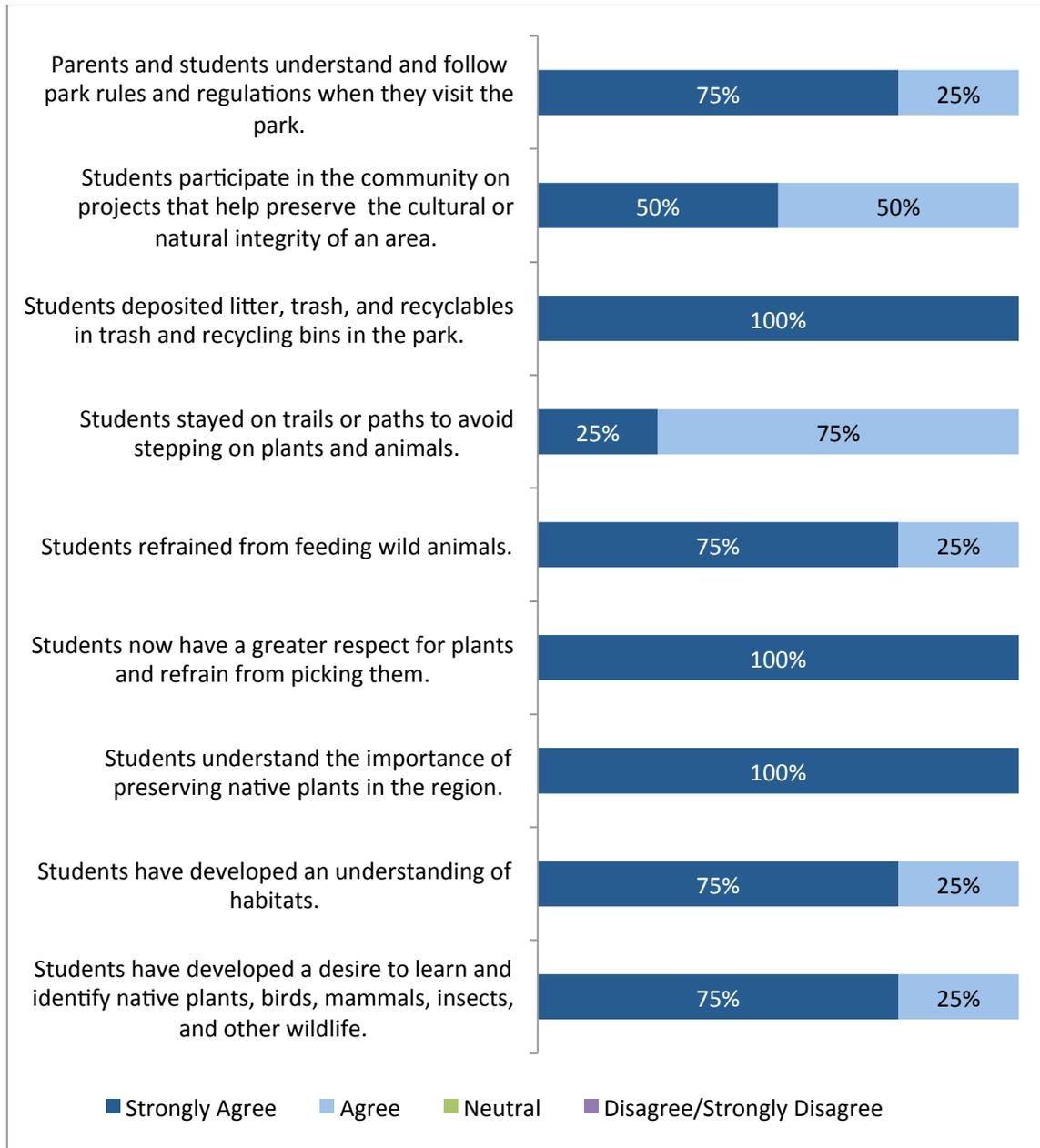
**Figure 1: Teachers' perception of SHRUB educational value**



When asked about how the SHRUB program contributes to various aspects of environmental stewardship all four agreed that their students developed an understanding of and appreciation for natural habitats, were more interested in learning more about native plants

and animals, had a greater respect for plants, and that both students and the adults who accompanied them on the field trips complied with park rules and regulations (Figure 2).

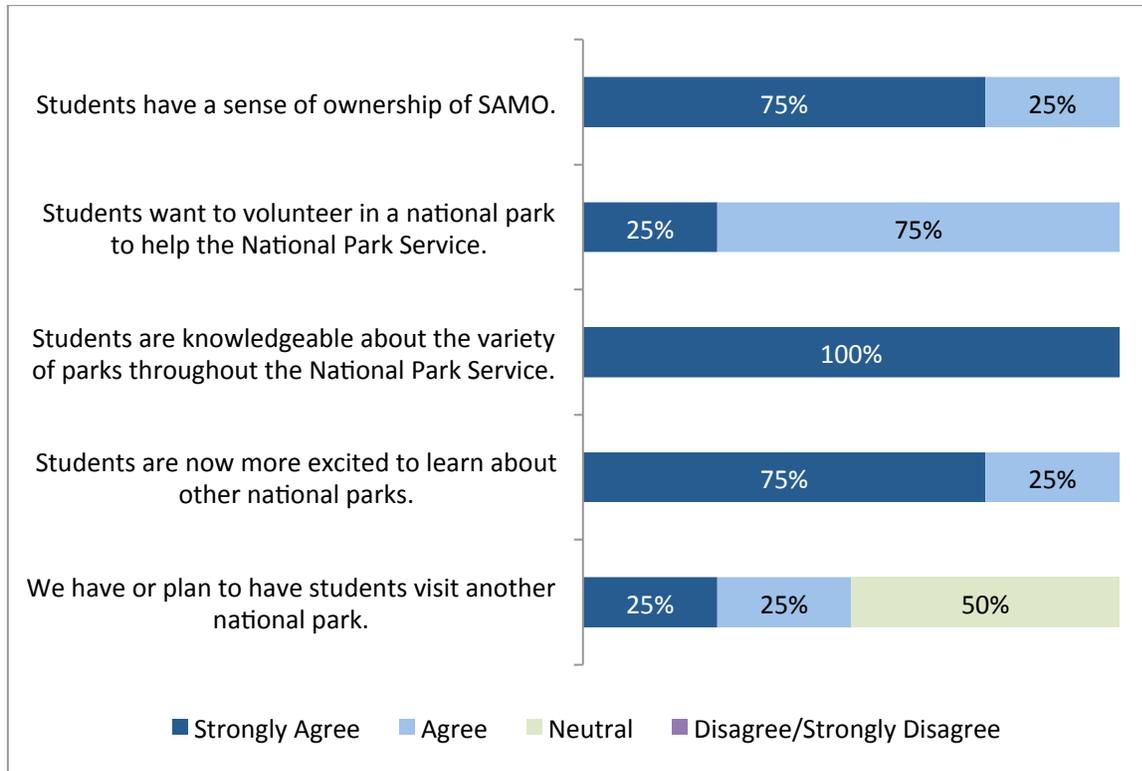
**Figure 2: Teachers' reports of rule compliance, interest in ecosystem, and stewardship**



Teachers also uniformly agreed that participation in the SHRUB program increased student interest in SAMO and the National Park Service (NPS). They reported that their students gained a sense of “ownership” of SAMO, that they want to volunteer in a national park, and

are more excited to learn about or visit other national parks (Figure 3). Two teachers (50%) reported plans to have their students visit another national park.

**Figure 3: Teachers' perceptions of student interest in NPS and SAMO**



Teachers were also asked to respond to open-ended prompts about their and their students' experiences in the SHRUB program. Teachers indicated praise for the hands-on aspect of the program when asked what they liked best. For example:

*I think the SHRUB program is an amazing program that gives children hands-on science investigations, facilitates learning science concepts and encourages ownership in keeping our native habitats pristine, as much as possible.*

*The learning time spent in nature ... and the mentoring of the Rangers is really impacting and important.*

*I like that the kids get a better understanding of the National Parks and how important it is to maintain the ecosystems.*

When asked what they liked least and/or how to better serve students, there were no complaints. Teachers wrote comments such as “*What’s not to like?*” Similarly, when asked what they would like to change, there were no major suggestions for change, although one teacher mentioned a desire for expanding the program to additional sections of SAMO.

## Student Survey Results

A total of 183 fifth grade students from the three participating schools responded to at least one round of surveys. Table 1 displays the characteristics of students at the time of the post-survey (end of the school year). Earths and Third Street students took both a pre- and a post-survey while Conejos Elementary students only took the post-survey. Students were ethnically diverse both overall and among the schools. The ethnic/racial categories in Table 1 represent those most frequently checked by students; students were able to designate more than one response.

Earths Magnet School students were predominantly White and non-Hispanic; Third St. students were predominantly Asian (Korean-American); and Conejos students were predominantly Hispanic. Students were asked to state their first language in an open-ended item. Table 2 shows the most common answers to this question for each school. Earths students were primarily English speakers, Third Street students were mostly English and Korean speakers, while Conejos students were almost evenly split between English and Spanish speakers.

**Table 1. Characteristics of Student Respondents**

	Earths Elementary	Third St. Elementary	Conejos Elementary	Total
N surveyed	93	55	37	183
% Male	64%	44%	62%	57%
% Hispanic/Latino(a)	35%	0%	62%	33%
% Asian	14%	65%	8%	32%
% African American	6%	9%	11%	11%
% White	67%	26%	43%	58%

**Table 2. Students' First language by School (most frequently mentioned)**

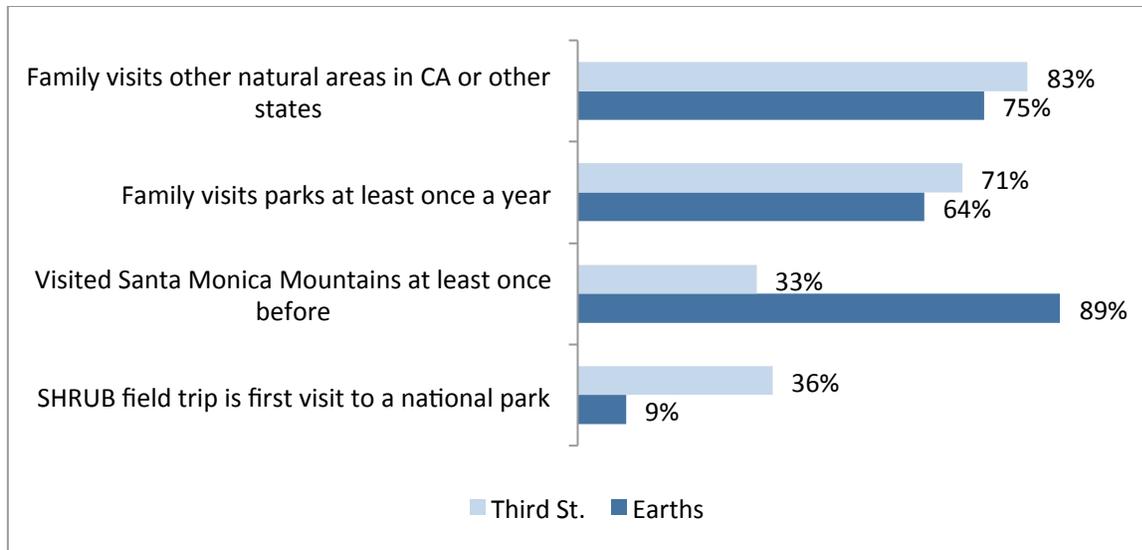
First Language	Earths	Third St.	Conejos
English	71%	50%	51%
Spanish	17%	0%	46%
Korean	0%	33%	0%

## Student interests and experiences at pre-survey

The pre-survey was administered to Earths and Third Street Elementary school students, but not to students from Conejos Elementary (n=170). To gain a sense of how familiar students were with SAMO, national parks, and visiting parks in general, they were asked a series of questions about their past experiences in these areas. The Earths and Third Street Elementary school students had varying levels of familiarity and experience in parks (Figure

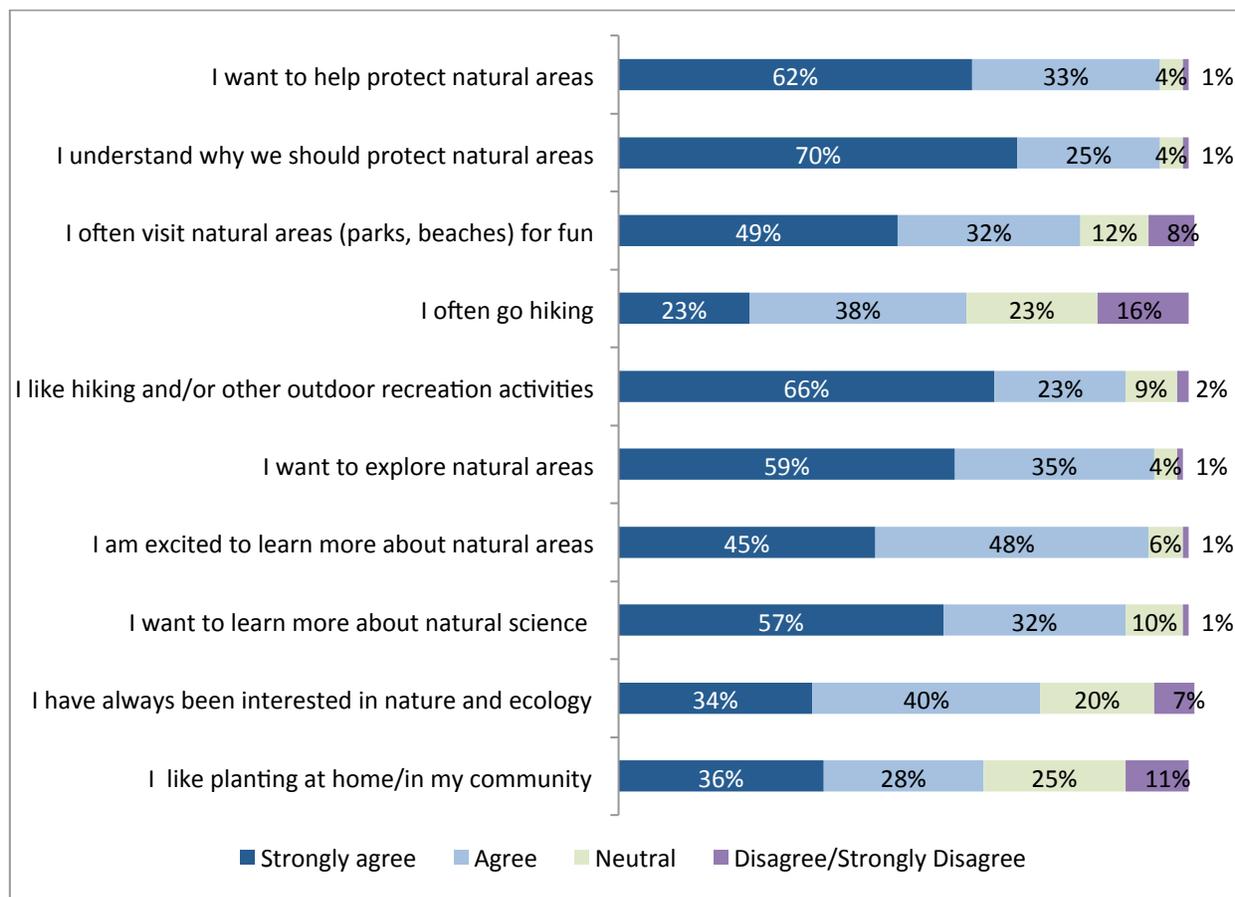
4). While the majority of both groups reported visiting parks and natural areas, students at Earths Elementary reported considerably more direct exposure specifically to SAMO and national parks. Only a third of the Third St. students reported a previous visit to SAMO, compared to 89% of the Earths Magnet School students. Only 9% of the Earths students indicated that their class fieldtrips would be their first visit to SAMO, compared to 36% of the Third Street students.

**Figure 4: Students' pre-SHRUB experience visiting parks (N=170)**



The students' pre-survey results suggest strong pre-existing interest in natural science, ecology, and nature in general (Figure 5). Also, although most students indicated strong interest in hiking and outdoor recreation, a smaller proportion reported "often" hiking, although most did report visiting natural areas and beaches. About two-thirds of the students indicated previous experience in planting activities in their home or community.

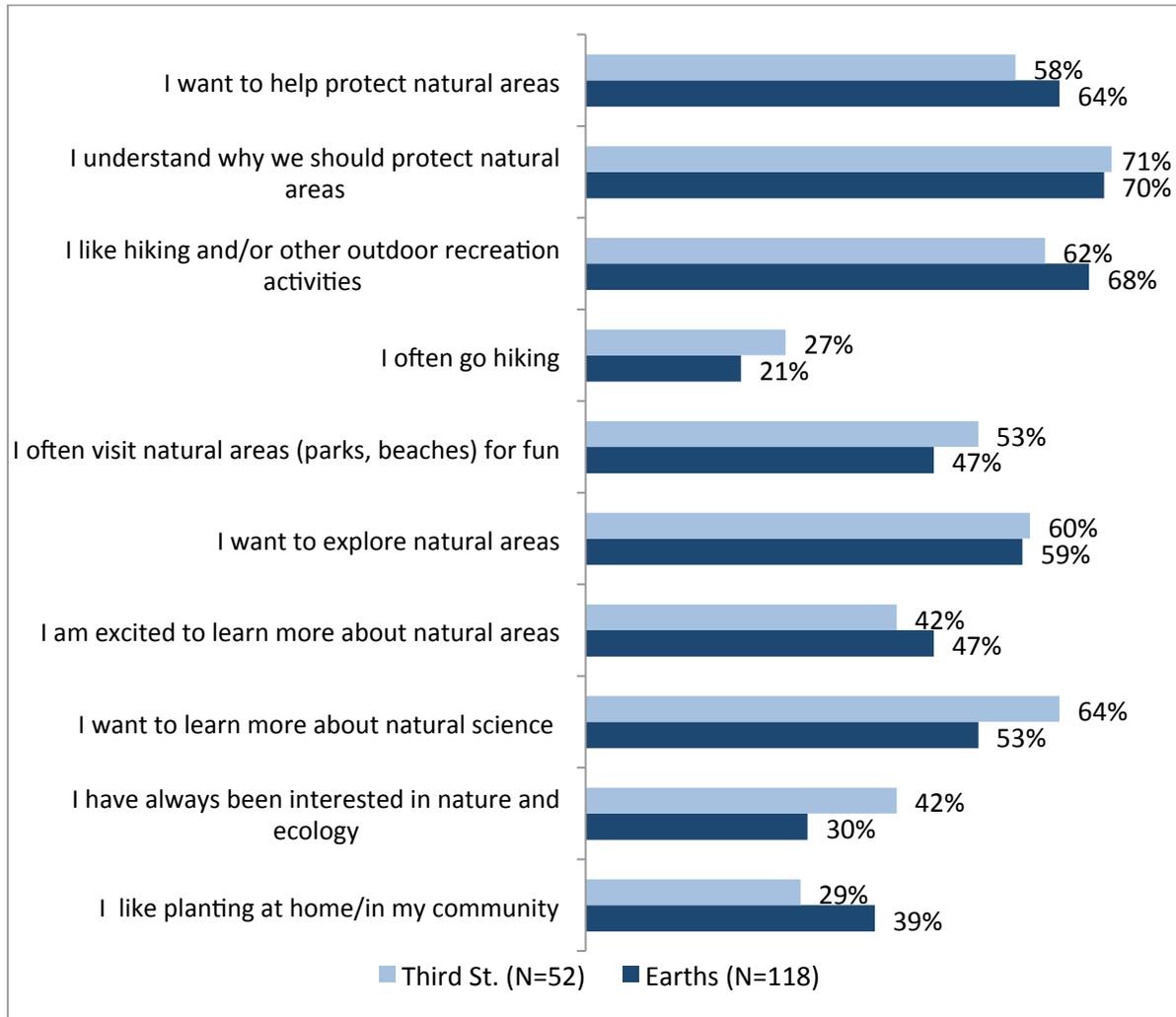
Figure 5: Pre-SHRUB student interest in nature/natural science overall (N=170)



Because the student responses clustered primarily in the “agree” and “strongly agree” categories, the following school-level breakdowns focus only on the “strongly agree” category to gauge strength of response across the schools. The assumption is that the extreme values may better reflect possible variations in student experiences and options.

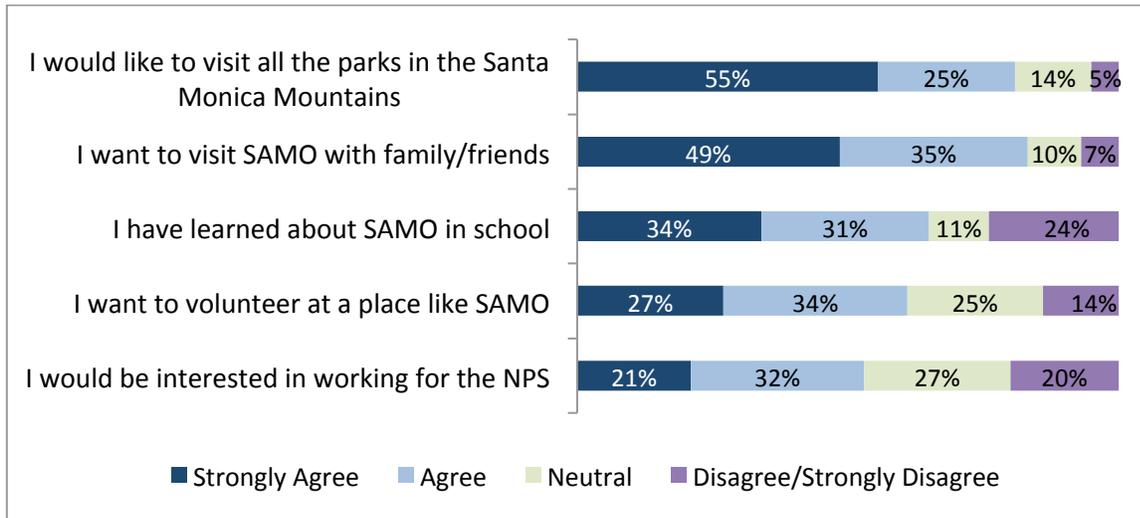
Responses to the interest and experience items did not vary dramatically between the schools (Figure 6). Students attending Earths Magnet School had slightly more interest in natural area preservation, hiking and outdoor recreation, and planting activities. Third Street students, on the other hand, tended to have slightly stronger levels of agreement about wanting to learn more about natural science and pre-existing interest in nature and ecology.

**Figure 6: Pre-SHRUB student interest in nature/natural science by school (% "Strongly Agree")**

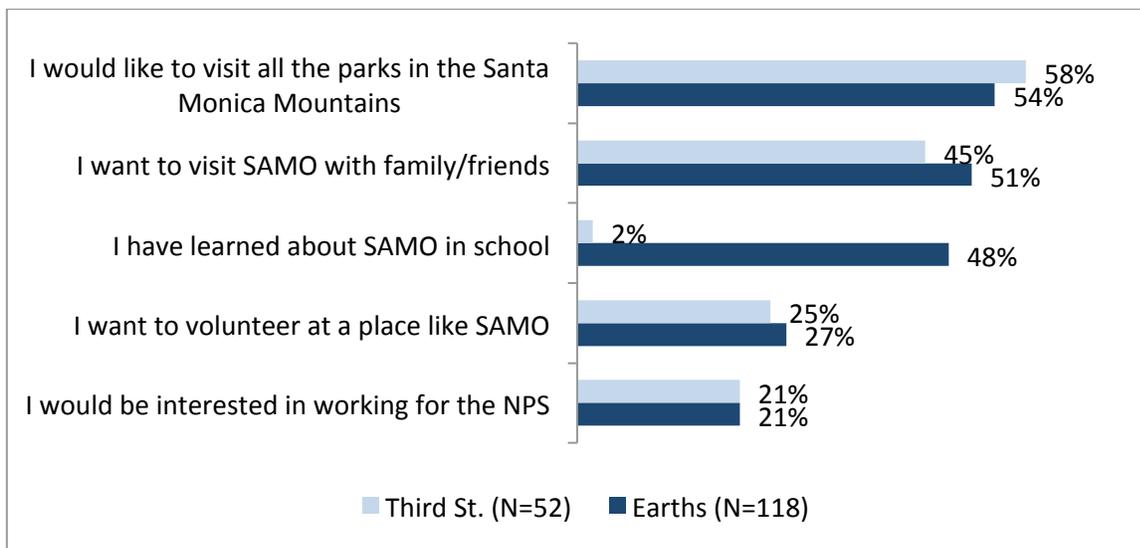


Students were also asked about their familiarity with and interest in SAMO prior to their participation in the SHRUB program. As Figure 7 illustrates, most students indicated an interest in visiting SAMO (84%) and/or all the parks in the Santa Monica Mountains (80%). Students expressed somewhat lower levels of interest in volunteering at SAMO (61%) or working for the NPS (53%) at pre-survey. Overall, more than half indicated they had learned about SAMO in school (56%), although when examined by school, the majority of these students attended Earths, rather than Third Street (Figure 8). This may be due to the timing of the pre-survey (before or after the initial classroom visit from the NPS ranger) or because Earths students have, overall, greater familiarity with SAMO (having visited more often). There was very little difference between the two schools on the other items in this category.

**Figure 7: Pre-SHRUB student interest/experience in SAMO and NPS overall (N=170)**

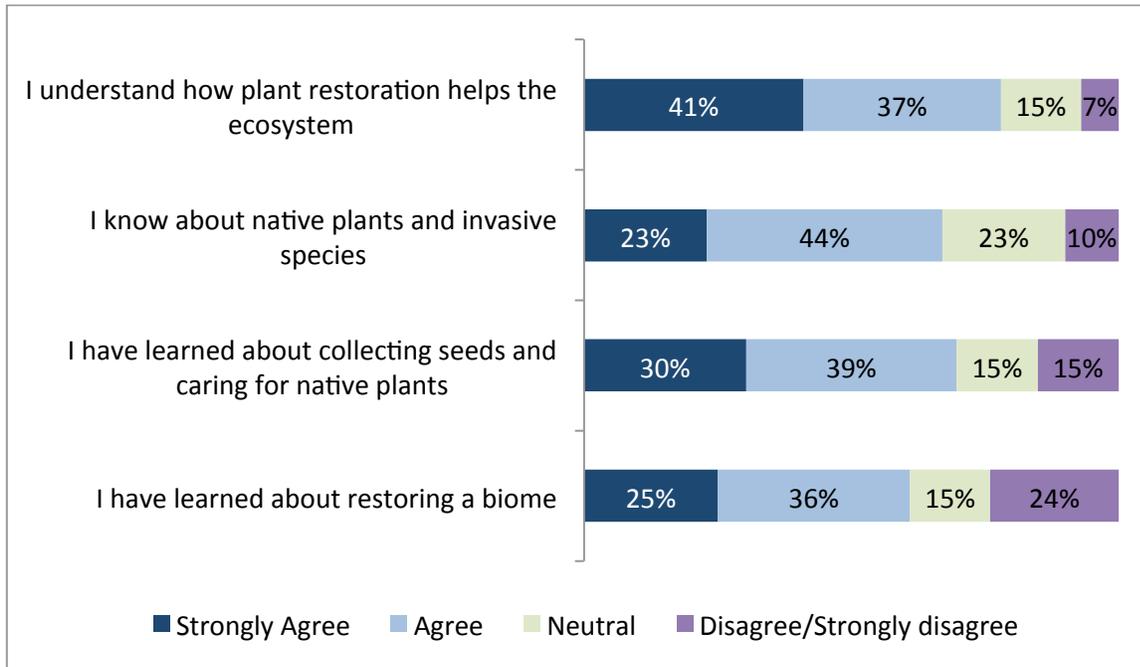


**Figure 8: Pre-SHRUB student interest in SAMO and NPS by school (% Strongly Agree)**



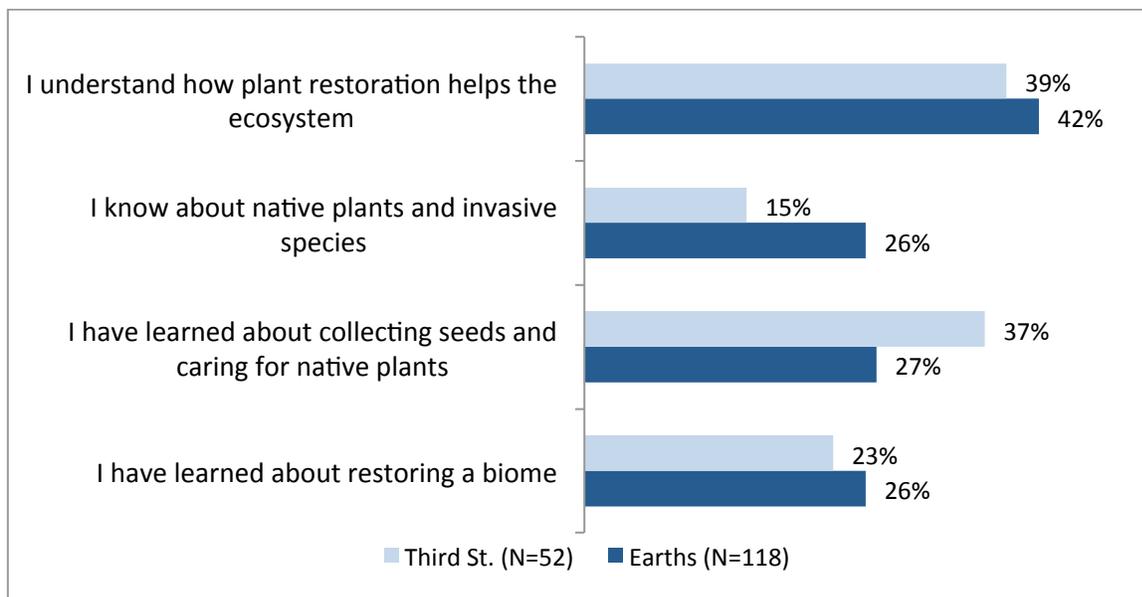
Students were also asked about their familiarity with several habitat restoration topics in the pre-survey. Most (78%) agreed that they understand why plant restoration is good for the ecosystem. About two-thirds indicated they knew about native plants and invasive species and that they had learned about collecting seeds and caring for native plants. A smaller majority (60%) said they had learned about restoring a biome.

**Figure 9: Pre-SHRUB student familiarity with habitat restoration overall (N=170)**



There were some differences between the schools (Figure 10). Earths students indicated more knowledge about native plants and invasive species, while Third Street students were more likely to agree strongly that they had learned about seed collection and native plant care.

**Figure 10: Pre-SHRUB student familiarity with habitat restoration by school (% Strongly Agree)**

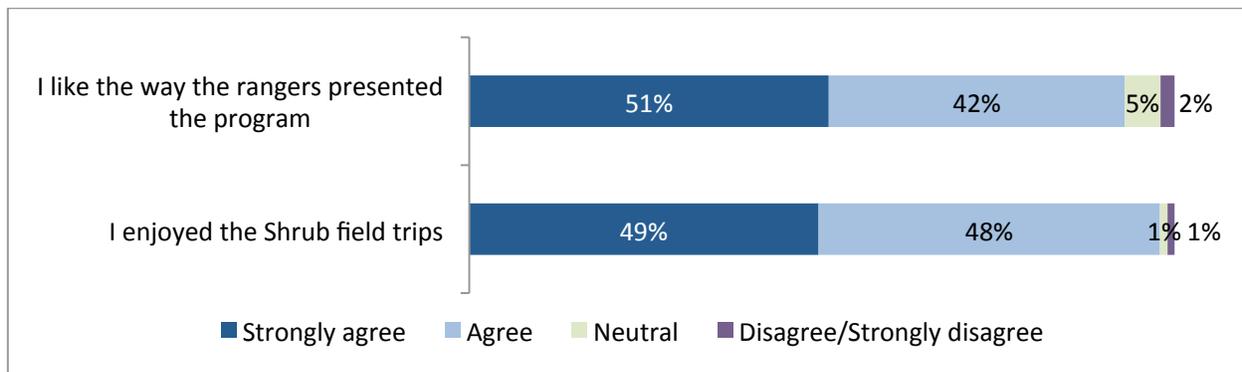


### Students' Post-Program Responses

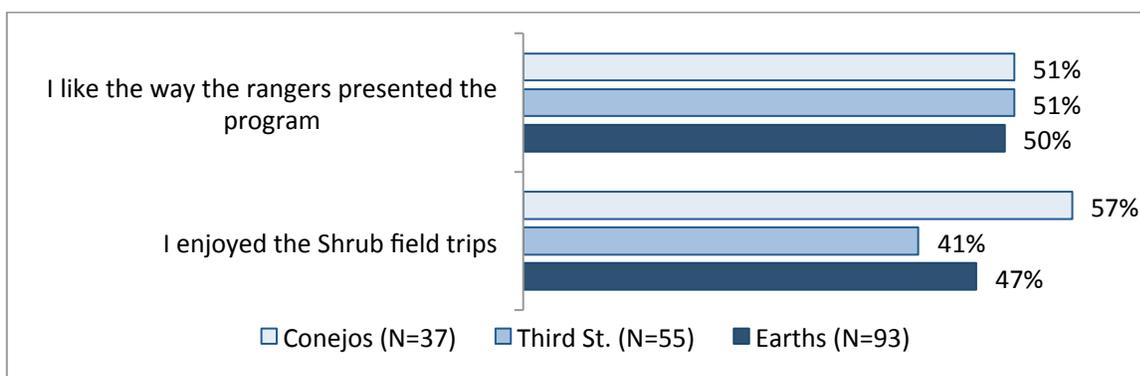
Each of the three schools administered the post-survey at the end of their participation in the SHRUB program, although survey content varied somewhat from school to school, reflecting differing program content and length among the schools. The total number of students responding to any individual survey item varied from 91-183. Individual student identifiers were not collected (meaning individual students' pre-survey responses cannot be matched to their post-survey responses) and very few survey items' wording matched exactly between the pre- and post-surveys. Consequently, there are no formal comparisons of students' pre and post responses. However, the pre-survey does provide useful contextual information to assist in interpreting the post-survey results below.

Students generally reported enjoying the SHRUB program (Figure 11). The vast majority of students (97%) agreed/strongly agreed that they enjoyed the field trips and liked the ranger presentations (93%). Third St. students reported slightly less enthusiasm for the field trips than the other two schools (Figure 12).

**Figure 11: Students' general enjoyment of SHRUB program overall (N=183)**

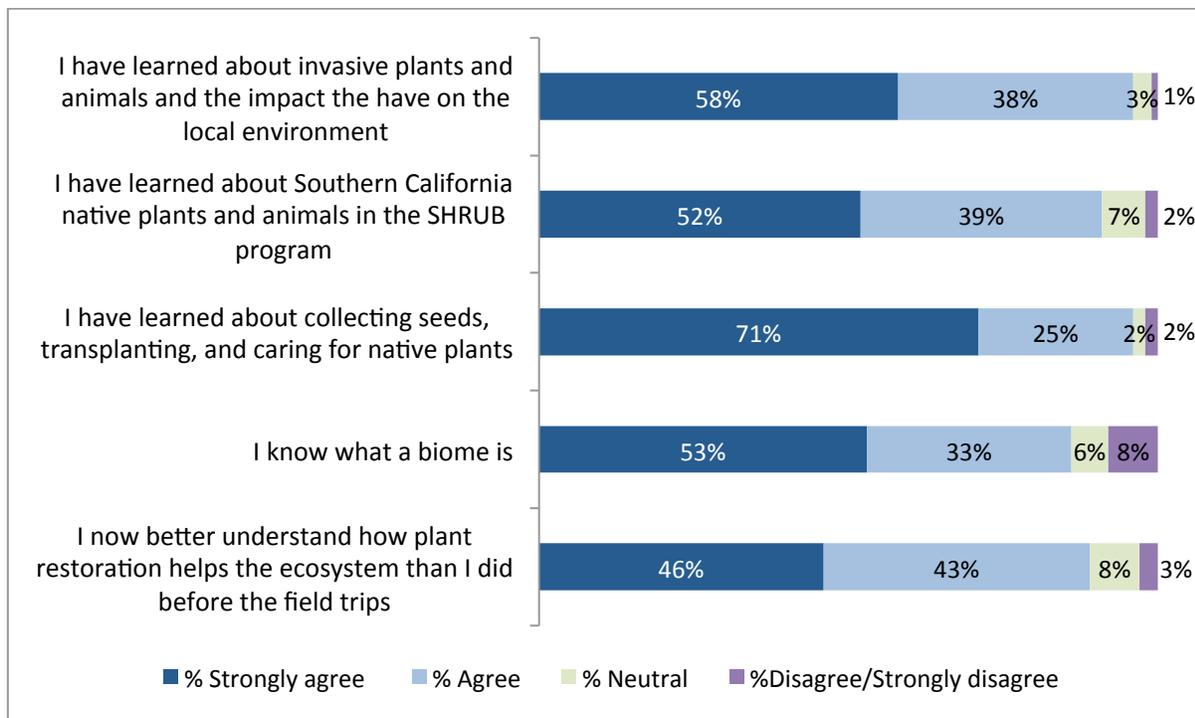


**Figure 12: Students' general enjoyment of SHRUB program by school (% "Strongly Agree")**



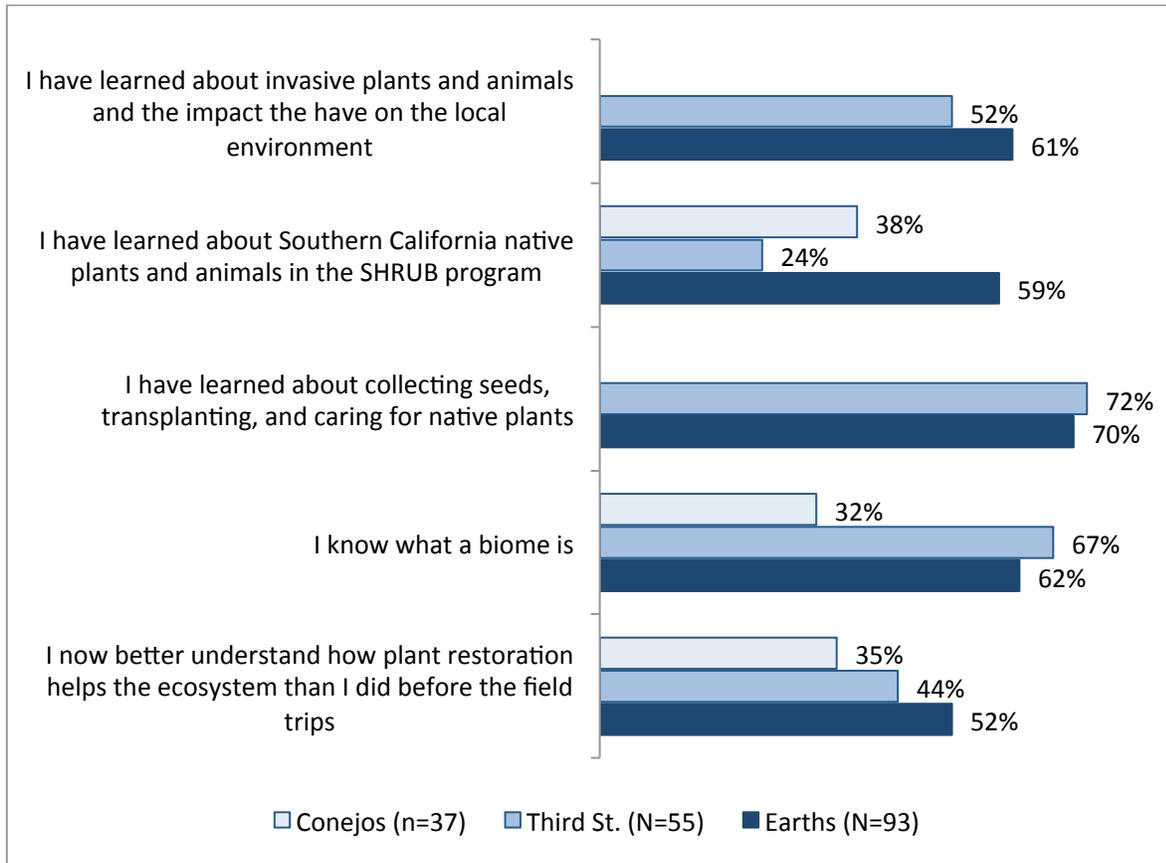
*Student learning.* Students strongly agreed to learning about native plants and animals and ecosystem restoration (Figure 12), particularly regarding native plants and invasive species. Prior to the program, 22% of the students indicated that they did not or were not sure if they understood how plant restoration helps the ecosystem (Figure 9), compared to 4% of students post-program. Similarly 30% were unfamiliar with collecting seeds and caring for native plants at pre-survey, compared to only 4% at post-survey.

**Figure 13: Post-SHRUB student learning overall (N=183)**



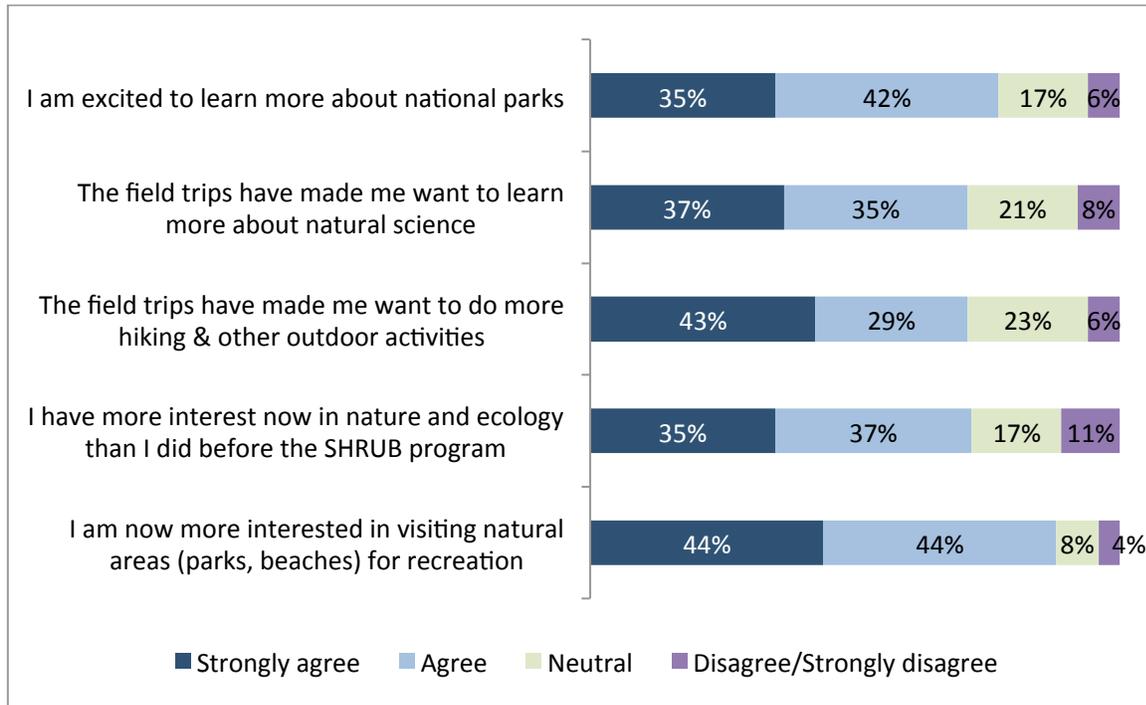
Responses to these items varied a bit among the schools (note that two of these items were not on the Conejos students' post-survey), as indicated in Figure 14. Third Street students had lower "strongly agree" responses than students from the other two schools in regards to learning about southern California plants and animals through the SHRUB program. Additionally, Conejos students had lower "strongly agree" responses to knowing what a biome is and to better understanding how plant restoration helps the ecosystem.

**Figure 14: Post-SHRUB student learning by school (% Strongly Agree)**



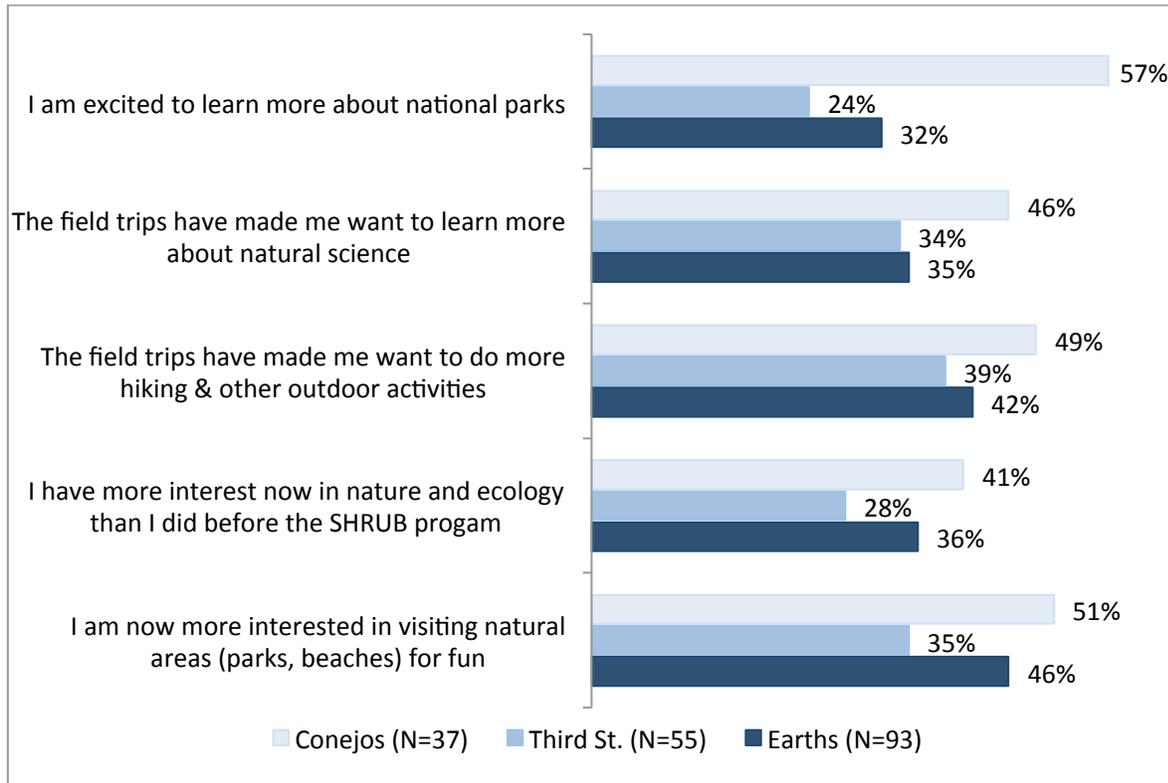
*Interest in nature and the outdoors.* Students were asked about their interests in nature and the outdoors in both the post- and pre-surveys. Figure 15 illustrates how students reported on their interests post-program overall. Although students expressed strong interest in nature and outdoor recreation at the outset (Figure 5), post-program survey results suggest that these interests were strengthened as a result of program participation. Most (88%) of the students said they were more interested in visiting natural areas and 72% indicated increased interest in hiking and other outdoor recreation due to their participation in the SHRUB program. Even though 74% indicated on the pre-survey that they had “always been interested in nature and ecology”, post-survey results show that 72% said they are now more interested than they were prior to the SHRUB program. However, it is important to keep in mind that the pre-survey population is not identical to the post-survey population (notably no Conejos students participated in the pre-survey) so comparisons are suggestive, not definitive. More than three-fourths of the students (77%) indicated an interest in learning more about the national parks on the post-program survey.

Figure 15: Post-SHRUB increase in student interest overall (N=183)



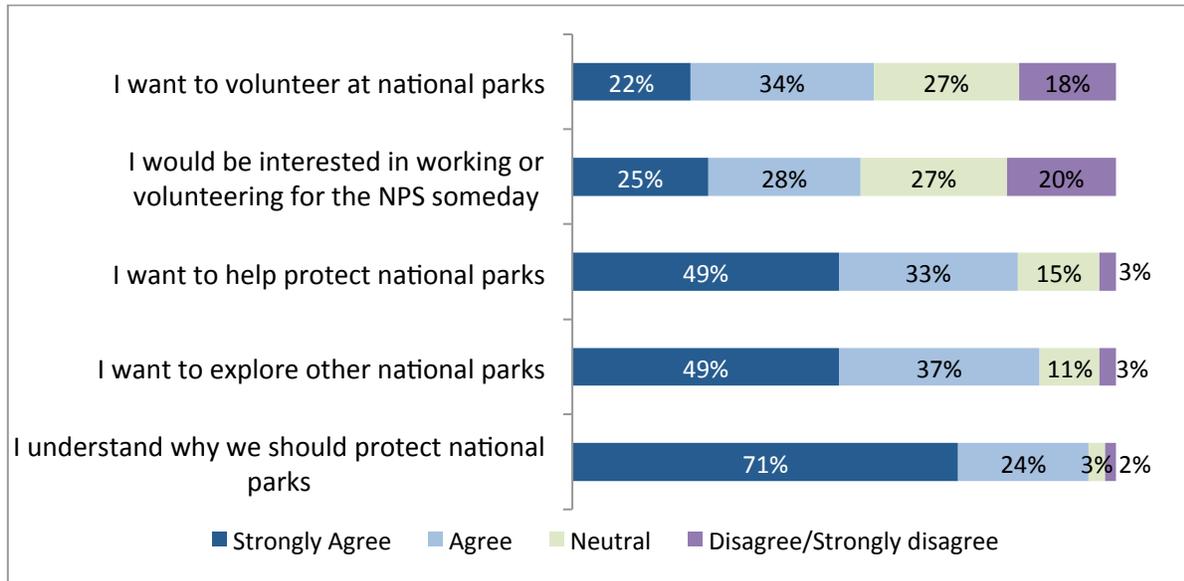
When examined school by school, the Conejos students expressed particularly strong increases in interest in national parks, natural science/ecology, and outdoor recreation compared to their peers in the other two schools (Figure 16). However, since Conejos students did not complete the pre-survey, it is difficult to know if they entered the program with lower interest and, thus, had more room to increase than was true of the other students.

**Figure 16: Post-SHRUB increase in student interest by school (% Strongly Agree)**



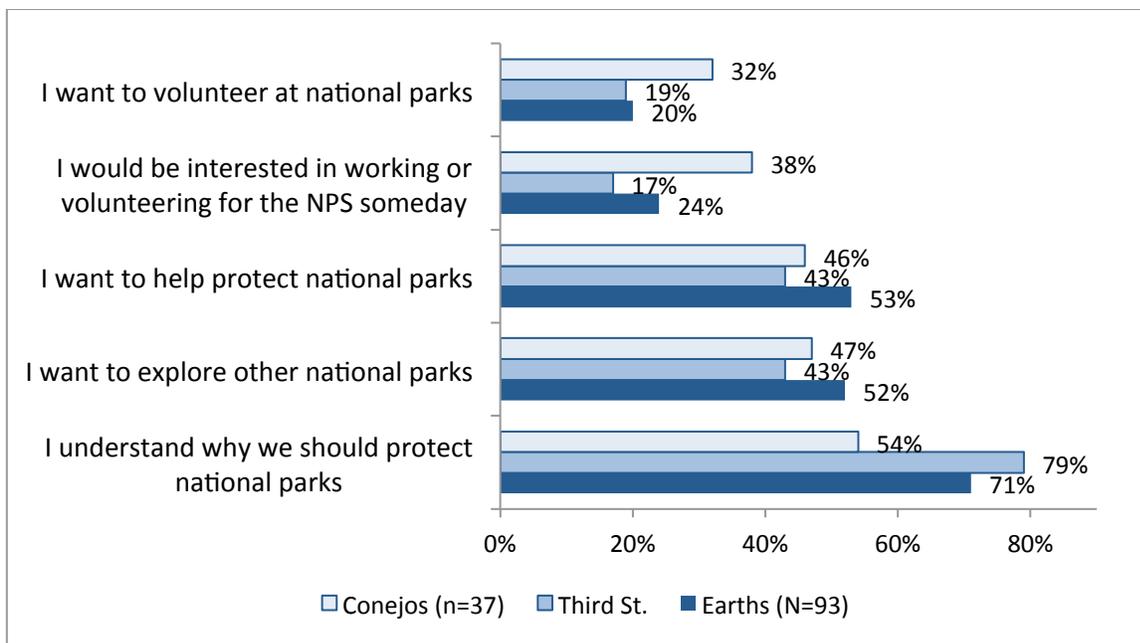
*Stewardship.* Another goal of the SHRUB program is to encourage students’ feelings of stewardship for the national parks. Figure 17 shows how students responded at post-program to several questions about these topics. Nearly all the students (95%) agreed that they understand why national parks should be protected, 86% want to explore other national parks, and 82% agreed that they want to help protect national parks. However, only slightly more than half indicate an interest in becoming a NPS volunteer (56%) or working for the park service (53%). This is consistent with pre-program survey results where 53% indicated an interest in working for NPS and 61% said they would be interested in volunteering at “a place like SAMO” (Figure 7).

**Figure 17: Post-SHRUB student stewardship for/interest in NPS overall (N=183)**



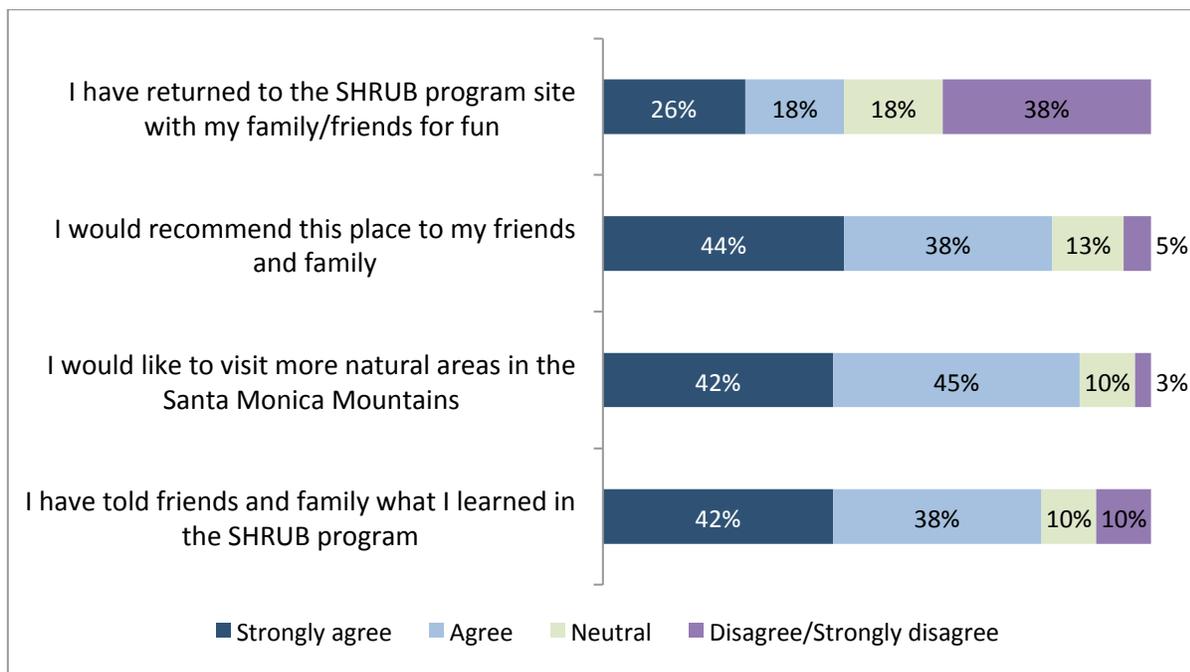
In terms of how this varies by school, Conejos students are somewhat more likely than those in the other two schools to indicate strong interest in volunteering or working in the park service and, oddly, a less likely to indicate strong agreement that they understand why it is important to protect the national parks (Figure 18). Conejos students, however, are as interested as students from the other two schools in helping to protect the parks.

**Figure 18: Post-SHRUB student stewardship for/interest in NPS by school (% "Strongly agree")**



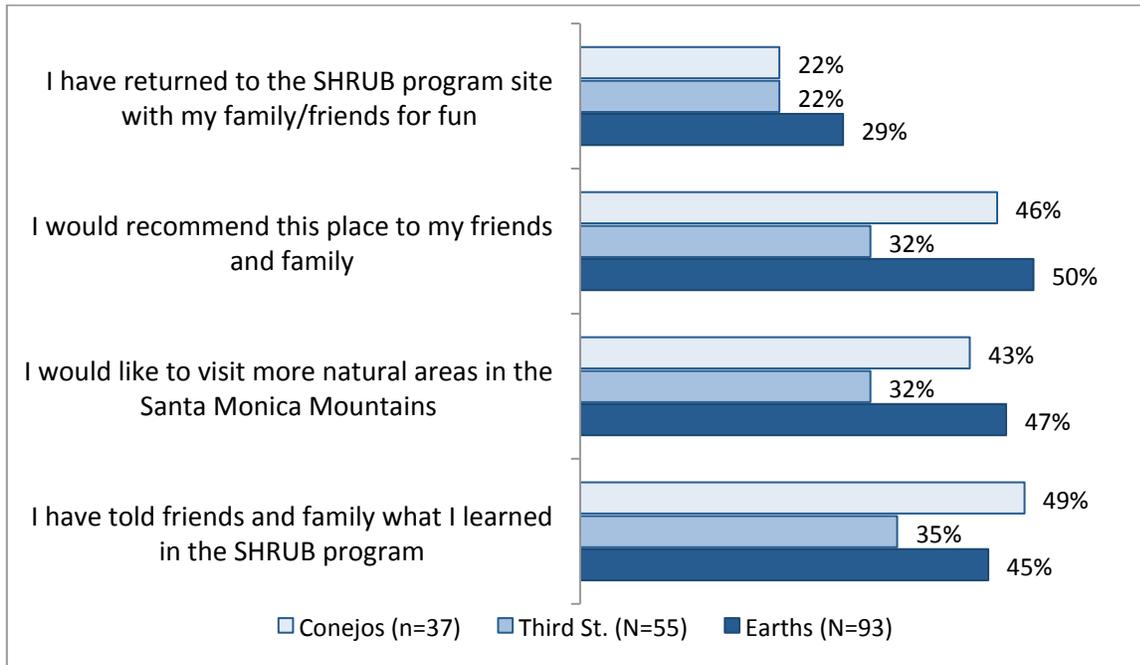
*Spreading the word.* Another aspect of stewardship is to act as advocates and “spread the word” about the value of the park (SAMO) and their habitat restoration activities. Students were asked several questions related to this concept. While only 44% of the students report having visited their SAMO field trip locations with their families, 82% say they would recommend SAMO to their friends and family and 80% report having told friends and family about what they learned in the SHRUB program (Figure 19). Most (80%) of the students taking the pre-survey indicated they would like to “visit all the parks in the Santa Monica Mountains” (Figure 7); on the post-program survey 87% said they would like to visit “more natural areas in the Santa Monica Mountains” (Figure 19).

**Figure 19: Post-SHRUB student advocacy for SAMO overall (N=183)**



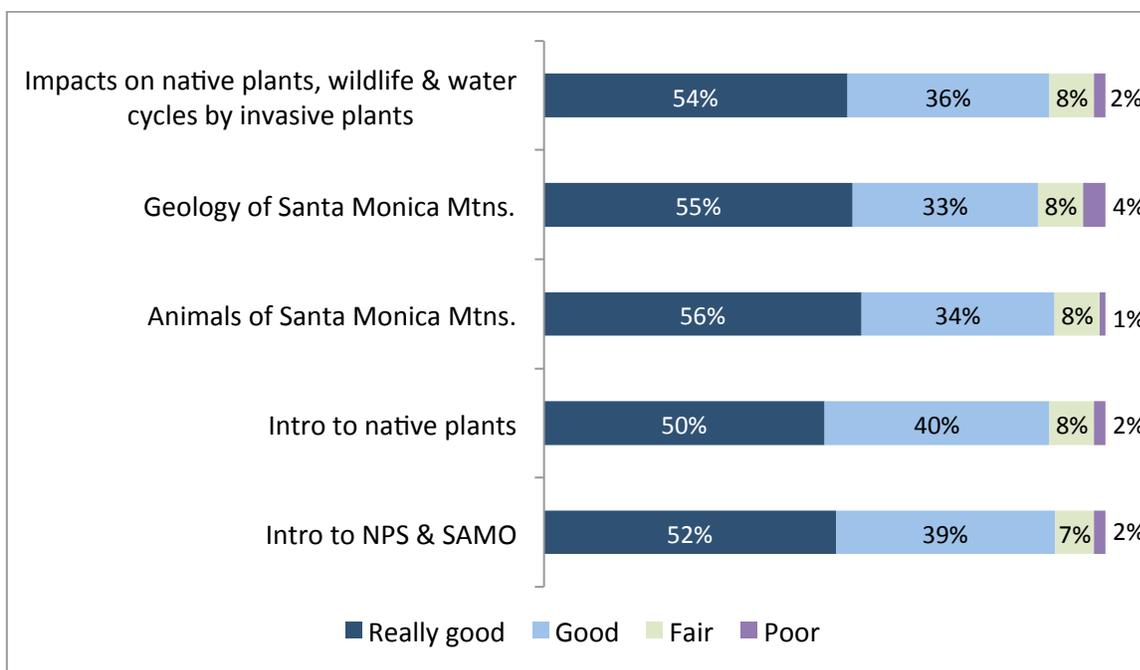
Responses to these items on the post-program survey varied some among the school sites. As Figure 20 indicates, students at Third St. had fewer “strongly agree” ratings in each of the items (with the exception of having returned to the program site). Whether this reflects less enthusiasm for the SHRUB program or SAMO among this group of students is difficult to confidently assess. It is possible that these differences in response patterns are related to some other local or cultural factor.

**Figure 20: Post-SHRUB student advocacy for SAMO by school (% "Strongly agree")**



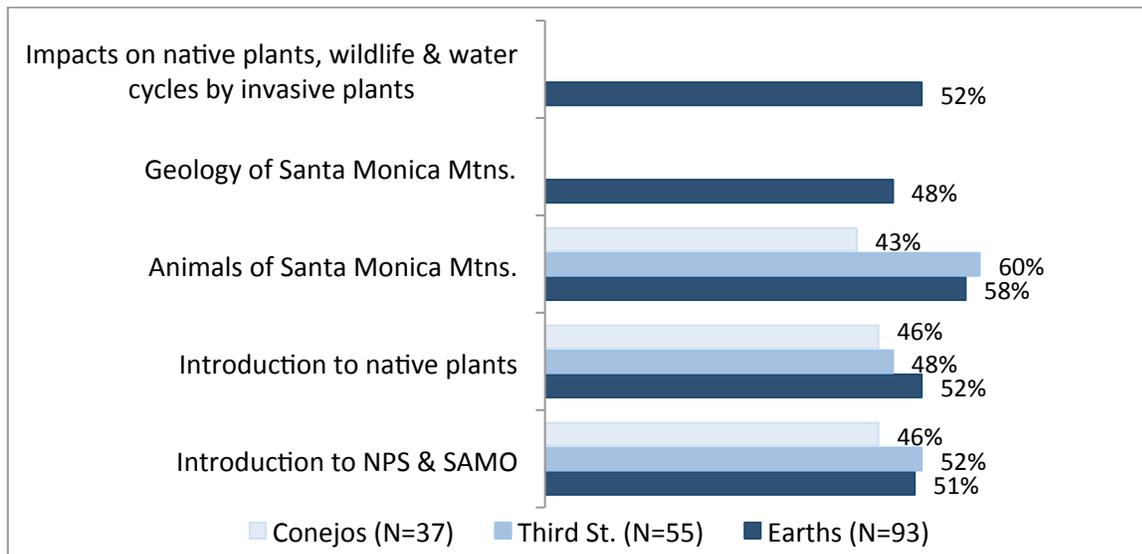
*Response to program components.* Finally, students were asked to “rate” various components of the SHRUB program. When asked about their opinions of the ranger programs, most (88-90%) rated each ranger presentation as “good” or “really good” (Figure 21). The programs on geology and invasive plants were only presented to the Earths students.

**Figure 21: Student response to ranger programs overall (N varies by item)**



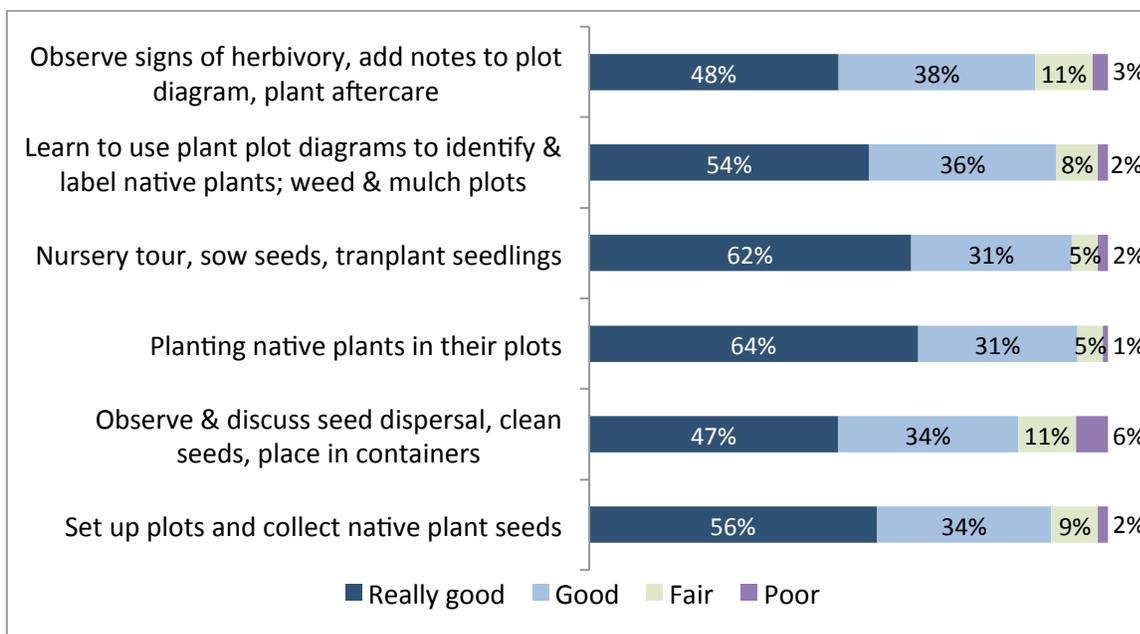
When examined school by school (Figure 22), there is little variation among the schools, with the exception of the “Animals of Santa Monica Mountains” presentations which was less popular among the Conejos students than the students at the other two schools.

**Figure 22: Student response to ranger programs by school (% "Really good")**



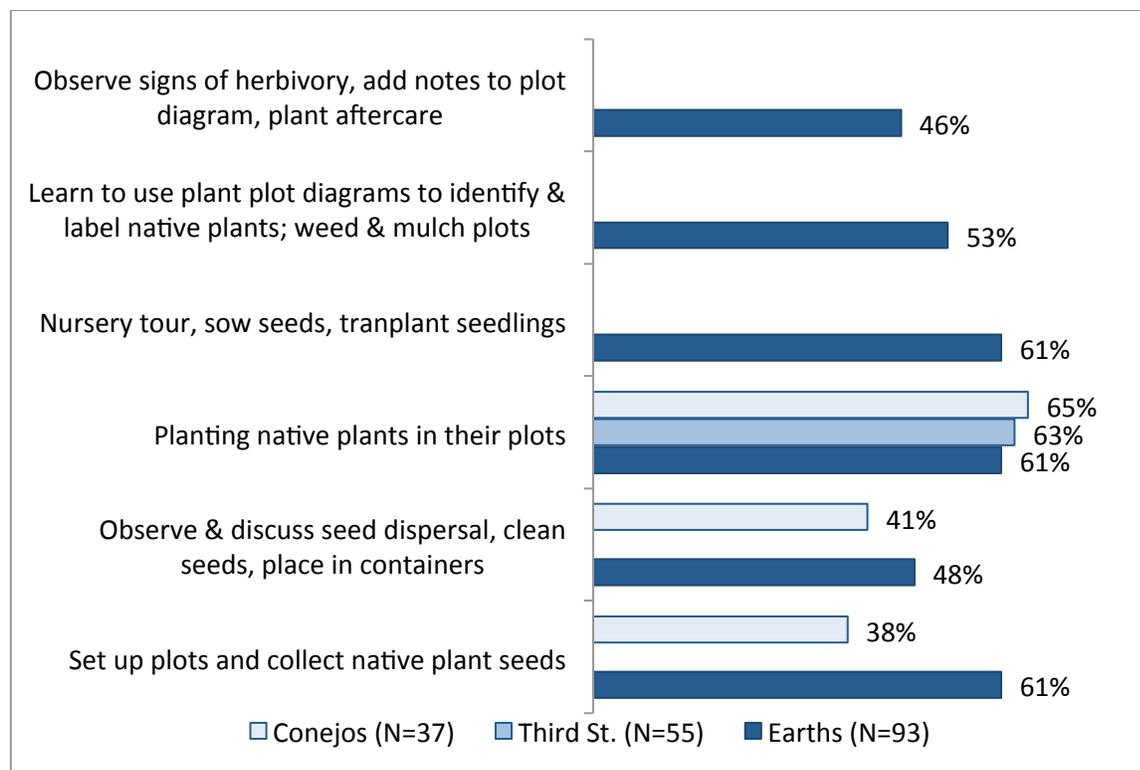
Students were also asked to rate the restoration activities they participated in during their SHRUB field trips. Not all groups engaged in each activity. The most well-liked activities overall were the nursery tour and planting the native plants in their plots (Figure 23).

**Figure 23: Student response to restoration activities overall (N varies by item)**



When examined by school, there is some variation (Figure 24). Earths is the only school that engaged in all of these activities. Third Street students only responded regarding one of the activities. Most (61-65%) of the students in each school appear to have enjoyed planting the native plants in their plots. Earths students appear to have enjoyed setting up the plots and cleaning the seeds and placing them in containers slightly more than did the Conejos students.

**Figure 24: Student response to restoration activities by school (% "Really good")**



*Student open-ended comments.* The last four questions in the survey were open-ended, allowing the students to write in their own words: (1) what they liked best, (2) what they liked least, (3) what they would change, and (4) what they most remember from the SHRUB field trips. Only Earths and Third St. students answered these questions; the Conejos students' post-program survey did not include these items. Figures 25-28 summarize the remarks by illustrating the categories within which the individual responses to each question fell. Please note that categorizing open-ended responses is a judgment call – different people might categorize the answers differently; the figures represent a rough approximation of what the students talked about in their comments. The SAMO NPS office has access to the detailed individual answers; some examples are included in this report for illustrative purposes. The following figures show the numbers of comments, not the number of students – long comments might be coded into more than one category (e.g. “I liked the hikes and planting the

*seeds best*” would be counted in both the “hiking” and the “planting” categories) and some students did not answer or had answers that could not be categorized.

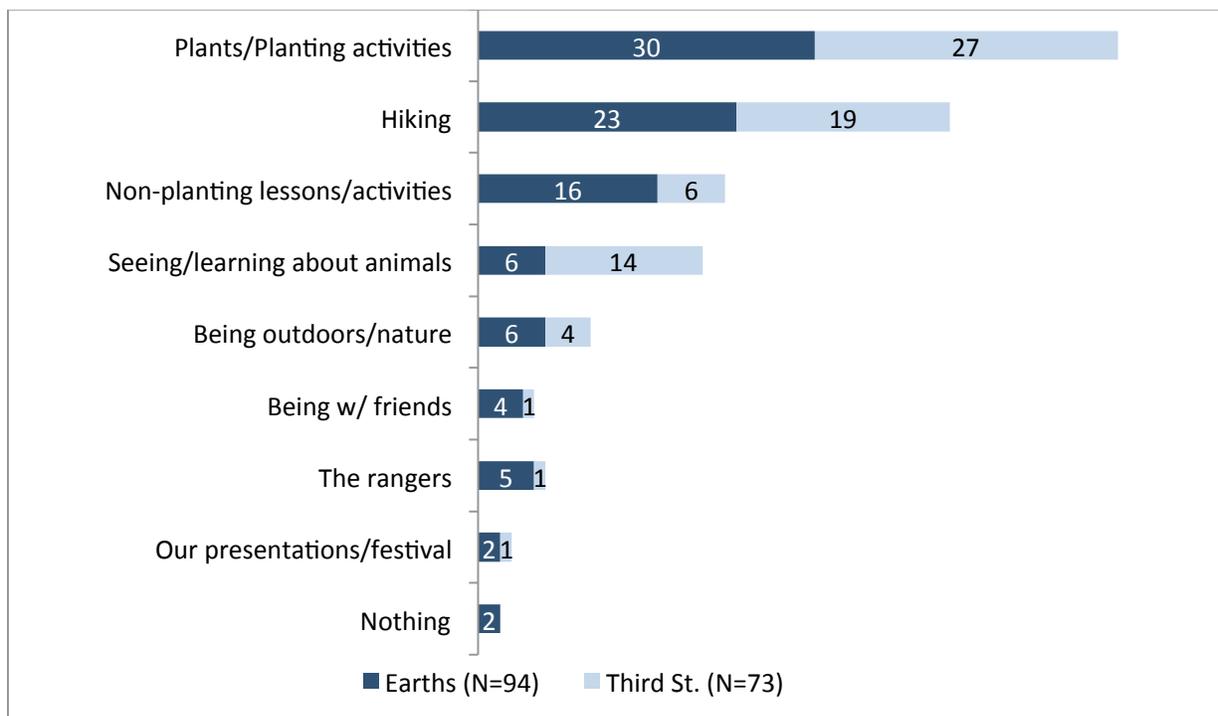
When asked what they liked best about the SHRUB program (Figure 25), the most frequently mentioned category was the planting activities (34% of all comments) – planting, making the plots, caring for the plants, etc. This was true at both schools (32% of Earths comments and 37% of the Third St. student responses). For example:

*“I enjoyed most making the plots”*

*“I like that we got to learn a lot about invasive plants”*

*“I liked planting the plants and watering them”*

**Figure 25: What students liked best (Number of comments)**



The next most frequently mentioned were the hikes (25% of all comments). About a quarter of the responses from each school (24% at Earths and 26% at Third St.) chose something about the hikes, or a specific hike, as their “favorite.” For example:

*“I liked all the hikes we did at the beginning of the day. They were really thrilling.”*

*“I liked the hiking because it was calming and I got to be in nature and learn about it.”*

*“It was fun to hike and be outside and smell the fresh air.”*

*“The hike around Satwiwa to see how it has recovered from the fire last year”*

Next most frequently mentioned were specific lessons or activities (not related to the planting activities) – 13% of all the comments overall, 17% among Earths students and 8% among Third St. students. These varied widely, for example:

*“I liked the animal skulls and geology”*

*“I learned a lot about the biome that we live in, it is a rare biome.”*

*“Learning about trilobites”*

*“I liked learning about our national parks”*

*“We got to learn about the Indians.”*

A number of students’ comments (20 comments, 12% overall) mentioned seeing or learning about animals as what they liked best (6% of Earths and 19% of Third St. student comments). According to the comments, it appeared that the Third St. students engaged in a field project focused on counting lizards. For example, some Third St. students said:

*“I loved spotting reptiles and we saw a dung beetle”*

*“I liked learning about the lizards.”*

But there were also more general comments about animals from both student groups, such as:

*“ We got to explore the wild life of animals”*

*“Seeing the many evidences that animals were there (footprints, fur, feces)”*

Various other topics were also brought up by the students as the “best” features: being outdoors or in nature (6% overall), having fun with friends (3%), the rangers (4%), and students’ own presentations (2%). For example:

*“ The rangers who work there are great at giving presentations and are so nice to us”*

*“I think the best was to work as a team”*

*“When we did the SHRUB presentation because we got to tell the 4<sup>th</sup> graders what we knew and we got them ready for 5<sup>th</sup> grade.”*

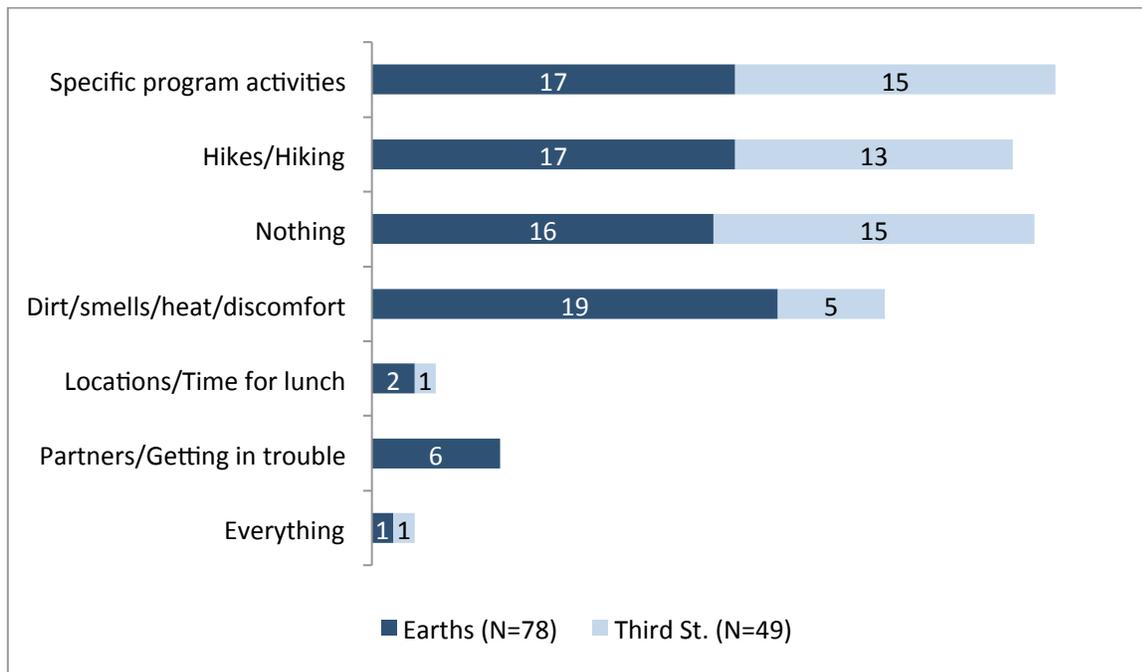
*“Going on adventurous fieldtrips and learning about nature”*

*“We got to go out and have fun in the Santa Monica Mountains”*

*“I liked learning about our national parks and spending time outside”*

When asked to identify what they liked least, the top three categories were (a) specific program activities (25% overall, 22% of Earths student comments and 31% of Third St.), (b) hikes/hiking (24% overall, 22% of Earths, 27% of Third St. comments), and (c) “nothing” (24% overall, 21% of Earths and 31% of Third St. comments). Figure 26 displays the breakdown.

**Figure 26: What students liked least (N of comments)**



Comments about specific program activities that they disliked ranged from the general;

*“I didn’t like how sometimes it was the same thing over and over again”*

*“I didn’t like sitting around just listening”*

*“Lessons”*

to the specific:

*“The GLX”*

*“The posters”*

*“Looking for the lizards”*

While the hikes were the favorite activity in about 25% of the “liked best” comments, they were also the least favorite activity in 25% of the “least liked” comments. For example:

*“I didn’t like the hiking it was too tiring and we barely saw any animals”*

*“I least liked it when we had to walk because it was hot and I was tired”*

*“I also disliked the hikes because I think we should be given more time to observe the nature around us and the rangers just kept it moving”*

*“I did not like how we went on the same hiking trail every time”*

About a quarter of the “least liked” comments were positive - students responded that they did not dislike anything:

*“Nothing, it was all fun”*

*“I liked everything at SAMO”*

Some students complained about the downsides of being in the natural environment – the heat, smells, dirt, etc.:

*“About how little shade there was”*

*“All the flying dirt”*

*“I did not like sitting in the dirt while plotting charts because it was really not and I got my clothes really dirty.”*

*“That there were snakes”*

*“The hikes location because I have a fear of heights”*

*“The smells of the outside”*

*“All the poop bothered me a lot”*

Other comments addressed issues such as having inadequate time for lunch or benches/tables to sit at during lunch, or not being able to choose their own partners (only Earths students mentioned this).

The next question was “What would you change about the SHRUB field trips?” Most comments fell into the “specific activities” category (32% overall), followed by “nothing” (17%), and comments regarding the hikes – 14% mention wanting longer or more hikes and 12% mention desired changes in the hikes (shorter, embedded activities, different destination). Figure 27 shows these categories overall and by school.

The specific activities comments range from the general (“*I would have more activities*”) to very specific such as:

*“I would add games”*

*“Go outside and find animals and follow them”*

*“I would permit students to experience a larger diversity of hands on experiments”*

*“I thought they weren’t teaching well so I would get them to teach better”*

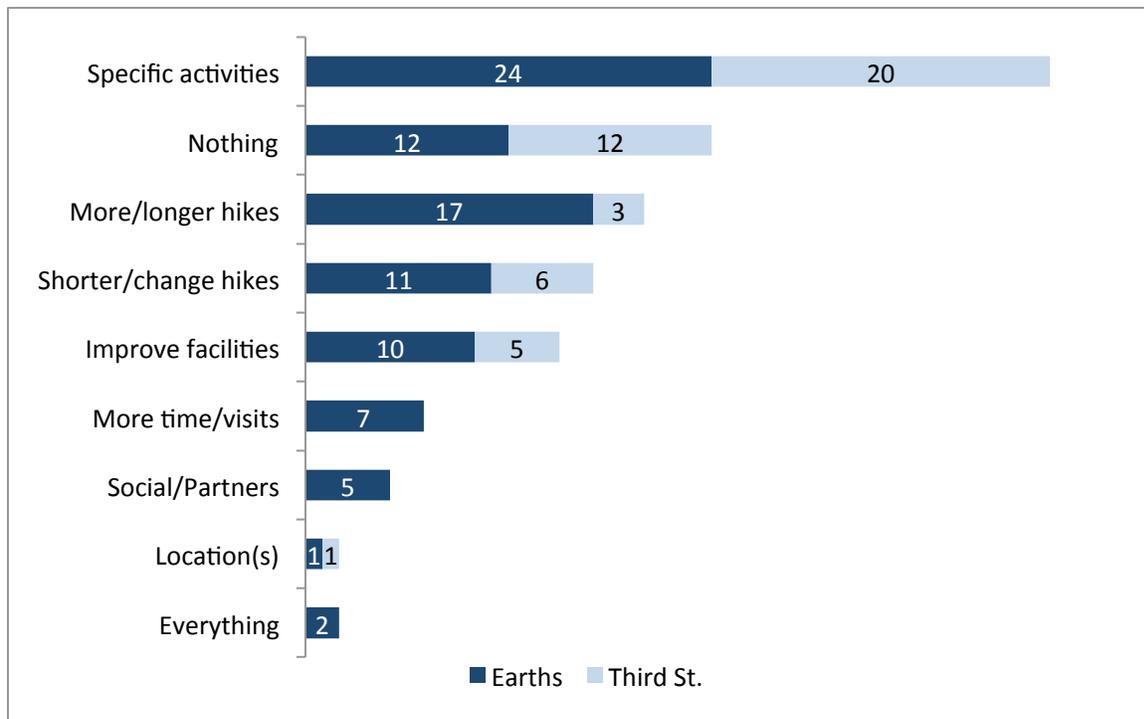
*“I would like to have more animals there”*

*“I would say that we get to feed some of the animals we found”*

*“Boring and long presentation”*

*“I would change the amount of native shrubs we plant”*

**Figure 27: What students would have changed about the field trips (N of comments)**



The “more/longer hikes” category is self-explanatory: this request was most prominent among the Earths students’ comments. However, the shorter/change hikes category included both the simple “*less hiking*” types of comments as well as requests for hikes to specific locations (“*Climb Boney Mountain*”) or modifying the way the hikes were conducted (e.g. “*I would change the hikes because I think we should do them more fun and like sing songs or something*”).

The “improving facilities” comments included several comments from Earths students about “*better fencing*” related to an incident when a parent fell off a fence during one of the field trips. Other comments included:

*“A lot more benches so you can sit and relax”*

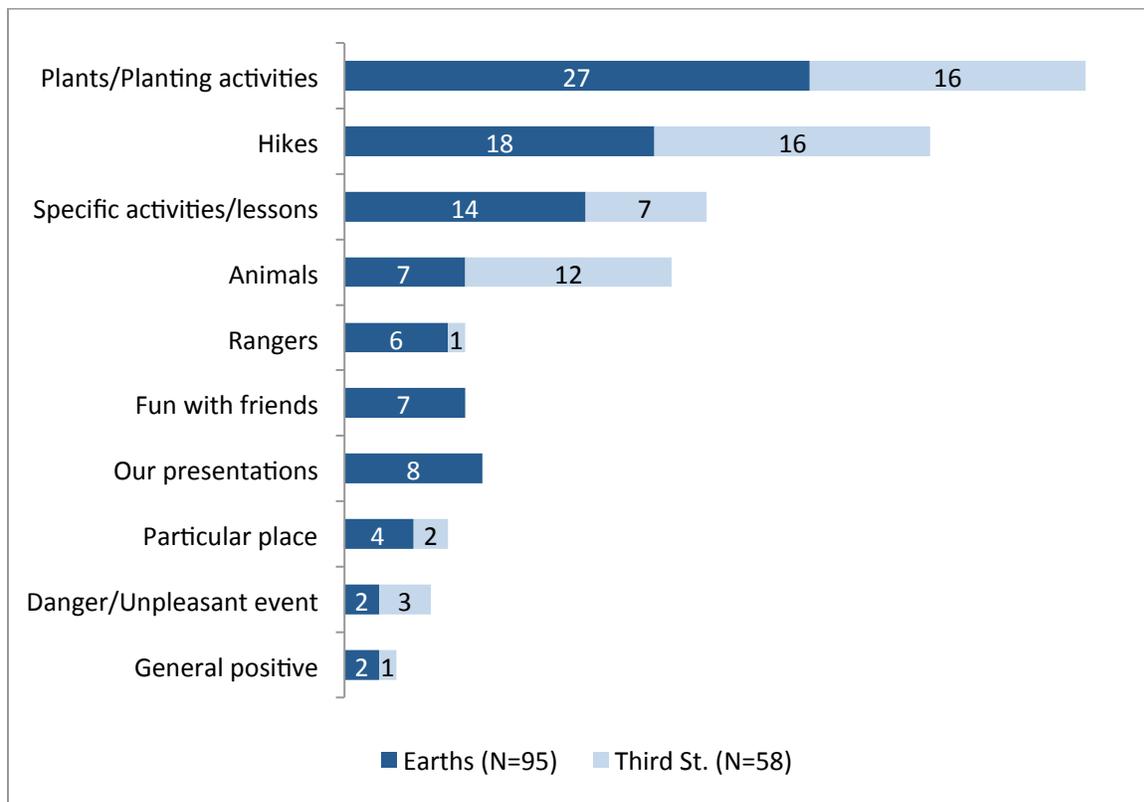
*“I think we should eat inside because bugs and leaves get in our food”*

*“Have mist bottles for everyone”*

The “more time/visits” comments are related to wanting either more time onsite per visit or more visits to the sites. These comments came from Earths students as well as the ones about social aspects of the fieldtrips – wanting to choose their own activity partners and “*we should be able to wear whatever we want.*”

The final open-ended question was “What do you remember about your SHRUB field trips?” As Figure 28 illustrates, the planning activities (28% of the comments overall) and hikes (22%) were the most commonly mentioned memorable moments, followed by specific activities or lessons (14% overall) and animals (12%).

**Figure 28: Students’ most memorable experience (N of comments)**



Because the planting/habitat restoration activities were a central focus of the SHRUB program, it is not surprising that it was mentioned so frequently as a memorable experience (mentioned in 28% of the comments from each school). Examples of comments about planting include:

*“I mostly remember when we planted plants because I had a lot of fun that time”*

*“Planting the plants and taking care of them like a real garden”*

*“The plots were so much fun”*

Many students also mentioned the hikes as being memorable (19% of Earths comments and 28% of those from Third St.). For example:

*“Going on the hike to Solstice Canyon”*

*“I remember the hiking we took and how hard it was to go up a steep hill”*

*“Hiking with my friends”*

The comments about specific activities varied (15% of Earths comments and 12% of Third St. comments). Some examples are:

*“I remember about the migration bank and all that stuff”*

*“I remember most the GLX program”*

*“The leaf rubbing”*

*“Being in nature, learning about geology, biology, and many other things”*

*“I remember the skull identification thing”*

Animal sightings and activities were also quite memorable, 7% of the comments from Earths students mentioned animals and 21% of the Third St. comments did.

*“Finding a lot of animals such as lizards”*

*“I remember seeing a snake”*

*“I remember the Red-tailed hawk on our first field trip to SAMO”*

About 5% of the comments specifically mentioned the rangers, such as:

*“All of the awesome and great rangers that let our brains know that the national parks are just as important as our friends and family”*

*“I remember our ranger lessons the most”*

*“I remember one ranger who was always funny and taught us very well”*

Earths students mentioned the fun they had with their friends (7% of all Earths comments) and the presentations they did for the fourth grade class (8% of Earths comments). For example:

*“I mostly remember spending great times with my friends”*

*“I remember our SHRUBs partners; I liked that we had to do team work”*

*“Presenting native plants to other students”*

*“The presentations we did”*

Some students mentioned a particular place (“*Boney Mountain*”) or just being at the site (“*What I remember about SHRUBS is that the whole park was beautiful*”). Others remarked on something that frightened or bothered them as being most memorable (“*Falling because I was hiking,*” “*My mom falling and cutting her head open,*” “*Kicking a giant pile of poop*”). Finally, a few students just made general positive remarks such as “*Awesomeness*” or “*Everything.*”

## **Summary**

In summary, both teachers and students appear to have enjoyed mostly positive experiences in the SHRUB program. Teachers uniformly felt the program was an educationally enriching experience for their students. They reported that the field trips also helped their students gain appreciation for the environment, habitat protection and restoration, and national parks overall.

Students, although diverse in terms of ethnicity and home language, appeared to have fairly high levels of incoming (prior to program participation) interest and experience in natural areas, in general, across the schools; although they do vary somewhat in the extent to which they are familiar with SAMO prior to their field trips. In the post-program survey nearly all the students reported enjoying the SHRUB field trips and their interactions with the rangers. Even though many students were interested in and had been studying habitats prior to the field trips, most reported having learned more about native plants and ecosystems through participating in the SHRUB program. The variations in survey responses among the schools on these items may reflect some variation in content of the field experiences and/or classroom lessons.

In spite of strong levels of interest in natural areas and science prior to program participation, about two-thirds of the students indicated increased interest on the post-program survey. Interestingly, although the Conejos students tended to indicate slightly lower levels of content learning compared to those in the other two schools, they reported the highest levels of increased interest in parks, natural science, and ecology of the three schools. While students mostly (80% or more) reported interest in and support for national parks, overall, they were somewhat less likely to say they wanted to actually work or volunteer in the parks

(around half of all students). This varied a little among the schools, with the Conejos students more likely to report interest in volunteering or working for NPS than was true in the other two schools.

While only about a quarter of the students reported returning to their SHRUB field trip sites with their family or friends (possibly a function of travel distance for some students), most (80% or more) indicated interest in SAMO and reported having talked about what they learned in the SHRUB program with their friends and family. This varied a bit among the schools with the Third St. students being slightly less enthusiastic than was true for the other two schools.

In terms of student response to specific program activities, most (around 90%) report liking the individual ranger programs and restoration activities. Students were especially enthusiastic about the hands-on activities such as sowing seeds, transplanting seedlings, and planting in their plots. This was also reflected in the students' open-ended responses where the planting activities were often the most often mentioned as what they liked "best" and what they "remembered most."

Next most commonly mentioned in open-ended remarks were the hiking experiences, both positive ("best") and negative ("liked least"). While many students were enthusiastic about the hikes and wanted more or longer hikes, others objected to the physical challenges or lack of variety in the hikes. Similarly, while many students mentioned enjoying the opportunity to be outdoors, some complained about the heat, smells, or dirt inherent in being in a natural setting. Seeing animals and learning about animals was often mentioned as a positive part of the program, although some student remarks seem to reflect a bit of misunderstanding about the realities of managing natural areas – some asked to have more animals available or to feed the animals – and others objected to some of the specific animals in the park (e.g. snakes) or the byproducts of animals (e.g. animal droppings).

Taken as a whole, the survey responses, including the open-ended comments, suggest that the vast majority of students enjoyed their experiences in the SHRUB program and had a positive learning experience, overall. Most indicated considerable enthusiasm for the program and a continued lively interest in natural habitats and the parks.

### *Survey Revision Recommendations*

During the course of analyzing survey results several possible areas of improvement of the surveys or survey administration were identified. A number of the recommendations below have already been shared with and implemented by the SAMO staff. Some of the below recommendations cannot be implemented prior to the OMB third year review (e.g. adding new items) but others can be done this year without violating the existing approval documents.

### *Teacher survey recommendations*

- Rather than having a different survey instrument for each school, a single survey could be implemented with a checkbox for the teacher to indicate their school location.
- Because the number of teachers is small, we recommend that SAMO staff monitor teacher survey returns and contact non-responding teachers directly to encourage their participation.
- We recommend issuing both the teacher and student post-surveys as soon as possible after the end of the program. The end of the school year is a very busy time and teachers are unlikely to respond after the year ends.
- Consider rewording the following items:
  - “Students participate in the community on projects that help preserve the cultural or natural integrity of an area” to “I encourage my students to participate in projects, beyond the SHRUB program, that help preserve....” It is possible that teachers do have personal knowledge of other projects their students are involved in.
  - Break the single item “The SHRUB program reinforces what is taught in the classroom and covered education materials in a fun way” into two separate items: “The SHRUB program reinforces what is taught in the classroom” and “The SHRUB program covers educational information in a fun way.” This avoids any ambiguity if a teacher thinks, for example, that the program is fun but does not reinforce their classroom instruction adequately.

### *Student survey recommendations*

- Ask the teachers to implement the student pre-survey before the first ranger visit to their classroom.
- Encourage all participating schools to issue both pre and post surveys.
- Consider having a single student post-survey with check boxes for student school and “did not do this” check boxes for the program components that are not consistent across the schools.
  - The benefits of a single survey with “school” being a closed choice (check box), rather than a write-in box is to (a) increase the ease of analyzing the data both overall and by school and (b) avoid inadvertently having items that are missing or that do not match across post-surveys customized to each school.
  - The drawbacks of a single student post-survey are (a) the possibility that students will accidentally check the wrong school (which might be caught by matching teacher name and school) or (b) not answer this question (although it can be designed as a required item in the survey software), and (c) not being

able to customize to match the actual program activities which may vary across schools.

- Consider providing check boxes for students to indicate their home language, with a text box for “other,” to avoid having to manually tally the written responses.
- Discuss with teachers the extent to which they feel their students are clear about which parks are NPS areas and which are not - typically the general public is often confused about which government agency administers various parks and natural areas. This is relevant to the “SHRUB field trip is my first visit to a national park” in the pre-survey.
- Consider rewording the item “I have always been interested in nature and ecology” to “I am interested in nature and ecology” to avoid the possibility of some students overthinking this question in terms of what “always been interested” might mean.
- Consider adding an item about scientific inquiry – it appears that the SHRUB program engages students in some inquiry projects such as counting lizards, it might be useful to add an item pre and post such as “I understand how scientists conduct research in the natural environment.”
- Consider adding an item about citizen science – for example, “I would be interested in helping collect scientific information in natural areas in the future.”
- Reword key survey items across both surveys to match wording exactly so they can be more easily compared pre to post. For example:
  - Pre-survey items tend to reference “natural areas” while post-survey items tend to reference National Parks. If measuring growth in stewardship tendencies is desirable, it would be beneficial to be consistent pre to post in item wording.
  - Match the wording pre and post around students’ interest in volunteering and working for NPS or in similar settings.
  - The items about student learning regarding habitat restoration activities and their interest in natural science and outdoor recreation do not have to match exactly – there is value in asking at pre if they know or have learned about something in school or are interested in certain topics and then at post if they feel they learned more than they had known previously about these topics or increased their interest – but the specific knowledge or topics addressed should match pre and post. For example, the current pre-survey item about biomes reads “I have learned about restoring a biome” while the post-survey item says “I know what a biome is.” Using the “I know what a biome is” wording pre and post would be preferable.
- Consider reducing the number of open-ended items to reduce the time required to analyze the individual responses and the time required for the students to complete the survey.

- Students tended to repeat what they “liked best” in the item asking about their most memorable experience and to repeat what the “liked least” in the requested program changes.
- Alternatively, the “what I would change” and “what I most remember” items could be replaced by more targeted open-ended items about what they found most surprising about natural processes or what they learned in the field trips that best helped them understand what they learned about in school or some other sort of targeted question about the learning experience.
- SAMO could consider having a set of several open-ended questions approved by OMB and then cycle through some of those specific questions, using different ones each year.