

Youth Intern Program Natural Resource and Climate Change Saguaro National Park



The YIP Crew at historic Manning Cabin in the Rincon Mountain District of Saguaro National Park, July 2010

Final Report
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Summary

Saguaro National Park hosted a Youth Intern Program (YIP) crew from late May through October, 2010. We sought a diverse group of student talent through advertising our positions to a wide variety of audiences. To maximize training and mentoring opportunities, we created a mixed-age student (STEP) crew that included two recent high-school graduates, four undergraduates ranging from freshmen to seniors, and two graduate students.

The YIP program focused on field work related to natural resource monitoring and climate change, with a strong training and mentoring component. Field work included monitoring of saguaros and buffelgrass, an exotic plant that threatens the saguaro and appears to be increasing with warming winter temperatures. We also measured sediment levels in stream pools that are important wildlife habitat, and worked on many other projects such as wildlife and plant monitoring, relocating historic photo points, and weed removal.

Training and mentorship were major aspects of this program. The interns received intensive training and education in the mission and organization of the NPS, in resource management skills such as GIS and GPS, and in interpretive techniques, leadership skills, climate change, hiking and camping, and cultural resources. We focused on safety training including CPR/First Aid, Wilderness First Aid, emergency communications, and specific hazards. Each intern worked on a project under a mentor that was customized to meet their career interests, skills, and the park's needs. The intern's individual projects included focused work in environmental compliance, GIS, data management, mule packing, wildlife monitoring, and other areas. All of the crew gained a huge amount of experience in leadership and working as part of a team.

Seven of the eight students continued to work part-time for the Park Service following the summer field season and have expressed a strong desire to continue working. The YIP program has been a great success for Saguaro National Park in that it has brought new energy and diversity to our park and allowed us to accomplish a large amount of important work that we would not otherwise have been able to do. We are very grateful for this opportunity.



Mapping buffelgrass in the Rincon Mountains.

Introduction

Saguaro National Park received a Youth Intern Program grant in spring, 2010. The purpose of this program was to expand the park's existing student internship program in natural resource management with a specific focus on diversity and global climate change. Saguaro has been actively engaging with our local community in Tucson in recent years by increasing our outreach and education and hiring a more diverse staff. Student (STEP) employees, mostly from the University of Arizona, make important contributions to natural resource management activities while learning skills in fire-fighting, mapping, plant and wildlife monitoring, volunteer coordination, ecological restoration, and environmental education.

Saguaro National Park is often cited as an example of a park where global climate change may already be having an impact on the park's natural resources, which include the saguaro cactus, Sonoran Desert plants and animals, and unique high-elevation "Sky Island" species. Buffelgrass, an invasive African grass that threatens saguaros through competition and fire, is believed to be expanding in part due to steadily warming winters. The goals of our YIP program were to build a team of students who could accomplish important work in climate change monitoring, while learning new skills that serve them well as future leaders in the National Park Service.

Specific objectives of Saguaro's 2010 YIP program were to:

1. Recruit and hire a diverse group of student employees during the summer of 2010, including high school, undergraduate, and graduate students;
2. Provide intensive training in safety topics, natural resource management, NPS history, and interpretation;
3. Provide mentoring for each student by park staff who would help them develop a project that would improve their skills and serve the park's need;
4. Provide field work in natural resource management projects related to global climate change that will greatly benefit the park and provide skills for the students; and
5. Provide opportunities for future skill development and employment in the National Park Service through the opportunity to work part-time during the 2010-2011 academic year and beyond.

Program results

We had a great summer crew and were able to accomplish many of the goals we set out to achieve. In addition, seven of the eight crew members were able to continue part-time work into the school year and have continued to be employed by NPS. Specific accomplishments were as follows:

Recruitment and crew composition

In March and April 2010 we recruited students from underserved and underrepresented audiences through a variety of targeted recruitment efforts with the support of the park's EEO Committee. We used student group web sites and job fairs associated with University of Arizona, Pima College, and local area high schools, including: UA Chicano/Hispano Student Affairs office, UA American Indian Science and Engineering Society, UA African American Student Affairs, Sunnyside High School, Tucson Hispanic Chamber of Commerce, and a wide range of other groups.

Our goal for this program was to achieve >50% underrepresented and lower socio-economic audiences. We received approximately 40 applications and hired the most qualified candidates, four young women and four men, including five students with Hispanic backgrounds, two white, and one with an Asian/Pacific Island background. Our 11-person crew consisted of two recent high school graduates, four undergraduates (one freshman, one junior, and two seniors), and two graduate students, as well as a park supervisor, a teacher-ranger-teacher, and a teacher working at the park under the National Park Foundation's Park Stewards program.

Training

We provided a week-long orientation at the start of the season that included the following topics:

1. Plant identification and other natural resources management skills
2. History and organization of the NPS
3. Interpretive skills
4. Climate change and science in the national parks
5. GPS and GIS
6. Wilderness and fire management
7. Ethics and other policies
8. Park visitors and visitor protection



June training in riparian survey techniques, Rincon Mountains.

Our major training focus was safety, and included the following specific topics:

1. CPR/AED and First Aid
2. Emergency communications
3. Heat-related illness
4. Dangerous wildlife and plants
5. Other specific safety topics.



Morning safety circle, Tucson Mountains

Both formal and informal trainings continued throughout the season and into the fall, including Wilderness First Aid (2 days), cultural resources (the Saguaro fruit harvest), desert tortoise biology, plant identification, and many other topics. Typically, we had a meeting every Wednesday afternoon that included a safety topic, safety debriefing, and one other training topic. We held daily safety circles and ad hoc safety briefing and debriefings.

Mentoring

Each student met at least monthly with the crew supervisor. In the first meeting we outlined the intern's interests and career and summer goals, and in subsequent meetings we reviewed progress towards these goals. The students all developed projects with an NPS mentor that were of interest to them and helped support the park (Table 1).



Learning desert tortoise monitoring techniques with researcher Erin Zylstra.

Table 1. Intern projects, mentors, and outcomes

Project/s	Mentor	Outcome
Assist with environmental compliance and report writing projects	Park's compliance lead (N. Kline)	Produced one grant and a series of reports on science in park for lay readers
Develop systems for managing historic repeat photos and wildlife photo data	Crew leader with database management experience (A. Springer)	Created systems and populated with existing data and photos
Wildlife monitoring, and develop park policy on handling venomous reptiles	Park's wildlife biologists (N. Kline and D. Swann)	Conducted surveys of leopard frogs, managed wildlife cameras, and completed reptile policy
Assist with park mule packing program	Trail crew staff and packer	Assisted packer in packing gear, transporting it, and loading mules
Analyze rainfall data from 3 meteorological stations	Crew supervisor (D. Swann)	Produced report on rainfall during last 10 years throughout park
Develop method for mapping saguaro distribution using remote imagery	Park's GIS specialist (B. MacEwen)	Developed and tested techniques for identifying saguaros and worked on habitat model
Developed maps for monitoring saguaros and buffelgrass	Crew leader (A. Springer) and other staff with GIS skills	Produced maps
Crew leadership	Crew supervisor (D. Swann)	Learned extensive crew management skills



Feeding the mules.

Summer work

The crew spent approximately 75% of their time in the field working under intense heat and demanding field conditions. There were three major types of work, plus a number of other projects:

Saguaro monitoring and mapping. The crew helped complete the 2010 Saguaro Census, a large Citizen Science project that is conducted every 10 years in Saguaro National Park. They measured and counted literally thousands of saguaros on previously established census plots and on new plots developed to map the distribution of saguaros in the park.



Measuring large and small saguaros.

Buffelgrass mapping. The crew tested, refined, and implemented a program to map buffelgrass at a fine scale. They surveyed along 1 kilometer transects 20 meters apart, using GPS units to follow transects and map any patches of buffelgrass encountered. They removed the small patches and mapped the perimeters of larger ones in a very steep area of the park (the project will continue using volunteers in flatter areas during the winter).



Repeating 1937 photo near Manning Camp.

Pool sediment monitoring. The crew used survey equipment to estimate the volume of sediment in more than 30 rock pools in the park. These pools represent important aquatic wildlife habitat that is rare in the desert. The pools are sometimes degraded by large wildfires, which fill them with sediment and reduce or eliminate them as water sources, and we are monitoring them throughout the entire Rincon Mountain District (approximately 100 square miles) to understand long-term dynamics. The crew completed the round of surveys, analyzed the data, and completed a draft report on the project.



Surveying sediment volume in a pool, Chimenea Creek.

Other resource management projects. In addition, the crew worked on a wide range of resource management projects that increased their skills and benefitted the park. These included:

1. Vegetation mapping using total station survey equipment
2. Surveys for lowland leopard frogs
3. Mapping saguaros on historic (from 1941 and 1975) research plots
4. Monitoring of mammals using wildlife cameras
5. Identification and removal of exotic plants
6. Relocating and repeating historic photos for analysis of vegetation change
7. Assisting with the park's Climate Change Symposium
8. Assisting with the park's Native American Cultural Festival

In addition, students had opportunities to work informally with other park work units on projects such as helicopter mapping, mule packing, fire effects monitoring, vehicle maintenance and inspection, and other projects.

Project evaluation

In addition to weekly meetings, we assessed each student's work and the program at regular intervals throughout the season. At the end of the summer we held a close-out meeting. Each student filled out a detailed evaluation of the program and met with the supervisor.

In their evaluations (Appendix A) the students were very enthusiastic about their summer at the park and the YIP program. Below are excerpts from the evaluations for each student.

Intern 1: “This internship exceeded my expectations! I actually thought we were going to jump into fieldwork almost right away this summer. I was pleasantly surprised when I discovered we would receive hours and hours of pertinent training and preparation. I have always wanted to work for a federal agency, and I am excited because this job helped me realize I absolutely want to be a federal employee. I am also excited that funding will probably be extended, and that I can continue learning and exploring with the Park Service....”

Intern 2: “This job went beyond my expectations. I feel I learned qualities in this job that will definitely help me in my career later on and as a person. I got to walk the areas where the prescribed burns happened near Manning Camp with Shannon... We took samples from trees in and out of the burnt area to be examined. With this summer job I was able to learn how to work the total station and that skill will definitely help me in my career and I am glad to have learned it early on. Also, I got a chance to work with ArcMap another tool that I will definitely use in the future...”



Fixing the Manning Camp sign!

Intern 3: “This summer has proven more useful to my future career than any other time. I hope to one day be employed with either the Forest Service, US Fish and Wildlife, National Park, or BLM. I have gained skills this summer that I never thought I would. For example, my GIS and GPS skills were almost nonexistent; I took an introductory course on GIS but never thought I would apply it in the field... Not only has this summer given me new skills that will better qualify me for my future career, but it has also enhanced certain skills I had already obtained through college courses. This summer I have measured Saguaro, completed spatial mapping of invasive grass species, measured sedimentation, and experienced frog surveys, and did tortoise tracking. All of these skills might possibly use in future careers...”

Intern 4: “I definitely did not expect to be working with stock this summer. Furthermore, I didn’t expect to be backpacking a week at Manning Camp. Thus, this “job” surpassed my expectations for the summer. I helped pack all of the food and gear for the YCC crew and

delivered it to the packers at 2 30 AM...learning about stock and how to properly pack gear is an experience I will never forget. After college, I want to work for NASA which is a Federal agency. If I have experience working with the Federal Government and connections with people I've met who can help my social network, I will be much closer to my goal than working at some fast food restaurant...."

Intern 5: "I knew that this summer job had the potential of being very engaging on several levels. These expectations were met and exceeded in many cases. Being outside everyday using my body in a satisfying way was awesome and the leadership staff worked hard to facilitate us having a lot of time in the field. Learning many new skills whether they were in the field or the office was exhilarating and fulfilling. Having a tight crew of friends was great and aided in communication and a positive atmosphere in the work that we did...I was given the opportunity to work on a saguaro distribution model that incorporated GIS /remote sensing technology and ground truthing in the field. All aspects of this task required applied knowledge and creativity...My experience this summer will be extremely valuable in my future career and made me a more confident, safe, and capable outdoor leader, helped me to apply technical GIS skills to an engaging project, facilitated valuable medical training, enhanced my knowledge of national parks structure and protocol, gave me insight into the ecology and biology of the park, helped me understand the process of research and the methods involved with research...I had a wonderful and fulfilling experience this summer and hope that many in the future will have this opportunity at Saguaro National Park."

Intern 6: "This job exceeded my expectations. I got to see some of the most beautiful places in the park while collecting data to help the rangers and buffelgrass crew protect and conserve it. It was however, a lot more physically demanding than I expected...My experiences outside of park work were more limited than others but I did get to work on a rainfall report for the park that would be used to answer visitors' questions about the rainfall in the park. My future career is going to be in optical engineering, so while this job may not directly relate to my career in an obvious way, I believe that all experiences are good for enriching a person. What I learned here about working with a regular crew, taking pride in your work, and having a sense of responsibility for something greater than yourself, are invaluable lessons that will be of use to me in any career position I eventually end up."

Intern 7: "Entering this job I expected to be challenged physically, stimulated mentally and to learn a new set of skills that I would not have had the opportunity to otherwise. Although this experience was much different then I expected, I was definitely challenged physically in a way that makes me feel stronger. I learned so much that I didn't know before about the desert and the way that the park service functions that I am inspired to continue this path of work. Finally, I believe that this job gave me not only technology skills but also teamwork and leadership skills that will help in any path I decide to take. Aside from the everyday field surveying that the crew did, a couple of us had the opportunity to become more familiar with GIS software and programs such as Arcmap and Surfer. Experience working with and understanding these programs will equip me with some skills that might be useful in future careers especially given that I will be working with computers...I believe that my experience using GPS, GIS, and Total Station technologies as well as the computer programs to accompany them will definitely be useful when pursuing a career in computer sciences. Also, the way the crew leaders were "cycled" so that

everyone had a chance to lead was very useful in helping to develop leadership skills that will help in any career I land in.



Mapping vegetation using a total station.

Intern 8: “My top professional development objective for the summer was to gain leadership experience. I am very satisfied with the opportunities I was given....This was my first experience leading a group for an extended period of time. This summer solidified my desire to continue working for the Park Service following graduation, and this work experience will help me in securing a job. The best and worst parts of the summer were the flexibility of the program. We were simultaneously working on several projects, and individuals worked on their own projects. This could at times be difficult to manage, but kept the work fresh and helped the morale of the crew. Overall, it was a great summer!”

Project follow-through

Seven of the eight interns have been able to continue to work part-time for the NPS following the field season (one intern needed to resign after the field season due to a family issue). All seven hope they can continue working part-time while they are in school this year.

Since returning to school, the interns have worked on important park projects based on their school schedule. One intern is working on interpretive writing products, one is helping with wildlife monitoring, and a third is assisting in GIS. Several interns are working Saturdays on a range of projects including completing saguaro surveys and assisting at major park events such

as the Climate Change Symposium and Native American Cultural Fair. One intern is attending college in Flagstaff and is now working in GIS support for the Flagstaff area parks.

Additionally, interns have served as ambassadors for the park by sharing their experiences, both formally and informally, with their peers, communities, classrooms and schools. For example, one student spoke at his former high school to the entire student body about his experiences working at Saguaro National Park. These activities have increased the visibility of the park in underserved and underrepresented communities and have strengthened the collaborative relationship between the park and local schools.



The YIP crew taking a well-deserved break on the 9-mile hike to Manning Camp.

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