

The Nature Conservancy's
Long-Term LEAF Program Evaluation 2011

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“After learning about watersheds, I’m going to think more about what I take for granted in the city, like clean drinking water. Not enough people take the time to learn about these things, but just think what wonderful things we could accomplish if we all just tried a little harder to protect this world”.¹

¹ LEAF Summer Intern , 2009.

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EXECUTIVE SUMMARY

Purpose

Sixteen years after the first high school students set out on their summer stewardship experience and in the context of a national trend of declining nature participation (Pergams et al. 2004, Pergams 2006, Pergams & Zaradic 2006, 2008; Zaradic & Pergams 2007; Zaradic et al. 2009), The Nature Conservancy determined that it was time to carry out an independent outside evaluation of the long-term impact of this urban youth outreach program. Oliver Pergams and Patricia Zaradic at Red Rock Institute (RRI) partnered with Brigitte Griswold, The Nature Conservancy's Director for Youth Programs, to design and execute a quantitative evaluation of the long-term impact of this nature immersion internship program, which has served approximately 300 students from 1995-2009. Overall the evaluation examined the question: "What are the long-term impacts of The Nature Conservancy's Leaders in Environmental Action for the Future (LEAF) Program on an urban youth population?" The assessment focused on long-term quantitative measures of environmental values, activism, academic outcome, career track and support for conservation. Responses from program alumni were, when possible, compared with prior survey responses from the general US population to provide a baseline.

Methodology

The first step of the assessment design process identified outcomes indicative of long-term conservation support, environmental values and activism, academic outcome and career track. Existing surveys of demographic baseline populations were further identified for comparison. Alumni survey questions were designed by RRI and vetted by The Nature Conservancy Director for Youth Programs and The Nature Conservancy's Chief Scientist for consistency with program goals and observable indicators of success. Questions were refined and focused using laboratory cognitive interviews (focus groups) of demographically similar individuals. Videos are available upon request (with The Nature Conservancy approval) from RRI. Nature Conservancy program staff provided initial alumni contact information and the outside evaluator further expanded the known alumni contacts through multi-media searches to 161 contacts. Messages via phone, email, and digital media were used to reach out to alumni and provide access to the survey tool. A total of 61 responses were coded (38% of alumni contacted), compared to demographic baseline responses, and further analyzed by individual question and in category groups.

Findings and Interpretation

The goal of the LEAF program is to help urban youth gain critical life, school and workplace skills; provide sustained exposure to nature; support students pursuing higher education opportunities and career paths in environmental fields; create a passion for nature; and empower a diverse population of future environmental leaders.

LEAF program goals were translated into a set of short and long-term program objectives: acquisition of nature stewardship skills; acquisition of life, school and workplace skills; improved academic outcomes and career track; long-term commitment to conservation support; environmental values; and environmental activism.

The LEAF program successfully achieves its stated goals, particularly in the area of conservation support, environmental values and community level environmental activism. Results are described below each objective.

Program Demographics

Based on alumni respondent demographics the program is successfully targeting (85% non-white, Figure 2) ethnic and racial groups underrepresented in the conservation community. Moreover, for almost all of the youth participants (93%, Figure 4), the LEAF program represented the first sustained exposure to nature.

Nature Stewardship and Life Skills

Sustained exposure to nature, particularly with a mentor, is one of the fundamental experiences thought to lead to long-term conservation support and environmental activism (Chawla 1999, Bögeholz 2006, Wells & Lekies 2006), a key program goal. In addition, allowing the students to perceive themselves as having a positive impact on the environment (98%, Figure 5) encouraged them to develop confidence in pursuing environmental and personal goals beyond the summer program. Alumni expressed a sense of empowerment from the LEAF experience: self-reliance (92%), self-initiative (91%), and confidence (91%, Figure 8).

Mentors and program staff succeeded in creating a supportive environment for urban youth to adapt to natural settings, work collaboratively, and gain social, work and life skills. Urban students felt relaxed and at peace immersed in nature (93%, Figure 9) and expressed greater interest in environmental issues (93%, Figure 7) and a greater awareness of conservation career paths (91%, Figure 13) from the LEAF experience.

Academic Outcomes and Career Track

The majority of the alumni (96%) went directly to college (Figure 14) and attained higher education levels as compared to their peers nationally (Figure 17). College matriculation rates for LEAF alumni are up to 45% higher than average for the participating high schools (participating high school rates for college matriculation range from 51% to 98%). When comparing completed educational levels of alumni with national averages (US Census Bureau, 2009), alumni compare favorably in the Bachelor's (21% alumni completed bachelor's degrees as compared to 9% nationally) and Advanced degree (7% intern respondents as compared to 1% nationally) categories (Figure 17). In addition, most (85%) alumni are non-white. Compared to the achievement gap between the non-white and national population, LEAF alumni excel: 21% of alumni completed BA, as compared to 6% nationally (Figure 17).

As compared to the population at large, many more LEAF alumni were employed (Figure 18) and more had experience with employment in environmental organizations (33%, Figure 19). Alumni in a variety of professions incorporate environmental practices/issues in their work (55%, Figure 20). A high percentage of alumni (27%, Figure 21) are also in education-related careers, increasing the ethnic and racial diversity of environmental role models to potentially attract more urban youth of color to conservation and the environmental movement.

Notably, LEAF program alumni that are employed earn markedly higher incomes as compared to national non-white averages (Figure 22). LEAF appears to pay off in more success at attaining higher income employment.

Conservation Support and Environmental Values

Consistent with the program goal of instilling conservation support and environmental values, LEAF alumni are aware of and rank almost all environmental factors as extremely serious among a list of various current issues (Figure 23). Moreover, as compared to the national average, alumni place greater value on environmental issues, ranking them even higher in priority (Figure 25). For example, 73% of alumni rank “global warming” as “extremely serious” as compared to 37% across the nation. Similarly, 67% of alumni rank “loss of natural areas” as a “extremely serious” compared to 22% nationally (Figure 25). Results indicate the LEAF program successfully meets objectives of cultivating long-term and high-level support for environmental and conservation values.

Environmental Behavior, Advocacy and Activism

LEAF program alumni exhibit environmental behaviors at rates higher than the general public (Figure 28). In addition, alumni spend substantial (2-4 hours/day) daily leisure time outdoors, in balance with daily time reported on the internet and close to the overall time spent daily on electronic media (Figure 29). LEAF alumni hike remarkably more frequently (72%) than their peers (12%) age 18 to 24 (Outdoor Foundation, 2010).

LEAF alumni are environmental advocates; they take a stand for environmental issues with their peers and in their communities (Figure 30). Almost all the respondents (96.5%) would be likely to sign a petition for an environmental cause (Figure 30, Question 88). Almost all respondents (91.2%) have pointed out to someone his or her un-ecological behavior (Figure 30, Question 89). Alumni (70%) feel that their environmental activities change the behavior of others (Figure 30), and not surprisingly most (72%) define themselves as environmentalists (Figure 30). The LEAF program excels at meeting the objective of encouraging diverse urban youth to become environmental advocates with their peers and in their communities.

LEAF alumni invest their time in support of environmental organizations. More than half of alumni (52%) volunteered their time for an environmental organization over the past year, more than twice as many (22% in 2010 age 16-24) as the national average (US BLS, Table 1 2010; Figure 28). In particular, nationally, volunteers for environmental organizations make up only a small percentage (3.3% in 2010 for age 16-24) of the national average; even less so for Hispanic volunteers (1.4%) and African-American volunteers (0.5%) (US BLS, Table 4 2010). LEAF alumni volunteer their time for environmental organizations at more than ten times the national average rate.

Implications

Currently, conservation support depends primarily on a very narrow group of relatively elite outdoor enthusiasts: overwhelmingly European-American, mostly college educated, higher income, over 35, former backpackers and hikers, 11-12 years after their peak of outdoor participation (Zaradic, Pergams, Kareiva 2009). Given the trends of increasing US population diversity, urbanization, and economic and cultural changes, this narrow base of conservation

supporters is likely to become even narrower (Zaradic, Pergams, Kareiva 2009). By 2042 the non-white population in the US is predicted to become the majority of the population. Today's young people are leading this demographic shift, i.e. 40% of US youth age 25 and younger are non-white, 44% of youth age 18 and younger are non-white, and 50% of children age 5 and younger are non-white (US Census 2010). Nationally and globally, The Nature Conservancy and the field of conservation will depend on the support of this coming generation.

The LEAF program targets young people characteristic of the growing demographic shift in diversity, during adolescence, an age range where outdoor participation tends to decline sharply (Outdoor Recreation 2010). LEAF alumni are (85%) non-white, and demonstrate value systems consistent with environmental leadership.. Spending sustained time in nature, particularly with a mentor, is thought to be one of the foundations for nurturing the types of environmental attitudes and values leading to long term conservation support (Bögeholz 2006, Lang 2006, Wells and Lekies 2006, Zaradic and Pergams 2007). The sustained experience of the LEAF partnership model, which combines what students are learning in environmental high schools with real world experience in the field during critical high school years, seems to create just such an environmental foundation (Bailey, Hughes, Moore 2004, Rickinson et al. 2004) for its alumni. LEAF graduates are outdoor enthusiasts, environmental advocates and volunteers; and they influence their peers and community.

LEAF alumni depart the program college bound and many choose environmental majors. The strengths and skills gained at each step of the process accumulate to produce improved academic and career outcomes. Alumni leverage their gained life, academic, and work experiences to attain professional careers; LEAF pays off in a higher proportion of better paying jobs attained by alumni.

Although alumni are doing well, the LEAF program could develop more structured partnerships with other organizations to facilitate a more direct conservation career pathway following the high school experience. Given their environmental values and local advocacy, LEAF participants and alumni should be encouraged to present their views and experiences in a more public forum. Perhaps as the program expands, these young, motivated, diverse environmentalists from environmental high schools across the country can work together to engage in environmental and conservation advocacy at a national level. After all, ultimately, the fate of biodiversity and intact ecosystems may depend less on rates of habitat loss or invasive species, than on public perception of the value of supporting conservation.

REPORT

Introduction

Since the decline in nature based recreation was reported in conservation research (Pergams et al. 2004, Pergams 2006, Pergams & Zaradic 2006, 2008; Zaradic & Pergams 2007; Zaradic et al. 2009) and the popular press (see <http://www.videophilia.org/media.html>), there has been a growing awareness of the importance of nature-based outreach, particularly for populations traditionally underrepresented in the conservation movement. The Nature Conservancy's LEAF program is visionary in developing a program that offers both career development and also direct hands-on stewardship experience at key conservation nature areas. Working with The Nature Conservancy mentors, the interns are well supported and guided to gain work and life skills within a context of connecting with nature. These types of mentored nature experiences are the key component to producing life-long conservation supporters.

The Nature Conservancy LEAF Program

As the largest non-profit private conservation organization, The Nature Conservancy's goals and strategies influence public and private conservation all around the world. The Nature Conservancy's mission is "to protect the plants, animals, and natural communities that represent the diversity of life on earth by protecting the lands and waters they need to survive." Further, The Nature Conservancy partners with diverse organizations around the globe to protect ecologically important lands and waters for nature and people

Global conservation efforts consistent with The Nature Conservancy's mission require a diverse constituency of support. The Nature Conservancy's LEAF program is designed to develop just such a constituency. Urbanization is a growing national and international trend. By targeting urban youth from populations largely underrepresented in the conservation movement, TNC is training and developing the next generation of broad based supporters and diverse conservation leaders.

By providing paid, residential internship positions, The Nature Conservancy creates points of access for diverse urban youth to a wide variety of environmental conservation careers. Through immersion in natural areas, pre-program training, on the job fieldwork, and post-program alumni opportunities provided through The Nature Conservancy, youth that would otherwise have little exposure to nature gain the experiences and encouragement to identify themselves as conservationists.

Purpose of Report

In light of the growing concern with declining outdoor nature recreation and future conservation support (Pergams 2006, Pergams & Zaradic 2006, 2008; Zaradic & Pergams 2007; Zaradic et al. 2009), The Nature Conservancy decided to examine the long-term impacts of its LEAF program. The Nature Conservancy is ideally positioned to consider the long-term impacts of this program on the lives of its alumni after 16 years. In addition, The Nature Conservancy students are drawn from a population of students that receive additional academic-year environmental programming. As such, the academic-year activities offered by partner

environmentally themed high schools round out and further support the summer programming. Rather than a stand-alone intervention, by partnering with schools such as New York City's High School for Environmental Studies, the impact on the high school students occurs in the supportive context of an environmentally informed academic setting. Continuity of support is a core principle for successfully youth development programs, including those in work-based learning settings (Bailey, Hughes, Moore, 2004). Therefore, the long-term results of the LEAF program on the lives of its alumni must be considered in the context of this environmentally supportive academic programming. Offering a summer experience without the broader academic support structure that paved the way for and then reinforced the summer experience is likely to be less impactful (Bailey, Hughes, Moore, 2004).

The first step of the assessment inquiry was to identify the types of alumni life outcomes that would characterize the fulfillment of short-term and long-term program goals: acquisition of nature stewardship skills; acquisition of life, school and workplace skills; improved academic outcomes and career track; long-term commitment to conservation support; life-long environmental values; and environmental activism. Where possible, data from existing surveys of demographic baseline populations was identified and used for comparison with alumni responses.

Context

The goal of The LEAF program is designed to help urban youth gain critical life, school and workplace skills; provide sustained exposure to nature; support students pursuing higher education opportunities and career paths in environmental fields; create a passion for nature; and empower a diverse population of future environmental leaders. LEAF program goals were translated into a set of short and long-term program objectives: acquisition of nature stewardship skills; acquisition of life, school and workplace skills; improved academic outcomes and career track; long-term commitment to conservation support; strong environmental values; and environmental activism.

The LEAF program has successfully placed summer interns at Nature Conservancy field sites for 16 years. The Nature Conservancy started LEAF in partnership with New York's Friends of the High School for Environmental Studies in 1995. Sophomores and juniors from the high school live and work through paid internships at Conservancy preserves throughout the US. Initially summer programs consisted of approximately 9 students, but the most recent classes have placed over 50 student interns per summer. LEAF currently partners with 12 environmentally themed high schools in the New York metro-area. Most of these students come from low-income, minority groups underrepresented in the conservation movement. For most of the students, the summer experience is their first sustained period in nature.

During the program, students are placed at Conservancy sites in small teams with approximately three students paired with a mentor. Mentors are recruited from the high school teaching staff and live and work on a daily basis with the students. Mentor-student teams work alongside Nature Conservancy staff for a four-week summer fieldwork session. Fieldwork consists of a variety of tasks categorized as land management, educational outreach to local communities and scientific research. Students learn about career opportunities either directly from their work or indirectly through Nature Conservancy staff and LEAF mentors. Several

college visits take place during the program to facilitate an introduction to college life. A variety of weekend outdoor recreation experiences such as swimming and kayaking also expand the students' nature experiences.

For many of the students, the summer experience is their first time living on their own, managing a budget, cooking meals, doing laundry, and developing self-reliance. It is also often their first job working in a diverse team and participating in challenging physical hands-on fieldwork. The LEAF program is physically, socially, and intellectually demanding. Yet, it is through these challenges that the students develop improved work, social, academic, and life skills.

After the summer experiences, alumni serve as advocates for their peers. The Conservancy provides formal and informal opportunities for interns to share their experiences with peers and the public. They also serve as ambassadors to recruit the next year's candidates for the program.

The impact on the students occurs in the supportive context of an environmentally informed academic setting. As such, students receive additional academic-year environmental programming and the academic-year activities round out and further support the summer programming. Therefore, the assessment of the long-term results of LEAF on the lives of its alumni must be considered in the context of this environmentally supportive academic programming.

Literature Review

Decline of Nature-Based Recreation. Research shows that people in the US and other developed nations are spending far less time in nature than ever before (Pergams and Zaradic 2006, 2008). This research examined 16 measures of nature participation related to visitation of various types of public lands in the US and other countries; number of various types of game licenses issued; and amount of time spent camping, backpacking, or hiking. The US activities with the greatest participation were visits to US State Parks, US National Parks, and US National Forests. All three visitation rates are in downtrends and are declining on average between 1% and 3% per year (Pergams and Zaradic 2008).

“The longest and most complete of the 14 US nature recreation datasets show that ongoing declines in nature participation typically began between 1981 and 1991, are losing on average over 1% per year, and have lost between 18% and 25% to date. There is no longer any real doubt that the percentage of people involved in most nature-based recreation is in long-term decline” (Pergams and Zaradic 2008).

Benefits of Sustained Nature-Based Programs. Direct contact with nature has been shown to provide physical and psychological benefits (Zaradic and Pergams, 2007). Particularly relevant to the LEAF program are studies that examine the impacts of nature-based education on outcomes associated with LEAF program goals such as environmental attitude and life, social, and academic skills.

Environmental Attitude. One of the most direct benefits of nature-based experiences is an increase in environmental attitude. A review of research related to the benefits of nature based experiences (Zaradic and Pergams 2007), suggests that direct contact with nature, especially as children, is the most critical influence on later attitude toward the environment (Bögeholz 2006, Lang 2006, Wells and Lekies 2006). Family vacations and time with family and other mentors outdoors are a major influence on later environmental attitude. Environmental education is also important, but to a lesser degree than direct actual experience of natural areas (Wells and Lekies 2006, Chawla 1999). It is ideal is when exposure to nature occurs in the presence of a knowledgeable mentor or teacher. Such a teacher answers questions and helps to convert the rich experience of nature to knowledge and increased curiosity in the student. Direct contact with wild nature (such as hiking, playing in the woods, camping, hunting, or fishing), and (to a lesser extent) domesticated nature (such as gardening or pet care) has been shown to be particularly important in shaping later environmental attitudes and behaviors (Bögeholz 2006).

Life, Social and Academic Skills. Nature, or lack of nature experiences, impacts cognitive development. Three ways of experiencing nature have been described (Kellert 2002). Direct experience is undirected play in nature, for example in a forest, neighborhood park, backyard, or even a vacant lot. Indirect experience includes zoos, nature centers, aquariums, and museums. Vicarious experience is without actual physical contact with nature; for example art, photographs, videos, and webcams.

Direct experience with nature plays the most significant role in cognitive and evaluative development (Kellert, 2002, Zaradic and Pergams 2007). Direct experience of nature offers a multitude of continuously changing sights, sounds, smells, and touches that promote a wide range of adaptive and problem solving responses, alertness, and attention. The more structured, indirect experiences of nature do not require the same level of spontaneous engagement and do not have the same developmental benefits. The least engaging and spontaneous type of nature contact is vicarious experience through electronic media.

Incorporating direct exposure to nature into outdoor learning can continue to benefit students' self-perception, self-esteem, pride, and cognitive growth for some years after the experience (American Institutes for Research, 2005; Rickinson et al. 2004). Further, living in high-nature conditions can reduce the incidence of psychological stress (Lang 2003). As a result, combining fieldwork with a residential nature-based experience can be particularly effective for individual growth (Rickinson et al. 2004).

Moreover, well-executed fieldwork can develop skills that effectively support classroom learning (Rickinson et al. 2004). Some of the benefits of outdoor learning include: increased academic scores on standardized tests for reading, writing, math, science and social studies (SEER 2000); also increased science scores for at risk students; as well as increased student engagement, enthusiasm, and problem solving skills (American Institutes for Research, 2005).

Long Term Benefits. Several core elements regularly appear in impactful youth development programs and successful work-based learning settings: 1) close relations with caring adults, 2) high expectations, 3) engaging activities, 4) opportunities to make a difference in their world, and 5) continuity of support (Bailey, Hughes, Moore, 2004). Incorporating these

elements into youth programs builds the kinds developmental competencies that are indicative of more successful adults (Bailey, Hughes, Moore, 2004).

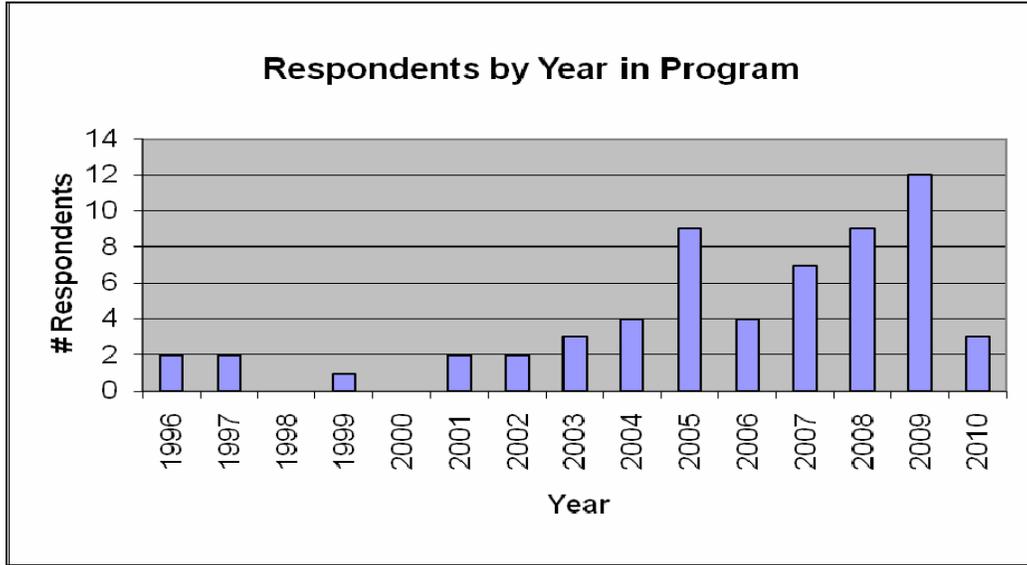
Summer work programs for high school students can be particularly effective for economically-disadvantaged youth, most at risk both academically and socially (Sum 2008). Some of the benefits reported of high school workforce development programs include: improved high school graduation rates among economically-disadvantaged youth and a more successful transition from high school to the labor market upon graduation (Sum 2008). These improved outcomes benefit not only the individual but also society. Better employment rates and fewer institutionalized individuals results in increased societal tax benefits and decreased societal costs (Sum 2008).

Conservation support is strongly correlated with participation in nature based activities such as hiking and backpacking (Zaradic, Pergams, Kareiva 2009). People seem to be more likely to invest in what they know from firsthand experience. As a result, lack of experience with nature is likely to result in reduced support for conserving nature (Kareiva 2008). Conservation organizations seem to be receiving donations from a very narrow group of relatively elite outdoor enthusiasts: overwhelmingly European-American, mostly college educated, higher income, over 35, former backpackers and hikers, 11-12 years after their peak of outdoor participation (Zaradic, Pergams, Kareiva 2009). Given the trends of increasing US population diversity, urbanization, and economic and cultural changes, this narrow base of conservation supporters will become even narrower (Zaradic, Pergams, Kareiva 2009). To avoid becoming marginalized, the conservation movement will need to diversify its outreach strategy, engaging novel and diverse constituencies.

Evaluation Methods: Participants, Data Instruments, and Collection Process

Nature Conservancy program staff provided contact information for approximately 300 LEAF program alumni. Some of the older contact data was outdated and no longer valid so RRI conducted further searches including individual phone calls, emails, and social media searches. In all, a total of 161 alumni were found and “friended” through and alumni Facebook group. After four group and supplementary individual messages, a total of 61/161 (38%) of alumni contacted responded to the survey. This is a very high response rate. The majority of the respondents, (85%) were from the most recent seven years of the LEAF program, 2003-2010 (see Figure 1). As a result the strongest conclusions and comparisons can be made concerning alumni from 2003-2010, likely in their college and early career years at the time of the survey. Comparisons regarding earlier graduates, 1995 to 2002 offer more limited conclusions.

Figure 1: Survey respondents by the year they participated.



Respondents were diverse in their ethnic and racial heritage (see Figure 2) with the greatest percentage reporting as Hispanic-American (31%). The large majority of respondents, 85% were non-European-American/White as compared to approximately 23% non-white in the national population of 16 to 24 year olds.

The large majority, 85%, of the respondents were non-white, suggesting the LEAF program and successfully targets students underrepresented in the conservation community.

Figure 2. Ethnic and racial heritage of respondents.

5. What is your main ethnic or racial heritage?		
		Response Percent Response Count
European-American/White		14.8% 9
African-American/Black		26.2% 16
Hispanic-American		31.1% 19
Native American/First Nations/American Indian		0.0% 0
Asian-American		18.0% 11
Other		9.8% 6
answered question		61
skipped question		0

There were many more female than male respondents; 72% of respondents were female. Women, particularly of diverse racial and ethnic heritage are underrepresented in science and in senior conservation positions.

The greater proportion of female respondents suggests the LEAF program and this longitudinal survey successfully targets groups consistent with its goals of diversifying the base of long-term conservation support and leadership.

Figure 3. The percentage of male and female respondents.

7. What is your gender?			
		Response Percent	Response Count
Male		27.9%	17
Female		72.1%	44
answered question			61
skipped question			0

The survey instrument consisted of an online questionnaire with 96 questions. Survey questions were comprised primarily of the following targeted categories: environmental values, environmental activism, conservation support, academic outcome, career track, and demographics. An additional category of questions related to nature stewardship skills and life skills acquired during the summer program and closely aligned with the program goals. Multiple questions within the same category insured triangulation of responses in order to validate consistency of the survey measures. Respondents tended to answer consistently among questions within the same category suggesting that the survey measures provided reliable results.

Results and Recommendations

The majority of responses were positive and suggest the LEAF program is meeting both short-term goals of training in nature stewardship and life skills and long-term goals of instilling an ethic of conservation support and environmental activism. Responses to some questions revealed specific areas where the program could more effectively meet its goals.

This section of the report reviews the key findings of the survey results and recommends action items in specific areas the LEAF program could develop further to more effectively meet its goals. Specific results for questions with either very positive responses (the great majority) or less positive responses are reviewed. Very positive responses were, for example, those with more than 90% of participants responding “Strongly Agree” or “Agree”. Less positive responses were, for example, those with fewer than 70% of participants responding “Strongly Agree” or “Agree”; these are accompanied by recommendations for action items.

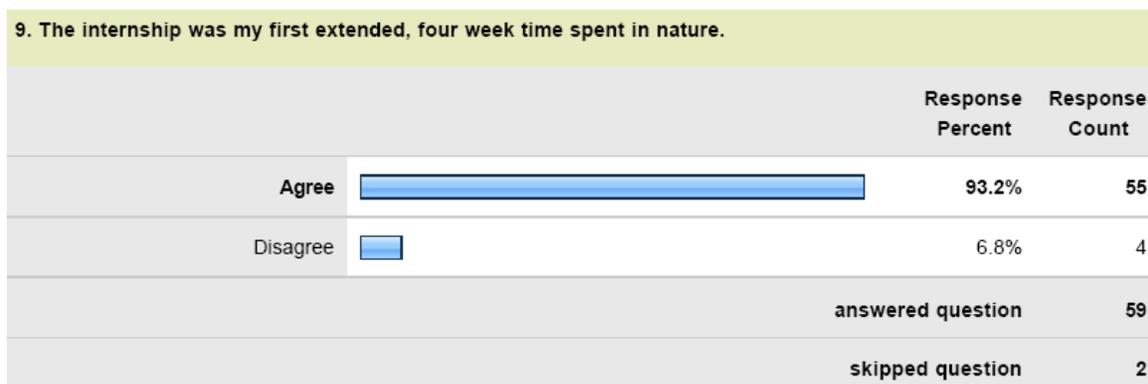
Section 1: Nature Stewardship and Life Skills

The first series of survey questions ask alumni to reflect on the shorter term nature stewardship and life skills goals and experiences gained from participating in the LEAF Program.

For the overwhelming majority of participants (93.2%) the LEAF Program was their first extended, four-week period spent in nature (Figure 4). Not only are the interns ethnically and racially diverse, but they are also individuals unlikely to otherwise spend extended time in nature.

This suggests the LEAF Program is successfully meeting its goals of reaching out to new audiences with little alternative exposure to nature.

Figure 4. The first extended nature experience for alumni.



Almost all of the alumni (98.3% Agreed or Strongly Agreed) felt that by participating in the LEAF program they were doing something helpful for the environment (Figure 5). Gaining a sense of empowerment through a perceived positive impact on the environment has previously been shown to be one of the most rewarding aspects of nature stewardship (Grese et al, 2000). In a series of related questions, many alumni expressed a heightened sense of empowerment and self-confidence as a result of the summer experience (Figure 8). In addition, the perception of positive impact from their summer work may have been the inspiration for greater interest in environmental issues reported by the alumni (Figure 7).

Providing an experience that allowed the alumni to perceive themselves as having a positive impact on the environment encourages alumni to gain confidence in pursuing environmental and personal goals beyond the summer program.

Figure 5. The percentage of alumni that felt they were helping the environment.

8. I felt I was doing something helpful for the environment.		Response Percent	Response Count
Strongly agree		74.6%	44
Agree		23.7%	14
Undecided		1.7%	1
Disagree		0.0%	0
Strongly disagree		0.0%	0
		answered question	59
		skipped question	2

Not only did most alumni feel that they were helping the environment in general, but almost all of the alumni surveyed, (98.3 %) “Agreed” or “Strongly Agreed,” that they learned about specific plants & animals and how to care for them (Figure 6). Hands-on experience with specific plants and animals is considered a rewarding component of nature stewardship (Grese et al. 2000), and is cited as playing a major role in building affinity for nature (Zaradic and Pergams 2007).

Spending hands-on time in nature, particularly with a mentor, is one of the fundamental experiences thought to lead to long-term conservation support and environmental activism, a key program goal.

Figure 6. The percentage of alumni that felt they learned about nature stewardship.

10. I learned about specific plants/animals, and how to care for them.		Response Percent	Response Count
Strongly agree		64.4%	38
Agree		33.9%	20
Undecided		1.7%	1
Disagree		0.0%	0
Strongly disagree		0.0%	0
		answered question	59
		skipped question	2

The majority of alumni (93.2%) became more interested in environmental issues as a result of their participation in the summer experience (Figure 7). This could reflect a greater sense of empowerment gained from perceiving their role in helping improve the environment (Figure 5), combined with an increased understanding of hands-on nature stewardship leading to a greater affinity for nature (Figure 6).

This outcome meets the program goal of generating greater environmental awareness and activism.

Figure 7. The percent of alumni interested in environmental issues.

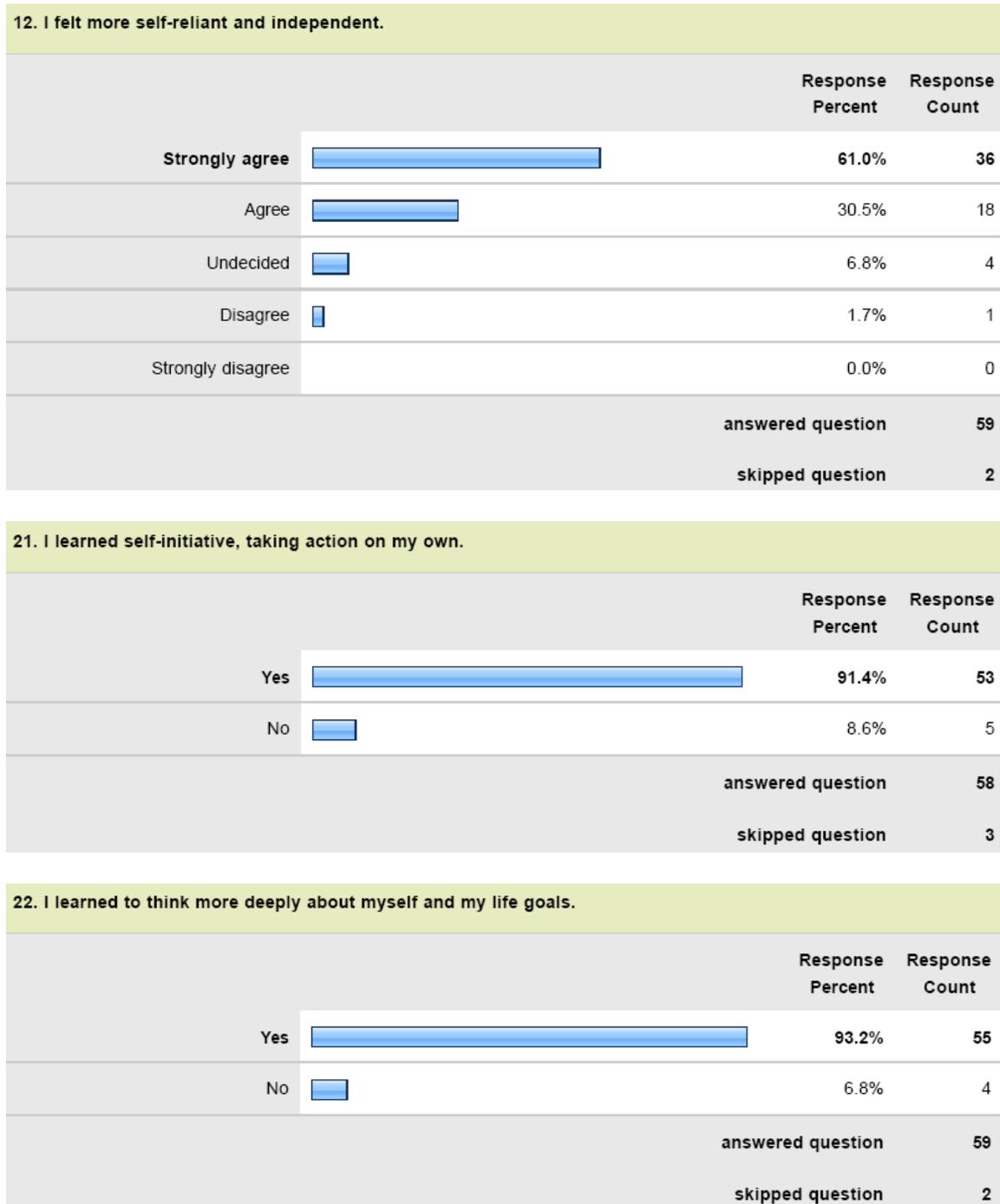
14. I became interested in getting more involved in environmental issues.			
		Response Percent	Response Count
Strongly agree		54.2%	32
Agree		39.0%	23
Undecided		6.8%	4
Disagree		0.0%	0
Strongly disagree		0.0%	0
answered question			59
skipped question			2

Responses to several questions consistently reflected increased confidence and empowerment gained from the summer experience (Figure 8). Increased empowerment was reflected in questions regarding self-reliance and self-initiative. Alumni overwhelmingly (91.5% Agreed or Strongly Agreed) felt more self-reliant and independent as a result of their summer experience (Figure 8, Question 12). For many participants the summer represented the first time away from home for an extended period, the first time managing a budget, their first job, and the first time living on their own. Corroborating this 91.4% of alumni reported learning self-initiative during the summer program (Figure 8, Question 21).

The LEAF mentors and program staff contribute to insure a successful experience for the interns, facilitating the transition to independence and providing a supportive environment. In addition, mentors and program staff contribute to conversations regarding career paths, future goals and visits to prospective colleges. As a result, through their summer experience, 93.2% of alumni reported that they learned to think more deeply about their goals (Figure 8, Question 22) and 91.4% reported gaining confidence in applying for a better job/college (Figure 8, Question 23).

Providing a supportive environment for growth facilitates increased confidence and empowerment, fulfilling short-term program goals. Increased confidence and empowerment provide the foundation for improved long-term academic and career path outcomes.

Figure 8. Increased self-reliance, self-initiative, and confidence (Questions 12, 21-23).



23. I gained the confidence to apply for a better job and/or college.			
		Response Percent	Response Count
Yes		91.4%	53
No		8.6%	5
answered question			58
skipped question			3

LEAF mentors and program staff offer support as students transition from an urban to rural nature setting. The transition from primarily urban-based experiences to nature settings can be problematic, sometimes triggering negative responses to unfamiliar sensory experiences (Bixler and Carlisle, 1994). However, the great majority (93.1%) of alumni reported (“Agreed” or “Strongly Agreed”) feeling more relaxed and at peace during the program (Figure 9). Results suggest that LEAF mentors and program staff provide enough support for students to adapt successfully to living and working in a nature-based environment.

Mentors and program staff successfully met goals of creating a supportive environment for urban youth to adapt to living and working in a nature-based environment.

Figure 9. Percent of urban alumni feeling relaxed and at peace in nature-based settings.

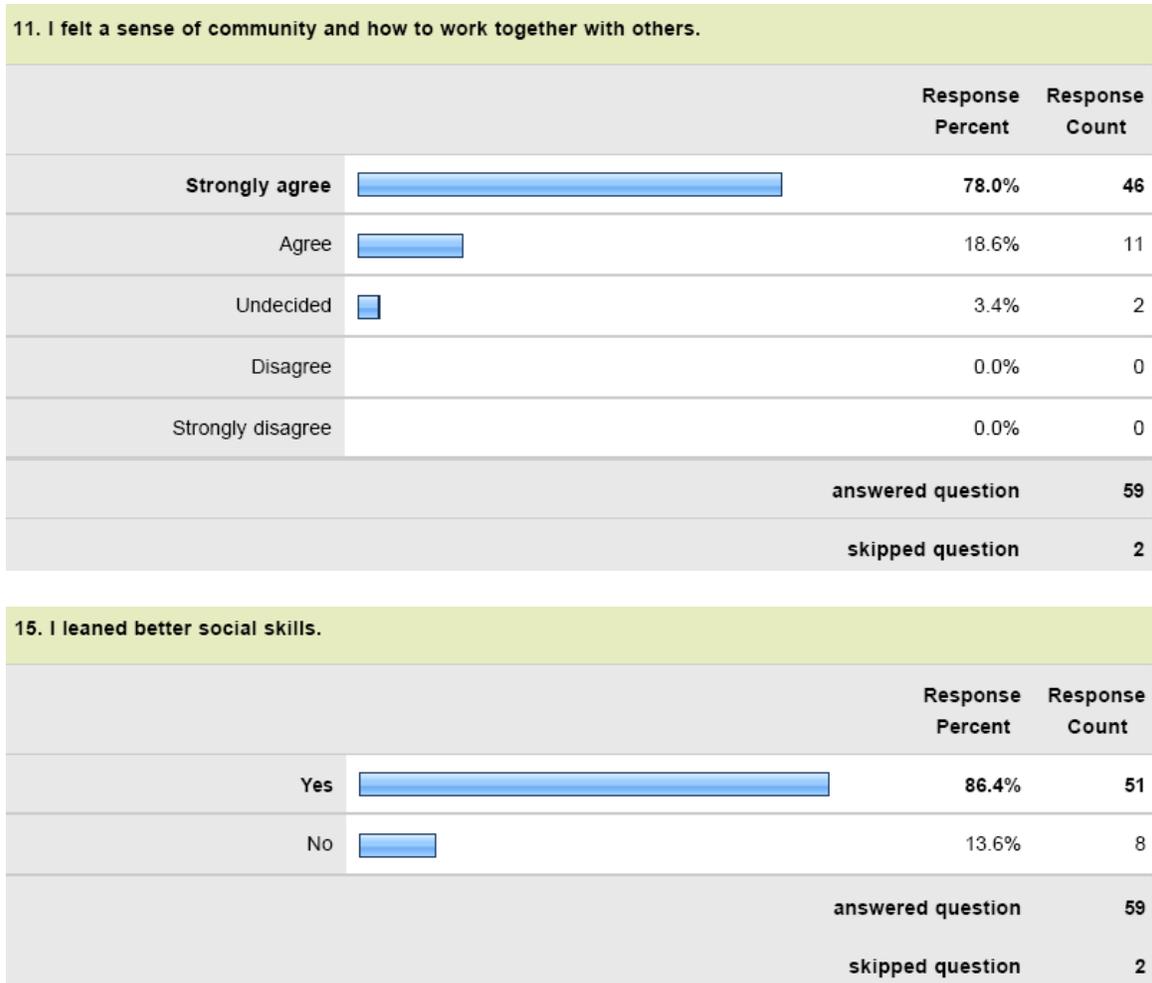
13. I felt more relaxed and at peace during the program.			
		Response Percent	Response Count
Strongly agree		56.9%	33
Agree		36.2%	21
Undecided		6.9%	4
Disagree		0.0%	0
Strongly disagree		0.0%	0
answered question			58
skipped question			3

Part of the transitional process for students is not only moving outside of their home for the first time but also living and working together on a daily basis with other diverse urban youth. Mentors and program staff play a large role in facilitating this transition. Almost all of the alumni (96.6% “Agreed” or “Strongly Agreed”) felt an increased sense of community and ability to better work with others out of their participation in the program (Figure 10, Question 11).

Corroborating this, 86.4% of alumni thought they learned better social skills from participating in the LEAF (Figure 10, Question 15).

Mentors and program staff successfully support teambuilding and a sense of community. Students gain social skills and experience working collaboratively on teams with diverse constituents.

Figure 10. Alumni experience community and gain social skills. (Question 11, 15).



The LEAF program was the first real job experience for many of the alumni. In addition to acquiring life skills and social skills, the vast majority of alumni (94.8%) felt they had learned how to be a good employee during the program (Figure 11).

LEAF alumni gain good work habits critical for better academic and career outcomes and key to meeting long-term program goals of developing the next generation of environmentalists and conservation leaders.

Figure 11. Alumni learned good work habits.

34. I learned how to be a good employee during my internship.		Response Percent	Response Count
Yes		94.8%	55
No		5.2%	3
answered question			58
skipped question			3

Alumni are interested in becoming environmental advocates. The LEAF program is designed to encourage and develop the next generation of conservation leaders from among the diverse program participants. Program participants have a chance to do presentations for the public, their peers, and the media about their internship experiences. However, only 67.2 % felt the program improved their public speaking (Figure 12).

Action item: Given the program goal of supporting alumni to become environmental advocates and the next generation of conservation leaders, we recommend that more attention is placed on developing the alumni public speaking skills.

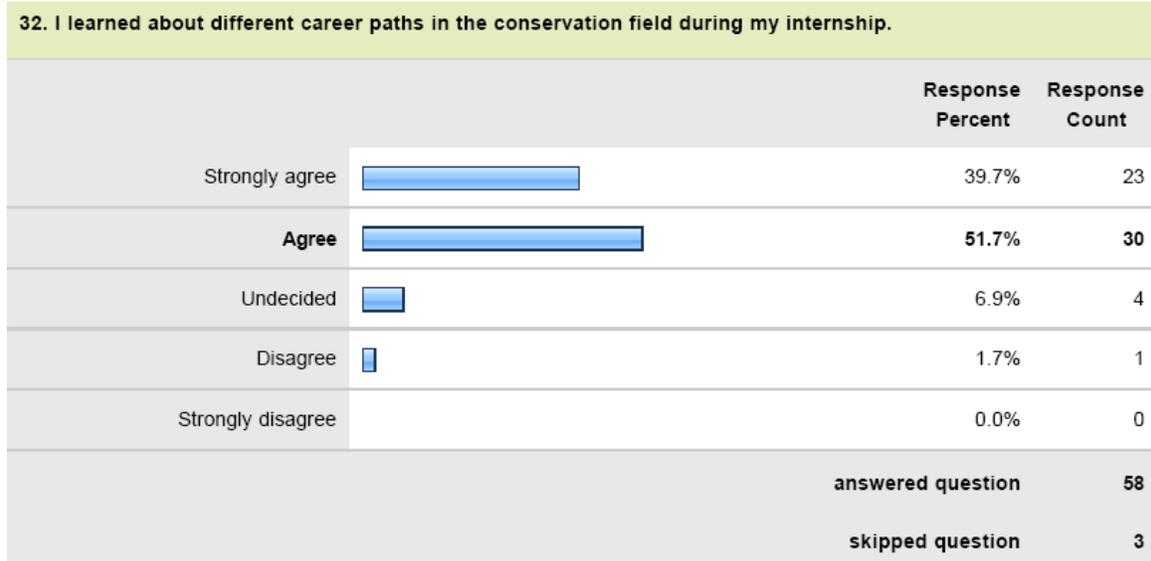
Figure 12. Percent of alumni that improved public speaking skills.

16. I improved my public speaking.		Response Percent	Response Count
Yes		67.2%	39
No		32.8%	19
answered question			58
skipped question			3

Either directly during their hands-on summer work experience or indirectly from program staff and mentors, most alumni learned (91.4% “Strongly Agreed” or “Agreed”) about different career paths in the conservation field during their internship (Figure 13). For many alumni this was the first exposure to environmental fieldwork and meeting various conservation professionals.

Expanding the perceived choices in conservation career paths increases the likelihood of attracting more diverse constituents to professional and leadership roles in the field of conservation.

Figure 13. Percent of alumni that increased knowledge of conservation career paths.



Section 2: Academic Outcomes and Career Track

The next series of survey questions ask alumni about academic outcomes and career track subsequent to participating in LEAF. The Program goals of helping urban youth gain school and workplace skills and successfully engaging and inspiring the next generation of environmental leaders should be reflected in improved academic outcome and career track. Where possible, alumni responses are compared to existing survey data from demographic baseline populations.

The majority of alumni (96.3%) went straight to college after the internship program, few (3.7%) took a break and, none went straight to work (Figure 14); this is an incredibly high percentage as compared to high school graduates across the nation (70.1%, BLS 2010). College matriculation rates for LEAF alumni are up to 45% higher than average for the participating schools (participating high school rates for college matriculation range from 51% to 98%). Although college enrollment for recent high school graduates age 16 to 24 is currently at a 50 year high at 70.1%, LEAF alumni college enrollment is much higher (96.3%). Moreover, nationally black (68.7%), and Hispanic (59.3%) enrollment trails behind Asian (92.2%) and white (69.2%) college enrollment. In contrast, LEAF respondents are 85% non-white (Figure 2) and yet 96.3% college bound. Increased empowerment, confidence, life skills, and work habits, along with college exposure through college visits likely contribute to the extremely high proportion of college bound program alumni.

Producing college-ready students meets a key short-term goal of the LEAF program and provides a strong foundation for long-term program goals.

Figure 14. Percent of alumni that proceeded directly to college

24. After high school, I _____.		Response Percent	Response Count
went straight to college or other postsecondary school.		96.3%	52
took a break of one year or more and then went to college or other post-secondary school.		3.7%	2
started full-time work right away.		0.0%	0
		answered question	54
		skipped question	7

Almost all of the program participants went straight to college or other postsecondary school, and over a third 38.6% applied directly to the colleges visited during the program.

Action item: Some of the students applied to colleges visited during the program. Other alumni may need more support making a connection to the schools visited or during the application process.

Figure 15. Percent of participants that applied to one of the colleges visited.

26. I applied to or attended one of the colleges I visited during my internship with The Nature Conservancy.		Response Percent	Response Count
Yes		38.6%	22
No		61.4%	35
		answered question	57
		skipped question	4

For many of the alumni (49.1%, “Strongly Agree” or “Agree”), the LEAF program had an impact on the academic choice of study (Figure 16). In addition, some program participants were likely already interested in biology or an environmental major.

Action Item: Gathering information on academic choice of study prior to the program would help better determine impact on academic major. We recommend pre-program, post-program,

and post-graduate surveys of academic choice of study to better evaluate impact on academic major.

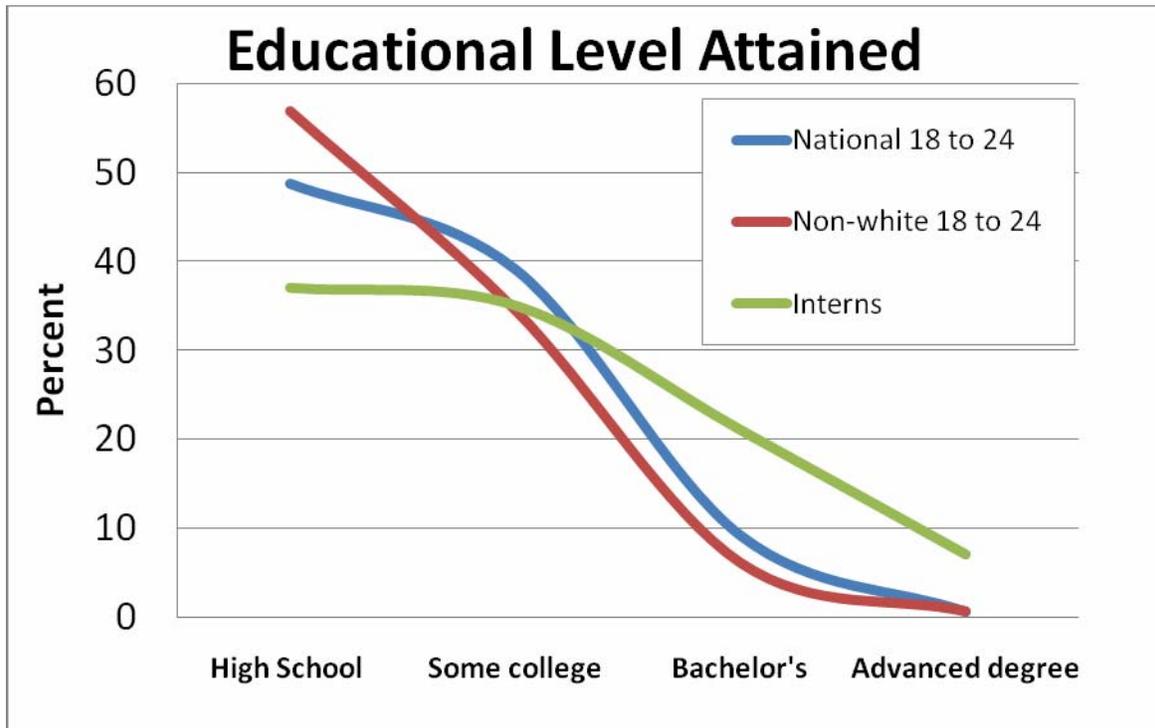
Figure 16. LEAF had an impact on academic major.

29. My internship with The Nature Conservancy affected my academic choice of study.			
		Response Percent	Response Count
Strongly agree		23.7%	14
Agree		25.4%	15
Undecided		30.5%	18
Disagree		18.6%	11
Strongly disagree		1.7%	1
answered question			59
skipped question			2

Out of 47 respondents that listed an academic field of study, 21% reported Environmental majors/minors including wildlife biology (Appendix B). An additional 13% reported biology majors. In contrast, for the US population age eighteen and over where the highest degree is a bachelor’s degree, “Life Sciences” (including environmental studies, biology, and wildlife biology) represents only 6% of degrees nationally; of those, 82% are white (US Census Bureau, 2004). Not only are a much higher percentage of LEAF alumni choosing “Life Sciences” (34%) and specifically Environmental Studies, but 80% of those students are non-white (Appendix C).

When comparing completed educational levels of alumni with national averages (US Census Bureau, 2009), alumni compare favorably in the Bachelor’s (21% alumni completed bachelor’s degrees as compared to 9% nationally) and Advanced degree (7% intern respondents as compared to 1% nationally) categories (Figure 17). In addition, most (85%) alumni are non-white. Compared to the achievement gap between the non-white and national population, LEAF alumni excel: 21% of alumni completed BA, as compared to 6% nationally (Figure 17).

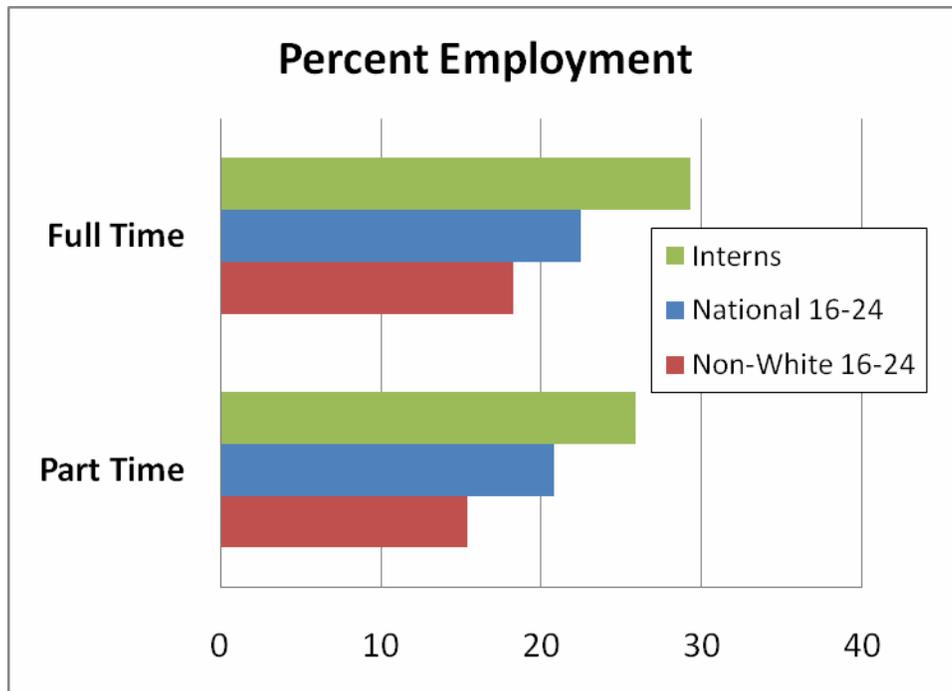
Figure 17. Education levels completed by alumni compared to 18-24 yr olds nationally.



Many of the respondents are likely to still be in college, so employment numbers are relatively low (29% employed full time, 26% part time) but equal to or better as compared national employment rates (22% employed full time, 21% part time) for similar age groups (US BLS 2010; Figure 18). This is particularly true when LEAF respondents (85% non-white, Figure 2) are compared to non-white employment rates nationally (26% LEAF as compared to 15% non-white full time employment; 29% LEAF as compared to 18% non-white part time employment).

***Action item:** Although LEAF alumni are doing well compared to other young people in the job market, unemployment is high for all young job applicants (US BLS, 2011). Successfully engaging and inspiring the next generation of environmental leaders suggests that a role exists for this next wave of trained and motivated diverse environmentalists in the marketplace. Given that alumni are coming from a population that is underrepresented in conservation, they may not be aware of the diverse conservation related career opportunities and pathways available. We recommend placing more emphasis on post-program development of an academic/career path. We suggest that LEAF facilitate more of a direct path or pipeline to employment, either through The Nature Conservancy or through collaboration with other private and public sector organizations.*

Figure 18. Percent of alumni employed as compared to national averages.



LEAF alumni have a much higher rate of employment in environmental organizations than the national average. However, some respondents may have associated the LEAF Program as an environmental job. A third (33.3%) of respondents said they have had or currently have a job in an environmental organization (Figure 19). Contrast this with the national average of environmental jobs for 2008 of 0.06% (SA USA, 2009) and it is clear that alumni are more likely to have experience working for an environmental organization than the population at large.

Many more LEAF alumni have experience with employment in environmental organizations than the population at large. This supports the program objective of engaging urban youth to become environmental leaders.

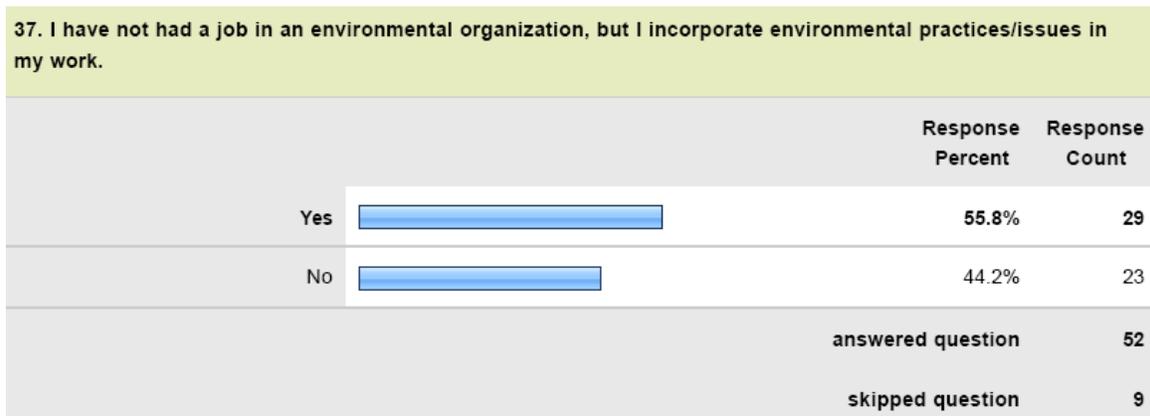
Figure 19. Percent of alumni with experience in an environmental organization.

36. I have had or currently have a job in an environmental organization.			Response Percent	Response Count
Yes			33.3%	19
No			66.7%	38
			answered question	57
			skipped question	4

Over half of respondents (55%) incorporate environmental practices/issues in their work (Figure 20). Given that environmental jobs are a small portion of the job market (0.06% in 2008, US BLS Jan 2009, US BLS 2011) it is much more likely that alumni will be employed at other types of organizations. Successfully incorporating environmental practices/issues at work is a likely and viable way for LEAF alumni to express environmental leadership within their field.

Encouraging alumni to incorporate environmental practices/issues in their work may be a strategic way for LEAF alumni to exhibit environmental leadership within their field.

Figure 20. Alumni incorporate environmental practices/issues in their work.



A substantial percentage (27%) of alumni respondents are currently employed in education-related careers, much more than the national average. (26.9%, Figure 21, are employed in Education, Training, & Library, as opposed to 5.9% in a national sample; SA USA, Table 603). Moreover, because of the ethnic composition of the LEAF program, a large proportion (3/7, 43%) of the LEAF alumni that are now educators are Hispanic (nationally 7.5% are Hispanic). Note that a large proportion of respondents skipped the question (35/61), probably because they are not currently employed and that as a result our sample size is small for this question.

Again, given that environmental jobs are a small portion of the job market (0.06% in 2008, US BLS Jan 2009, US BLS 2011) it is more likely that alumni will be employed in other types of career fields. Entering the field of education may be a good way for LEAF alumni to leverage their experiences, training, and commitment to environmental advocacy to influence many more individuals. Increasing the number of environmentalists of color in mentor roles such as education is likely to attract more urban youth of color to conservation and the environmental movement.

In addition, the next two highest proportions of alumni are currently employed in “Life, Physical, and Social Sciences” and “Business and Financial Operations” with 11.5% of the alumni in each category. The category with the second highest proportion of alumni, of “Life Sciences,” includes jobs in conservation and environmental science.

In addition to environmental jobs, the high percentage of alumni currently employed in education-related careers may increase the ethnic and racial diversity of environmentalist role models and attract more urban youth of color to conservation and the environmental movement. This could multiply the potential impact of individual alumni.

Figure 21. LEAF alumni career fields.

35. I have a job in the following career field:			Response Percent	Response Count
Management		3.8%	1	
Business and financial operations		11.5%	3	
Computer and mathematical		0.0%	0	
Architecture and engineering		3.8%	1	
Life, physical, and social science		11.5%	3	
Community and social services		3.8%	1	
Legal		3.8%	1	
Education, training, and library		26.9%	7	
Arts, design, entertainment, sports, and media		3.8%	1	
Healthcare practitioner and technical		7.7%	2	
Healthcare support		0.0%	0	
Protective service		0.0%	0	
Food preparation and serving related		7.7%	2	
Hosts and hostesses, restaurant, lounge, and coffee shop		3.8%	1	
Building and grounds cleaning and maintenance		0.0%	0	
Personal care and service		3.8%	1	
Sales and related		7.7%	2	
Office and administrative support		0.0%	0	
Farming, fishing, and forestry		0.0%	0	
Construction and extraction		0.0%	0	

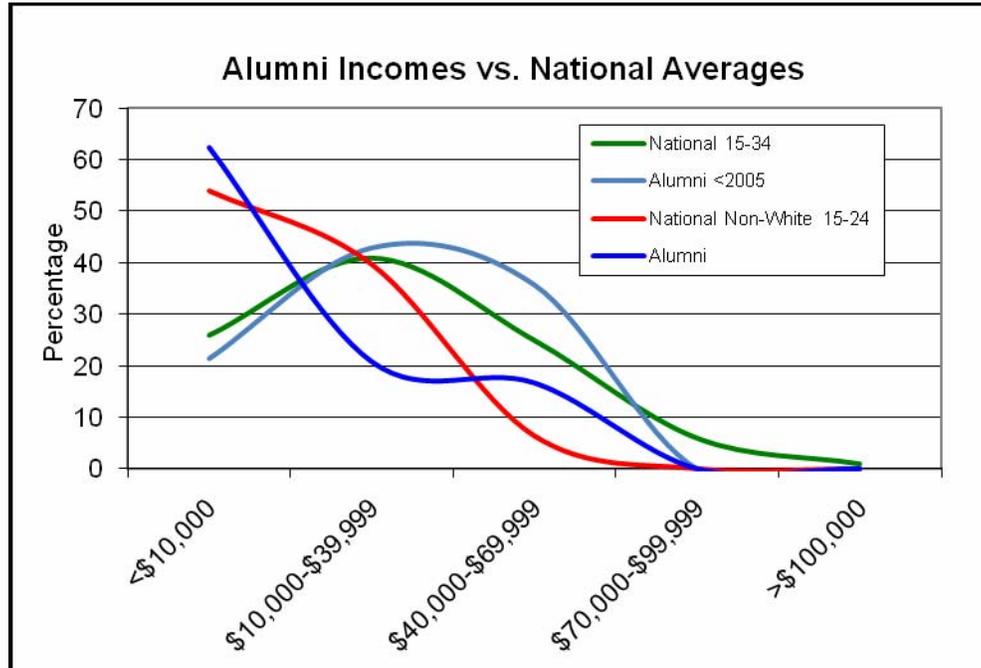
Installation, maintenance, and repair	0.0%	0
Production	0.0%	0
Transportation and material-moving	0.0%	0
Other (please specify)		14
answered question		26
skipped question		35

One measure of career outcome is income level. When comparing reported income levels of LEAF alumni with 2008 national averages for 15-34 year-olds (US Bureau of Labor Statistics, compiled from SA USA Table 701, 2009) alumni compare unfavorably in all categories. There are more alumni at the lowest income and fewer alumni at all higher incomes (Figure 22). However, when comparing alumni with Non-White 15-25 Year-Olds (US Bureau of Labor Statistics, SA USA Table 701, 2009), much of the gap disappears and more LEAF alumni are in a higher earning bracket than the national average (Figure 22). Specifically, more alumni fall into the \$40,000 to \$70,000 income bracket than the national, non-white average.

To further compensate for the fact that most responders were recent alumni (2003 or later, Figure 1), and likely to still be in college or early career, we filtered responses to only those who had been LEAF interns in the year 2004 or earlier. This filtered out all but 14/61 (23%) of responses, a small sample. Notably, these alumni compare favorably to the income distribution of the national 15-34 year-old group, a group including white earners as well as somewhat older earners (though the very highest income levels were not represented). Even among this selection, more alumni fall into the higher, \$40,000 to \$70,000 income, bracket than the national average. In general, LEAF interns seem to be more successfully at attaining higher income employment than their comparable age peers.

LEAF program alumni that are employed earn much higher incomes as compared to the national non-white average. Moreover, LEAF alumni close or surpass the achievement gap in income as compared to the overall national average. LEAF appears to pay off in more success at higher income employment. This indicates success meeting program objectives of increased workplace skills and leadership.

Figure 22. Comparison of LEAF alumni incomes with National Averages.



Section 3: Conservation Support and Environmental Values

The next series of survey questions ask alumni about conservation support and environmental values. These questions deal with the program goals of building long-term interest, awareness and support of environmental issues and conservation. Questions tend to focus on alumni attitudes, opinions, and values relating to conservation and the environment. Where possible, alumni responses are compared to existing survey data from demographic baseline populations.

Figure 23 summarizes questions #41-61, which ask how serious a problem respondents think various environmental factors are along with various current political and social issues. An X is used to indicate the majority of respondents. Almost all of the environmental factors were ranked as “Extremely Serious.” Lack of neighborhood parks, access to public lands, and overfishing were thought to be less serious than other factors (Figure 23). Given that a majority of respondents thought that all except three factors were “Extremely Serious”, we might suggest looking into these factors in a little more detail.

LEAF alumni rank almost all environmental factors as extremely serious among a list of various current issues, consistent with the program goal of long-term environmental awareness and values.

Figure 23. Alumni attitude regarding various environmental, political, and social issues.

Environmental Issue	Extremely serious	Very serious	Somewhat serious	Not serious
A lack of neighborhood parks in your area		X		

Poorly-planned growth and development	X			
Pollution of rivers, lakes and streams	X			
Lack of access to public lands		X		
The economy and unemployment	X			
Loss of habitat for fish and wildlife	X			
Pollution of oceans	X			
A lack of affordable health insurance coverage	X			
Loss of natural areas	X			
Global warming	X			
Toxins and pesticides in our food and drinking water	X			
Too much government spending	X			
The quality of drinking water	X			
Government waste and mismanagement	X			
Damage caused by oil and gas drilling in natural areas	X			
Air pollution and smog	X			
The quality of public education	X			
Inadequate water supplies	X			
Overfishing in oceans		X		
Traffic congestion	X			
Loss of coastal lands, wetlands and marshes	X			

The following table (Figure 24) ranks the Extremely Serious environmental, political and social factors by percentage of respondent replies. National average (Metz et al, 2009) results are included for comparison. There is a great degree of variation between the alumni and the national average in these rankings. Environmental issues that were ranked as extremely serious by the majority of alumni were not ranked as highly in a national survey (Figure 24). For example, loss of natural areas was ranked as extremely serious by 67% of alumni but only 22% of the general public (Figure 24). LEAF alumni tend to rank environmental issues as higher priority as compared to the national average.

Consistent with the program goal of instilling environmental values, LEAF alumni rank environmental issues higher than the national average.

Figure 24. Environmental issues ranked in order of respondent replies.

	Alumni	National
Environmental Issue	% Extremely Serious	% Extremely Serious
Damage caused by oil and gas drilling in natural areas	74	15
Global warming	73	37
Toxins and pesticides in our food and drinking water	73	33
The economy and unemployment	72	82
Pollution of oceans	72	38

Loss of natural areas	67	22
Pollution of rivers, lakes and streams	67	32
Loss of habitat for fish and wildlife	64	29
Government waste and mismanagement	63	61
Air pollution and smog	63	30
The quality of drinking water	62	21
The quality of public education	61	48
Inadequate water supplies	56	30
A lack of affordable health insurance coverage	55	50
Loss of coastal lands, wetlands and marshes	51	19
Too much government spending	46	53
Poorly-planned growth and development	40	34
Traffic congestion	39	29

Taking a closer look at the difference between the opinions of LEAF alumni and the general public produces illuminating results (Figure 25). The differences in values are striking: LEAF alumni feel much more strongly about ecological issues (Figure 25, green shaded) as compared to social issues (Figure 25, blue shaded). The national ranking is exactly the reverse: a much stronger ranking for social issues as compared to ecological issues. These differences in groupings are striking and exclusive: a parsimonious explanation is that the program is highly successful at inculcating environmental opinions.

Results indicate the LEAF program successfully meets objectives of cultivating long-term high level support for environmental and conservation values.

Figure 25. Issues ranked by greatest difference between respondents and national values.

Environmental Problem	% Extremely Serious Difference (Alumni minus National)
Damage caused by oil and gas drilling in natural areas	59
Loss of natural areas	45
The quality of drinking water	41
Toxins and pesticides in our food and drinking water	40
Global warming	36
Loss of habitat for fish and wildlife	35
Pollution of rivers, lakes and streams	35
Pollution of oceans	34
Air pollution and smog	33
Loss of coastal lands, wetlands and marshes	32
Inadequate water supplies	26
The quality of public education	13
Traffic congestion	10
Poorly-planned growth and development	6
A lack of affordable health insurance coverage	5

Government waste and mismanagement	2
Too much government spending	-8
The economy and unemployment	-10

LEAF alumni were asked to rank their agreement with a series of statements regarding conservation and environmental attitude (Figure 26). In each case, the majority of respondents strongly agreed with the statements regarding conservation (Figure 26, shaded cells). In contrast, the majority of alumni did not respond as strongly when asked how well informed they are about environmental issues (59.6% “Agree, Figure 26). Similarly, the majority of alumni did not respond as strongly when asked if they pay a lot of attention to environmental issues as reported by the media (47.4% “Agree”).

***Action item:** Although participants express strong support regarding conservation and environmental attitude, most feel that they could be better informed and pay more attention regarding environmental issues. We recommend the LEAF program cultivate long-term strategies for keeping alumni informed on environmental issues. We further encourage the LEAF program to train participants to become confident and discriminating consumers of media information regarding environmental issues.*

Figure 26. Environmental attitude ranked in order of respondent replies.

Environmental Attitude	Strongly Agree	Agree
Humans have a responsibility to protect nature and the environment.	87.5	
We should have more city parks and other urban green spaces.	76.4	
We should have more State Parks, National Parks, National Forests, National Seashores and other protected nature spaces.	73.7	
Humans are severely abusing the environment.	52.7	
I am well informed about environmental issues.		59.6
I pay a lot of attention to environmental issues as reported by the media, (including internet, radio, TV, newspapers, and magazines)		47.4

Section 4: Environmental Behavior, Advocacy and Activism

The final series of survey questions ask alumni about environmental activism, advocacy and behavior. These questions evaluate whether alumni take action consistent with environmental values. Questions tend to focus on alumni actions and behaviors. Where possible, alumni responses are compared to existing survey data from demographic baseline populations.

Respondents were asked questions regarding behavior consistent with environmental values. For example, many alumni (87.7% “Always” or “Usually”) recycle (Figure 27).

Figure 27. Environmental behavior: recycling.

69. I recycle glass, paper, and/or aluminum cans.			Response Percent	Response Count
Always			50.9%	29
Usually			36.8%	21
Sometimes			12.3%	7
Never			0.0%	0
answered question				57
skipped question				4

In a series of questions on environmental behavior LEAF alumni scored as well or better than the public for most measures of environmental behavior (Figure 28). Almost all LEAF program alumni have spent time in city parks within the last year (95%) and a higher proportion of alumni (86%) visit state/local parks than the national average (81%, Figure 28). Alumni go hiking much more frequently (72%) than overnight camping (36%, Figure 28). LEAF alumni hike remarkably more frequently (72%) than their peers (12%) age 18 to 24 (Outdoor Foundation, 2010). Nationally, participation in outdoor activities tends to peak at age 15 and decline sharply into young adulthood, continuing to decline more gradually after that (Outdoor Foundation, 2010). In contrast, LEAF alumni seem to be maintaining high levels of outdoor participation.

In addition to outdoor time in parks, LEAF alumni are also much more likely to garden vegetables (43%, Figure 28) than the national average (23%, SA USA table 1205, 2009) as well as more likely to garden flowers (45%, Figure 28) than the national average (32%, SA USA table 1205, 2009).

More than half (54%) of alumni have taken part in an environmental activity in their community in the past year. Similarly, more than half of alumni (52%) volunteered their time for an environmental organization over the past year, more than twice as many (22% in 2010 age 16-24) as the national average (US BLS, Table 1 2010; Figure 28). In particular, volunteers for environmental organizations make up only a small percentage (3.3% in 2010 for age 16-24) of the national average; even less so for Hispanic volunteers (1.4%) and African-American volunteers (0.5%) nationally (US BLS, Table 4 2010). LEAF alumni volunteer their time for environmental organizations at more than ten times the national average rate.

Alumni lag behind the national average (16% compared to 36%, Figure 28) in donating money to environmental organizations. This is at least partially because most are recent graduates and not making much money yet; it may also be because they have yet to pass the 11-12 year time lag from peak of hiking/backpacking and peak donation (Zaradic et al. 2009).

As might be expected in highly urban setting, very few alumni hunt (1.8%), even less than the national average (3%); however even fewer alumni fish (0% alumni have fishing licenses) as compared to the national average (16%, Figure 28).

LEAF program alumni exhibit behavior consistent with environmental values and at rates equal to or higher than the general public for most measures of environmental behavior. LEAF program alumni spend time outdoors in parks as well as backyard gardens at rates higher than the national average. More than twice as many alumni volunteer their time to environmental organizations as compared to the national average for all organizations. LEAF alumni volunteer for environmental organizations at more than ten times the national average rate. Results strongly suggest that the LEAF program meets long-term goals of cultivating a body of diverse urban alumni with long-term environmental values.

***Action item:** Some of the behavioral indicators, such as travel to National Parks and donations to environmental organizations are likely to increase as alumni progress to peak earnings and pass the 11-12 year time lag from peak of hiking/backpacking and peak donation (Zaradic et al. 2009). In the meantime we recommend the LEAF program encourage the idea of volunteering time and reinforce the value of volunteering and philanthropy as time and funds become available to alumni.*

Figure 28. Environmental behavior: Outdoor recreation.

Question	Alumni	National
	Yes	Yes
I have taken part in an environmental activity (for example: beach/park cleanup, community garden, or tree planting) in my community in the last year.	54	
In the last year have you visited a national park? A national park is a large park maintained by the federal government, rather than a state or local park	47	52
In the last year have you visited a state or local park?	86	81
In the last year have you visited a city park?	95	
In the last year have you gone hiking or backpacking?	72	12
In the last year have you gone overnight camping?	36	
In the last year have you participated in vegetable gardening (either at home or in a community garden)?	43	23
In the last year have you participated in flower gardening (either at home or in a community garden)?	45	32
In the last year have you volunteered your time in support of an environmental organization?	52	3
In the last year have you donated money to an environmental organization?	16	36
I have had a hunting license in the past three years.	2	3
I have had a fishing license in the past three years.	0	16

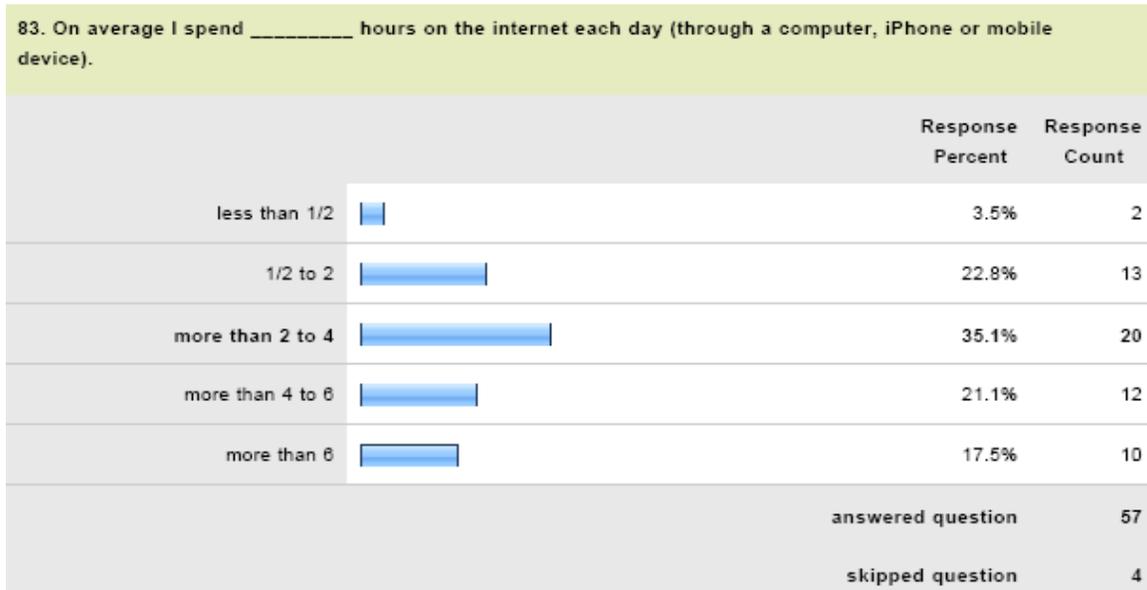
In addition to tracking environmental behavior, alumni were asked about the amount of recreation time spent on electronic media as compared to time spent outdoors. The majority of

respondents (35.1%) used the internet 2-4 hours/day (Figure 29, Question 83). This is a substantial daily dose of electronic media. The majority of respondents (75.4%) spent less than a half hour a day playing video games (Figure 29, Question 84). This is almost identical to the 2010 national average for playing video games of 0.35 hours/day (SAUSA Table 1094). The majority of respondents (42.1%, Figure 29, Question 85) spent less than a half hour watching TV per day, much less time than the national average of 4.4 hours/day (SAUSA Table 1094, 2010). The 2010 national average for watching TV was 4.4 hours/day (SAUSA Table 1094).

In contrast to the time spent with electronic media, respondents averaged 2-4 hours/day outside, a substantial daily dose, equivalent to the time spent on the internet. (Figure 29, Question 86). LEAF alumni spend much more time (2-4 hours/day) outdoors compared to their peers (1-2 visits outings/week for 18 to 24 year olds) nationally; further, friends among that age group play a major influence on outdoor participation (Outdoor Foundation, 2010).

LEAF alumni report spending a substantial amount of daily time outdoors, in balance with daily time reported on the internet and close to the overall time spent daily on electronic media. Results suggest that alumni continue to spend daily leisure time outdoors at rates much higher than the national average. Moreover, LEAF alumni can play a compelling role in influencing their peers to spend more time outdoors.

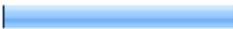
Figure 29. Recreation behavior: videophilia/electronic vs outdoors. (Questions 83-86)

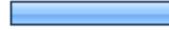


84. On average I spend _____ hours playing video games each day (on a computer, iPhone, or mobile device).

		Response Percent	Response Count
less than 1/2		75.4%	43
1/2 to 2		15.8%	9
more than 2 to 4		7.0%	4
more than 4 to 6		0.0%	0
more than 6		1.8%	1
answered question			57
skipped question			4

85. On average I spend _____ hours watching TV each day.

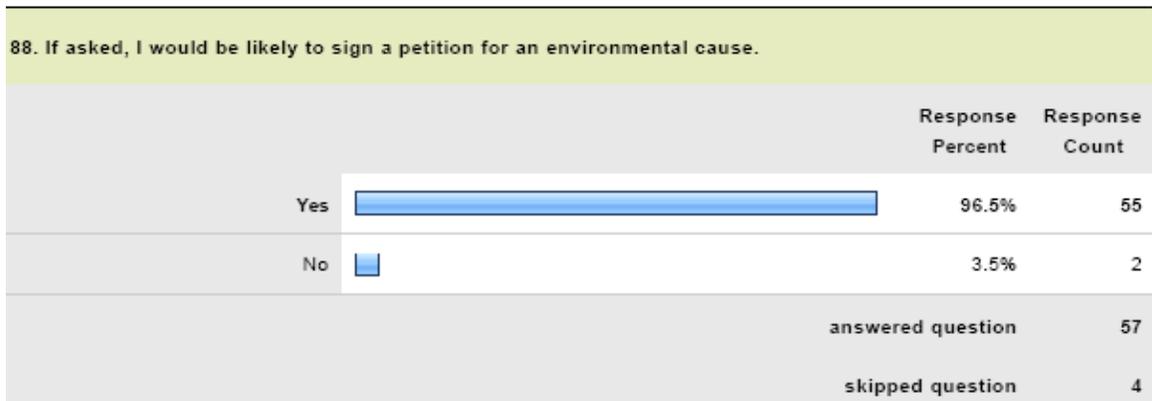
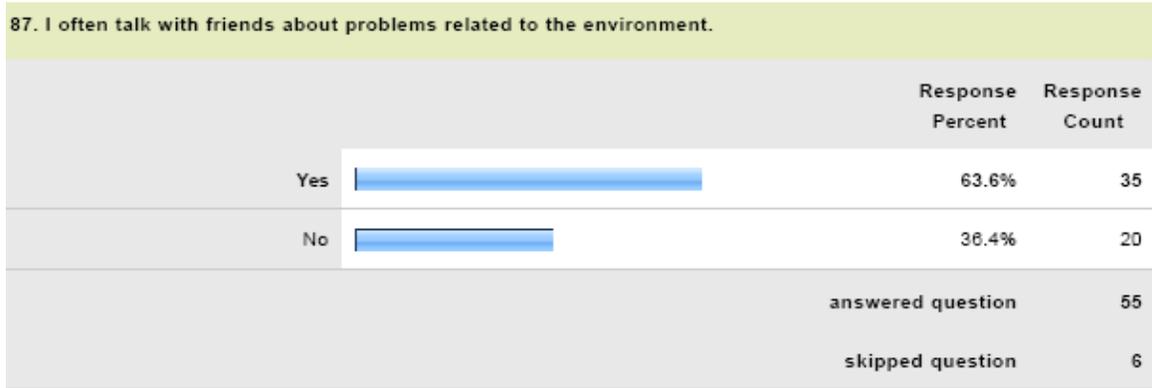
		Response Percent	Response Count
less than 1/2		42.1%	24
1/2 to 2		33.3%	19
more than 2 to 4		14.0%	8
more than 4 to 6		8.8%	5
more than 6		1.8%	1
answered question			57
skipped question			4

86. On average, I spend _____ hours outdoors each day.			Response Percent	Response Count
less than 1/2			1.8%	1
1/2 to 2			29.8%	17
more than 2 to 4			24.6%	14
more than 4 to 6			29.8%	17
more than 6			14.0%	8
			answered question	57
			skipped question	4

Alumni were asked about environmental advocacy and activism - taking a stand for environmental issues. The overwhelming majority of respondents report taking environmental advocacy roles with peers and in their community (Figure 30). The majority of respondents report talking with friends (63.6%) about problems relating to the environment (Figure 30, Question 87). Almost all the respondents (96.5%) would be likely to sign a petition for an environmental cause (Figure 30, Question 88). Almost all respondents (91.2%) have pointed out to someone his or her un-ecological behavior (Figure 30, Question 89). The large majority (69.6%) of respondents feel that their environmental activities have changed the behavior of others (Figure 30, Question 90). The great majority (72.2%) of respondents consider themselves to be environmentalists (Figure 30, Question 91).

LEAF alumni take a stand for environmental issues with their peers and in their communities. Alumni feel that their environmental activities change the behavior of others, and not surprisingly most define themselves as environmentalists. The LEAF program excels at meeting the objective of encouraging ethnically diverse urban youth to become environmental advocates with their peers and in their communities.

Figure 30. Environmental advocacy. (Questions 87-91)



89. In the past, I have pointed out to someone his or her un-ecological behavior.			
		Response Percent	Response Count
Yes		91.2%	52
No		8.8%	5
answered question			57
skipped question			4

90. My environmental activities have changed the behaviors of others.			
		Response Percent	Response Count
Yes		69.6%	39
No		30.4%	17
answered question			56
skipped question			5

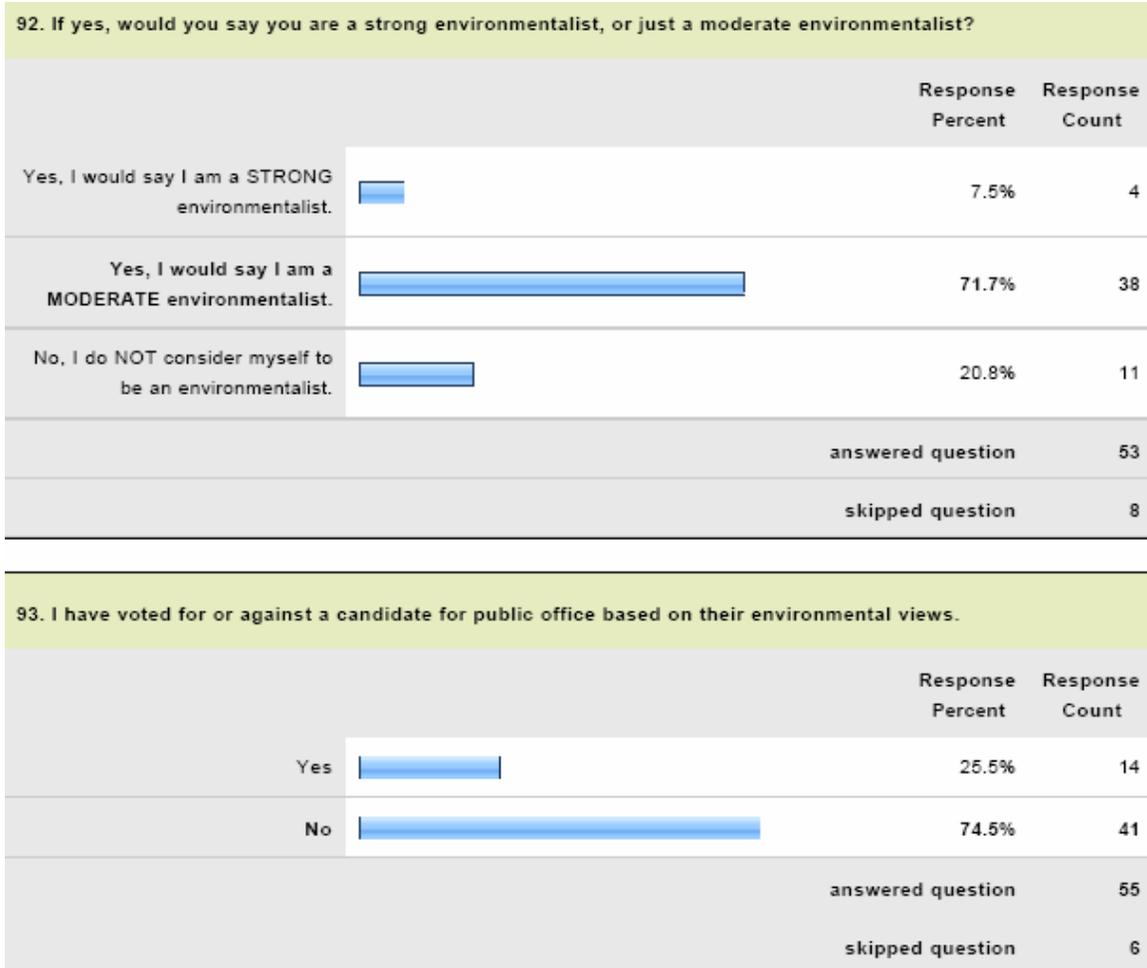
91. Do you consider yourself to be an environmentalist?			
		Response Percent	Response Count
Yes		72.2%	39
No		27.8%	15
answered question			54
skipped question			7

Participants were then asked to classify themselves in more of a political context. Perhaps surprisingly most alumni respondents (71.7%) classified themselves as only “Moderate” environmentalists and very few (7.5%) classified themselves as “Strong” environmentalists (Figure 31, Question 92) . Even more surprising, the majority of respondents (74.5%) do not seem to use their right to vote as a tool for environmental change (Figure 31, Question 93).

Action item: *Although the LEAF program has fulfilled its goals of cultivating participants’ identity as environmentalists and role as advocates within their peer group and community, that identity does not seem to transfer as powerfully to the political arena. We recommend LEAF*

advance participants' knowledge of the political process; empower alumni to register and make sure alumni are aware that they can use their right to vote as a tool for environmental change.

Figure 31. Environment and politics. (Questions 92-93)

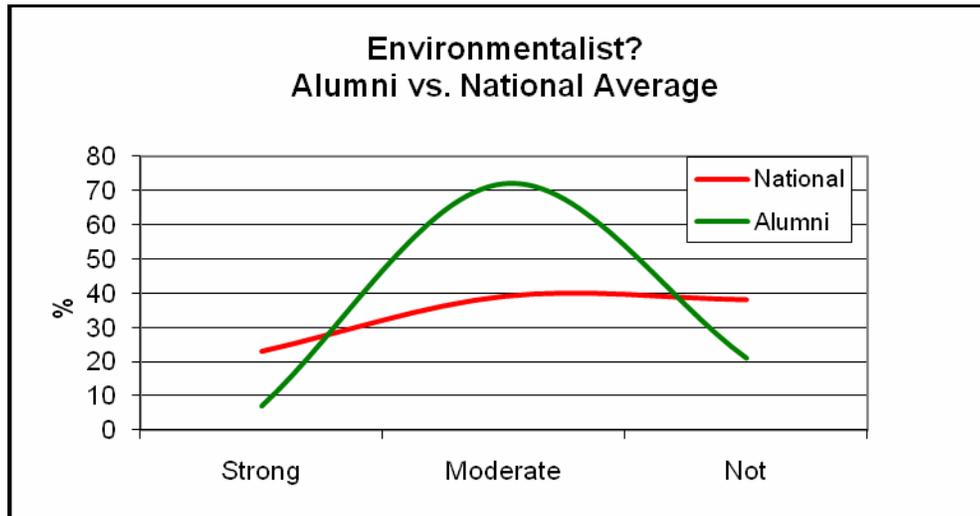


Fewer alumni (7%) identify themselves as “Strong Environmentalists” than the national (23%) average (Metz et al, 2009), (Figure 32). This may be because participants are drawn from a demographic that is underrepresented in the environmental movement; an identity gap remains between how the participants view themselves and their perception of what it means to be a strong environmentalist in the broader political and cultural context

Action item: LEAF alumni have the conservation values and community advocacy behaviors consistent with “Strong Environmentalists” however there remains a perception gap in alumni envisioning themselves as strong environmentalists. We recommend the program more proactively address the impressions students have of what it means to be an environmentalist in the broader political and cultural context. For effective outreach, conservation groups may want to invest more effort to understand the issues of communities of color as it relates to perceptions of environmentalism. There may be a monolithic image around environmental activism

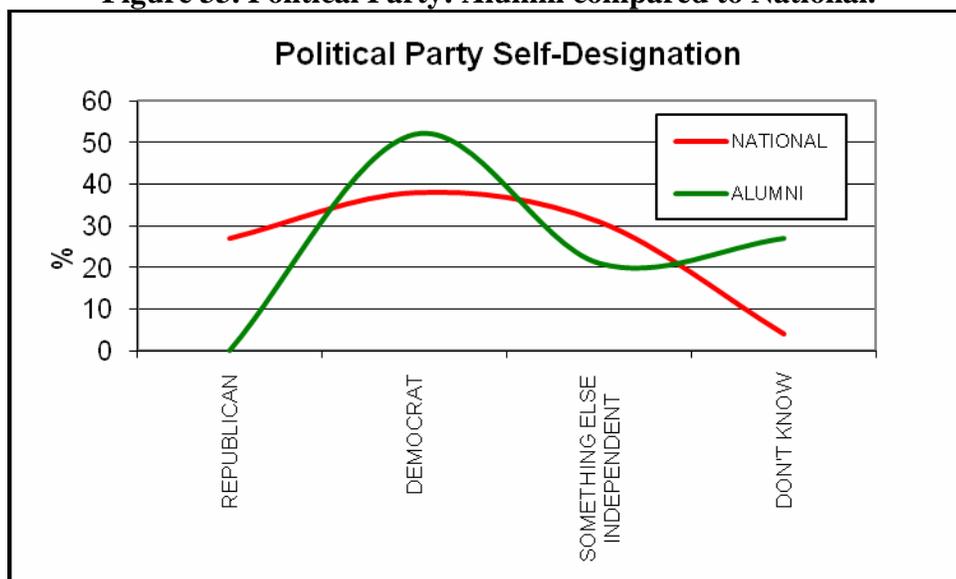
perpetuated by the marketing and programming of many mainstream environmental groups. We also suggest that as the LEAF program expands nationally, alumni are empowered to partner across schools and engage in environmental advocacy at a national level, by that very process redefining the role of strong environmentalists to include themselves.

Figure 32. Self identify as “Environmentalist:” Alumni compared to National.



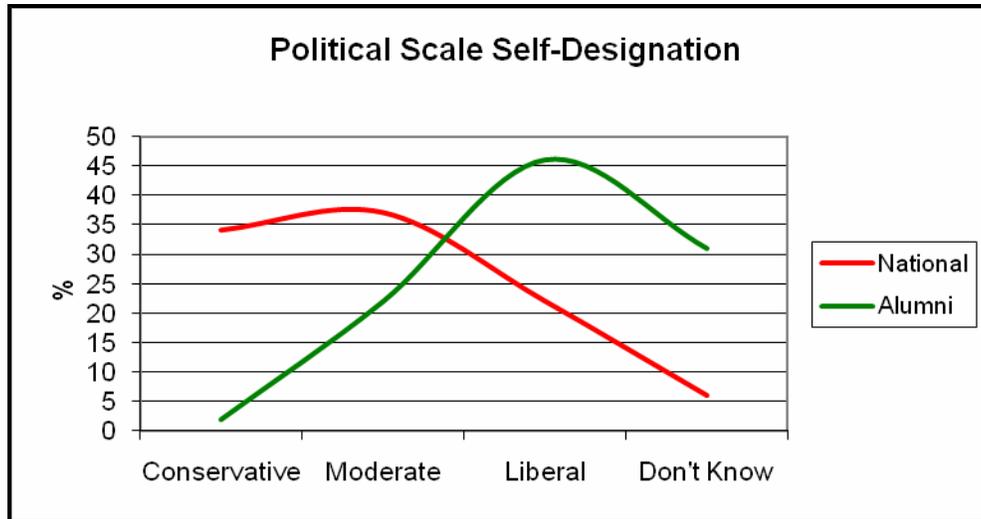
When asked about political party designation, respondents were much more likely to be Democrats (52%) and unlikely to be Republicans (0%) than the national average (Nationally Democrats 38%, Republications 27%, Metz et al, 2009, Figure 33). Consistent with responses suggesting alumni felt less connected to a political identity, alumni were less likely to have a political self-designation (27% “Don’t Know”) as compared to the national average (4% “Don’t Know,” Figure 33).

Figure 33. Political Party: Alumni compared to National.



Further, when asked choose on a political scale, very few respondents identified themselves as “Conservatives” (2%) as compared to the national average (34%, Metz et al, 2009, Figure 34). Respondents identified themselves as predominantly “Liberal” (46%), more so than the national average (22%, Figure 34). Strikingly, many alumni chose “Don’t Know” (31%), almost twice the national average (16% “Don’t Know,” Figure 34).

Figure 34. Political Scale: Alumni compared to National.



These last two sets of responses seem to reinforce results from previous questions indicating that many participants do not strongly identify with the political process. While participants do have environmental attitudes, values and opinions and do advocate within their communities, many seem less politically informed or active.

Action item: We recommend the LEAF program provide more opportunities for alumni to act as advocates outside of their peer community. We further suggest the program support alumni in having a political voice, and reinforce the idea that voting and political activism are cogent tools for environmental change.

Findings and Interpretation

The goal of the LEAF program is to help urban youth gain critical life, school and workplace skills; provide sustained exposure to nature; support students pursuing higher education opportunities and career paths in environmental fields; create a passion for nature; and empower a diverse population of future environmental leaders.

LEAF program goals were translated into a set of short and long-term program objectives: acquisition of nature stewardship skills; acquisition of life, school and workplace skills; improved academic outcomes and career track; long-term commitment to conservation support; life-long environmental values; and environmental activism.

The LEAF program successfully achieves its stated goals, particularly in the area of conservation support, environmental values and community level environmental activism. Results are described below each objective.

Program Diversity

The program is successfully targeting the intended audience. The large majority (85%) of alumni respondents were non-European-American/White, and included ethnic and racial groups underrepresented in the conservation community. Moreover, participants had little prior extended outdoor experience; for almost all of the participants, the LEAF program represented the first sustained exposure to nature.

Nature Stewardship and Life Skills

Sustained exposure to nature, particularly with a mentor is one of the fundamental experiences thought to lead to long-term conservation support and environmental activism, a key program goal. In addition, allowing the alumni to perceive themselves as having a positive impact on the environment encouraged alumni to gain confidence in pursuing environmental and personal goals beyond the summer program. Alumni expressed a sense of empowerment from the LEAF experience: self-reliance, self-initiative, and confidence.

Mentors and program staff succeeded in creating a supportive environment for primarily urban based youth to adapt to living and working in a nature-based environment. Further, mentors and program staff successfully supported teambuilding and a sense of community among the alumni. Alumni learned to work collaboratively with diverse constituents and gained social skills, work skills and life skills throughout the program.

Alumni gained stewardship skills and learned about specific plants and animals; they felt relaxed and at peace immersed in nature. Alumni expressed greater interest in environmental issues and a greater awareness of conservation career paths from the experience.

Action item: More attention could be placed on developing the alumni public speaking skills.

Academic Outcomes and Career Track

Most alumni went straight to college. A third (33.3%) of respondents said they have had or currently have a job in an environmental organization (Figure 19). Contrast this with the national average of environmental jobs for 2008 of 0.06% (SA USA, 2009) and it is clear that alumni are more likely to have experience working for an environmental organization than the population at large. This experience supports the program objective of engaging urban youth to become environmental leaders.

The high percentage of alumni in education-related careers may increase the ethnic and racial diversity of environmentalist role models to attract more urban youth to conservation and the environmental movement. This would support program goals of increasing the diversity of conservation supporters and would magnify the potential impact of individual alumni. Over half of respondents (55%) incorporate environmental practices/issues in their work (Figure 20); encouraging alumni to do so regardless of career choice is a strategic way for LEAF magnify the impact of the program.

LEAF program alumni that are employed earn markedly higher incomes as compared to national non-white averages. LEAF appears to pay off in more success at attaining higher income employment.

Action item: Respondents may need more support making a connection to the colleges visited - either better tailoring visits or during the application process.

Action Item: We recommend pre-program, post-program, and post-graduate surveys of academic choice of study to better evaluate impact on academic major.

Action item: We recommend placing more emphasis on post-program development of an academic/career path. We suggest that LEAF facilitate more of a direct path or pipeline to employment, either through TNC or through collaboration with other private and public sector organizations.

Conservation Support and Environmental Values

LEAF alumni are aware of and rank almost all environmental factors as extremely serious among a list of various current issues. Moreover, LEAF alumni place even greater value on environmental issues, ranking them higher in priority as compared to the national average. For example, 73% of alumni rank “global warming” as a “extremely serious” as compared to 37% across the nation. Similarly, 67% of alumni rank “loss of natural areas” as “extremely serious” compared to 22% nationally (Figure 25). Results indicate the LEAF program successfully meets objectives of cultivating long-term and high level support for environmental and conservation values.

Action item: We recommend the LEAF program cultivate long-term strategies for keeping alumni informed on environmental issues and train alumni to become confident and discriminating consumers of media information regarding the environment.

Environmental Behavior, Advocacy and Activism

LEAF program alumni exhibit behavior consistent with environmental values and at rates equal to or higher than the general public for most measures of environmental behavior. LEAF program alumni spend time outdoors in parks, hiking, and in backyard gardens at rates well above than the national average.

LEAF alumni volunteer their time to environmental organizations at over ten times the national average rate. Results strongly suggest that the LEAF program meets long-term goals of cultivating a body of diverse urban youth with long-term conservation support and environmental values.

Alumni spend substantial daily leisure time outdoors as compared to peers, in balance with daily time reported on the internet and close to the overall time spent daily on electronic media.

LEAF alumni take a stand for environmental issues with their peers and in their communities. Alumni feel that their environmental activities change the behavior of others, and not

surprisingly most define themselves as environmentalists. The LEAF program excels at meeting the objective of encouraging ethnically diverse urban youth to become environmental advocates with their peers and in their communities.

Action item: *We recommend the LEAF program continue to reinforce the value of volunteering and philanthropy as time and funds become available to alumni.*

Action item: *Although the LEAF program has fulfilled its goals of cultivating participants' identity as environmentalists and role as advocates within their peer group and community, that identity does not seem to transfer as powerfully to the political arena. We recommend LEAF advance participants' knowledge of the political process; empower alumni to register and make sure alumni are aware that they can use their right to vote as a tool for environmental change.*

Action item: *We recommend the program more proactively address the preconceived perceptions and misconceptions students may have of what it means to be an environmentalist in the broader political arena, such that alumni can more readily identify themselves in the role of environmental leaders. We also suggest that as the LEAF program expands nationally, alumni are empowered to partner across schools and engage in environmental advocacy at a national level; by that very process redefining environmental leadership to include themselves.*

Action item: *We recommend the LEAF program provide more opportunities for alumni to act as advocates outside of their peer community. We further suggest the program support these young, motivated, diverse environmentalists in having a political voice, and reinforce the idea that voting and political activism are cogent tools for environmental change.*

Implications

Currently, conservation support depends primarily on a very narrow group of relatively elite outdoor enthusiasts: overwhelmingly European-American, mostly college educated, higher income, over 35, former backpackers and hikers, 11-12 years after their peak of outdoor participation (Zaradic, Pergams, Kareiva 2009). Given the trends of increasing US population diversity, urbanization, and economic and cultural changes, this narrow base of conservation supporters is likely to become even narrower (Zaradic, Pergams, Kareiva 2009). By 2042 the non-white population in the US is predicted to become the majority of the population. Today's young people are leading this demographic shift, i.e. 40% of US youth age 25 and younger are non-white, 44% of youth age 18 and younger are non-white, and 50% of children age 5 and younger are non-white (US Census 2010). Nationally and globally, the future of The Nature Conservancy and the field of conservation will depend on the support of this coming generation to meet its conservation goals. To avoid becoming marginalized, the conservation movement will need to diversify its outreach strategy and engage these constituencies.

The LEAF program targets young people characteristic of the growing demographic shift in diversity, and at a young adult age during which outdoor participation tends to decline sharply (Outdoor Recreation 2010). These primarily (85%) non-white participants and alumni represent the future leaders and environmentalists which will be needed to support global conservation goals. Spending sustained time in nature, particularly with a mentor, is thought to be one of the foundations for nurturing the types of environmental attitudes and values leading to long term

conservation support (Bögeholz 2006, Lang 2006, Wells and Lekies 2006, Zaradic and Pergams 2007). The sustained experience of the LEAF partnership model, which combines what students are learning in environmental high schools with real world experience in the field, seems to create just such an environmental foundation (Bailey, Hughes, Moore 2004, Rickinson et al. 2004) for its alumni. LEAF graduates are outdoor enthusiasts, environmental advocates and volunteers; and they influence their peers and community. As Louv suggests, "place-based education increases students' sense of stewardship and environmental consciousness and adds to their sense of attachment to place" (Louv 2006).

LEAF alumni depart the program college bound and many choose environmental majors. Consistent with successfully youth development programs, the strengths and skills gained at each step of the process accumulate to produce improved academic and career outcomes (Bailey, Hughes, Moore 2004, Sum 2008). Alumni leverage their gained life, academic, and work experiences to attain professional careers; LEAF pays off in a higher proportion of better paying jobs attained by alumni.

Although alumni are doing well, the LEAF program could develop partnerships with other organizations to facilitate a more direct conservation career pathway following the high school experience. Given their environmental values and local advocacy, LEAF participants and alumni should be encouraged to present their views and experiences in a more public forum. Perhaps as the program expands, these young, motivated, diverse environmentalists from environmental high schools across the country can work together to engage in environmental and conservation advocacy at a national level. After all, ultimately, the fate of biodiversity and intact ecosystems may depend less on rates of habitat loss or invasive species, than on public perception of whether conservation should be supported at all.

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Sorted with Environmental responses first, Biology next, followed alphabetically by all other.

Q. If you attended college, what was your major/ minor?

Biology/ Environmental Science and Policy
Civil Engineering, Environmental Studies Minor
Environmental Science
Environmental Science and Policy, BA/Sustainable Development, MA
Environmental Studies
Environmental Studies
Environmental Studies
Environmental Studies
Environmental Studies
Wildlife Biology
Biological Sciences/Medicine
Biology
Biology
Biology
Biology
Intending on Biology
Bachelor in Childhood Education
Cartooning
Communication Arts
Contract Major: African and Middle Eastern Studies
Double major, Sociology & English
Double major: Spanish and Sociology
English Major and Psychology Minor
Forensic Science
Forensic Science
French language
History, Chinese Language and Culture Studies
Industrial & Labor Relations
Information Management and Technology
Liberal arts
major: chemistry, minor: English
Media and Cultural Studies
Pharmacology
Pharmacy
Physical Therapy
Political Science
Pre-professional (in Health Sciences)
Psychology
Psychology
psychology/criminal justice
Public Relations
sociology
Sociology
Sports Management
Undecided
Veterinary Technology
Writing and Literature

Heritage and Current Academic Status of Environmental and Biology majors/minors.

Out of 47 students, 10 (21%) reported Environmental majors/minors including wildlife biology. Another 6 students (13%) reported biology majors.

In contrast, for the US population age eighteen and over where the highest degree is a bachelor’s degree, “Life Sciences” (including environmental studies, biology, and wildlife biology) represents only 6% of Bachelor’s degrees nationally; of those, 82% are white.² Not only are a much higher percentage of LEAF alumni choosing “Life Sciences” and specifically Environmental Studies, but 80% of those students are non-white.

<i>Heritage</i>	<i>Major</i>	<i>Current Status</i>
Asian	Environmental Science	High School
Asian	Environmental Studies	Some college
Hispanic	Environmental Studies	Some college
Hispanic	Environmental Studies	Some college
Hispanic	Environmental Studies	Some college
Hispanic	Wildlife Biology	Some college
Asian	Civil Engineering, Environmental Studies Minor	Graduated college
White	Biology/ Environmental Science and Policy	Graduated college
Hispanic	Environmental Studies	Graduate school
White	Environmental Science and Policy, BA/Sustainable Development, MA	Graduate school
Asian	Biology	High School
Hispanic	Biology	High School
Other	Biology	High School
Black	Biology	Some college
Black	Intending on Biology	Some college
White	Biological Sciences/Medicine	Graduate school

² Source: US Census Bureau, Survey of Income and Program Participation, 2004 Panel. TABLE 3C. Bachelor's Degree Field by Sex, Race and Hispanic Origin, and Age, 2004 <http://www.census.gov/hhes/socdemo/education/data/sipp/2004/tables.html>