

Women and Minorities in Ecology II

(WAMIE II)

Committee Report

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EXECUTIVE SUMMARY

In its 1993 report, the Women and Minorities in Ecology (WAMIE) Committee developed a vision for the Ecological Society of America (ESA): “To achieve a population of ecologists that reflects the gender and cultural diversity of the general population of the United States.” Ten years later, a new Women and Minorities in Ecology Committee (WAMIE II) was formed to assess the progress made toward implementing the original report’s recommendations.

Since the first WAMIE report was published, ESA has made significant progress in several areas. Most notable was the addition of an Education Section to implement WAMIE I recommendations. An important achievement under the direction of ESA’s Education Section was the creation of the Strategies in Ecology Education, Development, and Sustainability (SEEDS) program. Through SEEDS, ESA has seen an increase in the participation of underrepresented undergraduate students at ESA meetings, and SEEDS mentoring activities, field trips, Chapters, and outreach efforts have been instrumental in developing interest in ecology among minority undergraduate students.

Other recommendations implemented by ESA include: the addition of childcare at ESA meetings, the creation of the Education and Human Resources Committee (EHRC), the publication of *Frontiers in Ecology and the Environment* as a potential venue for articles on education and women and minority issues, the development of a new ESA award to recognize teaching and mentoring in ecology, the sponsorship of diversity mixers and diversity luncheons at ESA Annual Meetings, and the diversification of its Profile of Ecologists series.

In this report, prepared by the WAMIE II Committee, we review recommendations made in the original WAMIE report, present an overview of actions taken to date, and make specific recommendations in each area. We also analyze demographic trends in the United States to determine how ESA membership compares to the general population of the US. Our preliminary findings indicate that there continues to be a serious under-representation of women and minorities in ecology.

We also recognize that diversity issues should be integrated within the larger vision of ESA. Critical and emerging issues should be taken into account in ESA’s future plans, including actions that will promote the relevance of ecology to address local ecological and environmental justice issues. Attention must also be paid to fostering retention of graduate students, post-docs and young professionals, broadening the career horizons of ecologists beyond academic positions, and developing leadership skills including communicating science to a broad audience. Diversity issues encompass more than gender, race, and ethnicity, and another group that must be

considered in future plans is ecologists with disabilities; this sector of the population was left out of WAMIE I, and we cannot let the same omission occur again. We have chosen not to address it in detail this time, although we recognize that parallel issues exist in many cases and there are many other characteristics that constitute diversity.

This report makes several concrete recommendations that can be implemented immediately. It also makes two major recommendations for developing future plans:

1. Organize a workshop with a larger representation of ESA members to develop an action plan for the next decade and beyond in the context of the Ecological Visions report.
2. Conduct a new survey of ESA members by a professional organization in consultation with the WAMIE II committee. It is only with accurate data that we can truly learn how much ESA has advanced towards its vision of achieving a society that mirrors the general population of the United States.

INTRODUCTION

In the last decade of the 20th century, the Ecological Society of America published two significant documents: “The Sustainable Biosphere Initiative” (SBI) (Lubchenco et al. 1991) and the Women and Minorities in Ecology (WAMIE) report, *Mechanisms to Increase Recruitment and Retention of Women and Under-represented Groups in Ecology* (Bentley et al. 1993). These two reports created awareness within the Society, served to communicate ESA goals to a larger community of scientists, policy makers, educators, and citizens, and recommended that the Society engage its membership in contributing to solutions for important societal issues.

In 2002, the ESA Governing Board formed the Ecological Visions Committee to address major ecological challenges such as overpopulation and strong influences of humans on their surrounding environment and to increase the contribution of ecological sciences in the coming decades. The Committee’s report, *Ecological Science and Sustainability for a Crowded Planet: 21st Century Vision and Action Plan for the Ecological Society of America* (Palmer et al. 2004), emphasizes the need to stimulate cultural changes in the ecological sciences and calls for transforming the culture of ecology to promote rather than hinder collaborations, partnerships, and diversity.

Concurrently, ESA’s Education and Human Resources Committee (EHRC) embarked on an assessment of the 1993 Women and Minorities in Ecology report to evaluate where ESA is situated and to determine how to proceed in the future with regard to women, minorities, and other underrepresented groups in ecology. The EHRC considered this assessment necessary to determine how much ESA had advanced towards the WAMIE I goal of “achieving a population of ecologists that reflects the gender and cultural diversity of the general population of the United States of America.”

The first WAMIE Committee was organized to respond to the publication of *Profiles of Ecologists: Results of a Survey of the Membership of the Ecological Society of America* (Holland et al. 1992). *Profiles* documented that, like many professional scientific organizations, women and minorities were significantly underrepresented within the ESA membership. At that time, out of US respondents, 25% of the ESA membership were women and 4.1 % were minorities; when looking at total membership, 5.9% of all members identified themselves as a minority. This 1992 poll also highlighted two broad trends: 1) women were more likely than men to leave the field of ecology, and 2) ethnic minorities were not being recruited into the Society in any appreciable numbers. Responding to these trends, the ESA Executive Committee commissioned a Strategic

Planning Workshop to provide guidance to the Society in promoting increased recruitment, retention, and recognition of women and minorities in the field of ecology.

Since the publication of WAMIE I, diversity issues have gained considerable prominence within the Society. After a decade of effort, the time is right to assess the extent to which the increased attention has led to real changes in the education, recruitment, retention, and advancement of women and minorities in ESA. In 2000, the ESA Ad Hoc Task Force on Membership conducted a survey to determine the status and needs of the ESA membership. The resulting report (Chazdon 2001) assessed many aspects of the ESA membership, but unfortunately no information on ethnicity was included in the survey. The membership survey thus offers no useful information for evaluation of progress toward diversity goals. The most recently available membership demographics can be gleaned from membership subscription forms, although members are not required to supply information on gender and ethnicity. In the 2003 ESA Annual Report, 26% of the membership is identified as female. Regarding ethnicity, membership subscription forms over the past 6 years indicate a slight increase in minority participation in the membership from a total of 6.3% in 1999 to 8.8% in 2005.

Table 1. Ethnicity as reported on ESA membership subscription forms from 1999 – 2005

Year	Total	White		Asian		Hispanic		Black		Native American		Other/ Un reported	Total % Minorities
2005	9264	6877	74.23%	386	4.17%	323	3.49%	74	0.80%	30	0.32%	1574	8.78%
2004	8718	6497	74.52%	353	4.05%	266	3.05%	59	0.68%	10	0.11%	1533	7.89%
2003	8116	6055	74.61%	315	3.88%	261	3.22%	51	0.63%	10	0.12%	1424	7.85%
2002	7834	5442	69.47%	280	3.57%	212	2.71%	32	0.41%	10	0.13%	1858	6.82%
2001	7833	5397	68.90%	280	3.57%	203	2.59%	31	0.40%	12	0.15%	1910	6.72%
2000	7807	5248	67.22%	252	3.23%	184	2.36%	30	0.38%	12	0.15%	2081	6.12%
1999	7713	5477	71.01%	264	3.42%	184	2.39%	26	0.34%	14	0.18%	1748	6.33%

The Education and Human Resources Committee, chaired by Carol Brewer, elected to assess the outcomes of the WAMIE I report and the impact of its recommendations. A WAMIE II Committee was formed under the leadership of Sonia Ortega. The WAMIE II Committee was charged with two responsibilities: 1) revisit the recommendations of the first WAMIE report to determine the extent to which they have been implemented in ESA policy and programs by studying available data on programs, policies, and membership demographics, and 2) advance new recommendations toward the continuing goal of increasing the participation of women and minorities in ecology based on past progress, and prioritizing recommendations in light of current circumstances and unmet needs. This document reports on their findings and recommendations.

DEMOGRAPHICS

The WAMIE I report highlighted the problem of low numbers of women and minorities in ecology as a profession at a time when women and minorities were projected to comprise the majority of new entrants into the general workforce of the United States by the year 2000. Today, women and minorities are still underrepresented as professional ecologists when compared to the general population of the United States, and these disparities are reflected in the current makeup of ESA, which is still a professional organization disproportionately composed of white males.

In the latest U.S. census, women (50.9%) slightly outnumbered men, and ethnic minorities (Asians/Pacific Islanders, African Americans, Hispanics, and American Indians) comprised just over 30% of the general U.S. population (U.S. Census Bureau 2004a). In contrast, in 2003, only 26% of ESA members were women, and ethnic minorities made up about 9% of the membership (ESA 2003). Thus, the percentage of women in the ESA membership has changed little over the last decade, whereas for ethnic minorities, the proportion of ESA members has inched up to some extent. Nevertheless, the demographic disparity between the ESA and the USA for ethnic minorities has grown larger during this same period. The composition of ESA membership, as representative of the field of ecology, also is less diverse when compared with the whole of Science, Technology, Engineering, and Mathematics (STEM) careers with 3.0% Hispanics, 3.2% African Americans, and less than one percent American Indian (NSF 2000c).

While ESA has experienced an increase by a little more than 3% in the proportion of ethnic minorities in the Society since the WAMIE I report, there has been an 11% expansion in the percentage of minorities in the general population of the United States. Thus, the challenge of achieving a population of ecologists resembling the cultural diversity of the United States involves a moving demographic target. Projections for the U.S. population suggest that minorities will constitute an increasingly greater percentage of the population in the 21st century; by the year 2025 non-Hispanic whites are projected to decrease to around 62% of the U.S. population and projections for the year 2050 suggest that about half of the population of the United States will be an ethnic minority with Hispanics alone constituting nearly one quarter of the population (U.S. Census Bureau 2004b).

Demographic trends by gender and race for the biological sciences as a profession point to some of the major challenges to be confronted. For example, the percentage of female tenure-track faculty in the biological sciences was only 20.2% in FY 2002 (Nelson and Rogers 2003), whereas the percentage of female B.S. recipients in biology in 2001 was 59.7% (NSF 2004), inevitably resulting in a dearth of female role models and mentors. Men continued to be hired in

the biological sciences in substantially greater proportions (69.8% assistant professors in 2002) relative to male Ph.D. recipients (55.3% from 1993-2002) (Nelson and Rogers 2003). Moreover, married women are more likely than married men to face the challenges of dual career households. Among married doctorate holders in science and engineering, a much greater proportion of women (84.4%) have spouses employed full time compared to men (45.9%) (NSF 2004). Similarly, a troubling set of disparities exist for ethnic minorities. For example, non-Hispanic whites were 61.6% of the total doctorate recipients in biological sciences in 2001, yet they represented 73.9% of the total number of biological scientists and 94.6% of environmental scientists employed in the United States (NSF 2004). Of the total number of biological scientists employed in the United States in 2001, only 1.7% were African American and 2.8% were Hispanic (NSF 2004).

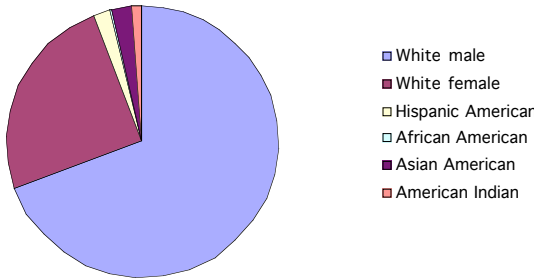
The U.S. Census Bureau estimated that 19.6% of the population had some form of disability and 12.3% were severely disabled (U.S. Census Bureau 2001). In 2000, 9% of college freshmen reported having a disability (NSF 2003a). No information currently exists on the numbers of ESA members with disabilities. A survey of the ESA membership, that includes information on disabilities, should be a high priority if ESA is to address disability issues in the future.

Table 2. Comparison of racial/ethnic composition of ESA membership to whole of US population and Science, Technology, Engineering, and Mathematics (STEM) workforce

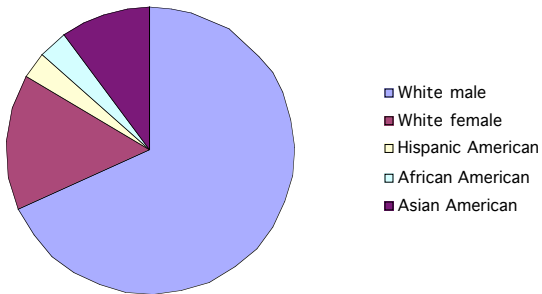
	ESA membership 2000	US population 2000	STEM workforce 1997
White	94.1%	75.1%	83.3%
White male	69.1%	37.1%	67.9%
White female	25.0%	38.0%	15.4%
Hispanic American	2.1%	12.5%	3.0%
African American	0.3%	12.3%	3.2%
Asian American	2.4%	3.6%	10.2%
American Indian	1.1%	1%	0.3%

Figure 1. Graphic representation of racial/ethnic composition of ESA membership to whole of US population and Science, Technology, Engineering, and Mathematics (STEM) workforce

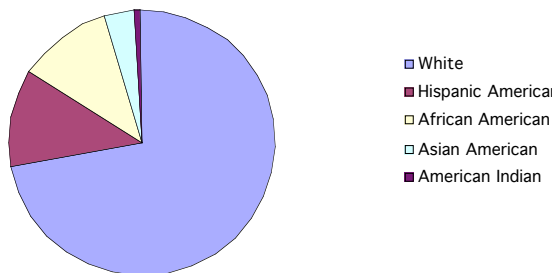
Racial/ethnic composition of ESA membership in 1992



Racial/ethnic distribution of US STEM workforce in 1997



Racial/ethnic population of US in 2000



SIDEBAR: Acronyms used in this report

AGEP Alliances for Graduate Education and the Professoriate

AIBS American Institute of Biological Sciences

AISES American Indian Science and Engineering Society

ASLO American Society of Limnology and Oceanography

AWIS Association for Women in Science

DOE-ORNL Department of Energy/Oak Ridge National Laboratory

EHRC Education and Human Resources Committee

EIN Ecological Information Network

EJ Environmental Justice

ESA Ecological Society of America

GEM Graduate Education for Minorities

HBCU Historically Black Colleges and Universities

ILTER Long Term Ecological Research

MANRRS Minorities in Agricultural, Natural Resource and Related Sciences

NABT National Association of Biology Teachers

NAAEE North American Association for Environmental Education

NBII National Biological Information Infrastructure

NSTA National Science Teacher's Association

PAO Public Affairs Office

SACNAS Society for the Advancement of Chicanos/Latinos and Native Americans in Science

SBI Sustainable Biosphere Initiative

SEEDS Strategies for Ecology Education, Development, and Sustainability

STEM Science, Technology, Engineering and Mathematics

SYEFEST Schoolyard Ecology for Elementary School Teachers

TEK Traditional Ecology Knowledge

TIEE Teaching Issues and Experiments in Ecology

WAMIE Women and Minorities in Ecology

WAMIE I RECOMMENDATIONS AND ACTIONS, 1993-2004

In 1993, the Women and Minorities in Ecology Committee set forth a goal for the Ecological Society of America to achieve a population of ecologists that reflects the gender and cultural diversity of the general population of the United States of America. In order to move toward this goal, the WAMIE I Committee recommended that the ESA:

- Create a scientific environment that embraces diversity and allows all professionals to flourish regardless of gender, racial or cultural background.
- Reduce or remove barriers to entry and advancement in the profession.
- Strive to assure that the teaching and research agendas in ecology address the relevance of ecological knowledge to our diverse society.
- Promote and encourage increased participation of all members of society in the application of ecological principles.

The WAMIE I report built upon a number of studies of the federal workforce that clearly demonstrated the serious discrepancy between the changing U.S. demographics and the low representation of women and minorities in the scientific workforce. The report made a strong argument for the importance of diversity in ecology, particularly as it relates to issues of environmental justice and the complex interplay between cultural patterns and environmental problems. The report also presented a comprehensive series of recommendations designed to identify and change the traditional patterns of recruitment and retention leading to diminished representation of women and minorities in the discipline of ecology, and recognized that these patterns are often rooted in pre-college and undergraduate experiences that discourage participation in sciences by women and minorities. The group also recommended changing ecological education in order to inspire greater interest and broaden participation in ecology.

The WAMIE I report identified the issues facing the Society as it made a commitment to expanding the diversity of its membership and presented a comprehensive series of recommendations designed to realize this vision, including suggested actions focused on making changes in ESA policy, structure and programs. Since that time, ESA has acted to implement a number of the recommendations, and has made significant progress on achieving the vision set forth by WAMIE I. Most notable has been the creation of new ESA staff positions, including an

Education Director who helped establish the SEEDS (Strategies for Ecology Education, Development and Sustainability) program. With generous funding from the Andrew W. Mellon Foundation, SEEDS has been instrumental in developing interest and participation in ecology among underrepresented undergraduate students, at both Historically Black Colleges and Universities (HBCU) and Tribal Colleges. SEEDS brings underrepresented students and faculty to the ESA Annual Meeting where excellent high-visibility programs nurture student interest and success in ecology. The program has built SEEDS chapters at 32 schools across the country (as of March 2006), has organized ecological field trips, and has coordinated the SEEDS fellowships to sponsor and mentor undergraduate research. ESA is now well represented at professional meetings of minority students such as the American Indian Science and Engineering Society (AISES) and the Society for the Advancement of Chicanos Latinos and Native Americans in Science (SACNAS). Highly successful, SEEDS has become a model for other scientific societies seeking to build diversity in the professional membership.

Other WAMIE I recommendations implemented by ESA include the formation of the Education and Human Resources Committee (EHRC) with subcommittees for education and women and minority issues, availability of childcare at Annual Meetings and ESA functions, expansion of the scope of ESA journals, development of new ESA awards to recognize teaching and mentoring in ecology, sponsorship of the Diversity Mixer at the Annual Meeting, and creation of the Profile of Ecologists series. These actions and others represent a serious commitment by the Society to enhancing the climate for women and minorities.

The following section provides an overview of specific WAMIE I recommendations and efforts made towards implementation, followed by WAMIE II recommendations where appropriate. It follows the same format as in WAMIE I. Specific data and graphs referenced are included as Appendix 1: WAMIE Data Review.

1. THE GENERAL PUBLIC AND STUDENTS OF ALL AGES

*“ESA has a unique role to play in helping students and the general public understand the importance of ecology, the exciting and rewarding nature of work in the field, and the pathways for pursuing ecology careers. Such efforts must provide role models for women and minorities and embrace a diversity of topics and approaches to assure that diverse interests and modes of thought are respected and valued.” -- WAMIE I**

* All unattributed quotations in this section have been taken directly taken from the 1993 WAMIE I report. If not in quotation marks, recommendations from WAMIE I have been edited for brevity. A complete copy of the original WAMIE I report is available from the ESA Education Office.

Focus on Ecologists

By 2005, 30 (or 31%) women and 66 men (69%) have been profiled; 71 profiles feature Caucasian/Whites (22 women, 49 men), 9 African American/Blacka (1 women, 8 men), 2 are American Indian, 4 are Asian American, and 10 are Hispanics (see Table 2: Ethnicity and Gender of “Profile of Ecologists” Online Poster Series). No research profile has explicitly highlighted social or environmental issues.

WAMIE II Recommendations: ESA profiles should be linked with other organizations’ minorities/women-in-science web pages (e.g., ASLO, SACNAS, AISES) and the number of women/minorities ESA members featured should be increased. Ecology issues related to social issues/environmental justice also need to be highlighted as recommended in the WAMIE I report. Questions asked of prospective profile participants should draw out diversity aspects from respondents. ESA should also create a promotional brochure featuring those profiles that highlight women, minorities, and/or those working on social issues.

Table 3. Ethnicity and Gender of “Profile of Ecologists” Online Poster Series

Ethnicity	Caucasian / White	African-American/ Black	Asian-American	American Indian	Hispanics	Total
Female	22	1	1	2	4	30 (31%)
Male	49	8	3	0	6	66 (69%)
Totals	71 (73%)	9 (0.9%)	4 (4.2%)	2 (2.0%)	10 (10.4%)	96

Videos and Other Recruitment Materials

WAMIE I recommended creating a series of videos featuring ecologists helping solve social problems and related materials showing how to pursue an education and career in ecology. No videos were created, but a “Careers in Ecology” brochure (with both high school and undergraduate versions) is available. Brochures on how to choose a graduate school and/or get a job have not been developed by ESA, but this information is readily available on the web from groups like GEM (Graduate Education for Minorities) and AWIS (Association for Women in Science). Women and Minorities in Science & Engineering Careers in Ecology roundtable evening sessions have been held at ESA Annual Meetings and the graduate student section has become active in ensuring more student needs are met.

WAMIE II Recommendations: ESA should create a short public service announcement featuring ecologists helping solve locally important social problems; this could be a project for a SEEDS chapter or a service-learning project for any student. Brochures should be distributed

proactively, targeting women- and minority-based institutions/organizations. The ESA website should be organized to highlight resources (e.g., articles, biographies, news stories, press releases) that feature women and/or minority ecologists and others addressing social problems and environmental issues. Links should be created to teachers' associations (e.g., NSTA, NABT) and materials should be distributed at their meetings. ESA should also reach out to guidance counselors and the various Alliance for Minority Participation (AMP) programs offered nationwide to increase awareness about career opportunities.

Events that encourage personal interaction and conversation between seasoned and student members to foster mentoring relationships should be continued, and the link between the education section and graduate students maintained. All ESA web links regarding careers and fellowships need to be kept up to date and easily accessible, and a web link created to the NSF-funded Alliances for Graduate Education and the Professoriate (AGEP) program to help influence the career/professional development workshops AGEP offers to Ph.D. students.

Women in Science Conferences

WAMIE I recommended that ESA co-sponsor, with DOE-ORNL and AWIS, a series of Women in Science Conferences aimed at pre-college and undergraduate women. This recommendation was not implemented because the initial proposal was not funded.

WAMIE II Recommendation: ESA should explore the need for this in the proposed follow up *Women & Minorities Visioning Workshop*.

New ESA Awards

WAMIE I recommended expanding the ESA awards program to include three new awards to recognize teaching at the pre-college and college level and mentoring of women and underrepresented groups. ESA created the Odum award to recognize performance in ecology education. Of the six recipients to from 2000 - 2005, one is female (17%), and none are minorities.

WAMIE II Recommendation: ESA should institute a second award that recognizes efforts to increase further the participation of women and minorities in ecology (by outreach, involvement in the community, and/or by mentoring).

2. PRE-COLLEGE ECOLOGY EDUCATION

“Ecology education must be relevant to all students. To do this, it must focus on the scientific understanding of the student’s local environment and the ecological context of her or his self. Such teaching and learning is necessarily outdoors and community or ecosystem-oriented.

Humans should be included explicitly as components and their interchanges with the other parts of ecological systems duly noted and investigated. Students should be given the opportunity to discover, investigate and create meaning or to ‘construct’ concepts from their own experiences as opposed to simply being told information and concepts by a teacher or textbook. In addition, students need to be aware of career options and opportunities in ecology at an early age, and benefit greatly from role models.” -- WAMIE I

Collaboration in Existing Reform Efforts

WAMIE I recommended that ESA be an active participant in ongoing efforts to reform pre-college science education. Since that time, some collaborative efforts have been made towards reforming pre-college education. For example, a number of members reviewed the drafts of materials from the North American Association on Environmental Education (NAAEE) Excellence in Environmental Education project; however, the extent of the impact this had is unknown. In 1999, the EHRC Vice President and members of the ESA Governing Board met with members of the U.S. House of Representatives to discuss ecology education and its great potential for serving as an integrating and motivating discipline for K–16 education reform.

WAMIE II Recommendation: The EHRC should continue to seek and accept involvement in K-12 education reform initiatives. With help from the Education Section, EHRC should summarize each state’s reform of science education, if any, so that ecologists can easily determine if their state is one where a little effort toward reform initiatives would be timely.

K-12 Ecology Education Program

WAMIE I included four recommendations for K-12 education: 1) establish relationships with professional societies serving K-12 teachers; 2) identify successes and needs of ESA members, including a list of successful programs that target underrepresented groups; 3) develop and promote useful strategies to improve K-12 ecology education; and 4) be vocal about the need for funds to continue and increase teacher training opportunities. ESA has acted on some of these recommendations, but not others. For example, ESA appointed liaisons to work with other professional societies, but this initiative has since become relatively inactive, as no formal channel exists to report back to ESA. In addition, the ESA co-sponsors Schoolyard Ecology for Elementary School Teachers (SYEFEST), a national project of the Institute of Ecosystem Studies to help teachers use their school grounds for teaching inquiry-based ecology. Ecologists and teachers at 17 sites were involved in the initial phase of the project; ESA’s current level of involvement in this project is low. Workshops for K-12 teachers have been organized at ESA

Annual Meetings and a survey (Chazdon et al. 2000) explored some of the needs of K-12 educators, but a larger survey of members was not conducted.

WAMIE II Recommendations: EHRC should follow up on collaborations with professional organizations and reinstitute those that have become inactive. The communication among societies should increase, and more attention should be paid to the goals of organizations with whom we choose to collaborate; special effort should be made to join forces with organizations that focus on women and minority issues. Member involvement and input into K-12 ecology education programs should be included in surveys of members. Projects like SYEFEST should be developed and/or supported by ESA. Also, the federal ‘No Child Left Behind’ Act requires teachers to seek additional experience and training to become highly qualified to teach ecology. The needs of K-12 teachers should be assessed, and ESA should make an effort to meet these needs or provide assistance to those wishing to pursue such efforts. The WAMIE I recommendation to seek more funds for hands-on training should be pursued.

In addition to the aforementioned projects and initiatives, ESA Education office staff members occasionally participate in high school and junior high science-related activities, and some SEEDS chapters are involved with local high schools. However, this does not begin to meet the recommendations of the original WAMIE report. In Education and Human Resources Committee meeting notes and action agendas, K-12 education is continually mentioned as a goal to work on, but there is not much record of more than these few things being done. The original recommendations of the WAMIE I report should be implemented or expanded and new ideas for improving pre-college ecology education should be developed, especially as they pertain to underrepresented students.

3. UNDERGRADUATE EDUCATION

“The way we teach ecology in college powerfully influences science teaching at all levels. We refer to both our methodologies (lecture, text-oriented, content-dominated) and our subjects (pristine systems, non-human processes, humans, and negative impacts). These facts of current undergraduate ecology education turn away women and minorities because those who learn less well in traditionally taught courses are discouraged (Brush 1991) and because science (ecology) is presented as an irrelevant discipline (Alper 1993).... Because more ecologists are involved in undergraduate teaching than in any other education activity, the indirect influence we have on K-12 teaching through instruction of future teachers is the single most important way the ESA membership can contribute to the diversification of the discipline in the long run.” –WAMIE I

Research Opportunities Clearinghouse

WAMIE I recommended that ESA create a centralized database of and mechanisms for advertising research opportunities and sending notices to targeted institutions. In response to this recommendation, ESA used the listserv, ECOLOG-L (started by David Inouye in 1992 and hosted by the University of Maryland; now has $\geq 5,100$ subscribers) to advertise research and job opportunities to the membership. Research opportunities have also been published as part of the Public Affairs office newsletter. Targeting specific institutions has not been done.

WAMIE II Recommendations: ESA should continue to support ECOLOG-L as a vehicle for advertising opportunities to the membership, with research opportunities also sent directly to targeted minority institutions. SEEDS should continue to disseminate research opportunities on its web site.

Mentoring and Internships

WAMIE I recommended that ESA facilitate and support mentoring and internship opportunities, design a newsletter focused on issues of mentoring/internships, and monitor the quality of the programs. Since that time, ESA has facilitated and supported mentoring opportunities, mainly through the SEEDS program, which matches underrepresented undergraduate students with ESA member volunteer mentors for the Annual Meeting, Undergraduate Research Fellowship, and informally during field trips. From 2002 - 2005, a total of 211 ESA members have served as SEEDS mentors (see Table 4: ESA Member Volunteers). The SEEDS program also introduced a cross-cultural mentoring workshop at the Annual Meeting in 2003. Concerned with the success of mentoring relationships, the WAMIE I suggested that a staff coordinator closely monitor the success of programs the Society sponsors. Three full-time,

one part-time, and two seasonal intern positions have been established in this regard. In addition, the SEEDS monthly newsletter contains a section called “Ecology Marketplace” where positions are advertised.

Table 4. *ESA member volunteers for the SEEDS Program*

	ESA member 2002	ESA member 2003	ESA member 2004	ESA member 2005	Total/event
Fellowship mentors	n/a	3	5	8	8
Field Trip	1	15	20	23	42
Annual Meeting mentors	22	27	31	35	115
Selection Committees	n/a	11	20	20	46
Total volunteers per year	23	56	76	86	211

WAMIE II Recommendations: ESA should broaden mentoring opportunities to other groups (e.g., graduate students, post-docs, women, and people with disabilities). For the Annual Meeting, the option to mentor or be mentored should be added to the meeting registration form so that matches can be made prior to the meeting, expanding the mentoring network beyond SEEDS travel award recipients. In addition, informal mentoring sessions where people can meet and make connections should be organized along with a centralized mentoring database of ESA members that have been and/or are willing to serve as mentors (i.e., at the Annual Meeting and/or fellowships, internships, etc.). Expanding the cross-cultural mentoring workshop currently offered by SEEDS at the Annual Meeting should be expanded to reach a greater number of people, possibly by organizing a traveling workshop or an article series in an ESA publication. Finding ways to support promising students not accepted in a competitive aspect of the SEEDS program (e.g., Annual Meeting travel awards, fellowships, field trips, etc.) should also be considered since SEEDS currently receives twice as many applications than spaces available. At a critical point when rejection could potentially turn students to another career path, ESA should look into what it can do to support all students with interest in ecology.

Student Participation Program

WAMIE I recommended creating a student participation program involving a coordinator, faculty mentors and student participants who could attend ESA Annual Meetings to interact with ecology professionals. As a result, ESA established the SEEDS program in 1996. The focus of the original document was to bring undergraduate students to the Annual Meeting, matching them with ESA member mentors, and hiring a staff person to manage this effort. This idea evolved into

the SEEDS student travel awards, the longest-standing aspect of the program with an average of 35 underrepresented undergraduate students attend the Annual Meeting each year. Since 1996, SEEDS has awarded 206 undergraduate students, 17 graduate students, and 174 professional faculty travel grants to attend the ESA Annual Meeting; 135 ESA members have served as mentors to students during the meeting over the past decade. Currently, the program awards travel grants to 35 undergraduate students, 20 faculty, and five to seven alumni graduate students each year. ESA also added a diversity mixer and luncheon at the Annual Meeting to support a broader spectrum of attendees.

WAMIE II Recommendation: SEEDS should support graduate students and people with disabilities who want to attend the Annual Meeting. High priorities should be given to women of color, given their virtual invisibility in ecology. Further suggestions include establishing an undergraduate oral poster session during the meeting to provide prominence and experience for aspiring students.

Careers in Ecology Workshop

WAMIE I recommended that ESA develop a program focused on ecological careers at universities and colleges. Responding to this recommendation, the SEEDS program exposes students to a variety of ecological careers through career panels on SEEDS field trips, presentations when staff members make site visits to SEEDS chapters, and presentations and exhibits at minority-serving conferences. SEEDS also created the “Profile of Ecologists” poster series and website, described above. The SEEDS program has targeted minority-serving institutions, but otherwise ESA members have not consistently visited targeted institutions to speak on careers in ecology. At one point, SEEDS schools were matched with a local ESA member partner, with the goal of providing faculty at SEEDS institutions assistance in curriculum development and career presentations. ESA partnering did not work over a long period in part because faculty at SEEDS schools had different requests of ESA members, and schedules were difficult to coordinate.

WAMIE II Recommendation: ESA should broaden its target groups to include people with disabilities, women, and graduate students in order to inform them about ecology careers. ESA should furnish a basic power point presentation plus some matching funds for ESA members willing to recruit at a minority-serving institution.

Recruitment through Community Involvement

WAMIE I recommended bringing academic ecologists in contact with grassroots community groups to form coalitions focused on a specific ecological problem and its solution. Whenever possible, these groups would involve minority students, specifically those of the same ethnic background as the targeted community. This initiative has not been implemented even though collaboration between ecologists and communities is a potentially powerful way to involve and attract women, minorities, and people with disabilities to ecology.

WAMIE II Recommendation: ESA should prioritize efforts to support collaborations between academic ecologists and grassroots community groups for addressing specific ecological problems, which could serve as an important tool for recruiting minorities and women in ecology. ESA chapters and sections such as the Traditional Ecological Knowledge (TEK) and Rangeland Round Table can be enlisted to help support collaborations.

Comprehensive Program to Improve Introductory Ecology Instruction

WAMIE I recommended that ESA embark on a long-term project defining excellence, promoting adequate representation of ecology in college curricula, developing new curriculum materials, sharing ideas through publications, recognizing excellence in undergraduate education, and sponsoring faculty development workshops. Responding to the recommendations, the ESA's Education and Human Resources Committee has been active in improving ecology education. In 2002, the education oral sessions at the Annual Meeting increased from one to three, and that number has since remained constant. Education workshops, discussions, and symposia are also available at Annual Meetings. In addition, three resources -- Teaching Issues and Experiments in Ecology (TIEE), the Ecology Education Network (EcoEdNet), part of the Biology Education Network, and the ESA Syllabus Exchange -- have been developed. These provide venues for undergraduate educators to contribute and obtain innovative teaching ideas and materials, including images, articles, lab ideas, and even entire course syllabi. The Odum Award, which recognizes those who have made important strides in ecology education, has also been implemented within the ESA.

WAMIE II Recommendation: More education sessions and workshops ought to be encouraged at the Annual Meeting, and they should be actively advertised to increase interest and participation. Efforts should be made to expand the resources available on ESA's web-based education resources (Teaching Issues and Experiments in Ecology (TIEE), Ecology Education Network (EcoEdNet), and the Ecology Syllabus Exchange); these efforts could include encouraging members to contribute resources as well as dedicating adequate ESA staff time to

these projects. Efforts should be disseminated to minority-serving institutions and/or community college faculty who may not be attending the Annual Meeting or joining ESA sections.

4. ECOLOGY AS A PROFESSION

“In order to promote diversity in the field of ecology and inform people of the professional options in the field of ecology, workshops and discussion sessions can be organized at ESA Annual Meetings and elsewhere.” --WAMIE I

Sessions at Annual ESA Meetings

WAMIE I recommended that the ESA sponsor consciousness-raising sessions at the Annual Meeting, using the AIBS Women in Biology Luncheon as a model for the first step. ESA should also sponsor at least one workshop at the Annual Meeting designed to promote career advancement skills and/or discuss conflicts and opportunities at the interface between personal lives and professional development. Discussion sessions should also be organized on topics related to education, recruitment, retention, or employment for students contemplating a career in ecology.

Since the WAMIE I report, several consciousness-raising sessions have been initiated at the Annual Meeting, and there has been a growing interest in environmental justice and traditional ecological knowledge (see Appendix II). The Diversity in Ecology Luncheon, which features a keynote speaker, and the Diversity in Ecology Mixer have become regular events at the Annual Meeting and appear to be successful venues for women and minorities to interact and meet potential mentors and role models. In addition to the diversity luncheon, a brown bag lunch has been established at the Annual Meeting for gay, lesbian, bisexual and transgender ecologists. A number of discussions and workshops at the Annual Meeting have dealt explicitly with education, recruitment, retention, and employment of women, minorities, and people with disabilities in ecology.

Occasional sessions have been held on lifestyle themes promoting career advancement skills (e.g., dual career couples, non-traditional and alternative career paths), however, for the past five years very few sessions have explicitly focused on lifestyle issues. Since the Snowbird meeting in 2001, a workshop or evening session has taken place at the Annual Meeting on careers in ecology (see Appendix II), however, the degree to which different lifestyle themes have been addressed is unclear. An evening session, organized by the student section, was held at the Portland 2004 meeting on “How to Succeed in Ecology: Advice from Current and Aspiring Eminent Ecologists.”

WAMIE II Recommendation: There needs to be a greater variety of sessions at the Annual Meeting dealing with human diversity issues. The luncheon, brown bag lunch, and mixer should continue as annual events at ESA meetings. Given that “diversity” has a broad variety of meanings to ecologists, there is potential for a loss of focus on women, minorities, and underrepresented groups. In addition, more attention needs to be paid to ecologists with disabilities. Workshops on lifestyle themes that are integrated into the fabric of professional ecologist careers should be organized as well as structured informal interactions focusing on lifestyle themes, with at least some lifestyle workshops explicitly addressing human diversity issues. There should be a coordinated effort to promote informal discussion sessions and workshops at the Annual Meeting that address recruitment, retention, and employment of students, recent Ph.D.s, and young faculty from underrepresented groups. These sessions are important for the advancement of underrepresented groups because they provide a means of gathering information and exchanging ideas about graduate school recruitment, job acquisition, and job retention.

Recruitment and Retention Workshops for University Administrators

WAMIE I recommended that the Society participate in workshops at professional meetings of university administrators and industry managers employing ecologists, and encourage members to work actively on recruitment and retention issues at home institutions. In particular, it was recommended that ESA identify ongoing activities and materials that present creative solutions to employment difficulties faced by women and minorities. ESA has not responded to this recommendation. For example, members have not been formally encouraged to work on recruitment and retention in home institutions, and ESA has not been directly involved with university administrators and industry managers on the recruitment and retention of women and minorities in ecology. There has been no specific focus by ESA on employment hurdles faced by underrepresented groups, in part because this is a complex and monumental task.

WAMIE II Recommendation: ESA should retain the goal of active involvement in the recruitment and retention of women and minorities in ecology with participation in workshops for university administrators. Because similar issues are common throughout the sciences, ESA should partner with other life science organizations. With several members of the current ESA Governing Board in active university administrative positions, ESA has a unique opportunity to take a leading role among professional scientific organizations. ESA should also offer workshops aimed at diversity strategies for the academic workplace that can be promoted to institutions or administrators as value added for any travel support the faculty member receives from the home

institution. It should also produce some brief materials about the crucial need to diversify science, and some suggested strategies and resources that any member might take back to his or her institution and administration.

5. ESA POLICY AND STRUCTURAL CHANGES

“ESA should strive to become more supportive of diversity through its policies and procedures. Indeed, ESA should be a leader among scientific societies in the strength of its programs in this regard. The goals are to eliminate sexism and racism from all Society functions and decisions, to achieve representation in all Society activities that reflects the full diversity of our membership, and to encourage the fullest participation of all peoples in the organization.” – WAMIE I

Composition of ESA Committees

WAMIE I recommended that ESA formalize a policy that all committees, symposia, workshops, and activities have a diverse composition that includes, where possible, some women, minorities and people with disabilities. This policy was not developed by ESA. A recent analysis of the composition of ESA committees (see Table 5: ESA Committee Composition) indicates that women are active participants both as committee chairs and as members of committees. Currently, more than half of committee chairs are women. However, the participation of ethnic minorities remains extremely low. An analysis of symposium speakers and organizers for the past two years indicates that women are participating as presenters, authors and organizers of symposia although in lower numbers than men. The majority of women participating in symposia are Non-Hispanic Whites. As with committee composition, the participation of ethnic minorities is extremely low (see Table 6: ESA Annual Meeting Symposia Composition). When ESA members were asked about the composition of the symposia they organized, they responded that they didn't receive any guidance about diversifying the composition of the group. Several members expressed their willingness to increase the diversity of the symposia if they had explicit directions to do so. Some also stated that they were aware of the lack of diversity in their symposia, but they found it difficult to find ecologists to participate that were not white males. While this is not a good statistic, it provides a strong rationale for the goals of WAMIE.

WAMIE II Recommendation: ESA should create a policy and a mechanism by which the Governing Board assures that, where possible, every committee and symposia reflect the diversity of the Society. Each committee chair should be informed of this policy and encouraged to follow it.

Table 5. ESA Committee Composition

Chairs

Ethnicity	Caucasian/ White	African-American/ Black	Asian- American	American Indian	Native Hawaiian/ Alaskan	Hispanics/a	Totals
Female	10	0	0	1	0	0	11 (57%)
Male	8	0	0	0	0	0	8 (43%)
Totals	18 (95%)	0%	0%	1 (5%)	0%	0%	19

Members

Ethnicity	Caucasian/ White	African-American/ Black	Asian- American	American Indian	Native Hawaiian/ Alaskan	Hispanics/a	Totals
Female	28	0	0	2	0	1	31 (41%)
Male	40	0	2	0	0	2	44 (59%)
Totals	68 (91%)	0%	2 (3%)	2 (3%)	0%	3 (3%)	75

Table 6. ESA Annual Meeting Symposia Composition

Presenters		Respondents: 34/59						
Ethnicity	Caucasian/ White	African- American/ Black	Asian- American	American Indian	Native Hawaiian/ Alaskan	Hispanics	International	Totals
Female	78	2	1	1	0	1	5	88 (29%)
Male	200	2	4	1	0	1	12	220 (71%)
Totals	278 (90%)	4 (1%)	5 (2%)	2 (<1%)	0	2 (<1%)	17(6%)	308
Organizers		Respondents: 34/59						
Ethnicity	Caucasian/ White	African- American/ Black	Asian- American	American Indian	Native Hawaiian/ Alaskan	Hispanics/a	International	Totals
Female	25	1	0	0	0	1	0	27 (42%)
Male	33	0	1	0	0	1	2	37 (58%)
Totals	58 (91%)	1 (1.5%)	1(1.5%)	0	0	2 (3%)	2 (3%)	64

Topic	Scientific	Education	Social	Cultural	Policy	Total
	51 (86%)	3 (5%)	2 (3%)	1 (2%)	2 (3%)	59

Child Care

WAMIE I recommended that childcare be provided during Annual Meetings and other ESA functions (i.e. committee meetings), and children should be involved in nature-oriented activities. Since 1997, childcare has been provided at ESA annual meetings at a cost to the Society of \$1,500 for infant and toddlers and another \$1,000 to \$2,000 for summer camps to help underwrite the costs not borne by the parents. About 11% of meeting attendees bring a family member to the meeting. Approximately 5-6% bring children. Because each city where the meeting has been held offers different providers, the quality of childcare has varied. Ideally,

childcare should be available at the convention center where the meeting is held, but this has not always been possible. Childcare reimbursement has not been implemented at other ESA functions. There are no data to indicate that child/family care is an obstacle for participating in ESA activities/events.

WAMIE II Recommendation: ESA should continue to provide and work to improve childcare at Society functions.

Women and Minority-Owned Businesses

WAMIE I recommended that efforts be maximized to include women- and minority-owned businesses in any competition for contracts. At least 30% of ESA business should be the target. ESA has used a small number of women or minority-owned business during the Annual Meeting, however, formalization of this policy has not been established, nor has any effort been made to actively seek women and minority contractors.

WAMIE II Recommendation: ESA should seek ways to send specific guidelines and target numbers to meeting organizers. ESA meeting organizers should be encouraged to work with the EHRC and other groups that can assist with finding women- and minority-owned business.

Scope of Society Publications

WAMIE I recommended that ESA broaden its publication scope to include teaching, mentoring, recruitment, and retention issues. Specifically, *Ecological Applications* should accept articles on methods of teaching ecology and mentoring young ecologists. This was the only WAMIE I recommendation that was rejected by ESA's Executive Committee because it wanted to maintain the original scope of *Ecological Applications*, arguing that changing the scope would dilute the journal's focus. However, *Ecological Applications* now accepts education manuscripts. Since the publication of WAMIE I, ESA started the publication of *Frontiers in Ecology and the Environment*. This journal has become a venue for the type of articles recommended in WAMIE I. In particular, in each issue of *Frontiers* a *Pathways to Scientific Teaching* section of the journal highlights the practical application of one of the journals research articles.

WAMIE II Recommendation: Encourage more articles in *Frontiers* on teaching, mentoring, recruitment, and retention issues. At least one special issue in *Frontiers* should be devoted to traditional knowledge of ecological applications.

Membership Database Services

WAMIE I recommended that ESA play an active role in creating, updating, advertising, and disseminating databases useful for increasing recruitment and retention of women and minorities in ecology. For example, it was recommended that the Ecological Information Network (EIN) be redesigned to provide lists of women and minorities by categories such as potential speakers, potential mentors, and persons interested in working with pre-college and public groups. WAMIE I also recommended that ESA develop, maintain, and publish a member directory with a coding method designed to identify women and other underrepresented members and that this be made available to prospective employers.

In its review of the EIN and membership databases in 2006, WAMIE II found few individuals with expertise in “Minorities in Science” (16 volunteers total) or “Women in Science” (18 individuals total), and only a single individual identified with a working knowledge of “Disabilities in Science.” The Society has not developed a directory of prospective and recent graduate degree recipients that includes a list of women and minorities. ESA maintains a membership directory that is available to members; however, information on age, ethnicity, and gender is not identified. The membership database is not searchable with respect to women and minorities.

WAMIE II Recommendations: The EIN should be updated and made more visible and accessible. Currently, there is not sufficient participation by ESA members for the EIN to be an effective clearinghouse for WAMIE issues. A searchable database with lists of potential speakers and mentors associated with human diversity topics would be valuable and its development should be an ongoing goal. Moreover, there should be a quick link to the EIN database from the ESA homepage, if EIN is expected to become a useful database for enhancing human diversity in science. In addition, ESA should develop a voluntary directory that codes for women, minorities, and other underrepresented groups, and the directory should be searchable for prospective and recent degree recipients. At the time of annual membership renewal, ESA should gather more self-reported information on its members in regards to ethnicity, gender, age, and disabilities. This information should be organized into a searchable database for internal use by ESA, in order to evaluate demographic patterns readily for underrepresented groups and there should be an option for members to release this information for a searchable directory available to the broader ESA membership. The Society should explore the possibility of developing a searchable directory for students and mentors of underrepresented groups to introduce themselves, similar to the minority student directory of other societies such as ASLO (see www.aslo.org/mas.html).

Changes in the Structure of ESA

WAMIE I recommended that ESA hire a coordinator for Education and Human Resources to be supported by other staff as needed, and create a standing EHR Committee (EHRC) with subcommittees on education, women, and minorities. Communication among committees needed improvement. Also committees needed mechanisms to seek ESA endorsement for funding of special programs. WAMIE I also recommended encouraging the formation of local ESA chapters.

In response to WAMIE I, and the rise of the SEEDS program, ESA added a new education staff, including a full-time Education Program Director, an Education Coordinator, and a Student Coordinator. Part-time staff includes a SEEDS Program Coordinator and one or two seasonal interns. An EHR Committee has also been created, however, the charge for the three subgroups (education, women and minorities) has not been delineated. In the last ten years, more attention has been paid to education issues than to women and minority issues. Information regarding ESA endorsement guidelines is incomplete and there still remains little communication among ESA committees. Regional chapters have formed, but only one (southeastern) remains active. However, the SEEDS program has encouraged the formation of local chapters, with 30 SEEDS Campus Ecology Chapters active throughout the country promoting ecology opportunities for minority students through education, outreach, recruitment, and career development.

WAMIE II Recommendations: ESA should ensure appropriate staff numbers are maintained in the Education and Human Resources office and the staff should be expanded if necessary. ESA should follow through with the creation of EHR subcommittees and/or consider the separation of EHRC into two distinctive committees, one on education, and a second on women and minorities, which could be renamed the Diversity Committee. The chair of the education committee should be added to EHRC as an ex-officio member and EHRC should consider members with disabilities issues. An electronic mechanism by which ESA committees can communicate more effectively should be created as suggested by the ESA 2000 survey (Chazdon et al. 2000). ESA's endorsement policy should also be evaluated. In addition, ESA should explore the possibility of initiating student-based chapters following the SEEDS model. Such chapters could be expanded to include non-student members and could focus on specific issues or concerns (e.g., environmental justice).

CRITICAL AND EMERGING ISSUES

Six key issues emerged during our review of WAMIE I that were not part of the WAMIE I recommendations. These seem critical for the future of the Ecological Society of America, its members and the field of ecology: 1) community outreach, 2) environmental justice, 3) graduate students/post docs/young professionals, 4) career horizons, 5) partnerships, 6) leadership, and (7) changing the culture of ecology. The first two were mentioned in WAMIE I, but were not developed with specific recommendations. The latter five have emerged more recently. We believe the 21st century presents challenges and opportunities for new generations of ecologists that may not have been a consideration when the original WAMIE committee met over ten years ago. Our ultimate goal in presenting these “new” ideas is to bring awareness to the Society and to generate discussions through ESA committees for future consideration and potential actions.

1. COMMUNITY OUTREACH

Ecological research on key questions of concern and the application of ecological knowledge play an important role in the decision-making and improvement of local communities. WAMIE I called for expanding the scope of ecology education, “... to address local environments and local ecology where all students, including those from underrepresented groups, live” (Bentley et al. 1993; p. 29). Addressing local issues is a way to improve learning opportunities in disadvantaged communities. By studying problems of immediate interest and relevance, residents are also exposed to learning about environmental justice and other issues of concern in a broader context and can experience firsthand the social nature of the scientific enterprise.

To meet the special needs of underrepresented ethnic groups, WAMIE I called for bringing “academic ecologists in contact with grassroots community groups (environmental equity/environmental justice) to form a coalition focused on a specific ecological problem and its solution.” Also critical was the development of “broad and sustained coalitions between academic ecologists and community groups dedicated to social and environmental equity.” Neither has occurred.

Steps that have been taken to advance the community outreach agenda through ESA include formation of local student chapters through the SEEDS program, inclusion of local culture and issues at annual ESA meetings, outreach workshop at the ESA meeting in Spokane in 1999, and a workshop on urban ecology in Portland. Ecologists have advanced community outreach approaches within the highly funded urban ecology initiatives such as the Baltimore Long Term Ecological Research (LTER) site and the Phoenix LTER, but more funding is needed for smaller, community-based approaches, such as the exemplary initiatives of Eric Pallant of Allegheny

College in sustainable development and collaboration (Pallant 2000). New initiatives incorporating local concerns and involvement in urban ecosystem ecology are emerging (Berkowitz et al. 2003), including engagement in ecological restoration and an ESA 2004 Organized Oral highlights “Community Stewardship Organizations: Potential Laboratories for Ecological Research.”

The WAMIE I proposal, “Recruitment through community involvement: meeting the special needs of underrepresented groups” should be revisited. Implementation should include the skills of community organizers, members of environmental organizations addressing environmental justice and equity, minority students, and ecologists from both academic and non-academic settings. We propose a collaborative pilot program identifying several target locations and bringing teams from each to a training workshop of up to one week in duration to identify the problem and to develop skills for solving it.

We also propose working with local SEEDS chapters to identify unifying themes that will further community outreach in areas such as environmental justice. Members of local chapters could share their experience with one another as well as the broader ESA membership. Local community outreach initiatives should be organized at each Annual Meeting, including outreach workshops highlighting the role of ecology and ecological issues, involvement of local community representation, and cultural/natural history events.

2. ENVIRONMENTAL JUSTICE

Environmental justice (EJ) calls attention to the disproportionately negative environmental impact on disadvantaged groups, insists that no one group (racial, ethnic, national, socio-economic) be disproportionately impacted, and that all affected by an environmental issue have a voice in the decision-making process. EJ has been a critical environmental and social issue of concern among minorities and EJ concerns are part of the social justice agenda of faith communities who have been involved since EJ inception. While social scientists have been engaged for some time, ecologists have been noticeably absent in both EJ activities and literature, and in taking their appropriate scientific role (Middendorf et al. 2003).

WAMIE I highlighted movements of EJ and environmental equity and concluded that the ESA, in order to show the relevance of ecology to our diverse society, “must reach out to (achieve) a broader racial and ethnic diversity of ecologists by linking with social and environmental justice movements at the grassroots level in order to recruit and retain minority involvement in the field” (Bentley et al. 1993; p. 29). EJ dimensions included the disproportionate share of US environmental problems being near areas of large populations of

ethnic minorities, the linkage between the ecological, social and economic problems in minority communities, and increased awareness among communities and ecologists of the magnitude of problems.

Within ESA, the EJ dimension has developed predominantly in educational activities that have increased member awareness. As summarized in the ESA *Frontiers* feature, “The Challenge of Environmental Justice” (Middendorf et al. 2003), these include ecology research areas and questions and their relevance to minorities, ecologist involvement in providing data and testimony in public policy pertaining to EJ issues, and developing ecology activities to educate about environmental justice. The importance of forming partnerships with community-based organizations and other organizations engaged in environmental justice (including faith-based organizations), particularly when planning ecological studies and research (such as in ecological restoration and urban ecology) has been emphasized. EJ has been highlighted at the ESA Annual Meetings since 1998 through two EJ Symposia (2000, 2002 with SER) and an organized oral session (2004), annual evening discussion sessions, involvement of SEEDS students and faculty as participants in EJ-related events, and an educational fieldtrip highlighting urban issues (Baltimore, 1998). Member interest in environmental justice issues is demonstrated by an informal working group of Education/EHRC members, over 300 ESA members attending Annual Meeting functions (which have been inclusive of minorities and whites) and lively debates at sessions and write-back articles (Bangert 2003; Jablonski 2004).

Advancement of the EJ agenda is hampered by resource limitations including funding compensation, and lack of support by home institutions. The engagement of academic or governmental members has often not been institutionally recognized or supported. ESA members working for non-profits/non-governmental organizations often can only work on funded projects, and so those with training, aptitude and desire have limited time available to assist moving this initiative ahead. Because EJ research cuts across the sciences and social sciences, traditional sources of funding have been extremely limited.

ESA needs to develop and take a strong position that recognizes both the “science” of such research and the need for support, and then provide ESA endorsement to relevant proposals. An official environmental justice task force should be designated, with a budget, staff support and reporting mechanism to help accomplish this vision. EJ-relevant ESA initiatives include community outreach, collaboration with relevant sections (e.g., urban ecology, traditional ecological knowledge), linking with the SEEDS program, highlighting research concerns that address EJ issues, developing TIEE educational activities, working with minority media, highlighting social issues, and engagement of ecologists.

It is critical that ESA develop relationships with organizations engaging in EJ at the grassroots and system levels. These include the Environmental Justice Resource Center at Clark Atlanta University (www.ejrc.cau.edu), the Center for Community Action and Environmental Justice (www.ccaej.org), the Environmental Justice Foundation (www.ejf.org) and faith-based organizations such as the National Religious Partnership for the Environment (www.nrpe.org) and Atlanta's Interdenominational Theological Center and Faith and the City Initiative (www.faithandthecity.org). With these and other professional societies incorporating EJ dimensions, ESA can play an important role in bringing ecological expertise to partnerships that can help solve environmental problems and eradicate environmental injustice.

3. GRADUATE STUDENTS, POSTDOCS, AND YOUNG PROFESSIONALS

The WAMIE I report organized recommendations to increase recruitment and retention of women and minorities in ecology around five themes: the general public, pre-college education, undergraduate education, ecology as a profession, and ESA policy and structure. However, WAMIE I contained relatively little on programs explicitly targeting graduate students, postdoctoral associates, and young professionals. Part of the rationale for the focus of WAMIE I on K-12 and undergraduate education was the sense that these stages are most critical for recruiting members from underrepresented groups into fields such as ecology. Nevertheless, attention must be paid to fostering and retaining members of underrepresented groups who choose to pursue ecology as a profession. There continues to be a large gulf between the percentage of women and minorities who are recipients of B.S. degrees in biological sciences and the proportion that ultimately pursue careers in biological sciences and related fields (NSF 2003a). In many instances there are not sufficient mentors for women and minorities at critical junctures early in their graduate and professional careers as scientists. For example, a large disparity exists between the percentage of female B.S. recipients in Biological Sciences and the proportion receiving Ph.D.s (NSF 2003a), with an even smaller percentage of women faculty in academic institutions (FY 2002: 20.2% women faculty in Biological Sciences) (Nelson & Rogers 2003). Due to this lack of women faculty, in many institutions female Ph.D. students might have little interaction with female role models during formative years as graduate students and as post-doctoral associates. For women of color, it is likely that a Ph.D. student will never encounter a minority female faculty member in her field (Nelson & Rogers 2003). ESA needs to proactively address graduate programs for underrepresented groups if it is to achieve the overarching WAMIE vision of the face of ecology resembling the demographic makeup of the general population. For example, a graduate version of the highly successful SEEDS program could provide valuable

opportunities for promising graduate students of color to attend and participate in the annual ESA meeting, interact with role models and mentors, and help build cohorts of ecologists of color.

Women, minorities, and people with disabilities face additional challenges as they attempt to enter the workforce and maintain employment in ecology. For example, in academia, women are less likely to be in tenure-track positions, and they receive lower salaries and have lower rates of promotion than their male counterparts (NSF 2003b). Women in science are less likely than men to be married. Moreover, among married scientists, women are almost twice as likely as men to have a full-time employed spouse, which has significant implications for accommodating dual careers (NSF 2000a). These statistics point to the need for programs for women, minorities, and members of other underrepresented groups during the critical periods of graduate school and the years beyond when recent Ph.D.s in ecology are trying to get established as young professionals and need mentoring and role models that may not be widely available.

4. CAREER HORIZONS

Technological advances of the 21st century, the multidisciplinary nature of science, and the need to communicate with the public and decision makers have created new challenges and opportunities for students of ecological and environmental sciences. We see a need to prepare students with the necessary skills to seek careers in areas other than the academic sector. An advanced college degree in ecology combined with other skills such as communication, management, computer sciences, foreign languages or business can prepare students for careers in government, non-profit organizations and the private sector.

The National Science Foundation has taken a leadership role in addressing broad career horizons through the creation of the IGERT (Integrative Graduate Education Research Training) and GK-12 (Graduate Teaching Fellowships in K-12) programs. Both of these programs provide opportunities for graduate students to expand their training by including skills such as those mentioned above. With an increased set of skills, students can seek careers in areas that had not been considered before.

As computer technologies are increasingly needed for the analysis of complex ecological data, new career opportunities are being developed. For example, research involving long-term and large-scale data requires that we have specialized people trained in eco-informatics. Also, the trend for synthesis science in the next decade (Krishtalka 2002) calls for preparing young scientists in ecology to utilize eco-informatics tools. Ecology students with a solid training in the use of these tools can now consider careers in eco-informatics. In its Environmental Science and Engineering report, the National Science Foundation strongly recommends that environmental

education and training should be science based, but should prepare students for broad career horizons and should integrate new technologies, especially information technologies, as much as possible (NSF 2000a).

In preparing students for the future, it is important that they interact with role models and mentors who support broad career horizons. A change in the academic culture might be necessary to encourage students to explore diverse career options rather than pushing them only towards research and academic careers. Students should learn and be exposed to broad career opportunities as early as in K-12 education. Some of these careers might be in research but others might be in journalism, law, education, administration, consulting, or business. Because women and minorities in environmental sciences are still underrepresented in academic positions (NSF 2000b), students find few role models to emulate and to guide them towards future careers. Therefore, we should continue to encourage women and minorities to pursue careers in academia as well as in other areas.

The Ecological Visions Report states the difficulty in bringing together science, policy, and management decisions related to the sustainability of our environment. Despite the huge knowledge base that ecologists have created, they have limited opportunities to offer their ideas or may not understand the policy implications well enough to provide useful advice. By including policy and management in the training of students, they will be able to pursue careers in those sectors where a combination of skills would allow them to make informed decisions based on science knowledge.

5. PARTNERSHIPS

In the last decade we have seen an increase in the recognition of collaborations and partnerships as crucial to advancing the scientific enterprise. For example, recent documents published by the National Science Foundation (NSB 2000, NSF GPRA Strategic Plan 2001-2006) strongly promote partnerships and recommend integration, cooperation and collaborations at many levels within NSF programs, among federal agencies, and across disciplines. For example, NSF has developed collaborative programs such as the Biocomplexity Initiative, which emphasizes research with a high degree of interdisciplinarity.

Similarly, the Ecological Visions Committee Report emphasizes the need to strengthen collaborative work at all levels: between scientists and managers, among scientists from different disciplines, between scientists and the private sector, and across international boundaries. Collaboration is fundamental to tackle global environmental issues and achieve sustainability.

As ecology broadens in scale and time, and data sharing becomes increasingly necessary, a collaborative environment will be even more crucial. For example, the Twenty-Year Review (Krishtalka 2002) of the Long Term Ecological Research Network (LTER) states that: “the LTER program should become a research collaboratory, namely a seamless, integrated continuum from site-specific to cross-site to network- and systems-level ecological research.”

It is equally necessary for ESA to develop collaborations and partnerships to achieve a more diverse membership. Collaborations and partnerships with the private sector, organizations focused on women and minorities, the media, government institutions, scientific societies, and international and non-profit organizations would help diversify ESA, and would enable it to address global environmental issues more effectively. Many organizations centered on minorities in science (i.e. SACNAS, AISES) currently have little focus on ecology and environmental sciences, but partnerships with these societies are a logical step towards increasing interest and opportunity in these fields among minorities. Collaborations like this have the potential not only to increase the diversity of our society and field, but also to meet many WAMIE goals.

6. LEADERSHIP

In 1998, ESA spearheaded the creation of the Aldo Leopold Leadership Fellows Program (www.leopoldleadership.org) to bridge the gap between scientists, the media, the general public, and policy makers. This was the first formal effort in the United States to train mid-career environmental scientists to communicate effectively with non-scientific audiences. Aldo Leopold Fellows have formed a network to do outreach and have begun to influence policies and decision-making related to environmental issues. For example, Diana Wall (1999 Fellow), professor and director of the Natural Resource Ecology Laboratory at Colorado State University, was appointed by the Secretary of State in 2004 as an at-large member to the U.S. National Commission for the United Nations Educational, Scientific, Cultural Organization (UNESCO). Steven Handel (2001 Fellow) from Rutgers University was recently selected to lead a team of ecologists to design and establish the ecological basis of the new Olympic Forest Park for the 2008 Beijing Summer Olympic Games. Jack Liu (2001 Fellow) from Michigan State University was selected to be on the Steering Committee for this effort to facilitate collaboration with Chinese scientists and universities and to contribute with his knowledge of Chinese wildlife issues.

The National Science Foundation recognized the need for scientists to improve their communication skills with the creation of the Graduate Teaching Fellows in K-12 Education (GK-12 Program). Through this program, graduate students improve their communication skills by

interacting with K-12 teachers and students. An analysis of current projects indicates that, in general, fellows seem to be gaining an increased ability to communicate their ideas to both a professional audience and the general public. In turn, teachers are gaining increased confidence in their ability to teach science (NSF 2003c). Although communication is important, other skills are also necessary for leadership development. For example, the Ecological Visions Committee Report recommends developing leaders trained in the art of collaboration.

We view leadership as one of the most important critical and emerging issues for ESA. Leadership training following the model of the Aldo Leopold Fellows should start earlier in the scientific training of students. Communication, management, planning, decision-making and organizational skills should be an integral part of the training of ecologists and environmental scientists. We also see a particular need to encourage leadership training for women and minorities so they become stronger role models for future generations.

7. CHANGING THE CULTURE OF ECOLOGY

When considering how the culture of ecology and the ESA must change to be more inclusive and attractive to diverse thinkers, we must first be able to understand the culture and recognize that it exists. Ecology is a science and, as all modern empirical sciences, it has a rich history that describes how it came to be. The cultures, characters, economics, and politics that contributed to the development of modern science are vast and deserving of much deeper discussion than can be provided here. When examining how to diversify our field, we first must look deeply at ourselves and our culture, and identify who is included and excluded from it. This novel approach to diversifying the scientific field is currently not being explored. Ecology is an ideal science to begin making changes from the inside out, as its knowledge about the natural world is becoming increasingly intertwined with knowledge about the social world.

When attempting to attract diverse thinkers into the ecology profession, we must genuinely include them in our script for doing ecology, and we must give them freedom within the process itself. This may look like an interdisciplinary approach to the scientific process that includes several fields relevant to the researcher. Such an approach is in fact underway nationwide, encouraged by the National Science Foundation's programs such as Collaborative Research at Undergraduate Institutions, Frontiers in Integrative Biology Research, and Integrative Graduate Education and Research Traineeship. But rather than forcing students and researchers to seek other fields when conducting an interdisciplinary ecological investigation, we should consider whether or not this broad approach can eventually be inherent to the field.

The science of ecology faces an enormous task. Ecologists are the ones asking the questions and determining the research agenda for the field. It will take a diverse group of thinkers that represent all of society to ensure the research agenda is relevant to all of society. Still, not all ecologists are doing applied research, and many underrepresented researchers will also want to do basic research for the love of ideas and advancing knowledge for knowledge sake. Regardless of the type of research a person of an underrepresented group will be doing, it is imperative that he/she is included in deciding what is important in ecological research.

Much money has been spent in attempting to diversify the sciences, but not much progress has been made, especially when considering the rate at which society's minority groups have increased and that they are projected to soon become the majority. It is time for us to consider our approach to ecology, the culture behind it, and possibly make some fundamental changes that may have significant implications when it comes to attracting diverse people to the profession. If this is the case, ecology and the ESA will be the model for the many other sciences and societies attempting to achieve the same goals.

WAMIE II ACTION PLAN

In the preceding sections, we presented a series of recommendations to implement the programs and ESA policy and structural changes suggested in the original WAMIE report. However, changes over the last decade in the ESA, the social and political landscape, and technology require some fresh rethinking of WAMIE I goals and the most effective means to accomplish them. Thus, we see a need to develop a new comprehensive WAMIE II Action Plan. We recognize that ESA is presented with challenges and opportunities to become a scientific society that others would want to emulate. Therefore, the WAMIE II report should be a comprehensive enterprise integrated within the larger vision of ESA. In order for us to accomplish this larger vision and action plan we need to:

- Organize a workshop with a larger representation of ESA members to help identify the critical issues necessary to develop an action plan for the next decade in the context of the Ecological Visions Committee Report. An intense workshop contributed to the success of the original WAMIE report and we believe this process is important for developing the most effective action plan for the future.
- Develop a professional, comprehensive survey that includes the type of questions that would give us the information needed to make informed recommendations.
- Engage the ESA membership in an ongoing dialog to address diversity within a much larger context as suggested by the Visions Committee Report.
- Consider the separation of the Education and Human Resources Committee (EHRC) into two separate committees: 1) Education, and 2) Women and Minorities.
- Develop an internal database from membership information that can be used in the future to analyze demographic trends.

We recommend that the Governing Board provide funding and resources to:

1. Organize a workshop with a larger participation of ESA members (15-20) to develop an action plan to build on what we have started. We need a broader group to expand our

initial assessment of WAMIE I so ESA can fulfill its vision to “achieve a population of ecologists that reflects the gender and cultural diversity of the general populations in the United States of America” (Bentley et al. 1993), and to become an organization that serves as a model to other scientific societies in addressing women, minority and diversity issues. We embrace the view of the Visions Committee Report to go a step further and achieve “a membership that will mirror the gender and ethnic diversity of the global community and that will be informed by the insights and expertise this diversity brings” (Palmer et al. 2004). We seek participants that have experience in recruiting, retaining and advancing women and minorities in science. We seek input from ESA’s Governing Board and from members of the Ecological Visions Committee as well as from members of the WAMIE I committee. We also invite representatives/members from organizations involved in issues related to women and minorities (e.g. Association for Women in Science (AWIS), Society for the Advancement of Chicano/Latino and Native Americans in Science (SACNAS), Minorities in Agricultural, Natural Resource and Related Sciences (MANRRS), etc.) to get their perspectives on the issues. This workshop is critical to turn ESA into an effective organization that will contribute towards the goals of the Ecological Visions Committee Report.

2. Conduct a new survey of its members. This survey should be conducted by a professional organization in consultation with the WAMIE II Committee. A new survey following the model of the original Profiles of Ecologists would be designed not only to learn about ESA’s demographic composition but also should include questions to inform the Society about issues directly related to women and minorities. For example, the survey should identify barriers or incentives for career development and how women, minorities and persons with disabilities have been encouraged or discouraged from choosing environmental fields.

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Appendix I. Summary of WAMIE I recommendations, status, and WAMIE II recommendations

	WAMIE I Recommendation	Recommendation Status	WAMIE II Recommendation
A. The General Public and Students of All Ages			
<i>A.1. “Focus on Ecologists” Brochures</i>	ESA should prepare a series of brochures profiling ecologists including women and/or members of underrepresented groups	A web version exists which highlights new ecologists each year; posters of the profiles are also displayed at Annual Meetings	Increase the number of women/underrepresented members featured; Increase focus on ecology/social issues; Create brochure
<i>A.2. Support Materials for ESA Recruitment and Retention Programs</i>	(a) Create a video that targets underrepresented groups showing how ecologists help to solve locally important social problems	No videos were created	Create a short public service announcement for TV/radio; Organize links on ESA website to highlight similar resources
	(b) Develop a video and brochure showing steps to become an ecologist	No video was made, but a “Careers in Ecology” brochure is available	Distribute brochures more proactively; Link with teachers associations and guidance counselors
	(c) Develop additional materials to show how to choose a graduate school, get a job in ecology, etc.	Information specifically designed by ESA does not exist, but this information is available in other resources	Continue ESA events that foster mentoring relationships; Ensure web links for other resources are easily accessible
<i>A.3. Women in Science Conferences</i>	Co-sponsor a series of Women in Science Conferences	Not implemented; Initial proposal was not funded	Explore need for this in the proposed workshop
<i>A.4. New ESA Awards</i>	Expand award structure to include awards recognizing teaching at pre-college and college level and mentoring of women and underrepresented groups	The Odum award was created to award performance in Ecology education	Institute an award that recognizes efforts to further concerns of women and minorities in ecology
B. Pre-College Ecology Education			
<i>B.1. Collaboration in Existing Reform Efforts</i>	ESA should be an active participant in ongoing efforts to reform pre-college ecology education	Some efforts have been made, but none were consistent or ongoing	The EHRC should continue to seek and accept involvement in K-12 education reform initiatives
<i>B.2. K-12 Ecology Education Program</i>	(a) Establish relationships with professional societies	Collaborations were formalized by appointing liaisons from ESA to other professional societies, but this has since become relatively inactive	EHRC should follow up on and reinstitute these collaborations; Join forces with organizations whose focuses include women and minorities
	(b) Survey members to determine their successes and needs	This has not been done to the extent outlined in WAMIE I	Member needs regarding gender, race, ethnicity, and disabilities should be included in the proposed survey
	(c) Create a collection of tested approaches for teaching ecology in primary and secondary schools	The ESA is a sponsor of Schoolyard Ecology for Elementary School Teachers (SYEFEST)	Similar projects should be developed and/or supported by ESA
	(d) ESA should be vocal about the need for funds to continue and increase opportunities for teachers to participate in hands-on training	Workshops for K-12 teachers have been organized at ESA Annual Meetings	Increase efforts in this area, and seek more funds for hands-on training
C. Undergraduate Education			

<i>C.1. Research Opportunities Clearinghouse</i>	ESA will create a centralized database and mechanism for advertising research opportunities	ESA has created the listserv ECOLOG-L; Research opportunities have also been published in the Public Affairs Office newsletter	ESA should continue to support ECOLOG-L; Research opportunities should also be sent to targeted minority institutions
<i>C.2. Mentoring and Internships</i>	Facilitate and support mentoring and internship opportunities	ESA has facilitated and supported mentoring opportunities, mainly through the SEEDS program	Broaden mentoring opportunities beyond SEEDS; Create a centralized mentoring database of ESA members
<i>C.3. Student Participation Program</i>	Create a student participation program involving a program coordinator, faculty mentors, student participants	ESA has been successful in implementing this particular recommendation through the establishment of SEEDS	Broaden SEEDS to support graduate students and people with disabilities to attend the Annual Meeting
<i>C.4. Careers in Ecology Workshop</i>	ESA will develop a program focused on ecological careers that can be implemented at area universities and colleges	A version of this has been implemented via the SEEDS program	Broaden target groups to include people with disabilities, women, and graduate students
<i>C.5. Recruitment through Community Involvement</i>	Bring academic ecologists in contact with grassroots community groups to form a coalition focused on a specific ecological problem and its solution	This initiative has not formally been implemented through the society	ESA should prioritize efforts to support such collaborations
<i>C.6. Comprehensive Program to Improve Introductory Ecology Instruction</i>	ESA should embark on a long-term project to improve undergraduate ecology education	TIEE, EcoEdNet, and the Syllabus Exchange have been developed and supported by members and ESA staff	Actively advertise related sessions at the Annual Meeting; Encourage contributions to TIEE, EcoEdNet, and the Syllabus Exchange
D. Ecology as a Profession			
<i>D.1. Sessions at Annual ESA Meetings</i>	Initiate consciousness-raising sessions at the Annual Meeting	Several such sessions have been initiated	There needs to be a greater variety of sessions at the Annual Meeting dealing with human diversity issues
	(a) The Society should sponsor at least one workshop at the Annual Meeting designed to promote career advancement skills and discuss issues that are at the interface of personal life and professional development	Very few sessions have explicitly focused on lifestyle issues	At each Annual Meeting there should be workshops on lifestyle issues that are integrated into the fabric of professional ecologist careers
	(b) Discussion sessions should be sponsored at the ESA Annual Meeting on topics related to education, recruitment, retention, or employment	Few discussions and workshops at the Annual Meeting have dealt explicitly with these issues	There should be a coordinated effort to promote informal discussion sessions and workshops at the Annual Meeting that address such issues
<i>D.2. Recruitment and Retention Workshops for University Administrators</i>	The Society should participate in workshops and encourage members to actively work on recruitment and retention issues at home institutions	ESA has not formally encouraged members to actively work on recruitment and retention in home institutions	ESA should retain the goal of active involvement in the recruitment and retention of underrepresented groups in ecology with participation in workshops for university administrators
E. ESA Policy and Structural Changes			
<i>E.1. Composition of</i>	Formalize a policy that all committees,	Women are active participants	ESA should create a

ESA Committees	symposia, workshops, activities, etc. have, where possible, some women members and members from other underrepresented groups	both as committee chairs and as members of committees; the participation of other minorities remains low	mechanism that assures, where possible, every committee and symposia reflects the diversity of the Society
E.2. Child Care	Child care should be provided during annual meetings and other ESA functions	Childcare has been implemented at ESA Annual Meetings at least since 1997; Childcare reimbursement has not been implemented at other ESA functions	Continue to provide and improve childcare at Society functions
E.3. Women and Minority- Owned Businesses	Maximize efforts to include women and minority-owned businesses in any competition for contracts	There has been no formalization of this policy or any effort to actively seek women and minority contractors	Seek ways to implement this recommendation by sending specific guidelines and target numbers to meeting organizers
E.4. Scope of Society Publications	Broaden publication scope to include teaching, mentoring, recruitment, and retention issues; Specifically, <i>Ecological Applications</i> will accept articles on methods of teaching ecology and mentoring young ecologists	<i>Frontiers in Ecology and the Environment</i> has become a venue for these types of articles	Encourage submission of more articles to <i>Frontiers</i> on teaching, mentoring, recruitment, and retention issues
E.5. Membership Database Services	(a) The EIN should be redesigned so that the Society can provide lists of women and members of other underrepresented groups by categories such as potential speakers, mentors, etc.	The EIN is searchable by the recommended categories, but not by gender, race, or ethnicity	The EIN should be updated and made more visible and accessible
	(b) ESA should develop, maintain, and publish a member directory including a coding method to list women and other underrepresented members	ESA maintains a membership directory that is available to members only; however, information on age, ethnicity, and gender is not identified	ESA should pursue the development of a voluntary directory that codes for women and other underrepresented groups, that is searchable for prospective and recent degree recipients
E.6. Changes in the Structure of ESA	(a) Create a position and hire ESA Coordinator for EHR; will be supported by other staff as needed	The education staff includes 2 full-time employees, 1 part-time employee, and 1-2 seasonal interns	Ensure appropriate staff numbers are maintained; expand if necessary
	(b) Committee Structure		
	(1) Create a standing committee on Education and Human Resources; divide into subcommittees: education, women, minorities	An EHR Committee has been created, but the three subgroups (education, women and minorities) have not been delineated	ESA should consider splitting EHRC into two separate committees, (1) Education, and (2) Women and Minorities with increased focus on (2)
	(2) Review structure and function of committees; Improve communication among committees	There continues to be relatively little communication among committees	Create an electronic mechanism by which ESA committees can communicate (Chazdon et al.)
	(c) Develop mechanisms for seeking ESA endorsement of proposals for funding of special programs	Information regarding ESA endorsement guidelines is incomplete	ESA's endorsement policy should be evaluated
	(d) Encourage the formation of local ESA Chapters	Regional Chapters have formed, but only one remains active; The SEEDS program has encouraged the formation of local chapters	Explore the possibility of initiating student-based chapters; such chapters could be expanded to include non-student members

Appendix II. Workshops, sessions, and other activities related to women, minorities, and underrepresented groups in ecology at ESA Annual Meetings, 2000-2005.

Montreal, 2005

- SEEDS orientation, outing, faculty meeting, Faculty/Mentor Orientation, Mixer and Buffet Dinner, Mentors' Breakfast, Participants' Workshop, Wrap-up and Farewell
- Workshop: Teaching and learning ecology in the schoolyards
- Workshop: Surviving grad school: Balancing the demands of teaching and research
- Workshop: Environmental justice and ESA: A vision for research, education, and outreach
- Special Session: Sense of Place: Indigenous homelands of eastern Canada
- Special Session: Diversifying ecology
- Workshop: SEEDS Program: How ESA members can get involved
- Gay, Lesbian, Bisexual, and Transgender Ecologists' Brown Bag Lunch
- Diversity Mixer "SEEDS Highlights" Reception and Program
- Diversity in Ecology Luncheon – Accepting student into the field: A talk by Dr. Robin Kimmerer
- Evening session: How to Succeed in Ecology: Advice from Current and Aspiring Eminent Ecologists

Portland, 2004

- SEEDS orientation, outing, faculty meeting, Faculty/Mentor Orientation, Mixer and Buffet Dinner, Mentors' Breakfast, Participants' Workshop, Wrap-up and Farewell
- Special Session: Diversifying Ecology: Assessment of Gender and Cultural Diversity Programs Within the Ecological Sciences
- Special Session: Sense of Place: Indigenous Homelands of the Pacific Northwest
- Evening Session: Columbia River Natives Encounter Lewis and Clark
- Evening Session: Cross-cultural Mentoring
- Workshop: Introduction to SEEDS
- OOS-16: Environmental Justice and Education
- DIS-2: Environmental Justice Education
- Gay, Lesbian, Bisexual, and Transgender Ecologists' Brown Bag Lunch
- TK-4: Education Mosaic Mixer "SEEDS Highlights" Reception and Program
- Diversity in Ecology Luncheon – Recognized and Unrecognized Merits of Diversity: A talk by Dr. Carlos Robles
- Evening session: How to Succeed in Ecology: Advice from Current and Aspiring Eminent Ecologists

Savannah, 2003

- Workshop: Introduction to SEEDS
- Evening Session: Minority student mentoring workshop
- Special session: A sense of place: traditional ecological knowledge among Southeastern Native American tribes
- Evening Session: Environmental Justice: a role for ecologists in education and research
- SEEDS orientation, outing, Mentors' Orientation, dinner, Mentors' breakfast
- Gay, lesbian, bisexual, and transgender ecologists' brown bag lunch
- ESA Traditional Ecological Knowledge Section brown bag lunch
- Education Mosaic Mixer (formerly the Diversity in Ecology Mixer)
- Diversity in Ecology Luncheon – Communicating ecology to diverse audiences
- Evening Session: Finding your niche IV: Building career and recruitment networks

Tucson, 2002

- Workshop #12: Global Climate Change & Environmental Justice Education
- Symposium #23: Relationship, Community, and Intergenerational Innovation: Traditional Ecological Knowledge for Ecosystem Restoration
- Symposium #28: Can Human Cultural Activities be Included in Reference Ecosystems?
- Symposium #32: Ecological Restoration and Environmental Justice: Empowering Communities
- SEEDS orientation, mentors' orientation, luncheon, mentors' breakfast

- Gay, lesbian, bisexual, and transgender ecologists' brown bag lunch
- Traditional Ecological Knowledge – Organizational meeting
- Diversity Mixer – “Pathways to Ecology”
- Diversity in Ecology Luncheon – “juggling careers and personal life: Finding the right balance”
- Evening session: How to find your niche: Career options in ecology

Madison, 2001

- Workshop: Traditional Ecological Knowledge
- Evening Session: Environmental Justice and Ecology Education
- Evening Session #6: From Here to Perpetuity: Traditional Ecosystem Knowledge, Western Science, and Ecosystems for Future Generations
- Evening Session: Diversifying the Field of Ecology: In What Ways Does the Field Need to Change?
- Evening Session: Diversity in the Nature and Purpose of Ecological and Environmental Education: Questions of Literacy and Perspective
- SEEDS Mentors' briefing, orientation, Mentors' breakfast, Business meeting and luncheon
- Evening Session: Environmental justice and ecology education
- Evening Session: Diversifying the field of ecology: In what ways does the field need to change?
- Diversity Mixer: Environmental education programs: fostering diversity and serving diverse communities
- Diversity in Ecology Luncheon: “Does ecology reflect America's Diversity?: Perspectives in recruiting and retaining minorities”
- Workshop: How to find your niche II: Careers in ecology

Snowbird, 2000

- Symposium # 12: The Role of Ecology in Environmental Justice
- SEEDS orientation, Mentor orientation, Mentors' breakfast, participants workshop
- Diversity Mixer: EHRC Committee
- Evening session: Environmental Justice Workshop
- Diversity in Ecology Luncheon: “Ecology and people with disabilities”
- Workshop: How to find your niche: Career options in ecology