

**WHITE PAPER: OVERCOMING THE GENDER AND ETHNIC DIVERSITY GAP
IN THE NATURAL RESOURCE PROFESSION**

The Texas Chapter of the Wildlife Society, James G. Teer Conservation Leadership Institute 2016

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Increasing diversity in the Texas Chapter of the Wildlife Society is as valuable as maintaining biodiversity in healthy ecosystems. Species richness is directly correlated to the amount of productivity in the environment (Waide 1999), and having a diverse workforce may prove to be just as advantageous because diverse teams have higher creativity and are more able to solve complex problems (Glasscock 2015). Diversity is multidimensional and not only includes ethnicity, gender and religious beliefs, but also personality, career levels, socioeconomic status, education levels, life experiences, skills, and problem solving abilities (Cheruvilil et al. 2014). Our environment, management techniques, and issues facing the natural resource field are constantly evolving, and as natural resource professionals we must adapt to those changes in our workforce and constituency. Some of the most complex human adaptations have to do with the cultural and technological advances humans use (Stock 2008). As globalization increases urbanization and conservation issues create the need for increased interaction among people with diverse backgrounds. “The vision of the TCTWS is to assure a sustained diversity of wildlife and their habitats in Texas (TCTWS 2016). The goal of The Wildlife Society (TWS) is to promote excellence in wildlife stewardship through science and education (TWS 2016a). The North American Model of Conservation establishes public trust doctrine which “holds that certain natural resources, such as water, fish, and wildlife, are held in trust by the government for the benefit of the people (Smith 2011). This paper recognizes that the public to which those resources belong is changing and provides suggestions on how natural resource professionals may stay relevant to changing stakeholders in an increasingly urbanized population disconnected from nature.

Minorities and women are historically underrepresented in all science, technology, engineering, and math (STEM) profession; the National Science Foundation (2015) reported only 22% of women, 17% Asian, 6% Hispanic, and 5% African American are employed in science and engineering. Minorities and women are underrepresented in leadership and advanced positions in a broad range of professional fields. It wasn't until 1981, 11 years after the Environmental Protection Agency began, that the agency hired the first female at a senior level position. The United States Fish and Wildlife Service hired the first female director in 1993 (Nicholson 2013). Women's "presence in top leadership positions—as equity law partners, medical school deans, and corporate executive officers—remains stuck at a mere 10 to 20%", natural resource professions are no different (Nicholson et al. 2008). Strides to increase gender and ethnic diversity in STEM and other professions have been ongoing since the implementation of national policies that began with the Civil Rights Act of 1964 (Civil Rights Act 1964) and Title IX of the Education Amendments Act of 1972 (20 U.S.C. Â§1681). Such national policies seem to have had little impact on diversity in many natural resource professions. For instance, in 1994, female representation among resource professionals in both white and minority groups in the southeast was 20% or less (Adams & Moreno 1998). Moreover, an analysis of TWS publications shows "only 18% of 11,363 TWS journal articles from 1937-2006 have female contributors" (Nicholson et al. 2008). These national statistics illustrate a dismal view of diversity in the scientific fields, however, this paper will address common questions and solutions about diversity within the natural resource profession in Texas. A survey of the Texas Chapter of the Wildlife Society (TCTWS) membership was conducted in late 2016 to quantify minority and female representation in professional and academic realms, and the results of which will be presented in this white paper and at the 2017 meeting of the Texas Chapter of the Wildlife Society.

NEED FOR DIVERSITY IN THE WILDLIFE PROFESSION

Challenges to natural resource management abound globally. Human population growth is associated with over-harvesting resources, the expansion of exotic and invasive species, urban sprawl and habitat fragmentation, and these are only a few of the most pressing concerns for the future of wildlife and fisheries management (Evans et al. 2006; Jacobson et al. 2006). The key to solving new wildlife and natural resource dilemmas lies in our profession's collective ability to draw on our varying strengths, knowledge bases, and perspectives. Welcoming distinct ideas from women and people of diverse ethnic backgrounds into natural resource professions will allow the members of the TCTWS to achieve the Chapter's first strategic goal: "Anticipate the future to best serve the changing needs of wildlife professionals and society. We are responsive to changes that are occurring in society" (Texas Chapter of the Wildlife Society 2016). Natural resource professionals have a chance to tap into the benefits human population growth, the diversity within our species, to find creative solutions for wildlife management.

Although public trust doctrine of the North American Model of Conservation entrusts wildlife to all, land ownership in Texas creates unique challenges for natural resource managers. Over 95% of Texas lands are privately owned (IRNR 2014), therefore the future of Texas wildlife and fish requires not only engaging the public interest but also landowner cooperation to create and maintain wildlife habitat on private lands. The majority of these private lands, 84% in fact, are working lands (IRNR 2014). Texas A&M Institute of Renewable Natural Resources (IRNR) define working lands as "privately owned farms, ranches, and forests that produce food and fiber, support rural economies, and provide wildlife habitat, clean air and water, and recreational opportunities." IRNR (2014) reports that Texas has the greatest loss of working lands (in total acres) to urban uses in the country. Between 1997 and 2012 the average

size of privately owned tracts was reduced by 60 acres (IRNR 2014). Working lands are dwindling. Even more startling is the limited population of landowners who receive professional (federal, state or private) advice for management during the last five years. The Sustaining Family Forests Initiative (2016) further identifies that only 9% of surveyed Texas landowners have been actively engaged in management or protection activities during the last five years. By diversifying the workforce that engages Texas landowners and creates programs to incentivize habitat management, the wildlife and fisheries profession can help Texas landowners steward important private lands. One program to assist Texas landowners protect threatened and endangered species and waters is program of TPWD Wildlife and Inland Fisheries Divisions. This collaborative effort called the Texas Landowner Incentive Program (LIP) meets specific needs of private, non- federal landowners. This program is designed to help those enact good conservation practices for the benefit of healthy ecosystems on their lands (TPWD 2016).

Many studies have shown how teams of professionals work together and we presume that the characteristics of these successful teams are similar across disciplines. In business, professional diversity boosts productivity, customer satisfaction, earnings and profits (Glasscock 2015). As natural resource professionals, we frequently collaborate with others in teams to accomplish a common outcome. Diverse, high performing research groups show characteristics of positive interdependence of team members, effective communication, and individual and group accountability (Cheruvilil et al. 2014). Increasing diversity in the workplace can have many benefits like reducing lawsuits and increasing marketing opportunities, recruitment, creativity, and business image. It has also been expressed that employees also have greater morale when they work in an organization that is comprised of a diverse group of people (Esty et al. 1995).

CHANGING TEXAS DEMOGRAPHICS

The face of Texas is changing. “Between 2005 and 2013, 4.8 million people moved to Texas from other states” (White et al. 2016). In 2013 women made up 50.3% of the population in Texas. Minorities in Texas have shown historic growth, with the Hispanic population now at 39.1%, African Americans comprising 11.5% of Texans, and other nationalities in at 6% (Office of the State Demographer 2016). In response to the growing need for diversity in the natural resource profession the largest employer of natural resource professionals in Texas, the Texas Parks and Wildlife Department (TPWD), conducted an analysis of their own employee demographics in 2013. Data on other employers of resource professionals is not as readily available for this discussion, but will be included in the 2016 TCTWS membership survey. According to the TPWD’s Diversity Working Group Final Report (TPWD 2013) only 33% of TPWD’s workforce is female. The agency's workforce also demonstrates ethnic underrepresentation with only 17% Hispanic, 3% African Americans, and 1% Asian and American Indian representation respectively, while the remaining 78% is white (TPWD 2013). According to the Texas Office of the State Demographer (2016) population projections, by 2050 Texas populations are expected to be 50% Hispanic, 10% African American and 6% other minorities. Natural resource managers and educators must continually strive to recruit and retain highly skilled people from diverse backgrounds so that novel traditions, perspectives, and approaches can be introduced into adaptive management. Future challenges, professionally and environmentally, will be met if decision makers and the workforce do not more closely reflect their constituents and stakeholders. The Texas Chapter of the Wildlife Society has an important role to play in the future of wildlife conservation and the diversity of those who manage Texas wildlife.

EFFORTS TO INCREASE WORKFORCE DIVERSITY

The Wildlife Society published a position statement highlighting the importance of [Workforce Diversity within the Wildlife Profession](#) that states “The Wildlife Society is committed to the identification and removal of barriers to recruitment, effective mentoring, retention of a diverse workforce, and to communicating with a diverse array of stakeholders” (TWS 2016b). Many studies and reports aim to move the needle on professional diversity in STEM industries. Haynes et al. (2015) analyzed 55 peer reviewed journal articles that examined variables which influence minority recruitment using studies from many STEM careers spanning 32 years. However, few of these studies looked at minority representation in natural resource fields. This study found that more than 20 federal natural resource agency diversity programs exist, all of which focused recruitment to minorities at the high-school level and above (Haynes et al. 2015). This demonstrates the effort made to recruit diverse professionals to resource management over the past three decades.

The TCTWS professionals have worked hard in this regard. The Wildlife Conservation Camp (WCC) has targeted high school age children since 1993 by creating opportunities for outdoor learning and natural resources experiences (Griffin 2015). Each year has brought many challenges to light, including cross-cultural interactions between urban and rural campers, professionals needing to take off from work to mentor and teach, and general conflict resolution and scheduling management issues. The WCC has also created mentorship opportunities within the chapter, as college students are also receiving hands-on training by TCTWS professionals. This unique learning environment has increased the number of students in the ‘pipeline’ to the wildlife and fisheries profession by increasing participation in outdoor recreational activities, and has exposed hundreds of high school students to careers in natural resources (Griffin 2015). Some Wildlife Conservation Camp graduates return in the

summers as college students to volunteer back at the Wildlife Conservation Camp or in wildlife internships around the state. Those who were mentored by TCTWS volunteers often return as college mentors and professionals to teach the skills they've learned to the next generation. The next step for these professionals is the James G. Teer Wildlife Conservation Leadership Institute as young professionals. This Leadership Institute provides an opportunity to pass on knowledge, train the next generation of leaders, and retain the diversity of people and experiences that is needed for the future of natural resource professionals and wildlife.

BARRIERS TO DIVERSITY IN THE WILDLIFE PROFESSION

Professional wildlife and natural resource managers have been working to discover barriers to gender and ethnic diversity recruitment and retention in our profession for decades. Many factors like income equality, perceived discrimination, and lack of mentors restrict minorities in engaging in educational opportunities (Haynes et al. 2015), though in general financial restrictions affect most people interested in education. Haynes et al. (2015) define barriers as “negative influences that inhibit recruitment” and they discuss barriers in terms of life stage and type. Barriers, supports, and influences all interact with each other in multiple ways. Barriers, recognized in this most recent study, include lack of exposure to the outdoors, no knowledge of the profession, lack of mentors, societal pressures, and discrimination. For all age groups, a lack of outdoor experiences was the most cited barrier to gaining interest in the natural resource field (Haynes et al. 2015). Encouraging and facilitating positive outdoor activity for families of minority populations may lead to more knowledge and support of the wildlife profession and could lead currently underrepresented groups to a path to a resource career. Recognition of wildlife and fisheries sciences as a profession and discipline for scientific discovery did

not begin until the early 20th century. Providing outdoor experiences using natural resource professionals as mentors could overcome three of the most significant barriers concurrently.

Stereotype threat is an intangible barrier that people feel about themselves and has been known to influence performance on tests and attrition from STEM majors (Beasley & Fisher 2012). Stereotypes based on gender and ethnicity abound. Stereotypes of women as “genteel”, “proper” or “feminine” can affect female participation in resource management field work. The fear of being seen as too feminine can keep women in the background, relegated to by-stander or note-taker in field situations. Stereotype threat is known to influence women, minorities, and even white men changing from STEM majors to another field of study (Beasley & Fischer 2012). Interactions between discrimination and stereotype threat could influence what Haynes et al. (2015) refer to as self-efficacy. Self-efficacy is how one feels about oneself, how determined he or she is and what one chooses to do when confronted with obstacles. In natural resource fields that are dominated by Caucasian males, looking and thinking differently than the majority can be daunting. Self-efficacy can be influenced by stereotype threat and feelings of discrimination. These real and perceived threats have tangible effects on the hiring and retention of minority groups, especially in the science fields (Adams & Moreno 1998; Beasley & Fisher 2012; Haynes et al. 2015). The impacts of stereotype threat and discrimination can be reduced by simply bringing the issues to light. One example of an agency addressing these concerns is by using feedback from fiscal year (FY) 2016 employee surveys led the U.S. Fish and Wildlife Service to launch a national hotline to report incidents of harassment, establish a Service-wide Barrier Analysis Team, and initiate a Dignity and Respect campaign in FY 2017. Further steps to overcome these barriers could include programs that provide mentors, scholarship opportunities and training to build self-efficacy and increase minority recruits into natural resource professions.

It is also important to note that showing results in overcoming many of these barriers is impacted by a time lag, or delay, between youth initially becoming engaged in natural resources and when these young people enter the field. That makes it even more important that TCTWS efforts continually aim toward recruiting and retaining a diverse workforce and membership that keeps youth engaged as they progress from secondary to collegiate education and into the workforce.

DIVERSITY IN TEXAS WILDLIFE & FISHERIES UNIVERSITY PROGRAMS

The 2012 U.S. Census Bureau projections show that by 2043, the US population is to become a majority-minority nation for the first time (U.S. Census Bureau 2012). The non-Hispanic white population will remain the largest single group, but no one group will make up a majority. This means recruitment and retention to the profession will need to be just as diverse as our constituents. Results from Adams and Moreno (1998) revealed that minority-group respondents became interested in natural resources late in their academic lives, which indicates a gap in outreach to young audiences. Haynes et al. (2015) surmised that the lack of institutional diversity, diversity within agencies, organizations, or universities, may hinder efforts to recruit diverse populations. On a positive note, Texas higher education institutions have seen increasing enrollment of female and minority students, while only 26.6% of all graduates from Texas fish and wildlife programs were female in 2004 this increased to 51.6% females graduating in 2015 (FAEIS 2016). The National Science Foundation (NSF) reports having a strong foundation for educated women in “biological sciences” but they are not being employed, not getting the same salary, and within specific fields, women are outnumbered by more than twice as many males (Nicholson 2013). Ethnic diversity of Texas fish and wildlife graduates has increased, more than doubling from 10.1% of minority graduates in 2004 to 20.5% in 2015 (FAEIS 2016, see Figure 1). In spite of this increase of diversity in academia, these populations are not currently represented in the

profession which is demonstrated in the 2016 TCTWS membership survey results discussed at the end of this white paper.

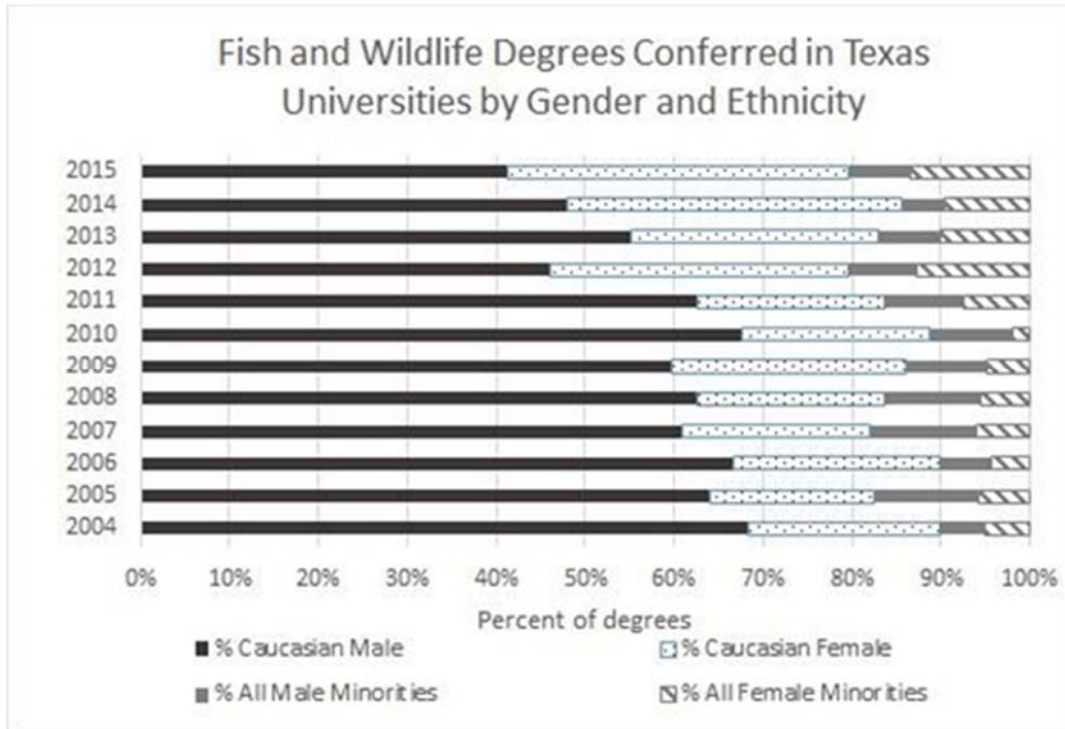


Figure 1. Comparison of minority and Caucasian male and female graduates of Texas Universities from 2004 to 2015 in Fisheries and Wildlife Management (Source FAEIS 2016).

One reason that students fail to make the jump to careers in wildlife is a return on investment: student loans outweigh starting salaries. Due to the low compensation in natural resource professions college students cannot offset the balance of education with the future payoff of a resource career. Natural resource professionals, agencies, and universities need to make changes to their salary structure if they are to stay relevant to our changing Texas constituents. One way to increase recruitment to the profession is to increase compensation for natural resource jobs. More advocates for higher wages in the conservation profession from interns to entry-level are needed. Education and training can be arduous and expensive and many college students choose majors based on future salary. Providing scholarships and financial incentives to reduce the financial burden of these educational requirements

can make education and a future profession in natural resource management more appealing to all economic classes. It is difficult to recruit and retain professionals if compensation is not competitive with related fields and justifiable with educational expenses. In 2016-17, average in-state tuition and fees for students in Texas at public four year institutions is \$9,566 (College Board, Annual Survey of Colleges). While more jobs are available than before, the current (2016) annual salary of a Texas Parks and Wildlife Department (TPWD), the largest employer of biologists in Texas, entry level wildlife biologist is just under \$33,000 per year (Texas State Auditor's Office 2016).

SUGGESTED ACTIONS FOR THE TEXAS CHAPTER OF THE WILDLIFE SOCIETY

The challenge of increasing diversity in natural resource professions does not have a simple solution. The Texas Chapter of the Wildlife Society can employ strategies that address barriers to recruitment and retention of diverse people at all levels of natural resource studies, education and careers. Many efforts outlined herein will address both recruitment into university programs, and professional retention in the natural resource field. Many wildlife agencies and universities look to TCTWS for leadership in the area of professional diversity, as well as resource training. The actions of the TCTWS have the potential to unify people within the wildlife profession. Davis et al. (2002) called for "immediate, aggressive, and strategic action to achieve a more diverse workforce in wildlife-related professions." Texas universities have already seen an improvement in student diversity, now TCTWS stands on the precipice to continue this work through thoughtful and continued action to retain and recruit diverse professional for 21st century challenges.

First, we recommend the Texas Chapter of the Wildlife Society adopt the parent society's position statement supporting gender and ethnic diversity in the wildlife profession, entitled "Workforce Diversity in the Wildlife Profession".

Secondly, creating a system of oversight ensures proper accountability to keep the diversity momentum going. A specialized committee or subcommittee within the TCTWS, such as the Ethnic and Gender Diversity Working Group of the Wildlife Society (2015), could focus on the recruitment, retention, and career-long mentoring of natural resource professionals from ethnic, gender, and socioeconomic backgrounds previously underrepresented in natural science professions. This committee could also facilitate professional mentorship programs throughout the state to build partnerships across agencies, universities, and private industry. Additionally, a committee such as this could highlight stories of women and minority members in the chapter through outreach, media, awards, and partnership programs. This committee or subcommittee could also be in charge of maintaining and collecting future survey data for the TCTWS similar to surveys which the 2016 Cohort of the James G. Teer Leadership Institute Early Career Professional Training initiated.

Third, develop precision recruitment strategies at Historically Black Colleges and Universities and minority institutions by offering visiting instructors, increasing wildlife courses and TCTWS mentors. Research recognizes the importance of institutional diversity, to allow minority and women biologists to feel a sense of belonging increase recruitment and retention in natural resource careers (Haynes et al. 2015). There is a significant need seen by professionals within the TCTWS to develop wildlife and natural resources curricula compliant with Certified Wildlife Biologist Certification from the parent society (TWS) at most state universities; as well as create student chapters of the Wildlife Society in areas with high minority populations. It is also posited that recruitment to natural resource disciplines can be effective when reaching out to other science disciplines. Targeting outreach to environmental science groups at community colleges, technical schools and small universities in specific regions of Texas will reach more minority individuals than targeting traditional large universities. Strategically

increasing the interactions between professionals and students will allow increased mentorship opportunities and exposure to the wildlife and fisheries realm.

Fourth, we suggest marketing and outreach of the profession through increased partnership with schools at all levels, outdoor and conservation organizations (Boy Scouts, 4H, etc.), and community groups by taking the 'pipeline' approach to expose students of all ages to natural resources (Adams & Moreno 1998; Davis et al. 2002; Haynes et al. 2015). Providing a shortened version of the Wildlife Conservation Camp in one urban area around the state could increase participation for young people limited by geographic barriers who cannot attend camps held hundreds of miles away. Positive partnerships with resource professionals can increase outdoor experiences, family support and exposure to the profession at young ages, which addresses a recognized gap in outreach. TCTWS may be able to facilitate this partnership through the creation of Wildlife Society Ambassadors, members of TCTWS that would serve in outreach capacities to these communities and organizations. Regional ambassadors could be recruited from professionals in public and private resource agencies and academia. Ambassadors should be those already involved with Wildlife Conservation Camp and James G. Teer Conservation Leadership Initiatives or other professional leadership activities.

The role of media is also important to mention. Confusion abounds when it comes to the public's perception of wildlife and fisheries biologists. Mass marketing strategies that clarify misconceptions about the profession can begin by developing a specific, representative logo for the TCTWS that combines and represents the multifaceted interests of the membership. Figure 2 is a previous logo that TCTWS could use to represent the many interests of the membership. Along with the membership newsletter, media could be developed for mass markets to explain the wildlife and fisheries profession including our daily tasks, the North American Model of Conservation, public trust,

conservation, etc. Targeting younger age groups through social media and podcasts could help recruit people that are comfortable with technology.



Figure 2. Example logo for the Texas Chapter of the Wildlife Society.

Fifth and finally, addressing known barriers attributed to social factors of limited finances, discrimination, stereotype threat, and self-efficacy through scholarships, incentives and training can begin to change the culture of natural resource fields. Initial efforts can include sensitivity training for admissions counselors and hiring professionals to describe the barriers in retaining minorities in natural resources. The TCTWS could support training programs that recognize and reduce discrimination and stereotype threat in work environments, or among our constituents and clients. As many professionals realize, wildlife management is often people management. Many studies also advocate for recognition, incentives, and scholarships for natural resource professionals and students (Adams and Moreno 1998; Davis et al. 2002; Haynes et al. 2015). The Wildlife Society council established an annual ethnic and

gender award in 2001 that “recognizes an individual or organization for outstanding efforts in promoting ethnic and gender diversity in the natural resource professions, especially wildlife conservation and education (TWS 2016c).” Awards like this can advance the knowledge of the wildlife profession as a whole and make strides to bridge the minority gap. Scholarships, specifically for underrepresented populations, can also overcome some barriers to students who lack financial support.

Overall, the Texas Chapter of the Wildlife Society is robust enough to overcome obstacles dealing with conserving our natural resources, and engaging in the predicted models for the changing demographics of Texas. The TCTWS has supported youth and collegiate education and training for almost 25 years with professional volunteers and resources directed at the Wildlife Conservation Camp, and now also the James G. Teer Conservation Leadership Institute. The Wildlife Society has also dedicated career resource training for retaining a diverse workforce for the future of wildlife. However, while these efforts are making strides toward ending discrimination, creating opportunities, and meeting the needs of our constituents, they are currently not enough to meet the rate of change that is predicted for Texas. More dedicated and concerted efforts can be implemented now within the TCTWS to secure the future of our wildlife and natural resources.

DIVERSITY OF THE TEXAS CHAPTER OF THE WILDLIFE SOCIETY (TCTWS): Results of a 2016 demographic survey of TCTWS members

The Texas Chapter of the Wildlife Society (TCTWS) has existed for more than five decades, but until recent challenges associated with increasing diversity recruitment and retention, no measures of membership demographics had been captured. To assess diversity of the TCTWS the 2016 cohort of the John G. Teer Conservation Leadership Institute created and delivered a fifteen (15) question survey for the membership. The survey was designed to gauge gender, age, race, education, job level, organization/affiliation, salary, student status as well as opinions on TCTWS priorities and discrimination in the profession (a copy of the survey is included as an appendix to this white paper). All of the questions asked were purposed to uncover as many variations of diversity as we could within the membership of the largest state chapter of the Wildlife Society. The survey was created and hosted via surveymonkey.com thanks to the generosity of Dr. Selma Glasscock and the Welder Wildlife Foundation. A link to the survey was sent to 799 TCTWS members with email addresses on October 31, 2016 followed by two reminder emails. The survey closed on December 20, 2016 with a total of 206 member responses for a 25.78% response rate. When considering a 95% confidence interval and response rate, the sampling error of the TCTWS survey is 6% which applies to all stated results and figures that give estimates for the entire survey respondent sample.

Respondent Demographics

The initial question of the survey was designed to loosely gauge the spatial extent of TCTWS members. Respondents of the TCTWS survey were from all areas of the state; indicating that 37.6% live in urban areas, the same percentage (37.6%) reside in suburban locales, while only 24.9% indicated rural

homes. Question two captured gender of respondents, which was 33% female and 67% male (See Figure 3).

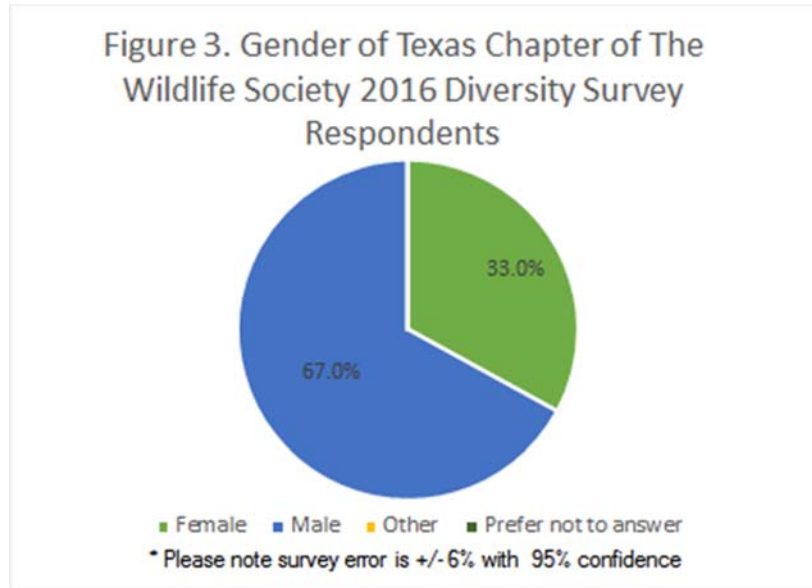


Figure 3. Gender of Texas Chapter of the Wildlife Society 2016 Diversity Survey respondents.

The third question of the survey quantified age of TCTWS survey respondents, the majority of which, 28.2%, were between the ages of 30 and 39, followed closely at 22.3% of respondents in their forties. Only 2.4% of respondents were between the ages of 18 and 22, 16% of the respondents were from 23 to 29 years of age (post-college young professional range). Those in their fifties, sixties, and seventies made up 15, 11.2, and 4.9% of the respondents, respectively. Educational background of survey respondents was covered in the fourth question of the survey. Of all respondents none had less than a high school diploma or indicated they held a degree from a technical school. Only one (1) respondent (0.5%) indicated a high school degree, 1.9% selected and some college with no degree, 2.4% of respondents had an associate's degree while 28.2% held bachelor's degrees. The majority of TCTWS survey respondents, 67% in fact, hold advanced degrees. Master's degree recipients were the most

numerous in the survey at 43.2% while 23.8% had completed doctorates. A key question of the TCTWS survey asked about member ethnicity. Only three (3) respondents chose not to provide ethnicity information. The overwhelming majority, 89.8% of respondents, selected Caucasian as their race. The second most represented race of respondents was Hispanic at 4.4%. Third most numerous ethnicity selected was designated as 'other' represented 3.9% of respondents (see Figure 4). It is also important to note that no African American or Pacific Islanders were identified in this survey.

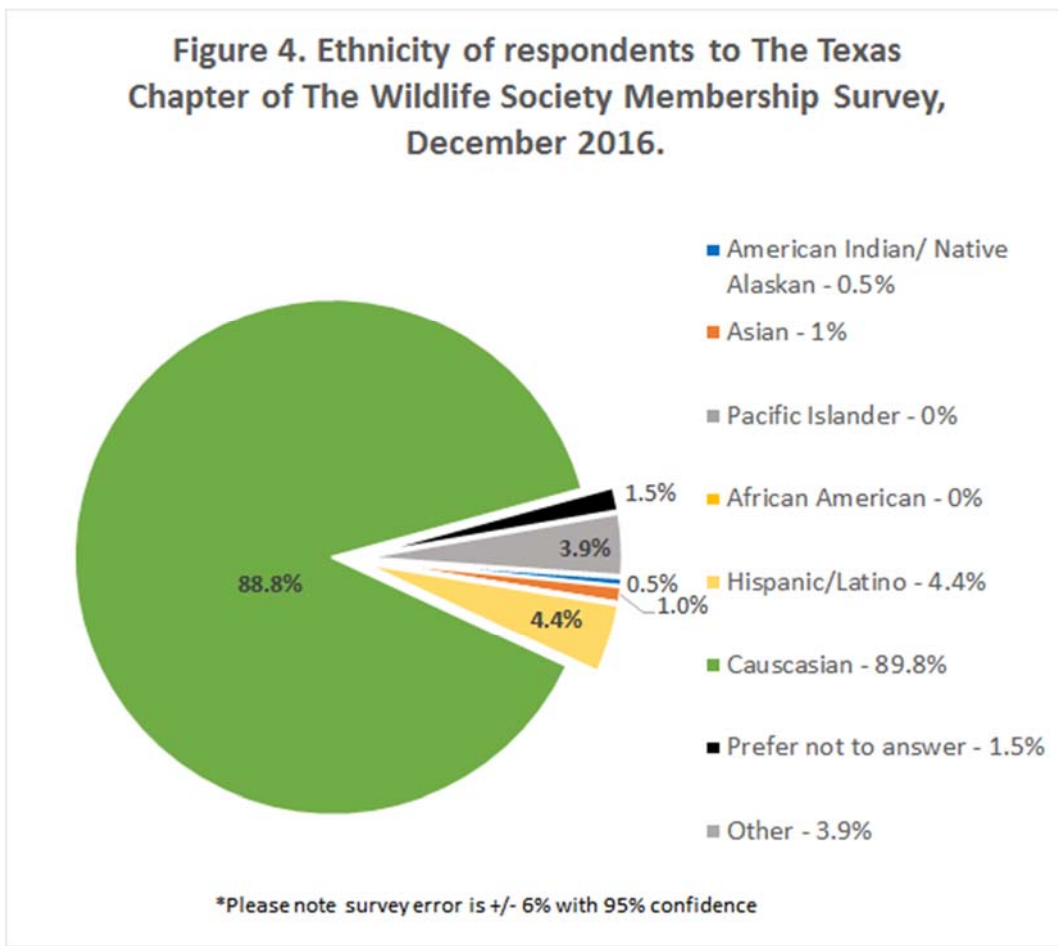


Figure 4. Ethnic profile of respondents to the Texas Chapter of the Wildlife Society's 2016 membership survey.

Respondent Employment and Student Status

Employment or student status was the topic of five questions on the survey. These questions were used to gather information about TCTWS members. The majority of survey respondents were employed full-time (76.7%). The remainder of respondents were full-time students (10.7%), part-time employees (5.8%), retired (5.3%) or not employed (1.5%). The majority of survey respondents were not currently students (81.4%) which indicates students were not well represented in survey results. Anecdotal observations of participants at TCTWS meetings suggest that student membership is much higher than 2016 survey reflected. Membership surveys should be continued annually to more accurately reflect student membership, and several other tactics could be used to increase student responses and overall survey response rate in subsequent years. Of the students that responded to the survey (38 out of 204), 50% were full-time graduate students, 28.9% indicated they were full-time undergraduates, 18.4% were part-time graduate students and only 2.63% were attending full-time at a two-year institution.

When examining questions of employment, it is encouraging that 82.9% of respondents were currently employed in a wildlife related job and only 1% were not employed and looking for work. TCTWS survey respondents work mostly at state institutions: 33.7% at state government agencies and 30.7% at collegiate institutions. The remaining respondents indicated working for a federal government agency (9.3%), non-profit organizations (9.3%), private industry (6.3%), and 10.7% worked in other realms (see Figure 5). Job levels of respondents were mostly intermediate (39.3%), followed by senior career level biologists (32.5%), 15% of respondents were entry level employees, and the remaining 13.1% fell in the “other” category (see Figure 5). The majority of survey respondents, 34%, also indicated salaries between \$50,000 and \$75,000. Fifteen percent of respondents make between

\$30,000 and \$50,000. The third largest component of respondents, 11.2%, are compensated with more than six figure incomes (greater than \$105,000). Slightly more than ten percent (10.2%) of TCTWS biologists made less than \$30,000 but more than \$15,000. Biologists with salaries that ranged between \$75,000 and \$90,000 and \$90,000 and \$105,000 had equal representations in the survey, each with 7.3% of the sample. The smallest proportion of survey respondents, 6.8%, reported incomes of less than \$15,000 per year.

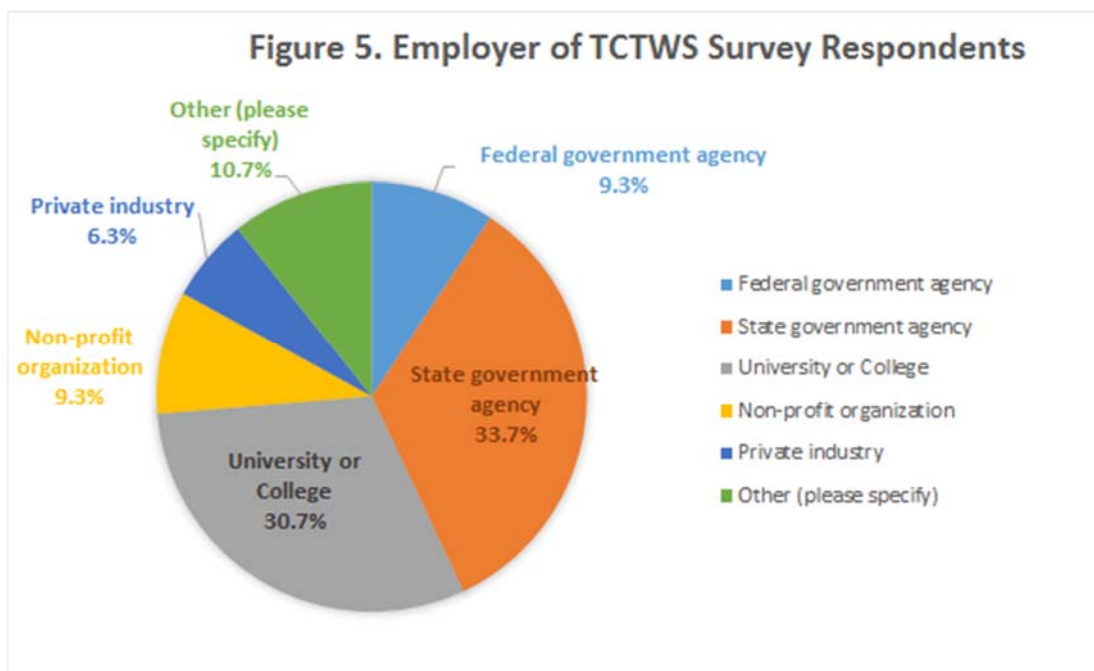


Figure 5. Employers of Texas Chapter of the Wildlife Society (TCTWS) members that participated in the 2016 membership survey.

Outlooks on Bias and Diversity Efforts

The last few questions of the survey were written to measure TCTWS member outlooks on biases that exist in the natural resources professions and the future direction of the Texas Chapter to increase diverse biologists. Survey respondents were split on the existence of bias and discrimination in the natural resource profession in the last ten years. While 49% of TCTWS member respondents had

experienced or observed bias or discrimination, 51% reported no such experience. This question also asked about the type of bias or discrimination that had been observed. Respondents indicated that gender bias was the most encountered form of discrimination, with 36.8% of all that answered selecting this issue. About one fifth of survey respondents indicated that bias based on race (21.6%) and age (20.6%) remains a problem for natural resource professionals in Texas. Smaller proportions of survey respondents indicated that bias against non-traditional sexual orientation (13.7%), gender identity (8.3%) and religion (7.4%) exists in some form (see Figure 6).

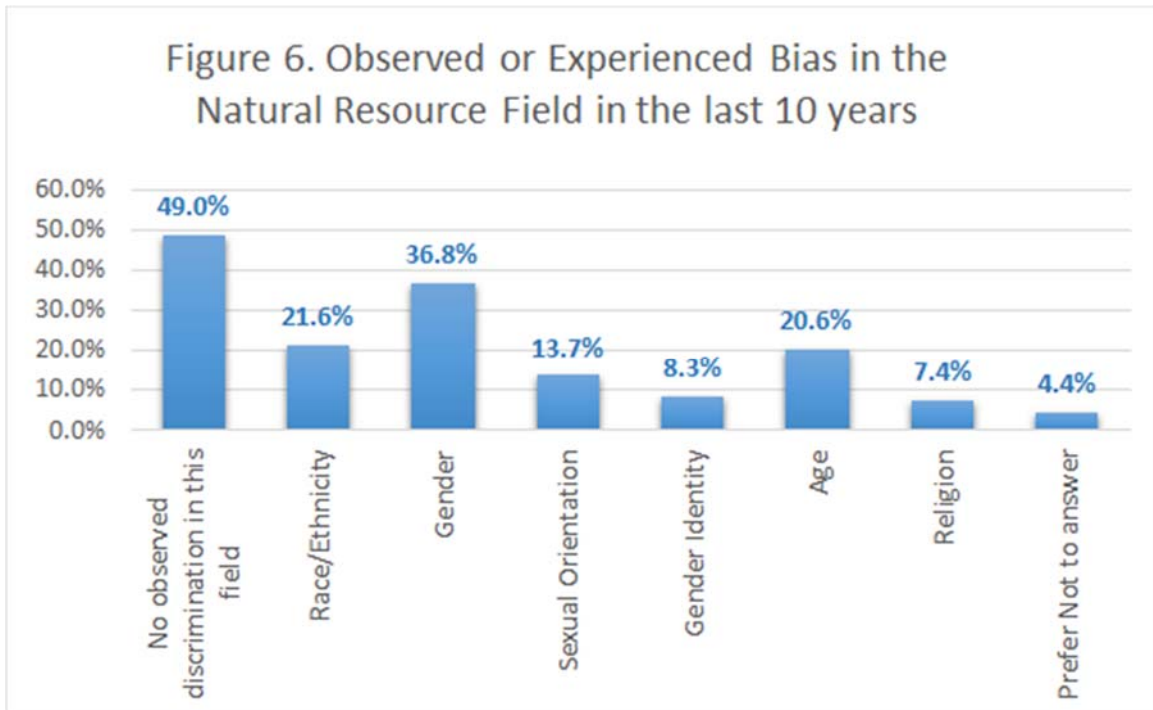


Figure 6. Observed discrimination and bias in the natural resources field in Texas as experienced by TCTWS survey respondents in winter 2016.

The second to last response question allowed members to rank Texas Chapter activities to increase gender and ethnic diversity in order of their importance. Members were allowed to rank five choices with a one (1) as the highest priority and a five (5) as the lowest, thus the choice with the lowest

average rank has the most support by survey respondents. Member respondents believe that the Texas Chapter’s most important efforts to recruit diverse populations should focus on youth populations from grade school through high school (K-12 score = 2.32). The second and third most important priorities indicated in the survey showed very close ranking scores; recruitment and retention of professionals (score = 2.83) and emphasis on diverse degree programs in college curricula (score = 2.86). Texas Chapter members think that establishing and increasing more student chapters (score = 3.32) and recruitment and retention of faculty (score = 3.57) are the least important strategies to increase the diversity of biologists in Texas (see Figure 7).

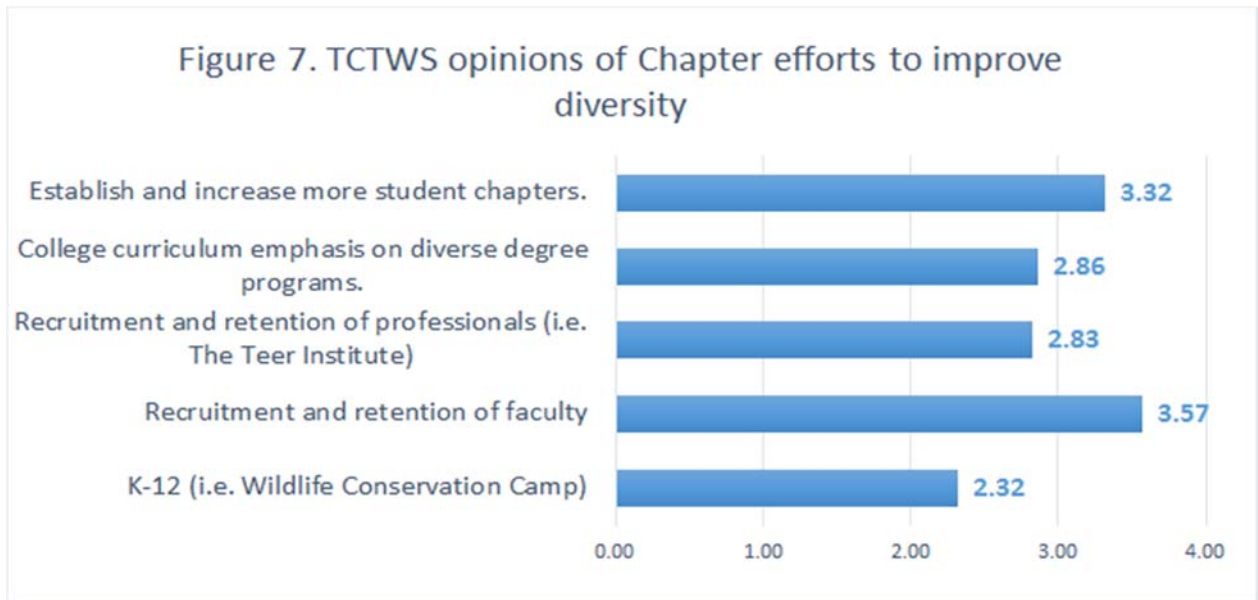


Figure 7. Opinions of TCTWS members on what efforts are most important for increasing ethnic and gender diversity in the profession. Please note respondents were instructed to rank the most important as 1 and the least important as 5, therefore the choice with the lowest score is the one designated as the most important.

The last multiple choice question of the survey allowed members to express their opinion on the current diversity of the Texas Chapter of the Wildlife Society Membership. The question asked members to either agree or disagree with the statement “The Texas Chapter of the Wildlife Society

membership already reflects the diverse and growing population in Texas.” Responses were generally split across all levels of agreement, with two (2) respondents choosing not to answer. Roughly a third of respondents or 34.5% disagreed (disagree - 23.8%; strongly disagreed - 10.7%) that TCTWS is as diverse as the general Texas population. Interestingly, the same percentage of respondents, 34.5% agreed (agree - 27.2%; strongly agree - 7.3%) the statement that TCTWS was already diverse. The remaining 30.1% of respondents did not agree or disagree with the statement and chose a neutral response.

The final question of the survey was an open-ended question designed to allow members to “provide any comments you think are important to consider to improve diversity in the wildlife profession and university programs.” Sixty-four respondents provided feedback in this way. The majority of respondents to the open ended question, 40.2%, used the word “diversity” in their comments. The words “job” or “employment” was mentioned in 31.25% of responses. Respondents also mentioned “students” 23.4% of the time when adding comments about diversity in the Texas Chapter. Other topics of note in open ended responses were “job” at 21.9%, “recruit” or “recruitment” at 20.3%, “college” or “university” at 17.2%, “minorities” and “qualified” showed up in 14.1% of responses and finally “young”, “experience”, and “pay” were each contained in 10.9% of responses.

Discussion

Taking a closer look at the 2016 Texas Chapter of the Wildlife Society membership survey results exposes current and past disparities in representation of diverse groups. As well, TCTWS 2016 membership survey results seem to confirm that a time lag plays a role in diversity as a whole and in gender representation at leadership levels. Cross-tabulations and figures are presented to examine any differences in gender or ethnic representation at different career levels, institutions, salaries, etc.

When examining gender representation by ethnicity, we see that men make up more than two-thirds of the Caucasian population (68.5% male) of survey respondents, while women represented only 31.5%. Hispanic/Latino survey respondents showed more equal gender representation with 55.6% men and 44.4% women (see Table 1). With the exception of those who chose not to provide their ethnicity (1.5%, 4 out 206) men outnumber women in all ethnicities selected by TCTWS members. One caveat to the conclusions made about all races other than Caucasian is the small samples size of respondents in those categories (American Indian - 3, Asian - 2, Hispanic - 9, Other - 8.)

Race	Female	Male
Caucasian	31.49%	68.51%
Hispanic/Latino	44.44%	55.56%
Multiple	25.00%	75.00%
No answer	60.00%	40.00%
Other	42.86%	57.14%
Grand Total	33.01%	66.99%

* Please note survey error is +/- 6% with 95% confidence

Table 1. Gender representation by ethnicity of Texas Chapter of the Wildlife Society survey respondents.

Results of the survey that examine gender and ethnicity by age reflect that efforts made in the last several decades to increase female and diverse biologists have made an impact. Figure 8 (below) shows that, with the exception of the 18-22 age group, more women and diverse races are represented in younger cohorts of biologists. Respondents between the ages of 60 and 69 are the least diverse with only 8.7% of survey respondents identifying as a race other than Caucasian. Comparatively, biologists from 23 - 29 years old were the most diverse age group with 24.24% ethnically diverse respondents. Similarly, only 13.04% of sixty-year-old biologists were female compared to women representing 60% of biologist from 18 - 22 years old. Figure 8 also illustrates that the time it takes from recruiting a young

person through training to entering the workforce, also known as time lag, or delay, does have an impact on workforce diversity.

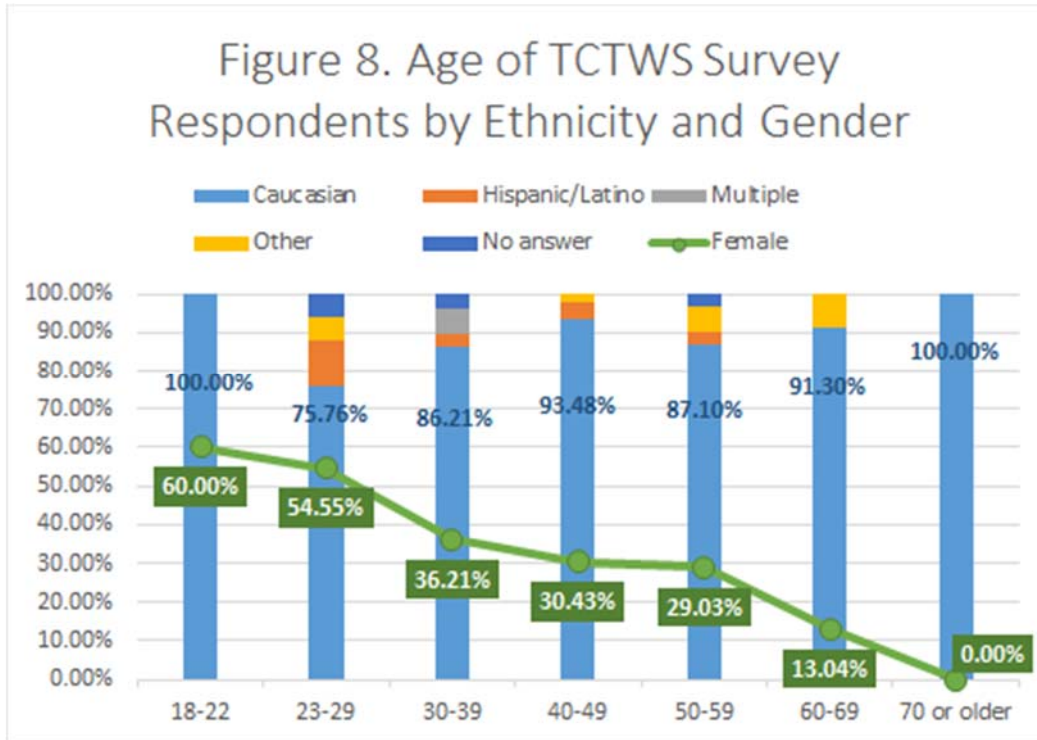


Figure 8. Age of TCTWS survey respondent according to gender and ethnicity.

This survey demonstrates from respondents that salary, job level, and advanced education are unequal for women and diverse populations. Analysis of job level uncovers interesting trends in jobs that women hold compared to men: 54.84% of respondents who serve in entry level positions are women, intermediate position female biologists fall to 37.04% and only 10.45% of senior career level biologists are women. Ethnicity does not show as marked a fall from low to high career levels, but underrepresentation is demonstrated at all levels with a maximum of non-Caucasian races at intermediate career levels with 12.35% of respondents. Diverse entry-level biologists made up 9.68% of

respondents compared to 7.46% at the senior career level. The Caucasian ethnicity dominates all three job levels with over 87% representation at all career levels (see Figure 9).

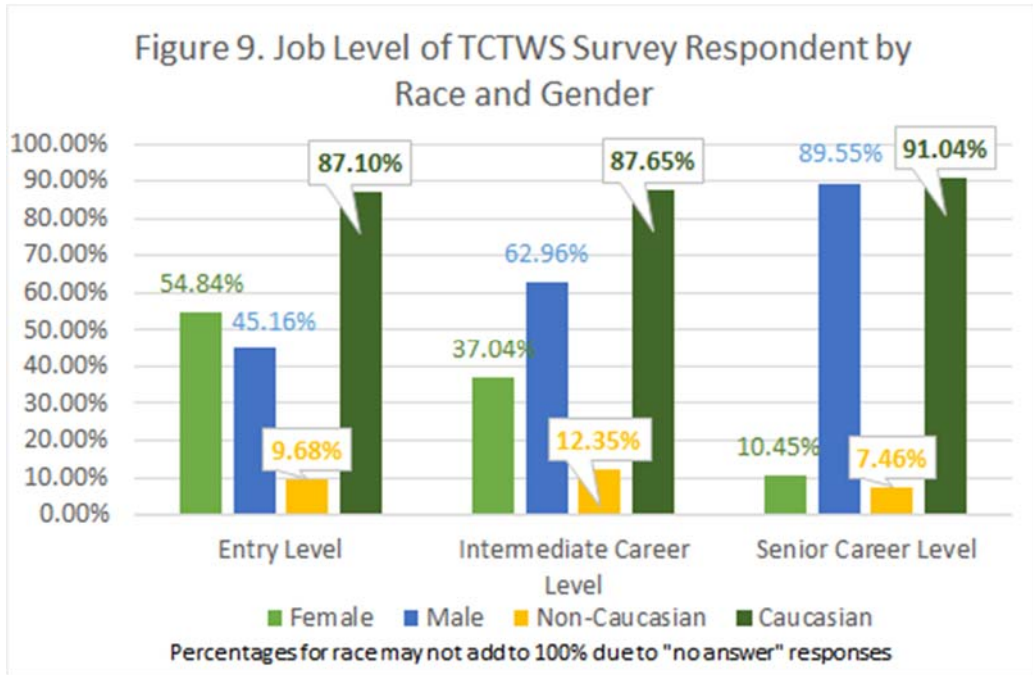


Figure 9. Job level of TCTWS survey respondent by gender and ethnicity.

Salaries demonstrate the same trends as career level with gender and diversity being underrepresented at higher salary levels. Only 8.82% of women survey respondents made over \$75,000 per year compared to 34.07% of men. When considering race and income level, 27.62% of Caucasian respondents made over \$75,000 annually compared to 22.2% of Hispanic respondents, 0% of multiple race respondents and 14.29% of those who selected 'other' race (See Figure 10).

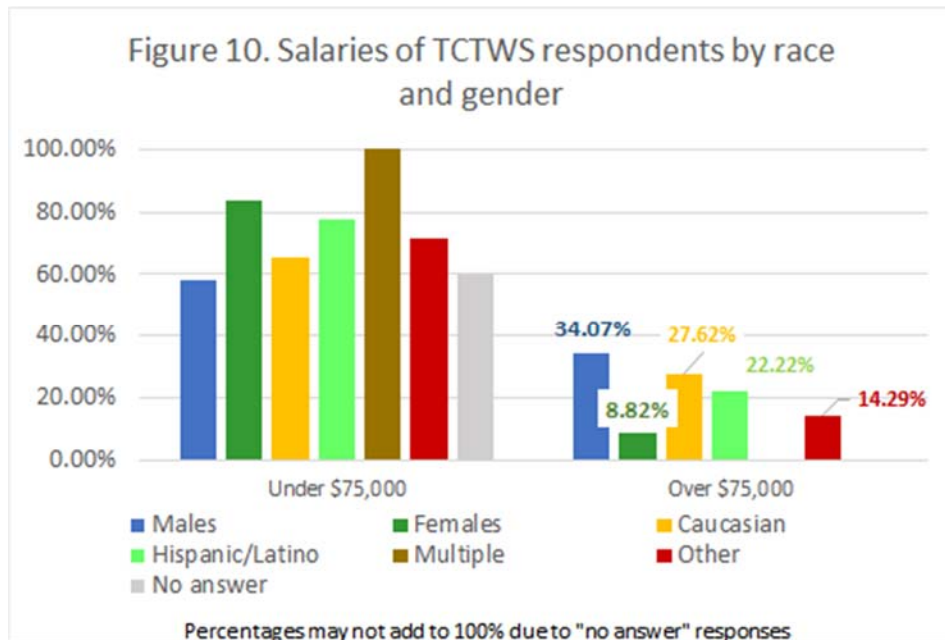


Figure 10. Salaries over and under \$75,000 by ethnicity and gender of survey respondent.

Educational levels of survey respondents confirm the lack of diversity at high education levels, like job and salaries. Only 12.07% of survey respondents who were of a non-Caucasian race have a bachelor’s degree, 10.11% have master’s degrees and fewer still, 8.16% have doctorates. Women respondents, similarly to ethnically diverse biologists hold fewer advanced degrees. Of the total respondents, 39.66% of female biologists hold bachelor’s degrees, 32.58% hold master’s degrees and 22.45% of respondents were women with doctorates (see Figure 11).

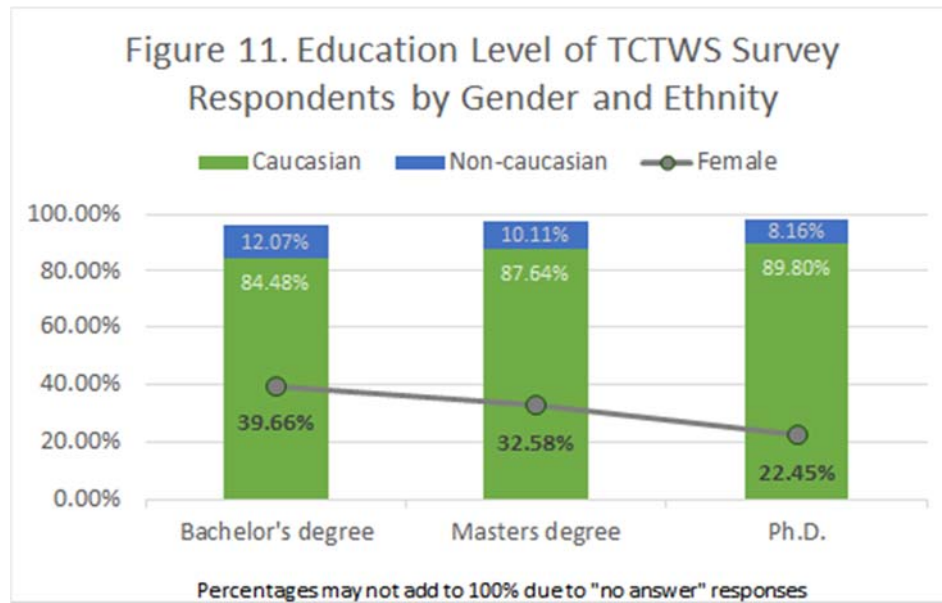


Figure 11. Ethnicity and gender of TCTWS survey respondents by education level.

In conclusion, it is evident that gender and ethnic division still exist in the natural resource fields in Texas. However, great strides have been made that have resulted in the gradual increase of greater gender and ethnic diversity in the profession. Efforts that have been successful in the past should continue to increase not only the diversity of biologists but also recruit and retain the best and brightest in the field.

Systems Thinking Model of Diversity in Natural Resource Professions

While training during the JGTCLI, the 2016 cohort attended the King Ranch Institute for Ranch Management lectureship in systems thinking. This systems thinking lectureship is designed to teach, organize, and understand complex systems and their functions, how each aspect of a problem connects and interconnects. The diversity team used this approach to model and address some parts of the diversity questions we were asked (see Figure 12).

From the many obstacles that were studied when confronting systemic variables associated with recruitment and retention of diversity in the natural resources professions, just a few were isolated in order to study them within the systems thinking framework. The analysis has been limited to terms cited most often in the literature as key to increasing diversity:

Discrimination – the unjust or prejudicial treatment of the different types and backgrounds of people. Examples include age, race, gender, religious, political or other group affiliations, lifestyle choices, worldviews, or cultural backgrounds different from one’s own. This is a force external to the system because bias and/or discrimination exists in society apart from one’s profession.

Institutional Diversity – Organizational change and systemic approaches by which higher education, governments, companies, and non-profits develop, execute, and assess best practices in order to embed and infuse equity, diversity and inclusion into the fabric and culture of the workplace.

Wildlife & Fisheries Professional Diversity – the demographic data that exists for any professional within the wildlife and fisheries professions.

Wildlife & Fisheries Student Diversity – the demographic data that exists for any university or educational establishment that feeds into the wildlife and fisheries professions.

Outreach to diverse populations – Separate from mentorship, this meaning in the model describes the extending of services or assistance beyond current or usual limits. It can include existing outreach programs already in place, or be the creation of new programs and services that address the needs of diverse unreached constituencies.

Mentorship – the guidance provided by a mentor, especially an experienced person in a company or educational institution. A period of time during which a person receives guidance from a mentor.

Family Support – The emotional, verbal, and sometimes tangible support one receives from family members that encourages him/her to pursue natural resource careers.

Interest in science and the outdoors – Stems from many sources, but this is the culmination of background and passion, which sparks a curiosity to pursue knowledge in the STEM careers by an individual.

Recruitment – the actions of finding new, diverse, and qualified people to join an organization or support a cause.

Funding and the Economy – Funding, defined as money provided, especially by an organization or government, for a particular purpose and/or the action or practice of providing money for a particular purpose. The combination of funding and the economy is to describe that both must be in sync for a positive or negative effect on the model. There will be limited funding when the overall economy is struggling. This is an outside force that affects the system but funding nor the economy is influenced by diversity in natural resource professions.

Outdoor Experiences – Refers to leisure pursuits engaged in the outdoors, often in natural or semi-natural settings out of town. These positive or negative experiences can be performed individually or as a team.

Awareness of Wildlife and Fisheries Professions – Describes any individual or group of people that do not know about careers in the natural resources professions.

Scholarships, Internships, Assistantships – Cumulatively, the incentive programs that can be offered to reward successes in the field, or to overcome economic barriers to recruitment and retention can be associated with educational institutions or work environments.

Wildlife and Fisheries Job Availability and Salaries – Affected by overall funding and economy, this is defined as the number of hiring positions that are open for new careers as well as the ability for raises and promotions within a job track. Salaries is tied to this because of its effect on recruitment for these early career positions, and its retention ability for later career decision for qualified individuals to remain in the natural resource careers. Also, if funding is a stable amount there should be an inverse relationship between the number of biology jobs and their associated salaries.

The issue of diversity is often thought of as a pipeline; however, systems thinking can visually represent it as a nonlinear system, as seen in Figure 12. What drives student diversity? What drives professional diversity? What can we leverage as the TCTWS to recruit and retain diverse people in our field?

The key to understanding systems thinking diagrams is to first understand the direction and flow patterns. Starting with 'Discrimination' in the diamond icon on the left side, follow the arrow down towards the next dialogue box and the Letter 'O'. This causal link relationship indicates an opposing force that drives something in the opposite direction. In this case the outside factor, 'Discrimination', is a force outside the system that can cause existing 'Institutional Diversity' to decrease. Causal links with the letter 'O' show an opposing reaction, as one side goes up, the other must come down.

The 'Institutional Diversity' box can be traced to two different but connected loops via a causal link labeled 'S', indicating that if one side increases the same thing will happen to the next box, or vice

versa. The parallel lines that intersect some of the causal links indicate that there is a time lag or delay. Described earlier in the paper, there is a time delay between recruitment events and a resultant diversity increase in either academia or professional settings. The example in the model is the 'Wildlife and Fisheries Professional Diversity' box, connected to the 'Outreach to Diverse Populations' box with an 'S' causal link with a time delay, on the bottom left of the larger loop. This indicates that as a type of diversity among professionals (with an organization, society, or as a whole) decreases, with time the effective outreach of that group towards groups that are different tends to decrease as people are naturally more comfortable with things to which they can relate.

The central 'R' inside the system indicates which of the two types of loop diagrams are drawn. An 'R', or reinforcing loop, describes amplification or a scenario with spiraling growth or decline. Indicators of reinforcing loops are no 'O' type causal links, or loops with an even number of 'O' links. Another type of loop is balancing. A 'B' loop describes a limiting, constraining, or self-regulating process and has an odd number of 'O' links. The closest archetypes to this current model are "Success to the Successful" and the "Tragedy of the Commons".

The systems thinking model presented herein should be an encouragement for the leadership of the Texas Chapter of the Wildlife Society. Leverage points exist in the model where impacts can be made to increase the number of diverse biologists in training and in the workforce. Mentorships, incentives and recruitment are some of variables in the system that can be leveraged to grow overall interest in the sound scientific management of wildlife and fisheries as well as increasing diversity and inclusion in the profession. Suggested actions in the first section of this white paper outline strategies that include precision recruitment and marketing to leverage important points in the model. One final note of optimism for the future of diversity that the systems thinking model highlights, is the fact that it is a

reinforcing loop. Once efforts are made to increase any one of the variables linked in the system a cascade of increasing affect will lead to increased professional and student diversity. With small changes and continued efforts to increase workforce diversity, Texas natural resource professionals and students can soon reflect the diversity of our great state.

Figure 12. Systems Thinking Model of Diversity in Natural Resource Professions

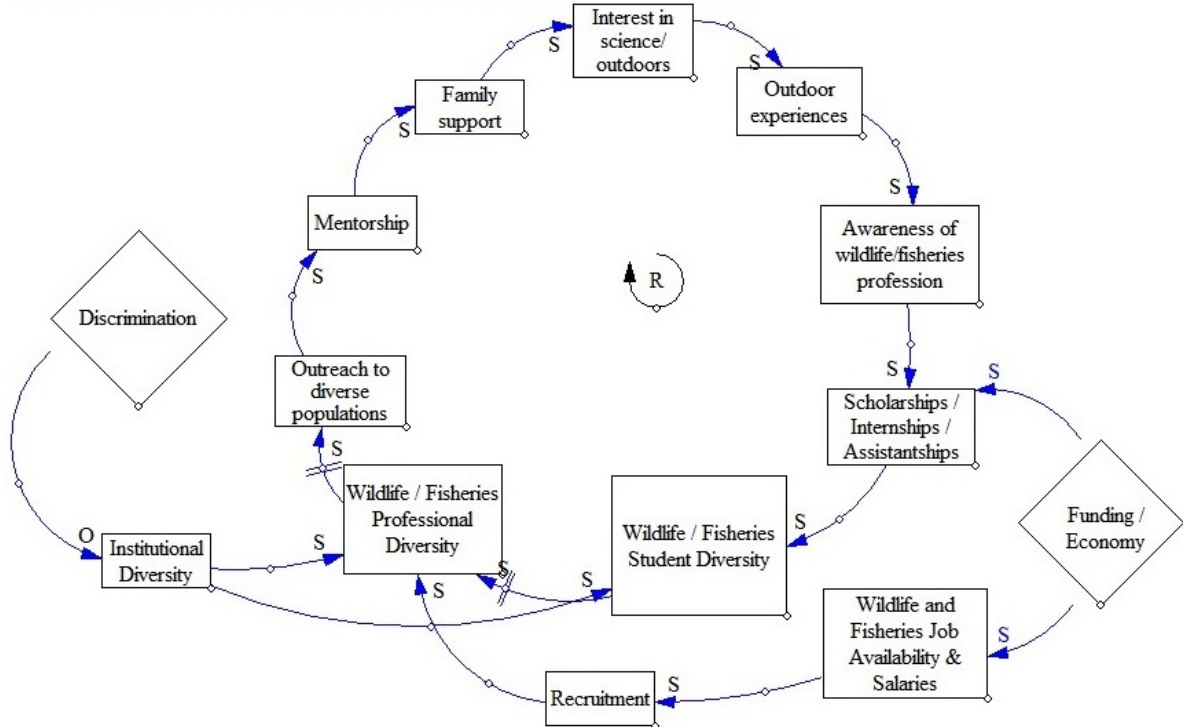


Figure 12. Systems thinking model of variables that contribute to ethnic and gender diversity in the natural resource professions.

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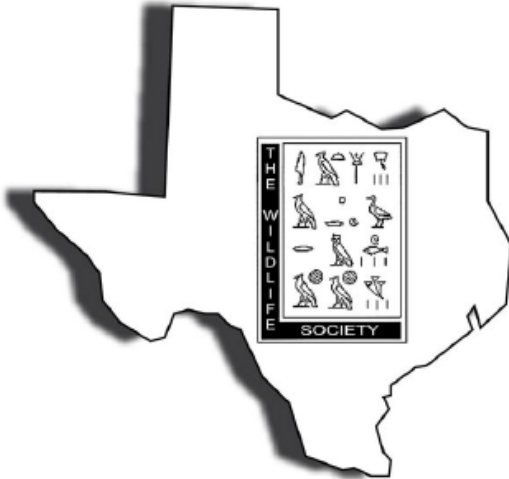
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Appendix 1. Texas Chapter of the Wildlife Society

Membership Survey



Texas Chapter of The Wildlife Society Membership Survey

James G. Teer Early Career Professionals Conservation Leadership Institute

This survey consists of 15 multiple choice or short answer questions and should only take 5 to 10 minutes to complete.

The 2016 Cohort of the Early Career Professional Leadership Program within the James G. Teer Conservation Leadership Institute has been tasked with measuring the current gender and ethnic diversity of the Texas Chapter of the Wildlife Society. This anonymous survey instrument will help us measure the current diversity of the Texas Chapter and also gather opinions for the best direction TCTWS can move forward for efforts to diversify our future wildlife workforce.

1. In what size community are you located?

- Urban (>50,000)
- Suburban (2,500-50,000)
- Rural (<2,500)

2. What is your gender?

- Female
- Male
- Other
- Prefer not to answer

3. What is your age?

- 18-22
- 23-29
- 30-39
- 40-49
- 50-59
- 60-69
- 70 or older
- Prefer not to answer

4. What is the highest level of education you have completed?

- Less than high school degree
- High school degree or equivalent (e.g., GED)
- Some college/technical school but no degree
- Technical school degree
- Associate degree
- Bachelor degree
- Masters degree
- Ph.D.

5. Which race/ethnicity best describes you?

- American Indian / Alaskan Native
- Asian
- Pacific Islander
- Black / African American
- Hispanic/ Latino
- White / Caucasian
- Prefer not to answer
- Other

6. Are you employed in a wildlife related job?

- Yes
- No

7. Which of the following categories best describes your employment status?

- Employed, full-time
- Employed, part-time
- Not employed, looking for work
- Not employed, NOT looking for work
- Retired
- Disabled, not able to work
- Full-time student

8. Are you currently enrolled as a student?

- Yes, full time at a two year college/trade school
- Yes, part time at a two year college/trade school
- Yes, full time at a four year undergraduate college/university
- Yes, part time at a four year undergraduate college/university
- Yes, full time at a graduate school
- Yes, part time at a graduate school
- No, I am not currently enrolled as a student

9. What is your current annual salary before taxes?

- Less than \$15,000
- \$15,001 - \$30,000
- \$30,001 - \$50,000
- \$50,001 - \$75,000
- \$75,001 - \$90,000
- \$90,001 - \$105,000
- Over \$105,000
- Prefer not to answer

10. What best describes the company or organization for which you work?

- Federal government agency
- State government agency
- University or College
- Nonprofit
- organization
- Private industry
- Other (please specify)

11. Which of the following best describes your current job level?

- Senior Career Level
- Intermediate Career Level
- Entry Level
- Other (please specify)

12. Over the past 10 years, I have observed or experienced bias in the natural resource field, professionally or in volunteer situations, towards one or more of these historically underrepresented groups (Check all that apply):

- No observed discrimination in this field
- Race/Ethnicity
- Gender
- Sexual Orientation
- Gender Identity
- Age
- Religion
- Prefer Not to answer

13. Prioritize where the TCTWS should focus its efforts to recruit and retain diversity and improve inclusion in its Chapter membership. Please rank your Highest Priority preference as a 1, and Lowest Priority as a 5.

<input type="text"/>	<input type="text"/> K-12 (i.e. Wildlife Conservation Camp)
<input type="text"/>	Recruitment and retention of faculty
<input type="text"/>	Recruitment and retention of professionals (i.e. The Teer Institute)
<input type="text"/>	College curriculum emphasis on diverse degree programs.
<input type="text"/>	Establish and increase more student chapters.

14. The Texas Chapter of the Wildlife Society membership already reflects the diverse and growing population in Texas.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Prefer not to answer

15. Do you have any other comments or concerns? Please provide any comments you think are important to consider to improve diversity in the wildlife profession and university programs.

Finished