

# FWF STRATEGIC PLAN

2016-2021







# Table of Contents

Vision

Mission

Goals

Who We Are

1

Driving Forces

Demographics

Climate Change

Invasive Species

Land Ownership

Commodity Emphases

1-4

What We Do

Research

Teaching

Extension

5-13

Progress Made During  
the Previous Strategic  
Planning Period  
(2009-2015)

14-16

## Vision

We will be recognized nationally and internationally as a premier university research, teaching, and outreach department focusing on the natural resource disciplines. As the foremost natural resource program at the flagship Land Grant University in Tennessee, we will be known for our leadership and our ability to address the needs of the state, the region, the nation, and the world.

## Mission

The mission of the Department of Forestry, Wildlife and Fisheries (FWF) is to advance the science and sustainable management of natural resources to promote their health, utilization, and appreciation in Tennessee, the region, and beyond through programs in research, teaching, and extension.

## Goals

Research Goal: to explore opportunities and provide solutions to challenges in natural resource management, conservation, and sustainability.

**Teaching Goal, Undergraduate Education:** to provide students with the challenges, opportunities, and training—with emphasis on field experience—they will need to prepare themselves for a variety of outstanding careers across a diverse set of natural resource employers such as state and federal agencies, industry, non-governmental organizations, and academia.

**Teaching Goal, Graduate Education:** to provide students with the challenges, opportunities, and training they need to become world experts and leaders in their chosen natural resource discipline.

**Extension Goal:** to meet the needs of clients in the public and private sectors of Tennessee, the Southern Region, and the nation through (1) improving the profitability of forest ownership, (2) encouraging responsible and sustainable management of natural resources, and (3) facilitating a better understanding of the natural resource environment (ecology, succession, and growth).

## Who We Are

The Department of Forestry, Wildlife and Fisheries is one of 11 academic departments in the University of Tennessee, Institute of Agriculture. Our 32 faculty members perform a wide range of applied and basic research, teach undergraduate and graduate students,

and educate professionals and the general public through statewide extension programs. Current enrollment (fall, 2015) in our academic programs totals 278 students (229 undergraduates and 49 graduate students) spread over two undergraduate majors (*Forestry and Wildlife and Fisheries Science*), two master's degree programs (*Forestry and Wildlife and Fisheries Science*), and one doctoral program (*Natural Resources*). The Department recently (2014) celebrated its 50th anniversary.

## Driving Forces

“Change” is the one word that best characterizes the natural resources of Tennessee, the surrounding region, the nation, and the world—now and into the foreseeable future. Many underlying factors are driving this change. The faculty in the Department of Forestry, Wildlife and Fisheries must address these factors as they develop a strategy for the future. The major factors to consider include changes in demographics, climate, invasive species, land ownership, and commodity emphases.

### Demographics

Several trends in population demographics for the state and region are evident. In general, the population is aging as the “baby boom generation” continues to retire. There is also a national movement of population away from rural areas into more urban environments. Urban areas are a melting pot of different cultural and ethnic groups. A dramatic demographic shift in the United States has significantly increased the numbers of ethnic minorities in high-school- and college-age populations. Overall, the state of Tennessee is experiencing an increase in population due to an influx of retirees, of recreationists who desire second homes, and immigrants from other states (and countries) seeking a higher quality of life and the amenities afforded by our natural resources. Associated with population increases is a concomitant loss of wild and agricultural lands due to development. Approximately 80,000 acres per year are lost to development, greatly impacting wildlife and forest resources. This trend is expected to continue as the state population is predicted to increase by 20% over the next 20 years.

These human demographic changes are also interacting with climate- and habitat-induced changes in the distribution of wildlife that can spread disease to people and domestic animals (e.g., the recent spread of rabid raccoons into eastern Tennessee and accelerating rates of wildlife-hosted tick-borne disease across the state). Continuation of these trends will likely lead to resource demands that will stress the state's forests









and wildlife and emphasize the interaction (both positive and negative) of humans with our state's natural resources.

### Climate Change

Another factor that brings change, and potentially more stress, is climate change. Expected warming of the region may result in the decline of some species (both plant and animal) and in the influx of others more suited to warmer climes. The 2006-2008 regional drought and the 2010 Nashville flood highlight the potential negative consequences and added stress that can be linked to changes in the region's climate. In addition, regional human influences may have an additive effect on the stress brought about from climate change. Projected population growth may lead to increased nitrogen/sulfate deposition, air quality issues, and impacts on the water table as well as soil and water chemistry. As a result, there is a need to adapt our science and education activities to encompass natural and human-induced fluctuations in temperature, water quality and quantity, air quality, and related threats to the health of our ecosystems.

### Invasive Species

A third major factor, the significant impact of invasive, nonnative species, is also linked to population and climate change. As our growing population leads to an increased use of our resources by both tourists and native Tennesseans, invasive plant and animal species are inadvertently spread. Changing transportation infrastructure and increased world commerce also lead to progressively increasing numbers of nonnative introductions and the potential movement of plants, insects, and diseases throughout the region. A plethora of exotic forest pests including hemlock and balsam woolly adelgids, butternut canker, beech bark disease, and dogwood anthracnose continue to devastate native host species. Two new threats, emerald ash borer and thousand canker disease have arrived in Tennessee over the past few years. Zebra mussels, first found in the Tennessee River in 1991, now can be found throughout its length. Asian carp are now threatening to enter the Cumberland and Tennessee Rivers from the Mississippi River Basin. Fire ants continue their slow but steady spread northward, and pests such as the gypsy moth, Asian

longhorned beetle, and sudden oak death loom as future threats to our hardwood forests. Feral hogs continue to alter plant and animal communities where their populations thrive. The Tennessee Exotic Plant Council lists 29 plant species as serious threats, including Japanese knotweed, kudzu, mimosa, Japanese stiltgrass, tree of heaven, johnsongrass, sericea lespedeza, oriental bittersweet, and Japanese honeysuckle, all of which displace native plant species and potentially inhibit natural and artificial forest regeneration. Scientists and educators will be faced with the new challenges posed by these invaders.

### Land Ownership

Yet another factor that potentially threatens the health of the state and regional ecosystems is change in land ownership due to two major trends: (1) aging of the population and (2) divestiture of land by traditional forest industries. As our population continues to age, landowners will pass on their estates to heirs who may have weaker ties to the land (especially if they live in more urban communities) and less interest in conserving and managing the lands they inherit. Another traditional forest landowner, forest industry, has all but completed total divestiture of their lands because of changes in the tax code that made it more economically sensible to create and sell land to financial institutions such as timberland investment management organizations (TIMOs), real estate investment trusts (REITs), and limited liability and master limited partnerships. The objectives of these new land owning organizations may not coincide with previous management activities and methodologies. Both major factors, population aging and land divestiture, will continue to increase the fragmentation of the land base that supports our forests and wildlife, leading to new and varied stresses on processes and species that normally depend on contiguous vegetation over large geographic areas.

### Commodity Emphases

One final factor affecting the structure and function of our forested ecosystems is a change in emphasis on the commodities produced from these lands. For example, a “commodity” receiving increased emphasis is recreation. Tennessee’s natural resources are the basis of much of the tourism industry in the state. Increasing fragmentation and development, coupled with increasing demands for recreation, will place

additional stress on the natural resources of the state, remove land from the overall base, and affect the use of adjacent land due to changes in visual values. We need to better understand the importance of the recreation and tourism sector and its interaction with competing interests for the state’s natural resources.

Another prominent example of a commodity that has moved to the forefront of our resource management strategy, due to a desire to reduce dependency on non-renewable fossil fuels, is the production of biofuels and bio-based products from cellulosic feed stocks—such as woody biomass—from our forests. Increased use of timber resources for biomass will potentially affect plant and animal species, as well as the markets for traditional wood products. In the fisheries sector, sustainable aquaculture support of subsistence and commercial seafood markets is a current and future concern as human population grows and wild-capture fisheries dwindle. Rather than wait until such changes have occurred to determine appropriate forest, wildlife, and fisheries management strategies, proactive work is needed if we are to help promote sustainable use of our valuable natural resources.

All of the significant factors mentioned above (population change, climate, invasive species, shifts in ownership, and changes in product emphasis) will likely lead to increased stress on our environment. Cutting across several factors is the influence of globalization. While current economic conditions are dampening the effects somewhat, the impacts of globalization are becoming increasingly evident. Mills are producing wood pellets to feed the European energy market, international tourism is increasing, and international competition is affecting the forest industry in the state. These factors and the influence of globalization will necessitate new approaches to wise management and conservation. Ultimately, the health of our forests, streams, wildlife, and the communities that depend on them, will depend on the research and education efforts of scientists and educators like those in the Department of Forestry, Wildlife and Fisheries. It is our responsibility to plan to meet these needs in the future. This strategic plan for the department has been developed with such factors firmly in mind.



## What We Do

5

### Research

Upon consideration of external driving forces, current research activities, and foreseeable opportunities, the following six strategic research directions have been identified for the department: bio-based products, disturbance-related ecology and land management, native grassland ecology and management, wildlife health, human dimensions and institutions of natural resource management, and improvement and protection of Tennessee forest resources.

**Bio-based products** includes energy, chemicals, composites, and solid wood products from cellulosic sources. Although much of this effort is focused on the bioenergy component at present, the initiative cuts across land management (forest and grassland), policy and socio-economics, wildlife management and ecology, and watershed management projects.

**Disturbance-related ecology and land management** includes “traditional” disturbances of our natural ecosystems such as timber harvesting, prescribed fire, herbicide application, mechanical disturbances, storms, wildfires, and endemic insects and diseases, plus sources of disturbance related to the changes we see in our state and region. These disturbances also include the introduction of exotic invasive species, land conversion, temperature change via climate warming, and chemical effluents into aquatic ecosystems. Research activity within this broad category encompasses forest and wildlife population growth, monitoring, and viability.

### **Native grasslands ecology and management**

Native grasslands, once a significant component of eastern landscapes, have been reduced more than any other ecosystem in North America. These grasslands included extensive prairies, pine and oak savannas, oak woodlands, and cedar glades, each with specially adapted flora and fauna. Today, approximately 51 million acres of pasture and hay lands (with mostly non-native grass species) occur in the Mid-South alone, a very significant component of non-forested cover within the region. Grasslands also occur on reclaimed surface mines, military training areas, and as small but important features within row crop dominated landscapes (e.g., grassed waterways, field buffers, and filter strips).

**Wildlife health** Wildlife health research is a broad field that includes restoration of populations (both aquatic and terrestrial); assessing and promoting genetic diversity of wildlife populations; understanding of contaminants in the environment (i.e., aquatic and terrestrial toxicology); both monitoring and modeling of population growth; determination of factors affecting population viability (which often relate to ecosystem disturbance); and factors affecting nutrition and life history. Recent growth in this field is being driven in part by concern about zoonotic diseases—







cross-species diseases that travel to humans from other animals—as well as diseases that travel from wildlife to livestock and thereby threaten our agricultural production systems. Endocrine disruption and its anthropogenic causes are a new line of research for aquatic wildlife (e.g., salamanders, mussels, invertebrates, etc.), and fish health.

**Human dimensions of natural resource management** includes the traditional disciplines of natural resource policy, economics, psychology, sociology, and the emerging fields of ecosystem services markets, climate change policy, natural resource sustainability, forest therapy, and rural tourism including agritourism, heritage tourism, and ecotourism/nature based tourism.

**Improvement and protection of forest tree genetic resources** encompasses the oldest research program in the department, the UT Tree Improvement Program. This program was initiated in 1959 and has holistic objectives of improving different tree species in areas valued by Tennessee landowners while engaging in genetic conservation of species that are threatened or endangered within the state. The program is integrated with the Tennessee Division of Forestry (TDF), Tennessee Wildlife Resources

Agency (TWRA), and USDA Forest Service, Southern Region and Southern Research Station through separate formal memorandums of understanding in order to coordinate research and development activities, efficient technology transfer, and to avoid duplication of effort.

The breadth of the six strategic focus areas for the department recognizes the range of faculty expertise and the ability of faculty to work within multi-disciplinary teams—both internally to FWF and externally with faculty from other units. This is not to imply that there are no disciplinary gaps within FWF that could be filled to strengthen our research, teaching, and extension programs. The most prominent disciplinary gap recognized by the department is in the disciplinary area of spatial technology and analysis. Expertise in this disciplinary area would bolster efforts across all six strategic focus areas.

**Research Goal:** Provide solutions to challenges in natural resource management, conservation, and sustainability.



## Objectives:

1. **Secure existing faculty positions—in discipline areas that match the needs and priorities of the department—when or if they become vacant.**

**Action:** Review positions of faculty that are retirement-eligible, plan future of each position, develop position request support material for each.

**Timeline:** Fall 2016/17, continuous evaluation and revisions as faculty become retirement-eligible, or as priorities change (revisit each summer at minimum).

2. **Compete successfully for new faculty positions—in discipline areas that match the needs and priorities of the department—when opportunity arises.**

**Action:** Develop position request support material for high-priority faculty positions (particularly in the area of spatial technology and analysis).

**Timeline:** Fall 2016/17, continuous evaluation and revisions as priorities change (revisit annually).

3. **Restore and secure four new permanent research support positions (approximately one per eight faculty members).**

**Action:** Develop position request support material for high-priority staff positions.

**Timeline:** Fall 2016/17, continuous evaluation and revisions as priorities change (revisit annually).

4. **Secure development funds for endowed faculty positions.**

**Action:** Work with UTIA Development Office and FWF Advisory Board Sub-development Committee personnel to engage existing donors and seek new donors through initiatives such as the Volunteer Forest.

**Timeline:** Obtain commitment for position by 2020.

5. **Provide more GRA opportunities.**

**Action:** Develop GRA request support material linked to strategic research initiatives.

**Timeline:** Fall 2016 for FY18 and each subsequent fall for the following fiscal year in preparation for budget requests during the spring.

6. **Secure development funds for endowed graduate fellowship positions.**

**Action:** Work with UTIA Development Office personnel to engage existing donors and seek new donors through initiatives such as the Volunteer Forest, link to research areas of interest to donor.

**Timeline:** Obtain commitment for at least one fellowship by 2020.

7. **Ensure the publication success of master's and doctoral students' research in refereed journals.**

**Action:** Assess and monitor the success rate for graduate student publication success; provide incentive for publication through support of publication costs through departmental funds when available.

**Timeline:** Assessment of last five years should be completed by the end of the fall 2016 semester; monitoring will be ongoing.

## Research Priorities:

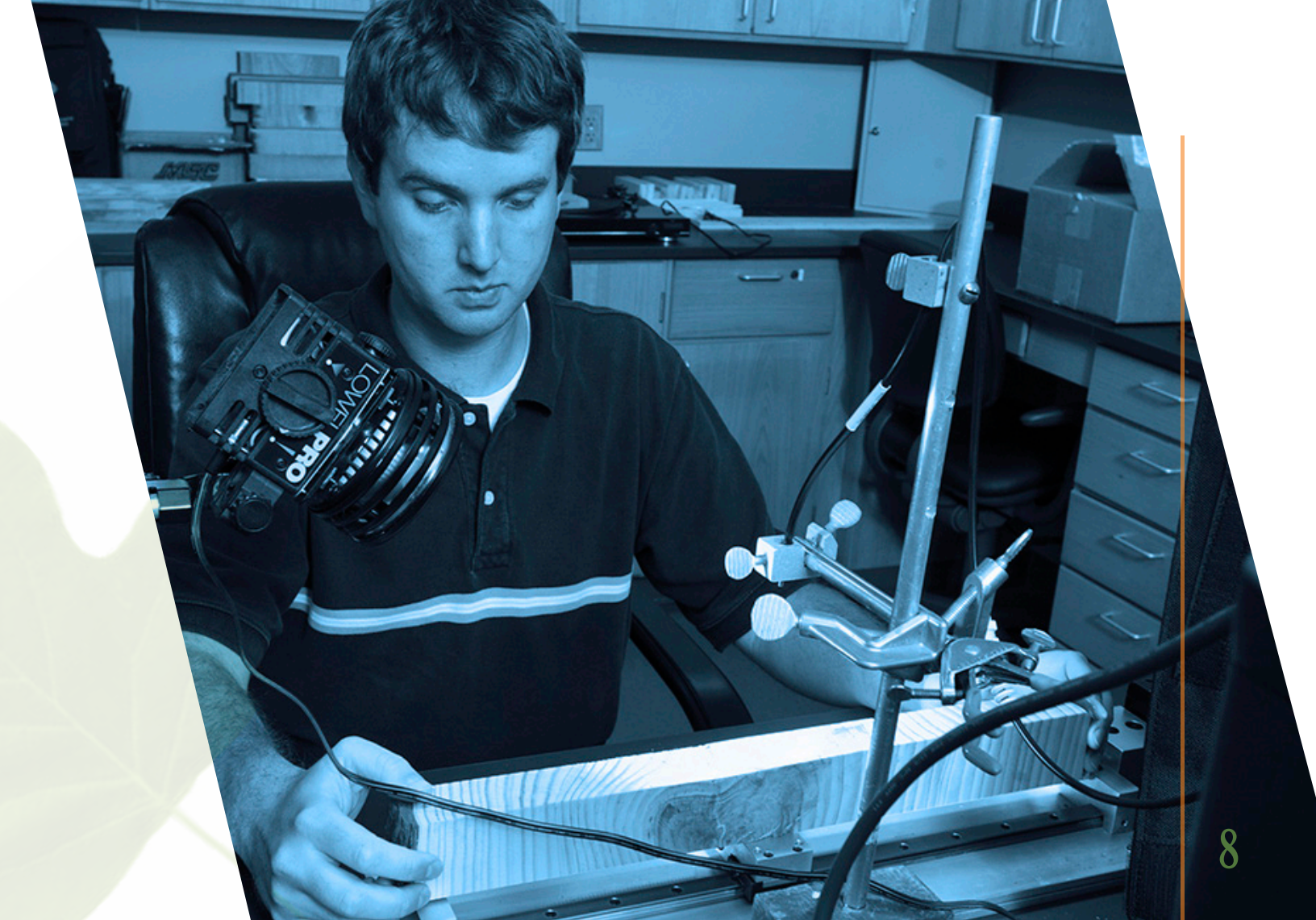
1. The greatest need is for graduate student support, especially tuition funds.
2. Secure support for new permanent research support-staff positions.

## Teaching

We have a diverse, comprehensive department (forestry, wildlife, fisheries, and forest products) that provides many opportunities for multi-disciplinary instruction and sets us apart from many of our peer programs at other institutions. Unlike most programs in the southeastern region, we have a strong focus on hardwood forest ecosystems in addition to pine and mixed forest types. We emphasize applied, field-based, hands-on experiences, not only in field camp courses, but in many other forestry, wildlife, and fisheries courses. Students receive one-on-one interaction with faculty in all courses and through academic/career advising rather than interacting solely with teaching assistants or post-docs. Designated faculty and staff work with students to ensure that they understand the core aspects of cultural competency within their fields of study. Furthermore, students are highly encouraged by their faculty, staff, and peers to participate in student organizations that promote professional development and global awareness.

**Undergraduate education:** Undergraduate options focus on two bachelor of science degree majors, one in *Forestry* and the other in *Wildlife and Fisheries Science*. Both majors allow for specialized instruction





via academic concentrations. Enrollment in the forestry major has remained fairly steady over the past 10 years, averaging about 50 students, while enrollment in the Wildlife and Fisheries Science major has nearly tripled (from 69 to 167) over the same time period. Academic support in terms of new faculty FTEs as well as graduate teaching assistantships have not kept pace with the overall increase in enrollment. The department is currently exploring ways to manage undergraduate enrollment to match academic support.

**Graduate education:** focuses on two master's degree majors, one in *Forestry* and one in *Wildlife and Fisheries Science*, plus a doctoral major in *Natural Resources*. Areas of specialization are available in all three degree programs. Enrollment in the graduate majors has declined over the past 10 years, averaging in the low 60s for the beginning of the period; it now averages in the low 50s. The reason for the decline has been a reduction in funding that can offset tuition costs (either departmental funding that was lost to budget reductions or restrictive federal policies that

do not allow tuition payment). Over the time period of this decline in graduate student enrollment, faculty in the department have more than doubled their research expenditures, substituting research associates, post-docs, and research technicians for graduate students in their grant proposals.

**Teaching Goal, Undergraduate Education:** to provide students with the challenges, opportunities, and training—with an emphasis on field experience—that they will need to prepare for a variety of outstanding careers with a diverse set of natural resource employers, such as state and federal agencies, industry, non-governmental organizations, and academia.

**Objectives:**

I. **Resolve over-enrollment in the wildlife program.**

**Action:** Revise and strengthen U-Track milestones for the Wildlife and Fisheries Science major, Wildlife and Fisheries Management



concentration to encourage underachieving students to either change majors or meet progression requirements.

**Timeline:** Complete and submit proposal for milestone changes by the end of summer 2016.

**Action:** Secure additional wildlife program teaching resources.

**Timeline:** Continuous.

**Action:** Continue to address “bottleneck” courses that impede timely graduation, especially for transfer students.

2. ***Students should master course topics in a logical order and manner throughout the curriculum.***

**Action:** Both wildlife and forestry camps have been shifted to fall senior year to improve the logical flow of course topics, but there is still room for improvement through enforcing course prerequisites and fine-tuning the scheduling of courses in the curricula.

**Timeline:** Continuous.

3. ***Provide opportunities and raise expectations for students to synthesize important concepts throughout the curriculum rather than focusing exclusively on the capstone course as the mechanism for such synthesis.***

**Action:** Identify (and document) synthesis opportunities in existing courses and add these to the courses’ expectations.

**Timeline:** Complete by end of academic year 2016-2017.

4. ***Provide more opportunities for critical thinking during all courses. We emphasize change is important in research. We must also emphasize that change and new ways of thinking are important in student education.***

**Action:** Identify (and document) critical thinking opportunities in existing courses and add these to the courses’ expectations.

**Timeline:** Complete by end of academic year 2016-2017.

5. ***Monitor employer needs (i.e., knowledge and skills) and expectations for graduates of our programs.***

**Action:** Develop and implement employer and alumni survey.

**Timeline:** Complete survey by end of 2016.



6. ***Increase the use of spatial technology across the curricula of both majors.***

**Action:** Add a course in spatial technology.

**Timeline:** Contingent on new hire specializing in spatial technology.

**Action:** Incorporate the use of spatial technology in existing courses.

**Timeline:** Continuous.

7. ***Increase student involvement in opportunities outside of the classroom such as College of Agricultural Sciences and Natural Resources (CASNR) honors programs, undergraduate research, study abroad and exchange programs, and internships (i.e. municipalities, agencies, and industry).***

**Action:** Involve students who have participated in these programs in classroom discussions and presentations, and have speakers from across the university who can present to students and faculty what opportunities are available and how to pursue them.

**Timeline:** Continuous.

**Action:** Promote study abroad opportunities and the minor in International Agriculture and Natural Resources.

**Timeline:** Continuous.

**Action:** Continue current and develop new faculty-led study abroad opportunities.

**Timeline:** Continuous.

**Action:** Explore the possibility of requiring professional experience as part of the undergraduate degree program(s).

**Timeline:** Complete research and make decision by end of spring semester, 2016.

8. ***Make it easier for transfer students to make the transition to our undergraduate programs.***

**Action:** Update specific transfer guides for students transferring to FWF undergraduate majors from Tennessee community colleges.

**Timeline:** Complete by end of fall semester 2016.

9. ***Prepare undergraduates to succeed within their chosen field.***

**Action:** Provide students training on how to effectively communicate with diverse stakeholders within their profession.

**Timeline:** Continuous.

**Action:** Introduce them to multiple career opportunities within their fields of study.

**Timeline:** Continuous.

**Teaching Priority, Undergraduate:** Manage enrollment to match resources available for support of the program.

**Teaching Goal, Graduate Education:** Provide students with the challenges, opportunities and training they need to become world experts and leaders in their chosen natural resource discipline.

**Objectives:**

1. ***Attract and retain master's and doctoral students to forest products/wood science-related disciplines.***

**Action:** Continue to promote the Bio-based Products and Wood Science and Technology Concentrations.

**Timeline:** Continuous.

**Action:** Continue the successful summer internship program for European students and FWF faculty members affiliated with the CRC as a pipeline for graduate recruiting. Explore ways to expand the program to other international universities.

**Timeline:** Continuous.

**Action:** Pursue individual joint graduate degree programs with targeted UTK departments.

**Timeline:** Continuous.

2. ***Increase graduate course offerings within the department.***

**Action:** Analyze specific course needs, create new courses as faculty resources become available.

**Timeline:** Complete analysis of needed courses by end of summer 2017.

3. ***Increase graduate teaching assistantships.***

**Action:** Continue to make the case for allocation of greater numbers of graduate teaching assistantships to the CASNR and UTK.

**Timeline:** continuous





4. ***Achieve departmental consensus on the expectations for graduate education.***

**Action:** Discuss and draft departmental guidelines for research and course work expectations tied to degree program (i.e., MS vs. PhD) and major. Draft a departmental IDP (Individual Development Plan) and make available to students and faculty.

**Timeline:** hold discussions during summer/fall, 2016; complete draft by end of fall semester, 2016.

**Teaching Priority, Graduate:** Increase support for graduate assistantships and tuition.

### Extension

A wide range of expertise exists within the department

to address the needs of a diverse state clientele. Just like FWF faculty with teaching/research appointments who are involved with Extension activities, all Extension professionals are also involved to varying degrees in research and teaching activities. Our FWF Extension emphasis continues to be to serve as a first responder to the requests of the county Extension network in forest/tree/wildlife biology and conducting continuing education for natural resource professionals and landowners. Strengths of FWF faculty include established faculty knowledge and expertise, regional and national recognition, external funding success, 4-H youth education in forestry and wildlife, and participation in organizations that promote diversity in agricultural disciplines (i.e., Minority in Agriculture Natural Resource and Related Science (MANRRS) and Tennessee Louis Stokes Alliance for Minorities Participation (TLSAMP). Relationships with other state agencies and non-government organizations (NGOs) are excellent, promoting collaboration with such partners as the Tennessee Wildlife Resources Agency, Tennessee





Forestry Association, Quality Deer Management Association, Tennessee Division of Forestry, and the Natural Resources Conservation Service.

Extension professionals within FWF receive planning input directly from county agents and area specialists within Extension, natural resources professionals, and landowners. As a result, they are able to provide service and education that is very relevant to the needs of the public being served. The existence of a network of County Forestry Associations (CFAs) also provides opportunities to engage landowners interested in natural resource issues and educational information.

Current FWF Extension efforts focus on continuing education in natural resources including professionals, Extension personnel, and Master Loggers; applied upland habitat management; forest products utilization and value; forest certification; grasslands and forage systems related to wildlife; hardwood silviculture and forest management; invasive species; prescribed fire; taxation; white-tailed deer management; wildlife damage; youth education through 4-H programs; and partnering with inner-city high schools.

### Opportunities

Areas of opportunity are proposed to extend FWF Extension programs in new subject areas and engaging new Extension audiences for natural resource continuing education beyond what is currently offered with existing programs and FWF personnel with the traditional Extension county agriculture model.

1. An **Extension fisheries faculty position** would provide outreach programs for subject areas in sport fishing, aquaculture, and pond management.

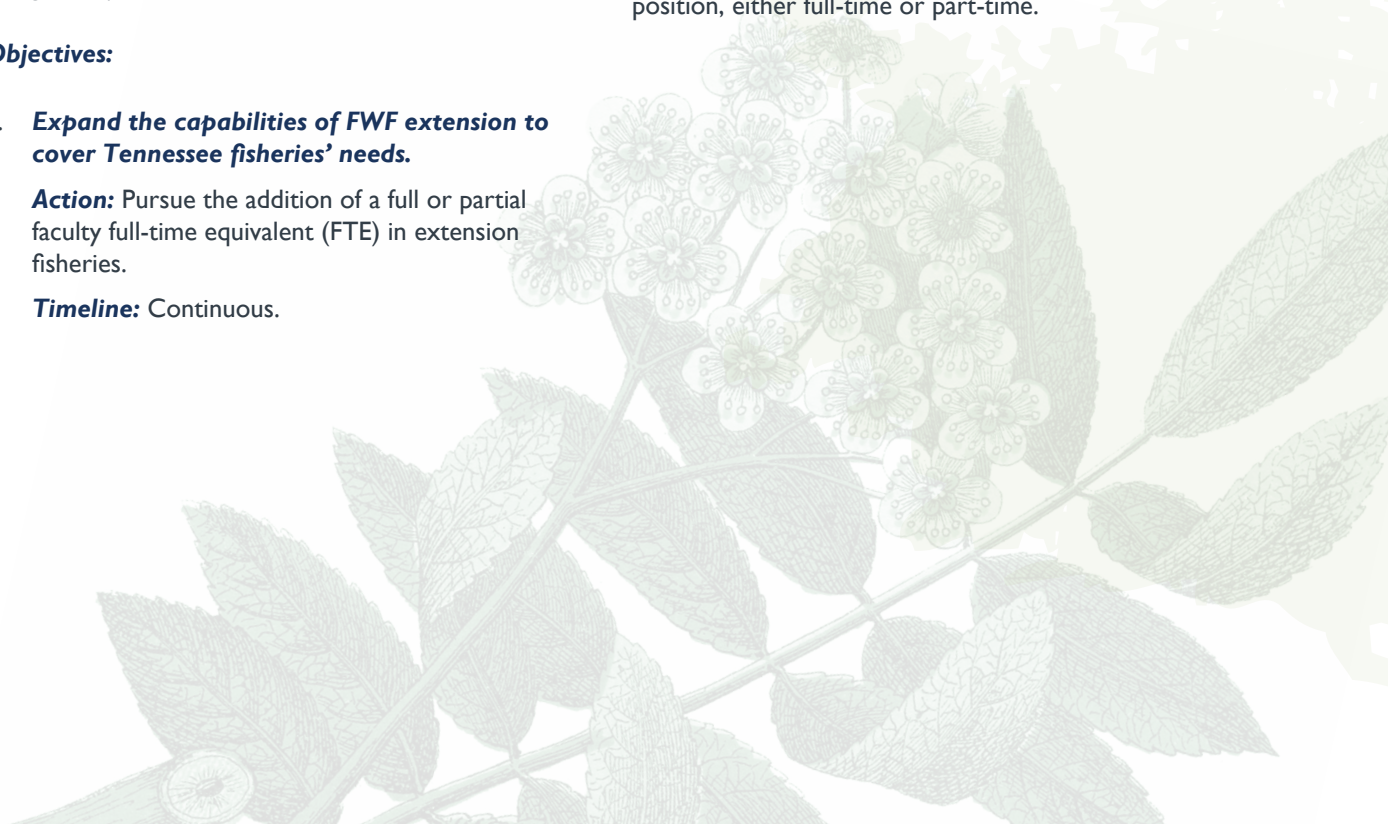
More than \$1.1 billion is spent annually in Tennessee on fishing-related activities, and 826,000 people fish annually according to the Fish & Wildlife Service. Fish consumption from aquaculture is a growing industry replacing red meat for a healthier diet. Most every farm in Tennessee has a pond or ponds that could be more efficiently managed for fish, water quality, and recreation purposes. The present situation of having a selected district county Extension person available for fisheries questions in each district is not a long-term solution since most of these

people are not trained in fisheries science, do not have a fisheries educational background, and do not have an opportunity to stay up-to-date with new technologies and ongoing fisheries issues and information.

2. An additional position in **Extension wildlife** would provide more in-depth training and education statewide as well as contributing to the wildlife 4-H program. More than 375,000 people hunted and two million people watched wildlife in Tennessee each year, composing \$1.4 billion spent on wildlife-related activities. FWF Extension only has one wildlife position to cover educational activities associated with wildlife management. This Extension wildlife position also covers youth education in 4-H.
3. According to USDA Forest Service landowner surveys, more than 40% of present forest landowners (approximately 100,000 of the estimated 250,000 owners in TN with more than 10 acres of forested land) no longer live on the land (absentee landowners), but live elsewhere, presumably in urban areas where Extension programs in natural resources are not conducted. Most of the natural resource Extension programs are conducted in Tennessee counties where forested land is located. Given the changes in forest land ownership in Tennessee as well as the increasing urbanization of the state, two recommendations are proposed to reach out to people who have not previously benefited from traditional Extension activities:



- a. **Urban Forestry:** Investigate ways to provide additional urban forestry programming to Tennessee citizens, to emphasize the role (education and information) of the urban forests in communities.
- b. **Absentee Forest Owners:** Provide in-service training to Extension personnel in metropolitan counties on forest landowner education and information as well as facilitate absentee forest landowner meetings and distance learning opportunities via web resources. Based on preliminary data for a grant project, most absentee forest owners in urban areas did not know that UT Extension even existed, much less that they would have educational information on natural resource/forest management.
4. **Web Technology Extension Position:** With the increasing pressure to provide web-based information and distance learning opportunities, especially to a more-fluent web-based audience, an Extension Associate position (possibly part-time) would facilitate this knowledge through webpages, interactive distance learning modules, webinars, digital spatial technologies, and information organization.
- Extension Goal:** to meet the needs of clients in the public and private sectors of Tennessee, the Southern Region, and the nation through (1) improving the profitability of forest ownership, (2) encouraging responsible and sustainable management of natural resources, and (3) facilitating a better understanding of the natural resource environment (ecology, succession, and growth).
- Objectives:**
- I. **Expand the capabilities of FWF extension to cover Tennessee fisheries' needs.**  
**Action:** Pursue the addition of a full or partial faculty full-time equivalent (FTE) in extension fisheries.  
**Timeline:** Continuous.
  2. **Build on the strength of the wildlife management program.**  
**Action:** Pursue the addition of a wildlife management specialist to be stationed in either Middle or West Tennessee.  
**Timeline:** Continuous.
  3. **Create capacity in urban forestry.**  
**Action:** Pursue the addition of a full or partial faculty FTE in urban forestry (the position could be shared with other units on campus, with Tennessee State University, or with the University of Kentucky).  
**Timeline:** Continuous.
  4. **Increase capacity to serve the needs of absentee forest landowners in Tennessee.**  
**Action:** Pursue the addition of a full or partial extension associate FTE to assist the existing faculty and specialists in FWF.  
**Timeline:** Continuous.
  5. **Increase web-based capacity to serve the needs of current and future FWF extension programs.**  
**Action:** Pursue the addition of a full or partial extension associate FTE with expertise in web-based technology to assist the existing faculty and specialists in FWF.  
**Timeline:** Continuous.
- Extension Priority:** Web technology Extension position, either full-time or part-time.





## Progress Made During the Previous Strategic Planning Period (2009-2015)

### Research

1. In July of 2010, we hired a tenure-track faculty member in urban forestry to address research and teaching needs in this disciplinary area. This was an opportunity hire supported by the Provost's Office, CASNR, and AgResearch. The appointment was designated 25% research, 75% teaching.
2. In January of 2011, we hired a tenure-track faculty member in wildlife pathology to strengthen our Center for Wildlife Health. The position was an opportunity hire with a joint appointment between FWF (70% research) and CVM (30% clinical).
3. In May of 2012, we hired a new tenure-track faculty member in wildlife management. The position was created by the conversion of a research associate position (in the same discipline area) that was vacant due to retirement. The appointment conversion was supported by AgResearch and CASNR, with a split of 40% research, 60% teaching.
4. In August of 2012, we hired a new non-tenure-track faculty member in wildlife human dimensions. The position was an opportunity hire supported by the Provost's Office and through research grant funds.
5. In October of 2013, we hired a tenure-track faculty member in fisheries science. We received permission to refill the position which was opened due to retirement. Initial responsibilities were 70% research, 30% teaching.
6. In December of 2013, we hired a tenure-track faculty member in natural resources policy and human dimensions. We received permission to refill the position which was opened due to retirement. Initial responsibilities were 50% research, 50% teaching.
7. In June of 2014, we hired a tenure-track faculty member in natural resources biometrics. We received permission to refill the position which was opened due to non-retention of the previous faculty member. Initial responsibilities were 25% research, 75% teaching.

8. Construction of a new storage structure was completed on the Organic Unit of the East Tennessee AgResearch and Education Center. The structure provides space to store small vehicles (ATVs, boats, etc.) and equipment.

### Teaching

#### **Undergraduate Program**

1. The concern that student involvement in the major should begin upon entering our program and continue throughout their academic career has been addressed by adding WFS 100, an introductory wildlife course for freshman, as a companion to the existing FOR 100, Forests and Forestry in American Society introductory course.
2. The concern that training related to habitat management is needed throughout the curriculum for both majors has been partially addressed through the addition of FWF 415, Upland Habitat Management, and WFS 423, Wildlife Habitat Evaluation, in the forestry and wildlife fall camps, respectively.
3. The concern that increased emphasis on ecosystem services beyond traditional commodities produced from the land base may require a shift in topics throughout the curriculum has been at least partially addressed through the incorporation of material involving a variety of ecosystem services in FORS 100, Forests and Forestry in American Society; FORS 314, Economics of Forest and Wildland Resources; FORS 322, Silvicultural Practices; FOR 331, Wood Properties and Uses; FORS 420, Forest Resource Management; FORS 422, Forest and Wildland Resource Policy; FWF 250, Conservation; FWF 312, Principles of Silviculture; FWF 324, Applied Ecosystem Restoration; FWF 416, Planning and Management of Forest, Wildlife, and Fisheries Resources; and FWF 420, International Natural Resource Issues.
4. In July of 2010, we hired a tenure-track faculty member in urban forestry to address research and teaching needs in this disciplinary area. This was an opportunity hire supported by the Provost's Office, CASNR, and AgResearch. The appointment was designated 25% research, 75% teaching.
5. An Urban/Community Forestry Concentration has been developed and implemented within the forestry major to meet the demand for foresters capable of managing urban forest resources



as the urban (and suburban) forest interface continues to grow. Monitoring the growth of this concentration and its promotion are ongoing.

6. From May of 2012 through June of 2014, we hired faculty in two new positions, and refilled three open positions as summarized in items 3–7 above under the Research section, all of whom have teaching responsibilities.
7. A Restoration and Conservation Science Concentration within the Forestry Major has been developed and approved to meet the demand for foresters capable of designing and implementing restoration and conservation programs within forested ecosystems. This concentration is designed as a forestry option for students who are interested in conservation rather than production forestry.
8. The forestry and wildlife camps were shifted from spring of the junior year to the fall of the senior year to improve the logical flow of course topics within the curricula and reduce limitations to field activities resulting from late winter and early spring weather conditions.
9. Transfer guides were developed for students transferring to FWF undergraduate majors from Tennessee community colleges.
10. An interdisciplinary team of faculty and staff were awarded a five-year grant from USDA Multicultural Scholars Program (MSP) in 2016 to recruit, retain, and graduate diverse undergraduates in forestry.

#### **Graduate Program**

1. A Bio-based Products and Wood Science and Technology Concentration was added to the MS in Forestry to aid recruitment of master's students by FWF faculty affiliated with the Center for Renewable Carbon.
2. A Bio-based Products and Wood Science and Technology Concentration was added to the PhD in Natural Resources to aid recruitment of PhD students by FWF faculty affiliated with the Center for Renewable Carbon.
3. A Natural Resource Economics Concentration was added to the PhD in Natural Resources to better serve and recruit PhD students interested in the area of natural resource economics.

4. A Wildlife Health Concentration was added to the MS in Wildlife and Fisheries Science to better serve and recruit MS students interested in Wildlife Health.
5. A Wildlife Health Concentration was added to the PhD in Natural Resources to better serve and recruit PhD students interested in Wildlife Health.

FWF faculty have added the following new graduate courses since 2009:

- **FWF 515**, *Upland Game Management*
- **FWF 525**, *Applied Natural Resource Statistics*
- **FWF 430**, *Introduction to Geographic Information Systems (GIS) for Natural Resources*
- **WFS 501**, *Ecology and Management of Wildlife Health*
- **WFS 520**, *Identification and Ecology of Freshwater Mussels*
- **WFS 552**, *Ecology and Management of Fishes*

#### **Extension**

1. A series of deer management workshops implemented each year since 2011, in cooperation with the Quality Deer Management Association, has impacted more than 700 people from 33 states and two Canadian provinces who manage land on over one million acres. An average of 73% of workshop graduates have gained knowledge from the experience.
2. The quality deer management program at Ames Plantation has averaged 80 members since 2009 and provided over \$135,000 annually in dues, which supports employee salaries and land management at Ames Plantation. Hunter satisfaction has remained high (98% satisfied with program). Hunter success has remained high with one mature buck (>3 years old) killed per 0.38 hunters and two does killed per hunter per year.
3. Absentee forest landowner (an underserved audience) seminars were held at five metropolitan locations during 2010 (Memphis, Cookeville, Chattanooga, Nashville, and Knoxville) with 280 landowners attending one of the five workshops. Seventy percent of the attendees had never attended a natural resource or Extension education program. Absentee landowners in populated areas are a new clientele for UT Extension in the natural resources subject area.
4. Ongoing programs (e.g., Tennessee Healthy Hardwoods, Teachers' Forest Conservation



Workshops, and TN Master Logger Training) have been very successful and will continue into the foreseeable future.

5. Based on our improved understanding of native grass production systems, we continued training technical and science experts in Tennessee and nationally regarding the opportunities these grasses offer for forage production and for wildlife habitat.
6. Producers, primarily in Tennessee, have been provided the latest research results for managing native grasses in a forage setting and for conservation.
7. The annual three-week national training for certification of USDA Forest Service silviculturists on National Forests continued throughout the strategic planning period.
8. The Wildlife Habitat Education Program (4-H WHEP), called Wildlife Judging in TN, teaches youth principles and practices of wildlife management

through local training (at the county level through Extension agents and volunteer leaders) and a series of contests. In Tennessee, three regional and one state contests were conducted each year. State-winning Tennessee teams finished first at the National 4-H WHEP Invitational in 2013, 2014, and 2015.

9. FWF Extension Specialists assist county 4-H agents each year in conducting three regional and one state 4-H Forestry Judging contest. These contests are designed to “develop an appreciation for the importance of conserving forestland as a source of products, benefits, and services necessary for quality living” (see [4hforestryinvitational.org](http://4hforestryinvitational.org)). Through regional, state, and national contests, 4-H foresters learn practical forest management skills as well as leadership and citizenship. Teams from Tennessee have competed extremely well, winning the national competition in 2012 and 2015.

