Note: The Department Research Roadmap articulates closely with the overall Department Strategic Plan. Detail on aspects of the Research Roadmap and linkages to Teaching, Extension, and overall program development are presented in the Strategic Plan.

Vision for WEC program development- WEC will develop or strengthen its role as a regional, national, and international leader in research, education, and outreach/extension in the ecology and conservation of wildlife. The department will grow to meet regional and international demands for its programs, and will have world-class facilities to help the department achieve its goals.

1. What areas of research are your department best known for by others?

Conservation Biology- Faculty in WEC are widely recognized for their research programs that are focused on questions related to the conservation and management of biological diversity at genetic, species, population and ecosystem levels, using approaches that incorporate technologies such as remote sensing, molecular genetics and modeling. Focal points of their research include assessment of critical linkages across biological and landscape scales, habitat fragmentation, fire effects, invasive species, sustainable use of ecosystems, and the interrelations of cultures, economics, and political processes, all with a goal of increasing our understanding and identifying innovative practical solutions for dealing with the biodiversity crisis.

Landscape Ecology- Since the publication of The Fragmented Forest by Dr. Larry Harris in 1984, our department has been known as an active department for the field of Landscape Ecology. Landscape ecology is concerned with how species respond to habitat patterns at multiple spatial scales, how human activities alter those patterns over large areas, and how such changes play a role in the ecology and the conservation of biodiversity. This is a crucial area of research for the department, because it is at the landscape scale that management and conservation actions often take place. Many of the current faculty participate in landscape ecology research at some level in Florida and throughout the world. Our faculty are becoming increasingly known to be recognized as leaders in landscape ecology and its applications to wildlife biology and conservation.

Human Dimensions in Wildlife Conservation- Research on the Human Dimensions of Wildlife Conservation focuses on how people's knowledge, values, and behaviors influence and are affected by decisions about the conservation of wildlife and management of natural resources. It offers interdisciplinary approaches that encompass
the theory and practice of environmental communication, public participation, and the process of integrated ecosystem management.

- International Wildlife Ecology and Conservation
- Wetland Ecology and Management

2. What truly are your current areas of excellence, your research strengths, currently in the discipline including your entire statewide faculty?

Same as above:
- Conservation Biology
- Landscape Ecology
- Human Dimensions in Wildlife Conservation
- International Wildlife Ecology and Conservation
- Wetland Ecology and Management

The Department’s leadership at the Ordway-Swisher Biological Station is a Departmental strength. We fully anticipate this to become even more important as the Station expands its impact over time.

3. What are your research weaknesses, gaps that are not covered now, yet you deem essential for the future directions and scientific impact of your discipline?

We have virtually no expertise in wildlife disease ecology and only weak support in this area from the College of Veterinary Medicine. Yet, emerging wildlife diseases and the roles wild animals play as disease vectors are at a critical nexus of both biological conservation and human health. There is enormous growth potential in this field. Further, the importance of wildlife disease ecology has been largely ignored in our department even as basic knowledge for our students—WEC is also relatively weak in ecological modeling. We are far behind other universities in our ability to link species, habitats, processes, and human needs into landscape level conservation and management recommendations.

Florida’s coastal areas will receive the brunt of predicted climatic change induced ecological disturbances. Although we have some faculty that, yet we have no faculty to focus on particular aspects of coastal wildlife ecology and conservation (notably sea turtles and beach mice), this is an area where departmental expertise is weak relative to the magnitude of the issue. While our aquatic expertise is very good in freshwater wetlands, there is a gap in our ability to project effects in coastal ecosystems—in a state with an extensive coastline like Florida’s, we need much better linkage both with fisheries and with marine science. In addition, there are niches that we need to fill that will not be filled by either fisheries or the marine sciences—ecology of coastal birds, mammals and reptiles. This is particularly important considering the human density on the coastline, rising sea level, and the effects of hurricanes.
We have no expertise in the economics of wildlife in Florida. Yet, in 2006, Florida residents who enjoyed viewing wildlife around their homes outnumbered the entire population of 21 states. (U.S. Census Bureau). Since 2001, the number of people who visited Florida to view wildlife has increased 50 percent. Understanding the social and economic impacts of wildlife in Florida is critical to conserving and managing wildlife resources in the 21st century. We need to develop our expertise in quantitative socio-economics research to achieve excellence in our field.

We have limited expertise in conserved land management. Lands are being conserved from future development or intensification of agriculture in Florida and in the tropics. We have limited expertise in conserved land management. Similar principals and practices of land management and conservation will apply to privately-owned lands, as well.

Impacts of global change on wildlife resources and their habitats is a field ripe for expansion, yet our department has no faculty dedicated to addressing this need. Expertise in this area of endeavor will greatly augment UF’s collaboration with the NSF-funded NEON program being established on the Ordway-Swisher Biological Station.

4. Where is your discipline moving to in the future? What are the major trends in your field of science? What do the very best departments in the country look like in this discipline?

Wildlife resources continue to be extirpated or disturbed as human populations expand, thus impacting the basic biology and ecology of animal populations and landscapes. Our department plans to refocus efforts and programs in the area of wildlife ecology and management in human-influenced landscapes. The geographic scope of this area will be both domestic and international and requires the combination of expertise in animal ecology and management, economics, human dimensions and land use policy. The best departments contain this combination of expertise or have strong linkages to other departments housing the expertise.

Wildlife disease ecology is one area in which we are grossly lacking, as noted above. The importance of this area has been underscored by recent cluster hires in wildlife disease specialists in other southeastern schools, and by the rapid emergence of disease issues in conservation biology journals. A related concern is that ecotoxicology is quite weak on the UF campus in general, especially in relation to strong evidence of its growing importance to animal health and population dynamics. There is one strong lab on campus looking at toxicological effects (Zoology) due to sunset with the eminent retirement of the lab leader, and essentially only weak expertise elsewhere. Traditional toxicology from veterinary and pharmacological schools is proving to be weak at understanding effects in wild animal populations – recent publications demonstrate that the cutting edge of this field must be led by ecologists.
Wildlife departments around the country have added entire programs in the human dimensions of wildlife. We need to develop expertise in examining the social and economic impacts of wildlife in Florida and beyond to stay relevant in the 21st century. We need to develop our expertise in quantitative socio-economics research related to wildlife to achieve excellence in our field.

The world’s climatic patterns are changing, and all natural resources will be affected. Since precise predictions of climatic change in both the spatial and temporal aspects are not known, the field of ecosystem modeling as it applies to wildlife resources, supported by strong statistical underpinning, will be rejuvenated. Our department does not have faculty with the requisite ecological modeling expertise to address this growing need and the Program for Ecological Statistics within IFAS is providing critical statistical support.

5. Aside from times of limited resources, what/who are the major research threats to fulfilling your vision?

There is a lack of a unified, informed and vocal clientele group to champion the need for increased awareness, appreciation and funding of wildlife conservation and management research within the state and internationally. Although there are a substantial number of potential stakeholders for wildlife research in the state, they tend to be diffuse and poorly organized. Failure to develop and strengthen relationships with key stakeholders could result in inadequate support for achieving the Department’s vision.

University faculty expertise in natural resource conservation and management is scattered across multiple buildings throughout the entire campus. This diffuse condition impedes research in an arena that requires a trans-discipline approach. Construction of a Natural Resources Building, large enough to house several departments, is badly needed.

Procurement of endowment funds would help support graduate stipends as our faculty compete for an ever-shrinking pool of competitive research dollars. Endowment funds also are needed to provide support operations and development of for the newly-created Ordway Swisher Biological Station (OSBS).

6. What current areas of research in your department will need to be enhanced to be the leading department in your field? What new areas will need to be added to be the leading department in your field? Which areas of your discipline are less likely to be essential in the department in 10 to 20 years?
Enhancement- wetland ecology, conservation genetics, human dimensions/public education, sustainable use and management of natural resources, both domestically and internationally.

New areas- wildlife health/ecotoxicology, modeling, coastal wildlife ecology, conserved land management, sociology and economics of biodiversity conservation and management.

7. What are the cross-cutting research topics that need to be addressed through partnership with other disciplines in UF, at our universities, or with other agencies? How would your department benefit from partnerships/interaction with other units?

As above, collaborative research on wildlife disease and ecotoxicology seems most likely with the College of Veterinary Medicine. Ecological modeling seems strongest right now in Zoology, though the collaboration seems to have reached a peak – the benefits to WEC are potentially strong, but the resource seems limited. Potential for interactions with fisheries are strong especially with particular faculty.

Sustainable land use and management could use added collaboration with SFRC, Soil and Water Sciences, FRED, Urban and Regional Planning, and the Center for Latin American Studies. Ecological systems are complex and need trans-discipline teams of researchers to handle complex research questions.

Research on global climate change is fundamental to the future of wildlife and natural ecosystems in the state and globally. Such a focus is inherently multi-disciplinary. Although the Department has limited expertise in this area currently, interactions with a diverse group of researcher from across IFAS and UF will be valuable in expanding our impact in this area.

The National Ecological Observatory Network (NEON) is a cutting-edge, multi-disciplinary national effort that will provide an important linkage to a number of research opportunities of interest to the faculty in our Department and many others across the University. Deployment of the program also will transform the program at the Oordway-Swisher Biological Station and provide one of the most significant research platforms for the ecological sciences in the Southeast. Partnership with this program will significantly benefit the Department and will open pathways for significant interdisciplinary research and research funding.

Socio/economic constraints on, and solutions for, biodiversity conservation and management, both domestically and internationally.

8. Knowing the faculty that you must have in place to accomplish your goals, what critical hires in order of importance in your discipline will be necessary to position your department as the leader in its discipline?
(Note- the ranking below is in need of deliberation of entire faculty.)

**Wildlife disease/toxicologist**- Research and teaching position to address wildlife diseases and wildlife responses to environmental pollution.

**Wildlife/wild lands manager**- Research and teaching position to address application of ecological principals for the use and conservation of wildlife resources and their habitats, both domestically and internationally.

**Coastal ecologist**- Research and teaching position to address ecological and social aspects of changing coastal environments.

**Ecological modeler**- Research and teaching position to assess future ecological scenarios, as well as current interactions of land use management. Modeling impacts of global climate change should be a priority.

**Wildlife/wildlands-based natural resources economist**- Research and teaching position to address socio-economic benefits and opportunities of natural resource conservation.

9. Would reaching your research goals be helped by key research hires in other IFAS departments?

- **Wildlife disease veterinarian/ecologist**- Vet Medicine
- **Wildlife/wildlands-based natural resources economist** – Food and Resource Economics

10. Are there mechanisms of research administration that you see as needing to change to assist you in attaining your department’s goals? How can IFAS administration change and thereby help your department meet its goals?

Establish of a natural resources advisory council on same level of agriculture advisory council.
Continued and enhanced support of Ordway-Swisher Biological Station, including basic infrastructural support and increased staffing, and continued UF’s commitment to NEON and NEON’s long-term research projects.

Growth management is the number one issue in Florida. Decisions made at the planning level dictate how communities grow, and these policy decisions determine how different land uses are designed and managed. I suggest that we need a planning and policy researcher (with a focus on wildlife and conservation issues) that not only researches the impacts of different policy decisions, but utilizes participatory research to help facilitate the creation of successful policies.