

**New Program Proposal  
 Master of Science in Wildlife and Fisheries Resources  
 Clemson University**

**Summary**

Clemson University requests approval to offer a program leading to the Master of Science in Wildlife and Fisheries Resources, to be implemented in January 2020 through distance education 100% online. The following chart outlines the stages of approval for the proposal. The Advisory Committee on Academic Programs (ACAP) voted to recommend approval of the proposal. The full program proposal and support documents are attached.

<b>Stages of Consideration</b>	<b>Date</b>	<b>Comments</b>
Program Proposal Received	8/02/19	Not Applicable
Staff comments to the institution	8/23/19	Staff requested revisions to the proposal to address program questions: <ul style="list-style-type: none"> <li>▪ Inclusion of interested student and prospective employer feedback to highlight the need of the program and enhancement of employment opportunities;</li> <li>▪ The addition of similar programs from Coastal Carolina and University of South Carolina Columbia;</li> <li>▪ How the increase of new students coupled with students matriculating out of the non-thesis option program would impact faculty and staff; and</li> <li>▪ Further narrative on student learning outcomes.</li> </ul>
Revised Program Proposal Received	8/30/19	The revised proposal satisfactorily addressed the requested revisions.
ACAP Consideration	9/12/19	Representatives from Clemson University (CU) introduced the proposal, citing the need to establish the current MS in Wildlife Fisheries and Biology non-thesis option, which is overwhelmingly composed of working professionals, as a standalone degree to solidify the value of the credential for students and employment. CU representatives cited compelling student testimonials (see attachment) which explain how the non-thesis option allowed for professional opportunities. Representatives also explained that although there are “new” costs in the budget, the costs will be expended as current from the non-thesis option; the only true cost is for modest marketing expenses.  Staff expressed thanks for the revision and commendations for clarity.  After remaining discussion, ACAP voted unanimously to recommend approval of the program proposal. Staff had no further questions for transmittal.

**Recommendation**

The staff recommends the Committee on Academic Affairs and Licensing favorably commend to the Commission the program leading to the Master of Science in Wildlife and Fisheries Resources, to be implemented in January 2020.

**Clemson University Student and Program Data**

<b>Graduate In-/Out-of-State Enrollment Fall 2018</b>	2,195 (41.56%)/3,087(54.44%)
<b>Number of Approved Programs in 10 Yrs. (FY 2009- 2018)</b>	37
<b>Number of Terminated Programs in 10 Yrs. (FY 2009- 2018)</b>	18

**Industry Related Occupational Wages and Projections in South Carolina, 2016 – 2026\***

<b>Occupational Field<sup>1</sup></b>	<b>2016 Median Income<sup>2</sup></b>	<b>2016 Estimated Employment<sup>3</sup></b>	<b>2026 Projected Employment</b>	<b>Total 2016-2026 Employment Change</b>	<b>2016-2026 Annual Avg. Change</b>	<b>Annual Percent</b>	<b>Total Percent Change</b>
Farming, Fishing, and Forestry	\$31,710	23,738	20,899	-2,839	-1.27%		-11.96%

<sup>1</sup>“Occupational Field” represents the closest related occupation category that includes the occupations aligned with the program proposal.

<sup>2</sup> SC Department of Employment & Workforce (DEW), Labor Market Information. (2019). Occupational Employment and Wage Rates (OES) for All Major Groups in South Carolina in 2016 [Data file]. Retrieved from <https://jobs.scworks.org/vosnet/lmi/default.aspx?pu=1>

<sup>3</sup> SC Department of Employment & Workforce (DEW), Labor Market Information. (2019). Occupational Projections (Long-term) for Multiple Occupations in South Carolina in 2016-2026 [Data file]. Retrieved from <https://jobs.scworks.org/vosnet/lmi/default.aspx?pu=1>

\* Data downloaded September 16, 2019; Most recent data available.

**NEW PROGRAM PROPOSAL FORM**

Name of Institution: **Clemson University**

Name of Program (include degree designation and all concentrations, options, or tracks):  
**Master of Wildlife and Fisheries Resources**

Program Designation:

- Associate's Degree                       Master's Degree  
 Bachelor's Degree: 4 Year             Specialist  
 Bachelor's Degree: 5 Year             Doctoral Degree: Research/Scholarship  
 Doctoral Degree: Professional Practice (e.g., Ed.D., D.N.P., J.D., Pharm.D., and M.D.)

Consider the program for supplemental Palmetto Fellows and LIFE Scholarship awards?

- Yes  
 No

Proposed Date of Implementation: **January 2020**

CIP Code: **03.0601**

Delivery Site(s): Online (85750) and Clemson University Main Campus (50104)

Delivery Mode:

- Traditional/face-to-face                       Distance Education  
\*select if less than 25% online                       100% online  
 Blended/hybrid (50% or more online)  
 Blended/hybrid (25-49% online)  
 Other distance education (explain if selected)

Program Contact Information (name, title, telephone number, and email address):

**Dr. Althea Hagan; Lecturer, Forestry and Environmental Conservation Department**  
**864.656.4823; [shotali@clemson.edu](mailto:shotali@clemson.edu)**

**Dr. Jeremy King; Associate Provost for Institutional Effectiveness**  
**864.656.4592; [jking2@clemson.edu](mailto:jking2@clemson.edu)**

Institutional Approvals and Dates of Approval:

**Department Curriculum Committee: 10/17/2018**

**College Curriculum Committee: 11/12/2018**

**University Graduate Curriculum Committee: 12/14/2018**

**Provost: 5/14/2019**

**Board of Trustees: 2/7/2019**

### **Background Information**

The Department of Forestry and Environmental Conservation at Clemson University delivers unified education, research and public service programs in forestry, wildlife conservation, and ecology by providing excellence in instruction, scientific inquiry, and outreach to citizens of South Carolina, the nation, and the world. In accordance with this mission, the department currently offers a Master of Science in Wildlife and Fisheries Biology that maintains both a thesis and non-thesis option, with the *thesis option* providing a research-intensive experience that prepares students for doctoral work, while the *non-thesis option* targets working professionals with an application-based curriculum. As such, these two options present important differences in curriculum the types of students recruited/enrolled. To better reflect these differences for both students and potential employers, we propose the creation of a *Master of Wildlife and Fisheries Resources*. This “new” 30-credit-hour program will essentially elevate the current non-thesis option of Wildlife and Fisheries Biology into a standalone degree program with its own, more accurate credential.

The proposed non-thesis Master of Wildlife and Fisheries Resources degree is designed for students with substantial experience in natural resources who specifically wish to enhance their professional skills. These students will be Federal and State Agency wildlife and fisheries employees, educators, and private industry professionals who want to increase their knowledge about wildlife and fisheries biology while often continuing to work fulltime. A 100% online delivery mode option will accommodate working professionals and/or those who live a significant distance from Clemson’s main campus. Meanwhile, a face-to-face delivery mode will provide a more traditional experience for students residing in the Upstate. (Please note that the non-thesis option for the current Master of Science in Wildlife and Fisheries Biology, upon which this proposed program is being mirrored, already successfully maintains both traditional/face-to-face and 100% online delivery modes. Thus, the proposed program intends to retain both modes of delivery for future Master of Wildlife and Fisheries Resources students as it leverages current Clemson University assets, course offerings, faculty, equipment, and facilities.)

The proposed program aligns with the *ClemsonForward* strategic plan while supporting the university’s overarching land grant mission. A vital element of *ClemsonForward*’s academic core is a greater commitment to graduate education, and the applied nature of the proposed program supports the strategic plan’s initiative of promoting real-world problem-solving experiences that foster student learning. Meanwhile, coursework such as conservation physiology, restoration ecology, and forest health ensure that students “think deeply about and engage in the social, scientific, economic, and professional challenges of our times”—actions that honor our founder’s vision of developing the material resources of the State for the people of South Carolina while also supporting the overarching mission of Clemson University.

### **Assessment of Need**

Wildlife-related recreation adds \$3.7 billion annually to the state’s economy and is a major economic driver in rural South Carolina communities (2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation). The faculty of the Department of Forestry and Environmental Conservation believed there was a need for a professional wildlife and fisheries master’s degree program to strengthen this growing sector of the economy. To better understand the potential need for a non-thesis Master of Wildlife and Fisheries Resources (especially one with an online delivery mode), a survey of Federal and SC State Agencies and SC educators was conducted. There were 199 survey respondents. Seventy-four percent (147) of respondents were moderately, very, or extremely interested in an online

Master's degree in Wildlife Biology. Forty-three percent (63) of those with at least moderate interest were K-12 educators, 31% (45) worked for a state agency, 16% (23) worked for the federal government, and 10% (14) were in private industry. Their primary motive for being interested in pursuing a Master's was the increase in job options (45%, 64), followed by personal satisfaction (29%, 41), promotion potential (16%, 23), and pay raise (10%, 15). Nearly all interested participants resided in South Carolina-- 32% (47) resided in the Upstate and 67% (98) resided in other areas of the state.

Many recent program graduates report that they pursued their master's degree in Wildlife and Fisheries online because they were geographically immobile due to either their or their spouses' job. They all reported a need to continue to work full time to help support their families. Traditional on campus thesis master's degrees do not accommodate those who need to work fulltime. Further support of program need can be found in Appendix 2.

For comparison purposes, faculty are aware of only one substantially similar degree program available in the country. Texas A&M offers an online Master of Wildlife Science. However, the curriculum proposed by Clemson would better reflect the mission of Clemson University, focusing on wildlife of South Carolina and the southeastern U.S. Likewise, the program will offer a Fisheries component that faculty believe would best serve populations residing in or serving South Carolina.

#### **Transfer and Articulation**

*Identify any special articulation agreements for the proposed program. Provide the articulation agreement or Memorandum of Agreement/Understanding.*

None.

**Employment Opportunities**

Occupation	State		National		Data Type and Source
	Expected Number of Jobs	Employment Projection	Expected Number of Jobs	Employment Projection	
<b>Conservation Scientist and Forester</b>	640 (2016)	6% (2026)	34,600 (2016)	6% (2026)	<a href="https://www.bls.gov/ooh/life-physical-and-social-science/conservation-scientists.htm">https://www.bls.gov/ooh/life-physical-and-social-science/conservation-scientists.htm</a> AND <a href="http://www.projectionscentral.com/Projections/LongTerm">http://www.projectionscentral.com/Projections/LongTerm</a>
<b>Environmental Scientist and Specialist</b>	420 (2016)	16.7% (2026)	89,500 (2016)	11.1% (2026)	<a href="https://www.bls.gov/ooh/life-physical-and-social-science/environmental-scientists-and-specialists.htm">https://www.bls.gov/ooh/life-physical-and-social-science/environmental-scientists-and-specialists.htm</a> AND <a href="http://www.projectionscentral.com/Projections/LongTerm">http://www.projectionscentral.com/Projections/LongTerm</a>
<b>Zoologist and Wildlife Biologist</b>	240 (2016)	8.3% (2026)	19,400 (2016)	7.7% (2026)	<a href="https://www.bls.gov/ooh/life-physical-and-social-science/zoologists-and-wildlife-biologists.htm">https://www.bls.gov/ooh/life-physical-and-social-science/zoologists-and-wildlife-biologists.htm</a> AND <a href="http://www.projectionscentral.com/Projections/LongTerm">http://www.projectionscentral.com/Projections/LongTerm</a>
<b>Biological Technician</b>	590 (2016)	11.9% (2026)	82,100 (2016)	10.1% (2026)	<a href="https://www.bls.gov/ooh/life-physical-and-social-science/biological-technicians.htm">https://www.bls.gov/ooh/life-physical-and-social-science/biological-technicians.htm</a> AND <a href="http://www.projectionscentral.com/Projections/LongTerm">http://www.projectionscentral.com/Projections/LongTerm</a>
<b>Forest and Conservation Technician</b>	260 (2016)	3.8% (2026)	33,200 (2016)	3.9% (2026)	<a href="https://www.bls.gov/oes/2017/may/oes194093.htm">https://www.bls.gov/oes/2017/may/oes194093.htm</a> AND <a href="http://www.projectionscentral.com/Projections/LongTerm">http://www.projectionscentral.com/Projections/LongTerm</a>
<b>Fish and Game Wardens</b>	Not available	Not available	7,000 (2016)	4.3% (2026)	<a href="https://www.bls.gov/oes/2017/may/oes333031.htm">https://www.bls.gov/oes/2017/may/oes333031.htm</a> AND <a href="http://www.projectionscentral.com/Projections/LongTerm">http://www.projectionscentral.com/Projections/LongTerm</a>

The total number of jobs are 2150 (state) and 265,800 (national). With the estimated employment projections in the table above, the total number of jobs by 2026 will be 2,356 (state) and 288,998 (national) indicating average projected growths of 9.58% (state) and 8.7% (national) in the occupations that will employ employee graduates from this program.

### Supporting Evidence of Anticipated Employment Opportunities

The curriculum that will be associated with the proposed program has already been in effect as part of the current M.S. in Wildlife Fisheries and Biology online non-thesis program. While all referenced numbers are collected from the reputable Bureau of Labor Statistics and the associated Projections Central, the program knows from experience that the occupations listed will be served by students who complete this program.

South Carolina DNR (Conservation Scientist and Forester, Environmental Scientist and Specialist, Zoologist and Wildlife Biologist, Biological Technicians, Forest and Conservation Technician, Fish and Game Wardens) and the South Carolina Department of Education are both current and potential future employers of graduates from our proposed program. The SC Department of Education offers a roughly \$7,000 increase in annual salary to employees with a master's degree. Similarly, SCDNR uses the state of SC pay bands for its employees. In order to move up a pay band or be competitive for hire at higher pay bands employees must have a master's degree. While information from private industry and NGO's about pay grades is harder to come by similar limitations to employment exist in the Wildlife and Fisheries field without a graduate degree.

### Description of the Program

All students that are expected to enroll in the new Masters of Wildlife and Fisheries Biology Resources program will be working professionals and part-time students. The projected enrollments table below is based on headcounts of all part-time students.

Projected Enrollment			
Year	Fall Headcount	Spring Headcount	Summer Headcount
2019-20	0	5	10
2020-21	20	25	30
2021-22	40	44	46
2022-23	50	54	56
2023-24	60	62	62

### Explain how the enrollment projections were calculated.

Enrollment projections are based on enrollment numbers for the existing M.S. Wildlife and Fisheries Biology (online non-thesis) program as well as past enrollments in a similar program at Texas A & M. Simplified tables used to project these headcounts are presented in Appendix 1.

The table below provides the **past enrollment for the online modality of the MS Wildlife and Fisheries Biology non-thesis option**. All students in the existing program option are part-time students.

Past Enrollment at Clemson University			
Year	Fall Headcount	Spring Headcount	Summer Headcount
2017-18	13	21	31
2018-19	52	54	56

The program has maintained conservative estimates for enrollment in the initial years to ensure resource availability for growing the program.

Beginning in January 2020, all newly admitted students pursuing a non-thesis option in the MS Wildlife and Fisheries will do so under the proposed Masters of Wildlife and Fisheries Resources program. The current non-thesis option of the Wildlife and Fisheries Biology M.S. program (the option from which the proposed Wildlife and Fisheries Resources program is derived) has 65 students currently enrolled. All students currently enrolled will be allowed to (a) complete their degree in the existing MS Wildlife and Fisheries Biology program, or (b) pursue the Master of Wildlife and Fisheries Resources credential instead. However, faculty do not anticipate many students in the existing M.S. Wildlife and Fisheries Biology program switching to the Master of Wildlife and Fisheries Resources program. Therefore, the past enrollment in the online Wildlife and Fisheries Biology, MS (non-thesis) program was used to project the enrollment for the new Masters of Wildlife and Fisheries Resources.

As current M.S. students graduate and new enrollees enter under the proposed program, faculty project that enrollment will steadily increase to numbers equivalent to—and exceeding—the current non-thesis M.S. enrollment figures.

It is also expected that enrollment will emulate that of a **similar distance education program at Texas A & M, Masters of Wildlife Science**. These data is based on the data reports [published on the Texas A & M website](#).

Enrollment (headcount) in Similar Program			
Year	Fall headcount	Spring headcount	Summer headcount
2014-15	59	55	21
2015-16	53	45	25
2016-17	55	49	24
2017-18	44	43	19
2018-19	41	36	23

Based on the employment projections provided in the ‘Employment Opportunities’ section above, the total number of jobs (from the Bureau of Labor Statistics) in 2016 are 2,150 (state) and 265,800 (national). With the estimated employment projections provided in the table, the total number of jobs by 2026 will be 2,356 (state) and 288,998 (national) indicating average projected growths of 9.58% (state) and 8.7% (national). This indicates an increasing demand for graduates. Furthermore, the [data published in DataUSA](#) related to the supply to this program, which includes Bachelors graduating from natural science disciplines indicates an average growth of over 3%. Below are the number of graduates from these majors. In addition, this program is intended to cater to working professionals in the areas of forestry, fisheries and natural resource conservation, which further indicates that the supply to this program will only be positive. It is due to these reasons that we have projected a positive growth in the enrollment surpassing the enrollment in the existing Wildlife and Fisheries Biology MS (online) program.

Major	Degrees awarded in 2016 (National)	Growth projected (%)
General Biological Science	85,077	2.17
General Biology	91,839	3.06
Biology	150,020	3.83
Natural Resource Conservation	18,684	2.54

and Research		
Natural Resources and Conservation	26,267	2.0

**Besides the general institutional admission requirements, are there any separate or additional admission requirements for the proposed program? If yes, explain.**

Yes

No

### Curriculum

#### **New Courses**

*List and provide course descriptions for new courses.*

There are no new courses associated with this degree program. The curriculum is identical to the current M.S. non-thesis option except for the requirement to complete 3-6 hours of WFB 8630, non-thesis research. All courses are already taught by faculty as part of the non-thesis, online option for the M.S. in Wildlife and Fisheries Biology.

Total Credit Hours Required: 30

**FULL TIME\***

<b>Curriculum by Year</b>					
<b>Course Name</b>	<b>Credit Hours</b>	<b>Course Name</b>	<b>Credit Hours</b>	<b>Course Name</b>	<b>Credit Hours</b>
<b>Year 1</b>					
<b>Fall</b>		<b>Spring</b>		<b>Summer</b>	
Scientific Writing (WFB 8610)	2	Restoration Ecology (ENR 6130)	3	Applied Wildlife Habitat Management (FOR 8930)	3
Graduate Seminar (FNR 8080)	1	Aquatic Ecology (WFB 8610)	3	Conservation Issues (ENR 6500)	3
Wetland Wildlife Biology (WFB 6620)	3	Advanced Conservation Biology (WFB 8510)	3	GIS for Natural Resource Professionals	3
Waterfowl Ecology and Management (WFB 6800)	3				
Total Semester Hours	9	Total Semester Hours	9	Total Semester Hours	9
<b>Year 2</b>					
<b>Fall</b>		<b>Spring</b>		<b>Summer</b>	
Conservation Physiology (WFB 8610)	2				
Graduate Seminar (FNR 8080)	1				
Total Semester Hours	3	Total Semester Hours		Total Semester Hours	

\* While available, the fulltime track for this program will be pursued less frequently than the part-time option due to the demographics of enrolled students (i.e., working professionals).

**PART TIME (majority of students)**

<b>Curriculum by Year</b>					
<b>Course Name</b>	<b>Credit Hours</b>	<b>Course Name</b>	<b>Credit Hours</b>	<b>Course Name</b>	<b>Credit Hours</b>
<b>Year 1</b>					
<b>Fall</b>		<b>Spring</b>		<b>Summer</b>	
Scientific Writing (WFB 8610)	2	Restoration Ecology (ENR 6130)	3	Applied Wildlife Habitat Management (FOR 8930)	3
Graduate Seminar (FNR 8080)	1			GIS for Natural Resource Professionals (FOR 6340)	3
Total Semester Hours	3	Total Semester Hours	3	Total Semester Hours	6
<b>Year 2</b>					
<b>Fall</b>		<b>Spring</b>		<b>Summer</b>	
Global Change Ecology (WFB 8530)	3	Human Dimension of Wildlife Conservation (WFB 6700)	3	Fish Diversity and Evolution (WFB 8540)	3
Wetland Wildlife Biology (WFB 6800)	3			Conservation Issues (ENR 6500)	3
Total Semester Hours	6	Total Semester Hours	3	Total Semester Hours	6
<b>Year 3</b>					
<b>Fall</b>		<b>Spring</b>		<b>Summer</b>	
Waterfowl Ecology and Management (WFB 6800)	3				
Total Semester Hours	3	Total Semester Hours		Total Semester Hours	

**Similar Programs in South Carolina offered by Public and Independent Institutions**

*Identify the similar programs offered and describe the similarities and differences for each program.*

<b>Program Name and Designation</b>	<b>Total Credit Hours</b>	<b>Institution</b>	<b>Similarities</b>	<b>Differences</b>
Marine Biology, M.S.	30	College of Charleston	Some similarities in curricular options (e.g., conservation biology, geographic information systems, fisheries)	<b>CofC program:</b> Face-to-face delivery mode; research-oriented; requires a thesis  <b>Clemson proposal:</b> Online delivery mode; oriented towards improving applied, professional degree skills; does not utilize a thesis
Coastal Marine and Wetland Studies, MS	30 Thesis 36 Non-Thesis	Coastal Carolina University	Offers a non-thesis option but requires additional coursework or an internship/project for the non-thesis option. Some similarities in curricular options (Coastal Marine and Wetland Ecology, Effective Scientific Communication). We offer wetland wildlife biology and Scientific Writing.	CCU program: Face-to-face delivery mode; thesis or internship/project; overall focus on marine/coastal topics and research  Clemson proposal: Online delivery mode; oriented towards improving applied, professional degree skills; does not utilize a thesis/internship/project.
Marine Science, MS	30	University of South Carolina	We do not offer oceanography courses which seems to be the focus of USC program, but we do have fisheries courses which might have a small amount of overlap.	<b>CofC program:</b> Face-to-face delivery mode; research-oriented; requires a thesis; focus on marine science/oceanography  <b>Clemson proposal:</b> Online delivery mode; oriented towards improving applied, professional degree skills; does not utilize a thesis

**Faculty**

<b>Rank and Full- or Part-time</b>	<b>Courses Taught for the Program</b>	<b>Academic Degrees and Coursework Relevant to Courses Taught, Including Institution and Major</b>	<b>Other Qualifications and Relevant Professional Experience (e.g., licensures, certifications, years in industry, etc.)</b>
Lecturer and Program Coordinator, FEC (Full-time)	Restoration Ecology, ENR 4130/6130  Graduate Seminar FNR 8080  Non-thesis Project WFB 8630	Ph.D., Interdisciplinary Ecology, University of Florida	
Chair and Professor in FEC (Full-time)	Applied Wildlife Habitat Management FOR 8930	Ph.D., Doctor of Forest Wildlife Ecology, Stephen F. Austin State University	
Director of Assessment and Scholarship Extension, FEC (Full-time)	Quality Deer Management WFB 6150  Wildlife and Fisheries Ecology and Management WFB 8500	Ph.D., Wildlife Biology, Clemson University	
Professor of Environmental Information Science, FEC (Full-time)	GIS for Natural Resource Professionals FOR 6340	Ph.D., Environmental Information Science, Cornell University	
Assistant Professor, FEC (Full-time)	Invasion Ecology FOR 8930	Ph.D., Forest Entomology, University of Arkansas	
Assistant Professor of Fisheries Ecology, FEC (Full-time)	Fish Diversity and Evolution WFB 8540  Advanced Study Design and Analysis WFB 8610	Ph.D., Fish & Wildlife Conservation, Virginia Tech	
Associate Professor, FEC (Full-time)	Conservation Issues ENR 6500	Ph.D., Environmental Toxicology, The University of Tennessee	
Assistant Professor of Fisheries Ecology, FEC (Full-time)	Fish Conservation and Management WFB 8610	Ph.D., Evolution, Ecology & Organismal Biology, The Ohio State University	

Intermittent Faculty, FEC (Part-time)	Global Change Ecology WFB 8530  Advanced Conservation Biology WFB 8510	Ph.D., Environmental Sciences, University of Virginia	
Director, James C. Kennedy Waterfowl & Wetlands Conservation Center (Full-time)	Waterfowl Ecology and Management WFB 6800	Ph.D., Michigan State University	
Associate Professor of Wildlife Ecology and Conservation, FEC (Full-time)	Wetland Wildlife Biology WFB 6620	Ph.D., Biology, Auburn University	
Professor, FEC (Full-time)	Conservation Physiology WFB 8610	Ph.D., Wildlife Science, Oregon State University	
Intermittent Faculty, FEC (Part-time)	Aquatic Habitat Management WFB 8610  Aquatic Ecology WFB 8610	Ph.D., Ecology, University of Georgia	
Assistant Professor of Human Dimensions of Wildlife, FEC (Full-time)	Human Dimensions of Wildlife Conservation WFB 6700	Ph.D., Fisheries, Wildlife and Conservation Biology, North Carolina State University	
Assistant Professor, School of Math & Stat Sciences (Full-time)	Statistical Methods I with Lab STAT 8010	Ph.D., Statistics, Colorado State University	
Intermittent Faculty, FEC (Part-time)	Scientific Writing WFB 8610	Ph.D., Ecology, Evolutionary Biology and Behavior, Michigan State University	

Total FTE needed to support the proposed program:

Faculty: 5 (~ 20 courses, if 1, 3 credit course is 0.25 FTE then 5 for all courses)

Staff: 0.33 (Student Support Services)

Administration: 0.5 (Director of Online Program)

### **Faculty, Staff, and Administrative Personnel**

The current faculty, staff, and administrative personnel already associated with the non-thesis option of the existing Wildlife and Fisheries Biology M.S. program are sufficient to effectively support the proposed program. These resources will be essentially transferred to the proposed Master of Wildlife and Fisheries Resources program upon approval of this proposal. No additional faculty, staff, or administrative personnel are needed to support the program at this time.

## Resources

### Library and Learning Resources

*Explain how current library/learning collections, databases, resources, and services specific to the discipline, including those provided by PASCAL, can support the proposed program. Identify additional library resources needed.*

The Clemson University Library holdings and electronic access are adequate to support the program. The Clemson University Libraries maintain online research resources serving Wildlife and Fisheries Biology students and faculty in the form of field-related print and e-books, as well as peer-reviewed journal sources (e.g., Web of Science, BioOne Complete, Taylor and Francis Online, and JSTOR Life Sciences). The required resources for the program are also available through Interlibrary Loan and PASCAL, which are offered to students and faculty without cost as they are covered by the RM Cooper Library existing budget. The same resources currently serving the Wildlife and Fisheries Biology M.S. (non-thesis) program will serve the proposed program, and all major journals in the field are available online. No additional library resources are anticipated.

### Student Support Services

*Explain how current academic support services will support the proposed program. Identify new services needed and provide any estimated costs associated with these services.*

In addition to library and learning resources, a number of academic and student support services are available to all graduate students—including online students—at Clemson University:

- **Clemson Computing and Information Technology (CCIT)** - Provides a leading-edge integrated information environment integral to learning and research. Graduate students may (but are not limited to) take advantage of services such as Clemson email account, emergency text messages, mobile guidebooks, video conferencing, web development, and data storage. Help services are available via phone, email, or online chat.
- **Student Accessibility Services** – Graduate Students may register with Student Accessibility Services to use services such as academic access letters, assistive technology, communication services, test proctoring center and electronic textbooks.
- **Center for Career and Professional Development** – Clemson University is dedicated to engaging students in career development that will empower them to successfully pursue their educational and professional goals. Services provided by the career center include career workshops, resume writing, career development, job search assistance, and networking.
- **Legal Assistance** - All Clemson students are eligible to receive one legal aid voucher per semester. Each voucher entitles the student to one-half hour consultation with a lawyer off campus.
- **Counseling and Psychological Services (CAPS)** - Counseling and Psychological Services (CAPS), the mental health department of Student Health Services, offers a wide array of services along a continuum of intensity for various psychological issues.

- **Graduate Student Life** – Operating under the Division of Student Affairs, this is a central body that collaborates with the Graduate School and Graduate Student Government to enhance the overall graduate student life experience.
- **Clemson University Writing Center** – The goal of the writing center is to help all members of the Clemson community become more confident and effective writers.
- **The Harvey and Lucinda Gantt Multicultural Center** - The Harvey and Lucinda Gantt Multicultural Center is committed to creating diverse learning environments that enhance the intercultural competence of our students. The center supports and advocates for the needs of all students, challenges students to think critically about themselves and their communities, provides engaging experiential learning opportunities and empowers students to be positive change agents.
- **Clemson Online** - Clemson Online staff are here to ensure that all online students have access to the same resources and support that a first-class Clemson education comprises for students enrolled in programs having in-person modalities. Clemson University is devoted to ensuring an innovative and substantive educational experience for all students.

### **Physical Resources/Facilities**

*Identify the physical facilities needed to support the program and the institution's plan for meeting the requirements.*

All physical facilities (e.g., offices, classrooms, computers) needed to support the program are already in existence and associated with the current non-thesis option of the Wildlife and Fisheries Biology M.S. program. All students currently enrolled in the Wildlife and Fisheries Biology M.S. program will be allowed to (a) complete their degree in the existing program, or (b) pursue the Master of Wildlife and Fisheries Resources credential instead. As the required courses are identical, this should prove minimally problematic for the student but will cause some temporary overlap in physical resource usage as students matriculate out of the current non-thesis option of the Wildlife and Fisheries Biology M.S. program. When all currently enrolled Wildlife and Fisheries Biology M.S. non-thesis students graduate, faculty will no longer admit new students to that option (the thesis option will remain unchanged), and the resources for a non-thesis Master's degree will reside solely with the proposed Master of Wildlife and Fisheries Resources.

### **Equipment**

*Identify new instructional equipment needed for the proposed program.*

All equipment needed to support the program is already in existence and associated with the current non-thesis option of the Wildlife and Fisheries Biology M.S. program. To reiterate, as the Master of Wildlife and Fisheries Resources program becomes the only non-thesis option for Master's-level students, necessary equipment will essentially carry over from the existing Wildlife and Fisheries Biology M.S. non-thesis option to the Master of Wildlife and Fisheries Resources program.

**Impact on Existing Programs**

*Will the proposed program impact existing degree programs or services at the institution (e.g., course offerings or enrollment)? If yes, explain.*

Yes

No

Because the proposed program is designed to replace and better represent the original goals of an existing program/option combination (Wildlife and Fisheries Biology, M.S., non-thesis), it is likely that the overall enrollment associated with the Wildlife and Fisheries Biology, M.S. program will see an initial decrease as new enrollees choose the proposed program and current enrollees matriculate out of the program. To maintain program quality and protect faculty from additional workload, courses for the online MWFR will be capped at their current sizes (15-25 students). We have hired several instructors from outside of the university to teach courses and can do that again to help existing faculty manage the workload if necessary. In anticipation of continued growth in the online MWFR program a student support services staff member was hired in March of 2019. This staff member has been tasked with handling the matriculating of students from the old program and enrollment of new students in the proposed online MWFR program. When the staff member was hired this additional work was included in her workload.

However, it is important to note that the Wildlife and Fisheries Biology, M.S., *thesis option* independently maintains a consistent enrollment of 20-25 students per semester, and no long-term negative implications are expected.

**Financial Support**

<b>Sources of Financing for the Program by Year</b>												
<b>Masters in Wildlife &amp; Fisheries Resources</b>	<b>1st</b>		<b>2nd</b>		<b>3rd</b>		<b>4th</b>		<b>5th</b>		<b>Grand Total</b>	
	<b>2019-20</b>		<b>2020-21</b>		<b>2021-22</b>		<b>2022-23</b>		<b>2023-24</b>			
<b>Category</b>	<b>New (\$)</b>	<b>Total (\$)</b>	<b>New (\$)</b>	<b>Total(\$)</b>	<b>New (\$)</b>	<b>Total(\$)</b>	<b>New (\$)</b>	<b>Total (\$)</b>	<b>New (\$)</b>	<b>Total (\$)</b>	<b>New (\$)</b>	<b>Total (\$)</b>
Tuition Funding	47,475	47,475	224,937	224,937	445,237	445,237	589,325	589,325	698,911	698,911	2,005,885	2,005,885
Program-Specific Fees												
Special State Appropriation												
Reallocation of Existing Funds	333,536	333,536	340,207	340,207	347,011	347,011	353,951	353,951	361,030	361,030	1,735,734	1,735,734
Feder, Grant or Other Funding												
<b>TOTAL</b>	<b>381,011</b>	<b>381,011</b>	<b>565,143</b>	<b>565,143</b>	<b>792,248</b>	<b>792,248</b>	<b>943,276</b>	<b>943,276</b>	<b>1,059,941</b>	<b>1,059,941</b>	<b>3,741,619</b>	<b>3,741,619</b>
<b>Estimated Costs Associated with implementing the Program by Year</b>												
	<b>1st</b>		<b>2nd</b>		<b>3rd</b>		<b>4th</b>		<b>5th</b>		<b>Grand Total</b>	
<b>Category</b>	<b>New (\$)</b>	<b>Total (\$)</b>	<b>New (\$)</b>	<b>Total(\$)</b>	<b>New (\$)</b>	<b>Total(\$)</b>	<b>New (\$)</b>	<b>Total (\$)</b>	<b>New (\$)</b>	<b>Total (\$)</b>	<b>New (\$)</b>	<b>Total (\$)</b>
Program Administration, and Faculty and Staff Salaries	333,536	333,536	340,207	340,207	347,011	347,011	353,951	353,951	361,030	361,030	1,735,734	1,735,734
Facilities, Equipment, Supplies and Materials	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	75,000	75,000
Library Resources												-
Other (Admin Overhead)	9,495	9,495	44,987	44,987	89,047	89,047	117,865	117,865	139,782	139,782	401,177	401,177
<b>TOTAL</b>	<b>358,031</b>	<b>358,031</b>	<b>400,194</b>	<b>400,194</b>	<b>451,058</b>	<b>451,058</b>	<b>486,816</b>	<b>486,816</b>	<b>515,812</b>	<b>515,812</b>	<b>2,211,911</b>	<b>2,211,911</b>
<b>Net Total (Sources of Financing Minus Estimated Costs)</b>	<b>22,980</b>	<b>22,980</b>	<b>164,949</b>	<b>164,949</b>	<b>341,190</b>	<b>341,190</b>	<b>456,460</b>	<b>456,460</b>	<b>544,128</b>	<b>544,128</b>	<b>1,529,708</b>	<b>1,529,708</b>

## Budget Justification

Since this is a new program, we considered all the revenue and costs associated with it as new revenue and new costs even though the program effectively currently exists as a non-thesis option within an extant degree program. Similarly, revenues associated with faculty resources are treated as reallocations since the associated costs are fixed sunk costs already associated with faculty/staff supporting the current MS non-thesis option.

### Revenue Highlights:

- **Tuition Funding:** Tuition funding was calculated based on the total number of credit hours for each semester. The total credit hours per semester were calculated as a product of the number of students per semester and the number of credit hours offered for that semester (from the tables in Appendix). For example, for year 1, 5 new students times 3 credit hours in spring in addition to 10 students times 6 credit hours in summer constitute the total credit hours for the year. Academic Tuition and Fees of \$633 per credit hour for online graduate tuition Tier 4 was applied. The financial plan assumes that tuition and fees grow at 3% annually. As enrollment grows from 10 students in year 1 to a total of 60 students in year 5, the program will eventually generate approximately \$689K in year five.
- **Reallocation of Existing Funds:** Since no new faculty resources will be required for this program and they will be reallocated from the existing MS in Wildlife and Fisheries Biology program, we have calculated reallocation funds based on courses taught. The reallocated resources are estimated at \$10K plus fringe of 36.2% per course for 20 courses to account for the faculty currently teaching courses where existing capacity will be utilized. Compensation growth rate is estimated to be 2% each year. Reallocation also includes 33% of one student support services personnel estimated at \$45K/year and 50% of one administrative staff personnel estimated at \$55K/year needed to administer the program. Fringe on each of the two positions is estimated at 43.9%.

### Expense Highlights:

- **Program Administration, Faculty and Staff Salaries:**
  - All courses (20) listed in the program are currently taught. The teaching cost is shown as a reallocated expense since the faculty are already in place (i.e., the instructional faculty neither represent new incremental revenues nor costs). The calculation of these costs are the same as the 'reallocation of existing funds'.
  - We estimate that 33% of one student support services personnel estimated at \$45K/year and 50% of one administrative staff personnel estimated at \$55K/year are needed to administer the program. Fringe on each of the two positions is estimated at 43.9%.
- **Facilities, Equipment, Supplies, and Materials:**
  - A marketing budget of \$15K will be used to communicate the new program nationally.
- **Other Costs:**
  - Administrative overhead represents departmental support costs pro-rated across academic programs.

**Evaluation and Assessment**

<b>Program Objectives</b>	<b>Student Learning Outcomes Aligned to Program Objectives</b>	<b>Methods of Assessment</b>
To train wildlife and fisheries professionals to meet the needs of government agencies, educational institutions, private industry, and non-profits in S.C., the U.S., and the world.	<ul style="list-style-type: none"> <li>• Students apply advanced theoretical knowledge to real-life wildlife and fisheries challenges facing their communities and region.</li> <li>• Students apply wildlife and fisheries management concepts to various real world scenarios</li> </ul>	Final projects and exams from the following courses: WFB 6700, WFB 8530, ENR 6130, FNR 8080, WFB 8610, ENR 6500, FOR 8930, FOR 8930
Graduates will be knowledgeable professionals who are able to sustainably manage and teach about wildlife and fisheries resources.	<ul style="list-style-type: none"> <li>• Students accurately communicate, in written and oral form, scientific theory related to the field to diverse audiences.</li> <li>• Students create and deliver lessons on wildlife and fisheries ecology to peers</li> </ul>	Participation in discussions, individual and group projects, peer reviews, and exams from the following courses: FNR 8080, WFB 6700, WFB 6800, WFB 8610, ENR 6130, FOR 8930
Graduates will demonstrate an advanced understanding of wildlife and fisheries biology and ecology	<ul style="list-style-type: none"> <li>• Students apply wildlife and fisheries biology concepts and theories to proposals, plans, and reports on wildlife and fisheries issues.</li> <li>• Students utilize critical thinking and problem-solving skills to analyze issues affecting the field and design realistic solutions.</li> </ul>	Final projects and exams from the following courses: WFB 6620, WFB 6800, WFB 8610, WFB 8540,
The program will produce a diverse group of graduates who contribute to the promotion of wildlife and fisheries resources across the state and region.	<ul style="list-style-type: none"> <li>• The program recruits and graduates a diverse student body, especially those from underserved communities without nearby Land Grant institutions.</li> </ul>	Enrollment and graduation rates as related to geographic location, gender, work experience, and race/ethnicity.

*Explain how the proposed program, including all program objectives, will be evaluated, along with plans to track employment. Describe how assessment data will be used.*

Means of assessment in addition to those done of the individual students within the curriculum will include but may not be limited to:

- Tracking of students' course completion, performance, and progression through the program by the program coordinator via advising sessions and faculty discussions.

- Exit surveys/interviews and other forms of self-reporting involving graduates of the program to measure perceived program success and job placement or promotion related to their completion of the program.
- Enrollment and retention rates to include contextual information such as students' geographic location, work experience, gender, and race/ethnicity.

The online delivery option for this program will allow curricula to be offered to historically rural or underserved areas because students will not need to relocate or travel to be near the university. These rural areas tend to have first-hand experience with the concepts and problems discussed within the program's curriculum and play a vital role in addressing them within South Carolina.

The Program Coordinator and Department Chair of Forestry and Environmental Conservation are responsible for ensuring the program's long-term viability, financial stability, and programmatic success. This proposed program is a re-conceptualization of an existing, successful degree program/option combination (Wildlife and Fisheries Biology, M.S., non-thesis) that faculty recently began offering online. The Program Coordinator has already begun collecting feedback from students, much of which informed this request to offer the program with a name that better reflects the program's curriculum and mission while aligning with both the expectations of employers and the career aspirations of the student.

#### **Accreditation and Licensure/Certification**

*Will the institution seek program-specific accreditation (e.g., CAEP, ABET, NASM, etc.)? If yes, describe the institution's plans to seek accreditation, including the expected timeline.*

Yes

No

*Will the proposed program lead to licensure or certification? If yes, identify the licensure or certification.*

Yes

No

*Explain how the program will prepare students for this licensure or certification.*

*If the program is an Educator Preparation Program, does the proposed certification area require national recognition from a Specialized Professional Association (SPA)? If yes, describe the institution's plans to seek national recognition, including the expected timeline.*

Yes

No (not applicable)

### Appendix 1

A simplified table was used to determine the projected enrollments. The total headcount per semester was calculated as a sum of new, continuing, lost and graduating student estimates. These estimates were based on past enrollments in similar programs at Clemson University and Texas A&M.

The following are definitions for the terms used in the simplified table.

**New:** Students that were admitted, accepted and enrolled in the program either as students starting the respective semester.

**Continuing:** Students who were previously enrolled in the program and continue to do so.

**Lost:** Students who have left the program permanently (without graduating) due to personal reasons, low GPA etc. Lost students account for attrition. This is important to track and minimize.

**Graduate:** Number of students who graduate with a degree in the program that semester.

Projected Enrollment												
Year	Fall Headcount				Spring Headcount				Summer Headcount			
	New	Continuing	Lost	Graduate	New	Continuing	Lost	Graduate	New	Continuing	Lost	Graduate
2019-20	0	0	0	0	5	0	0	0	5	5	0	0
2020-21	10	10	0	0	5	20	0	0	5	25	0	0
2021-22	10	30	0	0	9	40	0	5	7	44	0	5
2022-23	14	46	0	10	9	49	1	5	7	53	0	5
2023-24	14	55	0	10	11	58	1	9	7	60	0	7

To maintain consistency, the same simplified table was used to provide details of the student enrollments in the existing Wildlife and Fisheries Biology, MS (online without thesis) at Clemson University and the Masters in Wildlife and Fisheries Science (distance education) at Texas A & M. We are assuming an attrition rate less than 10% per year. Below is a simplified table providing the enrollments in a similar program at Clemson University.

Past Enrollment at Clemson University												
Year	Fall Headcount				Spring Headcount				Summer Headcount			
	New	Continuing	Lost	Graduate	New	Continuing	Lost	Graduate	New	Continuing	Lost	Graduate
2017-18	13	0	0	0	9	13	1	0	10	21	0	1
2018-19	22	30	0	0	9	52	1	6	4	54	0	2

Appendix 2

Jesse Magid  
208 Shaw Road Rock Tavern, NY 12575  
(845) 542-0178  
jessemagid@gmail.com

August 25, 2019

To Whom It May Concern,

The time that I spent working towards a graduate degree from Clemson University's online master's program in wildlife and fisheries biology proved to be one of the most enriching and motivating professional experiences of my life. After attaining my undergraduate degree in environmental biology, I was having great difficulties gaining any traction in the search for employment. I was afforded few opportunities to even interview for positions in the highly competitive field that I had selected, and my morale was worsening. The institution where I had attained by undergraduate degree from had even rejected my application to graduate school.

One day I came across an advertisement for Clemson University's online Master's program in wildlife and fisheries biology and I threw my application into the mix. In retrospect, this was one of the best decisions of my life. Clemson University took a chance on me and offered me an unprecedented level of support through its staff, allowing me to excel in my studies. I also believe that the online nature of this exceptional program increased my capacity to be self-motivated, which is an invaluable trait in the real world. Since graduating from this program, the number of interviews that I have been offered has significantly increased and my career outlook is more positive. This program both allowed me to advance in my field and made me a more productive member of society.

Best Regards,

Jesse Magid

## Shannon Gregory

For two years after graduating with a bachelor's degree in Ecology, I was unable to find career opportunities related to my field of study. It became apparent that by pursuing a graduate degree I would have a competitive advantage in finding a career. Earning such a degree based on my location and field of study was proving to be a difficult task until I learned about the online program offered by Clemson. I was accepted into the program and I vowed to hold myself to higher standards. Throughout the program I had access to different perspectives from my classmates located across the nation. This experience opened my eyes to a more diverse set of issues that wildlife biologists are facing. For this I cannot be more thankful; I now have a diverse foundation of knowledge that I could use in a variety of regions across the nation. Following graduation, I feel this program has given me the competitive advantage and the ability to use my experience to make a difference in the world.

**Michael J Murphy**  
238 Cameron Station Blvd  
Alexandria, VA 22304-8616  
Phone: (703) 751-5452

**Dr Althea Hotaling Hagan**

Director  
Online Masters Wildlife and Fisheries Biology Program  
Forestry and Environmental Conservation Department  
101 Barre Hall  
Clemson, SC 29634-0303  
(864) 656 3302

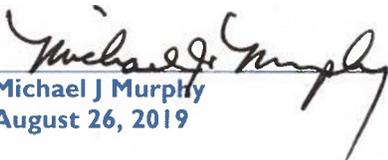
**Dear Dr Hagan,**

I am writing in response to your request for student input, dated Sunday, August 25, 2019, concerning your efforts to make the online non-thesis program for wildlife and fisheries biology a standalone program. As a recent graduate from this program, I am excited to provide input from a student's perspective. It is my hope that my heartfelt words will lead to a result that is best for the university and its hardworking faculty and students.

As someone who spent 21+ years as an Army officer (and another 15 years as a Department of Defense contractor), I thought my opportunity to pursue a degree in fish and wildlife passed me by long ago. With the availability of the GI Bill, I felt the pursuit for an MS was worth it. After completing a graduate certificate in *Grassland Management*, I yearned to open up the aperture to new and exciting opportunities. During that time, I learned from an institution on the West Coast that Clemson University had a MS program offering a *Waterfowl Ecology & Management* class. As they say, the rest is history.

The Online Masters in Wildlife and Fisheries Biology Program has opened so many doors for me that I thought shut long ago. Challenged every step of the way, I gained enormous confidence in my abilities to work in a field where my passion lies. The Clemson program made it all happen, and I will always be grateful.

Sincerely,



---

**Michael J Murphy**  
August 26, 2019

August 28, 2019

Althea Hotaling Hagan, PhD  
Director of Online Masters in Wildlife and Fisheries Biology Program  
Forestry and Environmental Conservation  
Clemson University

Dr. Hagan,

I am writing this letter in support of the online, Masters in Wildlife and Fisheries Biology program. As a recent graduate, I want to highlight how valuable this program was for my professional development as a wildlife biologist and is for many other working natural resource professionals and wildlife biologists.

I currently work as a wildlife biologist for a regional non-profit organization, The Longleaf Alliance, and have 17 years of experience. It had always been my intent to acquire an MS, but because of a variety of factors and challenges that many working professionals face, I was unable to return to school as a traditional MS student. The online degree program provided the opportunity to continue working while furthering my education, allowing me to build critical professional skills so I can contribute more significantly to my field, community, and further my career.

Also, I can confirm that the online MS degree program in Wildlife and Fisheries Biology addresses a critical need for working professionals in the field, particularly in the non-governmental sector. Because the work is so broad and varied, people that work for non-governmental organizations have a variety of backgrounds including policy, conservation planning, and other closely related fields. As they progress in their careers, they have a need and desire to further their education to become more scientifically literate and develop their professional skills.

Again, I am very appreciative and supportive of Clemson University and the online program, and the opportunities that were provided to me and other working professionals.

Sincerely,



Lisa Lord