

WILDLIFE AND FISHERIES SCIENCE, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

Program Description

The purpose of the Wildlife and Fisheries Science major is to develop the knowledge, skills, and professional ethics of undergraduates interested in the conservation and management of fish and wildlife and their environments. The curriculum is designed to provide a broad-based science background that incorporates natural resource management principles that prepare our students for a diverse array of opportunities such as graduate school, natural resource management agencies, consulting firms, non-profits, etc. Students can choose from two options:

1. Wildlife Option
2. Fisheries Option

Each option enables students to gain greater depth of knowledge in one area of the discipline. Coursework required for the Wildlife option meets The Wildlife Society's requirements for professional certification, and coursework required for the Fisheries option meets the American Fisheries Society's requirements for professional certification.

What is Wildlife and Fisheries Science?

Wildlife and Fisheries Science includes study of the conservation, management, ecology, behavior, and identification of wildlife and fish species; the terrestrial and aquatic habitats where they live; and application of that knowledge to conserve and manage biodiversity and ecosystems. The program includes applied outdoor lab experiences that complement course work, and bird, mammal, reptile, and amphibian collections facilitate hands-on learning and species identification.

MORE INFORMATION ABOUT WILDLIFE AND FISHERIES SCIENCE (<https://agsci.psu.edu/academics/undergraduate/majors/wildlife-and-fisheries-science/>)

You Might Like this Program If...

- You are concerned about society's impact on biodiversity and ecosystems.
- You are interested in conservation and management of wildlife and fish species.
- You want a career that combines indoor and outdoor activities with the opportunity to work in settings such as state or federal natural resource agencies, nonprofits, zoos and aquaria, or consulting firms.

Entrance to Major

In order to be eligible for entrance to this major, a student must:

1. attain at least a C (2.00) cumulative grade-point average for all courses taken at the University; and
2. have at least third-semester classification (<https://www.registrar.psu.edu/enrollment/semester-classification.cfm>).

READ SENATE POLICY 37-30: ENTRANCE TO AND CHANGES IN MAJOR PROGRAMS OF STUDY (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/37-00-entrance-to-a-college-or-major/>)

Degree Requirements

For the Bachelor of Science in Wildlife and Fisheries Science, a minimum of 120 credits is required for the Wildlife option and a minimum of 122 credits is required for the Fisheries option:

Requirement	Credits
General Education	45
Electives	3-9
Requirements for the Major	87-95

21 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses; 6 credits of GQ courses; 3 credits of GS courses; 3 credits of GWS courses.

Requirements for the Major

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44>).

Common Requirements for the Major (All Options)

Code	Title	Credits
Prescribed Courses		
BIOL 110	Biology: Basic Concepts and Biodiversity	4
BIOL 240W	Biology: Function and Development of Organisms	4
CHEM 110	Chemical Principles I	3
CHEM 111	Experimental Chemistry I	1
CHEM 202	Fundamentals of Organic Chemistry I	3
ECON 104	Introductory Macroeconomic Analysis and Policy	3
ENGL 202C	Effective Writing: Technical Writing	3
PHYS 250	Introductory Physics I	4
SOILS 101	Introductory Soil Science	3
WFS 446	Wildlife and Fisheries Population Dynamics	3
<i>Prescribed Courses: Require a grade of C or better</i>		
BIOL 220W	Biology: Populations and Communities	4
WFS 209N	Wildlife and Fisheries Conservation	3
WFS 300	The Vertebrates	2
WFS 301	Vertebrate Laboratory	2
WFS 310	Wildlife and Fisheries Measurements	3
Additional Courses		
FOR 350	Forest Ecosystem Monitoring and Data Analysis	3
or STAT 460	Intermediate Applied Statistics	
MATH 111	Techniques of Calculus II	2-4
or MATH 141	Calculus with Analytic Geometry II	
STAT 240	Introduction to Biometry	3
or STAT 301		
Select 3-4 credits of the following:		3-4
ANSC 322	Animal Genetics and Selection	
BIOL 133	Genetics and Evolution of the Human Species	
BIOL 222	Genetics	
BIOL 230W	Biology: Molecules and Cells	

Select 3 credits of the following: 3

AEE 440	Communication Methods and Media	3
ENGL 416	Science Writing	
ENGL 418	Advanced Technical Writing and Editing	

Additional Courses: Require a grade of C or better

MATH 110	Techniques of Calculus I	4
or MATH 140	Calculus With Analytic Geometry I	

Supporting Courses and Related Areas

Select 6 credits in natural resource economics, policy, planning, law, administration, or human dimensions from departmental list 6

Requirements for the Option

Select an option 18-23

Requirements for the Option Fisheries Option (22-23 credits)

Code	Title	Credits
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Prescribed Courses

WFS 410	General Fishery Science	3
WFS 452	Ichthyology	2
WFS 453	Ichthyology Laboratory	2
WFS 463W	Fishery Management	3

Additional Courses

Select 3-4 credits of the following: 3-4

ANSC 201	Animal Science	
BIOL 141	Introduction to Human Physiology	
& BIOL 142	and Physiology Laboratory	
BIOL 446	Physiological Ecology	

Select 3 credits of the following: 3

WFS 407	Ornithology	
WFS 408	Mammalogy	
WFS 447W	Wildlife Management	

Select 3 credits of the following: 3

ENT 425	Freshwater Entomology	
FOR 470	Watershed Management	
WFS 422	Ecology of Fishes	
WFS/ERM 435	Limnology	

Select 3 credits of the following: 3

GEOG 160	Mapping Our Changing World	
GEOG 363	Geographic Information Systems	
GEOG 303	Introduction to Environmental Geology	
GEOG 340	Geomorphology	
GEOG 412	Water Resources Geochemistry	
GEOG 440	Marine Geology	
GEOG 452	Hydrogeology	

Wildlife Option (18-19 credits)

Code	Title	Credits
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Prescribed Courses

FOR 203	Field Dendrology	3
WFS 407	Ornithology	3
WFS 408	Mammalogy	3
WFS 447W	Wildlife Management	3

Additional Courses

WFS 406	Ornithology Laboratory	2
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or WFS 409 Mammalogy Laboratory

Select 2-3 credits of the following: 2-3

WFS 410	General Fishery Science	
WFS 422	Ecology of Fishes	
WFS 452	Ichthyology	
WFS 453	Ichthyology Laboratory	
WFS 463W	Fishery Management	

Select 3 credits of the following: 3

BIOL 414	Taxonomy of Seed Plants	
FOR 308	Forest Ecology	
HORT 101	Horticultural Science	
HORT 138	Ornamental Plant Materials	
HORT 445	Plant Ecology	

General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (<https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/>) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required and Inter-Domain courses do not meet this requirement.)

- **Quantification (GQ):** 6 credits
- **Writing and Speaking (GWS):** 9 credits

Breadth in the Knowledge Domains (Inter-Domain courses do not meet this requirement.)

- **Arts (GA):** 3 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 3 credits
- **Social and Behavioral Sciences (GS):** 3 credits
- **Natural Sciences (GN):** 3 credits

Integrative Studies

- **Inter-Domain Courses (Inter-Domain):** 6 credits

Exploration

- **GN,** may be completed with Inter-Domain courses: 3 credits
- **GA, GH, GN, GS, Inter-Domain courses.** This may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher: 6 credits

University Degree Requirements

First Year Engagement

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3

credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum

3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80>)). For more information, check the Suggested Academic Plan for your intended program.

Program Learning Objectives

- Students will be able to evaluate the potential population level effect of alternative management actions based on development of appropriate population dynamics models; for example, students might explore the effect of supplementing an endangered species or the effect of different harvest regulations on a game species.
- Students will be able to identify wildlife and fish species and quantify relevant attributes of their life history and critical habitat.
- Students will have the ability to select and use appropriate techniques for a given purpose such as selection of field samples, observation of biota in the field or lab, measurement of habitat attributes, and analysis of data.

Academic Advising

The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged

in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/>)

University Park

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SUGGESTED ACADEMIC PLAN

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2023-24 academic year. To access previous years' suggested academic plans, please visit the archive (<https://bulletins.psu.edu/undergraduate/archive/>) to view the appropriate Undergraduate Bulletin edition (*Note: the archive only contains suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin*).

Fisheries Option: Wildlife and Fisheries Science, B.S. at University Park Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

First Year

Fall	Credits Spring	Credits
BIOL 110 [†]	4 CHEM 110 [†]	3
MATH 110 or 140 ^{**†}	4 CHEM 111 [†]	1
ENGL 15, 30H, or ESL 15 ^{††}	3 General Education Course	3
General Education Course	3 General Education Course	3
First-Year Seminar	1-3 MATH 111 or 141	2-4
	WFS 209N [*]	3
	15-17	15-17

Second Year

Fall	Credits Spring	Credits
ANSC 201, BIOL 141 <i>and</i> BIOL 142, or BIOL 446	3-4 PHYS 250	4
BIOL 220W [*]	4 BIOL 240W	4
CHEM 202	3 CAS 100, CAS 100A, CAS 100B, or CAS 100C ^{††}	3
BIOL 133, 222, 230W, or ANSC 322	3-4 SOILS 101 [†]	3
STAT 240 or 301 ^{††}	3 General Education Course	3
	16-18	17

Third Year

Fall	Credits Spring	Credits
WFS 300*	2 FOR 350 or STAT 460	3
WFS 301*	2 ENT 425, FOR 470, WFS 422, or WFS 435	3
WFS 310*	3 Wildlife Selection	3
WFS 452	2 ECON 104 [†]	3
Natural Resource Policy, Planning, Law, Administration (PPLA) and Human Dimensions (HD) Course	3 Natural Resource Policy, Planning, Law, Administration (PPLA) and Human Dimensions (HD) Course	3
Elective	0-4	
12-16		15

Fourth Year

Fall	Credits Spring	Credits
WFS 410	3 WFS 463W	3
WFS 453	2 WFS 446	3
ENGL 202C ^{††}	3 General Education Course	3
AEE 440, ENGL 416, or ENGL 418	3 General Education Course (GHW)	1.5
Physical Science Selection	3 Elective	3
General Education Course (GHW)	1.5	
15.5		13.5

Total Credits 119-129

* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

Advising Notes:

- All supporting course selections are listed in the WFS Handbook, which is available on the department's website (<https://ecosystems.psu.edu>) under Undergraduate > Student Resources > Student Handbooks.
- In the WFS program, either STAT 200 or STAT 250 is accepted as a substitute for the "STAT 240 or 301" requirement. It is important to complete STAT before the start of your fifth semester.
- Many WFS classes are offered only once per year, in the fall or the spring; plan your schedule accordingly.
- All WFS students should change their campus location to University Park by the start of their junior year (fifth semester).
- When a required course has both a lecture and practicum portion, such as PHYS 250L and PHYS 250R, students are required to take both portions.
- Courses that are listed as both US or IL and GA, GH, or GS can count for both requirements (i.e., a course listed for both GA and IL will satisfy both Arts and International Cultures).
- Students should monitor their academic progress by checking their degree audits in LionPATH.
- Questions about WFS academic plans or degree audits should be directed to academic advisers or to WFS Program Coordinator Ellen Rom, exr2@psu.edu or 814-863-0362.

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First Year

Fall	Credits Spring	Credits
BIOL 110 [†]	4 CHEM 110 [†]	3
MATH 110 or 140 ^{**††}	4 CHEM 111 [†]	1
ENGL 15, 30H, or ESL 15 ^{††}	3 MATH 111 or 141	2-4
General Education Course	3 WFS 209N [*]	3
First-Year Seminar	1-3 General Education Course	3
	15-17	12-14

Second Year

Fall	Credits Spring	Credits
BIOL 220W [*]	4 PHYS 250	4
FOR 203	3 BIOL 240W	4
CHEM 202	3 CAS 100, CAS 100A, CAS 100B, or CAS 100C ^{††}	3
BIOL 133, 222, 230W, or ANSC 322	3-4 SOILS 101 [†]	3
STAT 240 or 301 ^{††}	3 General Education Course	3
	16-17	17

Third Year

Fall	Credits Spring	Credits
WFS 300 [*]	2 FOR 350 or STAT 460	3
WFS 301 [*]	2 WFS 407 or 408	3
WFS 310 [*]	3 WFS 406 or 409	2
Natural Resource Policy, Planning, Law, Administration (PPLA) and Human Dimensions (HD) Course	3 ECON 104 [†]	3
Elective	3 Natural Resource Policy, Planning, Law, Administration (PPLA) and Human Dimensions (HD) Course	3
General Education Course	3 General Education Course (GHW)	1.5
	16	15.5

Fourth Year

Fall	Credits Spring	Credits
WFS 447W	3 WFS 446	3
ENGL 202C ^{††}	3 WFS 407 or 408	3
AEE 440, ENGL 416, or ENGL 418	3 General Education Course	3
Fisheries Selection	2-3 General Education Course (GHW)	1.5

Botany Selection	3 Elective	1-5
	14-15	11.5-15.5

Total Credits 117-127

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- In the WFS program, either STAT 200 or STAT 250 is accepted as a substitute for the "STAT 240 or 301" requirement. It is important to complete STAT before the start of your fifth semester.
- Many WFS classes are offered only once per year, in the fall or the spring; plan your schedule accordingly.
- All WFS students should change their campus location to University Park by the start of their junior year (fifth semester).
- When a required course has both a lecture and practicum portion, such as PHYS 250L and PHYS 250R, students are required to take both portions.
- Courses that are listed as both US or IL and GA, GH, or GS can count for both requirements (i.e., a course listed for both GA and IL will satisfy both Arts and International Cultures).
- Students should monitor their academic progress by checking their degree audits in LionPATH.
- Questions about WFS academic plans or degree audits should be directed to academic advisers or to WFS Program Coordinator Ellen Rom, exr2@psu.edu or 814-863-0362.

Fisheries Option: Wildlife and Fisheries Science, B.S. at Commonwealth Campuses

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First Year

Fall	Credits Spring	Credits
BIOL 110 [†]	4 CHEM 110 [†]	3
MATH 110 or 140 ^{††}	4 CHEM 111 [†]	1
ENGL 15, 30H, or ESL 15 ^{††}	3 MATH 111 or 141	2-4
General Education Course	3 BIOL 220W [*]	4
First-Year Seminar	1-3 General Education Course	3
	General Education Course (GHW)	1.5
	15-17	14.5-16.5

Second Year

Fall	Credits Spring	Credits
ANSC 201, BIOL 141 <i>and</i> BIOL 142, or BIOL 446	3-4 PHYS 250	4
CHEM 202	3 BIOL 240W	4
BIOL 133, 222, 230W, or ANSC 322	3-4 ENGL 202C ^{††}	3
STAT 240 or 301 ^{††}	3 ECON 104 [†]	3
CAS 100 ^{††}	3 General Education Course	3
	15-17	17

Third Year

Fall	Credits Spring	Credits
WFS 209N [*]	3 FOR 350 or STAT 460	3
WFS 300 [*]	2 ENT 425, FOR 470, WFS 422, or WFS 435	3
WFS 301 [*]	2 SOILS 101 [†]	3
WFS 310 [*]	3 Natural Resource Policy, Planning, Law, Administration (PPLA) and Human Dimensions (HD) Course	3
WFS 452	2 Elective	0-4
General Education Course	3	
	15	12-16

Fourth Year

Fall	Credits Spring	Credits
WFS 410	3 WFS 463W	3
WFS 453	2 WFS 446	3
AEE 440, ENGL 416, or ENGL 418	3 Physical Science Selection	3
Wildlife Selection	3 Natural Resource Policy, Planning, Law, Administration (PPLA) and Human Dimensions (HD) Course	3

General Education Course	3 Elective	3
General Education Course (GHW)	1.5	
	15.5	15

Total Credits 119-129

- * Course requires a grade of C or better for the major
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First Year

Fall	Credits Spring	Credits
BIOL 110 [†]	4 CHEM 110 [†]	3
MATH 110 or 140 ^{††}	4 CHEM 111 [†]	1
ENGL 15, 30H, or ESL 15 ^{††}	3 MATH 111 or 141	2-4
General Education Course	3 BIOL 220W [*]	4
First-Year Seminar	1-3 General Education Course	3
	General Education Course	3
	15-17	16-18

Second Year

Fall	Credits Spring	Credits
CHEM 202	3 PHYS 250	4
BIOL 133, 222, 230W, or ANSC 322	3-4 BIOL 240W	4
STAT 240 or 301 ^{††}	3 ENGL 202C ^{††}	3
CAS 100 ^{††}	3 ECON 104 [†]	3
General Education Courses (GHW)	1.5 General Education Course	3
	13.5-14.5	17

Third Year

Fall	Credits Spring	Credits
WFS 209N [*]	3 FOR 350 or STAT 460	3
FOR 203	3 WFS 407 or 408	3
WFS 300 [*]	2 WFS 406 or 409	2
WFS 301 [*]	2 SOILS 101 [†]	3
WFS 310 [*]	3 Elective	3
Natural Resource Policy, Planning, Law, Administration (PPLA) and Human Dimensions (HD) Course	3	
	16	14

Fourth Year

Fall	Credits Spring	Credits
WFS 447W	3 WFS 446	3
ENGL 202C ^{††}	3 WFS 407 or 408	3
AEE 440, ENGL 416, or ENGL 418	3 Natural Resource Policy, Planning, Law, Administration (PPLA) and Human Dimensions (HD) Course	3
Fisheries Selection	2-3 General Education Course (GHW)	1.5
Botany Selection	3 Elective	1-5

General Education Course	3
	17-18
	11.5-15.5

Total Credits 120-130

- * Course requires a grade of C or better for the major
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- Courses that are listed as both US or IL and GA, GH, or GS can count for both requirements (i.e., a course listed for both GA and IL will satisfy both Arts and International Cultures).
- Students should monitor their academic progress by checking their degree audits in LionPATH.
- Questions about WFS academic plans or degree audits should be directed to academic advisers or to WFS Program Coordinator Ellen Rom, exr2@psu.edu or 814-863-0362.

Career Paths

Employment in the wildlife and fisheries professions is highly competitive. Related work experience is often required for post-graduation employment. Students get that experience from summer jobs, internships, or independent study projects. Flexibility in job location and willingness to accept seasonal or part-time work can increase employment prospects. Our curriculum can provide a firm base for graduate study, as well as the opportunity to meet certification standards established by The Wildlife Society and the American Fisheries Society,

and the academic requirements set by the U.S. Office of Personnel Management for federal employment as a wildlife or fisheries biologist.

Careers

Wildlife/fisheries technician or biologist, ecologist, conservation officer, environmental educator, habitat manager, and zookeeper are just some of the opportunities pursued by Wildlife and Fisheries Science graduates. Employers include the U.S. Fish and Wildlife Service, the National Park Service, the USDA Wildlife Service, the Pennsylvania Game Commission, and conservation districts, as well as nongovernmental organizations and private industry.

MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES OF THE WILDLIFE AND FISHERIES SCIENCE PROGRAM (<https://ecosystems.psu.edu/undergraduate/resources/alumni-profiles/wfs/>)

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (<https://ecosystems.psu.edu/graduate/wfs/>)

Professional Resources

- American Fisheries Society (<https://fisheries.org>)
- The Wildlife Society (<https://wildlife.org>)

Contact

University Park

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Undergraduate Programs Office
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