

Warner College of Natural Resources
Department Of Fish, Wildlife, and Conservation Biology
Major in Fish, Wildlife, and Conservation Biology
FISHERIES AND AQUATIC SCIENCES

A minimum grade of C (2.0) is required for all biological, mathematical/statistical, physical science, fish, wildlife, conservation biology, and natural resource courses used to meet graduation requirements for the Fish, Wildlife and Conservation Biology Major. The minimum applies to courses taken as substitutions for meeting these requirements. Additionally, CSU requires completion of a minimum of 120 credits with 42 upper division (300-level or higher) credits and successful completion of all major requirements outlined below. Students choosing the Fisheries and Aquatic Sciences concentration are also required to complete at least 80 hours of paid or non-paid employment related to fishery and aquatic biology and FW487. Please see form.

<u>Course</u>	<u>Title (prerequisites)</u>	<u>Credits</u>	<u>AUCC</u>	<input checked="" type="checkbox"/>
Freshman (suggested course progressions, however some courses may be more appropriate for later years)				
<i>The following courses are REQUIRED (NO Electives)</i>				
CO	150 ^P College Composition (CO 130)	3	1A	
FW	104 Wildlife Ecology and Conservation	3	3A	
FW	179 New-to-the-Major Seminar	1		
AUCC	Arts and Humanities ²	3	3B	
<i>Select ONE SET of the following Biology courses</i>				
BZ	110 Principles of Animal Biology	3	3A	
BZ	111 ^P Animal Biology Laboratory (BZ 110 or concurrent registration)	1	3A	
BZ	120 Principles of Plant Biology	4	3A	
OR				
LIFE	102 Attributes of Living Systems ¹	4	3A	
LIFE	103 ^P Biology of Organisms- Animals and Plants ¹	4		
<i>Select ONE SET of of the following General Chemistry and Physics courses</i>				
CHEM	107 ^P Fundamentals of Chemistry (MATH 117 or place into MATH 118 or higher)	4	3A	
CHEM	108 ^P Fundamentals of Chemistry Laboratory (CHEM 107 or concurrent registration)	1	3A	
PH	121 ^P General Physics 1 (MATH 125 or concurrent registration)	5	3A	
PH	122 ^P General Physics 2 (PH 121)	5	3A	
OR				
CHEM	111 ^P General Chemistry 1 (MATH 118 or place into MATH 124 or higher; CHEM 105 or appropriate score in chem prep pre-assessment module)	4	3A	
CHEM	112 ^P General Chemistry Laboratory 1 (CHEM 111 or concurrent registration)	1	3A	
CHEM	113 ^P General Chemistry 2 (CHEM 107 or CHEM 111; MATH 124 or higher, or concurrent registration in MATH 124 or higher)	3		
CHEM	114 ^P General Chemistry Laboratory 2 (CHEM 112; CHEM 113 or concurrent registration)	1		
PH	110 Descriptive Physics	3	3A	
PH	111 ^P Descriptive Physics Laboratory (PH 110 or concurrent registration)	1	3A	
	TOTAL	30-33		

Sophomore (suggested course progressions, however some courses may be taken in later years - watch prereqs!)

The following courses are REQUIRED (NO Electives)

CHEM	245 ^P	Fundamentals of Organic Chemistry (CHEM 107 or CHEM 113)	4		
CHEM	246 ^P	Fundamentals of Organic Chemistry Laboratory (CHEM 108 or CHEM 112 or CHEM 114; CHEM 245 or concurrent registration)	1		
FW	204	Introduction to Fishery Biology	3		
FW	260 ^P	Principles of Wildlife Management (MATH 124, BZ 110 or LIFE 103)	3		
SPCM	200	Public Speaking ⁴ (or HONR 499 for Honors Program students)	3		
LIFE	320 ^P	Ecology (one course in biology, MATH 141 or MATH 155 or MATH 160)	3		
AUCC		Social and Behavioral Sciences ³	3	3C	

Select ONE of the following Genetics/Evolution courses

BZ	220 ^P	Introduction to Evolution (BZ 110 & 111 or BZ 120 or LIFE 103)	3		
BZ	346 ^P	Population and Evolutionary Genetics ³ (BZ 220; MATH 155; STAT 301 or STAT 307)	3		
BZ	350 ^P	Molecular and General Genetics (BZ 110 or BZ 120 or LIFE 102; STAT 201 or concurrent registration or STAT 301 or concurrent registration or STAT 307/ERHS 307 or concurrent registration)	4		
SOCR	330 ^P	Principles of Genetics (BZ 110 or BZ 120 or LIFE 102)	3		

Select ONE of the following Calculus courses

MATH	155 ^P	Calculus for Biological Scientists I (MATH 124, MATH 125)	4	1B	
OR					
MATH	160 ^P	Calculus for Physical Scientists I (MATH 124 & MATH 126 w/ a B or better)	4	1B	

Select ONE of the following Statistics courses

STAT	301 ^P	Introduction to Statistical Methods (MATH 117 or higher)	3		
OR					
STAT	307 ^P	Introduction to Biostatistics (MATH 117 or higher)	3		
TOTAL			30-31		

Summer (suggested course progression, however, it may be taken your Junior summer - watch prereqs!)

NR	220 ^P	Natural Resources Ecology and Measurements (LIFE 103 or BZ 110 & BZ 111 or BZ 120; MATH 118)	5		
TOTAL			5		

Junior (suggested course progressions, however some courses may be taken in later years - watch prereqs!)

The following courses are REQUIRED (NO Electives)

FW	300 ^P	Biology and Diversity of Fishes (BZ 110 and 111 or LIFE 103)	2		
AND					
FW	301 ^P	Ichthyology Lab (FW 300 or concurrent registration)	1		
FW	370 ^P	Design of Fish and Wildlife Projects (FW 260 or FW 360; LAND/LIFE 220 or LIFE 320; NR 220; MATH 155 or 160; STAT 301 or 307)	3	4A, 4B	
AUCC		Historical Perspectives ⁷	3	3D	
AUCC		Global and Cultural Awareness ⁸	3	3E	

Select ONE of the following Invertebrate courses or course pair (lecture and lab) for a total of 4 credits not taken					
BSPM	302	Applied and General Entomology	2		
AND					
BSPM	303A ^P	Entomology Lab - General (BSPM 302 or concurrent registration)	2		
OR					
BSPM	445 ^D	Aquatic Insects (BZ 111 or LIFE 103)	4		
OR					
BZ	212 ^D	Animal Biology - Invertebrates (BZ 110 and 111 or LIFE 103)	4		
Select ONE of the following Vertebrates classes not taken elsewhere					
BZ	214 ^P	Animal Biology - Vertebrates (BZ 110 and 111 or LIFE 103)	4		
BZ	329 ^D	Herpetology (BZ 110 and 111 or LIFE 103)	3		
BZ	330 ^D	Mammalogy (BZ 110 and 111 or LIFE 103)	3		
BZ	335 ^D	Ornithology (BZ 110 and 111 or LIFE 103)	3		
Select ONE of the following Plant Biology courses					
BZ	223 ^D	Plant Identification (BZ 120 or LIFE 103)	3		
BZ	321 ^D	Aquatic Vascular Plants (BZ 223 or BZ 325)	3		
BZ	325 ^D	Plant Systematics (BZ 220)	4		
BZ	332 ^D	Introductory Phycology (BZ 120 or LIFE 102; BZ 220)	4		
BZ	450 ^D	Plant Ecology (BZ 120 or LIFE 103)	4		
F/RS	310 ^D	Forest and Rangeland Ecogeography (BZ 101 or BZ 104 or BZ 110 or BZ 120 or LIFE 102)	3		
F	311 ^D	Forest Ecology (LAND/LIFE220 or LIFE320)	3		
NR	326 ^D	Forest Vegetation Management (NR 220)	3		
Select ONE of the following Advanced Writing courses					
CO	300 ^D	Writing Arguments (CO 150 or HONR 193)	3	2	
CO	301 A-D ^D	Writing in the Disciplines (CO 150 or HONR 193)	3	2	
JTC	300 ^D	Professional and Technical Communication (CO 150 or HONR 193)	3	2	
Select ONE of the following Earth Systems courses or course not taken elsewhere⁶					
GEOL	120	Exploring Earth: Physical Geography	3	3A	
GEOL	121 ^D	Introductory Geology Lab (GEOL 120 or concurrent registration in GEOL 120, GEOL 122, or GEOL 124)	1	3A	
GEOL	122	The Blue Planet: Geology of our Environment	3	3A	
GEOL	124	Geology of Natural Resources	3	3A	
GEOL	150	Physical Geology for Scientists and Engineers	4		
GR/WR	304 ^D	Sustainable Watersheds ⁶ (AUCC 1B math requirement) (Credit not allowed for both GR 304 and WR 304)	3	3A	
NR	319 ^D	Geospatial Applications in Natural Resources (Jr. Standing)	4		
NR	322	Introduction to Geographic Information Systems	4		
SOCR	240 ^D	Introductory Soil Science (CHEM 107 or CHEM 111)	4		
TOTAL			38-41		

Senior (depending upon prereqs, some of these courses may be taken in earlier semesters)				
<i>The following courses are REQUIRED (NO Electives)</i>				
FW	401 ^D	Fishery Science (Capstone) (FW 300; MATH 141/155/160; STAT 301/307 or ERHS 307)	3	4C
AUCC		Arts and Humanities ²	3	3B
<i>Select ONE Aquatic Ecology course or course pair not taken elsewhere from the following</i>				
FW	304 ^D	Conservation of Marine Megafauna (BZ101, or BZ110, or LIFE103)	3	
FW	430 ^D	Waterfowl Ecology and Management (FW370)	3	
BZ	471 ^D	Stream Biology and Ecology (LIFE 320 or LAND/LIFE 220)	3	
AND				
BZ	472 ^D	Stream Biology and Ecology Laboratory (BZ 471 or concurrent registration)	1	
OR				
BZ/ESS	474 ^D	Limnology (LIFE 320 or LAND/LIFE 220)	3	
OR				
FW/BZ	568	Sustaining River Ecosystems in a Changing World (instructor approval required)	3	
OR				
NR	370 ^D	Coastal Environmental Ecology (CHEM 107 or CHEM 113)	3	
<i>Select TWO of the following Advanced Fisheries courses</i>				
FW	400 ^D	Conservation of Fish in Aquatic Ecosystems (FW 300; LIFE 320)	3	
FW	402 ^D	Fish Culture (FW 300)	4	
FW	405 ^D	Fish Physiology (FW 300 or BZ 214)	3	
<i>Select ONE Human Dimensions course not taken elsewhere from the following</i>				
FW	472 ^D	Issues in Animal Conservation and Management (FW 260; LIFE 320)	3	
HIST	355 ^D	American Environmental History ⁴ (3 credits of history; completion of 45 credits)	3	
NR	320	Natural Resource History and Policy	3	
NR	400 ^D	Public Relations in Natural Resources (CO 300 or CO 301B or CO 301C or JTC 300 or LB 300)	3	
NRRT	330	Social Aspects of Natural Resource Management	3	
NRRT	400 ^D	Environmental Governance (NRRT 231)	3	
NRRT	440 ^D	Applications in Environmental Communication (NRRT 262)	3	
PHIL	320	Ethics of Sustainability	3	
PHIL	345	Environmental Ethics	3	
POLS	361 ^D	U.S. Environmental Politics and Policy (POLS 101)	3	
SOC	320 ^D	Population-Natural Resources and Environment (SOC 100/105)	3	
SOC	322 ^D	Introduction to Environmental Justice (SOC 100/105)	3	
SOC	460 ^D	Environment and Society (SOC 100/105)	3	
SOC	461 ^D	Water, Society, and Environment (SOC 100/105)	3	

Select Guided Electives (see footnote #9 below)					
See list	300+	Guided Elective ⁹	*Remember - credit not allowed for both FW455 and NR300	3	
Fisheries and Aquatic Sciences Work Experience Requirement					
FW	487	Internship		1 - 3	
Work Experience		80 hours pre-approved by FAS Faculty			
		TOTAL		22-28	
PROGRAM TOTAL = 120-121 credits					

^p This course has at least one prerequisite.

¹ Students taking this biology selection should choose a botany related course in the electives options to meet botany/plant course requirements for certain federal positions related to wildlife, fisheries and/or conservation biology

² Select from the list of courses in category 3B of the all-university core curriculum (AUCC). Only 3 of the 6 credits required for the arts and humanities may come from the intermediate (L*** 200 and L*** 201) foreign language courses

³ Students need to obtain registration override from the appropriate department to take this course

⁴ Students in the Honors Track 1 program must take HONR 499

⁵ Select from the list of courses in category 3C of the AUCC

⁶ Students selecting WR 304 only need select three credits. Students selecting one of the geosciences lecture courses (GEOL 120, GEOL 122, GEOL 124) also need to take GEOL 121

⁷ Select from the list of courses in category 3D of the AUCC

⁸ Select from the list of courses in category 3E of the AUCC

⁹ **Guided Electives** are courses intended to expand students depth and breadth of wildlife biology and include any 300- or 400- level regular course with a BC, BMS, BSPM, BZ, CHEM, ESS,F, FW, GES, MATH, MIP, NR, NRRT, PH, RS, SOCR, STAT or WR subject code (excluding courses that end in -80 to -99); or SOCR240; other course with prior approval by department and advisor. Courses may not double count as technical electives and for other requirements in the major.