FY2011 DEPARTMENTAL ANNUAL REPORT OF CONTINUOUS IMPROVEMENT

Department of Biology Fort Hays State University Prepared by Elmer J. Finck June 30, 2011

I. DEPARTMENTAL OVERVIEW

A. Departmental Mission and Vision Statements

The mission of the Department of Biological Sciences is encompassed within the mission of the University as a whole and focuses on the primary functions of instruction, scholarship, and service. The Department of Biological Sciences is committed to excellence in instruction, scholarship, and service.

These three functions are inextricably intertwined but, instruction serves as the basis common to all. Instruction provides educational opportunities that enable students both to understand essential concepts within individual biological sub-disciplines and the ability to connect those concepts to provide a holistic understanding of biology. The Department provides graduates with an excellent information base and both analytical and communication skills. Graduates of the Department are attractive to employers and successful in obtaining placement in programs of advanced study. The Department includes an array of biological sub-disciplines, including the following:

- 1. Botany
- 2. Cellular/Molecular Biology
- 3. Conservation Biology
- 4. Environmental Biology
- 5. Fisheries
- 6. Medical Technology
- 7. Pre-Forestry
- 8. Pre-Occupational Therapy
- 9. Pre-Physical Therapy
- 10. Range Conservation
- 11. Secondary Education
- 12. Wildlife Biology
- 13. Zoology

The primary mission of the Department is to provide excellent instruction in the biomedical sciences, modern organismal biology (in which this Department is unique in the region), traditional biology including secondary education, general science, and graduate studies. Furthermore the Department serves the University by providing quality instruction in the areas necessary to serve other majors and the general education program. The Department cooperates with the Department of Health and Human Performance in preparing students for entry into professional programs in Physical Therapy and in Occupational Therapy. The Department delivers key foundational courses for students of Nursing and in the Allied Health programs in Radiological Technology and Medical Diagnostic Imaging. Furthermore the Department serves the University by providing quality instruction for the general education program.

Instruction is the major responsibility of non-administrative personnel of the Department, including not only classroom instruction, but also state of the art laboratory and field instruction as well. The Department's mission is to use the latest instructional technology while maintaining quality teaching.

All faculty members are involved in scholarship and service, but the extent of each varies with the capability and expertise of the individual faculty members and the nature of the sub-disciplines involved. A close alliance with the Sternberg Museum of Natural History and the Kansas Wetlands Education Center provides opportunities for many Departmental functions of instruction, scholarship, and service. The Department is committed to serving the institution, the community, people of the region, and professional organizations, and to fulfill the University's mission of service.

To maintain the graduate program mission and scientific vigor of the Department, there is a strong emphasis on research as an essential component. The Department provides opportunities for both undergraduates and graduates to participate in professional activities both on and off campus.

B. Departmental Goals, Objectives, and Strategic Priorities

Goals and Objectives

- 1. To continue to provide undergraduate students with the best education in biology in the region. Related objectives:
 - A. To provide opportunities for students to apply what they learn in the classroom, in field, laboratory, and professional settings.
 - B. To provide research opportunities for students.
 - C. To provide opportunities for student oral and poster presentations outside the classroom.
- 2. To provide students with professional training.

Related objectives:

- A. To continue to prepare graduates who are competitive for employment within the region and nation.
- B. To encourage students to progress to doctoral and professional programs.
- 3. To foster faculty development by providing opportunities for active participation in professional organizations.

Strategic Priorities

• to develop research on the Smoky Valley Ranch owned by The Nature Conservancy

- to develop research on wind farms within the state relative to wildlife responses
- to develop State Wildlife Grants with the Kansas Department of Wildlife and Parks
- to renovate the cadaver lab, which we expect will come from FHSU monies
- to develop AH 168 as a research and teaching space for molecular biology
- to develop research on the Quivira National Wildlife Refuge and Kirwin National Wildlife Refuge
- to develop a monitoring and data analysis for species in Kansas in conjunction with the Kansas Department of Wildlife and Parks in the southwestern portion of the state
- to develop the KAMS program
- to develop PSM Biology

C. Department Productivity and Distinctive Accomplishments

- Faculty and Graduate Students have received \$575,101 from grant monies.
- Faculty and students have published 15 papers.
- Ms. Hilary Gillock developed the first virtual college lab course in BIOL 102 Laboratory Experiences in Biology.
- Dr. Greg Farley FHSU President's Distinguished Scholar.
- Dr. Greg Farley is a Council Member for the Wilson Ornithological Society.
- Dr. Greg Farley 46th year of population data collected on migratory birds at FHSU Banding Site.
- Mr. Jordan Hofmeier recipient of the Balthazor Fellowship
- Ms. Amanda Cheeseman recipient of the Fleharty Fellowship.
- Ms. Amanda Sara Rages recipient of the Fleharty Fellowship.
- Mr. Brian Gaston recipient of the Jerry R. Choate Fellowship.
- Dr. Rob Channell sabbatical seminar entitled "Splendid isolation: disturbance and the contraction of geographic ranges".
- Dr. Rob Channell Webmaster for the Central Plains Society of Mammalogists.
- Dr. Rob Channell Resources Coordinator for the International Biogeography Society.
- Dr. Rob Channell promoted to full professor.
- Mr. Mark Eberle President Southwestern Association of Naturalists.
- Mr. Mark Eberle Southwestern Association of Naturalist Board.
- Mr. Mark Eberle Executive Committee Kansas Chapter of the American Fisheries Society.
- Dr. Elmer J. Finck Board of Directors for the American Society of Mammalogists and also chaired the Membership and Graduate Student and Education committees at Annual Meeting.
- Dr. Elmer J. Finck Past-President of the Kansas Academy of Science.
- Ms. Caroline Curtis received the Biology Graduate Teaching Assistant Award.
- Ms. Caroline Curtis FHSU Graduate School Outstanding Graduate Assistant Teaching Award.
- Dr. Richard Packauskas FHSU Outstanding Research Award Fall 2010.
- Dr. Richard Packauskas President FHSU Phi Kappa Phi.
- Dr. Richard Packauskas is a Member-at large for AAUP.
- Dr. Richard Packauskas Treasurer, International Heteropterists Society.
- Dr. Richard Packauskas Associate Editor for Invertebrates for The Prairie Naturalist.
- Dr. William Stark CHLS Outstanding Service Award.

- Dr. William Stark Chair of the Kansas Nongame Advisory Council to the Kansas Department of Wildlife and Parks.
- Dr. Joseph Thomasson Instructor and Advisor for Conservation Leaders for Tomorrow Program.
- Dr. Eric Gillock FHSU Outstanding Research Award Spring 2011.
- Ms. Jessica Casey Kansas Natural Resources Conference Scholarship.
- Ms. Katie Talbott George Toland Award for best student presentation at the Kansas Herpetological Society meeting.
- Mr. Alex Galt Thesis entitled "Effects of sediment removal techniques on avian communities and vegetational attributes in restored prairie pothole wetlands".
- Mr. Alex Galt FHSU Graduate School Outstanding Thesis Award.
- Mr. Alex Galt Janice Lee Fenske Memorial award as Outstanding Graduate Student at the 71 Midwest Fish and Wildlife Conference.
- Mr. Shingo Ishihara thesis entitled "Genetic analysis of vancomycin-resistant gram-positive cocci isolated from wild songbirds".
- Mr. Shingo Ishihara FHSU Graduate School Outstanding Thesis Award.
- Mr. Justin Hamilton thesis entitled "Effects of prescribed burning on grassland nesting birds on Conservation Reserve Program Areas in Gove County, Kansas".
- Mr. Justin Hamilton FHSU Graduate School Outstanding Thesis Award.
- Ms. Kristen Polacik thesis entitled "Effects of flooding on photosynthesis and root respiration in saltcedar (<u>Tamarix ramosissima</u>), an invasive riparian shrub".
- Ms. Kristen Polacik FHSU Graduate School Outstanding Thesis Award.
- Mr. Zachary Schwenke thesis "Distribution and genetic structure of pocket gophers (Genus <u>Geomys</u>) in Kansas".
- Mr. Weston Fleming Duffy Student Travel Grant by Kamas Chapter and North Central Division of the American Fisheries Society.
- Ms. Stephanie Kane Kansas Ornithological Society Student Research Grant.
- Ms. Stephanie Kans Kansas Department of Wildlife and Parks Chickadee Checkoff Small Grant.
- Ms. Elizabeth Waring honorable mention for her oral presentation at the International Society for Wetlands Scientists.
- Ms. Stephanie Kane thesis entitled "Breeding habitat structure and use by Kansas-occurring black rail".
- Mr. Brian Tanis Kansas Department of Wildlife and Parks Chickadee Checkoff Small Grant.
- Mr. Brian Tanis American Society of Mammalogists Grants-in-Aid Research Award.
- Mr. Weston Fleming, Jordan Hofmeier, Ryan Pinkall, and Bryan Sowards Kansas Department of Wildlife and Parks Chickadee Checkoff Small Grant.
- Ms. Jenn Pfannenstiel CHLS Undergraduate Student Award.
- Ms. Jenn Pfannenstiel FHSU Torch Award Finalist
- Ms. Keri Caudle Kansas Academy of Science Undergraduate Research Grant.
- Ms. Keri Caudle Botanical Society of America Undergraduate Research Award.
- Ms. Keri Caudle Weed Science Society of America Undergraduate Research Award.
- Ms. Keri Caudle First Place Research and Creative Activities URE Poster contest.
- Mr. Heath Owens Second Place Research and Creative Activities URE Poster contest.

• Ms. Karina Barrett Third Place Research and Creative Activities Undergraduate Poster contest.

II. DEPARTMENTAL PERFORMANCE METRICS

A. Department Performance Indicators

Key Performance Indicator	FY2007	FY2008	FY2009	FY2010	FY2011
Freshmen [20 TH DAY FALL SEMESTER, HEADCOUNT]	40	48	48	61	45
Biology (BS/302-0401)	39	46	46	58	45
General Science (BS/302-4902)	1	2	2	3	0
Transfer Students [20 TH DAY FALL SEMESTER, HEADCOUNT]	18	25	15	14	22
Biology (BS/302-0401)	17	23	13	14	22
General Science (BS/302-4902)	1	2	2	0	0
Undergraduate (first majors/second majors) [20 TH DAY FALL SEMESTER, HEADCOUNT OF FIRST MAJORS, HEADCOUNT OF SECOND MAJORS]	178	183	177	203	193
Biology (BS/302-0401)	162	173	163	187	174
General Science (BS/302-4902)	16	10	14	16	19
Graduate Majors [20 TH DAY FALL SEMESTER, HEADCOUNT]	21	21	28	26	29
Major Retention [20 TH DAY FALL SEMESTER, PERCENT OF MAJORS RETURNING]	69.23%	66.46%	70.05%	72.57%	62.69%
Biology (BS/302-0401)	70.51%	68.18%	71.25%	72.04%	64.32%
General Science (BS/302-4902)	53.85%	46.15%	50.00%	78.57%	43.75%
Undergraduate Student Credit Hours [TOTAL UNDERGRAD SCH]	6744	6986	6723	6772	7455
Graduate Student Credit Hours [TOTAL GRAD SCH]	386	376	510	454	437
Tenured or Tenure-track Faculty (Headcount) [FTE <u>OCCUPIED</u> FROM POSITION CONTROL]	10	10	10	10	11
Non Tenure-Track Faculty (Headcount) [FTE <u>OCCUPIED</u> FROM POSITION CONTROL]	2	3	2	2	2
Other Faculty (Headcount/Sections Taught)	2/6	4/10	1	4/12	4/13
Undergraduate Degrees [UNDERGRAD DEGREES AWARDED]	30	29	23	26	30
Biology (BS/302-0401)	20	21	20	22	19
General Science (BS/302-4902)	10	8	3	4	11

Key Performance Indicator	FY2007	FY2008	FY2009	FY2010	FY2011	
Graduate Degrees [GRAD DEGREES AWARDED, NOT MLS]	6	6	9	8	6	
Transfer students are up 57.1%. Undergraduate studer up 15.4%.	Transfer students are up 57.1%. Undergraduate student credit hours are up 10.1%. Undergraduate degrees are up 15.4%.					
Number of books, book chapters, and refereed articles published	19	15	14	6	14	
Percent of faculty publishing refereed books, chapters, or articles	66.7%	83.3%	60.0%	41.7%	75.0%	
Number of non-refereed articles and presentations	12	43	35	54	53	
Percent of faculty publishing non-refereed articles or presentations	53.3%	66.7%	66.7%	90%	66.7%	
Number of scholarly performances and other creative activities						
Percent of faculty in scholarly performances or other creative activities						
Total number of external grant applications submitted/percent of faculty submitting	22/60%	22/86.3%	22/50%	21/60%	48/64.5%	
Total number of funded external grants/percent of faculty funded	17/46.6%	19/66.7%	18/60%	21/90%	31/83.3%	
Number of books and refereed articles published are 13 \$575, 101.	33.3%. Tota	l dollar amo	unt is up 100	5.1% from \$	283,547 to	
[NOTE: Each department MUST report at least two direct measures of student learning outcomes and two indirect measures. Examples of direct measures include: first-time pass rate or average scores on standard exit exam, number of students successfully completing reviewed portfolios. Indirect measures would include student satisfaction, alumni and employer data, or any other perception based data.]					two ard exit de student	
Direct Outcome 1 Number of students giving presentations at professional meetings.				15	18	
Direct Outcome 2 Number of outstanding student presentation awards				5	8	
Indirect Indicator 1 Number of students expressing satisfactions with their degree				3	5	
Indirect Indicator 2 Number of employers expressing appreciation for the skills of our students				4	8	
Dept senior students' Level of Academic Challenge [FHSU LAC SCORE, DEPT LAC SCORE]	54.15 57.49	53.87 48.29	54.65 61.08	55.9 57.00	56.4 60.97	
Dept senior students' Active and Collaborative Learning [FHSU ACL SCORE, DEPT ACL SCORE]	44.61 50.18	45.85 46.15	45.34 56.49	46.1 50.09	43.9 56.93	
Dept senior students' Student-Faculty Interaction [FHSU SFI SCORE, DEPT SFI SCORE, N, %]	44.19 42.78	44.73 40.51	45.34 54.00	41.0 46.56	38.5 56.82	
Dept senior students' Enriching Educational	33.44	34.09	34.72	34.0	32.9	

Key Performance Indicator	FY2007	FY2008	FY2009	FY2010	FY2011
Experiences [FHSU EEE SCORE, DEPT EEE SCORE, N, %]	32.21	32.14	29.50	32.34	38.26
Dept senior students' Supportive Campus Environment [FHSU SCE SCORE, DEPT SCE SCORE, N, %]	59.06 48.38	57.30 56.62	59.57 60.19	60.3 62.12	60.8 65.59
Number of NSSE participants [NUMBER OF DEPT SR STUDENTS, PERCENT]	13 27%	13 27%	11 23%	22 56%	22 42.3%

Number of students giving presentations at professional meetings is up 20%. Number of outstanding student presentation awards is up 60%.

[NOTE: Departments may pick up to three key performance indicators they currently measure but are not captured above. These measures could be used to track departmental results on specific yearly goals. Examples might include: number of SRPs attended, number of new freshmen contacted. (These will vary by department based on goals.)]

Outcome/Indicator 1 Number of faculty actively involved with professional organizations	10	10	9	9	8
Outcome/Indicator 2 Number of students attending professional meetings	69	43	71	74	62
Outcome/Indicator 3 Number of invited faculty seminars	9	5	4	4	6
Student attendance at meeting is emphasized by the faculty and students have responded well. We continue to					

Student attendance at meeting is emphasized by the faculty and students have responded well. We continue t have faculty invited to give seminars and presentations.

C. Department Quality Initiatives and Results

FY2011 Quality Initiatives	Results
Upgrading our ability to attract PSM –Biology graduate students.	Dr. Jordge LaFantasie initially wrote a grant for this project, but it was rejected. We completed another attempt, which was rejected.
Developing trails in conjunction with the Sternberg Museum of Natural History adjacent to the museum and in collaborations with Big Creek Middle Smokey Hill River Watershed WRAPS Project	The effort is collaborations between Dr. Elmer J. Finck, Dr. Reese Barrick, Brian Bartels, and James Leiker. We have a grant for \$54,211 pending with the Environmental Protection Agency. This initiative will enhance our ability to work with teachers and the K-12 students to have them understand and appreciate the importance of water quality and a functioning ecosystem. We are well on our way with the area burned this spring. A new trail system developed. An outdoor amphitheater developed and booklets for students and teachers in the process of developing.

FY2012 Quality Initiatives	Responsible Party, Resources, and Plan
Development of a monitoring system in conjunction with the Kansas Department of Wildlife and Parks for energy development in southwestern Kansas.	Drs. Bill Stark and Rob Channell are spearheading this effort. They recently won a \$369,421 grant to begin the project in August of 2011. The grant will allow at least four graduate research assistants and 6 undergraduate to do active research in that area of the state.
Development of protocol to	Dr. Rob Channell has secured a \$15,643 grant from the KDWP to begin this

measure changes in habitat that	effort. Three graduate students, Brandon Calderon, Brian Gaston, and Brian
affect species of concern for the	Tanis, have attend an occupancy modeling course at Central Missouri State
Kansas Department of Wildlife an	d University to help develop models in their research on guzzlers, free ranging
Parks.	cats, and wind farms, respectively.

D. Institutional Quality Results

FY2011 University Initiatives	Department Activities/Results
Increase access and retention for Hispanic students	We have intensified our advising with the Hispanic students and are actively encouraging them to join the Biology Club. We recruited to student, who will begin Graduate School this fall.
Increase the quantity and quality of K-12 teachers educated	We presently have 13 students in secondary education thanks to the efforts of Mr. Mark Eberle and Dr. Brian Maricle.
Improve undergraduate students' foundational skills	We are developing an undergraduate seminar and encouraging participation in professional meetings.
Enhance physical wellness of students, faculty, and staff	No action developed to date.
Internationalize the campus and curriculum	We have three activities. First, Dr. Jordana LaFantasie is developing a program with the University of Wyoming and Colorado State University to have students study the ecology and agriculture of Kenya. Second, Dr. Chris Bennett continues his research on pterosaurs in Europe and China Third, Dr. Rich Packauskas is attended a conference in China for the annual meeting of the International Heteropterists Society

III. FY2011 STRATEGY AND OPPORTUNITIES FOR IMPROVEMENT

A. Departmental Reflection of Strengths, Needs, Opportunities, and Threats

Current Strengths	Current Needs
 Overall strong, supportive collaborative environment with good cooperation among faculty, teamwork (sharing equipment, conducting collaborative project, etc), and congenial atmosphere Broad range of expertise interests among the faculty and graduate students Faculty are active in conduction research in their areas of expertise State of the art equipment and other resources are available for the conduct of research The Department has a strong focus on the success of undergraduates by encouraging them to participate in research. 	 We do not have expertise in molecular biology to modernize our department. Retention of majors with the high standards needed to complete a degree in biology The weakest areas of the Department presently are physiology and molecular biology. Botany needs to be expanded
Future Opportunities	Future Threats

B. Opportunities for Improvement

We are presently developing six strategic initiatives 1) to develop research on the Smoky Valley Ranch owned by The Nature Conservancy, 2) to develop State Wildlife Grants with the Kansas Department of Wildlife and Parks, 3) to renovate the cadaver lab, which we expect will come from FHSU monies, 4) to develop AH 168 as a research and teaching space for molecular biology, 5) develop research on the Quivira National Wildlife Refuge and Kirwin National Wildlife Refuge, 6) to develop of a monitoring and data analysis for species in Kansas in conjunction with the Kansas Department of Wildlife and Parks (KDWP), 5) to develop the KAMS program, and 6) to develop the PSM – Biology.

Opportunity for Improvement	Resources Required	Expected Result and Completion Date
The Nature Conservancy	GRA and Grassland Ecologist	Expect to work with TNC on the Smokey Valley Ranch. Ongoing
Kansas Department of Wildlife and Parks	OOE for travel, GRA and Grassland Ecologist	Working to develop State Wildlife Grants. Ongoing
Renovation of the Cadaver Lab	\$250,000.00	To cut the lab into two separate labs one for the cadavers-based instruction and one for other anatomy/physiology related research. Fall 2011
Development of a molecular biology	Access to AH 168 and renovation of that space \$100,000	Given the Congressional Grant of \$100, 00 for molecular biology equipment, we now need clean space to house the equipment and use it in research and teaching. Fall 2012
Quivira National Wildlife Refuge and Kirwin National Wildlife Refuge	\$200,000	Provide students and faculty with opportunities to study prescribed fire effects on invasive species and native species. Fall 2012
KDWP Long term Monitoring Network and data analysis for the mixed-grass and short grass prairie	\$500,000 annually, faculty position in bioinformatics	Assist the KDWP with the development of monitoring and analysis of species across the state, which will provide graduate and The weakest areas of department

		presently are physiology and molecular biology undergraduate research opportunities. Fall 2011
Development of the KAMS program	New faculty position that specializes in secondary education and/or middle school	New research projects with KAMS students, undergraduate, and graduate students. Fall 2011
Development of the PSM Program	New faculty position with expertise in molecular biology	New research project to aid the development of entrepreneuralship and management within biology. Fall 2011

IV. SUPPORTING MATERIALS

A. Department Degree Program Affinity Diagram(s)

Traits of a	Expected	
Biology Major	Learning	Curriculum
	Outcomes	
Biology majors are:	<u>∻GOAL</u>	Core Curriculum Develops Basic Knowledge of Biology
 Knowledgeable They understand the nature of life and its requirements as well as how it is applied in the context of human endeavors such as medicine, teaching, and managing natural resources. Analytical They understand the process of science. They have analytical/critical skills (enabling them to use their acquired knowledge to integrate in new biological information), 	To acquire knowledge of the basics of the biological sciences: the learner will be able to (1) describe the condition of that which distinguishes the living from non-living, (2) explain the basic structure and function of a prokaryotic and eukaryotic organism, (3) explain how life reproduce and evolves, (4) describe how biologists identify and organize the diversity of life, and (5) how life interacts with its environment on any scale of time. $\underline{\diamond GOAL} \diamond$ To implement the skills of the biological practitioner: the learner will be able to (1) operate the basic equipment necessary for work in the laboratory and field, (2) use	<u>Tier 1 Core</u> BIOL 222/222L Principles of Biology/Lab BIOL 130/130L Introductory Botany/Lab BIOL 150/150L Introductory Zoology/Lab BIOL 625/625L Genetics/Lab <u>Core Cognates Develop Foundation Knowledge and Perspective</u> <u>Tier 1 Core Cognates</u> CHEM 120/120L University Chemistry I/Lab CHEM 122/122L University Chemistry I/Lab MATH 331 Calculus Methods
 strong analytical skills. Flexible/Adaptive They have the generalist's ability to perceive relationships and to synthesize knowledge and information. They have the depth and breadth of knowledge to successfully adapt to new situations. Articulate They have the ability to express themselves in biologically correct and effective oratory and written discourse.	basic numerical and statistical techniques to analyze and present data in standard biological format, (3) communicate in the rhetoric of the professional biologist. <u>•GOAL</u> • To apply knowledge of the sciences that are ancillary to biology: the learner will be able to (1), apply chemistry to biological problem solving (2), and use knowledge gained from cognate requirements to the emphasis of the major to, e. g. GSCI 435 Hydrology and Water Resources to fisheries biology.	Courses Develop/Implement Skills of Biological Practitioner Tier 1 Core Cognate MATH 331 Calculus Methods Tier 2 Course BIOL 520 Biometry Develop Depth and Breadth of Biology Knowledge Tier 2 Courses (All majors to have at least 4 of the following courses) BIOL 520 Biometry BIOL 524/524/ Cellular Biology/Lab
• Insightful/Humane They value scientific literature as a source for understanding and interpreting diverse human experience and for affirming our commonness with nature. They appreciate the diversity of nature and intellectual assets of fellow biologists.	★GOAL★ To obtain employment wherein the biological knowledge obtained is at the very worst not a handicap to success, and at the very best, is incalculable.	BIOL 524/524L Cellular Biology/Lab BIOL 622/622L Ecology/Lab BIOL 523 Evolution BIOL 533/533L General Microbiology/Lab Anatomy: (only one of following will count towards tier two requirement) BIOL 351/351L Comparative Anatomy/Lab BIOL 345/345L Human Anatomy/Lab BIOL 331/331L Plant Anatomy/Lab

Traits of a	Expected	
Bioloav Maior	Learnina	Curriculum
	Outcomes	
 Creative They value the role of the creative imagination of past and future scientists in providing the body of evidence for scientific understanding and processes of the acquisition thereof. Collegial They are assertive, cooperative, and supportive of their colleagues. 	Outcomes	Physiology: (only one of following will count towards tier two requirement) BIOL 346/346L Human Physiology/Lab BIOL 534/534L Plant Physiology/Lab BIOL 534/534L Plant Physiology/Lab BIOL 534/534L Plant Physiology/Lab Biology Subjects Develop Depth and Breadth of Knowledge Tier 2 Courses: BIOL 523 Evolution BIOL 622/622L Ecology/Lab One additional Tier 2 Course Tier 3 Courses: BIOL 510/510L Taxonomy of Flowering Plants/Lab BIOL 567 Biodiversity and Conservation Biology BIOL 579 Wildlife Management Animal Taxonomy Electives (3 from following): BIOL 550/550L Ornithology/Lab BIOL 550/550L Ornithology/Lab BIOL 550/550L Ornithology/Lab BIOL 551/551L Mammalogy/Lab BIOL 531 Range Management BIOL 531 Range Management BIOL 531 Range Management BIOL 532 Forn following): BIOL 560/560L Herpetology/Lab BIOL 531 Range Management BIOL 532 Range Management BIOL 533 Range Management BIOL 560 Longical and Range Techniques BIOL 560 Landscape Ecology BIOL 591 Advage Ecological and Range Techniques BIOL
		Bio/Medical Laboratory Option

Traits of a Bioloay Maior	Expected Learnina	Curriculum
	Outcomes	
		Biology Subjects Develop Depth and Breadth of Knowledge <u>Tier 2 Courses:</u> BIOL 345/345L Human Anatomy/Lab BIOL 346/346L Human Physiology/Lab BIOL 520 Biometry BIOL 524/524L Cellular Biology/Lab
		<u>Tier 3 Courses:</u> BIOL 533/533L General Microbiology/Lab BIOL 648/648L Immunology/Lab <i>2 additional courses from following:</i> BIOL 506 Scanning Electron Microscopy - Theory and Operation BIOL 542/542L Parasitology/Lab BIOL 544/544L Embryology/Lab BIOL 545/BIOL 507 Histology/Lab
		Related Sciences <u>Tier 3 Cognates:</u> PHYS 111/111L Physics I/Lab CHEM 304/304L Essentials of Organic Chemistry /Lab CHEM 360/360L Essentials of Biochemistry/Lab
		Botany Option
		Biology Subjects Develop Depth and Breadth of Knowledge <u>Tier 2 Courses:</u> BIOL 331/331L Plant Anatomy/Lab BIOL 520 Biometry BIOL 534/534L Plant Physiology/Lab BIOL 622/622L Ecology/Lab
		Tier 3 Courses:BIOL 510/510L Taxonomy of Flowering Plants/LabBIOL 529 AgrostologyBIOL 532 DendrologyBIOL 543/543L Entomology/LabBiology Electives (3 from following):BIOL 506 Scanning Electron Microscopy - Theory and OperationBIOL 523 EvolutionBIOL 524/524L Cellular Biology/LabBIOL 531 Barge Management

Traits of a	Expected	
Biology Major	Learning	Curriculum
	Outcomes	
		BIOL 536 Ecological and Range Techniques BIOL 540 Principles of Systematic Biology BIOL 567 Biodiversity and Conservation Biology BIOL 569 Landscape Ecology BIOL 619/619L Aquatic Biology/Lab Related Sciences <u>Tier 3 Cognates:</u> AGRI 215/215L Soils/Lab CHEM 304/304L Essentials of Organic Chemistry/Lab Cognate Electives (1 course from following):
		GSCI 200/200L Physical Geology/Lab GSCI 340 Environmental Geology/GSCI 102 Introduction to Geology Lab
		Environmental Biology Option Biology Subjects Develop Depth and Breadth of Knowledge <u>Tier 2 Courses:</u> BIOL 520 Biometry BIOL 533/533L General Microbiology/Lab BIOL 622/622L Ecology/Lab One additional Tier 2 course required
		Tier 3 Courses: BIOL 221 Humans and the Environment BIOL 510/510L Taxonomy of Flowering Plants/Lab BIOL 556/556L Limnology/Lab BIOL 567 Biodiversity and Conservation Biology BIOL 569 Landscape Ecology BIOL 619/619L Aquatic Biology/Lab
		Related Sciences <u>Tier 3 Cognates</u> AGRI 215/215L Soils/Lab CHEM 250/250L Chemical Analysis /Lab CHEM 304/304L Essentials of Organic Chemistry/Lab GSCI 240 Introduction to Geographic Information Systems GSCI 435 Hydrology and Water Resources

Traits of a	Expected	
Biology Major	Learning	Curriculum
	Outcomes	
		Fishery Biology Option
		Biology Subjects Develop Depth and Breadth of Knowledge <u>Tier 2 Courses:</u> BIOL 520 Biometry BIOL 622/622L Ecology/Lab Two additional Tier 2 courses required
		Tier 3 Courses: BIOL 510/510L Taxonomy of Flowering Plants/Lab BIOL 527/527L Ichthyology/Lab BIOL 556/556L Limnology/Lab BIOL 567 Biodiversity and Conservation Biology BIOL 619/619L Aquatic Biology/Lab BIOL 655 Fisheries Management
		Related Sciences <u>Tier 3 Cognates:</u> CHEM 304/304L Essentials of Organic Chemistry/Lab GSCI 240 Intro to Geographic Information Systems (GIS) GSCI 435 Hydrology & Water Resources
		<u>Medical Technology Option</u> Biology Subjects Develop Depth and Breadth of Knowledge <u>Tier 2 Courses:</u> BIOL 346/346L Human Physiology/Lab BIOL 533/533L General Microbiology/Lab Two additional Tier 2 courses required
		<u>Tier 3 Courses:</u> BIOL 542/542L Parasitology/Lab <i>One additional from the following:</i> BIOL 507 Topics in Biology: Principles of Immunology BIOL 648 Immunology
		Related Sciences <u>Tier 3 Cognates:</u> PHYS 102/103 Physical Science/Lab (recommended) One from the following: CHEM 304/304L Essentials of Organic Chemistry/Lab CHEM 340/340L Organic Chemistry I/Lab One from the following:

Traits of a	Expected	
Biology Major	Learning	Curriculum
	Outcomes	
		CHEM 250/250L Chemical Analysis/Lab
		CHEM 342/342L Organic Chemistry II/Lab
		CHEM 360/360L Essentials of Biochemistry/Lab
		Rangeland Conservation Specialist Option
		Biology -Subjects Develop Depth and Breadth of Knowledge
		Tier 2 Courses:
		BIOL 520 Biometry
		BIOL 622/622L Ecology/Lab
		BIOL 534/534L Plant Physiology/Lab
		One additional Tier 2 Course required
		Tier 3 Courses:
		BIOL 507 Topics in Biology: Field Study of Range Plants
		BIOL 510/510L Taxonomy of Flowering Plants/Lab
		BIOL 531 Range Management
		BIOL 535 Range Planning
		BIOL 536 Ecological and Range Techniques
		BIOL 537 Range Condition & Improvement
		BIOL 538 Range Plants
		BIOL 567 Biodiversity and Conservation Biology
		BIOL 599 Wildlife Management
		Related Sciences
		Tier 3 Cognates
		CHEM 112/112L General Chemistry I/Lab
		CHEM 114/114L General Chemistry II/Lab
		AGRI 213 Pasture and Forage Crops
		AGRI 215/215L Soils/Lab
		GSCI 340 Environmental Geology
		AGRI 510/510L Beef Cattle Production/Lab
		AGRI 525 Soil and Water Management
		AGRI 531/531L Development and Classification of Soils/Lab
		Secondary Teaching Option
		Biology Subjects Develop Depth and Breadth of Knowledge
		Tier 2 Courses:
		BIOL 520 Biometry

Traits of a Biology Major	Expected Learning	Curriculum
	Outcomes	BIOL 523 Evolution BIOL 533/533L General Microbiology/Lab BIOL 622/622L Ecology/Lab
		<u>Tier 3 Courses:</u> BIOL 230 Human Anatomy and Physiology BIOL 232 Anatomy of Humans Laboratory BIOL 234 Physiology of Humans Laboratory BIOL 476 Apprenticeship in Biology
		Professional Education Develops Teacher Preparation
		COED 202 Foundations of Education BIOL 277 Early Field Experience TEEL 431 Educational Psychology TESS 494 The Secondary School Experience TESS 496 Directed Teaching (Secondary) BIOL 508 Teaching Methods in Biology SPED 601 Educating Exceptional Students
		PHYS 111/IIIL Physics I
		Wildlife Biology Option
		Biology Subjects Develop Depth and Breadth of Knowledge <u>Tier 2 Courses:</u> BIOL 520 Biometry BIOL 622/622L Ecology/Lab <i>Two additional Tier 2 courses</i> <u>Tier 3 Courses:</u> BIOL 510/510L Taxonomy of Flowering Plants/Lab BIOL 531 Range Management BIOL 550/550L Ornithology/Lab BIOL 551/551L Mammalogy/Lab BIOL 567 Biodiversity and Conservation Biology BIOL 599 Wildlife Management

Traits of a	Expected	
Biology Major	Learning	Curriculum
	Outcomes	
		Related Sciences <u>Tier 3 Cognates:</u> AGRI 215/215L Soils/Lab GSCI 200/200L Physical Geology/Lab GSCI 240 Introduction to Geographic Information Systems (GIS)
		Biology Subjects Develop Depth and Breadth of Knowledge <u>Tier 2 Courses:</u> BIOL 520 Biometry BIOL 622/622L Ecology/Lab <i>Two additional Tier 2 courses</i> Tior 2 Courses
		Tier 3 Courses: BIOL 510/510L Taxonomy of Flowering Plants/Lab BIOL 527/527L Ichthyology/Lab BIOL 543/543L Entomology/Lab BIOL 550/550L Ornithology/Lab BIOL 551/551L Mammalogy/Lab BIOL 560/560L Herpetology BIOL 567 Biodiversity and Conservation Biology <i>Two from the following:</i> BIOL 507 Topics in Biology: Behavioral Ecology BIOL 523 Evolution BIOL 524 Evolution BIOL 540 Principles of Systematic Biology BIOL 569 Landscape Ecology BIOL 599 Wildlife Management
		Related Sciences <u>Tier 3 Cognates:</u> CHEM 304/304L Essentials of Organic Chemistry/Lab <i>One elective from following:</i> GSCI 200/200L Physical Geology/Lab GSCI 240 Introduction to Geographic Information Systems (GIS) GSCI 340 Environmental Geology
		Pre-Physical Therapy Option
		Biology Subjects Develop Depth and Breadth of Knowledge

Traits of a	Expected	
Biology Major	Learning	Curriculum
	Outcomes	
		<u>Tier 2 Courses:</u> BIOL 345/345L Human Anatomy/Lab BIOL 346/346L Human Physiology/Lab BIOL 524/524L Cellular Biology/Lab <i>One additional Tier 2 course</i>
		<u>Tier 3 Courses:</u> BIOL 241 Microbiology for Allied Health BIOL 322 Human Heredity
		Related Sciences <u>Tier 3 Cognates</u> PHYS 111/111L Physics I/Lab PHYS 112/112L Physics II/Lab
		Skills MATH 122 Plane Trigonometry HHP 220 Standard First Aid MATH 250 Elements of Statistics
		Pre-Forestry Option
		Biology Subjects Develop Depth and Breadth of Knowledge BIOL 510/510LTaxonomy of Flowering Plants/Lab BIOL 532 Dendrology
		Related Sciences PHYS 111/111L Physics I/Lab GSCI 200/200L Physical Geology/Lab AGRI 215/215L Soils/Lab
		Skills AGRI 220 Agricultural Accounting MATH 234 Analytic Geometry & Calculus MATH 250 Elements of Statistics
		Pre-Health Information Management Option
		Biology Subjects Develop Depth and Breadth of Knowledge BIOL 263 Medical Terminology BIOL 345/345L Human Anatomy/Lab BIOL 346/346L Human Physiology/Lab
		Skills

Traits of a Biology Major	Expected Learning	Curriculum
	Outcomes	
		ACCT 203 Financial Accounting ENG 246 Technical and Report Writing

B. Department Staffing Plan

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Position Number	Projected Dept Needs	Faculty Member	Current Faculty Expertise	Assigned Instructional FTE	Current Rank (Date)	Degree	Track	Year Entered FHSU Service
						-		-
118111- 012	Anatomy Physiology Cell Biology	Bennett, Chris	Anatomy Paleontology Evolutionary Morphology Biomedical Education	1.0	Associate Professor (2008)	PhD	Tenured	2004
118111- 017	Conservation Biology/ Biogeography	Channell, Robert B.	Conservation Biology Biogeography GIS Statistics Landscape Ecology	1.0	Full Professor (2011)	PhD	Tenured	1999
118111- 013	Mammalian Systematics	Open	Mammalian Systematics	1.0	Assistant Professor	PhD	Tenure Track	
118111- 004	Biology/Lab Coordinator	Eberle, Mark E.	Biology Fisheries	1.0	Program Specialist (1996)	MS	Program Specialist	1994
118111- 009	Ornithology	Farley, Greg H.	Ornithology Zoology Behavioral Ecology	1.0	Professor (2007)	PhD	Tenured	1995
118111- 001	Administration Wildlife Biology	Finck, Elmer J.	Administration Wildlife Biology Mammalogy Human Dimensions Ornithology	0.5	Professor (2001)	PhD	Tenured	2001
118111- 018	Microbiology	Gillock, Eric T.	Microbiology Virology Molecular Biology	1.0	Associate Professor (2007)	PhD	Tenured	2001
118111- 002	Ecology	vacant	Plant Ecology Secondary	1.0	Assistant Professor	PhD	Tenured Tract	
118111- 007	Human Anatomy Physiology	Yasuhiro Kobayashi	Human Physiology Animal Physiology	1.0	Assistant Professor (2010)	PhD	Tenured	2010
118111- 006	Plant Biologist	Brian Maricle.	Plant Physiology	1.0	Assistant Professor	PhD	Tenured Track	2008

Department of Biological Sciences Staffing Plan 2011-2012

			Ecophyiology					
118111- 015	Entomology	Packauskas, Richard J.	Entomology Zoology Parasitology	1.0	Associate Professor (2001)	PhD	Tenured	1995
118111- 008	Ichthyology	Stark, William J.	Ichthyology Stream Ecology Fisheries Management	1.0	Full Professor (2010)	PhD	Tenured	1995
118111- 014	Range Ecology	Dr. Jordana LaFantasie	Range Management, Soils	1.0	Assistant Professor (2010)	PhD	Tenured Track	2008
118111- 005	Botany		Botany Paleobotany Aquatic Biology	1.0	Assistant Professor	PhD	Tenure Track	
118111-	Animal Physiology	projected	Animal Physiology Comparative Physiology	1.0	Assistant Professor	PhD	Tenure Track	
118111-	Wetlands Biology	projected	Wetlands Biology Waterfowl Biology	1.0	Assistant Professor	PhD	Tenure Track	

C. Bibliography of Departmental Scholarly Activity

- Austin, B. J., and E. A. Strauss. 2011. Nitrification and denitrification response to varying periods of desiccation and inundation in a western Kansas stream. Hydrobiologica 658: 183-195.
- Gido, K. B., W. K. Dodds, and M. E. Eberle. 2010. Retrospective analysis of fish community change during a half-century of land-use and stre3amflow changes. Journal of the North American Benthological Society 29:970-987.
- LaFantasie, J. J., and S. F. Enloe. 2011. Competition between black henbane (<u>Hyoscyamus niger</u>) and three native grasses. Invasive Plant Science and Management 21: .
- Maricle, B. R. 2010. Changes in chlorophyll content and antioxidant capacity during dark to light transitions in etiolated seedlings: Comparison of species and units of enzyme activity. Transactions of the Kansas Academy of Science 113:177-190.
- Maricle, B. R., and R. B. Alder. 2011. Effect of precipitation on photosynthesis and water potential in Andropogon gerardii and Schizachyrium scoparium in southern mixed grass prairie. Environmental and Experimental Botany 72:223-231.
- Maricle, B. R., O. Kiirats, R. W. Lee, and G. E. Edwards. 2010. Effects of salinity on photosynthesis in C₄ estuarine grasses. Pp. 55-58. <u>in</u> Ayres, D. R., D. W. Kerr, S. D. Ericson, and P. R. Olofson. Eds. Proceeding of the Third International Conference on Invasive Spartina, 2004 Nov. 8-10, San

Francisco, CA, USA. San Francisco Estuary Invasive Spartina Project of the California State Coastal Conservancy, Oakland, CA.

- Maricle, B. R., and R. W. Lee. 2010. Mechanisms of sulfide and anoxia tolerance in salt marsh grasses in relation to elevation zonation. Pp. 47-52 in Ayres, D. R., D. W. Kerr, S. D. Ericson, and P. R. Olofson. Eds. Proceeding of the Third International Conference on Invasive Spartina, 2004 Nov. 8-10, San Francisco, CA, USA. San Francisco Estuary Invasive Spartina Project of the California State Coastal Conservancy, Oakland, CA.
- Maricle, B. R., S. R. Zwenger, and R. W. Lee. 2011. Carbon, nitrogen, and hydrogen isotope rations in creekside trees in western Kansas. Environmental and Experimental Botany 71:1-9.
- McPherson, R. J. Packauskas, R. W. Sites, S. J. Taylor, C. S. Bundy, J. D. Bradshaw, and P. L. Mitchell.
 2011. Review of <u>Acanthocephala</u> (Hemiptera: Heteroptera: Coreidae) of America north of Mexico with a key to species. Zootaxa 2835: 30-40.
- Packauskas, R. 2010. Catalog of the Coreidae, or leaf-footed bugs, of the New World. Fort Hays Studies, Fourth Series, Number 5.
- Packauskas, R. J., and R. M. Shofner. 2010. A new species of jumping bristletail from Kansas (Micocoryphia: Meinertellidae: Hypomachilodes Silvestri, 1911). Journal of the Kansas Entomological Society. 83(4): 340-346.
- Thomasson, S. A., and J. R. Thomasson. 2011. A comparison of CPD (critical point drying) and HMDS (hexamethyldisilazane) in preparation of Coralloriza spp. rhizomes and associated mycorrihizae for SEM (scanning electron microscope. Transactions of the Kansas Academy of Science 114:129-134.
- Thompson, C. W., J. R. Choate, H. H. Genoways, and E. J. Finck. 2011. Blarina hylophaga (Soricomorpha: Soricidae). Mammalian Species 43(878):94-103.
- Thompson, C. W., P. S. Pfau, J. R. Choate, H. H. Genoways, and E. J. Finck. 2011. Identification and characterization of the contact zone between short-tailed shrews (<u>Blarina</u>) in Iowa and Missouri. Canadian Journal of Zoology 89:278-288.
- Welsch, T. T., and E. T. Gillock. 2011. Triclosan-resistant bacteria from feedlot and residential soil. Journal of Environmental Science and Health, Part A. 46:436-440.

D. Department Program Assessment Results

E. Other Departmental Information

Department Brand Essence Statement



in all options within biology to develop the technical, analytical, critical thinking,

collegial, and communications skills necessary for successful careers in biology including: botany, cellular/molecular, conservation, fisheries, medical technology, pre-forestry, pre-health information management, pre-physical therapy, range conservation, secondary education, wildlife, and zoology.

Guiding Principles

While the primary emphasis is on quality instruction, Departmental faculty are involved in scholarly activity, and service to the university, profession locally, within the state and nationally, and community. Faculty involve both undergraduate students and graduate students in scholarly and service projects. Coursework is delivered in the traditional on-campus environment as well as through the virtual environment to meet the need of students in western Kansas and beyond.



302 Albertson Hall, 600 Park Street Hays, KS 67601-4099 785-628-4214 Fax: 785-628-4153 www.fhsu.edu/biology

Core Values

Quality

The Department maintains a strong commitment to high standards through continuous quality improvement efforts. Evaluation, assessment, and analysis are considered an integral part of the program culture. We have exit interviews of all our graduating undergraduate and graduate students.

Change/ Innovation

The Department uses information gained from continuous evaluation, assessment and analysis to direct efforts. We consider change an integral part of the development of the Department. We strive to develop innovative teaching, service, and scholarship to assist our students in obtaining the best education possible.

Collaboration

The Department has developed and continues to develop relationships with academic units on campus, stakeholder, and professional entities to promote the best for our students and faculty. We have cooperative agreements with The Nature Conservancy, the Kansas Department of Wildlife and Parks, the Kansas Chapter of The Wildlife Society, the Society for Range Management, and Li-Cor Corporation.

Diversity/ Inclusiveness

The Department provides opportunities for all students and program participants and strives to ensure that graduates of the program value diversity and differences among individuals involved with biology. The Department also strives to ensure that students understand biodiversity as it relates to biology

Service

The Department provides service to constituents such as the Central Plains Society of Mammalogists, the American Society of Mammalogists, the Southwestern Association of Naturalist, the North Dakota Natural Science Society, and numerous state professional groups.

Lifelong Learning

The Department values continuous learning by fostering an environment that encourages lifelong learning for students, faculty, staff, and stakeholders through western Kansas. We provide learning workshops for professional biologists that teach participants about the recent innovations in biology.

Strategic Priorities

The Department has received and accepted a donation of a DNA sequencer from Li-Cor and has developed the use of the instrument in teaching and scholarship.

The Department is developing a biotechnology/bioinformatics laboratory that is state of the art and will allow the Department to be active in scholarship involving DNA sequencing.

The Department is developing a research project to study invasive plants and its effect on grassland nesting birds and small mammals in western Kansas.

General Parameters

- 1. No more than 20 pages, excluding appendix information.
- 2. Report submitted electronically to Dean, Assistant Provost for Quality Management, and Provost.
- 3. Note deadlines attached below.

Annual Timeline for Department Annual Report

March 1	Draft template distributed to Deans.
April 15	Final template and Directions distributed to Department Chairs. Selected enrollment data (fall 20 th day counts) distributed to Chairs and Deans in the departmental template.
June 1	Student system information (graduates, NSSE) delivered to Chairs.
June 1	Final cutoff date for elements to be considered in the Department's Annual Report.
June 30	Complete Department Annual Report due to Deans, Assistant Provost for Quality Management, and Provost. Submit electronically.
August 15	Completed College Annual Report due to Assistant Provost for Quality Management and Provost.