



NKU | **Research & Education
Field Station**

Biennial Report 2016-2018

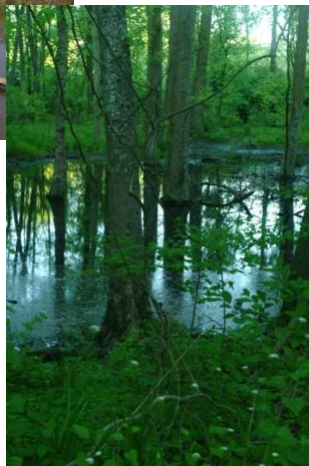
Richard D. Durtsche *Director*

INTRODUCTION:

The Northern Kentucky University (NKU) Research and Education Field Station (REFS) was established and began as a functional field station in July of 2016. The facilities which were purchased by NKU in 2015 were converted from a residential home to an operational research, teaching, and outreach facility in that year.

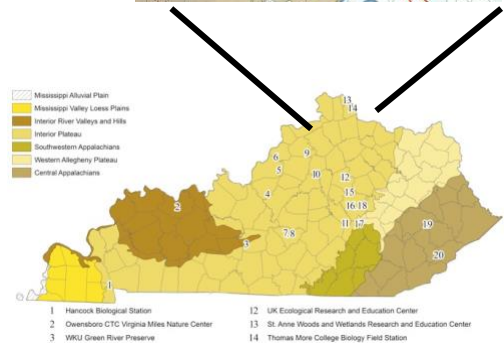


REFS is located adjacent to 155 acres of the St. Anne Woods and Wetlands (SAWW) Natural Area, a conservation easement on and near the Ohio River in Northern Kentucky. REFS facilitates the use of wetlands (both open and closed canopy), and upland mixed mesophytic, beech-dominated, old-growth forest and open grassland areas. The natural areas include 100 acres (40.5 ha) of wetlands and bottomland forest located between the Ohio River and Route 8. The 40 acres (18.2 ha) of uplands old growth forest and grassland are located to the south and east of the St. Anne Convent just south of Route 8. NKU research and field studies there over the 10 years



preceding REFS have focused on invasive species and their ecological impacts, biogeochemical processes, amphibian and reptile diversity, bird nesting biology, restoration, and Ecological Research as (NSF-EREN) studies. REFS facilities laboratory and field processing research, and have indoor restrooms. A future storage equipment and supplies, and a workshop, additional space for educational needs and experiments. The proximity of REFS to the the opportunity for ecological instruction while offering unique environmental Education Network provide space for indoor meetings, teaching areas, facility will hold while providing setting up research NKU campus expands undergraduate interdisciplinary teaching opportunities over a range of other disciplines. This facility enhances community outreach programs, summer camps, and teacher continuing education. REFS also functions as a conduit for programs sponsored by NKU's Center for Integrative Natural Sciences and Mathematics (CINSAM), Center for Environmental Education (CEE), and Ecological Stewardship Institute (ESI). The Center for Environmental Restoration (CER), an instruction-based environmental consulting center, currently uses REFS to train undergraduates in improved techniques of land management and restoration.

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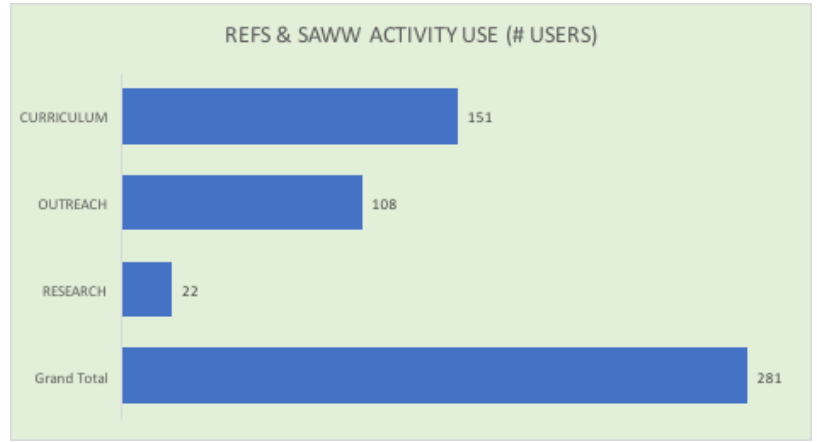
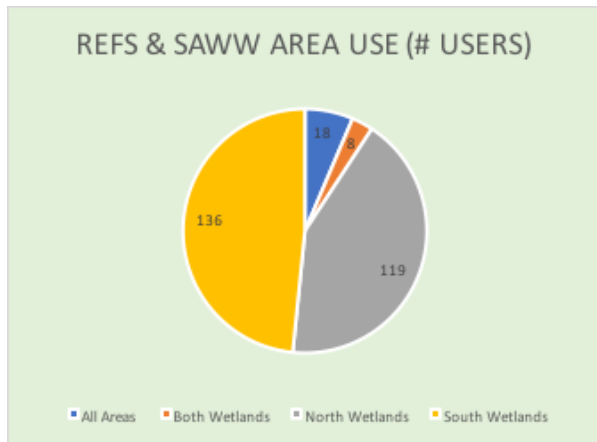
VISION: To inspire an understanding and appreciation of Northern Kentucky's natural areas from riparian wetlands and the Ohio River, to upland forests and grasslands through time.

MISSION: In support of NKU's mission and core values, REFS serves students, scholars, and the broader community. As a data-driven learning center, REFS fosters regional environmental and ecological research, and is an operations hub for field studies, multidisciplinary nature and outdoor-oriented courses, and interactions between professionals, students, and local citizens.

Quarter 1 Reporting Period: July 1 - Sept. 30, 2016

REFS began its operations in July, 2016. Research activities, university curriculum, and outreach opportunities to P-12 schools and the regional community are services provided by REFS. Work at REFS is in conjunction with the St. Anne Woods and Wetlands (SAWW) natural areas, a conservation easement established with funds from the Kentucky Heritage Land Conservation Fund and administered by the Campbell County Conservation District.

A total of 281 visitors used REFS during the first quarter. Based on these number, 35.2% of users were in July, 8.1% in August, and 56.7% in September. The SAWW natural areas include a north wetlands adjacent to the Ohio River and bordered to the south by railroad tracks, a south wetlands located between the railroad tracks and Route 8, and the uplands forest and grassland area. In the first quarter almost half (48.4%) of the activities took place



MONTH	JULY	AUGUST	SEPTEMBER	Grand Total
CURRICULUM			151	151
North Wetlands			51	51
South Wetlands			100	100
OUTREACH	96	12		108
All Areas	18			18
North Wetlands	42	12		54
South Wetlands	36			36
RESEARCH	3	11	8	22
Both Wetlands	2	5	1	8
North Wetlands	1	6	7	14
Grand Total	99	23	159	281

in the south wetlands, with 42.3% taking place in the north wetlands, 6% using both

wetlands, and 2.8% using all natural areas. From an activity perspective, 53.7% of REFS use was for university curriculum, 38.4% for outreach, and 7.8% for research.

During this first quarter, REFS hosted a NKU CINSAM summer camp entitled “The Art of Nature Exploration” for middle school students as part of the outreach activities. Students spent a week in a day camp format exploring and observing all aspects of the natural areas and using the REFS for both processing natural materials, lectures on various aspects of nature, and learning to create nature art through drawing, painting, and sculpture. The Northern Kentucky Sierra Club also used REFS for an outing to study insects. Several university (NKU) courses used REFS in the first quarter including: General Ecology Laboratory, Entomology, and the Environmental Sciences Careers course. Students from the Environmental

Sciences Careers course were the first to use REFS in the fall, and they had wonderful comments about the facility and the natural area. They also assisted in some trail building in the north wetlands. Research activities were carried out throughout the quarter by Dr. Richard Boyce, and by Dr. Richard Durtsche. Their work focused on wetland plants, amphibians, invasive species, and the establishment of vegetation in newly created open canopy wetlands.

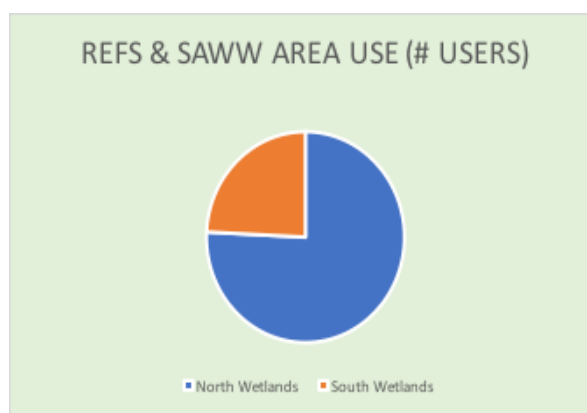
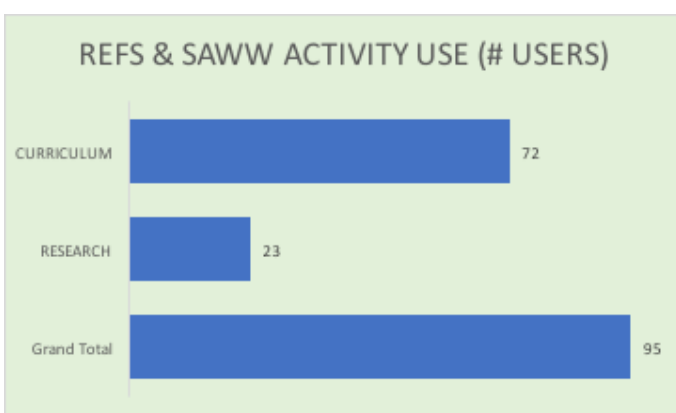


Environmental Science Careers Student: *“I plan to keep my eye out for any ways to get involved with REFS whether that be through any job opening for student researchers directly with the station or in other ways. I am very excited that NKU has its own field station now and I look forward to seeing how it progresses!”*

Quarter 2

Reporting Period: Oct. 1 - Dec 31, 2016

In the second quarter, the NKU Research and Education Field Station continued in service with both research activities and university curriculum. There were 95 users during this quarter. The vast majority of the natural area used was the north wetlands (75.8%) with the other 24.2% of usage taking place in the south wetlands. The upland forests and grassland was not used during this quarter. Curriculum use of REFS (75.8%) was the major activity that took place at REFS in the second quarter, with the other 24.2% of the activities in research. There were no outreach programs during this quarter. On a monthly basis for the second quarter, October had 29.5% of the activity, November had 56.8%, and December had 13.7% of the activity.



MONTH	OCTOBER	NOVEMBER	DECEMBER	Grand Total
CURRICULUM	23	49		72
North Wetlands		49		49
South Wetlands	23			23
RESEARCH	5	5	13	23
North Wetlands	5	5	13	23
Grand Total	28	54	13	95

REFS had several university (NKU) courses using the facilities and natural areas including the General Ecology Laboratory, Dendrology, and Vertebrate Zoology. As part of the Dendrology class, students learned the proper techniques for establishing a woody shrub by planting a rhododendron shrub next to the observation platform in front of the REFS facility. Research was carried out throughout the quarter by both Drs. Richard Boyce and Richard Durtsche on wetland plants, amphibians, invasive species, and the establishment of vegetation in newly created open canopy wetlands.

Vertebrate
Zoology



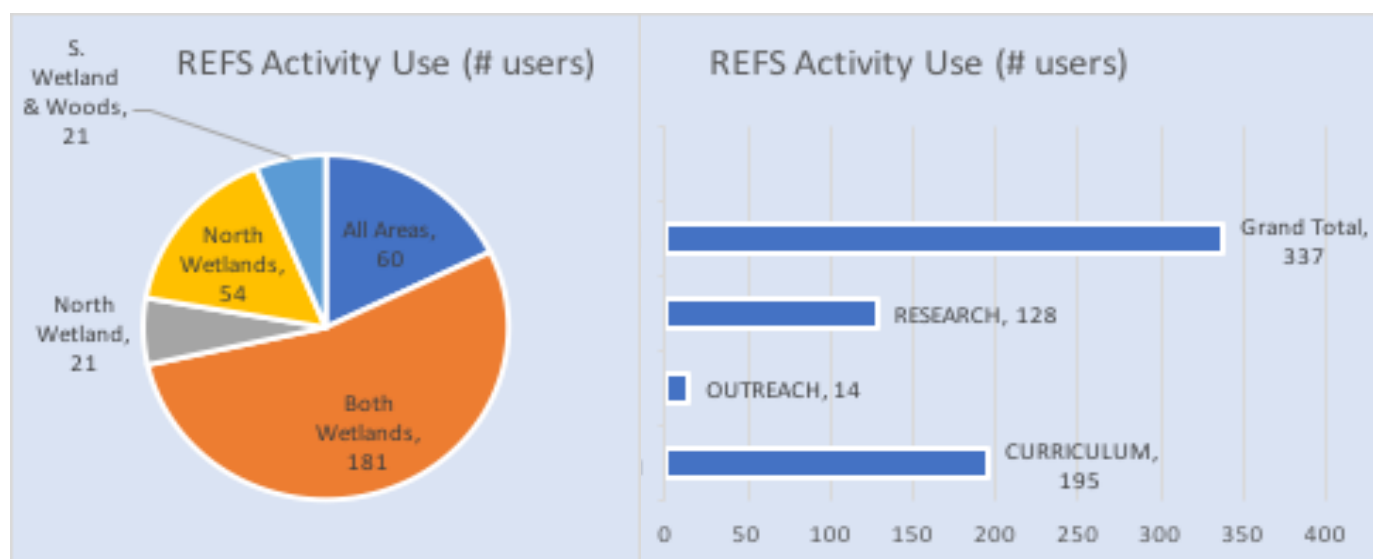
Dendrology
Shrub Planting



Quarter 3

Reporting Period: January 1 - March 31, 2017

The third quarter of activity and usage at REFS continued with research activities and university curriculum. There were a total of 337 users that came to REFS during this quarter. 20.4% of the people using REFS came in January, 29.7% in February, and 49.9% in March. There was more diverse natural area activity during this quarter with over half of the activities in both wetlands (53.7%), while all areas were used by 17.8%, 16% used the north wetlands only, 6.2% used the south wetlands only, and 6.2% used both the south wetlands and the upland forests. University (NKU) curriculum again was the major activity (57.9%) during this quarter with research activities at 38% of the station activities, and 4.1% of the activities involved with outreach programs.



Month	Jan	Feb	Mar	Grand Total
CURRICULUM		65	130	195
Both Wetlands		23	109	132
North Wetland		21		21
North Wetlands			21	21
S. Wetland & Woods		21		21
OUTREACH		14		14
North Wetlands		14		14
RESEARCH	77	21	30	128
All Areas		60		60
Both Wetlands		5	27	49
North Wetlands		12	3	19
Grand Total	77	100	160	337

University (NKU) courses that used REFS during the third quarter included the General Ecology Laboratory, and Herpetology. REFS also hosted a site visit from stakeholders that were participating in the first (of two) NSF Field Station Strategic Planning Grant Conferences. During this visit, stakeholders had the opportunity to see the REFS facility and hike some of the trails and see the associated SAWW natural areas. Research was carried out throughout the quarter by both Drs. Richard Boyce and Richard Durtsche on wetland plants, amphibians, invasive species, and the establishment of vegetation in newly created open canopy wetlands. The NKU Center for Environmental Restoration also made plans and started carrying out some invasive plant removal during this quarter. The NKU Biology Alumni also had their annual “Herping with Durtsche” outing at REFS this year. In addition to a short refresher lecture for those that may have forgot some of the finer points of herpetology, there was field observation of herps, and a follow-up bone fire and hot dog roast.

REFS Strategic Planning Outing



NKU Bio Alumni Outings



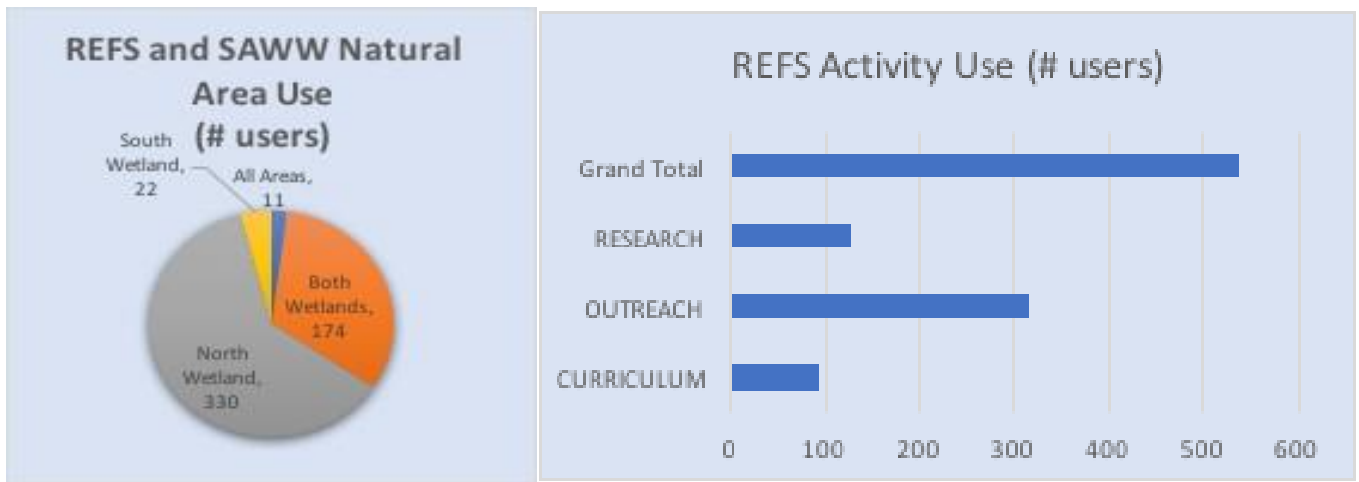
Herpetology



Quarter 4

Reporting Period: April 1 - June 30, 2017

The fourth quarter of this year for REFS was very eventful. REFS continued with activities of research, university curriculum, and outreach activities. There were a total 537 users that visited REFS and SAWW in the fourth quarter. April had 26.6% of the quarter's activity, May had 43% of the activity, and June had 30.4% of the activity. The north wetlands was primarily used (61.4%), followed by both wetlands at 32.4%, and south wetlands at 4.1%, and all areas at 2.1% for REFS activities. University (NKU) curriculum dropped off to 17.3% of the activity in the fourth quarter because classes finished at the end of April. Research activities picked up (23.8%) with the beginning of student summer research projects, however our greatest usage for the semester were several outreach activities (58.8%) that took place at REFS.



Month	Apr	May	Jun	Grand Total	
CURRICULUM		93		93	
Both Wetlands		65		65	
North Wetland		28		28	
OUTREACH		6	187	123	316
All Areas				11	11
North Wetland		6	187	90	283
South Wetland				22	22
RESEARCH		44	44	40	128
Both Wetlands		30	39	40	109
North Wetland		14	5		19
Grand Total		143	231	163	537

Several university (NKU) courses used REFS during the fourth quarter including the General Biology Laboratory, the General Ecology Laboratory, General Botany, and Herpetology. The General Biology Laboratory was a dual credit (high school/college) course with students from Bishop Brossard High School and Holy Cross High School and was taught by NKU Biology Faculty Rob Kues. Research was carried out throughout the quarter by both Drs. Richard Boyce and Richard Durtsche on wetland plants, amphibians, invasive species, and the establishment of vegetation in newly created open canopy wetlands. The NKU Center for Environmental Restoration



continued work on invasive plant removal during this quarter. Researcher Ann Ray and her team from Xavier University in Cincinnati started their research at REFS and SAWW on long-horn beetles (Cerambycidae) with trapping stations in both the north and south wetlands. REFS had extensive community outreach and engagement activities with a careers session for high school students in program run out of NKU Sanitation District 1 (SD1), with trail building on the north

wetland site, and with Biology Alumni events. For the second summer, a week-long CINSAM summer camp for middle school students “The Art of Nature Exploration” was held at REFS and lead by both a biology professor and an art professor. The big event was the REFS Grand Opening Ribbon Cutting and Tree Planting on the evening of May 19, and the REFS Grand Opening for the community with nature activities that took place on May 20th. Prior to these events, the facilities at REFS were renovated with



new lab benches, new windows and storm door, and the elimination of two old and hazardous sheds. The facility was also outfitted for WiFi access. A new website (<http://nku.edu/refs.html>) was developed to provide many more opportunities to connect and engage the public with nature. We

also established the first summer ‘Talk & Walk’ nature series that was kicked off in June. This nature series gives the public a way to connect with professionals and learn about and engage with nature.



NKU REFS Website (<http://nku.edu/refs.html>)

The screenshot shows the homepage of the NKU REFS website. At the top left is the NKU Northern Kentucky University logo. A navigation menu includes links for ABOUT NKU, ACADEMICS, ADMISSIONS, ATHLETICS, LIFE @ NKU, GET INVOLVED, CONTACT US, and QUICK LINKS. A search bar is located on the right. Below the navigation is a yellow banner with the text "inside NKU". The main content area features a large image of a stream with a fallen log. Overlaid on the image is the text "NKU | REFS". Below the image is a breadcrumb trail: "Inside NKU > Inside College of Arts & Sciences > Centers > Research and Education Field Station". The main heading is "RESEARCH AND EDUCATION FIELD STATION". Below this is a dark grey box with the text "UNDERSTANDING ENVIRONMENTAL CHANGE IN A CHANGING WORLD" in yellow. To the right of this box is a paragraph: "Northern Kentucky University's Research and Education Field Station (REFS) facility provides scholars an operations base for a wide range of field research and offers students across disciplines opportunities for field-oriented curricula, independent research, and close interactions with professionals. The REFS also serves as a center for the community to connect and learn about the environment."

REFS Grand Opening Ribbon Cutting-Tree Planting (May 19, 2017)



REFS Grand Opening Community Nature Day (May 20, 2017)





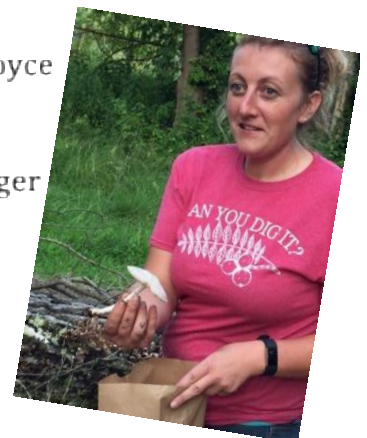
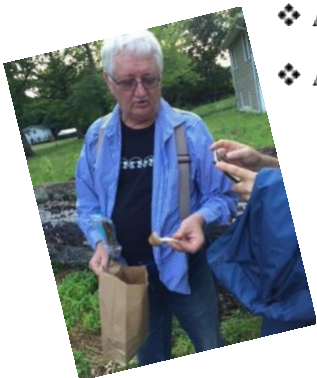
Talk-n-Walk Nature Series Northern Kentucky University's Research and Education Field Station(REFS)



Wednesday Evenings
Summer 2017

For Information and Registration: <http://nku.edu/refs>

- ❖ June 7: Pollinators – Dr. Maggie Whitson
- ❖ June 14: Mushrooms and Fungus – Dr. Dennis Lye
- ❖ June 21: Wetland Amphibians and Reptiles – Dr. Richard Durtsche
- ❖ June 28: An Evening with the Stars – Dr. Nathan De Lee
- ❖ July 5: Marvelous Milkweeds – Dr. Maggie Whitson
- ❖ July 12: Observations in Nature - Watercolor Landscape Sketches along the Ohio River – Professor Brad McCombs
- ❖ July 19: Invasive Plants and Their Control – Jacob Bartley
- ❖ July 26: Wetland Grasses and Their Relatives – Dr. Richard Boyce
- ❖ August 2: Fairy Gardens – Dr. Maggie Whitson
- ❖ August 9: Nutrient flow in a Wetland – Dr. Kristy Hopfensperger



REFS Facilities Renovations:

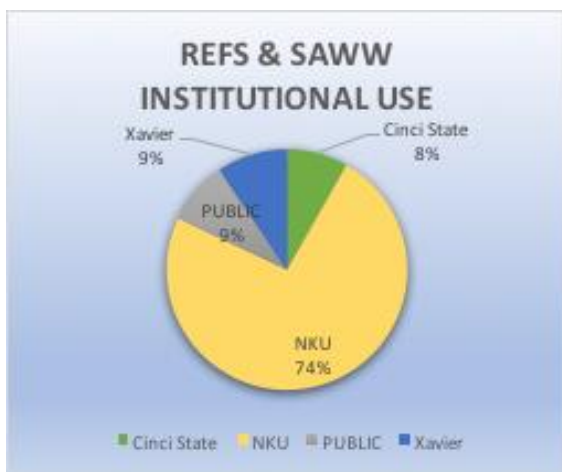
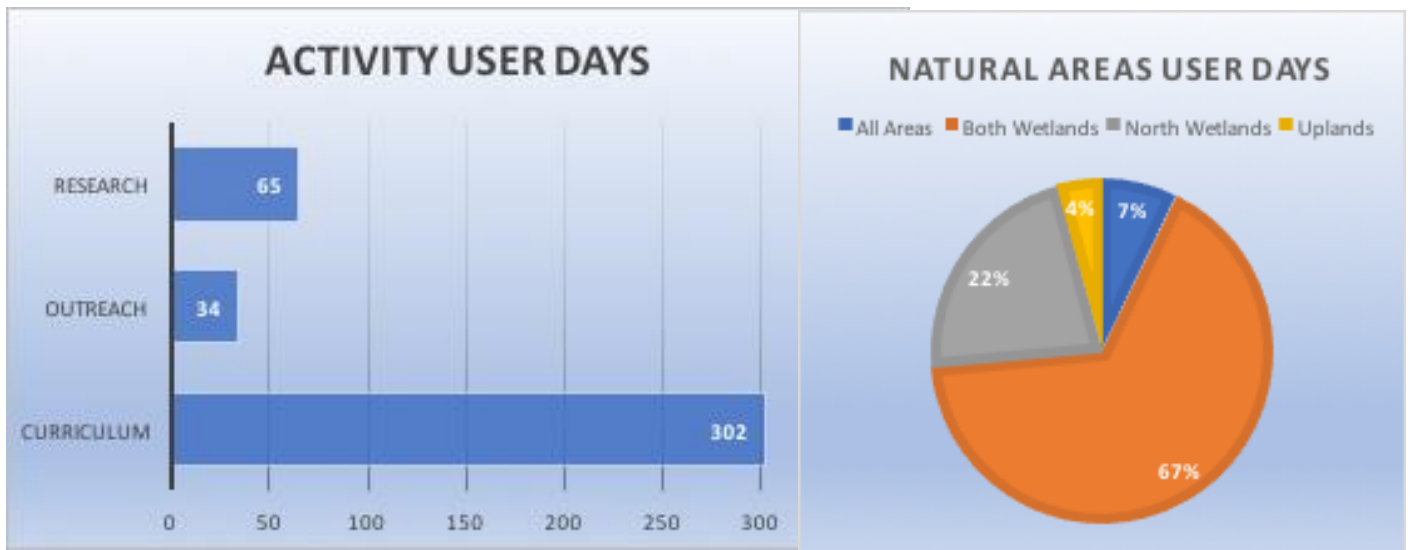
- Internet (DSL)
- Simplisafe cell-based security system
- Windows replaced
- 2nd floor counter tops
- 1st floor storm door
- Window treatments
- Projector system (1st floor)
- Flat screen TV with wall extension (2nd floor)
- Established terrarium
- Accordion wall (office)
- Removed old sheds
- New fire pit
- Large tent, folding tables (4)
- Restroom fixtures
- New Equipment/instrumentation for field and some laboratory studies
- Proposed shed replacement: (Summer 2018)
 - 24' x 30' x 16'
 - Garage door
 - Lexan upper wall (increase natural light)



Quarter 1

Reporting Period: July 1 – September 30, 2017

The NKU Research and Education Field Station (REFS) began its operations in July, 2016. Research activities, university curriculum, and outreach opportunities to P-12 schools and the community are the services provided by REFS. Work at REFS is in conjunction with the St. Anne Woods and Wetlands (SAWW) natural areas that was made a conservation easement with funds from the Kentucky Heritage Land Conservation Fund and is administered by the Campbell County Conservation District. During this first quarter, REFS hosted a NKU CINSAM summer camp entitled "The Art of Nature Exploration" for middle school students, and had an Insect outing for the Northern Kentucky Sierra Club. Several university (NKU) courses used REFS, including BIO 301L, Invertebrate Zoology Lab; BIO 304L, Plant Ecology Lab (2 sections); BIO 309L, Plant Ecology Lab; and ENVL 220L, Protecting Water Resources Lab. In addition, Dr. Annie Ray from Xavier University used the facilities for her entomology course, and Drs. Ann Gunkel and Gail Quinlan from Cincinnati State used the facilities for their environmental science courses. Research was carried out throughout the quarter by both Dr. Richard Boyce and Dr. Richard Durtsche on wetland plants, amphibians, invasive species, and the establishment of vegetation in a newly created wetlands.



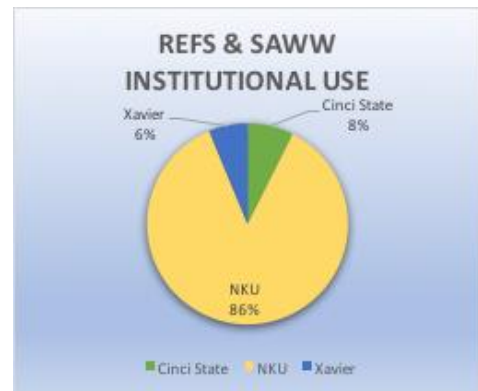
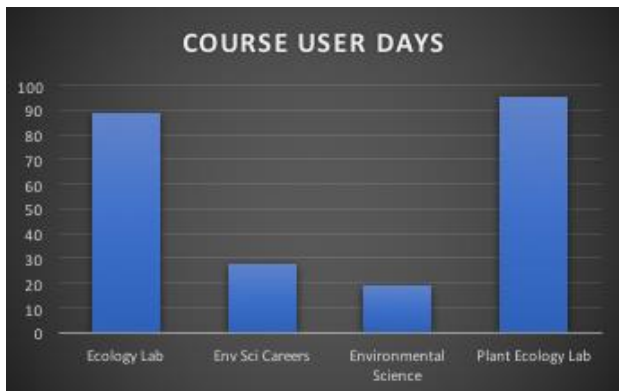
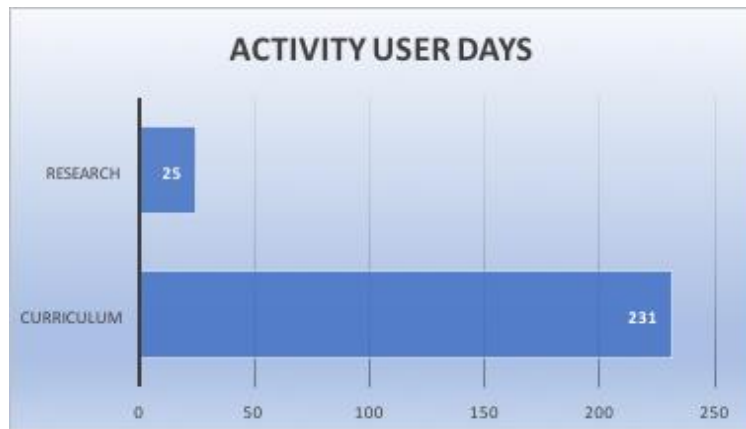
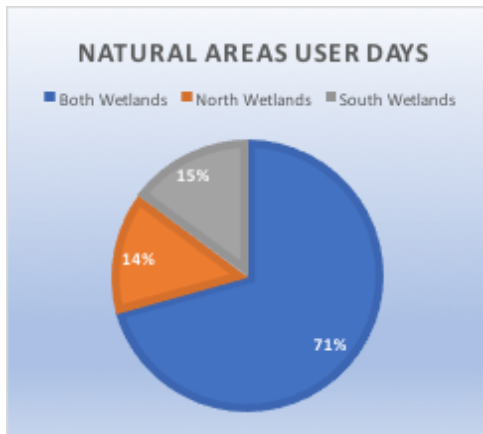
USER DAYS				
MONTH	July	August	September	Grand Total
CURRICULUM		65	237	302
Both Wetlands		55	183	238
North Wetlands		10	37	47
Uplands			17	17
OUTREACH	20	14		34
North Wetlands	20	14		34
RESEARCH	39	12	14	65
All Areas	29			29
Both Wetlands	8	8	12	28
North Wetlands	2	4	2	8
Grand Total	59	91	251	401

Quarter 2

Reporting Period: October 1 – December 31, 2017

The NKU Research and Education Field Station (REFS) continued research activities, and university curriculum during the second quarter. Several university (NKU) courses used REFS, including BIO 304L, Plant Ecology Lab (2 sections); BIO 309L, Plant Ecology Lab; and ENV 115, Environmental Careers.

Research was carried out throughout the quarter by both Dr. Richard Boyce and Dr. Richard Durtsche on wetland plants, amphibians, invasive species, and the establishment of vegetation in a newly created wetlands.



USER DAYS				
MONTH	October	November	December	Grand Total
CURRICULUM	174	38	19	231
Both Wetlands	127	38		165
North Wetlands	28			28
South Wetlands	19		19	38
RESEARCH	12	11	2	25
Both Wetlands	8	8		16
North Wetlands	4	3	2	9
Grand Total	186	49	21	256

Winter Wetlands



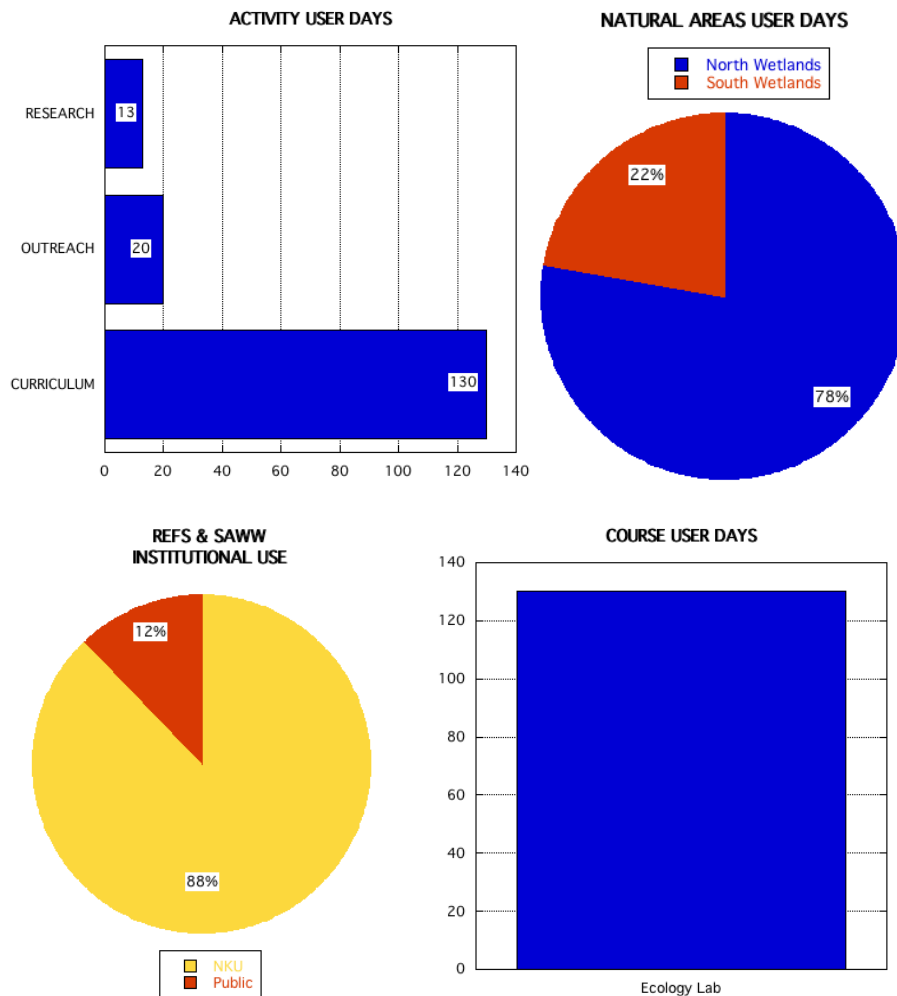
Spring flooding was high, but did not reach the REFS facility



Quarter 3

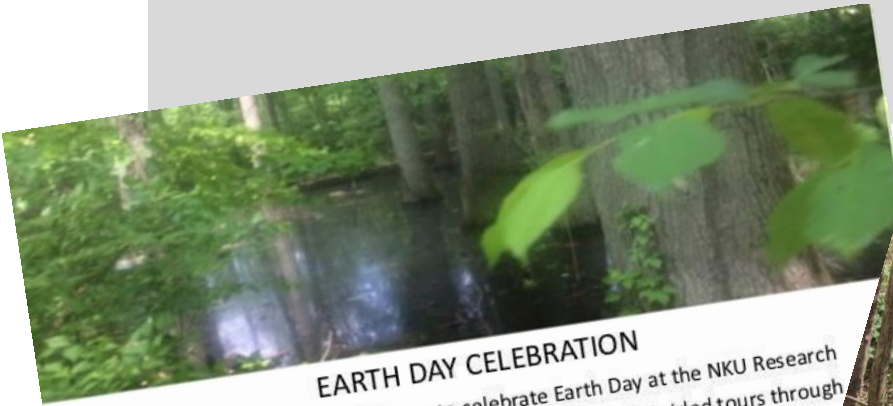
Reporting Period: January 1 – March 31, 2018

The NKU Research and Education Field Station (REFS) continued research activities, outreach, and university curriculum during the third quarter. From NKU, BIO 304L, Ecology Lab (2 sections) used REFS. Research was carried out throughout the quarter by Dr. Richard Boyce on environmental monitoring. Outreach was provided via tours to the American Heritage Girls and Prince of Peace Montessori School, Covington, on the South Wetlands.



USER DAYS				
MONTH	January	February	March	Grand Total
CURRICULUM				
North Wetlands	26	52	26	104
South Wetlands			26	26
OUTREACH				
North Wetlands			10	10
South Wetlands			10	10
RESEARCH				
North Wetlands	5	4	4	13
Grand Total	31	56	76	163

Earth Day Hike at REFS (April 21, 2018)



EARTH DAY CELEBRATION

Earth Day is April 22nd! Join us to celebrate Earth Day at the NKU Research and Education Field Station (NKU REFS) on April 21st! Guided tours through the St. Anne Wetlands will be available every half hour (1:00, 1:30, 2:00, and 2:30 P.M.).

Celebrate Earth Day by getting outside and learning about the flora and fauna that calls these wetlands their home. The St. Anne Woods and Wetlands are owned by the Campbell County Conservation District through a Kentucky Heritage Land Conservation Fund grant and is in collaboration with NKU REFS.



Saturday, April 21, 2018
1 p.m. to 3 p.m.
NKU Research and Education
Field Station (NKU REFS)
99 Harrison Ct, Melbourne, KY 41059



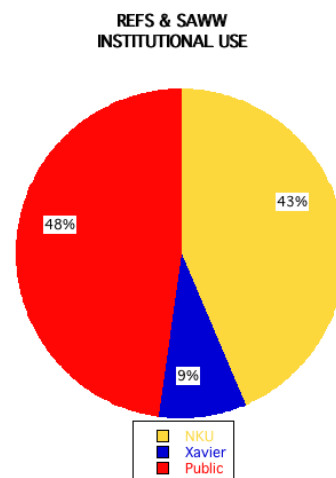
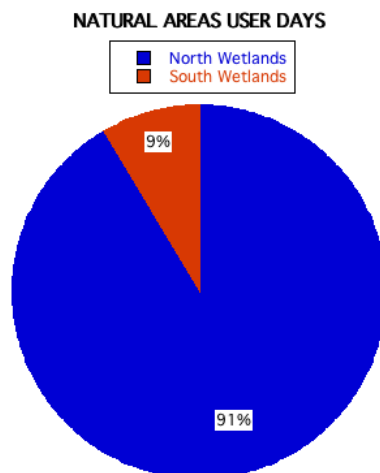
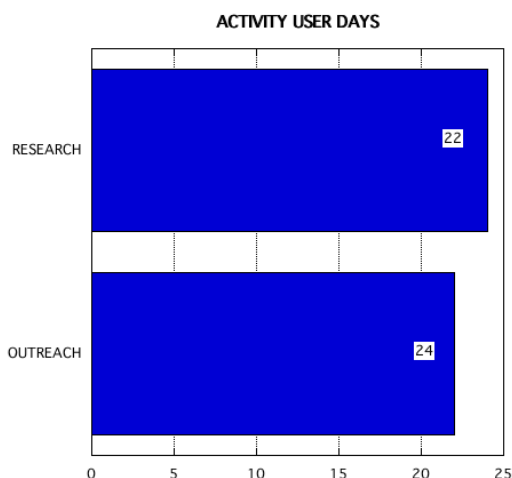
Questions? Contact the Campbell County Conservation District!
Phone: 859-635-9587
Email: amy.winkler@campbellkyconservation.org



Quarter 4

Reporting Period: April 1 – June 30, 2018

The NKU Research and Education Field Station (REFS) continued research activities and outreach during the fourth quarter. Research was carried out throughout the quarter by Dr. Richard Boyce and his students, NKU, on environmental monitoring and the effects of honeysuckle leaf blight on Amur honeysuckle growth, and by Dr. Ann Ray and Ms. Emily Franzen, Xavier University, on monitoring longhorn beetles. Outreach was provided via Earth Day in April and by the beginning of the Talk-n-Walk series in June.



USER DAYS				
MONTH	April	May	June	Grand Total
OUTREACH				
North Wetlands	8		14	22
RESEARCH				
North Wetlands	4	5	11	20
South Wetlands			4	4
Grand Total	12	5	29	46

Talk-n-Walk Nature Series
Northern Kentucky University's
Research and Education Field Station (REFS)



Thursday Evenings
7-9 pm
Summer 2018

For Information and Registration:

<https://inside.nku.edu/artsci/centers/refs.html>

- ❖ June 7: Early Summer Flowers at NKU REFS – Rick Boyce, NKU
- ❖ June 21: Here Be Dragons - Dragonfly Diversity in Kentucky – Emily Franzen, Xavier
- ❖ July 5: Entomology for Beginners: What to Look for and Where to Find It – Emily Franzen, Xavier
- ❖ July 19: Trees at NKU REFS – Maggie Whitson, NKU
- ❖ August 2: Life in the Water at NKU REFS – Josh Cooper, NKU

Research Activities

Research activities at NKU REFS: FY 2017 and FY 2018

Presentations & Publications: (* indicates an undergraduate researcher)

NKU

- V. K. Rice* and R. D. Durtsche. 2016. Songscape analysis of the breeding phenology in amphibians in wetlands with and without invasive plant species. Kentucky Academy of Sciences, Louisville, KY.
- V. K. Rice*, A. O'Brian*, and R. D. Durtsche. 2017. Kaleidoscope analysis of the breeding phenology in amphibians in wetlands with and without invasive plant species. NKU Celebration of Student Research and Creativity.
- J. Broering* and R. D. Durtsche. 2017. Analysis of the differences in digestive enzymatic activities among ontogenetic stages of *Rana clamitans* tadpoles. NKU Celebration of Student Research and Creativity.
- A. O'Brian*, J. Runion*, and R. D. Durtsche. 2017. Impact of invasive plants on amphibian breeding in wetlands. Heather Bullen Summer Research Celebration.
- S. Koch* and L. Walters. 2018. Sex Differences in Fecal Sac Removal from Carolina Chickadee (*Poecile carolinensis*) Nests. NKU Celebration of Student Research and Creativity.
- L. A. Walters, J. A. Webber*, B. A. Jones*, and C. L. Volker*. 2016. Taking a break: The relationships between ambient temperature and nest attendance patterns of incubating Carolina chickadees (*Poecile carolinensis*). *Wilson J. of Ornithological* 128: 719-726.
- D. M. Frevola* and L. A. Walters. 2016. Nest site selection and nest depredation of Carolina chickadee. *J. KY. Acad. Sci.* 77:44-51.

Xavier University

- Clayton*, E. Franzen, and A. Ray. 2018. Effect of invasive Asian longhorned beetle (*Anoplophora glabripennis*[Motschulsky]) on diversity of native cerambycids in southwestern Ohio. Midwest Ecology and Evolution Conference, Michigan State University's Kellogg Biological Field Station

REFS Budget

REFS Operations Budget			
FY 2017			
INCOME	Division	Detailed	Funds
	Foundation		
	Income	Carry Forward from Previous Year	\$0.00
	Donations	Jerry W Warner	\$1,000.00
		Carol Swarts	\$3,500.00
		Paul & Mary Stegeman	\$1,000.00
		Annonomous	\$1250.11
	Fees	SD1 - HS group	\$40.00
		Wetlands Tour Dinner Event	\$170.00
	Talk-&-Walk Series	4 of 10 summer 2017	\$290.00
		Pollinators - \$120	
		Fungi & Mushrooms - \$30	
		Wetland Herps - \$100	
		Evening with the Stars - \$40	
		TOTAL INCOME	\$7,250.11
EXPENSES	Division	Detailed	Funds
	Security	SimpliSafe	Unit Cost
			\$439.95
			monthly charges (@ \$14.99)
			\$44.97
	Internet	Cinci Bell	Initial DSL Setup
			\$68.56
			monthly charges (@ \$42.94)
			\$0.00
	Facilities	Adafruit Ind.	Trailcounter equipment
			\$84.86
		Cabela's Rtl	Binoculars
			\$1000
		Kroger	Wetlands Dinner Event Food
			\$120.00
		Lowe's	New Fire Pit Construction Materials
			\$50.00
		Rob Kues	Terrarium Construction Supplies
			\$317.93
	Marketing	Signs	10 @ \$20 ea. (OneTouchPoint)
			\$200.00
		Grand Opening	Lowe's 2 purchases (scissors, etc.)
			\$27.93
			Party City (plates, napkins)
			\$17.95
			FedEx (laminated ID cards)
			\$5.65
		TOTAL EXPENDITURES	\$2,377.80
		BALANCE	\$4,872.31

REFS Operations Budget

FY 2018

INCOME	Division	Detailed	Funds
	Foundation		
	Income Donations	Carry Forward from Previous Year	\$4,872.31
		Jerry W Warner	\$1,000.00
	Talk-&-Walk Series	Summer2 2017 & summer1 2018	\$145.00
		TOTAL INCOME	\$6,017.31
EXPENSES	Division	Detailed	Funds
	Security	SimpliSafe	monthly charges (14 months) \$211.28
	Internet	Cinci Bell	monthly charges (12 months) \$519.96
	Facilities	Maintenance	HVAC blower motor \$225.00
		Lab	supplies \$14.99
		OBFS	
	Operations	Membership	Dues 2017 & 2018 (@ \$150/year) \$300.00
	Outreach	Talk & Walk	Refreshments \$2.99
		Marketing	<u>KOFS Video Production featuring REFS</u> \$76.37
		TOTAL EXPENDITURES	\$1,350.59
		BALANCE	\$4,666.72

REFS NSF FSML Grant Budget				
FY 2017				
INCOME		Division	Detailed	Funds
	Grant	NSF-FSML #162466!	Planning Grant	\$25,000.00
			TOTAL INCOME	\$25,000.00
EXPENSES		Division	Detailed	Funds
	Grant	NSF-FSML #162466!	Planning Grant – F & A	\$2,416.96
	Travel	OBFS meetings	Sitka, AK – Drs. Durtsche & Boyce, Visits to local field stations	\$3,261.20
	Conference	Stakeholder Meeting	January Conference - Meals	\$1,361.44
			January Conference – Supplies, parking	\$314.35
		Outside Experts	Business Planning Meeting Dinner	\$408.79
			Travel and Lodging	\$804.55
		Facilitator	January Conference	\$2,500.00
			TOTAL EXPENDITURES	\$11,067.29
			BALANCE	\$13,932.71

REFS NSF FSML Grant Budget				
FY 2018				
INCOME		Division	Detailed	Funds
	Grant	NSF-FSML #1624665	Carry Forward from Previous Year	\$13,932.71
			TOTAL INCOME	\$13,932.71
EXPENSES		Division	Detailed	Funds
	Grant	NSF-FSML #162466!	Planning Grant – F & A	\$1,976.35
	Travel	OBFS meetings	Itasca, MN – Drs. Durtsche & Boyce, Strategies for Success Workshop	\$2,252.48
	Conference	Stakeholder Meeting	July Conference - Meals	\$911.48
			July Conference – Supplies	\$310.91
			July Conference – Printing	\$106.72
		Outside Experts	Business Planning Meeting Dinner	\$275.33
			Travel and Lodging	\$1,411.48
			Stipends (5 experts @\$500 ea.)	\$2,500.00
		Facilitator	July Conference	\$2,500.00
	Funds	Unspent	Reimbursed to NSF	\$1,687.96
			TOTAL EXPENDITURES	\$13,932.71
			BALANCE	\$0.00

REFS Renovation Budget				
FY 2017*				
INCOME		Division	Detailed	Funds
	NKU Provost	Renovation Funds	<u>Facilities Renovation</u>	<u>\$30,000.00</u>
			TOTAL INCOME	\$30,000.00
EXPENSES		Division	Detailed	Funds
	Renovations	Bldg Renovations	Bldg Renovations	\$4,212.95
		Consumables 1st yr	Consumables 1st yr	\$544.73
		Field Equip/Maint.	<u>Field Equip/Maintenance</u>	<u>\$9,781.29</u>
			TOTAL EXPENDITURES	\$14,538.97
			BALANCE	\$15,461.03

REFS Renovation Budget				
FY 2018*				
INCOME		Division	Detailed	Funds
	NKU Provost	Renovation Funds	Carry Forward from Previous Year	<u>\$15,461.03</u>
			TOTAL INCOME	\$15,461.03
EXPENSES		Division	Detailed	Funds
	Renovations	Bldg Renovations	Bldg Renovations	\$2,789.94
		Consumables 1st yr	Consumables 1st yr	\$1,646.71
		Field Equip/Maint.	<u>Field Equip/Maintenance</u>	<u>\$343.80</u>
			TOTAL EXPENDITURES	\$4,780.45
			BALANCE	\$10,680.58

* Spreadsheet of renovation expenses is attached.

REFS Summary Budget

FY 2017

INCOME	Division	Detailed	Funds
	Grant NKU	NSF-FSML #162466! Planning Grant	\$25,000.00
	Provost	Renovation Funds Facilities Renovation	\$30,000.00
	Foundation	Income Carry Forward from Previous Year	\$0.00
		Donations	\$6752.11
		Fees Outreach	\$210.00
		Talk-&-Walk Series	\$290.00
		TOTAL INCOME	\$62,252.11
EXPENSES	Division	Detailed	Funds
	Grant	NSF-FSML #162466! Planning Grant – F & A	\$2,416.96
		Grant Expenses	\$8,650.33
	NKU		
	Provost	Renovation Funds Facilities Renovation	\$14,538.97
	Foundation	Expenses <u>Operations and Programming</u>	<u>\$2,377.80</u>
		TOTAL EXPENDITURES	\$27,984.06
		BALANCE	\$34,268.05

REFS Summary Budget

FY 2018

INCOME	Division	Detailed	Funds
			\$13,932.7
	Grant	NSF-FSML #162466! Carry Forward - Planning Grant	1
		Carry Forward - Facilities	\$15,461.0
	NKU Provost	Renovation Funds Renovation	3
	Foundation	Income Carry Forward from Previous Year	\$4,872.31
			\$1,000.0
		Donations	0
		Talk-&-Walk Series	
		Summer1 2017	\$145.00
		TOTAL INCOME	35,411.05
EXPENSES	Division	Detailed	Funds
	Grant	NSF-FSML #162466! Planning Grant – F & A	\$1,976.35
			\$10,268.4
		Grant Expenses	0
		Grant funds returned to NSF	\$1,687.96
	NKU		
	Provost	Renovation Funds Facilities Renovation	\$4,780.45
	Foundation	Expenses <u>Operations and Programming</u>	<u>\$1,350.59</u>
			\$20,063.7
		TOTAL EXPENDITURES	5
			\$15,347.3
		BALANCE	0

SUMMARY:

During the 2016-2017 year, REFS had a total of 1250 researcher, students, educators, and public users of the facility and the surrounding natural areas. In 2017-2018, REFS had 866 users. Research activities were varied and included researchers from both NKU and Xavier University, making up 21% of the annual activities at REFS. A state-wide research program out of the University of Louisville on tree-ant interactions and species diversity was also conducted at REFS as part of class laboratory activities (Ecology Lab) with NKU students collecting the data. University (NKU) curriculum included nine different courses, Xavier had one course, and Cincinnati State had 2 courses all using the facilities at REFS. Curriculum has been the major REFS activity (54.7%) over the past two years. Outreach programs were varied and we kicked off the field station with a great response at our Grand Opening for both stakeholders and the community at large. Community engagement was 24.4% of the activity at REFS the past 2 years. We have Earth Day hikes, a summer Talk-&-Walk evening nature series, and a Family Nature Adventure Day as current annual community events. We embarked on the creation of a 5-year Strategic Plan for REFS with support of an NSF Field Station and Marine Laboratory (FSML) Planning Grant. In the process of constructing this strategic plan, we hosted two stake holder conferences, one in January 2017 (60 people attending) and one in July 2017 (30 people attending). Stakeholder groups included 10-20 researchers, university educators, community leaders, and university administrators from around the region contributed to the vision, mission, and sustainability assessment. A sustainability plan was then the basis for the goals, objectives, and implementation strategies of the strategic plan. In addition, we traveled to two Organization of Biological Field Station annual meetings (2016 & 2017) and participated in an ESA-SBI Strategies for Success workshop, and visited two regional university field stations to provide additional direction and assistance in developing the strategic plan. The plan was completed and submitted to NKU Administrators and to NSF in March of 2018. Our income during the fiscal years (FY) 2017 and FY2018 benefitted from the NSF FSML Planning Grant of \$25,000 to create a REFS 5-year Strategic Plan. REFS also received a major renovation contribution from NKU Provost Ott Rowlands for \$30,000. We had over \$7,750 from donors, and generated \$647 in fees from our Talk-&-Walk nature series and non-NKU research activities. Total income in FY17 was \$62,252. REFS Expenditures (\$27,984) were dominated with renovation costs (\$14,539). Utilities are covered by the NKU Facilities and Maintenance division, and communication and security costs were at 34.4% of the total expenditures for operations. Initial marketing purchases of yard signs for events at REFS and some costs for the Grand Opening were some non-recurring expenditures from FY2017. The carry-over at the end of FY2018 is \$15,347, of which \$10,680 is earmarked for the completion of a storage facility at REFS. Complications have delayed the construction of this facility, but it is anticipated to be completed in FY2019. We also have a donor (NKU alumni) that has signed a Heritage Planned Gift for REFS that we will use to create an endowment of \$500,000. We hope that the future brings an increase in the number of users

and contributors grow as we engage with researchers, university curriculum and the public at large.

Submitted by:

Dr. Richard D. Durtsche
Director – NKU REFS
Professor of Biological Sciences
July 31, 2018