2007-2008 PILOT
OHIO CAREER DEVELOPMENT EVENTS
ENVIRONMENTAL AND NATURAL RESOURCES RULES

Effective for Pilot Year 2008

Purpose
Environmental and natural resource education has a responsibility to ensure an educated public and provide students prepared to enter careers in the environmental and natural resource industry. The purpose of the environmental and natural resource career development event is to stimulate student interest and to promote environmental and natural resource instruction in the agricultural education curriculum and to provide recognition for those who have demonstrated skills and competencies as a result of environmental and natural resource instruction.

Date
Check current State CDE Schedule
Team event and test will occur Friday afternoon
Practicums will occur Saturday morning

Location
OSU and Columbus Metro Parks

CDE Rules
1. As a pilot year CDE, ten schools and maximum of twenty teams will enter the state CDE. Each team will consist of four dues paid FFA members.

2. No team, team member, or team coach shall visit the contest facilities to observe the contest site and/or the specimens one week prior to the CDE. Any infraction will disqualify the team from the CDE.

3. Under no circumstances will any contestant be allowed to touch or handle contest specimens during the CDE. Any infraction of this rule will disqualify the contestant from the contest.

4. Observers will not be permitted in the CDE area while the contest is in progress.

5. Participants must come to the event prepared to work in adverse weather conditions. The event will be conducted regardless of the weather. Participants should have rainwear, warm clothes and appropriate footwear.

6. Unsafe procedures or practices will result in a team's disqualification from that portion of the CDE.

Equipment and Materials
Students and/or teams must provide the following materials and equipment for the CDE. Failure to bring required items may result in disqualification from certain portions of the CDE.

1. Each participant is **required** to bring and wear eye protection and disposable gloves for any of the chemical tests conducted.

2. Each team is **required** to bring a projector and laptop computer with PowerPoint or similar capabilities for the team activity. There are to be no pre-formed presentations or wireless connections allowed. Teams may bring any reference materials they feel are necessary to prepare for the team activity presentation portion of the CDE. There will be NO Internet connections allowed.

3. Each participant should bring a clipboard and two No. 2 pencils.

4. Each participant may bring an electronic calculator. Calculators used in this event should be battery operated, non-programmable, and silent. Calculators should have only these functions- addition, subtraction, division, multiplication, equals, percent, square root, +/- key, and one memory register. No other calculators are allowed to be used during the event.

Teams must supply all practicum materials. The official test kits are listed in the rules; you may use another brand but the results will be calculated with the kits posted.

CDE Format
The CDE will be divided into the following three parts:

1) Written Exam – Objective Test (200 points)
Fifty multiple-choice questions from environmental science materials will be used for the test. This phase of the CDE will test the individual student's knowledge and understanding of basic principles and concepts. A time limit of 50 minutes will be allowed for completion of this section of the CDE. Each participant will take the exam as an individual and will receive a score out of 50 points. The four team scores will be added together for the overall written exam score out of 200 points.

2) Team Activity (200 points)
Students, as a team, will be provided a scenario that deals with an environmental/natural resource problem. Topics could include the following and will be announced one month prior to the competition:

Soils
- Physical Properties
- Soil Erosion
- Soil Analysis
- Environmental Impact of Soil Degradation

Water
- Importance of Water Quality
- Factors that Influence the Quality of Water
- Measure to Ensure Water Quality
- Management Practices Used to Ensure Water Quality

Ecosystems
- Basic Ecological Concepts
- Management of Eco-Systems
- Grassland Eco-Systems
- Forestry Eco-Systems
- Aquatic Eco-Systems
- Wetland Eco-Systems
- Non-Native Species effect on Ecosystems

Waste Management
- Preventing and Reducing Solid Waste
- Disposing of Waste
- Manure Management
- Hazardous Waste

Environmental Concerns and Issues

a. Teams will be required to develop an oral presentation that addresses the questions posed in the annual scenario.

b. Teams will present a summary of their findings using Microsoft PowerPoint or a similar program at the end of 90 minutes.

c. Teams will have ten minutes of prep time prior to their oral presentation.

d. Teams will be required to give an oral presentation using Microsoft PowerPoint or a similar program justifying the decisions made by the team. The team will have eight minutes to make the oral presentation.

e. Teams will be required to answer questions in regards to the decision reached by their team. The question period will be eight minutes in length.

Team Activity Score Card

PowerPoint presentation	50 points
Oral presentation	75 points
Questions	75 points
TOTAL	**200 points**

3) Annual Team Practicums (400 points)
Teams will participate in the following four practicums each year. A total of 30 minutes plus travel time will be allotted for each practicum. Each practicum is worth 100 points for a total of 400 points for the practicum score.

a. Water Analysis - (100 points)
1. Using measuring devices, each team will measure a sample of water for quality analysis and contaminants.
2. Teams will analyze the results of the measurements in addition to given factors.
3. Teams will name possible causes of the particulate or other contaminant(s), considering: Are they natural? Are they pollutants? What level is acceptable?
4. Teams will identify macroinvertebrates common to streams and calculate a stream quality assessment.
5. Teams will describe the effects on the environment of any pollutants, list the sources of the pollutants, and discuss ways the water quality can be improved.

b. Soil Analysis - (100 points)
1. Teams will determine the soil textural class of a given soil sample using a texture triangle and determine the name for the marked soil map unit based on this texture.
2. Teams will determine the area of a marked watershed by soil type and land cover type.
3. Teams will calculate the runoff curve number for the watershed based on given and calculated information.
4. Teams will pace the slope distance, survey the slope stakes, and calculate percent slope.

c. GPS Locations - (100 points)
Teams will utilize a global position system (GPS) unit to complete the following:
1. Identify the longitude and latitude of a given point.
2. Enter waypoints and determine the location.
3. Find locations based on longitude and latitude coordinates.

d. Environmental Analysis - (100 points)
1. Living Organisms – teams will identify and list marked living organisms (both native and non-native) found within the marked boundaries of the site. Species may be artificially introduced as mounted or preserved specimens or indicated by sign.
2. Non-living components (shelter, nutrients) – teams will inventory resources such as water, shelter, etc. upon which resident species depend for survival.
3. Ecological Succession – teams will identify the stages of succession of various grasses, shrubs and trees and identify causes of changes in succession patterns.
4. Situation Analysis – teams will determine limiting factors of specified species based on the components found at the site and determine whether a healthy balance exists between the environment and the species that depend upon it.

Scoring Guide:

Team score	Written Exam	200 points
	Team Activity	200 points
	Team Practicums	400 points
	Total Possible	**800 points**

References:

This list of references is not intended to be inclusive. Other sources may be utilized. The following list contains references that may prove helpful during event preparation.

National Council for Agricultural Education's material - "Applied Environmental Sciences" To order contact CMS at The Ohio State University at: 614-292-4848 or fax 800-292-4919 or online at http://cms.osu.edu/

Wildlife Science Manual Instructional CD-ROM: The Core Catalog, National FFA Organization product number CAERT-WSM. 888-332-2668 fax orders to 800-366-6556 or on line at www.ffaunlimited.org/caop

- *Environmental Science and Technology*. Porter, Lee, Turner and Hillan. Interstate Publishers, Inc. 1997. PO Box 50 Danville, IL 61834-0050

- *Managing Our Natural Resources*. Camp and Daughtery. Delmar Publishers, Inc. 1988. Albany NY.

- *Wildlife Management,* Stutzenbaker, Scheil, Swan, Lee and Mattics, Interstate Publishers, Inc. 1999.

- *Natural Resources and Environmental Technology,* Lee, Interstate Publishers, Inc. 2000.

- *Environmental Science for Agriculture and the Life Sciences.* Albany, NY. Delmar Publishers 1994.

- *Our Natural Resources and Their Conservation*. Kircher, H.B., Wallace, D.L., & Gore, D.J. Danville, IL. Interstate Publishers, Inc. 1992.

- *Soil Science: Evaluation, Interpretation, and Management of Soil*. Columbia, MO.

Instructional Materials Laboratory, University of Missouri, phone: 800-669-2465.

- *The Global Ecology Handbook. What You Can Do About the Environmental Crisis.* Courson, W.H. (Ed.). Boston, MA. Beacon Press 1990.

- *Biological Science, an Ecological Approach.* Dubuque, IA. Kendall Hunt Publishers, 1992

- *Introduction to Forestry Science*. L.DeVere Burton. Delmar Publishers, 2000.

- *Agriscience & Technology*. L. DeVere Burton. Delmar Publishers, 1992.

Non-Native Species Resource List

- U.S. Fish and Wildlife Service
- U.S. Park Service
- U.S. Dept. of Interior
- U.S. Forest Service
- Ohio Department of Natural Resources
- Gulf of Mexico Program
- Minnesota Sea Grant 2305 East 5th St. Duluth, MN 55812, Phone: 218-726-6191 www.ansc.purdue.edu/sgnis

Sea Grant has developed a CD-ROM titled "Your Exotic Species One-Stop Information Shop!" Price $14.00

- Internet Locations

Search Engines: Type in "exotic species", "non-native species", "non-indigenous species". Make sure to include quotations in search.
www.nbii.gov/invasive
www.glifwc.org
www.flmnh.ufl/fnps/exotics
www.gmpo.gov

Practicum Resource List

Field Manual for Water Quality Monitoring: An Environmental Education Program For Schools by Mark K. Mitchell, M.S., and William B. Stapp, Ph.D. (11th edition) Kendall/Hunt Publishing Company, Dubuque, Iowa. ISBN 0-7872-3730-2. (or most current edition)

Peterson Field Guides and *Audubon Field Guides* to Mammals, Eastern Birds, Wildflowers, Reptiles and Amphibians. Also, *Newcomb's Field Guide to Wildflowers*.

Contact your local SWCD Office for assistance with the soil analysis section!

Official Test Kits Used:

a. Water Analysis
   LaMotte Dissolved Oxygen Code 5860
   LaMotte Wide Range pH Code 2120
   Aquatic Ecosystems 1-800-422-3939

b. Soil Analysis
   Know how to use a dot grid and read a laser and receiver or optical level, grade rod, and tripod (which will be provided).

c. GPS Locations
   Etrex Legend or similar unit

d. Environmental Analysis
   None

Environmental and Natural Resources

Team: _____ Chapter No.: _____

ENVIRONMENTAL ANALYSIS SCORECARD

Your assignment is to analyze the given ecosystem with the following aspects in mind:

QUESTION	POSSIBLE POINTS	SCORE
Identify and list the TEN marked organisms (both native and non-native) that can be found within the marked boundaries of this site.	**20**	
Identify and list TEN additional species (native and/or non-native) that can be found within the site.	**20**	
Identify and list the different habitat components found with the marked site.	**20**	
Identify which stage(s) of succession exists within the marked site: pioneer, field, early successional, mid successional, late successional, or climax community. In addition, list two supporting reasons why.	**10**	
Identify the limiting factors for the given species as evidenced within the marked boundaries of the site and recommend management practices needed for these species to be successful.	**30**	
Total Score:	**100**	

_____ _____ _____

Judge's Name *Judge's Signature* *Date*

Environmental and Natural Resources

Team: _____ Chapter No.: _____

GPS LOCATIONS SCORECARD

Determine the following GPS coordinates and/or skills. Refer to special instructions at each site.
Note: Variance for differential corrections are noted on condition sheet.

LOCATION POINT	ANSWER NEEDED		POSSIBLE POINTS	SCORE
1	refer to site		20	
2	refer to site		20	
3	refer to site		20	
4	longitude / latitude		10	
5	waypoint name		20	
6	distance		10	
			Total Points: 100	

Teams must provide their own GPS units. GPS units must be capable of being zeroed out by the officials. Officials recommend teams use an Etrex Legend or similar unit and bring a minimum of two GPS units per team.

Teams will be asked to 1) find and confirm three sites based on longitude and latitude readings, 2) determine the latitude and longitude of a given fourth point and name this waypoint, and 3) determine the distance from the waypoint to an end point.

_____ _____ _____

Judge's Name *Judge's Signature* *Date*

Environmental and Natural Resources

Team: _____ Chapter No.: _____

SOIL ANALYSIS SCORECARD

Your job today is to calculate the runoff curve number for the marked watershed by determining the area, soil type, and land cover type within the watershed. You must also calculate the percent slope using the provided survey equipment.

Soil Name and Hydrologic Group	Cover Description	CN	Acres	Product of CN x Acres	Possible Points	Score
Unknown:					10	
		Totals=			40	

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = _____ = _____ → Use CN = [ ] **(10 points)**

Score: _____

SLOPE CALCULATION

	Answer	Possible Points	Score
Elevation of Point #1		5	
Elevation of Point #2		5	
Change in Elevation		5	
Distance from #1 to #2 (in feet)		15	
Calculated Percent Slope		10	

_____ _____ _____

Judge's Name *Judge's Signature* *Date*

Environmental and Natural Resources

Team: _____

Chapter No.: _____

TEAM ACTIVITY SCORECARD

	CATEGORY	POSSIBLE	SCORE
1	**PowerPoint Presentation (50 points)**		
	• Introduction	5	
	• Clearly identify the problem(s)	5	
	• Short term goals discussed	5	
	• Long term goals discussed	5	
	• Short term and long term goals are measurable	5	
	• Demonstrates knowledge and experience in subject area	5	
	• Possible solutions analyzed	5	
	• Recommendations discussed	5	
	• Clearly addresses the scenario	5	
	• Summary/Conclusion	5	
2	**Oral Presentation (75 Points)**		
	• Participation of all team members	15	
	• Logical progression of material	15	
	• Delivery professional, organized and well thought out	15	
	• Presentation clear and effective	15	
	• Team attitude	15	
3	**Questions (75 Points)**		
	• Each member of the team responds to at least one question	20	
	• Confidence shown	15	
	• Effectiveness and accuracy of each response	40	
	TOTAL	**200**	

****Points may be deducted due to spelling and grammar at the judges' discretion.**

****Oral presentation will be stopped at eight minutes and questions will commence. Teams will lose oral presentation points for information not covered at the end of the eight minutes.**

_____ _____ _____

Judge's Name *Judge's Signature* *Date*

Environmental and Natural Resources

Team: _____ Chapter No.: _____

WATER ANALYSIS SCORECARD

Your job today is to analyze the given water sample. You will need to test the dissolved oxygen, pH and the current temperature then finish filling out the Water Quality Index form. You will need to identify the macroinvertebrates and fill out the form. Finally, you will analyze the results by answering the questions on the reverse side of the form.

	Test Results	Q-Value	Weighting Factor	Answer Total	Possible Points	Score
Dissolved Oxygen	____% saturation		0.17		10	
Fecal Coliform	____ colonies/100 ml		0.16			
pH	____ units		0.11		10	
B.O.D.	____ mg/l		0.11			
Temperature Temp upstream __ C	____ C		0.10		10	
Total Phosphorus	____ mg PO4/l		0.10			
Nitrates	____ mg NO3/l		0.10			
Turbidity	____ ft or NTU		0.08			
Total Solids	____ mg/l		0.07			

WATER QUALITY INDEX RANGES
90-100 Excellent
70-89 Good
50-69 Medium
25-49 Bad
0-24 Very Bad

Total: _____
(10 points for form)

Score: _____

MACROINVERTEBRATE TALLY

GROUP 1 TAXA		GROUP 2 TAXA		GROUP 3 TAXA	
Water Penny Larvae		Damselfly Nymphs		Blackfly Larvae	
Mayfly Nymphs		Dragonfly Nymphs		Aquatic Worms	
Stonefly Nymphs		Cranefly Larvae		Midge Larvae	
Dobsonfly Larvae		Beetle Larvae		Pouch Snails	
Caddisfly Larvae		Crayfish		Leeches	
Riffle Beetle Adult		Scuds			
Other Snails		Clams			
		Sowbugs			
NUMBER OF TAXA X INDEX VALUE 3		NUMBER OF TAXA X INDEX VALUE 2		NUMBER OF TAXA X INDEX VALUE 1	

CUMULATIVE INDEX VALUE: _____
(20 pts. for form)

STREAM QUALITY ASSESSMENT
Excellent (>22) ____ Good (17-22) _____
Fair (11-16) ____ Poor (<11) _____

Score: _____

Name the possible sources of the contaminants. Are they natural? Are they pollutants? What level is acceptable? (**10 pts.**)

Identify the limiting factors in the above water body (**10 pts.**):

Explain the effects of the above tested items on the environment (**10 pts.**)?

How can the above water quality be improved (**10 pts.**)?

****Teams will be disqualified from this portion of the cde for unsafe practices and procedures. Record score as "0" and note the infraction.**

_____	_____	_____
Judge's Name	*Judge's Signature*	*Date*