

ENVIRONMENTAL AND NATURAL RESOURCES

3 or 4 members

I. PURPOSE

Environmental and natural resource education has a responsibility to ensure an educated public and provide students prepared to enter careers in 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 agriculture food and natural resource curriculum and to provide recognition for those who have demonstrated skills and competencies as a result of environmental and natural resource instruction.

II. EVENT RULES

- A. Under no circumstance will any participant be allowed to handle any of the items in the identification portion of the practicums. Any infraction of this rule will be sufficient to eliminate a team from the event.
- B. Participants must come to the event prepared to work in adverse weather conditions. The event will be conducted regardless of the weather conditions. Participants should have rainwear, warm clothes, and appropriate footwear. This is an outdoor event. Students should be appropriately dressed in compliance to state CDE standards and in attire suitable for this CDE.
- C. Approved calculators may be used. Possession of electronic devices is prohibited pursuant to CDE General Rules.
- D. All written material will be furnished for the event. No written materials such as tests, problems and worksheets shall be removed from the site. However, official results will be available online after contest awards assembly.

III. EVENT FORMAT

A. Equipment

1. Materials student must provide – Each participant may bring an electronic calculator. Calculators used in this event should be battery operated, non-programmable, and silent with large keys and large displays. Calculators should have only these functions: addition, subtraction, multiplication, division, equals, percent, square root, +/- key, and one memory register. No other calculators are allowed to be used during the event. EACH PARTICIPANT will be responsible for bringing his/her own dedicated handheld GPS unit. Team members are NOT permitted to share GPS units between teammates or among any other contestants. Minimum requirements for GPS will be Garmin eTrex receiver or compatible. Position accuracy WAAS enabled 3 meters, 20 routes, 500 waypoints (total). No PC application devices such phones, I-pods, I-pads, etc. will be allowed. EACH PARTICIPANT will also be responsible for bringing:
 - a. Safety glasses
 - b. Team members must provide their own compliant transparent plastic clipboard and/or clean folder with the following items: scan sheet, and/or copy of the scan sheet, optional Texas FFA CDE drop sheet,

and/or 2 sheets of lined or unlined blank paper.

c. (3) No.2 pencils.

2. Equipment provided – Participants must use the other tools and equipment furnished for the event. All activities will be on a scan sheet grading system. Hach brand water analysis kits will be provided for water analysis practicum.
3. Time Frames: The time allotted for each practicum will vary based on the individual practicum. The time allotted for each individual practicum will be set by the provider.

B. INDIVIDUAL ACTIVITIES

1. Written exam – Objective Test (100 points)

50 questions submitted by the committee from listed references.

2. Annual Practicum's

Students will participate in the following:

- a. Data Interpretation – (100 points)

- i. Student will be provided a survey analysis (waste, soil, air or water and they will be expected to answer questions related to this report.

- b. Identification – (100 points total-50 points for each section)

Every effort is made for actual specimens preserved or live for identification purposes. Students will identify 50 items. These may be pelts, bone, actual specimens, photos, footprint casts and scat from the following combined areas:

- i. Equipment list
- ii. Native species list
- iii. Invasive/non-native species list

- c. Water Analysis – (100 points)

CONTESTANTS ARE REQUIRED TO FURNISH OWN SAFETY GLASSES

- i. Using measuring devices, each participant will measure a sample of water for quality analysis. Four of the following categories will be tested each year: dissolved oxygen, nitrates, nitrites, pH, temperature, phosphates, water hardness, chlorine and ammonia.
- ii. Analyze the results of measurements and determine if it is suitable for a specific use.
- iii. Answer questions using the data collected about water quality and limiting factors.

- d. GPS Locations – (100 points)

Participants will utilize the global position system (GPS) unit (supplied by the team) to complete one of the following:

- i. Identify the longitude and latitude of a given set of points using a GPS unit and a map.
- ii. Identify boundaries of a given area including calculation of land area and linear feet of boundary.
- iii. Use GPS unit and topographic map to layout location of fence line, pond, drainage structure or other related facilities.
- iv. Use a GPS unit to mark location of a path or road through a given area.

- v. Use GPS unity to determine slope of land area for installation of drainage and/or other related facilities.
- e. Soil Profile – (100 Points)
 - i. Students will be furnished with a condition/information sheet and a pre-dug soil pit or core/monolith to judge. The participants will identify soil horizons, textures, percentages, course fragments, pH, horizon colors, slope, geologic origin, soil permeability, irrigation suitability and soil structure types of the soil present in the given example.
 - ii. Using information from the information/condition sheet the student will identify the most appropriate use for the given area and the erosion control practice that best fits the designated use for the land.
- f. Waste Management – (100 Points)
 - i. Participants will be presented with a scenario (agricultural producer, neighbor, office building, manufacturing plant, etc.,) that generates waste material creating environmental threats.
 - ii. Participants will evaluate the nature of waste output to identify plausible options for reducing the rate of waste generation, recycling or providing potential alternative uses for the waste, treating the waste or disposing of the waste.
 - iii. Participants should be able to identify at least one benefit and one deterrent for each possible option that is offered.

IV. SCORING

Written Exam	100 points
Data Interpretation	100 points
Identification	100 points
Water Analysis	100 points
GPS Location	100 points
Soil Profile	100 points
Waste Management	100 points
TOTAL POINTS	700 POINTS

V. TIEBREAKER

A. Individual –

1. Individual with the highest exam score.
2. Individual with the highest combined identification score.
3. Individual with the highest practicum score.
4. If individuals are still tied, they will be accompanied by their advisor and will meet with contest officials who will conduct a coin toss to determine the higher placing individual.

B. Team –

1. Team with the highest exam score.
2. Team with the highest combined identification score.
3. Team with the highest practicum score.

4. If team is still tied, they will be accompanied by their advisor and will meet with contest officials who will conduct a coin toss to determine the higher placing individual.

REFERENCES

The Texas ENR ID list can be found on JudgingCard at the following link:
<http://www.judgingcard.com/resources/List.aspx>

This list is not intended to be inclusive. Other sources may be utilized and teachers are encouraged to make use of the very best instructional materials available. The following list contains references that may prove helpful during event preparation.

- *For past materials and preparation documents log onto*
<https://www.ffa.org/participate/cdes/environmental-and-natural-resources>
- *Managing Our Natural Resources. Camp and Daughtery. Delmar Publishers, Inc. 2009. Albany NY.*
- *Land Judging in Oklahoma. J.H. Stiegler, 4-H Member's Guide, Oklahoma Cooperative Extension Service, Division of Agricultural Sciences and Natural Resources, Oklahoma State University. 4H.HPS.101*
- *Environmental Science: Fundamentals and Applications. Cengage learning. 2007*
- *Applied Environmental Science: <https://www.ffa.org/thecouncil/resources>*

Environmental and Natural Resources Event Identification List

Water Quality		Native Species Wildlife Cont.	
101.	refractometer	204.	bighorn sheep
102.	secchi disk	205.	bison
103.	water meter for physical/chemical parameters (pH, conductivity, and/or DO)	206.	black bear
		207.	blacktail deer
Aquatic		208.	bobcat
104	bottom dredges	209.	chipmunk
105.	fish measuring board	210.	cottontail
106.	plankton net	211.	coyote
107.	seines	212.	elk
108.	sieves	213.	fox squirrel
		214.	gray squirrel
Wildlife		215.	gray wolf
109.	animal tags / bands	216.	grizzly bear
110.	mammal traps	217.	jack rabbit
111.	snake/reptile stick	218.	mole
112.	radio telemetry unit	219.	moose
		220.	mountain goat
Weather		221.	mountain lion
113.	wind speed meter	222.	mule deer
114.	barometer	223.	muskrat
		224.	opossum
Soils		225.	pocket gopher
115.	abney level	226.	porcupine
116.	push probe	227.	prairie dog
117.	soil auger	228.	pronghorn
118.	soil color book	229.	raccoon
		230.	red fox
Native Species Wildlife		231.	skunk
201.	armadillo	232.	weasel
202.	badger	233.	whitetail deer
203.	beaver	234.	woodchuck

Birds		Reptiles/Amph. cont.	
301.	bald eagle	407.	copperhead snake
302.	blue jay	408.	coral snake
303.	bluebird	409.	corn snake
304.	brown thrasher	410.	cottonmouth
305.	Canada goose	411.	crocodile
306.	canvasback duck	412.	fence lizard
307.	cardinal	413.	garter snake
308.	Cooper's hawk	414.	green anole lizard
309.	Crissal's thrasher	415.	gray tree frog
310.	mourning dove	416.	rattlesnake
311.	great blue heron	417.	red eared slider
312.	great horned owl	418.	ring neck snake
313.	golden eagle	419.	rubber boa snake
314.	hummingbird	420.	scarlet king snake
315.	kestrel	421.	Woodhouse's toad
		Fish and Other Aquatic Animals	
316.	least tern		
317.	mallard duck	501.	blue catfish
318.	osprey	502.	bream/bluegill
319.	pelican	503.	brown trout
320.	purple martin	504.	carp
321.	quail	505.	channel catfish
322.	red-tailed hawk	506.	clam
323.	sandhill crane	507.	crab
324.	blue-winged teal	508.	crappie
325.	turkey	509.	crayfish
326.	whooping crane	510.	flathead catfish
327.	wood duck	511.	largemouth bass
		512.	lobster
Reptiles/Amphibians		513.	salmon
401.	alligator	514.	shrimp
402.	alligator snapping turtle	515.	smallmouth bass
403.	black rat snake	516.	sturgeon
404.	bullfrog	517.	trout
405.	collared lizard	518.	walleye
406.	common snapping turtle	519.	yellow bullhead catfish

Invasive/Non-Native Species Plants			Texas Plants Cont.	
601	broom snake weed		628.	live oak
602	cheatgrass		629.	mistletoe
603.	Chinese tallow		630.	pecan
604.	congograss		631.	post oak
605.	English ivy		632.	prickly pear
606.	Himalaya blackberry		633.	redbud
607.	hydrilla		634.	sedges
608.	juniper		635.	sideoats grama
609.	kudzu		636.	switchgrass
610.	leafy spurge		637.	wildrye
611.	melaleuca			
612.	mimosa tree		Animals	
613.	purple loosestrife		701	Asiatic clam
614.	Russian olive		702	Asian long-horned beetle
615.	saltcedar		705	Chinese mitten crab
			706.	chukar
Texas Plants			707.	English sparrow
616.	American beautyberry - Callicarpa americana		708.	European starling
617.	blackjack oak		709.	feral hog
618.	bullnettle		710.	Feral horse
619.	bumelia (chittimwood)		711.	fire ant
620.	cattail		712.	gopher
621.	cottonwood (ALL)		713.	Norway rat
622.	elm (ALL)		714.	nutria
623.	greenbriar		715.	ring neck pheasant
624.	hackberry (ALL)		716.	sea lamprey
625.	honey mesquite		717.	tilapia
626.	Johnson grass		718.	zebra mussel
627.	little bluestem			