Falls of the Ohio State Park
Educator News

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Professional Development Issue

In this issue

Quick Program Guide

Site-based Experiential Outdoor Fossil Bed programs - $7 / student

Offered May 1—Mid-November

Indoor labs offered Mid-November through April 30.

Outreach labs available to schools within a 60 mile radius of the park.

Inquiries welcome.

Field Paleontology Institute Returns

From 1995 through 2013, Alan Goldstein, interpretive naturalist and paleontologist at the state park, led a summer workshop called the Field Paleontology Institute. Its unique focus was more than the typical "learn background information to improve their knowledge on paleontology." That would simply be "Paleontology institute." The word "Field" is in there for a reason.

Teachers spend time in the field collecting fossils and learning about the geology behind these fossils. These are fossils participants keep! This three-day workshop puts fossils in context, making it suitable for general science, earth science and life science educators.

Instructional Objectives

Educators will learn ...

1.) how to use common field collecting techniques and tools in order to acquire fossils for the classroom.

2.) the regional geology and its paleontological implications.

3.) methods of paleontological interpretation.

4.) how to make and use fossils and models to interpret paleoecology by developing realistic reconstructions.

5.) how to identify fossils and rock types.

6.) of sources of free or low-cost information and technical support.

7.) to apply mathematics skills with paleontology.

8.) to apply organismic biology methods to paleontology.

9.) use dioramas as interpretation tools.

Continued on page 2

Waldron Shale Project PD

Dr. Kate Bulinski of Bellarmine University and Alan Goldstein of Falls of the Ohio State Park have teamed up once again to offer the professional development opportunity, "The Waldron Shale Project: Fossil identification and analysis for K-12 Science Classrooms."

The workshop will take place on Wednesday, June 22 on the campus of Bellarmine University in Louisville, Kentucky.

This project is limited to 18 teachers from public/private schools. We will train participants to perform a hands-on inquiry-based lesson using fossils in their classroom.

The ultimate goal of this project is to equip teachers with the knowledge and materials necessary to teach their students how to collect, analyze, interpret, and write about paleontological data.

Participants will receive:

1) a day-long professional development paleontology workshop at Bellarmine University

2) a bulk sample of fossiliferous shale and

3) ongoing professional support from Dr. Bulinski and Goldstein.

Participation will be determined by the following criteria:

1) Participants must be K-12 science teachers (public or private) or professional environmental educators

2) Priority will also be given according to when applications are received.

Continued on page 3

Field Paleontology Institute *continued*

from page 1

All objectives will be directed with student applications in mind.

Planned session chronology

Wednesday, June 15:

9:00 am Meet in Interpretive Center classroom, introduction

9:15 What are fossils? Geological time and its implications

10:15 Rock type and implications

11:00 Fossil preservation activity

11:45 Lunch break

12:45 pm Resources (books) on fossils and local geology

1:45 Fossil "Museum to Go" Kit

2:00 Explore the fossil beds

3:00 Extinction activity

3:40 Collecting trip plans

4:00 Conclusion for day

Thursday:

9:00 am Drive to Hwy 313, Hardin Co., KY. Eat in Shepherdsville upon completion. (Carpooling will be necessary for field excursions. Three stops.)

1:30 Fossil identification

2:30 Who ate what? Ancient food webs

3:00 Paleo-ecology: Reconstructing a Silurian and Devonian fossil community

3:15 Building a crinoid and other models

3:30 "Edible ecosystems" and "Why we aren't filter feeders" activities

4:00 Conclusion for day

Friday:

9:00 am Drive to Taylorsville to collect Ordovician fossils. Eat lunch in Taylorsville. (Carpooling necessary for this field excursion. Three stops.)

1:30 pm Fossil identification

3:15 Reconstructing an Ordovician fossil community / significant events in the Ordovician period.

3:45 Hand out park material

4:00 Conclusion of workshop

Program summary

Day 1: What are fossils? - A hands-on review

> Classification of fossils using modern methods/Linnean system

> Rock type and its implications

> Identifying fossils that are not preserved

> Reconstructing ancient environments: The Falls example

> Tools in paleontology - for the field and classroom

> Interpreting ancient environments with living marine aquariums and dioramas

> Using the Falls of the Ohio as an outdoor lab

Day 2: Fossil collecting techniques I - Mississippian Period Fossils / Outcrops (Photo 1)

> Reconstructing and interpreting an ancient ecosystem and making models of missing life forms

Day 3: Fossil collecting techniques II - Road cut with Ordovician Fossils (Photo 2)

> Reconstructing an Ordovician fossil community

> Paleontological resources for educators

> Institute summary and evaluation

Cost to participate

Choose what works for you. You cannot attend a field trip without attending the workshop on June 15. Payable upon arrival—cash or credit card, check made out to 'Indiana Department of Natural Resources."

__ Three days—$25.

Two dates—$20

__ June 15 & 16

__ June 15 & 17

__ First day only, June 15—$10

How to register

Send to agoldstein@dnr.IN.gov:

Name_____

School _____

Grade(s) and subject(s) _____

Best email: _____

Phone number: _____

Waldron Shale Project PD *Continued from page 1*

Participants will be expected to:

1) Attend the workshop

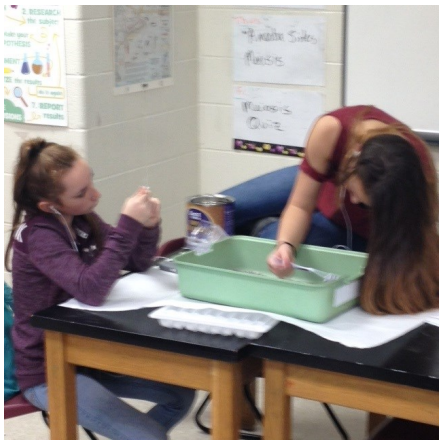
2) Incorporate the Waldron Shale Project in their curriculum during the 2022-2023 academic year

3) Complete a survey in the summer of 2023 summarizing the assessment of learning outcomes in their classrooms

In order to apply, please fill out the application found on our website and submit via email to kbulinski@bellarmine.edu. Applicants will be accepted on a first-come, first-served basis. If more than 18 applications are received, you will be placed on a waiting list.

Sample activity on page 4.

Photo gallery from Waldron Shale Project



Students in Henry County look for fossils.

A honeycomb coral (*Favosites*) penetrated by a crinoid column. This is an example of ancient symbiosis.

Waldron Shale exposed in IMI's Sellersburg Quarry. In Indiana and Tennessee, this shale is fossil-rich. In Kentucky, later groundwater chemistry dissolved the fossils away deep inside the earth.

Waldron shale fossils sorted by students at Twin Lakes High School.

Sample Waldron Shale Project Activity—Recognizing Fossils

Time: One class period

KY Standards: LS4.A, LS4.C **IN Standards:** 3.4.2, 7.2.8

Supplies (can be virtual) - Waldron fossils can be replaced with any of the same type of fossil.
Box 1 contains a Waldron Shale crinoid, a piece of sandstone or granite and a quartz crystal or geode.
Box 2 contains an odd-shaped rock (triangular or nodular), a Waldron Shale brachiopod shell, and a piece of Waldron Shale with multiple fossils).
Box 3 contains an assortment of loose and matrix fossils. Waldron Shale snail and coral; bone or tooth; leaf and wood.

Introductory question: What is a fossil?
Answer—A fossil is what is left when a living thing that lived long ago has turned into rock.
Most common are animals and plants, preserved as shell, bone, wood, or leaf.
They can also be tracks where something moved through the mud.
Fossils are from things that are extinct.

What does extinct mean?
Answer—All like things are dead. Dinosaurs (not just *Tyrannosaurus*). Mammoths (not African elephants). Trilobites (but not crustaceans), a single species like the passenger pigeon.

Give each work group three boxes (or sets of virtual photos) to help them learn about fossils.

How many fossils are in the first box?
Answer—One
How did they recognize the fossil?
Answers—Will vary, but relate to the shale and pattern in rock.
Can they tell you what the other samples are?
Answer—One is a rock, the other is a mineral.

Waldron Shale snail

What evidence is needed to determine if a rock is or contains a fossil?
Answer—It contains a special shape and pattern.

How many fossils are in box two? Two.
Repeat questions used with the first box.

How many fossils are in box three? All.
Describe the shape and pattern that identifies each fossil.

Contact Alan Goldstein for loaner trunks or photographic resources for activities involving fossils. Address on front page.

Waldron Shale trilobite—pygidium (tail) and thorax of a large specimen.

Photos from the Field Paleontology Institute

Collecting Mississippian crinoids and other fossils at stop 1 on day 2.

Fossil identification is an integral part of this workshop. We provide ID sheets and web-based resources to assist in identification.

Teachers have fun poring over the loose rocks looking for brachiopods, snails, clams, cephalopods, trilobites, bryozoans, trace fossils. You keep what you can carry! ID back in the classroom after the trip.

An activity that explores the different causes of extinction and how these propagate change in the fossil record.

A rare Ordovician trilobite (cephalon) found by a participant. It's possible to collect unusual fossils !