

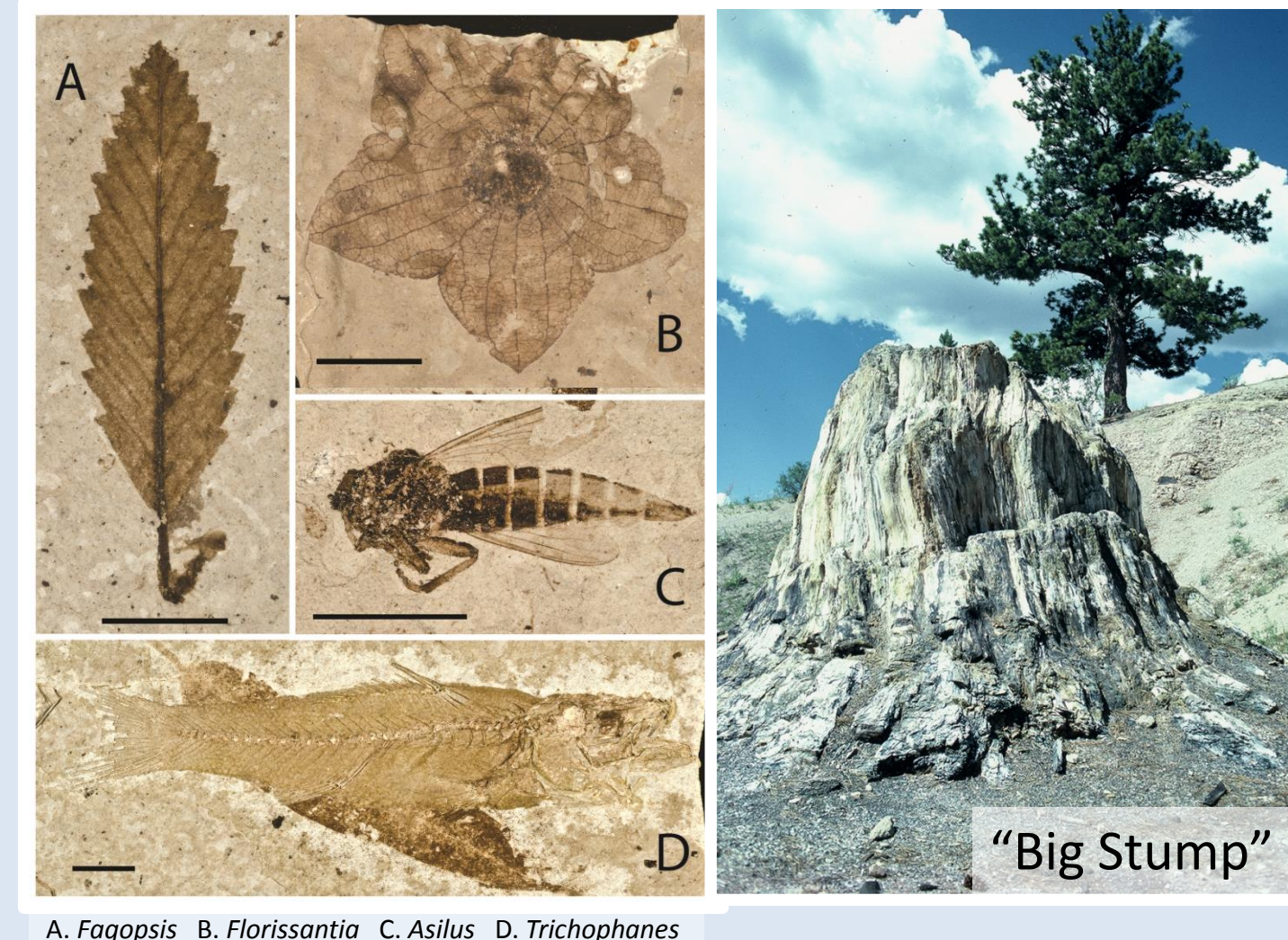
# Managing Geoheritage Assets for Research, Conservation, and Education at Florissant Fossil Beds National Monument, Colorado: A Textbook Example for North America



## Location



## Paleontological Resources



The fossil beds are located in a scenic mountain valley in the Rocky Mountains of Colorado.

Late Eocene (34.07 Ma)

Some of the world's largest known petrified trees

One of the world's most speciose fossil sites

~1800 species of fossil plants, insects, and vertebrates

Long history of exploration and research began in the 1870s with Hayden Survey paleontologists Scudder and Lesquereux.

First significant fossils were discovered by homesteader Charlotte Hill.

Attempts were made to saw the petrified "Big Stump" into pieces and ship it to the 1893 World's Fair, but the effort failed.

Tourism began with the arrival of the railroad in 1887.

Commercial petrified forests attracted tourists from 1920s-1969.

Establishment of the national monument in 1969 set new precedents for geoheritage in environmental law.

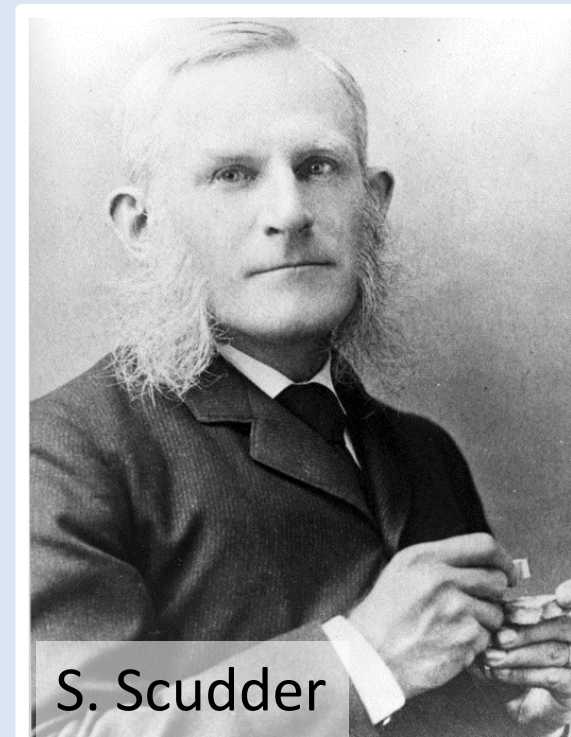


**Herbert W. Meyer**

National Park Service  
Florissant, Colorado USA



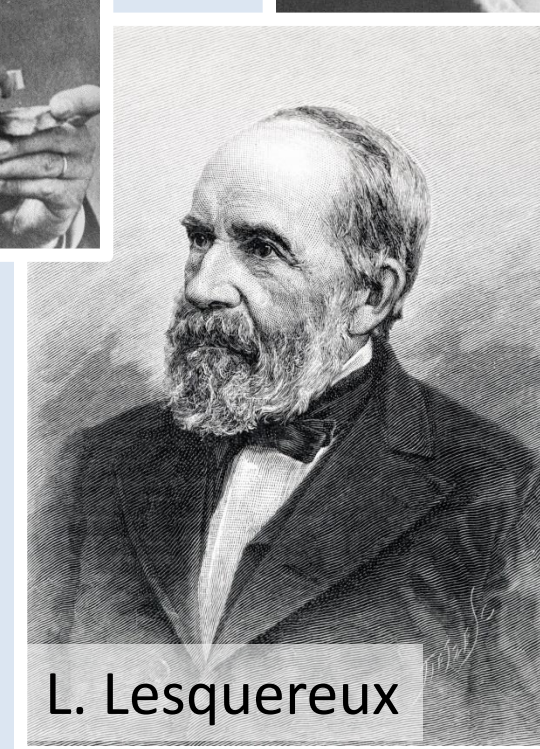
## Geoheritage History



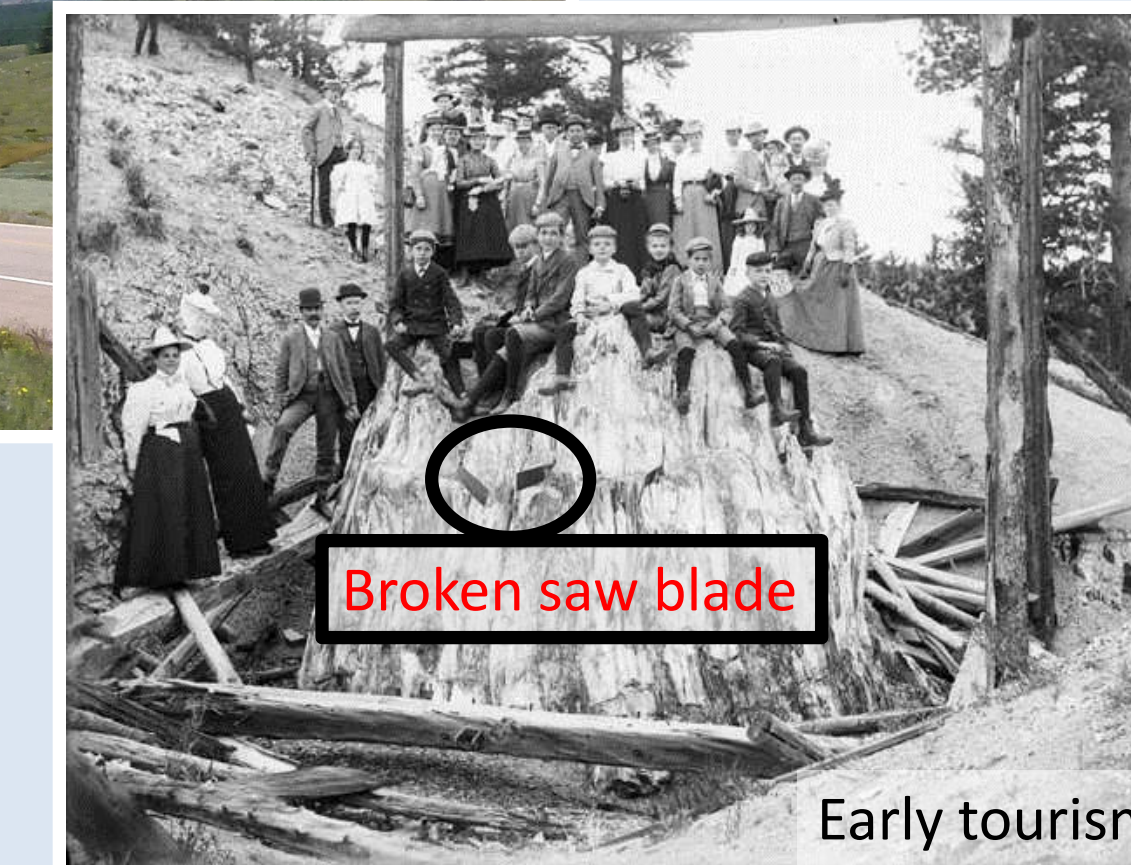
S. Scudder



C. Hill

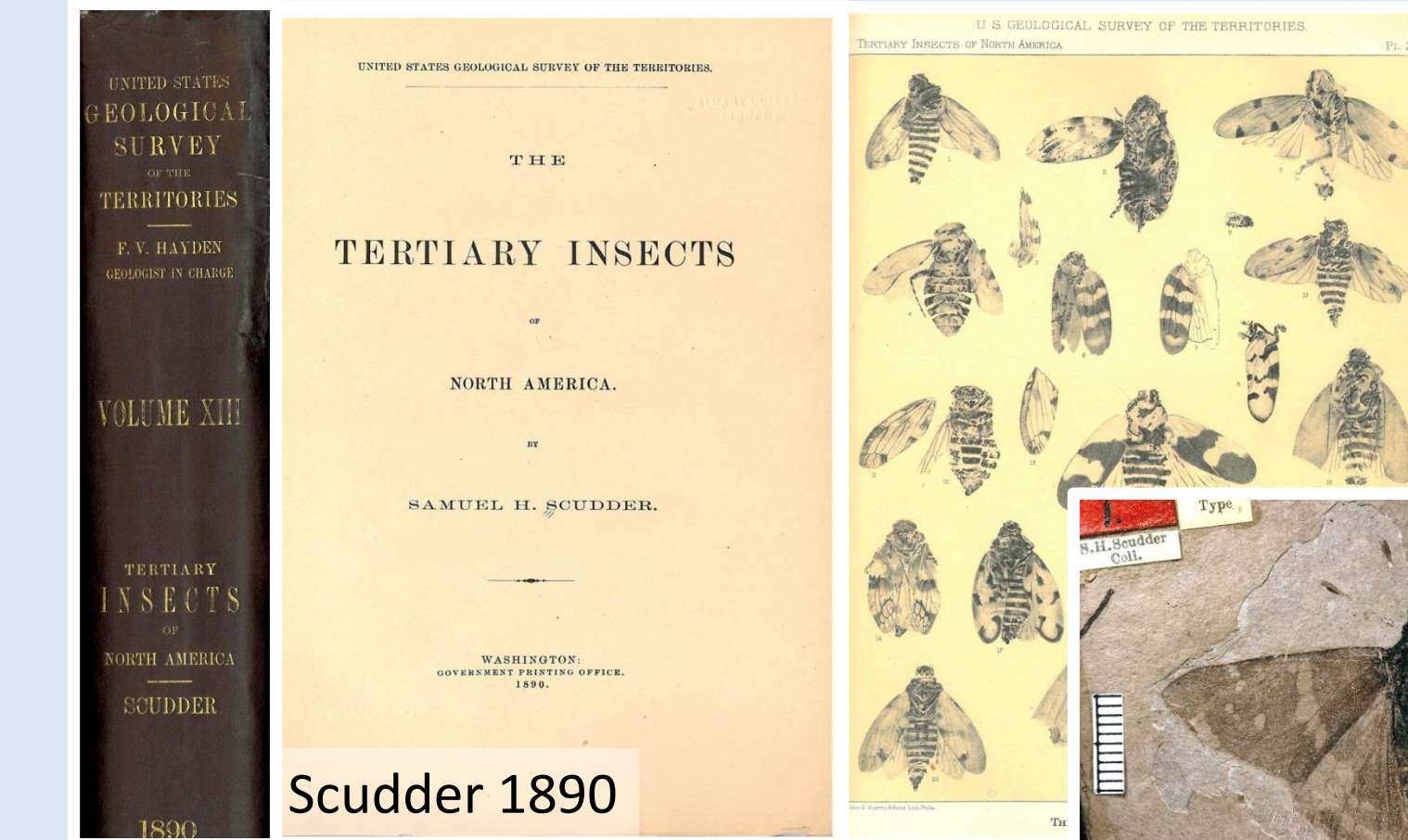
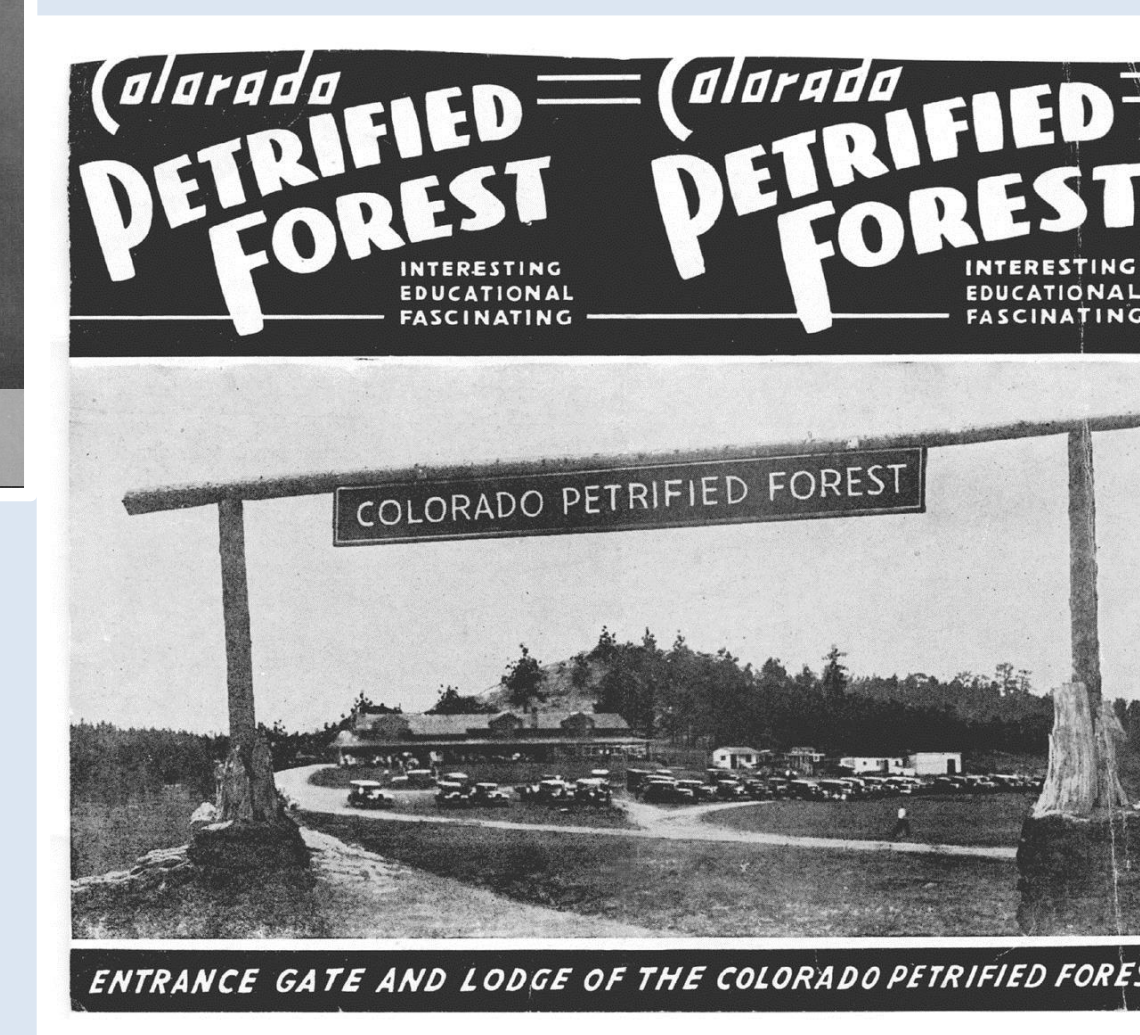


L. Lesquereux



Broken saw blade

Early tourism



Scudder 1890



Scudder's collection at Harvard

## Assessment of Geoheritage Assets



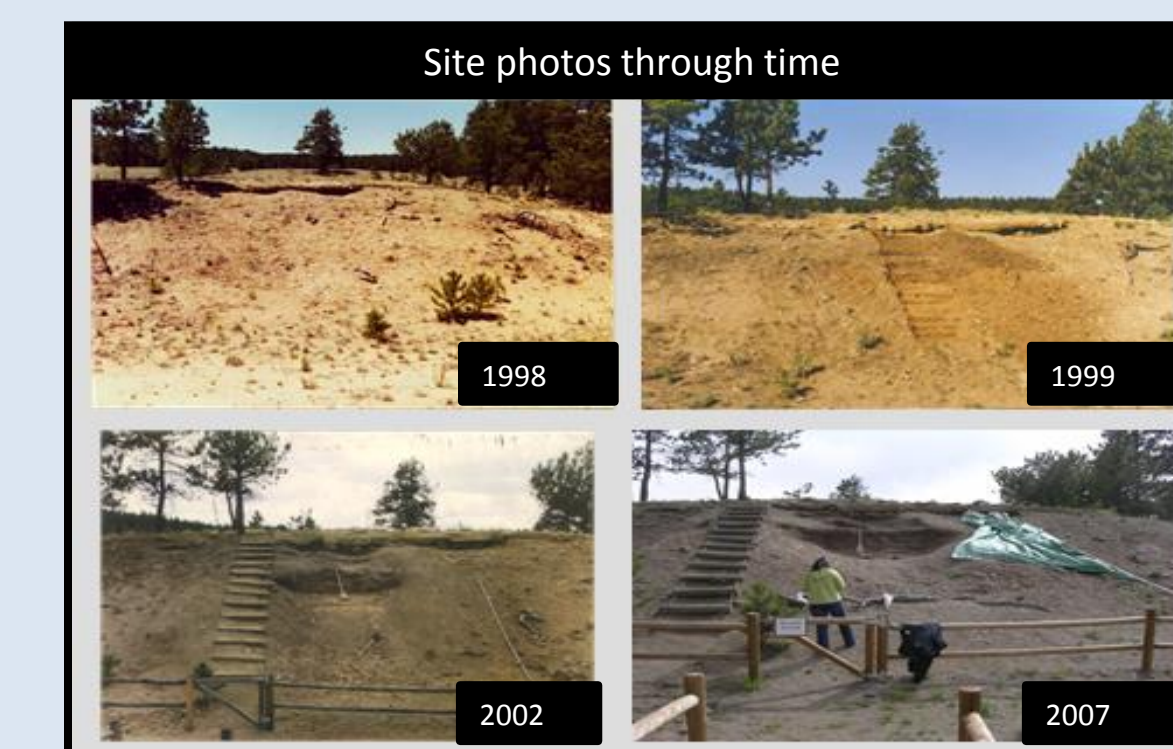
Photogrammetry



Florissant publications and collections at 17 museums have been surveyed to document taxonomic diversity.

Fossil sites have been inventoried and are continually monitored to assess changing conditions through time.

Photogrammetry creates 3-D images of fossil stumps.



Site photos through time

1998

1999

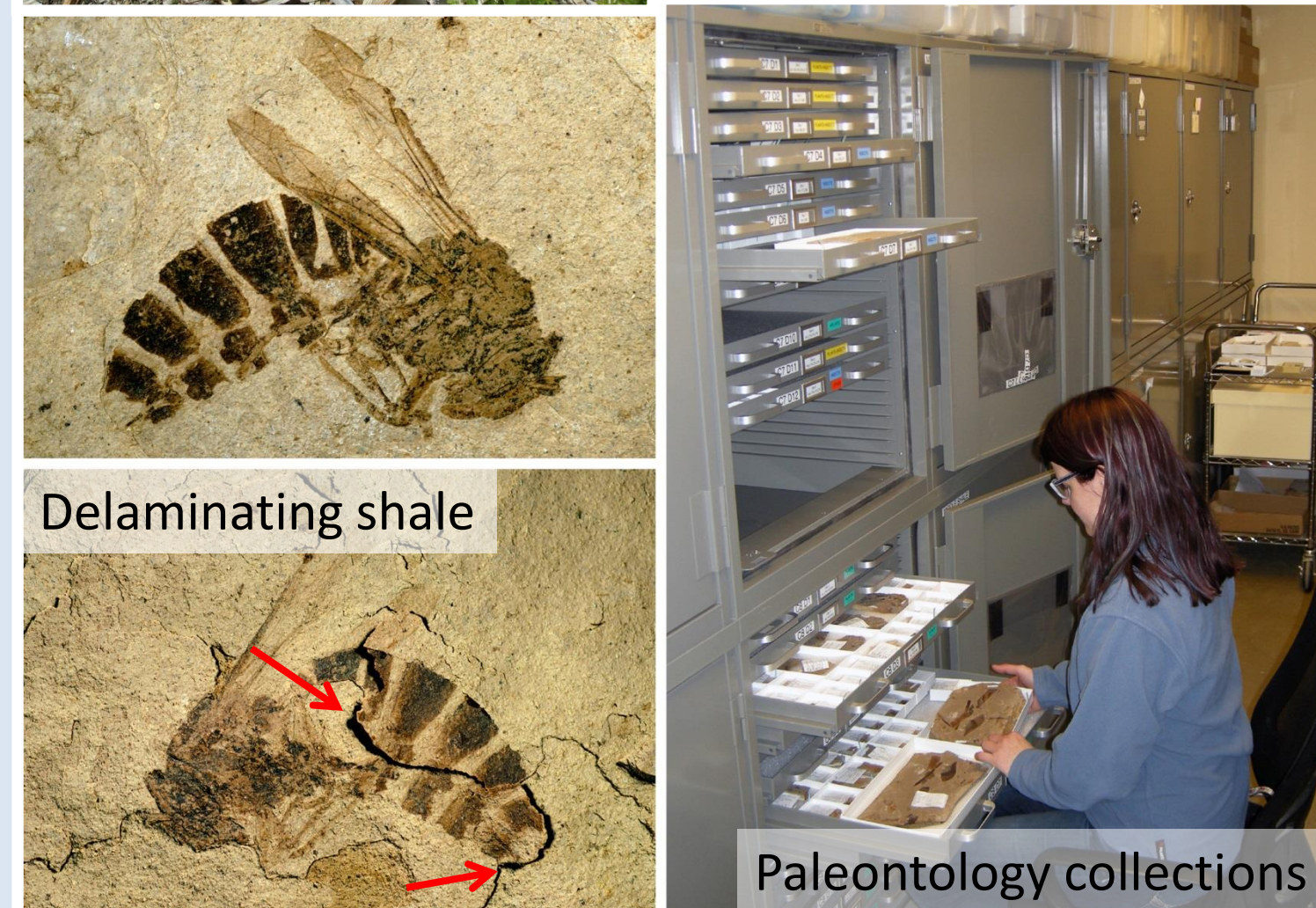
2002

2007





Deteriorating stump



Delaminating shale



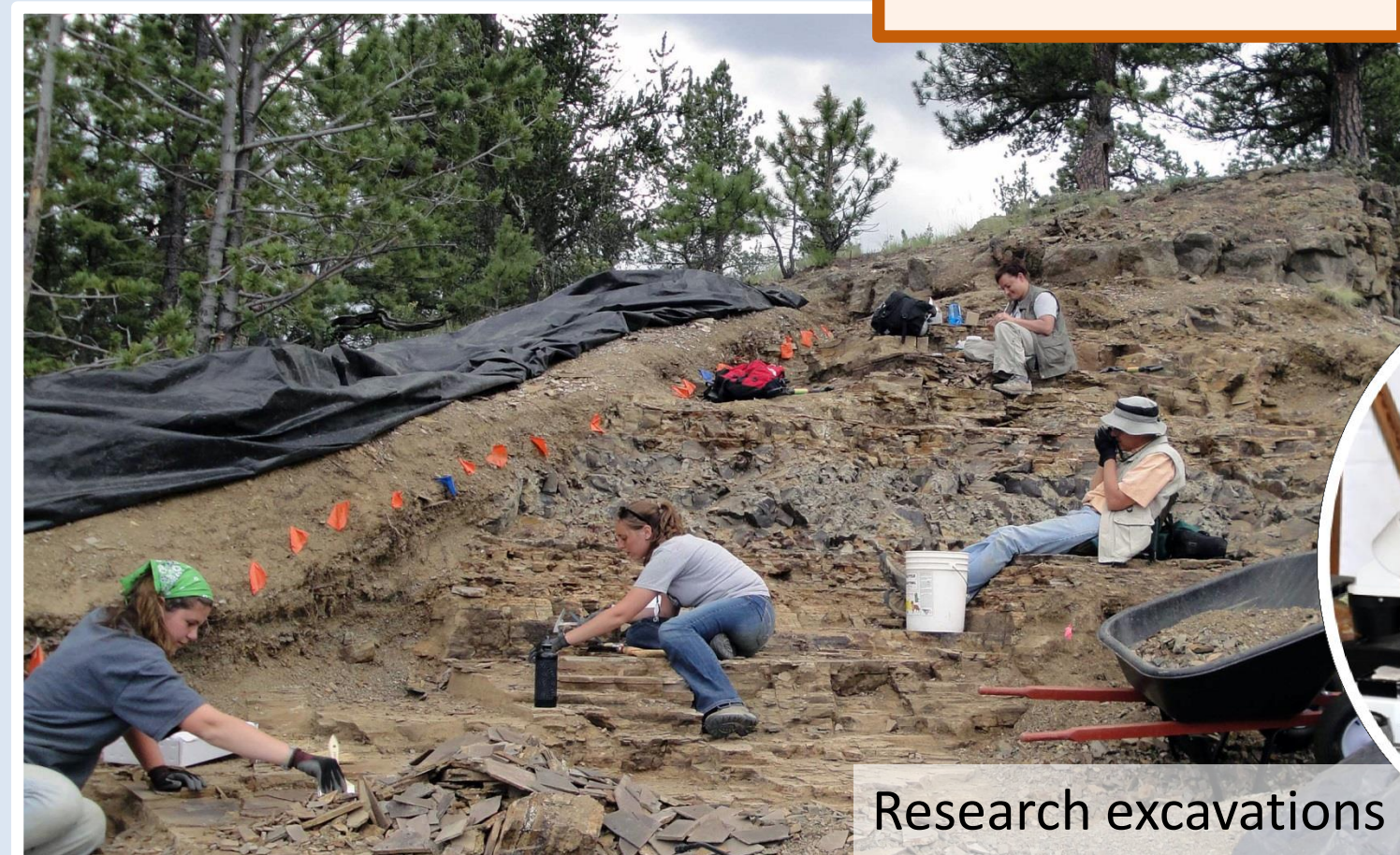
Paleontology collections

## Conservation

National Park Service (NPS) collection contains 12,000 specimens maintained to NPS museum standards.

New projects are being developed to conserve fragile delaminating “paper” shale and crumbling *in situ* petrified tree stumps.

## Research



Research excavations



Scientific research is one of the monument’s primary purposes.

Studies include paleoclimate and geochemistry.

New knowledge provides information for interpretive and educational media.

New visitor center with exhibits opened in 2013.

New Geologic Trail

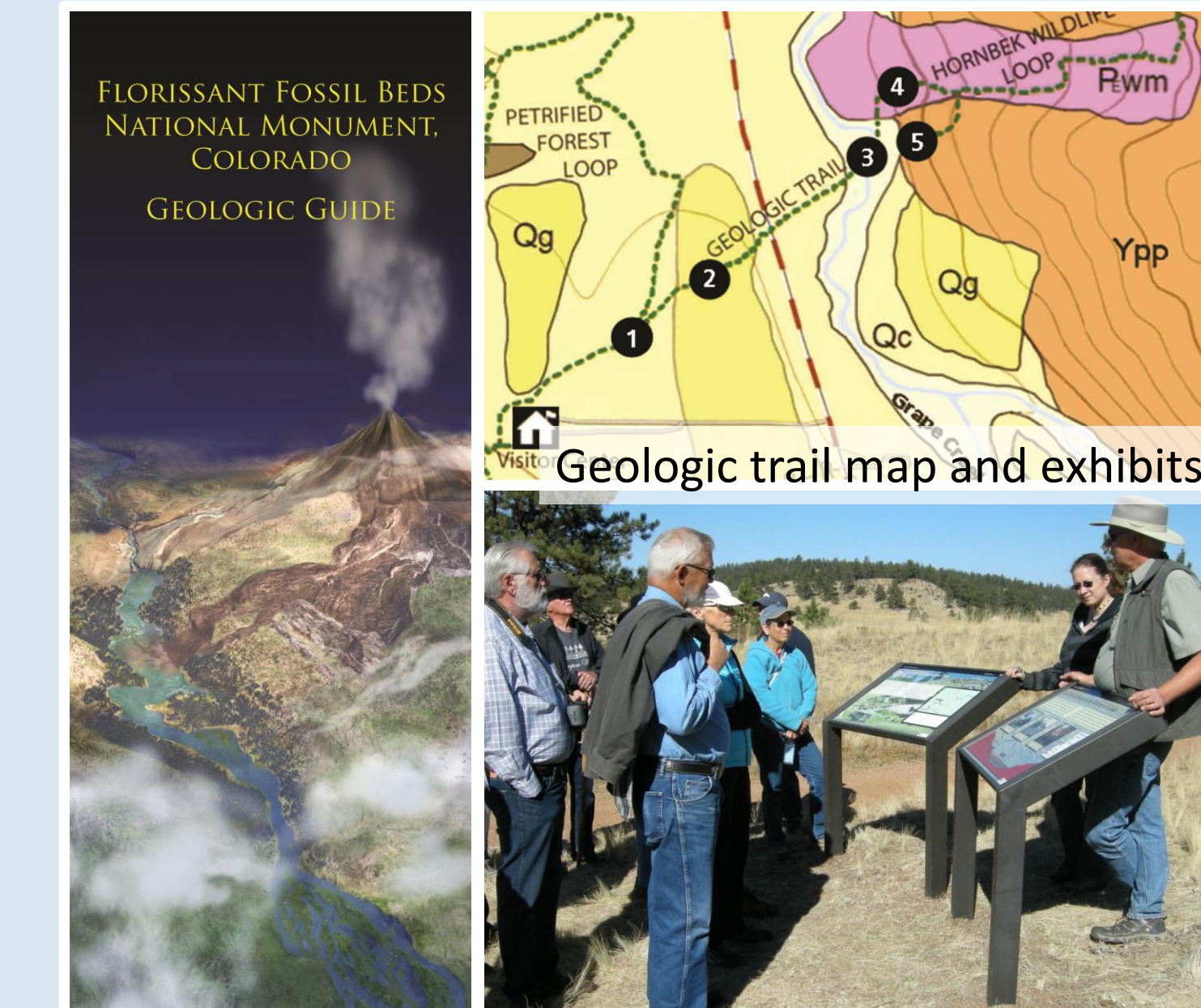
- Interpretive trail exhibit panels
- Geologic trail map and guide
- Mobile apps describing geologic features

Topical information brochures

Geology curriculum for elementary school students

“Junior Paleontologist” program

## Education and Interpretation



Geologic trail map and exhibits



Visitors at redwood trio



Exhibits



Paleontology Lab and Visitor Center

Inspiration for local residents beginning with the first homesteaders

Career-building opportunities for scientists and student interns

Inspiration for tourists and school groups to learn about Earth history

Economic benefits for local communities

Geopark designation has been considered at both UNESCO and national levels.

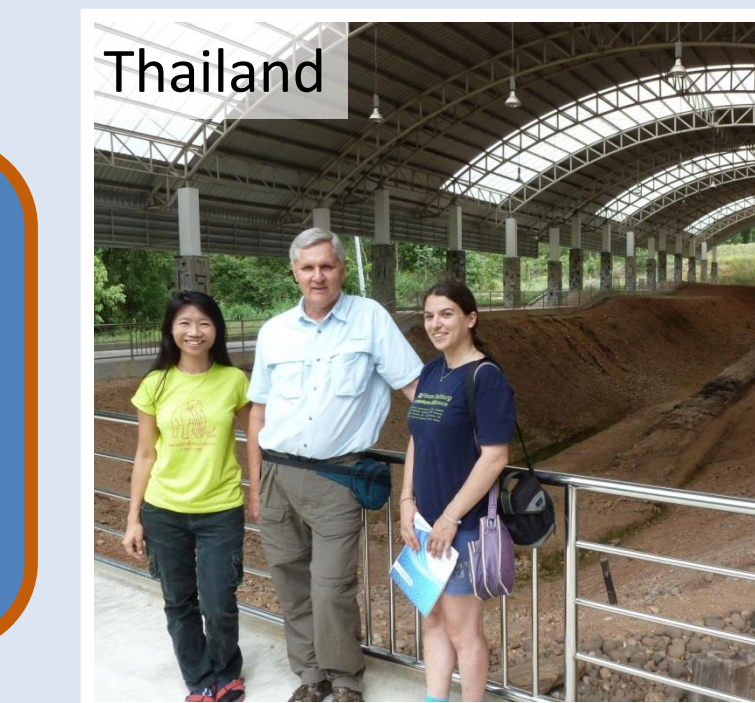
U.S. involvement in UNESCO is problematic.

Stronger support is needed from local communities who stand to benefit economically.

## International Collaboration

Collaboration with other petrified forest sites in Peru and Thailand

Shared objectives in conservation and geoheritage



Thailand



**PERU'S PETRIFIED FOREST**  
The Struggle to Study and Preserve One of the World's Most Remarkable Fossil Sites

Edited By  
Emmanuel Reynard and José Brilha

**EARTH**  
July 2014

The Friends of the Florissant Fossil Beds group in Colorado helped support a recent visit to Florissant by Santiago Asenjo Davila and Diana Pajuelo Aparicio, where they met with Herb Meyer and others to learn about ways of caring for important fossil sites and collections.  
Credit: Terri Cook

## Human Impacts

Benefit	Quantity
Total Visits	73,564
Visitor Spending	\$ 4,301,000
Jobs	65
Labor Income	\$ 2,354,000

Data from 2016

## Geopark Ambitions



## New Geoheritage Textbook

Florissant provides the single case study example of geoheritage for North America in a new textbook on geoheritage.



MANAGING CONSERVATION, RESEARCH, AND INTERPRETATION OF GEOHERITAGE ASSETS AT FLORISSANT FOSSIL BEDS NATIONAL MONUMENT, COLORADO, USA

CHAPTER

22

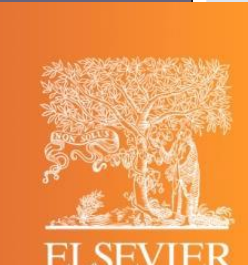
Herbert W. Meyer

Florissant Fossil Beds National Monument, Florissant, CO, United States

Edited By  
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**Geoheritage**

Assessment, Protection, and Management



October 2017