

Cowles Bog
Name of Property

Porter County, Indiana
County and State

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1 Name of Property

Historic name: Cowles Bog

Other names/site number: Mineral Springs Bog, Cowles Bog Wetland Complex, Cowles Bog National Natural Landmark

Name of related multiple property listing: N/A

(Enter "N/A" if property is not part of a multiple property listing)

2 Location

Street & number: 1100 N. Mineral Springs Road (this is the Admin Office for Indiana Dunes National Park; Cowles Bog is north and west of this address)

City or town: Chesterton

State: Indiana

County: Porter

Not For Publication: ☐

Vicinity: ☒

3 State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property meets does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:


X national statewide X local

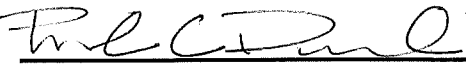
Applicable National Register Criteria:

X A X B C D

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	Federal Preservation Officer	March 14, 2025
Signature of certifying official/Title:		Date
<u>National Park Service</u>		
State or Federal agency/bureau or Tribal Government		

In my opinion, the property <u>X</u> meets ___ does not meet the National Register criteria.	
	<u>3/11/2025</u>
Signature of commenting official:	Date
<u>ASSISTANT DIR. OF PRES. SERVICES</u>	<u>INDIANA DIV. OF HIST. PRES. & ARCHAEO.</u>
Title :	State or Federal agency/bureau or Tribal Government

4 National Park Service Certification

I hereby certify that this property is:

- X entered in the National Register
___ determined eligible for the National Register
___ determined not eligible for the National Register
___ removed from the National Register
___ other (explain:)

<u>James Gabbert</u>	<u>4/29/2025</u>
Signature of the Keeper	Date of Action

5 Classification

Ownership of Property (Check as many boxes as apply.)

Private: ☐

Public – Local ☐

Public – State ☐

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Public – Federal

☒

Category of Property (Check only **one** box.)

Building(s)

☐

District

☐

Site

☒

Structure

☐

Object

☐

Number of Resources within Property (Do not include previously listed resources in the count)

Contributing

Noncontributing

0

0

buildings

1

0

sites

0

0

structures

0

0

objects

1

0

Total

Number of contributing resources previously listed in the National Register 0

6 Function or Use

Historic Functions (Enter categories from instructions.)

LANDSCAPE/Unoccupied Land

LANDSCAPE/Natural Feature

LANDSCAPE/Conservation Area

Current Functions (Enter categories from instructions.)

LANDSCAPE/Unoccupied Land

RECREATION AND CULTURE/outdoor recreation

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LANDSCAPE/Natural Feature

LANDSCAPE/Conservation Area

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7 Description

Architectural Classification (Enter categories from instructions.)

N/A

Materials: (enter categories from instructions.)

Principal exterior materials of the property: N/A

Narrative Description

Summary Paragraph

The Cowles Bog is a 56-acre area within an interdunal peat-base wetland that sits less than 1 mile from the shore of Lake Michigan, near the town of Porter, Indiana. It is part of the 205-acre Cowles Bog Wetland Complex (CBWC) within the Indiana Dunes National Park (IDNP) and is surrounded by a mix of National Park Service (NPS) and private land. It lies south of the town of Dune Acres; west of North Mineral Springs Road; north of the Calumet Trail, a series of Northern Indiana Public Service Company retention ponds, and US 12; and east of the massive industrial complexes of Burns Harbor. Cowles Bog includes a raised fen, flanked by two graminoid fens to the north and south; a forested swamp to the west; and portions of sedge meadow (Cattail Unit), shallow marsh (East Shrub Unit), wet prairie/sedge meadow (West Shrub Unit), and bog (West Shrub Unit). Named after University of Chicago Professor Henry Chandler Cowles, who studied the area extensively between 1896 and 1934, this section of the Indiana dunes was the first property purchased via tax sale by the Save the Dunes Council (STDC) in 1953 to conserve the dwindling lakeshore.¹ It was listed as a National Natural Landmark (NNL) in 1965 and sold to the NPS to become part of Indiana Dunes National Lakeshore (IDNL) the following year. The period of significance for Cowles Bog is twofold: 1909–1934, which corresponds with the years that Henry Cowles was conducting University of Chicago field trips and conducting research there, and 1909–1974, the time period when the previous Mineral Springs Bog was a source of study and conservation until the fifty-year threshold for listing in the National Register of Historic Places (NRHP). The ecological integrity of Cowles Bog has been compromised over the years with the introduction of invasive species of plants. However, several multi-year restoration efforts have been undertaken to remove such plants and reintroduce native plants. The seven aspects of National Register integrity that are typically evaluated don't apply in a traditional sense, given that Cowles Bog is a natural feature and does

¹ The entire southern shore of Lake Michigan in Indiana was once covered in sand dunes. For the purpose of distinguishing between the sand dunes of Indiana and the sand dunes within IDNP, Indiana dunes with a lowercase "d" will refer to the general sand dunes, while Indiana Dunes with a capital "D" will refer to the future and current state and national parks. A similar approach is taken for distinguishing the lakeshore (lowercase "l") of Lake Michigan and the Indiana Dunes National Lakeshore (capital "L").

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not have a typical “built” element to apply them to. However, of the four aspects that do apply (location, association, feeling, and setting), Cowles Bog retains good integrity.

Description

The Indiana dunes exist because of the northwest–southeast winds blowing across Lake Michigan dropping sand along the southeastern shore of the lake.² These dunes are part of the Great Marsh, the largest interdunal peat-base wetland along Lake Michigan, and consist of two separate dune systems. The Calumet Dunes are about 9,000 years old and form the southern edge, while the Tolleston Dunes are about 4,000 years old and form the northern boundary. Subsequent dunes also formed and continue to form in combination with the Tolleston Dunes along the northern edge. At the western end of the Great Marsh lies 83.00 hectares (ha; 205 acres [ac]) of wetland known today as the CBWC. The CBWC consists of “bog, fen, forested swamp, sedge-meadow, wet-prairie and marsh [including] the only remaining coniferous swamp associated with south Lake Michigan, the only native population of white cedar in Indiana, and the only raised fen in Indiana without adjacent higher topographical features.”³ The area commonly known as Cowles Bog consists of 56 ac in the north-central portion of the CBWC. This parcel is singled out from the overall CBWC because most of University of Chicago Professor Henry Chandler Cowles’ recorded observations were from this tract, and it was the first parcel purchased by the STDC in 1953 to help prevent its destruction.⁴

Some discussion of the name is necessary, because it was not always associated with Cowles, nor is it a “bog,” ecologically speaking. Cowles conducted significant research in the area and originally referred to it as Mineral Springs Bog, after the closest road and train station, which in turn were named after a spring in the area.⁵ Over time, this particular environment has been referred to as a bog, marsh, swamp, tamarack bog, tamarack swamp, quaking bog, and peat bog, mostly with Cowles’ name attached but not always. By the 1920s, scientists commonly associated it with Cowles, but the specific terminology varied. In 1922, Herman Kurz, a student of Cowles and a noted ecologist, referred to the unwooded wetland as Cowles Bog in his published research. However, the next year, George Brennan wrote that “the subdunal woods opposite Mineral Springs station form the very interesting Cowles’ tamarack swamp.”⁶ It is unknown when “Cowles Bog” became the common name for this ecological feature, but it was likely in the mid- to late 1920s.

² Jacqueline Alyse Mirandola Mullen, “Coastal Parks for a Metropolitan Nation: How Postwar Politics and Urban Growth Shaped America’s Shores” (PhD diss., University at Albany, State University of New York, 2015), 239.

³ Daniel Mason, “Cowles Bog Wetland Complex History; Inventory; Restoration Final Completion Report, Restoration of the Biological Resource of the Cowles Bog Wetland Complex: Phase I-Design PMIS #60703,” Indiana Dunes National Lakeshore (IDNL), National Park Service (NPS), 2009, 5.

⁴ Stanley Harris, James S. Fralish, and George T. Weaver, “Natural Landmark Brief: Cowles Bog” (Washington, DC: Department of the Interior, NPS, National Natural Landmarks Program, 1994), 1.

⁵ Sarah Gibbard Cook, *Henry Chandler Cowles (1869–1939) and Cowles Bog, Indiana: A Study in Historical Geography & the History of Ecology* (Porter: IDNL, NPS, Department of the Interior, 1980, revised 1999), 12.

⁶ Cook, *Henry Chandler Cowles*, 13.

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Ecologically, Cowles Bog is actually a fen. According to *Britannica*, a fen is a:

type of wetland ecosystem, especially a low-lying area, wholly or partly covered with water and dominated by grasses and grasslike plants such as sedges and reeds. Fens develop on slopes, in depressions, or on flats as a result of sustained flows of mineral-rich groundwater in the root zone. The near-constant inundation of water creates persistent anaerobic conditions that limit the decomposition of plant debris each growing season. Over time this organic matter accumulates to form peat, one of the key characteristics of a fen. Unlike typical bogs, which are not fed by groundwater but rather accumulate rainwater and are highly acid, the flow of water through a fen gives it a pH above 5; that is, it is only moderately acid. Fens are found extensively in the cool and moist boreal regions of the Northern Hemisphere, where evaporation is low and moisture accumulates from ample precipitation and high humidity from maritime influences.⁷

Historical documents do not explain why the name “Cowles Bog” was not changed to “Cowles Fen” once it was determined to be a fen.

Cowles Bog is in an open area between beach ridges and sand dunes with sandy soil that was at one point a pond or small lake, which has nearly completely filled in with plant “residue.”⁸ The 56 ac of Cowles Bog consist of a variety of ecological habitats including sedge meadow (Cattail Unit), shallow marsh (East Shrub Unit), wet prairie/sedge meadow (West Shrub Unit), bog (West Shrub Unit), and forested swamp, raised fen, and graminoid fens to both the north and south (see Maps 3 and 4 for the vegetation units as they existed in 2002–2004, as well as the desired vegetation units in 2009). The units are distinguished from one another based on the vegetation present, along with the soil and water chemistry.⁹

In the 1960s, tree species included “bog birch, bog willow . . . white cedar, paper birch, green tway blade, yellow birch, and dwarf dogwood.”¹⁰ Plant life at that time included carnivorous plants like the purple pitcher plant and sundew; sphagnum bog plants including ferns, mushrooms, sedges, and other climax vegetation; and northern fringe orchid. Rare plants previously found at Cowles Bog included the showy lady’s slipper orchid and the small white lady’s slipper orchid, which was one of the last remaining stands of this plant in the southern

⁷ Caren J. Crandell, “Fen,” *Britannica*, accessed August 24, 2023, <https://www.britannica.com/science/fen>.

⁸ NPS, “National Registry of Natural Landmarks: Indiana: Cowles Bog” (Washington, DC: NPS, Department of the Interior, September 1965), Files on National Natural Landmarks Program, NPS, Omaha, NE (COBO-IN_1-1); NPS, “Remarks by Dr. Stanley Cain, Assistant Secretary of the Interior of Fish and Wildlife and Parks, at the February 1966 dedication of Cowles and Pinhook Bogs to the National Natural Landmarks registry,” 72, Files on National Natural Landmarks Program, NPS, Omaha, NE (COBO-IN_4-1).

⁹ Mason, “Cowles Bog Wetland Complex History,” 36.

¹⁰ Lois F. Howes and Robert Pringle, “Memo regarding Cowles Bog, Porter County, Indiana,” 1965, 10, Files on National Natural Landmarks Program, NPS, Omaha, NE (COBO-IN_2-3).

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Great Lakes Region.¹¹ However, neither orchid has been found there since the early 1990s.¹² Narrow-leaved cattails (non-native, but not invasive) abound, as does poison sumac.¹³ Cowles Bog is noteworthy for the lack of some typical bog plants like cranberry, cottongrass, and bladderwort.¹⁴ The “ecological diversity is due in part because of the irregularity of the topography, the level of the water table, and the stage of soil development or erosion deposition of windblown sand.”¹⁵

Daniel Mason’s 2009 report, “Cowles Bog Wetland Complex History; Inventory; Restoration, Indiana Dunes National Lakeshore,” included a plan to restore eleven vegetation units within the CBWC. A portion of eight of those units fall within the boundaries of the section of Cowles Bog that is the subject of this nomination. The Disturbed Prairie/Lake Plain Wet/Mesic Prairie Unit is in the southeastern corner of the CBWC and beyond the Cowles Bog NRHP boundary. Moving in a clockwise direction around the perimeter of the 56 ac and then inward, the units include sedge meadow (Cattail Unit), shallow marsh (East Shrub Unit), wet prairie/sedge meadow (West Shrub Unit), bog (West Shrub Unit), forested swamp, raised fen, and graminoid fens to both the north and south.¹⁶ Additionally, it is noted in this report that “all cattail at CBWC is non-native cattail: narrow-leaf cattail (*Typha angustifolia*—not invasive) or hybrid cattail (*Typha X glauca*—invasive).”¹⁷

Sedge Meadow

The sedge meadow of the Cattail Unit is by far the largest vegetation unit within the CBWC. The largest swath is to the south and west of the Cowles Bog NRHP boundary. However, it meanders into small sections between some of the other vegetation units and surrounds approximately two-thirds of the raised fens and graminoid fens starting along the north side and fully encompassing the eastern side. It continues along the south side of the fens but stops where it abuts the bog at the far western end. In total, 5.78 ha (14.28 ac) of the sedge meadow are within the NRHP boundary. The northern portion includes swamp dogwood, black willow, and swamp rose; however, it is mostly dominated by cattails (*Typha angustifolia* and *Typha X glauca*) and common reeds (*Phragmites*).

¹¹ Leon Urbain, “Application for Cowles Bog to National Natural Landmark Program,” 1965, 8, Files on National Natural Landmarks Program, NPS, Omaha, NE (COBO-IN_2-1).

¹² Mason, “Cowles Bog Wetland Complex History,” 7.

¹³ Urbain, “Application for Cowles Bog,” 8.

¹⁴ Harris, Fralish, and Weaver, “Natural Landmark Brief: Cowles Bog.”

¹⁵ NPS, “National Registry of Natural Landmarks: Indiana: Cowles Bog.”

¹⁶ Mason, “Cowles Bog Wetland Complex History,” 72, [153].

¹⁷ Mason, “Cowles Bog Wetland Complex History,” 40.

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Shallow Marsh

A shallow marsh in the East Shrub Unit surrounds a deep marsh that rests entirely outside the NRHP boundary. An arm of the shallow marsh extends southwesterly into the sedge meadow, but only 0.08 ha (0.20 ac) is within the Cowles Bog NRHP boundary. Vegetation here includes swamp dogwood and peachleaf willow in the northern section, with cattails (*Typha angustifolia* and *Typha X glauca*) and common reeds (*Phragmites*) to the south.¹⁸

Wet Prairie/Sedge Meadow

Only a small corner (0.14 ha/0.34 ac) of the wet prairie/sedge meadow at the northeastern corner of the West Shrub Unit falls within the Cowles Bog NRHP boundary. The development that occurred historically in the unit as a whole has degraded the area. There are “remnant footprints of homesite, woody vegetation, and a functioning ditch system,” which disrupt the natural elements.¹⁹ This area has firm soil, along with sections of land at higher elevations that stay dry. A combination of deep and shallow marshes floods seasonally.²⁰ Dominant vegetation includes winterberry and nannyberry.

Bog

Tucked between the wet prairie/sedge meadow and the forested swamp is the roughly kidney bean-shaped bog of the West Shrub Unit, covering 2.20 ha (5.43 ac). All but the western edge of the bog falls within the Cowles Bog NRHP boundary. The northeastern edge of the bog abuts both the raised fen and the south graminoid fen, with over half of the bog consisting of water. It is one of the few units that has standing water year-round, along with pockets of sphagnum and an area of about thirty dead tamarack trees. There are higher elevations on the eastern side of the bog, and the soil is low in nutrients.²¹ Vegetation includes winterberry, nannyberry, speckled alder, and red maple.

Forested Swamp

The forested swamp at Cowles Bog runs southwesterly from the north-central part of the site along the southern edge of the Cowles Bog Trail. The entirety of the forested swamp is within the Cowles Bog NRHP boundary. Consisting of 4.93 ha (12.19 ac), it contains 122 species of vegetation, with the most common being yellow birch and red maple. In fact, these two species account for 74 percent of the vegetation in this section, making it a dark, forested area in the summer. It was originally dominated by conifers. The forested swamp also has the highest

¹⁸ Mason, “Cowles Bog Wetland Complex History,” 73–75.

¹⁹ Mason, “Cowles Bog Wetland Complex History,” 13.

²⁰ Mason, “Cowles Bog Wetland Complex History,” 72–75.

²¹ Mason, “Cowles Bog Wetland Complex History,” 75.

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concentration of silky dogwood in Cowles Bog. Other vegetation includes spicebush and nannyberry. Additionally, the forested swamp has the lowest groundwater alkalinity and the least mineral-rich soil in Cowles Bog.²²

Raised Fen

Approximately 2.71 ha (6.69 ac) running in a narrow strip east–west is a type of fen called a mounded or raised fen. All of this unit falls within the Cowles Bog NRHP boundary.²³ Also called spring mounds, these fens form “from within a sloping fen complex and indicate the location of a strong upward groundwater discharge”²⁴ (see Figures 2 and 3). At Cowles Bog, the 2.9 ha (7.17 ac) of raised fen is 1.3 meters (m) (4.27') higher than the land around it, making it both an ecological and topographical feature that stands out in the landscape.²⁵ It is home to a “quaking bog” that Cowles mentioned—a wet marshy area, covered with a mat of decaying vegetation that shakes when walked upon.²⁶ The east and west sections of the raised fen are separated from each other by a ditch excavated in the 1920s and have different vegetation. The west side is forested with species like white cedar, skunk cabbage, and spice bush, and the east side is overrun by cattails (*Typha angustifolia* and *Typha X glauca*) and common reeds (*Phragmites*). The groundwater chemistry and soil chemistry make the fen of Cowles Bog (including the raised fen and the north and south graminoid fens) the most biologically diverse area of the CBWC, with 150 different species of vegetation.²⁷ The white cedar trees here are the only native population of the species in Indiana.²⁸ Additionally, there are only four raised fens in Indiana, and the one at Cowles Bog is not associated with any additional topographic relief, making it unique.²⁹ Because of its distinctive nature, the raised fen is currently fenced off to prevent public access.

Graminoid Fens (North and South)

Surrounding the raised fen to both the north and south are two graminoid fens. Both are fully within the Cowles Bog NRHP boundary. These fens, referred to as the north graminoid fen (NGF) and south graminoid fen (SGF), are peatland areas less than half the size of the raised fen,

²² Mason, “Cowles Bog Wetland Complex History,” 13, 33, 58–59.

²³ Mason, “Cowles Bog Wetland Complex History,” 37.

²⁴ U.S. Forest Service, “Types of Fens,” accessed August 24, 2023, https://www.fs.usda.gov/wildflowers/beauty/California_Fens/types.shtml.

²⁵ Mason, “Cowles Bog Wetland Complex History,” 36–37.

²⁶ Cook, *Henry Chandler Cowles*, 14.

²⁷ Mason, “Cowles Bog Wetland Complex History,” 36–37, 58–59.

²⁸ NPS, “National Registry of Natural Landmarks: Indiana: Cowles Bog.”

²⁹ Mason, “Cowles Bog Wetland Complex History,” 2.

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with the NGF covering 1.65 ha (4.08 ac) and the SGF covering 1.03 ha (2.54 ac). The NGF is sandwiched between the forested swamp and the raised fen, with the eastern edge transitioning to the sedge meadow (Cattail Unit). There are 133 species of vegetation in the NGF, with 0.28 ha (0.70 ac) along the southern boundary consisting of tamarack trees. Other species are slippery elm, yellow birch, and nannyberry. Unlike the NGF, the SGF does not have any trees and is being consumed by cattails (*Typha angustifolia* and *Typha X glauca*) and common reed (*Phragmites*). It has a dramatically lower number of plant species—just 77 because of these two invasive species.³⁰

Cowles Bog Integrity

Development adjacent to Cowles Bog has led to some ecological changes in the area over the last century. Because it is a living, constantly changing environment, the continued evolution of the vegetation and forms is expected. This is where Henry Chandler Cowles developed the theory of plant succession. However, altering the hydrology, due to the removal of sand dunes west of Cowles Bog and the introduction of non-native species of vegetation like cattails (*Typha angustifolia* and *Typha X glauca*) and common reeds (*Phragmites*), has had a major impact. Cattails are extremely invasive and have stunted the ecological growth of the complex and decreased native plant and animal species. Several multi-year restoration efforts are underway to repair the damage.

Additionally, Cowles Bog retains good integrity in regard to six of the seven applicable aspects of integrity that are traditionally considered in a National Register nomination. Cowles Bog has integrity of location, association, feeling, setting, design, and materials. The primary aspects of integrity here are location, association, feeling, and setting. The location of the bog that Henry Chandler Cowles studied and is named after him remains the same. While development has occurred at the Indiana dunes, efforts have been made to isolate this unique environment from man-made interference and visual impacts, thus maintaining the association, feeling, and setting. Only two built elements are located within the approximately 59 acres of this nomination, but they are not historic: 1) a c.2001 barbed wire fence to prevent access to the mounded fen and 2) an approximately 355-foot elevated composite material (Trex) boardwalk that follows the diagonal northwest boundary of the forested swamp along the Cowles Bog trail (see Map 4). Of secondary importance are the aspects of design and materials. In this context, design and materials were taken to be the “design” (the natural occurrence, development, growth, and life-span) of plants, soil, and other natural materials present in the Bog and that remain today. As there are no historic built resources, the aspect of workmanship does not apply.

³⁰ Mason, “Cowles Bog Wetland Complex History,” 38–39.

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8 Statement of Significance

Applicable National Register Criteria (Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- ☒ A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- ☒ B. Property is associated with the lives of persons significant in our past.
- ☐ C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- ☐ D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations (Mark "x" in all the boxes that apply.)

- ☐ A. Owned by a religious institution or used for religious purposes
- ☐ B. Removed from its original location
- ☐ C. A birthplace or grave
- ☐ D. A cemetery
- ☐ E. A reconstructed building, object, or structure
- ☐ F. A commemorative property
- ☐ G. Less than 50 years old or achieving significance within the past 50 years

Areas of Significance (Enter categories from instructions.)

Conservation
Science

Period of Significance

1909–1934 (Criterion B)
1909–1974 (Criterion A)

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Significant Dates

1909, 1913, 1934, 1953, 1965, 1966

Significant Person (Complete only if Criterion B is marked above.)

Henry Chandler Cowles

Cultural Affiliation

N/A

Architect/Builder

N/A

Narrative Statement of Significance

Statement of Significance Summary Paragraph

The 56-acre Cowles Bog is significant for its role in the early study and scientific advancement in the field of succession ecology, as one of the sites at the Indiana dunes where University of Chicago Botany Professor Henry Chandler Cowles conducted decades-long research. Cowles, a pioneer in the field of succession ecology, studied the area extensively, and his academic and advocacy efforts helped garner national attention for the unique ecological environment of the Indiana dunes. Because of its rare biological qualities, Cowles Bog was the focus of early conservation efforts and was central to defeating various industrial developments in the area. This site is eligible for listing in the NRHP under Criterion A (local significance) for the role it played in early conservation efforts of the Indiana dunes during the period of 1909–1974. It ends with the fifty-year threshold, since the bog continues to contribute to scientific and conservation efforts because of its unique ecology and environment. It is also eligible under Criterion B (national significance) for its association with Henry Chandler Cowles, during the period of 1909–1934, as the remaining location of his teaching and scientific research at the dunes. Cowles first became aware of the bog that would bear his name around 1909 and continued to conduct student field trips and research there until his retirement from the University of Chicago in 1934. Significant dates for Cowles Bog include 1909, 1913, 1934, 1953, 1965, and 1966. Cowles first became aware of the area in 1909, and in 1913, he brought the International Phytogeographic Excursion to selected sites in the United States including the future Cowles Bog. Cowles retired from the University of Chicago in 1934. The STDC purchased the 56 ac of Cowles Bog in 1953, and it was designated in 1965 as a NNL. Congress authorized IDNL in 1966.

Developmental History

Preservation of the Indiana dunes on the shores of Lake Michigan was largely spearheaded by three individuals: University of Chicago botanist Henry Chandler Cowles, later known as the “father of plant ecology;” teacher and seasonal resident Dorothy R. Buell; and Illinois Senator

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Paul H. Douglas.³¹ Cowles and the unique, intricate ecosystem of the dunes gained notoriety internationally through publication of his *Ecological Relations of the Vegetation on Sand Dunes of Lake Michigan* in 1899. Cowles began conducting research in the area while a graduate student at the University of Chicago and continued to make regular teaching and research trips over the next thirty-five years.

Winds blowing across Lake Michigan from the northwest to southeast cause sand to accumulate on the southeastern shore, creating the dunes. This natural occurrence made the Indiana dunes the “largest freshwater coastal sand dunes in the world.”³² Despite international awareness of the dunes, the constant battle between industry and natural preservation threatened the landforms. Between 1890 and 1920, local industry carted away the entirety of the Hoosier Slide, the largest sand dune in the area at over 200 feet, to produce plate glass and mason jars.³³

This mass removal of natural material from a unique environment was the catalyst for Cowles, Thomas Allinson, and Jens Jensen to form the Prairie Club of Chicago in 1911, of which future NPS Director Stephen Mather was a member.³⁴ The Prairie Club was the first group to put forth the idea of conserving the Indiana dunes. In 1916, the year the NPS was established, Director Mather held local public meetings to gauge interest in creating Sand Dunes National Park. Despite widespread support, World War I put all national efforts on hold. However, locals proceeded to form the National Dunes Park Association to continue the campaign.³⁵ In 1926, Indiana Dunes State Park was established through the efforts of Cowles and others. However, it encompassed only about 2,000 ac, a relatively small portion of the entire lakeshore. The commitment remained for a national park.³⁶

Up to that point, the Department of the Interior had largely established grand parks with impressive vertical landscapes like Yosemite and Yellowstone. It was difficult to garner support for a site that was in the Midwest and horizontal with sand and swamps. The first flat national park authorized for its “biological uniqueness” was Everglades National Park in 1934.³⁷ Despite its own “biological uniqueness,” much of the area of the Indiana dunes was marsh and only considered useful once it was filled in.³⁸ However, America’s coasts, both seashore and

³¹ NPS, “History & Culture: History of Indiana Dunes National Park,” accessed November 8, 2022, <https://www.nps.gov/indu/learn/historyculture/index.htm>.

³² Mirandola Mullen, “Coastal Parks for a Metropolitan Nation,” 239.

³³ NPS, “History & Culture: History of Indiana Dunes National Park.”

³⁴ Ron Cockrell, *A Signature of Time and Eternity: The Administrative History of Indiana Dunes National Lakeshore, Indiana* (Omaha, NE: U.S. Department of the Interior, NPS, Midwest Regional Office, Office of Planning and Resource Preservation, Division of Cultural Resources Management, 1988), 17.

³⁵ Cockrell, *A Signature of Time and Eternity*, 18–20.

³⁶ Indiana Department of Natural Resources, “Indiana Dunes State Park,” accessed June 7, 2023, <https://www.in.gov/dnr/state-parks/parks-lakes/indiana-dunes-state-park/>.

³⁷ Mirandola Mullen, “Coastal Parks for a Metropolitan Nation,” 19–20.

³⁸ Mirandola Mullen, “Coastal Parks for a Metropolitan Nation,” 256.

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lakeshore, were immensely popular with the public. After World War I, beach visits soared. More paved roads led to these oases, and people had the money and automobiles to take fun day trips to the beach. However, less than 1 percent of the coastal lands were publicly owned, and they were underrepresented within the NPS portfolio. In 1936, Congress passed the Park, Parkway, and Recreational Study Act, making “recreation” part of the NPS mission and calling for a study to evaluate potential coastal parks. Things were falling into place to start protecting shorelines under the NPS umbrella.

However, by 1945, the NPS budget was down to one-seventh of what it had been in 1940, so the growth and condition of parks declined. Consequently, when military veterans and their families surged to the national parks after the war ended, they found the parks in rough shape. In response, the NPS created the Mission 66 program to revive the parks and to include the shorelines. A 1955 NPS report entitled *A Report on Our Vanishing Shoreline*, an easy-to-read and picture-laden publication, was disseminated around the country and garnered immediate attention from those both for and against adding seashores and lakeshores to the NPS. It prompted the formation of local groups with the time, money, and political connections to campaign for the conservation of these resources and for environmentalism in general.³⁹ In 1958, Congress formed the Outdoor Recreation Resources Review Commission (ORRRC), which consisted of politicians, industry representatives, conservation groups, and government leaders. The ORRRC was tasked with creating a forty-year comprehensive recreation plan, of which the seashores and lakeshores were a component.⁴⁰

Local resident Dorothy Buell became entrenched in the preservation of the dunes, first joining the Indiana Dunes Preservation Council in 1949 and assisting in the formation of the STDC in 1952. Her fundraising and campaign efforts played a key role in the grassroots success that the STDC had over the next several decades.⁴¹ Buell was instrumental in getting Illinois Senator Paul Douglas to sponsor a bill for the dunes to become a national park.

When Indiana received federal funds to construct a “Port of Indiana” along the dunes, the STDC, with Buell and Douglas, started a nationwide campaign to purchase some of the land in question to conserve the land and attempt to prevent the construction of the port. However, they were up against formidable opponents including the State of Indiana, politicians, steel companies, and local residents. The STDC purchased the 56 ac encompassing Cowles Bog in 1953, but the port remained a looming threat.⁴² However, the parties reached a compromise, known as the Kennedy Compromise, in 1963–1964. It set aside 11,700 ac for the IDNL while allowing for the development of the Port of Indiana on the central dune east of Ogden Dunes (only 8,330 ac were included in the final authorizing legislation for IDNL).⁴³ Many who had supported conservation

³⁹ Mirandola Mullen, “Coastal Parks for a Metropolitan Nation,” 21–31.

⁴⁰ Mirandola Mullen, “Coastal Parks for a Metropolitan Nation,” 31–32.

⁴¹ Cockrell, *A Signature of Time and Eternity*, 39.

⁴² NPS, “Dorothy Buell: Heroine of the Dunes,” Indiana Dunes National Park, accessed June 23, 2023, <https://www.nps.gov/people/dorothy-buell.htm>.

⁴³ NPS, “Dorothy Buell.”

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of the entirety of the dunes, including Douglas, were disappointed with the deal and attributed it to the massive influence of steel companies in the area.⁴⁴ President Lyndon B. Johnson signed the bill authorizing IDNL on November 5, 1966.⁴⁵

The National Natural Landmark (NNL) program was established in 1962 to recognize and encourage the conservation of sites that contain “outstanding biological and geological resources.”⁴⁶ NNL sites are designated by the Secretary of the Interior and identified through a regional natural features inventory. Cowles Bog was nominated and listed as an NNL in 1965 by architect and former Cowles’ student Leon Urbain, who had a deep appreciation for Cowles Bog.⁴⁷

Congress eventually increased IDNL’s size to more than 15,000 ac through four separate expansions between 1976 and 1986. In February 2019, after over a century of supporters working toward the goal, IDNL finally became Indiana Dunes National Park (IDNP).⁴⁸

Dr. Henry Chandler Cowles and the Science of Ecology

Background

Dr. Henry Chandler Cowles was born February 27, 1869, in Kensington, Connecticut. His childhood fascination with the natural environment led him to get his undergraduate degree from Oberlin College in 1893. He studied botany and geology at Oberlin and earned his PhD in the same subjects at the University of Chicago in 1898. After graduation, he worked at the University of Chicago, staying until he retired in 1934. Cowles died in 1939.⁴⁹

The Science of Ecology

During Cowles’ lifetime, the science of ecology developed significantly. Early European scientists like Antonie van Leeuwenhoek, Carl Linnaeus, and Alexander von Humboldt made initial attempts to investigate relationships within the natural world in relation to what would become the field of ecology. Leeuwenhoek created early microscopes that allowed him to observe bacteria and protozoa, as well as study cell structure of various animals;⁵⁰ Linnaeus created the two-part naming system for plants and animals (taxonomy) of genus and species,

⁴⁴ Cockrell, *A Signature of Time and Eternity*, 63–65.

⁴⁵ Mirandola Mullen, “Coastal Parks for a Metropolitan Nation,” 264.

⁴⁶ NPS, “National Natural Landmarks (U.S. National Park Service),” accessed December 22, 2022, <https://www.nps.gov/subjects/nnlandmarks/index.htm>.

⁴⁷ NPS, “National Registry of Natural Landmarks: Indiana: Cowles Bog.”

⁴⁸ NPS, “History & Culture: History of Indiana Dunes National Park.”

⁴⁹ Joel Hagen, “Henry Chandler Cowles,” *Britannica*, accessed June 19, 2023, <https://www.britannica.com/biography/Henry-Chandler-Cowles>.

⁵⁰ “Antonie van Leeuwenhoek,” *Britannica*, accessed May 3, 2024, <https://www.britannica.com/biography/Antonie-van-Leeuwenhoek>.

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along with cataloging thousands of plants and animals;⁵¹ and Humboldt undertook various expeditions through South and Central America where he studied the relationships between living things and their respective environments.⁵² Charles Darwin was greatly influenced by the studies of Linnaeus. While Darwin did not reference the word “ecology” in his work, he did have a “definite ecological view of adaptation” and is often credited with being the primary scientist responsible for advancing the field. Darwin believed that natural selection was based on the idea of competition (or the influence of the environment) rather than environmental selection (change in the genetic makeup of a species).⁵³ The work of men like Darwin and Charles Lyell were inspiring other scientists to investigate the “the relationships between animals, plants, and their environment in new ways.”⁵⁴

The next phase of European scientists who helped establish the fundamentals of ecology preceded Cowles by a generation, but he would have known of them and been influenced by their work. These were men like Karl Mobius, Ernst Haeckel, and Eugenius Warming. Mobius and his colleague Alfred Wallace were responsible for establishing the idea of biocenosis (an ecological community).⁵⁵ Haeckel himself was the first to use the term “ecology” in 1866. He was a strong supporter of Darwin and later, in 1870, further delineated the term as “the study of all those complex interrelations referred to by Darwin as the conditions of the struggle for existence.”⁵⁶ Eugenius Warming studied why different plants under the same environmental conditions would evolve in like ways, despite their physical differences. He specifically looked at plant morphology and anatomy in this regard. Warming later wrote *Plantensamfund* (or *Oecology of Plants*), which strongly influenced the next generation of scientists in the early twentieth century including Cowles.⁵⁷ Increasing numbers of scientists were noticing the environment and how the Industrial Revolution and human impacted it.

Thomas Chamberlin and John Coulter were “two of the best known men of science in the United States at the turn of the century.” Chamberlin, a geologist who was president of the University of

⁵¹ Staffan Muller-Wille, “Carolus Linnaeus,” *Britannica*, accessed May 3, 2024, <https://www.britannica.com/biography/Carolus-Linnaeus>.

⁵² Charlotte L. Kellner, “Alexander von Humboldt,” *Britannica*, accessed May 3, 2024, <https://www.britannica.com/biography/Alexander-von-Humboldt>.

⁵³ Libre Texts, “History of Ecology,” accessed May 4, 2024, https://bio.libretexts.org/Courses/Gettysburg_College/02%3A_Principles_of_Ecology_-_Gettysburg_College_ES_211/01%3A_Introduction_to_Ecology/1.02%3A_The_Scope_of_Ecology/1.2.01%3A_History_of_Ecology.

⁵⁴ Mary Schons, “Henry Chandler Cowles,” National Geographic Society, accessed December 22, 2022, <https://education.nationalgeographic.org/resource/henry-chandler-cowles>.

⁵⁵ Kerstin Nees, “Famous Scholars from Kiel: Karl August Mobius,” Christian-Albrechts-Universitat zu Kiel, accessed May 3, 2024, <https://www.uni-kiel.de/grosse-forscher/index.php?nid=moebius&lang=e>.

⁵⁶ Alkistis Elliott-Graves, “Ecology,” Stanford Encyclopedia of Philosophy, Spring 2024 edition, edited by Edward N. Zalta and Uri Nodelman, <https://plato.stanford.edu/entries/ecology/>.

⁵⁷ “Johannes Eugenius Bulow Warming,” *Britannica*, accessed May 3, 2024, <https://www.britannica.com/biography/Johannes-Eugenius-Bulow-Warming>.

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Wisconsin, left in 1892 to head the Geology Department at the University of Chicago. Coulter, a botanist and lecturer at the University of Chicago in 1893–1894, was the president of Lake Forest College when Cowles first arrived in Chicago, but he left Lake Forest in 1896 to become head of the Botany Department at the University of Chicago. Both men greatly influenced Cowles, who initially planned to study geology with Chamberlin, but after taking Coulter's classes and a series of conversations between the two in 1895–1896, Cowles turned to botany and found a mentor in Coulter.⁵⁸

Cowles Encounters the Indiana Dunes

During his initial trip to the University of Chicago in 1895, Cowles made his first visit to the Indiana dunes. He was so intrigued by what he saw through the train window that he got off at the next stop in Miller and took a horse and buggy to explore the dunes before continuing to Chicago. For the next two years, Cowles conducted field studies during all four seasons in what had become his living laboratory at the Indiana dunes.⁵⁹ This pocket of sand and plants along the southern shores of Lake Michigan was an ideal place for an ecologist to study plants in this harsh climate. While there, he determined that plants “are obliged to adapt themselves to a new mode of life within years rather than centuries, the penalty for lack of adaptation being certain death.”⁶⁰ While Cowles favored the sand dunes in Dune Park, an area between Miller and Baillytown that is now the Cleveland Cliffs Steel Mill and the Port of Indiana at Burns Harbor, he spent considerable time in the area that would become Cowles Bog.⁶¹ According to the application for the property to be an NNL, which was completed by Leon Urbain (one of Cowles' students), “many of his (Cowles) recorded observations are illustrated on this tract.”⁶²

Cowles' Landmark Research: Plant Succession and Climax Theory

As early as 1742, the observations of succession were recorded. That year, French naturalist George-Louis Leclerc, Comte de Buffon, noted that the evolution of forests transitioned from poplars to oaks and finally to beech trees.⁶³ Over a century later, in 1859, Henry David Thoreau wrote about succession in an oak-pine forest and presented “The Succession of Forest Trees” the following year.⁶⁴ Four years after that, Austrian botanist Anton Kerner observed succession in plants in the Danube River basin.⁶⁵ In the 1890s, ecology was still in its infancy. Within the

⁵⁸ Victor M. Cassidy, *Henry Chandler Cowles: Pioneer Ecologist* (Chicago: Kedzie Sigel, 2007), 26.

⁵⁹ Kay Franklin and Norma A. Schaeffer, *Duel for the Dunes: Land Use Conflict on the Shores of Lake Michigan* (Champaign: University of Illinois Press, 1983), 29–30.

⁶⁰ Schons, “Henry Chandler Cowles.”

⁶¹ Cook, *Henry Chandler Cowles*, 33.

⁶² Harris, Fralish, and Weaver, “Natural Landmark Brief: Cowles Bog,” 1.

⁶³ James A. Larson, *Ecology of the Northern Lowland Bogs and Conifer Forests* (New York: Academic Press, 1982), 4.

⁶⁴ James Lewis, “Reclaiming Henry David Thoreau, Forest Historian,” Forest Historical Society, 2017, <https://foresthstory.org/reclaiming-henry-david-thoreau-forest-historian/>.

⁶⁵ W. B. Drew, “New Biological Books,” *Quarterly Review of Biology* 27, no. 1 (March 1952): 75.

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science of ecology, ecological succession was one of the first theories to be investigated, and Cowles was the pioneer researcher.⁶⁶ Clearly influenced by early scientists, particularly Warming, Cowles started a brand-new topic of ecological research when he began studying the concept of plant succession.⁶⁷ Between 1899 and 1901, Cowles published three studies. The first, his dissertation entitled “The Ecological Relations of the Vegetation on the Sand Dunes of Lake Michigan” (1899) discussed the idea of plant succession. An article titled “The Physiographic Ecology of Chicago and Vicinity; A Study of the Origin, Development, and Classification of Plant Societies” (*Botanical Gazette*, 1901) examined the “physiographic ecology of the area surrounding Chicago,” and it “solidified his reputation as a leading figure in plant ecology.”⁶⁸ The third work, “The Influence of Underlying Rocks on the Character of Vegetation” (*Bulletin of the American Bureau of Geography*, 1901), examined why different soils and rocks grow different plants.⁶⁹ Cowles had a different approach to change within the environment. He understood that nature is constantly changing and evolving, whereas many botanists did not delve into that aspect in their research. This new perspective promoted by Cowles also helped establish him as a revolutionary in the science of ecology.⁷⁰

In the nineteenth century, ecology was mostly focused on the science of classification. However, Cowles helped expand the field based on research that studied the “theoretical relationships between plants and other natural life.”⁷¹ Additionally, his “concern with temporality helped establish ecology as the investigation of a changing, natural environment, defining patterns of transformation over time as plant communities succeed one another.”⁷² Cowles focused mainly on the field of plant succession, the process by which one plant community dying off creates conditions for a new type of plant community to replace or succeed it. Because sand dunes are constantly moving and changing due to strong winds, water currents, and grasses, Cowles found the entirety of the Indiana dunes an ideal location to study plant succession. He noticed a wide variety of plants grew in the dunes, but only the strongest plants survived closest to the water. When those hardy plants decomposed, their remaining matter created conditions favorable for other species. The death and decomposition of that second generation of plants would then create better conditions for even more plants, thus continuing the cycle. This meant that every phase of

⁶⁶ Max Witynski, “Ecological Succession, Explained,” *uchicagonews*, accessed August 19, 2024, <https://news.uchicago.edu/explainer/what-is-ecological-succession>.

⁶⁷ Sarah M. Emery, “Succession: A Closer Look,” *Nature Education Knowledge* 3, no. 10 (2010): 45. <https://www.nature.com/scitable/knowledge/library/succession-a-closer-look-13256638/>.

⁶⁸ Hagen, “Henry Chandler Cowles.”

⁶⁹ Cook, *Henry Chandler Cowles*, 36.

⁷⁰ University of Chicago Libraries, “University of Chicago Faculty: A Centennial View—Henry C. Cowles (1869–1939): Botany,” University of Chicago Centennial Catalogues, accessed June 19, 2023, <https://www.lib.uchicago.edu/collex/exhibits/university-chicago-centennial-catalogues/university-chicago-faculty-centennial-view/henry-c-cowles-1869-1939-botany/>.

⁷¹ University of Chicago Libraries, “University of Chicago Faculty: A Centennial View—Henry C. Cowles (1869–1939): Botany.”

⁷² University of Chicago Libraries, “University of Chicago Faculty: A Centennial View—Henry C. Cowles (1869–1939): Botany.”

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subsequent plants was more stable than the previous one.⁷³ Cowles also noted that “vegetation on dunes of different ages might be interpreted as different stages of a general trend of vegetation development on dunes.”⁷⁴ Cowles also established the concept of “primary succession,” being succession that “begins in new habitats, uninfluenced by pre-existing communities.”⁷⁵

Additionally, Cowles “observed that the shape of the land, or topography, and the type of soil have an enormous influence on the type of plants that grew there.” Subsequently, he developed the theory of climax formation, which is “the most stable plant community created by plant succession.”⁷⁶ At the Indiana dunes, this formation is an oak forest that evolves from beach grasses to cottonwood trees to pine trees to, finally, oak forests.⁷⁷ Through his research at other dunes, Cowles was able to determine that the climax formation is the same in all dune ecosystems.⁷⁸ This climax formation, a more stable plant community, occurs as a later stage of plant succession, and all stages of plant succession are working toward that goal.⁷⁹ It remains unless some kind of event such as a fire, occurs to “reset” the ecological process.⁸⁰ While Cowles first presented the concept of climax formation, Frederic Clements first used the term “climax” to describe the idealized endpoint of succession. Although the theory has evolved since Cowles’ introduction, it remains pertinent to the field of ecology.⁸¹

Under the supervision of his mentor, John M. Coulter, the first head of the new Botany Department, Cowles’ interest in botany grew.⁸² In fact, it was Coulter who suggested that Cowles study the dunes.⁸³ Cowles’ research and publications were well received and cemented Cowles as an influential scholar in the fields of ecology and botany. His 1898 dissertation “remains an important ecological topic of study.”⁸⁴ Cowles was considered “one of America’s most notable early ecologists.”⁸⁵ His British contemporary, Arthur Tansley, said of Cowles:

⁷³ Schons, “Henry Chandler Cowles.”

⁷⁴ Libre Texts, “Ecological Succession,” modified by Castilleja Olmsted and Kyle Whittinghill, accessed May 6, 2024, https://bio.libretexts.org/Courses/Gettysburg_College/01%3A_Ecology_for_All/18%3A_Ecological_Succession/18.01%3A_Introduction.

⁷⁵ Libre Texts, “Ecological Succession.”

⁷⁶ Schons, “Henry Chandler Cowles.”

⁷⁷ Schons, “Henry Chandler Cowles.”

⁷⁸ Schons, “Henry Chandler Cowles.”

⁷⁹ Schons, “Henry Chandler Cowles.”

⁸⁰ Witynski, “Ecological Succession, Explained.”

⁸¹ Emery, “Succession: A Closer Look.”

⁸² University of Chicago Libraries, “John Merle Coulter,” *A Bold Experiment: The Origins of the Sciences at the University of Chicago*, accessed May 14, 2024, <https://www.lib.uchicago.edu/collex/exhibits/bold-experiment-origins-sciences-university-chicago/botany/john-merle-coulter/>.

⁸³ Cassidy, *Henry Chandler Cowles*, 33.

⁸⁴ Libre Texts, “Ecological Succession”

⁸⁵ Schons, “Henry Chandler Cowles.”

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“During the first decade of this century indeed Cowles did far more than anyone else to create and to increase our knowledge of succession and to deduce its general laws. By acute and thorough observation and by lucid exposition he became the great pioneer in the subject.”⁸⁶ It was during the period 1896–1913 that Cowles’ career focused on research and publishing and would later be devoted to teaching and conservation.⁸⁷

Cowles and His Peers

Arthur Tansley was an early ecology leader in Britain of whom Cowles no doubt was aware, as Tansley was also a follower of Warming. He taught at University College London between 1893 and 1907 while also conducting research. He later taught at both the University of Cambridge and University of Oxford. In 1902, Tansley founded the *New Phytologist* and was also a founding member of the Central Committee for the Survey and Study of British Vegetation, the first professional society of ecologists. His efforts to promote ecology included being the founding editor and first president of the *Journal of Ecology* and the first chairman of the British Nature Conservancy.

Like Cowles, Tansley read Warming’s *Plantensamfund*, and it inspired him to make connections between Warming’s studies in Denmark to his home in England. If Tansley and Cowles had not been in touch previously, the year 1911 brought them together, when Tansley helped create the first International Phytogeographic Excursion (IPE), which brought ten scholars to the British Isles and included both Cowles and fellow American Frederic Clements, along with Swiss, Swedish, and German botanists. While there, Cowles presented a paper on the Indiana dunes. “The close tie that has existed between British and American ecologists in viewpoint and in methodology had its origin in this meeting, largely because Tansley, in this his first contact with Cowles and Clements, men so dissimilar in personality though fundamentally similar in their aims, understood and appreciated both.”⁸⁸ Tansley’s efforts with the IPE inspired Cowles to host the second IPE in the United States in 1913, in which Tansley participated.

As a researcher, Tansley is best known for being the person to first use the term “ecosystem” to describe a basic unit of nature. “His ideas about ‘systems’ were important in helping ecologists to understand that organisms and their communities are profoundly influenced by many non-living environmental factors, and vice versa (i.e., organisms and their communities also influence environmental factors).”⁸⁹

An American contemporary of Cowles, Clements attended the University of Nebraska and earned his undergraduate degree in 1894, his master’s in 1896, and his PhD in 1898, all in the field of botany. In 1905, Clements wrote what became the first American ecology book—

⁸⁶ NPS, “Henry Chandler Cowles,” accessed February 10, 2023, <https://www.nps.gov/people/henry-chandler-cowles.htm>.

⁸⁷ Cassidy, *Henry Chandler Cowles*, 57.

⁸⁸ William S. Cooper, “Sir Arthur Tansley and the Science of Ecology,” *Ecological Society of America* 38, no. 4 (1957): 658.

⁸⁹ “Arthur Tansley,” Accessed May 7, 2024, <https://www.encyclopedia.com/environment/encyclopedias-almanacs-transcripts-and-maps/tansley-arthur-g-1871-1951-british-botanist>.

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Research Methods in Ecology. He taught briefly at his alma mater before accepting a position as the head of the Botany Department at the University of Minnesota in 1907. Clements also studied plant succession, although his seminal work *Plant Succession: An Analysis of the Development of Vegetation* was not published until 1916, seventeen years after Cowles' dissertation. While Clements' view that "seres (the intermediate stages of ecological succession moving towards its climax community) were a highly predictable and deterministic series of successional plant communities that converged on a climatically determined stable climax community regardless of starting conditions" was widely accepted from the early 1900s until the 1960s, other ecologists like Henry Gleason, William Skinner Cooper, and Arthur Tansley strongly disagreed.⁹⁰ Unlike Cowles, Clements believed in secondary succession, where "part of an ecosystem is disturbed and remnants of the previous community remain."⁹¹ Cowles himself questioned Clements' ideas on primary and secondary succession in his article "The Causes of Vegetational Cycles" in the *Annals of the Association of American Geographers* (1911), in which he said, "This classification seems not to be of fundamental value, since it separates such closely related phenomena as those of erosion and deposition, and places together such unlike things as human agencies and the subsidence of land."⁹² Despite their differences, Cowles and Clements traveled together to Tansley's first IPE. This helps highlight Cowles' ability to create connections within the ecological community, both in the United States and internationally, in an effort to share insights, broaden the sphere of ecology, and build networks.⁹³

Cowles and Teaching

Following the success of his early publications, Cowles shifted focus from publishing to teaching and field studies. Between 1897, when he started as a laboratory assistant in Ecology, until 1915, when he became a professor of Ecology, he held positions as assistant, associate, instructor, and assistant professor. During this time, he conducted "field research in seventeen states, two Canadian provinces, Belgium, Holland, and the United Kingdom. He published three major studies of plant succession and other important papers, made presentations at professional meetings, and wrote 89 reviews and notices of 281 botanical and ecological books and studies." Additionally, he "created an ecology curriculum, expanded it as the field grew" and published what became the primary ecology textbook for close to twenty years, *Part Two: Ecology of the Textbook of Botany for Colleges and Universities* (1911).⁹⁴

⁹⁰ Joel Hagen, "Frederic Edward Clements," accessed May 7, 2024, <https://www.britannica.com/biography/Frederic-Edward-Clements>.

⁹¹ Matthew R. Fisher, *Environmental Biology* (n.p.: Open Oregon Educational Resources, 2017), 125. <https://open.umn.edu/opentextbooks/textbooks/687>.

⁹² Henry Chandler Cowles, "The Causes of Vegetational Cycles," *Annals of the Association of American Geographers* 1, no. 1 (1911) 3–20, quote on 9.

⁹³ Anne M. Keller, "One Narrow Thread of Green": *The Vision of May Theilgaard Watts, the Creation of the Illinois Prairie Path, and a Community's Crusade for Open Space in Chicago's Suburbs*. Dissertation & Theses. Antioch University, 2016. <https://core.ac.uk/reader/228958160>.

⁹⁴ Cassidy, *Henry Chandler Cowles*, 30.

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During his thirty-five-year professional career at the University of Chicago, Cowles worked in the Botany Building (now the Erman Biology Center) at the Hull Court Biology Quadrangle, built in 1897 by Henry Ives Cobb. While the building still exists, it was extensively renovated in 1971 thanks to a \$500,000 donation from Walter and Ida Erman.⁹⁵ According to the University of Chicago's 2011 Heritage Survey, the entry for the Botany Building/Erman Biology Center stated "little original fabric remains. Internal areas have been significantly renovated/reconfigured."⁹⁶ Additionally, Chicago city directories show that Cowles lived at 5524 Kimbark Avenue and 5759 South Blackstone Avenue during his professional career. While both houses remain, the majority of his professional work would have occurred at the University of Chicago or at the Indiana Dunes.⁹⁷

In addition to the classroom, Cowles immersed his students in the outdoors and regularly brought groups of students to northwestern Indiana to study local plant communities. The land of the Indiana dunes, including Dune Park and Cowles Bog, served as his classroom and laboratory.⁹⁸ Cowles' course offerings included those in elementary ecology (Botany 3 and 203), field ecology (Botany 36 and 336), and physiographic ecology (Botany 34, 234, and 334). Of these, Botany 36 was his most popular class between 1901 and 1931.⁹⁹ According to the University of Chicago Libraries' *The University of Chicago Faculty: A Centennial View* entry on Cowles:

He exerted a substantial influence on his students . . . as the leader of countless field trips. As these small groups cooked, hiked, and camped together, sometimes for extended periods, Cowles was able to generate an interest in botany and an uncommon rapport. It was here that Cowles had his most profound impact on the study of ecology. His students often published far more than he ever did, but it was Cowles, the effective teacher, who helped lay the foundation for their lifelong interest in ecological studies.¹⁰⁰

Because the Botany Building/Erman Biology Center's interior has been substantially altered, the Indiana dunes is the property most associated with Cowles' scientific contributions. In a similar vein, since Dune Park is long gone, due to the development of the area for Bethlehem Steel Mill and the Port of Indiana, Cowles Bog is the most intact location along the shoreline linked to Henry Chandler Cowles.

⁹⁵ "Erman Gives \$500,000 to Renew Botany Building," *Chicago Maroon*, August 19, 1971, 1.

⁹⁶ University of Chicago Facilities Heritage Survey, "Erman Hall," 2011, https://d3qi0qp55mx5f5.cloudfront.net/facilities/pdfs/Heritage_Surveys/Heritage_Survey_D11_Erman_Biology_Center.pdf.

⁹⁷ *The Lakeside Annual Directory of the City of Chicago 1913*, (Chicago: The Chicago Directory Company, 1913), 329; *Telephone Directory of Chicago, 1930*, (Chicago: Illinois Bell Telephone Company, 1930), 286.

⁹⁸ Cook, *Henry Chandler Cowles*, 33.

⁹⁹ Schons, "Henry Chandler Cowles."

¹⁰⁰ University of Chicago Libraries, "University of Chicago Faculty: A Centennial View—Henry C. Cowles (1869–1939): Botany."

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Cowles and Cowles Bog

Cowles became familiar with the bog that would bear his name around 1909, perhaps because it was visible from the South Shore interurban train, on which he traveled frequently between Chicago and the Indiana dunes.¹⁰¹

It included “some wooded sand dunes, but most of it was wetland—part open cattail marsh, part swamp with various kinds of trees, and part, the part most often noted through the decades, a tamarack stand.”¹⁰² A tamarack is a slender North American deciduous conifer.¹⁰³ Cowles referred to it as “Mineral Springs Bog,” after a nearby artesian well for which the closest train station and road were also named.¹⁰⁴

By 1917, Mineral Springs Bog had become well known as both a “tamarack bog” and “tamarack swamp.” By 1923, scientists were referring to this area as “Cowles Tamarack Swamp” and “Cowles Bog.” Generally, writers continued to call the area a “bog” because that was what it had previously been called, rather than something more scientifically accurate. Cowles called the “sedge- and grass-covered, alkaline or circumneutral, floating mat” a “peat bog,” meaning an undrained swamp. European scientists, and even Cowles when addressing a European audience, referred to it as a “fen.”¹⁰⁵

In 1913, Cowles led the IPE, at the request of the international scientists, through ecologically diverse environments, including “the Grand Canyon, Yosemite, Yellowstone Park, and . . . the Lake Michigan dunes.”¹⁰⁶ The fact that these scientists specifically requested to visit the dunes can be attributed to Cowles and possibly others, who were writing about the ecology there and held the environment in high esteem. In fact, he was the first person to write about the tamaracks and “quaking” mat in Mineral Springs Bog.¹⁰⁷ The description of this feature in the IPE program states:

The Mineral Springs bog is on one edge of this ancient valley, representing, probably, a former deep hole in the river which persisted long as a pond. There will be seen the stages of bog development from the reed swamp, through the stage of “xerophytic” shrubs to the tamaracks (*Larix*) and the climax forest, the latter only in its initial stages.¹⁰⁸

¹⁰¹ Cook, *Henry Chandler Cowles*, 51.

¹⁰² Cook, *Henry Chandler Cowles*, 12.

¹⁰³ “The Unique and Beautiful Tamarack Tree,” *The Last Green Valley*, 2021, <https://thelastgreenvalley.org/the-unique-and-beautiful-tamarack-tree/>.

¹⁰⁴ Cook, *Henry Chandler Cowles*, 12.

¹⁰⁵ Cook, *Henry Chandler Cowles*, 12–15.

¹⁰⁶ NPS, “Henry Chandler Cowles,”

¹⁰⁷ Cook, *Henry Chandler Cowles*, 66–67.

¹⁰⁸ Cook, *Henry Chandler Cowles*, 52.

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Cowles also brought members of the Ecological Society of America to the Indiana dunes during a four-day field trip to the Chicago area in June 1916. Cowles' University of Chicago colleague Victor Shelford gave a summary of the trip:

A four-day trip to the dunes of Lake Michigan and other localities in the vicinity of Chicago...under the leadership of Professor H.C. Cowles, Professor V.E. Shelford, and Dr. George D. Fuller . . . A study was also made of the successions in and about a tamarack swamp, and of the fauna of a floating bog, its pitcher plants and tamaracks.¹⁰⁹

In the years that followed, many peers and students “routinely discussed and explored (the tamarack swamp and quaking bog)” by studying under the direction of Cowles. Colleagues George Damon Fuller and Arthur Tansley wrote about the area after the IPE in 1913 and 1917, respectively.¹¹⁰ May Theilgaard Watts, noted teacher and naturalist, worked as a teacher during the school year and attended the University of Chicago during the summers. In her 1957 book *Reading the American Landscape*, she mentions three different trips taken with Cowles and fellow students to the bog in Chapter 5, entitled “History Book with Flexible Cover or the Records in a Quaking Bog.” This was likely between 1914 and 1918, as Watts graduated in 1918.¹¹¹ Another Cowles student was Herman Kurz, who in 1923 published the first quantitative study of Cowles Bog. In 1923, George A. Brennan, a member of the Prairie Club, called the quaking bog “one of the wonders of the dunes” in *The Wonders of the Dunes*. G. C. Cressy described the Mineral Springs quaking bog in his 1928 publication *The Indiana Sand Dunes and Shore Lines of the Lake Michigan Basin*.¹¹² Student Hazel Wiggers Olmsted traveled to the bog during her Physiographic Ecology class with Cowles in 1930, noting that it was “often strenuous trying to keep up with instructors and jot down notes, while moving rapidly over rough ground, through thickets, or across a quaking bog.”¹¹³ The 1913–1930 writings of these students and peers of Cowles link him to repeated visits to the bog. He even took his daughter, Harriet, to the bog as a child after they picnicked in the dunes.¹¹⁴

Henry Cowles and Conservation

Henry Cowles had a long-standing interest in conservation. Given his professional pursuits, this is not a surprise. He realized his scientific expertise could be used not only academically but also publicly to “introduc[e] ecological arguments for preserving natural areas for future generations.”¹¹⁵ Cowles' earliest effort came around 1911, when he formed the Prairie Club of Chicago with Landscape Architect Jens Jensen and conservation advocate Thomas Allinson in

¹⁰⁹ Victor E. Shelford, “The Ideals and Aims of the Ecological Society of America,” *Bulletin of the Ecological Society of America* 1, no. 3 (1917): 5.

¹¹⁰ Mason, “Cowles Bog Wetland Complex History,” 6.

¹¹¹ May Theilgaard Watts, *Reading the American Landscape* (New York: Macmillan, 1957), 74–75.

¹¹² Mason, “Cowles Bog Wetland Complex History,” 6.

¹¹³ Cassidy, *Henry Chandler Cowles*, 43.

¹¹⁴ Cassidy, *Henry Chandler Cowles*, 76–77.

¹¹⁵ Cook, *Henry Chandler Cowles*, 59–60.

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response to the mass removal of sand from the Indiana dunes.¹¹⁶ The Prairie Club and its impact on the Indiana dunes will be discussed more thoroughly in the next section.

Throughout his life, Cowles advocated for the creation of parks and natural preserves to protect environmentally sensitive areas from being encroached upon by industrial and commercial interests. In addition to his advocacy for preservation of the Indiana dunes, Cowles had a hand in several other public land conservation efforts, including the Cook County Forest Preserves and the creation of Starved Rock State Park, both in Illinois.¹¹⁷

Cowles' work and the attention it received played a key role in the campaign to protect the Indiana dunes. Cowles' study of the dunes began in 1896 and continued throughout his career, first at Dune Park and later at what would become Cowles Bog. He conducted hands-on research that solidified the theory of plant succession, built his scientific reputation, and established the study of American ecology.

Cowles' Legacy

Henry Chandler Cowles established himself as an influential figure in American ecology through his early research at the Indiana dunes. However, he was "cautious in the claims he made and never announced a complete theory of succession. A new generation of ecologists—some were his students—refined, amplified, and challenged his conclusions. But everyone started from Cowles, for he was the pathbreaker, the pioneer."¹¹⁸ Many of his students published more extensively than he did, but Cowles relished his role as "the effective teacher, who helped lay the foundation of their lifelong interest in ecological studies."¹¹⁹ William S. Cooper, a former student of Cowles, stated in his tribute to his mentor in a special issue of *Ecology*, "Even greater (than his research) is the number of teachers who have learned from him how to use the out-of-doors, how to bring their pupils directly into nature, and, above all, how to unfold to them the myriad mysteries of biology without recourse to the cheap and easy fallacies of anthropomorphism."¹²⁰ Cooper also wrote,

A man may be a great scientist and a great teacher and yet inspire in his colleagues and students little affection or none at all. With Cowles it was far otherwise. Something more than mere respect for high scientific attainment is necessary to account for the fact that, when the plan for the special number of *Ecology* was made public, more than three hundred persons responded. With almost every contribution came a letter expressing admiration for Cowles as a scientist, as a teacher, and, above all, as a man...He has laid the foundation for a new and useful branch of science, he has constructively influenced the thought of hundreds

¹¹⁶ NPS, "Henry Chandler Cowles."

¹¹⁷ University of Chicago Libraries, *Guide to Henry C. Cowles Collection c. 1860s–1985*, accessed June 19, 2023, <https://www.lib.uchicago.edu/e/scrc/findingaids/view.php?eadid=ICU.SPCL.HCCOWLES>.

¹¹⁸ Cassidy, *Henry Chandler Cowles*, 35.

¹¹⁹ University of Chicago Libraries, "University of Chicago Faculty: A Centennial View—Henry C. Cowles (1869–1939): Botany."

¹²⁰ Keller, "One Narrow Thread of Green," 26.

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of investigators and teachers, and in his profession and personal contracts he has made for himself a multitude of devoted friends.¹²¹

Summary

Henry Chandler Cowles and his research at the Indiana dunes set him apart early in his academic career. His studies established his national status as one of the forefathers of the emerging science of ecology due to his theories of plant succession and climax theory, but it was his complete devotion to teaching and instilling that same dedication in his students that truly drove him. By taking his peers and students on regular exploratory trips to the Indiana dunes, he was able to show other ecologists the original environment where he developed his theories. Since his office at the University of Chicago no longer retains historic integrity and his favored research area at Dune Acres has been developed by industry, Cowles Bog is the most intact area associated with the professional life and studies of Henry Chandler Cowles, making it nationally significant.

Conservation

Background

From as early as the 1880s, the Indiana dunes have been under threat from development. Standard Oil began building a refinery in Whiting in 1889, while U.S. Steel started a steel plant in 1901 in East Chicago.¹²² Both took over large expanses of the Lake Michigan shoreline. Later, the Lake Michigan Land Company and Inland Steel partnered in 1901 to build the Indiana Harbor and a steel company in East Chicago.¹²³ In 1906, U.S. Steel built the entire city of Gary, Indiana, including what would become the largest steel mill complex in North America, along the natural dunes.¹²⁴ The Hoosier Slide, the largest sand dune along the lakeshore at 200 feet, was sand-mined over the course of twenty years by two prominent central Indiana glass producers.¹²⁵

Early Conservation Efforts and a State Park: 1900–1926

With the establishment of steel mills along the water, people began raising concerns about the loss of the natural environment and the impact of industrial pollution. As early as 1899, Henry Chandler Cowles noticed that pine trees in the area were being injured and destroyed by such

¹²¹ Cook, *Henry Chandler Cowles*, 63.

¹²² J. Ronald Engel, *Sacred Sands: The Struggle for Community in the Indiana Dunes* (Middletown, CT: Wesleyan University Press, 1986), 4.

¹²³ Digital Public Library of America, “Original fifty acres of Inland,” accessed June 23, 2023, <https://dp.la/item/54a090e46f07fc8635a8a9f4d82485db>.

¹²⁴ Chicago Historical Society, “Gary, IN,” *Encyclopedia of Chicago*, accessed June 23, 2023, <http://www.encyclopedia.chicagohistory.org/pages/503.html>.

¹²⁵ Cockrell, *A Signature of Time and Eternity*, 17.

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pollution.¹²⁶ When the Ecological Society of America was founded in 1915 by twenty ecologists including Cowles, there was an understanding that the environments being studied faced unknown danger due to the impact of human activity.¹²⁷ Such scientists partnered with other progressive academics and scientists like Jens Jensen and Stephen Mather to advance the efforts of conservation. This effort to conserve natural resources and the environment was immensely aided by President Theodore Roosevelt, a passionate proponent for nature, who allayed this devotion into his political life.¹²⁸ Roosevelt created the U.S. Forest Service in 1905 and signed the American Antiquities Act of 1906. This act not only protected archeological and historic resources on public lands but also gave the President the authority to create national monuments.¹²⁹ Prior to the National Park Service being created in 1916, Roosevelt helped establish 5 national parks and 18 national monuments, along with 150 national forests, 51 federal bird reserves, and 4 national game preserves. In total, he set aside over 230 million ac of public land.¹³⁰

The early 1900s saw the development of outdoor recreation groups that promoted getting away from the dirt and crowding of cities to enjoy the fresh air and exercise provided in nature. Many such groups also supported conservation. In 1904, Jensen founded the Playland Association of Chicago and brought groups of hundreds of outdoor enthusiasts to the dunes for hikes. The Prairie Club of Chicago formed in 1911 as an off shoot of the Playland Association.¹³¹ The Prairie Club's conservation committee included Jensen, Cowles, Mather, and Thomas Allinson. The committee worked to protect the Indiana dunes from further industrial ruin.¹³² They also started promoting the idea of "Sand Dunes National Park."¹³³

When Mather became director of the National Park Service in 1916, he continued to advocate for the creation of a national park at the dunes. Additionally, Prairie Club members founded the National Dunes Park Association (NDPA) specifically to publicize and support the national park

¹²⁶ Mirandola Mullen, "Coastal Parks for a Metropolitan Nation," 241.

¹²⁷ Shelford, "The Ideals and Aims of the Ecological Society of America."

¹²⁸ Library of Congress, "Conservation in the Progressive Era," accessed June 23, 2023, <https://www.loc.gov/classroom-materials/united-states-history-primary-source-timeline/progressive-era-to-new-era-1900-1929/conservation-in-progressive-era/>.

¹²⁹ U.S. Forest Service, "Meet the Forest Service," accessed June 23, 2023, <https://www.fs.usda.gov/about-agency/meet-forest-service>; and NPS, "Antiquities Act of 1906," accessed August 20, 2024, <https://www.nps.gov/subjects/archeology/antiquities-act.htm>.

¹³⁰ NPS, "Theodore Roosevelt and Conservation," Theodore Roosevelt National Park North Dakota, accessed August 20, 2024, <https://www.nps.gov/thro/learn/historyculture/theodore-roosevelt-and-conservation.htm>.

¹³¹ NPS, "Early Development of the Indiana Dunes: 1870s–1910s," accessed August 16, 2024, https://www.nps.gov/indu/learn/historyculture/early_development.htm.

¹³² Cockrell, *A Signature of Time and Eternity*, 17.

¹³³ NPS, "Early Development of the Indiana Dunes: 1870s–1910s."

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effort.¹³⁴ Officers of the NDPA were Armanis Knotts, Thomas Cannon, and Bess Sheehan; Jensen and Cowles were on the board of directors; and Mather was a member. The NDPA aimed to raise funds to purchase and donate shoreline lands to the federal government for a park. On July 16, 1916, three special trains from Chicago brought 5,000 people to the dunes for a public meeting and to showcase the environment and beauty of the lakeshore.¹³⁵ Unfortunately, the efforts of the NDPA were stymied by the advent of World War I, as well as growing opposition to the idea of a national park. By 1919, they shifted focus to a state park.¹³⁶

An essential champion for the creation of a state park was Bess Sheehan, a Gary resident with a strong interest in nature and conservation. She was one of the earliest women to be involved in protection of the Indiana dunes, and in the 1920s, she served as the president of the Indiana Federation of Women's Clubs.¹³⁷ As secretary and then treasurer of the NDPA, the former history teacher and active women's club member gave talks around the state to promote the national park effort. Sheehan's endless devotion to the cause helped her connect with people like Jensen, Cowles, Richard Lieber (founder of the Indiana State Park system), and U.S. Senator Thomas Taggart (from Indiana). She made connections to people with the knowledge, dedication, and influence to advance the cause. Sheehan was instrumental in establishing Indiana Dunes State Park. For years, she had been working with women around the state in various clubs. The women in these clubs often had husbands who were wealthy, influential, and connected, and she used that to her advantage. When she conducted a special evening talk for the members of the Indiana General Assembly on the eve of a key vote for establishing the state park in 1923, she purposely included their wives.¹³⁸ Sheehan's work and devotion proved successful, and in 1926, Indiana Dunes State Park opened.¹³⁹

A New Threat and a National Lakeshore: 1930–1966

In the late 1930s, a new threat emerged: the development of "Burns Ditch," now known as Burns Harbor, into the "Port of Indiana." Although the U.S. Army Corps of Engineers (USACE) refused to approve the construction of the port in 1935 and 1944, the steel mills and politicians applied ongoing pressure to make the port a reality. The proposed St. Lawrence Seaway would provide a water route for companies such as Bethlehem Steel and Midwest Steel to ship goods and materials, if Indiana built a port. The USACE finally succumbed to the pressure and approved construction of the port in 1949, which would consume more shoreline and cause additional environmental damage to the already industrial-focused shoreline.¹⁴⁰

¹³⁴ NPS, "Early Development of the Indiana Dunes: 1870s–1910s."

¹³⁵ Cockrell, *A Signature of Time and Eternity*, 18.

¹³⁶ Cockrell, *A Signature of Time and Eternity*, 25.

¹³⁷ Engel, *Sacred Sands*, 54.

¹³⁸ NPS, "Bess Sheehan 'Lady of the Dunes,'" accessed June 23, 2023, <https://www.nps.gov/people/bess-sheehan.htm>.

¹³⁹ NPS, "History & Culture: History of Indiana Dunes National Park."

¹⁴⁰ Mirandola Mullen, "Coastal Parks for a Metropolitan Nation," 242.

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Although a Chicago resident, Dorothy Buell had a local connection to the dunes because her father had a cabin in Odgen Dunes. Buell attended a meeting of the Indiana Dunes Preservation Council, a group started by retired Professor Myron Strong in Chicago, in response to the USACE's 1949 approval of the port. Strong thought the effort needed a new leader with sufficient time to devote to the cause, and he suggested Buell. In response, Buell formed the Save the Dunes Council (STDC) in 1952. The first meeting was held at Buell's home, and twenty-seven women came, including previous state park crusader Bess Sheehan.

The STDC represented a new era of conservation, now called environmentalism, in northwestern Indiana. Initially consisting of suburban women who were educated, wealthy, and politically connected, the STDC was concerned about pollution, overpopulation, and sprawl as a result of postwar prosperity. The group believed in the ecological, health, and recreational benefits of nature.¹⁴¹ Many of the new women-run environmental groups emerging at the time believed that land conservation was the way to address these problems. The STDC believed that land conservation of the dunes overlapped with its national park efforts.¹⁴² In 1953, the STDC bought the 56 ac of Cowles Bog at a tax sale for \$1,730.¹⁴³ Sheehan was a key source of funding that purchase. As the treasurer of the then-defunct NDPA, she had access to the money that had been sitting in the organization's bank account for thirty years. She transferred the money to the STDC, and it covered about half of the cost of purchasing the land.¹⁴⁴

In 1955, the NPS published *A Report on Our Vanishing Shoreline* to promote protection of America's national seashores and lakeshores after realizing how little public access such locales offered. While still battling against the construction of the port, the STDC used the report to reinvigorate its ranks and generate support for preserving the dunes as a lakeshore. Members believed that land conservation could be used to prevent construction of the port while also preserving the dunes' unique ecology. The battle was stacked against them. Steel companies, politicians, and locals pushed back against the STDC's plans. However, the women followed the letter-writing and public relations format that Sheehan had utilized when lobbying for the state park and partnered with male allies like Senator Paul Douglas. Also following Sheehan's model, they made connections with related professionals like biologists, ecologists, architects, and urban planners to advance the issue on a national level.¹⁴⁵

All the while, encroachment on the dunes continued. In 1957, Bethlehem Steel purchased 4,000 ac, the Lakeshore Development Company purchased another 5,200 ac, and the State of Indiana allocated two million dollars toward land for the port.¹⁴⁶

¹⁴¹ Mirandola Mullen, "Coastal Parks for a Metropolitan Nation," 3–5.

¹⁴² Mirandola Mullen, "Coastal Parks for a Metropolitan Nation," 234.

¹⁴³ Save the Dunes, "How We Got Here," accessed August 16, 2024, <https://savedunes.org/history/>.

¹⁴⁴ NPS, "Dorothy Buell: Heroine of the Dunes."

¹⁴⁵ Mirandola Mullen, "Coastal Parks for a Metropolitan Nation," 234–38.

¹⁴⁶ NPS, "Dorothy Buell: Heroine of the Dunes."

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Although the STDC submitted alternative plans for the “Outer Indiana Port,” located along the previously developed western end of Indiana’s shoreline, both Bethlehem Steel and Midwest Steel opposed the idea.¹⁴⁷ The battle between the STDC and the port came to a head in 1963–1964, ultimately resulting in an agreement known as the Kennedy Compromise, which allowed for both the designation of Indiana Dunes National Lakeshore (IDNL) and the construction of the port. Unfortunately for the STDC, the purchase of Cowles Bog did not prevent construction of the port. While not a clear-cut win for the STDC, because the port would be constructed and the designation covered a much smaller area than proposed, supporters took what they could get. The establishment of IDNL was meant to counteract the likely environmental damage, as well as the threat of further degradation of the dunes, from the port.¹⁴⁸

The Threats Continue and Cowles Bog as a Tool for Conservation: 1967–1981

Despite what could be viewed as previous failed efforts to utilize Cowles Bog to hinder further destruction of the dunes, it was successfully used to fend off industrial development from the late 1960s into the early 1980s. In 1967, the South Shore Railroad, owned and operated by the Chesapeake & Ohio Railroad, sought to construct a 750-car railroad marshaling yard on 26 ac within IDNL. While negotiations between the railroad and NPS were ongoing, behind the scenes NPS Director George B. Hartzog, Jr., authorized “the Washington Office’s Chief of Land Acquisition, Philip O. Stewart to send in his staff in order to thwart the yard.”¹⁴⁹ The NPS rapidly acquired key parcels of the desired land, which also helped to thwart the project.

The STDC, then transitioning leadership from Dorothy Buell to Sylvia Troy, monitored not only what the railroad was doing but also NPS. “The agency (NPS) did not always behave as the group (STDC) expected. Instead of making decisions on substantive bases, zealously guarding its land and embracing other prized environmental issues, the NPS often took positions based on political assessment and bureaucratic considerations.”¹⁵⁰ Since the NPS was focused on land acquisition to prevent the marshaling yard, the STDC “watched for any hint of incipient threats to the natural qualities of the dunes.”¹⁵¹ “Environmentalists argued that alkaline from the yard’s gravel base would cause an imbalance in the acidity levels of nearby Cowles Bog.” The STDC proposed other sites for the railroad yard, which were rejected. It then demanded that the project go before the Indiana Dunes National Lakeshore Advisory Commission, which required that the project include “environmental guarantees.” This sealed the fate of the marshaling yard, and it was abandoned. Because the marshaling yard plan was defeated, Inland Steel opted to sell the

¹⁴⁷ Mirandola Mullen, “Coastal Parks for a Metropolitan Nation,” 257.

¹⁴⁸ Michael Hawthorne, “Indiana Steel Mill Emits 18,000 Pounds of Lead a Year. Is It Blowing toward Chicago?” *Chicago Tribune*, 2018, <https://www.chicagotribune.com/news/ct-met-burns-harbor-steel-mill-lead-pollution-20180723-story.html>.

¹⁴⁹ Cockrell, *A Signature of Time and Eternity*, 99.

¹⁵⁰ Franklin and Schaeffer, *Duel for the Dunes*, 218.

¹⁵¹ Franklin and Schaeffer, *Duel for the Dunes*, 218.

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land in question to the NPS.¹⁵² This was the first true conservation win that could be attributed to Cowles Bog.

In 1968, a proposal to build a third Chicago regional airport near Chesterton, Indiana, stated that the airport would be vital to the port. However, those against the development argued that the noise pollution over IDNL would “diminish the visitors’ park experience,” especially over West Beach and Cowles Bog. Opponents also argued that auxiliary development to the airport would cause additional environmental harm.¹⁵³ The Advisory Commission voted against the proposal due to the “overwhelming damage” to both the Lakeshore and the state park, yet another conservation win partially because of Cowles Bog.¹⁵⁴

The Science Office of IDNL started monitoring air quality in 1979. A particularly strong odor of burnt solvent was coming from the Continental Can Company, which was especially noticeable in Cowles Bog in the winter. The Air Quality Specialist determined the pollution was a result of faulty equipment and exceeded acceptable levels. Continental denied these claims until it received notice from the State of Indiana that the Environmental Protection Agency (EPA) office in Chicago agreed with the National Park Service findings. Eventually, the company corrected the problem.¹⁵⁵ The work of that first generation of conservationists from the Prairie Club of Chicago and NDPA and the next generation from the STDC was finally becoming the environmental tool members had envisioned.

While all of these smaller threats were being addressed and defeated, the STDC was immersed in two battles with the Northern Indiana Public Service Company (NIPSCO), one of which lasted eleven years. Unfortunately for NIPSCO, its eastern boundary abutted IDNL property, and not just a non-descript parcel, but Cowles Bog. The lesser of the two problems centered on the disposal of fly ash from its coal-fired generating plants. The fly ash seeped beyond a dike and into retention ponds on a portion of NIPSCO property nearest to IDNL and Cowles Bog. The STDC warned the National Park Service about the potential contamination, but NIPSCO refuted the claims. The data coming out of the IDNL Science Office verified the leak and raised the threat of further litigation in 1978. Finally, after years of complaints, the National Park Service and NIPSCO came to an agreement later that year where the fly ash would no longer be disposed of near IDNP land, and the ponds would be sealed.¹⁵⁶

The larger and lengthier conflict arose in 1970 when NIPSCO applied for a construction permit to build Bailly I, a nuclear power plant, on the western boundary of IDNL. NIPSCO’s original proposal estimated the costs to be \$185 million and that the plant would be complete in 1979.¹⁵⁷

¹⁵² Cockrell, *A Signature of Time and Eternity*, 97–101.

¹⁵³ Cockrell, *A Signature of Time and Eternity*, 110.

¹⁵⁴ Calumet Regional Archives Indiana University Northwest Library, “September 6, 1968,” *Indiana Dunes National Lakeshore Advisory Committee Minutes, 1967–1973*, from the John Schnurlein Collection, Box 1.

¹⁵⁵ Cockrell, *A Signature of Time and Eternity*, 233–34.

¹⁵⁶ Franklin and Schaeffer, *Duel for the Dunes*, 229–30.

¹⁵⁷ Franklin and Schaeffer, *Duel for the Dunes*, 232.

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This would turn out to be grossly inaccurate. Neither the National Park Service nor the Department of the Interior were able to take an active role against Bailly 1, as it had the support of another federal agency, the Atomic Energy Commission (AEC), and President Richard Nixon.¹⁵⁸ Unofficially, “Assistant Secretary of the Interior for Fish, Wildlife, and Parks Nathaniel P. Reed took a dim view of NIPSCO’s plans.”¹⁵⁹ Officially, a number of private organizations fought against it including the STDC, Porter County chapter of the Izaak Walton League, Joint Intervenors in partnership with the Businessman for the Public Interest, Concerned Citizens Against the Bailly Nuclear Site, Bailly Alliance, American Friends Service Committee, United Steelworkers Local 1010, and others.¹⁶⁰ These groups utilized “skillful legal appeals to delay construction” and “waged a mounting campaign to enlist public opinion against the projected Bailly plant.”¹⁶¹

The problems began when NIPSCO’s site maps did not accurately convey the population or residential density of the area—they called Dune Acres, Odgen Dunes, and Miller “forest cover” and claimed Gary was 10 miles from the proposed location when in reality it was 5.2 miles.¹⁶² The National Park Service opposed the location, and its concern pertained not only to Cowles Bog but also to the nearby Bailly Homestead, a National Historic Landmark. Impacts to the Bailly Homestead included visual impacts from two enormous cooling towers, fog and drift, and the impact from humidity and temperature changes on the historic resource. The Advisory Council on Historic Preservation became involved, causing construction delays.¹⁶³

When the time came for the AEC hearing on Bailly I in September 1973, Assistant Secretary Reed had to threaten to resign in order for Secretary of the Interior Rogers Morton to allow him to testify.¹⁶⁴ Reed visited IDNL before the meeting to familiarize himself with the property. He toured the site with Superintendent J. R. Whitehouse and saw Cowles Bog, the NIPSCO facility, and the hole being dug for Bailly I.¹⁶⁵ The hole required for Bailly was 32’ deep, 200’ wide, 675’ long, and adjacent to the Cowles Bog watershed.¹⁶⁶

When Reed appeared before the AEC, he had an extensive list of environmental concerns, especially relating to Cowles Bog and the nearby dunes and wetlands.¹⁶⁷ These included “impairment to the esthetic quality of the Lakeshore from the 450-foot cooling tower; defoliation

¹⁵⁸ Franklin and Schaeffer, *Duel for the Dunes*, 230.

¹⁵⁹ Engel, *Sacred Sands*, 286.

¹⁶⁰ Cockrell, *A Signature of Time and Eternity*, 238–39.

¹⁶¹ Franklin and Schaeffer, *Duel for the Dunes*, 230.

¹⁶² Cockrell, *A Signature of Time and Eternity*, 192.

¹⁶³ Cockrell, *A Signature of Time and Eternity*, 193.

¹⁶⁴ Engel, *Sacred Sands*, 286.

¹⁶⁵ Cockrell, *A Signature of Time and Eternity*, 194–95.

¹⁶⁶ Franklin and Schaeffer, *Duel for the Dunes*, 231–32.

¹⁶⁷ Cockrell, *A Signature of Time and Eternity*, 196.

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of vegetation by salt from the cooling tower plume; damage to plant and animal life from acid misting produced by the mixing of cooling tower vapors with sulphur dioxide from the coal-fired unit; seepage from waste holding basins; and lowering of the water table during excavation.”¹⁶⁸ Reed told the AEC, “I do not believe that the Congress intended the National Park System to be used as a buffer zone for industrial accidents, and, as a matter of policy, the Department (of the Interior) is opposed to such use.”¹⁶⁹ Despite Reed’s compelling statements, in addition to questions about the design and safety, the AEC approved the permit for Bailly I in 1974.¹⁷⁰ A series of court cases, appeals, and injunctions occurred over the years and delayed the start of construction until late 1976, and it was further postponed until early 1977.¹⁷¹

The fight against Bailly I continued as further environmental effects were studied. In 1978, IDNL became the first unit in the National Park System to have a Science Office to monitor and study adverse impacts to Cowles Bog NNL and the rest of the park. This addition to the staff was in response to a federal mandate inserted into the National Park Service 1977 appropriation bill by U.S. Representative from Illinois Sidney Yates for “a study of the hydrological consequences of the plant’s construction on the lakeshore’s water system.”¹⁷² Additionally, the IDNL Science Office was the only National Park Service unit to have both Air and Water Resource Specialists to monitor air and water quality, conduct their own research projects, and oversee contracts for other scientific studies. A series of studies conducted by the U.S. Geological Service in partnership with the National Park Service, EPA, U.S. Fish and Wildlife Service, and U.S. Forest Service monitored water quality/dewatering, ash pond seepage, fly ash disposal, heavy metal accumulations, and effects on flora and fauna via a series of monitoring stations along the dike between the ponds and Cowles Bog. It was determined that these issues would only worsen with the construction of Bailly I.¹⁷³

By March 1980, NIPSCO had spent \$182.2 million, almost the entire estimated budget back in 1970, and they only had a hole in the ground. The revised budget was \$1.1 billion, with the plant running by 1987.¹⁷⁴ By late 1981, NIPSCO had finally had enough. After an eleven-year battle that had included a ten-fold increase of the budget, court cases, massive time delays, and intense public and governmental scrutiny, NIPSCO abandoned the project. This was the first time that public opposition stopped a nuclear power plant already under construction in the United States, and protection of Cowles Bog played a primary role in defeating the proposed Bailly I construction.¹⁷⁵

¹⁶⁸ Engle, *Sacred Sands*, 287.

¹⁶⁹ Cockrell, *A Signature of Time and Eternity*, 196.

¹⁷⁰ Engel, *Sacred Sands*, 287.

¹⁷¹ Cockrell, *A Signature of Time and Eternity*, 199–200.

¹⁷² Franklin and Schaeffer, *Duel for the Dunes*, 232.

¹⁷³ Cockrell, *A Signature of Time and Eternity*, 226, 239, 259.

¹⁷⁴ Franklin and Schaeffer, *Duel for the Dunes*, 233.

¹⁷⁵ Cockrell, *A Signature of Time and Eternity*, 314.

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Additional Conservation-Related Resources at the Indiana Dunes

There are a handful of resources in the Indiana Dunes that have been listed in the National Register of Historic Places for their association with the conservation movement in northwestern Indiana. These include the Dune Acres Clubhouse in Dune Acres (National Register of Historic Places 01/25/2007), the Read Dunes House within Indiana Dunes National Park (National Register of Historic Places 12/08/2011), and the Hour Glass House in Ogden Dunes (09/01/2023). All three played a part in the conservation efforts and establishment of IDNL.

The Dune Acres Clubhouse was constructed in 1926 as the dining hall and meeting location for prospective property owners at Dune Acres, immediately north of the Cowles Bog. The theme for this development by William Wirt and Company was “rusticity” and the three story log cabin was designed with that in mind. It held a dining room, lounge, and game room with stunning views of Lake Michigan and provided a community meeting place for the residents of Dune Acres even after the building effort was complete. In addition to hosting meetings for Friends of Our Native Landscape and the Prairie Club of Chicago, respective guests included Jens Jensen, Henry Chandler Cowles, and Senator Paul Douglas. The National Register nomination states that “It is said that ‘a person or family moving to Dune Acres acquired not just a house but a way of life, based on love of natural beauty and on [a] shared recreation[al] social life.’ A big part of this ‘way of life,’ involved the Clubhouse, which with the Guesthouse, was the heart and soul of the community.”¹⁷⁶ Even though Cowles visited the Dune Acres Clubhouse and may have brought his students there, the work for which he is famous was conducted in the field.

The Read Dunes House, built in 1952 in Chesterton, was the home of Philo and Irene Read who were instrumental to the conservation efforts to preserve the Indiana Dunes. Designed by Herbert Read for his parents, he took into account his parents club groups when creating the house with a large open entertaining area to accommodate 40-50 people. The Reads specifically chose the site because of its natural surroundings of the dunes and associated vegetation, in combination with being close to the Tremont Station for the South Shore Rail Line so that fellow conservationists traveling to the Dunes would have easy access to their home. Both Reads were actively involved with saving the dunes. Philo Read, a member of the Prairie Club of Chicago, helped build the beach house that the Club used to attract new members and highlight the significance of the local landscape. Irene Read was an early active member of Save the Dunes Council, which Philo later joined. In 1958, the local chapter of the Izaak Walton League, the first national environmental organization in the United States, was established at the Read Dunes House. The house was the location of meetings, petition drives, letter writing campaigns, and the Save the Dunes Council’s public relations campaign, which advertising executive Philo oversaw.¹⁷⁷ Plans to purchase Cowles Bog likely took place there, but this was only one small part of the conservation significance of the Read Dunes House.

The Hour Glass Cottage was built by Dr O.D. & Tillie Frank in Ogden Dunes. The earlier part of

¹⁷⁶ Cynthia Ogorek, Dune Acres Clubhouse National Register of Historic Places nomination, 2007.

¹⁷⁷ Pia Lopez, Read Dunes House National Register of Historic Places nomination, 2011.

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the cottage was constructed in 1933-1934 with an addition in 1943. Dr. O.D. Frank received his undergraduate and graduate degrees from the University of Chicago and became an ecologist and nationally known botanist. It is unknown if he took classes with Henry Chandler Cowles, but the two knew one another and worked together until Cowles' retirement in 1934. Cowles introduced Frank to the Indiana Dunes and his field trips with students to study the environment there. Frank followed Cowles' example and brought his students there as well. They often used Hour Glass Cottage as home base for their jaunts. Frank built his cabin amidst the sand dunes of Ogden Dunes and utilized many natural materials in its construction to blend in with the surroundings. Over the course of his time there, Frank invited children and adults to come to his home and learn about the local environment, why it was special, and how to preserve it.¹⁷⁸

Summary

Cowles Bog is locally significant as the physical remnant of local conservation movement efforts over the years at the Indiana dunes and how the bog was used as a catalyst for environmental education, awareness, and eventual conservation. The many organizations that were involved in the efforts showed how concerned citizens and professionals united behind a cause, the tactics they used, and how long these tactics took to garner results. From the early beginnings of the Prairie Club of Chicago and the NDPA to the increasingly sophisticated work of the STDC, the devotional women leaders like Bess Sheehan, Dorothy Buell, and Sylvia Troy rallied supporters against powerful industry, stubborn politicians, and resolute public opinion and still managed to conserve this unique landscape on the southern shores of Lake Michigan, a remarkable achievement. Without their support and influence, it is entirely possible, if not likely, that Cowles Bog and the surrounding acreage at IDNL would have been destroyed by industry in the name of "progress." By promoting the rare ecology and the values of nature, conservationists lobbied successfully toward the creation of an eventual national park.

Conclusion

Cowles Bog and the surrounding area has been and will continue to be a scientifically valuable educational and research location and a tool for conservation. It presents the opportunity to observe and study a series of unique environments in relative proximity to one another including swamp, fen, marsh, meadow, prairie, and bog. Similarly, there are a series of distinctive biological specimens including the only native grouping of white cedar trees and one of four raised fens in the state of Indiana.

Since sand dunes are constantly changing and cannot be preserved in place, the National Park Service chose to conserve the species and ecologies in IDNP within the CBWC and, specifically, Cowles Bog. In 2015, there were 392 units within the National Park Service, and IDNP ranked seventh in plant diversity in just over 15,000 ac, a relatively small area, considering Yellowstone has over two million ac and Cape Cod National Seashore has 43,500 ac. This helps illustrate how

¹⁷⁸ Kurt West Garner, Hour Glass Cottage National Register of Historic Places nomination, 2023.

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remarkable the variety within IDNP is.¹⁷⁹ According to 2023 data, IDNP maintained that ranking.¹⁸⁰ For over a century, politicians, the National Park Service, and various conservation groups have leveraged the unique qualities of Cowles Bog and the surrounding Indiana dunes to successfully defend it from development pressure.

¹⁷⁹ Mirandola Mullen, “Coastal Parks for a Metropolitan Nation,” 267.

¹⁸⁰ “*All American National Parks Ranked by Plant Biodiversity*,” Ecoclimax, 2023.
<https://www.ecoclimax.com/2023/05/the-us-national-parks-with-most-plant.html>.

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Previous documentation on file (NPS):

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
☐ previously listed in the National Register
☐ previously determined eligible by the National Register
☐ designated a National Historic Landmark
☐ recorded by Historic American Buildings Survey # _____
☐ recorded by Historic American Engineering Record # _____
☐ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

- ☐ State Historic Preservation Office
☐ Other State agency
☐ Federal agency
☐ Local government
☐ University
☒ Other
Name of repository: Indiana Dunes National Park

Historic Resources Survey Number (if assigned): N/A

10 Geographical Data

Acreage of Property

56 acres

Latitude/Longitude Coordinates Use either the UTM system or latitude/longitude coordinates
(enter coordinates to 6 decimal places)

1. 16 492545 4610269
2. 16 492541 4609867
3. 16 491976 4609868
4. 16 491980 4610269

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Verbal Boundary Description (Describe the boundaries of the property.)

From the legal description for Tract 02-130:

The land referred to in this policy is situated in the County of Porter, State of Indiana and is described as follows:

The Northwest $\frac{1}{4}$ of the Southeast $\frac{1}{4}$ of Section 22, Township 37 North, Range 6 West of the Second Principal Meridian, in Porter County, Indiana. Also the West 16 acres of the Northeast $\frac{1}{4}$ of the Southeast $\frac{1}{4}$ of Section 22, Township 37 North, Range 6 West of the Second Principal Meridian in Porter County, Indiana.¹⁸¹

11 Boundary Justification (Explain why the boundaries were selected.)

Cowles Bog does not have definite physical features, so the boundary description was taken from the legal description for Tract 02-130. This was the tract of 56 ac that the STDC purchased in 1953.

12 Form Prepared By

name/title: Amy Borland, Cooper Shields, Wes Cunningham

organization: Gray & Pape, Inc.

street & number: 9802 Otis Avenue, Suite 220A

city or town: Indianapolis state: Indiana zip code: 46216

e-mail: aborland@graypape.com

telephone: 317-756-1672

date: 12/06/2024

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A USGS map or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs

¹⁸¹ "Legal Description Schedule A from the Chicago Field Office, National Park Service," November 6, 1963, revised March 15, 1972, Files on National Natural Landmarks Program, National Park Service, Omaha, NE (COBO-IN_5.1).

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Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered, and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photo Log

Cowles Bog

North of 1100 N Mineral Springs Road, within Indiana Dunes National Park

Chesterton vicinity, Porter County, Indiana

Photos taken by Cooper Shields on August 22–26, 2022

Photo CD with National Park Service, Indiana Dunes National Park

Photo 1: Camera facing southwest; view of sedge meadow and electric transmission towers.

Photo 2: Camera facing northeast; view of sedge meadow into south graminoid fen.

Photo 3: Camera facing northeast; view of sedge meadow into south graminoid fen.

Photo 4: Camera facing northeast; view of sedge meadow into south graminoid fen and raised fen.

Photo 5: Camera facing northwest; view of south graminoid fen and western end of raised fen with forested swamp in far background at left.

Photo 6: Camera facing southeast; view of southern edge of south graminoid fen into sedge meadow and shallow marsh.

Photo 7: Camera facing southwest; view of south graminoid fen into sedge meadow, bog, and wet prairie/sedge meadow in distance at right.

Photo 8: Camera facing west; view of raised fen and north graminoid fen.

Photo 9: Camera facing southeast; view of forested swamp.

Photo 10: Camera facing southeast; view of forested swamp with bog in background.

Photo 11: Camera facing southeast; view of forested swamp.

Photo 12: Camera facing south; view of north graminoid fen and raised fen.

Photo 13: Camera facing southeast; view of north graminoid fen and raised fen.

Photo 14: Camera facing southeast; view of raised fen.

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Figure 1: Henry Chandler Cowles (1911).
From University of Chicago Photographic Archive, University of Chicago, Special Collections Research Center.

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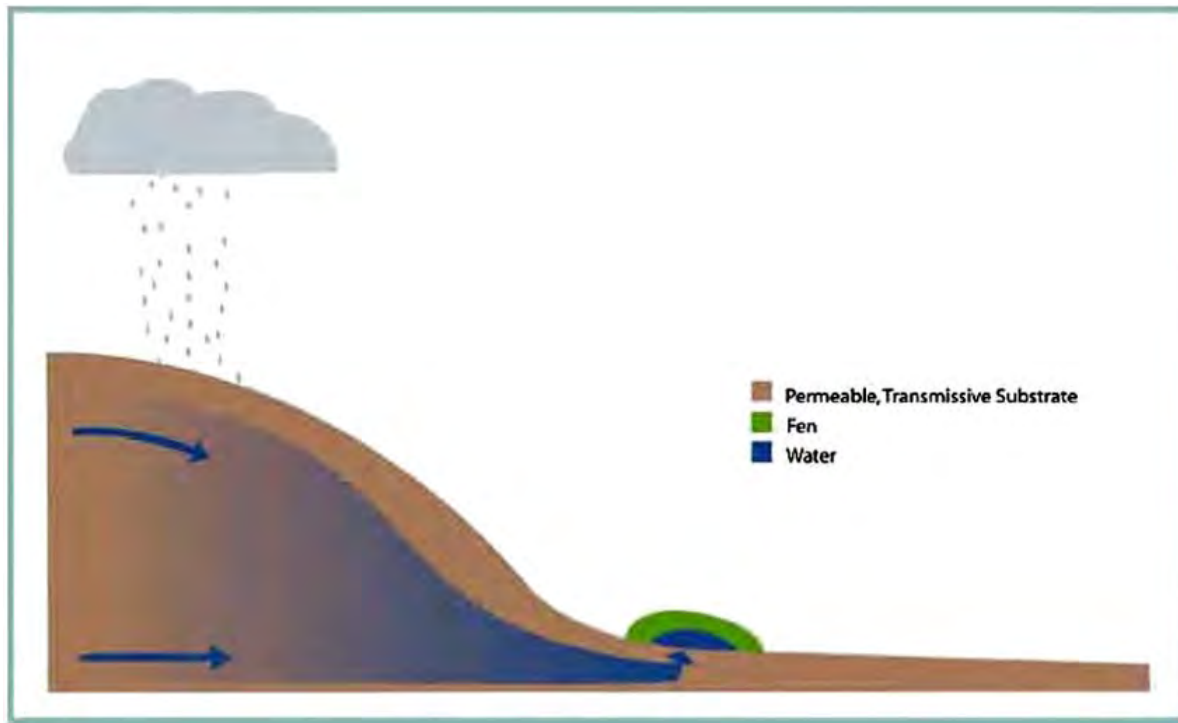


Figure 2: Illustration of a raised fen. From U.S. Forest Service, "Types of Fens."
Image by Wolf & Cooper, 2015.

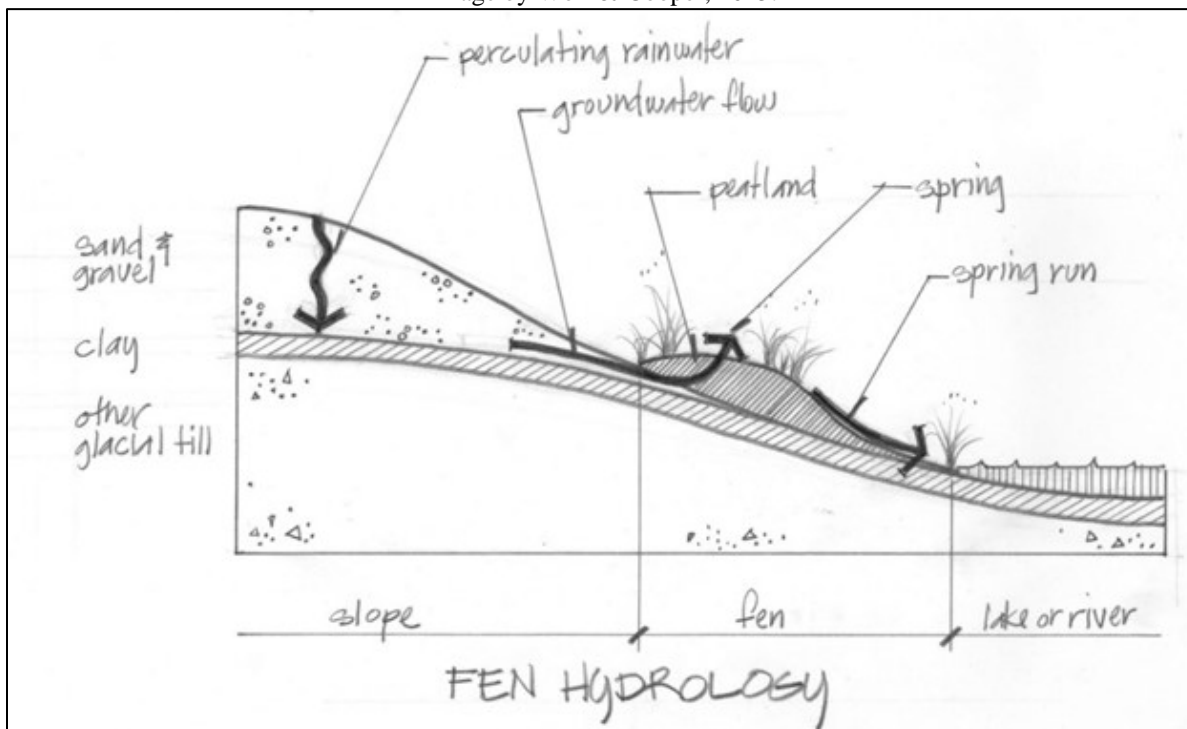


Figure 3: Illustration of fen hydrology. From Reena Ramos, "What is a fen? The nature of ACRES' 'springy places."
Sketch by Nate Simons, 2017.

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Figure 4: Group of people sitting on the ridge of a dune at Dune Park, Indiana (1907).
From University of Chicago Photographic Archive, University of Chicago, Special Collections Research Center.



Figure 5: Henry Chandler Cowles (right) with students on the South Shore interurban (1919).
From University of Chicago Photographic Archive, University of Chicago, Special Collections Research Center.

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Figure 6: Henry Chandler Cowles (second row, middle, with hat) and students at Indiana Dunes (1911). From University of Chicago Photographic Archive, University of Chicago, Special Collections Research Center.



Figure 7: *Larix laricina* swamp (tamarack swamp), Chesterton (unknown date). From University of Chicago Photographic Archive, University of Chicago, Special Collections Research Center.

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Figure 8: Sedge swamp, Chesterton (unknown date).

From University of Chicago Photographic Archive, University of Chicago, Special Collections Research Center.

Paperwork Reduction Act Statement: This information is being collected for nominations to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.). We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

Estimated Burden Statement: Public reporting burden for each response using this form is estimated to be between the Tier 1 and Tier 4 levels with the estimate of the time for each tier as follows:

Tier 1 – 60-100 hours

Tier 2 – 120 hours

Tier 3 – 230 hours

Tier 4 – 280 hours

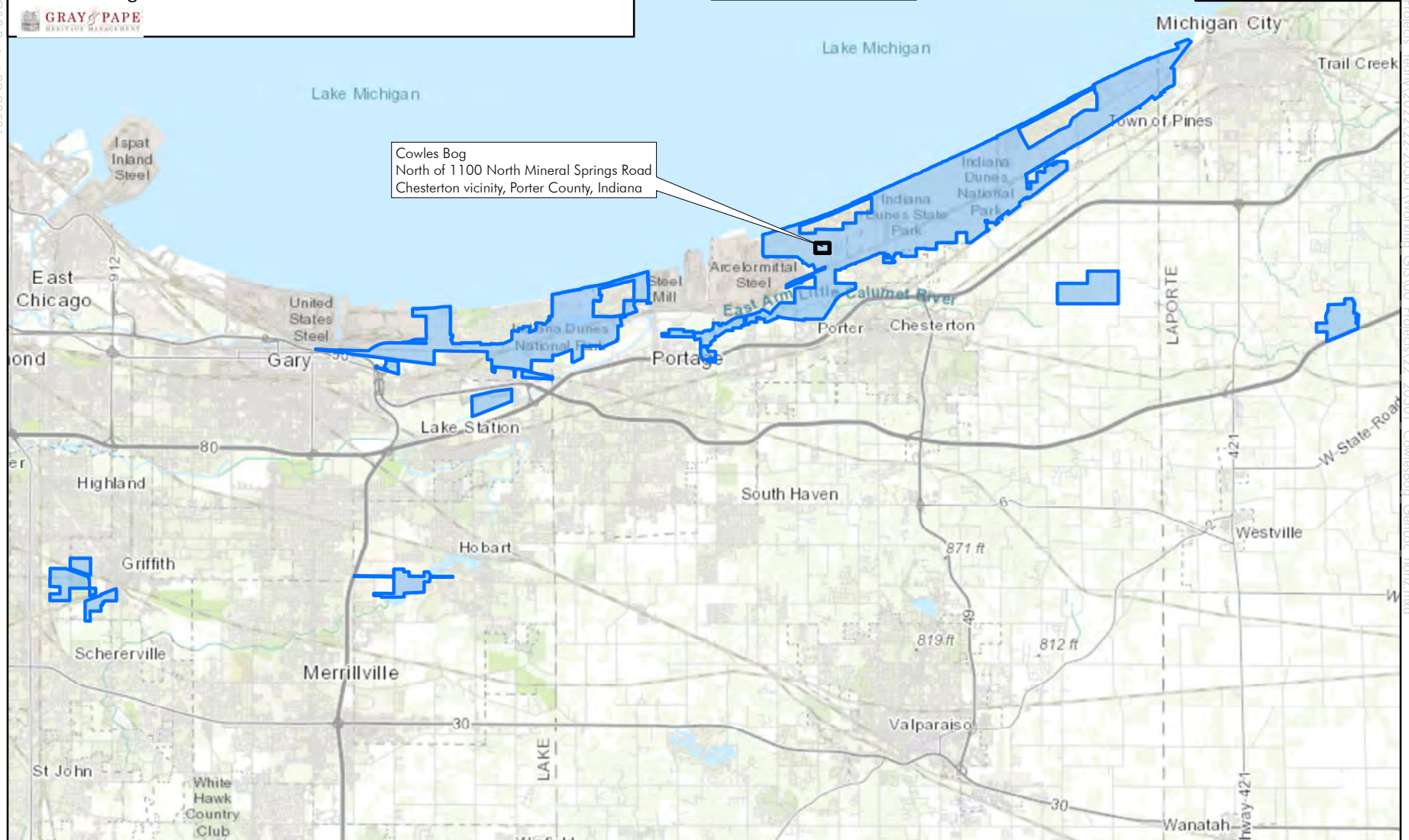
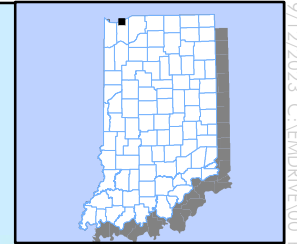
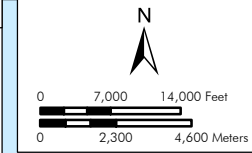
The above estimates include time for reviewing instructions, gathering and maintaining data, and preparing and transmitting nominations. Send comments regarding these estimates or any other aspect of the requirement(s) to the Service Information Collection Clearance Officer, National Park Service, 1201 Oakridge Drive Fort Collins, CO 80525.

Cowles Bog National Register of Historic Places
nomination
North of 1100 North Mineral Springs Road
Chesterton vicinity, Porter County, Indiana
Map # 1: Indiana Dunes National Park boundary &
Cowles Bog location



LEGEND

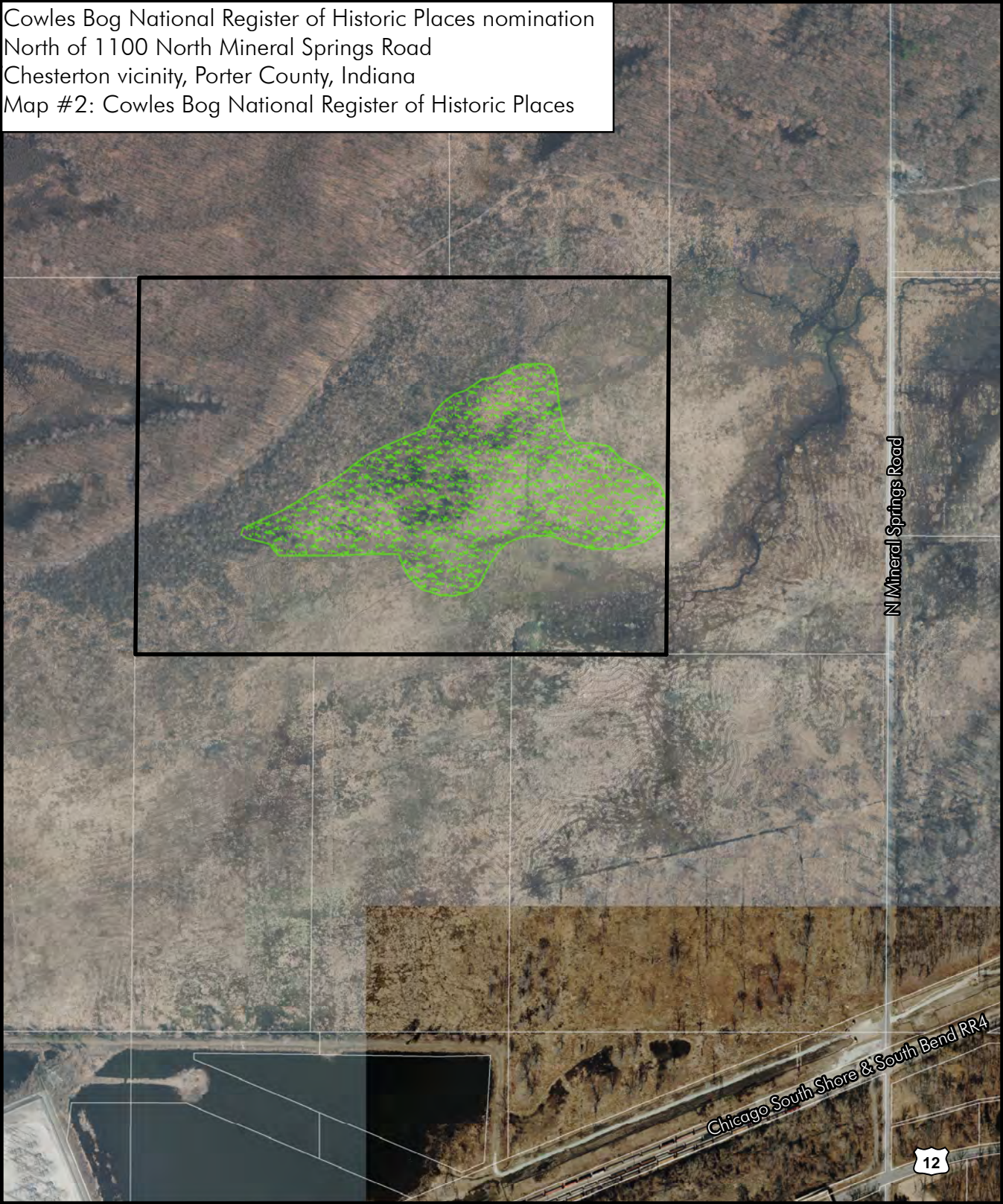
- Cowles Bog
National Register of
Historic Places
Nomination
- Indiana Dunes
National Park

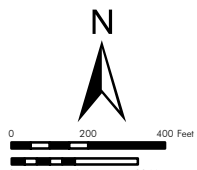
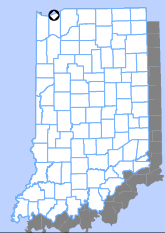






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9/12/2023 C:\ENDRIVE\00 Projects Yearly\2022\22-20501\Working GIS\00 Projects\22-20501 Cowles Bog Aerial.mxd

Cowles Bog National Register of Historic Places nomination
North of 1100 North Mineral Springs Road
Chesterton vicinity, Porter County, Indiana
Map #2: Cowles Bog National Register of Historic Places

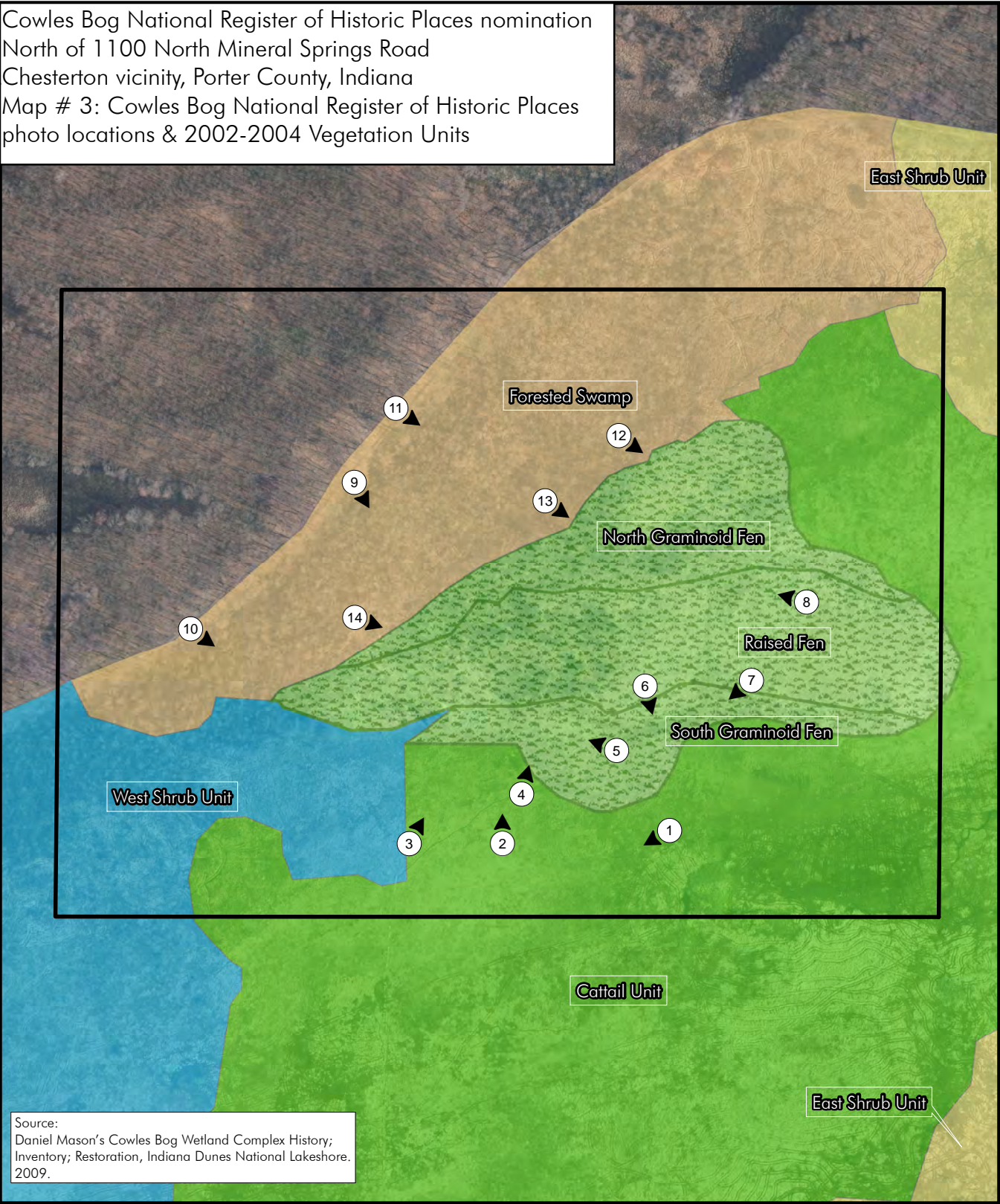


	Legend	
	<ul style="list-style-type: none"> Cowles Bog Fen Cowles Bog National Register of Historic Places Property Boundaries	
 GRAY & PAPE HERITAGE MANAGEMENT		Service Layer Credits:

9/12/2023 C:\ENDRIVE\00 Projects Yearly\2022\22-2050\1\Working GIS\00 Projects\22-2050\1 CowlesBog Vegetation.mxd

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Cowles Bog National Register of Historic Places nomination
North of 1100 North Mineral Springs Road
Chesterton vicinity, Porter County, Indiana
Map # 3: Cowles Bog National Register of Historic Places
photo locations & 2002-2004 Vegetation Units



Source:
Daniel Mason's Cowles Bog Wetland Complex History;
Inventory; Restoration, Indiana Dunes National Lakeshore.
2009.

0 100 200 Feet
0 30 60 Meters

Legend

Cowles Bog National Register of Historic Places	Raised Fen	East Shrub Unit
Vegetation Units	South Graminoid Fen	West Shrub Unit
North Graminoid Fen	Cattail Unit	Photo Orientation
Forested Swamp		

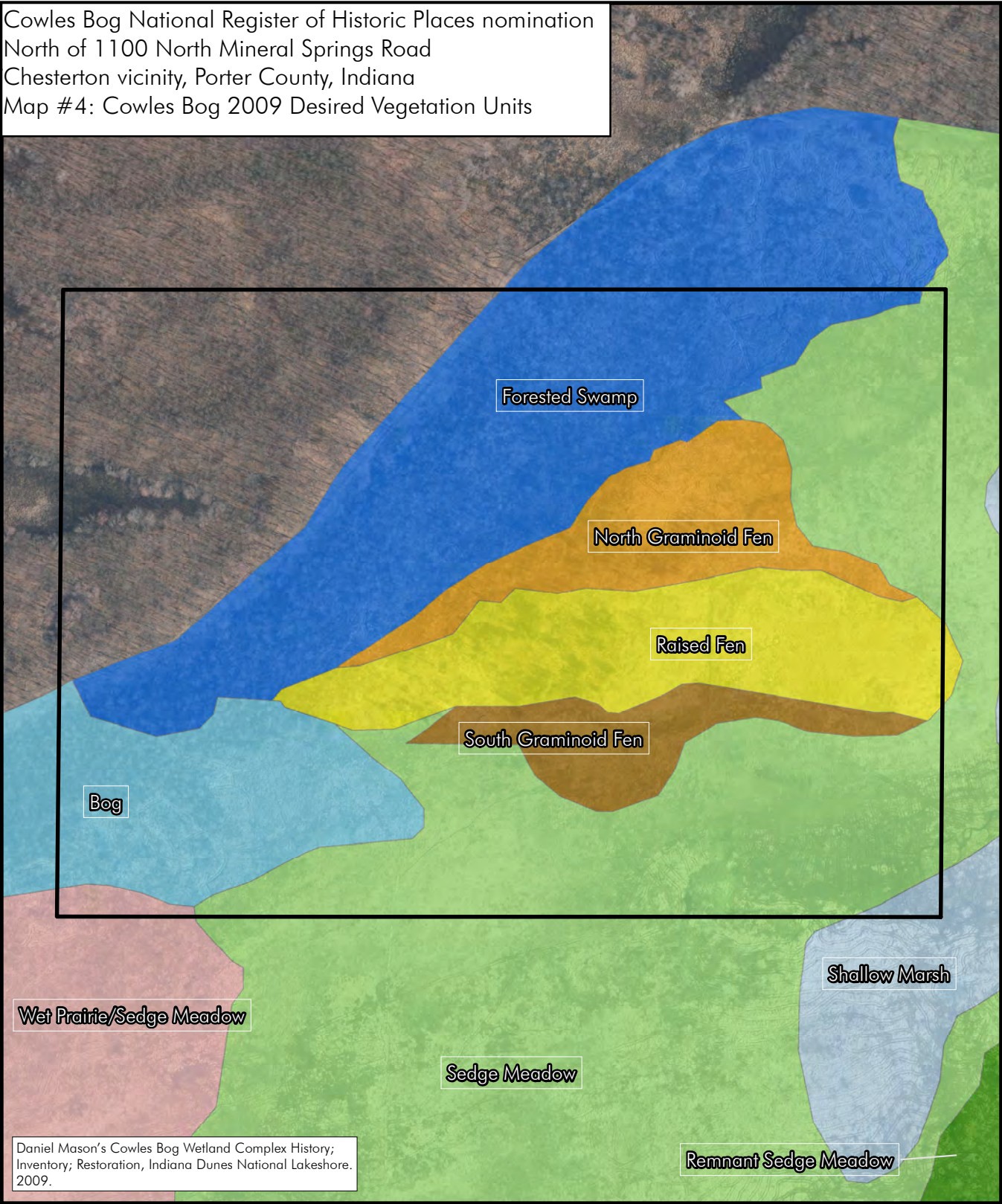
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri

Extent of Figure

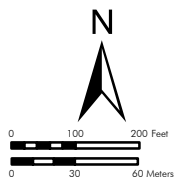
Created in ArcGIS 10.8.1 for G&P Project 22-20501

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
Cowles Bog National Register of Historic Places nomination
North of 1100 North Mineral Springs Road
Chesterton vicinity, Porter County, Indiana
Map #4: Cowles Bog 2009 Desired Vegetation Units



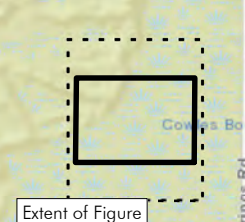
Daniel Mason's Cowles Bog Wetland Complex History;
Inventory; Restoration, Indiana Dunes National Lakeshore.
2009.




Legend

 Cowles Bog National Register of Historic Places	 Raised Fen
 Bog	 South Graminoid Fen
 Shallow Marsh	 Sedge Meadow
 Forested Swamp	 Remnant Sedge Meadow
 North Graminoid Fen	 Wet Prairie/Sedge Meadow

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri



Extent of Figure

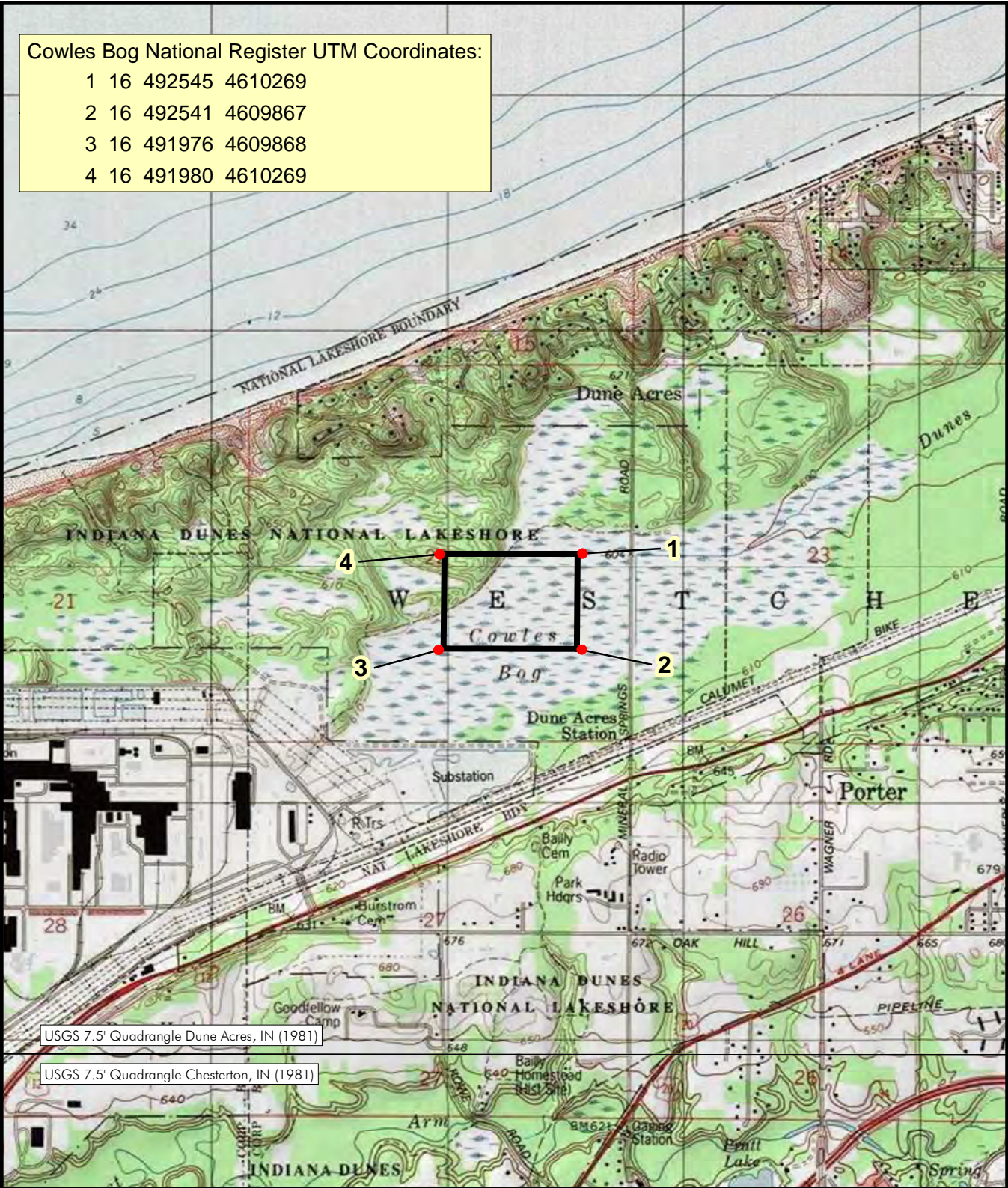


Created in ArcGIS 10.8.1 for G&P Project 22-20501

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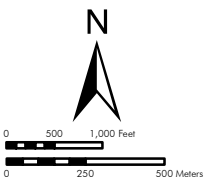
Cowles Bog National Register UTM Coordinates:

- 1 16 492545 4610269
- 2 16 492541 4609867
- 3 16 491976 4609868
- 4 16 491980 4610269



USGS 7.5' Quadrangle Dune Acres, IN (1981)

USGS 7.5' Quadrangle Chesterton, IN (1981)



 Cowles Bog National Register of Historic Places

1 Mile



 **GRAY & PAPE**
HERITAGE MANAGEMENT

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