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## Iowa Natural Heritage Preservation: History, Present Status, and Future Challenges

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# Iowa Natural Heritage Preservation: History, Present Status, and Future Challenges<sup>1</sup>

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Iowa was blessed with an abundant and diverse natural heritage. The history of problems of preservation of natural areas to depict the types and diversity of original Iowa are presented in an historical framework. The history is divided into 3 eras: an era of settlement (1832-1900), an era of academic concern (1900-1950), and a contemporary era (1950-present). The contemporary era is subdivided into 3 periods: an organizational period (1950-1965), a period of inactivity (1965-1975), and a period of renewed activity (1975-present). Two general themes are apparent: (a) numerous plans have been formulated but never adequately implemented, and (b) much of the successes are directly attributable to the active efforts of a very few people. Pre-eminent among Iowa naturalists in preservation efforts are Thomas Macbride, Louis Pammel, Bohumil Shimek and Ada Hayden. Although a resurgence of natural history-related efforts is evident in the last 5 years, the magnitude of the work remaining and the uncertainty of how much time might be left for its implementation, necessitates all Iowa natural historians participate in a more active manner.

INDEX DESCRIPTORS: Iowa, Iowa history, Heritage preservation, Iowa naturalists, Iowa conservation.

In its native condition, Iowa was surely one of the world's treasures. Its surface was approximately 85% prairie (Dick-Peddie, 1953), making it one of the premiere tall-grass prairie states. It contained in excess of 1.1 million acres (445,340 ha) of wetlands (Shaw and Fredine, 1956). It featured extensive transition zones between the eastern deciduous forest and the tall grass prairie and between the northern boreal forest and the Ozarkian oak-hickory forest. Our knowledge of the original vegetation is scant, but the writings of Shimek provide insight into the marvels of the state. One need only read the forward to his plant geography publication (1948) to glimpse the splendor:

"...in 1882 the writer still found much of the territory north and northwest from Wright County without roads other than uncharted prairie trails, and that not only was the flora of the prairie and the prairie 'sloughs' and lakes but little affected by the white man's invasion, but bird-life still occurred in old-time profusion. Prairie-chickens were found in countless thousands and their nests often coverd acres of the prairie; the long-billed curlew, now unknown in Iowa, everywhere hovered over the prairie, an easy mark for every pot-hunter; great clouds of golden plovers or 'prairie-pigeons' swooped down seemingly out of nowhere, apparently to alight, but only to sweep away again like a turbulent wave; the white and the sand hill cranes danced merrily (and awkwardly) before their mates; the borders of swamps and 'sloughs' were often lined with the nests of ducks of several species; pelican eggs could be collected in favored spots by the boat-load; and practically every muskrat house supported the nest of a wild goose."

Unfortunately, areas with these delightful qualities almost completely slipped away; we have managed to save only a few tiny remnants. Iowa has had a series of preservation efforts. These may be divided into an era of settlement, with the attendant rapid conversion of the native landscape (1832-1900), an era of concern, most eloquently expressed by those from the academic world (1900-1950) and the contemporary era (1950-present). The latter era may be subdivided into three periods: an organizational period (1950-1965), a period of relative inactivity (1965-1975) and a period of renewed activity (1975-present). There has been a recent renewal of efforts to save the last vestiges of a magnificent natural heritage, yet many vitally important natural history projects

remain to be done. This report presents an historical view, albeit a personal one, which is constructed to point out the importance of the individual and the essential need for action now. Individual efforts can have significant impacts. Future efforts might come too late.

## ERA OF SETTLEMENT (1832-1900)

An era of settlement extended from approximately statehood to 1900, and was characterized by the attendant exploitation of a good portion of our natural resource base. The wetlands were considered worthless and an impediment to travel. The prairies, at first thought worthless for growing crops, were an obstacle to overcome and put to good use. The forests were but fuel and fiber to the pioneers. Between 1850 and 1956, Iowa's wetlands were decreased by approximately 90% from 1,196,392 acres (484,369 ha) to 117,000 acres (47,368 ha) (Shaw and Fredine, 1956). Iowa's forests were perhaps the first major community-type to be heavily impacted and were cut for steamship fuel and as material for buildings. They were cleared for farming under the mistaken premise that such land would be good for raising crops. These forests were decreased from 6,680,926 acres (2,704,828 ha) during the original survey of 1832-1859 to 2,524,793 acres (1,022,183 ha) by 1875 (Thomson, 1980). Because the pioneers came from a wooded countryside in the east, they believed that a land which grew no trees could not be fit for farming. They found, after a few attempts, that the tenacious sod was too tough for old-fashioned plow and oxen. However, with the invention of the moldboard plow in approximately 1847, the prairie sod was turned in a surprisingly short time and by 1900 was essentially gone (Guldner, 1960; Smith, this issue). We managed to save only traces; approximately 2000 acres (810 ha) under state protection and perhaps another 1000 acres (405 ha) under private protection (personal estimates).

It has often been observed that only rich nations can afford to set aside land in a public trust. During settlement, Iowa was characterized as having a vast resource in a country not yet wealthy. Natural preservation was probably the last thing in the minds of early settlers who were contending with self-preservation.

Near the end of this era a few people, especially those in the academic community, started to raise their voices against the further loss of the native character of the land. Macbride, in 1895, commented: "It is a fact lamented, grievously lamented, by all intelligent men, that in all the older portions of the country, species of plants once common, to say nothing of the animals, are now

<sup>1</sup>Based on a contribution to the symposium "Perspectives on Iowa's Declining Flora and Fauna," held at the 92nd session of the Iowa Academy of Science, 18 April 1980.

extinct. County parks, if organized, soon would enable us to preserve many of these in the localities where originally found." This was the first of many calls for a system of parks, but it was to be many years before it became a reality.

Conditions were similar on a national scale. Near the end of this era the first National Park was established, the Sierra Club was formed in response to excesses in the western states, and Theodore Roosevelt was elected and took up the cause of conservation. In Iowa, late in this era, the Iowa Academy of Science was organized and the Iowa Fish and Game Commission was founded.

### ERA OF CONCERN (1900-1950)

Just before the turn of the century, questions about land utilization were being raised by a few concerned individuals, but most eloquently by those in the academic world. I feel it is appropriate to single out those whose words and deeds have had the most lasting impact on Iowa's natural heritage preservation.

#### *Thomas Huston Macbride (1848-1934)*

Perhaps Macbride was the most influential individual in sensing the need for resource protection and in setting in motion machinery toward that end. He was first president of the Iowa Park and Forestry Association, one of the original members of the Iowa Academy of Science and a moving force in its reorganization in 1887 (Swisher, 1931; Hanson, 1975), and was a founder of the Iowa Lakeside Laboratory on West Lake Okoboji (Macbride, 1909). It was his article on county parks (1895) that led to the establishment of the system of state parks we have today. In this article he suggested 6 sites which should be protected by state park status. These were: The Caves, Jackson county; The Backbone, Delaware county; Wildcat Den, Muscatine county; The Palisades, Cedar and Johnson counties; Pinney's Spring, Allamakee county; and Gray's Ford, Cedar county. Of these, only the last 2 are not presently parks. In his presidential address to the Iowa Academy of Science (1897), Macbride decried the loss of wetlands and contended that the "narrow measure of Iowa's woodlands be religiously preserved and in a thousand places extended." This interest and commitment to the preservation of natural features in Iowa were the result of his early association with Samuel Calvin. In a memorial article by Shimek (1934), Macbride was appropriately referred to as "distinctly the father of conservation in Iowa." Lake Macbride and the adjacent state park now bear the name of this early Iowa naturalist.

#### *Louis Herman Pammel (1862-1931)*

Macbride was joined by Pammel in attempts to secure natural areas for preservation. Pammel succeeded Macbride as president of the Iowa Park and Forestry Association, served as the first president of the Iowa State Board of Conservation Association and twice as president of the Iowa Academy of Science. He was a strong leader in the American School of Wildlife and served as one of its founders (Carlander, 1961). During his lifetime he published over 400 scientific articles (Shimek, 1931). Equally as impressive as his academic attributes, however, was his service to the state through his interest and commitment to Iowa's natural areas, evidenced through his prodigious writings on parks and by the publication of descriptive pamphlets (see list of over 35 such publications in Shimek, 1931). Pammel State Park, a 281 acre (114 ha) area in Madison county, now bears his name.

#### *Bohumil Shimek (1861-1937)*

Shimek was a contemporary of Macbride and Pammel. Although not as public-oriented, Shimek has had an equally lasting effect through his writings on the Iowa prairie (e.g., Shimek, 1911), the loess hills geology (1904a), the fossil malacology of the loess hills (1890), and the

plant geography of Iowa (e.g., Shimek, 1948). His writings and his extant notebooks are a main link to our knowledge of what Iowa was like in its native condition. His writings relative to the Iowa prairie have been summarized elsewhere (Roosa, 1978). He served as first director of the Iowa Lakeside Laboratory and as president of the Iowa Academy of Science in 1904. His presidential address (1904b) to that group decried the loss of our forest resource. Shimek State Forest in Lee and Van Buren counties has been named in his honor.

#### *Ada Hayden (1884-1950)*

Hayden spent her professional career in Iowa, teaching and studying the flora and prairie. In her natural history work, she was much influenced by L. H. Pammel. Her major contribution to natural area preservation came in the mid-1940's when she chaired the Iowa Academy of Science Committee that recommended the implementation of the "Twenty-five Year Plan," written earlier by Crane and Olcott (1933). She stated objectives and procedures for conservation of Iowa prairies (Hayden and Doty, 1945) and issued a progress report on prairie preservation (Hayden, 1945; 1946). In this latter article were descriptions of 32 tracts of native prairie which she considered suitable for preserves. Her original document gave locations of over 100 tracts, including the 32 mentioned above. As a result of her report, 4 were purchased, including one in Howard county which bears her name. The others are: Cayler prairie, Dickinson county; Kalsow prairie, Pocahontas county; and Sheeder prairie, Guthrie county. Her report continues to be of value as evidenced by the 1978 purchase of a 200 acre (81 ha) prairie in Emmet county which was included in her 1946 report. This tract is now a state preserve.

The Iowa prairie nearly slipped away without preservation. We might not now have our prairie preserve system without the influence of Ada Hayden. Now, it seems tragic that the state did not vigorously pursue the purchase of more of the tracts recommended by Hayden.

Admittedly, at the time when these people were making their contribution it was easier for academic persons to become involved in preservation attempts. In recent years, the proliferation of governmental agencies, each staffed with specialists, may have made such involvement less critical.

The selection of these 4 individuals is not meant to diminish the contribution of many others. Indeed, Iowa has excelled in producing conservationists; consider the names of some who have left Iowa to make names for themselves elsewhere (living persons omitted): Aldo Leopold, naturalist and ecologist; Paul Bartsch, malacologist and ornithologist; Ira Gabrielson, ornithologist and chief, Biological Survey; Dr. W. T. Hornaday, ornithologist; Major John Lacey, legislator; Dayton Stoner, biologist. And reflect on those who labored in and for Iowa: John Aikman, ecologist; Charles Bessey, botanist; Henry Conard, botanist; R.I. Cratty, botanist; J. N. 'Ding' Darling, conservationist; Paul Errington, animal ecologist; Joseph Gilman, mycologist; Charles Keyes, geologist; Ellison Orr, archaeologist and naturalist.

In this era of concern, the following significant events occurred:

- Call for a system of county parks (1893, 1895, 1914)
- Call for a system of township parks (1903)
- Iowa Park and Forestry Association founded (1903)
- Call for preservation of Iowa's interesting spots (1913)<sup>1</sup>

<sup>1</sup>Portions of this plan called for a highway connecting St. Louis, Keokuk, Davenport, Dubuque, LaCrosse and St. Paul, with a series of adjacent parks. The Great River Road program, a cooperative venture of the federal and state Departments of Transportation and the Iowa Conservation Commission, has much in common with this early plan.

- First Iowa Academy of Science Conservation Committee formed (1915)
- Iowa Conservation Association formed (1971)
- Call for preservation of large natural tracts (IAS presidential address, 1919)
- American School of Wildlife founded (1919)
- Call for the preservation of lakes (1920)
- Iowa Ornithologists' Union formed (1923)
- Biological survey of the IAS formed (1924)
- Twenty-five year plan written (1933)
- Outline for implementation of Twenty-five Year Plan (1934)
- Second report, State Planning Board (1935)
- Bill in legislature ordering Iowa Geological Survey to do biological survey of state (1925)
- Call for comprehensive land classification plan (1933)
- Creation of State Conservation Commission (1935)
- Recommendation to acquire 400,000 acres of woodland (1935)
- IAS Conservation Committee now advisory to Conservation Commission (1937)
- IAS prairie preservation plan (1944-1946)
- IAS Conservation Committee endorsed policy to preserve state and county parks and state legislation to protect archaeological sites

From the preceding list, it is obvious there has been no shortage of plans for the protection of natural diversity in Iowa; however, there has been a discouraging lack of successful implementation of these plans. The need for an effective program of natural resource protection was recognized. The state still had sizable areas with natural character. Aikman (1949) summarized how the Academy could help implement conservation efforts, but the impetus was gone. By 1950, those totally committed academic leaders' careers had come to an end and we were entering the contemporary era.

Undoubtedly, the depression years, followed by World War II, had a great impact on Iowa natural historians and their ability to be involved in problems of natural heritage preservation.

### THE CONTEMPORARY ERA (1950-PRESENT)

This era, roughly from 1950 to present, seems to be divided into three periods; an organizational period, a period of inaction and a period of renewed activity.

#### *The Organizational Period (1950-1965).*

During this time some significant events occurred, centered on the founding of new agencies or organizations. These included the following:

- 1) Establishment of the Iowa Teachers Conservation Camp (1950). This was a cooperative venture of the State Department of Instruction, State Conservation Commission and the University of Northern Iowa and was formed and operated at a CCC camp at Springbrook State Park.
- 2) Establishment of the county conservation board program. In 1955 the Iowa legislature passed a bill allowing each county to establish a county conservation board, to be funded within a specified millage rate to encourage the orderly development and conservation of natural resources (see Ennis, 1962, 1964 for history and purposes). This local form of conservation has been highly successful. Presently, 98 of Iowa's 99 counties have such an agency and 66,526 acres (26,934 ha) of conservation lands have been purchased.
- 3) The Iowa flora project was begun (1950's). Robert F. Thome, University of Iowa, supervised students in surveying the vegetation of Iowa. Nearly the entire state was covered in a series of studies designed to culminate in a book on the distribution of Iowa vascular plants.
- 4) Iowa Natural Resources Council formed (1957). This state agency

performs regulatory and planning functions pertaining to water resources and management.

5) Directory of Conservation Commission points out conservation needs in Iowa (Stiles, 1957).

6) Iowa Conservation Commission employs the Wildlife Management Institute to prepare a new ten-year conservation plan (1958).

7) Conservation section organized in the Iowa Academy of Science (1961).

8) J. N. 'Ding' Darling Foundation organized (1962). This organization was founded to carry out many of the ideals formulated by the famous conservationist and cartoonist. These include promotion of the Lewis and Clark Trail, assistance to the Izaak Walton League, and financial assistance to Ducks Unlimited and the national refuge system (Lendt, 1979).

9) Plan advanced to guide future action in preserving natural areas (see Smith, 1963, for details).

10) Establishment of an Iowa chapter of the Nature Conservancy (1963). This national, non-profit organization has become a significant factor throughout the United States in purchasing and retaining natural areas (see Burk, 1973, for history and holdings of the Iowa chapter). To date, approximately 1100 acres (445 ha) have been protected in Iowa.

11) Appointment of the Governor's advisory committee of conservation of outdoor resources (1964). This 24-member panel was asked to advise the governor on the total spectrum of outdoor recreation.

12) Establishment of the State Preserves Advisory Board (1965). This board, which recommends to the Governor significant sites which should be formally dedicated, was a direct outgrowth of the conservation committee of the Iowa Academy of Science. To date, 56 preserves, encompassing an area of approximately 4700 acres (1900 ha) have been dedicated (see Cawley, 1969, for history and purposes of the board).

Once again all of the necessary organizational depth and planning to make significant progress in preservation of natural areas was available, but implementation apparently languished. Perhaps natural historians needed time to reflect on recent gains in organizational strength. Either way, the state seemed to enter a period of relative inaction insofar as our natural heritage was concerned.

#### *Period of Inaction (1965-1975).*

There seems to be a low point in preservation and conservation activities from approximately 1965 to 1975, although the Iowa Chapter of the Sierra Club was founded during this period. The Conservation Committee and the Biological Survey Committee of the Iowa Academy of Science were not active and were dropped as standing committees. Any formal interaction between the State Conservation Commission and Iowa Academy of Science stopped and the state preserves system and the Iowa Chapter of the Nature Conservancy did not grow as rapidly as hoped.

New interest developed in the mid-1970's, perhaps as a result of the environmental awareness where ecology clubs and events such as Earth Day arose. Or, perhaps because new people with concerns, time and energy were becoming involved with resource protection. Whatever the cause, the mid-1970's ushered in a period of renewed activity.

#### *Period of Renewed Activity (1975-Present).*

During approximately the past 5 years, a series of encouraging events have occurred; some are listed and annotated in following paragraphs:

- 1) 'Open Space' Law passed. This law established a fund from which the Conservation Commission could purchase natural areas. This has been an eminently successful program, with over 16,000 acres (6478 ha) purchased.
- 2) Endangered Species protection. In late December, 1973, the federal government passed the federal Endangered Species law. In 1975 the Iowa legislature passed the Iowa Endangered Species Act.

3) County Conservation Board programs were expanded and professionalized, with naturalists added to the local staffs in numerous counties.

4) State Preserves Advisory Board activities expanded and a closer relationship to the State Conservation Commission established (1975).

5) Non-game biologist hired by the State Conservation Commission (1976).

6) 'Foray' concept established (1977). The foray concept, originally suggested for Iowa by Petersen (1971), was established when the State Preserves Advisory Board began to sponsor a field study in a different county each year. To date, Iowa natural historians have conducted these studies in Fremont county in 1977, Allamakee county in 1978, Lee county in 1979, and Lyon county in 1980. Numerous articles have summarized the findings (e.g., Roosa, 1977; Peck, et al, 1978, 1980; Peterson, 1979).

7) Protected Waters Program funded by the Iowa legislature and executed by the State Conservation Commission (1978). This program is an attempt to protect the best examples of remaining streams, stream corridors and wetlands.

8) Iowa Academy of Science conservation committee re-established on a trial basis (1979).

9) House file 2576 passed the Iowa House of Representatives; this would give private landowners a tax incentive for saving natural areas (awaiting further legislative action).

10) Presidential Order (Executive Order 11990) issued to protect wetlands (1979).

11) Iowa Natural Heritage Foundation formed to assist all levels of government and private entities in natural area protection (1979).

12) A full-time director of the Iowa Chapter of the Nature Conservancy hired (1980). The Iowa chapter now has 2500 members.

13) Endangered species research in Iowa funded under sections 6 and 15 of the federal Endangered Species Act (1980).

14) Natural area inventory of Iowa planned by the State Conservation Commission in conjunction with the Iowa Chapter of the Nature Conservancy (1980). This program would identify and locate remaining natural areas, habitats of endangered species and significant geological features, collect information on them to be stored in computers for use during land-use planning and to facilitate acquisition programs for governmental agencies.

15) Professional organization of natural historians formed (1980). This organization was formed 'to advance the study and preservation of Iowa's natural history'.

However encouraging the past few years have been, there remains a sizeable list of future needs to challenge our abilities.

### FUTURE CHALLENGES

Iowa still lags behind some nearby states in knowledge of its natural history. Reasons for this are complex, but a lower population density and thus a lower tax base contributed to the lack of funding of natural history projects. A 'now or never' situation is rapidly approaching and some of the needs which I perceive are described in the following paragraphs:

1) An expanded land acquisition program by the State of Iowa. Publicly owned land in Iowa totals slightly over 500,000 acres (202,429 ha). Of these, 315,267 acres (127,638 ha) are state-owned; 121,429 acres (49,175 ha) are federally owned, and 66,526 acres (26,934 ha) are county-owned (figures from the 1978 State Comprehensive Outdoor Recreation Plan, listing those lands classed as 'recreational' and does not include highways, etc.). This amounts to approximately 1.4% of our state which is available for recreation, wildlife habitat, endangered species protection, areas for solitude, scientific areas, etc. Many feel this is inadequate.

2) An inventory of our natural history base, including a search for remaining natural areas, a state-wide fish survey, a mussel survey, a state-wide gastropod survey, and checklists of Iowa vascular plants, bryophytes, lichens, and insects. Certain species of snails, birds and fish act as accurate barometers for environmental change. Yet we do not have up-to-date studies on any of these groups.

3) Land-use legislation. The day is past where only the owners are affected by what they do with their land. If we are to have planned growth, it must be tied to land-use legislation.

4) A Biological Survey or its equivalent. Some nearby states, most notably Illinois and Kansas, have a Biological Survey or Natural History Survey to promulgate basic research of a continuing nature on aspects of the state's natural history. Iowa needs such an agency, the mechanics of which could be set in motion in one of two ways: 1) attachment of a biological survey arm to the Iowa Geological Survey, or 2) realignment of the State Conservation Commission to include a Natural History section, such as the Departments of Conservation in Illinois and Missouri have recently done. Early in the century the Iowa Geological Survey supported and promoted some outstanding natural history work, for example, Rodents of Iowa (Stoner, 1918); The Raptorial Birds of Iowa (Bailey, 1918); Weed Flora of Iowa (Pammel, et al. 1926); Grasses of Iowa (Pammel, et al, 1901, 1905).

5) Development of River Corridor Management plans. Many Iowa river corridors need management plans. A model for such planning exists in the plan done by the Nature Conservancy and the Bureau of Outdoor Recreation for the Blackfoot river in Montana (1976). In Iowa, the Upper Iowa, and portions of the Wapsipinicon, Cedar, Iowa, Maquoketa and Middle Raccoon rivers have stretches in fairly natural condition which should be protected by careful planning. This is an opportunity for such organizations as the Nature Conservancy, Sierra Club, and Izaak Walton League to work with each other and with state agencies to develop such protection plans.

6) Publicity on Iowa's diminishing natural heritage. Perhaps an educational television series focusing on environmental issues facing Iowa and Iowans would best meet this problem.

7) Monograph series. Many Iowa groups of organisms are in need of a thorough monographic treatment; examples are certain groups of birds, numerous plant families, land snails, reptiles and amphibians, mosses, fungi, and certain orders of insects.

8) An expanded non-game and endangered species program. Interest in these topics is growing daily. Non-consumptive resource users need a method to lend financial support to programs of this type.

9) A coalition of concerned environmental organizations. The collective voice of all environmental organizations (Audubon Societies, Izaak Walton League, Nature Conservancy, Sierra Club, etc.) might make a significant impact that is impossible when each speaks alone.

### EPILOGUE

The foregoing has been a personal view of the history of preservation and conservation attempts in Iowa. For a thorough review of the history of the Iowa Academy of Science, including some of these same concerns, I recommend Swisher (1931) and especially Hanson (1975).

Iowa's flora and fauna are declining; animals, plants, and community types have been forever lost. Bishop, Bowles, Christiansen, Dinsmore, Menzel, Smith and Thomson, all specialists who have spent much of their lives studying their subjects, have sounded the alarm in preceding papers. The prairie is nearly a thing of the past, the wetlands are only a trace of what they once were. Numerous mammals are either gone or teetering on the brink; the fish, which once abounded in prairie streams, face great threats. Many sensitive species of birds are now missing from our state. We must heed the warning of these specialists.

Perhaps we should ask ourselves some personal questions. Do we

believe we have enough parks, preserves, prairies, wetlands and woodlands for all Iowa citizens, present and future? Are there sufficient native habitats for the flora and fauna to provide for the aesthetic and resource needs for future Iowans? Do we have sufficient funding and personnel to meet the future needs? Are we content to accept what we have at present as what will be handed down forever to succeeding Iowans? I do not think so. Iowans have enjoyed an unusually high standard of living, due, mainly, to the rich natural resource base. Do we care enough to help insure an equal standard of living for future Iowans? By reflecting on the role of a Hayden, a Macbride, a Pammel or a Shimek in the history of Iowa, it becomes clear that one person can have a great influence in natural heritage preservation. This was once true and I feel it is true today.

The Iowa Academy of Science was once a potent driving force in helping protect Iowa's natural heritage. In the past 2 decades it has not been a leader. The expertise of the collective membership of the Academy makes it the premiere scientific organization in Iowa. I hope it will again strive for leadership in the preservation of our natural heritage. Who among us will lead?

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