

## Chapter 5. Environmental Consequences

### Introduction

1 This “Environmental Consequences” chapter  
 2 analyzes both beneficial and adverse impacts  
 3 that would result from implementing any  
 4 of the alternatives considered in this CLR/  
 5 EA. This chapter also includes methods used  
 6 to analyze direct, indirect, and cumulative  
 7 impacts. Impacts are evaluated based on  
 8 context, duration, intensity, and whether  
 9 they are direct, indirect, or cumulative. A  
 10 summary of the environmental consequences  
 11 for each alternative is provided in “Chapter 4:  
 12 Alternatives.” The resource topics presented  
 13 in this chapter and the organization of the  
 14 topics correspond to the resource discussions  
 15 contained in “Chapter 3: Existing Conditions  
 16 and Analysis/Affected Environment.”

17  
 18 This CLR/EA assesses whether significant  
 19 impacts would occur as a result of the  
 20 proposed action or reasonable alternatives,  
 21 resulting in an environmental impact  
 22 statement, or whether a finding of no  
 23 significant impact is the appropriate decision  
 24 document.

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### General Methods

1 This section describes the environmental  
 2 impacts, including direct, indirect, and  
 3 cumulative impacts, and their significance  
 4 for each alternative. Because the actions  
 5 proposed under each alternative are similar  
 6 for each park unit, the impacts analysis  
 7 has been grouped under no action, action  
 8 alternative 1, and action alternative 2 and  
 9 are not broken out individually for each park  
 10 unit. For actions that apply to only one park  
 11 unit, those actions are described individually  
 12 under the appropriate alternative. The  
 13 analysis is based on the assumption that  
 14 the mitigation measures identified in the  
 15 “Mitigation and Best Management Practices”  
 16 section of this CLR/EA would be implemented  
 17 for the action alternatives. Overall, the NPS  
 18 based the impact analyses and conclusions  
 19 on the review of existing literature and park  
 20 studies, information provided by experts  
 21 within the park and other NPS personnel,  
 22 other agencies, professional judgment and  
 23 park staff insights, and public input.

24  
 25 In accordance with CEQ regulations, direct,  
 26 indirect, and cumulative impacts are  
 27 described (40 CFR 1502.16), and the impacts  
 28 are assessed in terms of context and intensity  
 29 (40 CFR 1508.27). Where appropriate,  
 30 mitigating measures for adverse impacts  
 31 are also described and incorporated into the  
 32 evaluation of impacts. The specific methods  
 33 used to assess impacts for each resource may  
 34 vary; therefore, these methodologies are  
 35 described under each impact topic.

36  
 37 The following terms are used in the  
 38 discussion of environmental consequences  
 39 to assess the impact intensity threshold and  
 40 the nature of impacts associated with each  
 41 alternative.

42  
 43 *Type:* Impacts can be beneficial or adverse.  
 44 A beneficial impact is an impact that

1 would result in a positive change in the  
2 condition or appearance of the resource.  
3 An adverse impact is an impact that causes  
4 an unfavorable result to the resource when  
5 compared with existing conditions.

6  
7 *Context:* The context is the significance of an  
8 action must be analyzed in several contexts  
9 such as society as a whole (e.g., human or  
10 national), the affected region, the affected  
11 interests, and the locality. Significance varies  
12 with the setting of the proposed action. For  
13 instance, in the case of a site-specific action,  
14 significance would usually depend upon the  
15 impacts in the locale rather than in the world  
16 as a whole. Both short- and long-term impacts  
17 are relevant.

18  
19 *Duration:* The duration of an impact is  
20 analyzed independently for each resource  
21 because impact duration is dependent on  
22 the resource being analyzed. Depending  
23 on the resource, impacts may last for the  
24 implementation period, a single year or  
25 growing season, or longer. Impact duration is  
26 described as short-term or long-term for each  
27 resource. For the purposes of this analysis,  
28 short-term and long-term impacts are defined  
29 for each resource.

30  
31 *Direct and Indirect Impacts:* Impacts can be  
32 direct, indirect, or cumulative. Direct impacts  
33 are caused by an action and occur at the  
34 same time and place as the action. Indirect  
35 impacts are caused by the action and occur  
36 later or farther away, but are still reasonably  
37 foreseeable. Direct and indirect impacts  
38 are considered in this analysis. Cumulative  
39 impacts are discussed in the next section.

40  
41 *Intensity.* Intensity refers to the severity of  
42 the impact. Responsible officials must bear in  
43 mind that more than one agency may make  
44 decisions about partial aspects of a major

1 action. The following should be considered in  
2 evaluating intensity:

3  
4 • Impacts that may be both beneficial and  
5 adverse. A significant impact may exist  
6 even if the federal agency believes that on  
7 balance the impact will be beneficial.

8  
9 • The degree to which the proposed action  
10 affects public health or safety.

11  
12 • Unique characteristics of the geographic  
13 area such as proximity to historic or  
14 cultural resources, park lands, prime  
15 farmlands, wetlands, wild and scenic  
16 rivers, or ecologically critical areas.

17  
18 • The degree to which the impacts on the  
19 quality of the human environment are  
20 likely to be highly controversial.

21  
22 • The degree to which the possible impacts  
23 on the human environment are highly  
24 uncertain or involve unique or unknown  
25 risks.

26  
27 • The degree to which the action may  
28 establish a precedent for future actions  
29 with significant impacts or represents  
30 a decision in principle about a future  
31 consideration.

32  
33 • Whether the action is related to other  
34 actions with individually insignificant  
35 but cumulatively significant impacts.  
36 Significance exists if it is reasonable to  
37 anticipate a cumulatively significant  
38 impact on the environment. Significance  
39 cannot be avoided by terming an action  
40 temporary or by breaking it down into  
41 small parts.

42  
43 • The degree to which the action may  
44 adversely affect districts, sites, highways,

## Cumulative Impacts

1 structures, or objects listed in, or eligible  
2 for listing in, the National Register, or  
3 that may cause loss or destruction of  
4 significant scientific, cultural, or historical  
5 resources.

- 6
- 7 • The degree to which the action may  
8 adversely affect an endangered or  
9 threatened species or its habitat that has  
10 been determined to be critical under the  
11 Endangered Species Act of 1973.
- 12
- 13 • Whether the action threatens a  
14 violation of federal, state, or local law or  
15 requirements imposed for the protection  
16 of the environment.
- 17

18 For each impact topic analyzed, an  
19 assessment of the potential significance of the  
20 impacts according to context and intensity  
21 is provided in the “Conclusion” section that  
22 follows the discussion of the impacts under  
23 each alternative. Resource-specific context  
24 is presented in the “Methodology” section  
25 under each resource and applies across all  
26 alternatives. The intensity of the impacts is  
27 presented using the relevant factors from the  
28 list above. Intensity factors that do not apply  
29 to a given resource and/or alternative are not  
30 discussed.

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1 Cumulative impacts (or effects) are defined  
2 as “the impact on the environment that  
3 results from the incremental impact of the  
4 action when added to other past, present,  
5 and reasonably foreseeable future actions,  
6 regardless of what agency (federal or  
7 nonfederal) or person undertakes such other  
8 actions” (40 CFR 1508.7). Cumulative impacts  
9 can result from individually minor, but  
10 collectively significant, actions taking place  
11 over a period of time. The CEQ regulations  
12 that implement NEPA require assessment of  
13 cumulative impacts in the decision-making  
14 process for federal projects.

15

### 16 **Methods for Assessing Cumulative Impacts**

17 Cumulative impacts were determined  
18 by combining the impacts of each action  
19 alternative and the no action alternative  
20 with other past, present, and reasonably  
21 foreseeable future actions. Past actions  
22 include activities that influenced and affected  
23 the current conditions of the environment  
24 near the project area. Ongoing or reasonably  
25 foreseeable future projects near the park or  
26 the surrounding region might contribute to  
27 cumulative impacts. The geographic scope of  
28 the analysis includes actions in the project  
29 area as well as other actions in the park or  
30 surrounding lands, including Ross County  
31 and adjoining states, where overlapping  
32 resource impacts are possible. The temporal  
33 scope includes actions within a range of  
34 approximately 10 years.

35

36 Once identified, past, present, and reasonably  
37 foreseeable future actions were then assessed  
38 in conjunction with the impacts of the  
39 alternatives to determine if they would have  
40 any added adverse or beneficial impacts  
41 on a particular resource, park operations,  
42 or visitor use. The impacts of past, present,  
43 and reasonably foreseeable future actions  
44 vary for each resource. Cumulative impacts

## Cultural Resources

1 are considered for each alternative and are  
2 presented in the environmental consequences  
3 discussion for each impact topic

4

### 5 **Past, Present, and Reasonably Foreseeable** 6 **Future Actions**

7 The following past, present, and reasonably  
8 foreseeable future actions are relevant to  
9 the analysis of the impacts on resources and  
10 values that would result from the alternatives  
11 and are based on actions described in the  
12 park's GMP (NPS 1997) and from internal  
13 scoping. Past, present, and reasonably  
14 foreseeable management of the earthwork  
15 complexes and buildings by the NPS includes  
16 constructing a visitor trail, overlook, and  
17 parking area at Hopeton Earthworks. Mowing  
18 vegetation at the earthwork complexes  
19 would continue. The existing overlook at  
20 the Hopewell Mound Group is planned to be  
21 moved in the future. Archeological research  
22 would continue at the park. Other reasonable  
23 foreseeable future actions include a power  
24 line project at Mound City that would replace  
25 the existing poles with new poles along the  
26 western boundary. In addition, a substation  
27 located 1/4 mile south of Mound City is  
28 planned to be rebuilt to be five times larger.

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### 1 Methodology

2 Potential effects on cultural resources  
3 were evaluated based on the presence and  
4 condition of existing above- and below-grade  
5 features within the park units as described  
6 in "Chapter 3: Affected Environment."  
7 Determination of impacts was based on the  
8 expected disturbance to cultural resources,  
9 professional judgment, and experience with  
10 previous projects.

11

### 12 No Action Alternative

#### 13 *Direct and Indirect Impacts of the Alternative*

14 Under the no action alternative, there would  
15 be minimal impacts on cultural resources at  
16 all five park units. The present level of use,  
17 management, maintenance, and operations  
18 would continue, including continued use of  
19 the existing visitor center, administrative/  
20 maintenance complex, and shelter at the  
21 Mound City Group; and maintenance of the  
22 archeological features as mown lawn with  
23 woodland perimeter. Failure to remove  
24 hazardous trees and woody vegetation may  
25 affect the integrity of buried archeological  
26 deposits through bioturbation from the  
27 root systems. Haying would continue in  
28 the northern portion of the Mound City  
29 Group which may also affect the integrity of  
30 buried archeological deposits. The no action  
31 alternative would have a local long-term  
32 minor adverse impact on cultural resources.

33

### 34 Cumulative Impacts

35 Past and ongoing NPS vegetation  
36 management, such as mowing, has  
37 maintained, but not improved, the  
38 archeological landscape within the park units.  
39 As currently managed, the vegetation does  
40 not enhance the visitor's understanding of  
41 the archeological features. Future vegetation  
42 management that does not consider  
43 bioturbation would continue to adversely  
44 affect the archeological landscape. Minimal

1 development of parking areas and visitor  
2 facilities at the Hopewell Mound Group and  
3 Hopeton Earthworks could impact existing  
4 and unknown cultural resources in those  
5 areas. When combined with past, present, and  
6 reasonably foreseeable future actions, the no  
7 action alternative would have the potential  
8 for local long-term minor adverse cumulative  
9 effects on cultural resources.

10

#### 11 Conclusions

12 The no action alternative would result in local  
13 minor adverse impacts on cultural resources  
14 if measures to identify and ensure the  
15 preservation of historic properties continue.  
16 To mitigate adverse impacts on cultural  
17 resources, survey, evaluative testing, or  
18 additional geophysical work may be required.  
19 This work would likely be conducted as part  
20 of a memorandum of agreement (MOA) or  
21 programmatic agreement (PA) between the  
22 NPS, Ohio State Historic Preservation Office  
23 (SHPO), and any interested American Indian  
24 tribes.

25

#### 26 Action Alternative 1

##### 27 Direct and Indirect Impacts of the Alternative

28 Under action alternative 1 at all five park  
29 units, preservation measures of above- and  
30 below-grade archeological features would  
31 be implemented. Removal of trees and other  
32 woody vegetation would occur to diminish  
33 impacts on the archeological features from  
34 bioturbation from the root systems. Tree  
35 removal could have direct impacts on buried  
36 archeological features. New circulation  
37 including trails, bridges, overlooks, and  
38 parking areas would be constructed.  
39 Vegetation would be removed and shallow  
40 subsurface disturbance would occur during  
41 construction of circulation features, which  
42 could affect subsurface cultural deposits. The  
43 removal of non-contributing features, trails,  
44 utility lines, or buildings would improve

1 the setting and feeling of the archeological  
2 landscape.

3

4 Action alternative 1 includes specific activities  
5 at three park units. At the Mound City Group,  
6 areas currently not owned by the park  
7 but within and adjacent to the authorized  
8 park unit boundary would be purchased;  
9 further evaluation would occur at three  
10 non-contributing, but potentially significant,  
11 features; non-contributing features to the  
12 archeological landscape would be preserved;  
13 and expansion of curatorial and educational  
14 spaces are proposed. Preservation of the  
15 Mission 66 Visitor Center, CCC/WPA features,  
16 and the remains of Camp Sherman would  
17 result in a long-term beneficial impact on  
18 historic resources within the park unit by  
19 expanding knowledge of the use of the site  
20 outside of its period of significance but  
21 could result in long-term minor adverse  
22 impacts to the archeological landscape.  
23 The continued and expanded use of non-  
24 contributing features would have no effect on  
25 cultural resources. Purchasing areas within  
26 or adjacent to the park unit boundary would  
27 result in a long term beneficial impact to  
28 cultural resources.

29

30 Action alternative 1 at the Hopewell Mound  
31 Group includes the conversion of a historic  
32 barn for a new park use. Preservation of the  
33 barn would have a beneficial impact, but  
34 modern upgrades may result in an adverse  
35 impact on cultural resources.

36

37 Action alternative 1 also considers the  
38 evaluation of two non-contributing features  
39 at Seip Earthworks, the Blackstone House,  
40 and the Fish Camp buildings. Evaluation of  
41 the buildings, if found to be significant, would  
42 have a beneficial impact through long-term  
43 preservation and by expanding knowledge  
44 of the use of the site outside of its period

1 of significance, but could have a long-term  
2 minor adverse impact on the archeological  
3 landscape.

4

#### 5 Cumulative Impacts

6 Past and ongoing NPS management  
7 has maintained, but not improved, the  
8 archeological landscape within the park.  
9 Reasonably foreseeable future actions  
10 include continuing vegetation management  
11 such as mowing, removing hazardous trees  
12 and woody vegetation, establishing new  
13 trails and visitor facilities, and removing  
14 non-contributing and nonsignificant  
15 features. Ground disturbances under action  
16 alternative 1 could adversely affect the  
17 integrity of known and unknown historic  
18 properties. The removal of non-contributing  
19 roads, utility lines and poles, and fencerow  
20 vegetation would improve the setting and  
21 feeling of the archeological landscape. When  
22 combined with past, present, and reasonably  
23 foreseeable future actions, action alternative  
24 1 would have the potential for both long-  
25 term beneficial and local short-term adverse  
26 cumulative effects on historic properties.

27

#### 28 Conclusions

29 Action alternative 1 would have local short-  
30 term and long-term minor adverse effects on  
31 cultural resources from removal of vegetation,  
32 construction of trails and parking areas, and  
33 preservation of historic structures that are  
34 not within the parks period of significance.  
35 Beneficial effects would occur from the  
36 removal of non-contributing features and the  
37 restoration of the setting and feeling of the  
38 archeological landscape during the period  
39 of significance. Cumulative effects would be  
40 local, short-term and long-term, and adverse  
41 and long-term and beneficial. To mitigate  
42 adverse impacts on cultural resources, survey,  
43 evaluative testing, or additional geophysical  
44 work may be required. This work would likely  
45 be conducted as part of a MOA or PA between  
46 the NPS, SHPO, and any interested American  
47 Indian tribes.

#### 1 Action Alternative 2

##### 2 Direct and Indirect Impacts of the Alternative

3 Activities under action alternative 2 that  
4 would differ from action alternative 1  
5 includes enhancing the archeological features  
6 through vegetation management, non-  
7 permanent markings, and rehabilitating  
8 earthen walls or mounds; creation of an  
9 interconnected water route between the park  
10 units; construction of additional trails, roads,  
11 parking areas, and interpretive waysides;  
12 and removal of additional non-contributing  
13 features that adversely effect the setting and  
14 feeling of the archeological landscape. Action  
15 alternative 2 would have the same direct  
16 and indirect adverse and beneficial impacts  
17 on cultural resources as action alternative 1,  
18 with the exception that there would be the  
19 potential for additional local adverse impacts  
20 from the removal of additional vegetation for  
21 marking the archeological features, removal  
22 of all non-contributing resources that impact  
23 the contributing archeological resources  
24 regardless of eligibility; rehabilitation of  
25 the archeological features, construction of  
26 additional visitor facilities, and creation of  
27 an interconnected water route between the  
28 park units. These actions have the potential  
29 to alter above- and below-grade features  
30 at the park units and would have a local  
31 short-term minor adverse impact on cultural  
32 resources. Action alternative 2 would also  
33 include the removal of non-contributing  
34 features including buildings, roads, and  
35 parking areas. Removing potentially eligible  
36 but non-contributing historic resources  
37 that impact the contributing resources  
38 would have an adverse effect to the non-  
39 contributing resources but a beneficial effect  
40 to the contributing resources by improving  
41 the setting and feeling of the archeological  
42 landscape. Retaining significant features  
43 that are noncontributing but do not detract  
44 from the archaeological landscape would  
45 have a beneficial effect to these resources.  
46 Removing buildings and structures that



1 are not significant nor contributing to the  
 2 archaeological landscape would have a long  
 3 term beneficial effect by improving the setting  
 4 and feeling. The restoration of these areas to  
 5 native vegetation communities would have  
 6 a local short-term minor adverse impact  
 7 on below-grade archeological deposits and  
 8 a long-term beneficial effect on cultural  
 9 resources from improving the setting and  
 10 feeling of the archeological landscape.  
 11 Rehabilitating original archeological features  
 12 could be a potential adverse effect as the  
 13 addition of fill to the mounds could impact  
 14 buried cultural features through compaction.  
 15 Rehabilitating archeological features at  
 16 Mound City Group would result in a long-term  
 17 negligible impact; all but one of the existing  
 18 features has been previously reconstructed  
 19 and restoration would not result in new  
 20 impacts. The treatment approach of  
 21 preservation instead of rehabilitation at  
 22 Hopeton Earthworks and High Bank Works  
 23 will have a long term beneficial impact. Any  
 24 facilities constructed for the interconnected  
 25 water route may have the potential to impact  
 26 below-grade cultural features. Overall,  
 27 action alternative 2 would have a long-term  
 28 beneficial effect and a local short-term minor  
 29 adverse impact on cultural resources.

### 31 *Cumulative Impacts*

32 Reasonably foreseeable future actions  
 33 include continuing vegetation management  
 34 techniques such as thinning, mowing,  
 35 removing hazardous trees and woody  
 36 vegetation, establishing new trails and  
 37 visitor facilities, and removing existing non-  
 38 contributing nonsignificant features. Action  
 39 alternative 2 would have the same cumulative  
 40 impacts as those for action alternative 1,  
 41 which would be local, minor, and adverse as  
 42 well as long-term and beneficial.

### 44 *Conclusions*

45 Action alternative 2 would have local short-  
 46 and long-term adverse impacts on cultural

1 resources from removal of vegetation,  
 2 rehabilitation and delineation of archeological  
 3 features, and construction of trails and  
 4 parking areas. Beneficial effects would  
 5 occur from the removal of non-contributing  
 6 features and restoration to native vegetation  
 7 communities. The impacts on cultural  
 8 resources from action alternative 2 would  
 9 be minor to moderate because the proposed  
 10 activities, specifically the rehabilitation of  
 11 some of the archeological features, would  
 12 alter the cultural features within the park.  
 13 Effects on the archeological landscape  
 14 would be beneficial from the continued  
 15 enhancement of the archeological landscape.  
 16 To mitigate adverse impacts on cultural  
 17 resources, survey, evaluative testing, or  
 18 additional geophysical work may be required.  
 19 This work would likely be conducted as part  
 20 of a MOA or PA between the NPS, SHPO, and  
 21 interested American Indian tribes.

## Vegetation

### 1 Methodology

2 Potential impacts on vegetation were  
3 evaluated based on existing vegetation and  
4 natural or human-based processes sustaining  
5 them within the park as described in “Chapter  
6 3: Affected Environment.” Predictions  
7 about impacts were based on the expected  
8 disturbance to vegetation communities,  
9 professional judgment, and experience with  
10 previous projects. Short-term impacts are  
11 those where the vegetation would recover in  
12 less than one year and long-term impacts are  
13 those that would take more than one year for  
14 the vegetation to recover. Resource-specific  
15 context for assessing the impacts of the  
16 alternatives on vegetation includes:

- 17
- 18 • The contribution of vegetation to the  
19 visitor experience within the park  
20 and the visitor’s understanding of the  
21 archeological features.  
22
- 23 • Potential for establishing proposed  
24 vegetation types considering existing and  
25 future geographic, climatic, and other  
26 conditions.  
27
- 28 • The potential short-term and long-term  
29 impacts on the overall health of the  
30 ecosystems of the park and surrounding  
31 lands.  
32

### 33 No Action Alternative

#### 34 Direct and Indirect Impacts of the Alternative

35 The no action alternative would have  
36 minimal impacts on vegetation at the park  
37 units. The present level of use, management,  
38 maintenance, and operations would continue,  
39 including removal of nonnative species and  
40 restoration of native species, resulting in  
41 a beneficial effect on vegetation. Mowing  
42 operations would also continue, resulting in  
43 a minor adverse impact on vegetation from  
44 the reduction in native species and mature

1 growth. Haying some areas will be necessary  
2 in the near future as the only practical  
3 means to protect archaeological resources  
4 and visitor experiences from encroachment  
5 by woody plants and exotic invasive weeds.  
6 Overall, the no action alternative would have  
7 a long-term beneficial and long-term minor  
8 adverse impact on vegetation.  
9

### 10 Cumulative Impacts

11 Past and ongoing management practices,  
12 such as mowing and haying vegetation,  
13 has resulted in minor adverse impacts on  
14 vegetation because mowing and haying  
15 reduces native vegetation cover and prevents  
16 vegetation from maturing. The proposed  
17 parking area, overlook, and trails at Hopeton  
18 Earthworks would reduce the vegetation  
19 communities in those areas. The combined  
20 effects of past, present, and reasonably  
21 foreseeable future projects would result in  
22 local long-term minor adverse impacts on  
23 vegetation. The overall cumulative impacts  
24 on vegetation from the no action alternative,  
25 combined with past, present, and reasonably  
26 foreseeable future actions, would be local,  
27 long-term, minor, and adverse from mowing  
28 operations and development at Hopeton  
29 Earthworks and long-term and beneficial  
30 from restoration of native species.  
31

### 32 Conclusions

33 The no action alternative would have local  
34 long-term beneficial and local long-term  
35 minor adverse impacts on vegetation.  
36 Cumulative impacts would be local, long-  
37 term, minor, and adverse. The impacts on  
38 vegetation from the no action alternative  
39 would not be significant because the impacts  
40 would not appreciably alter the vegetation  
41 communities within the park.  
42



1 Action Alternative 1

2 Direct and Indirect Impacts of the Alternative

3 Under action alternative 1, the vegetation at  
4 the earthwork complexes would be altered  
5 to allow for improved interpretation of the  
6 earthwork complexes. Removal of trees  
7 and other woody vegetation would occur  
8 in certain locations to enhance the visitor's  
9 understanding, provide trails to the river, and  
10 open the views. Other vegetation would be  
11 removed for the establishment of trails and  
12 parking areas at the earthwork complexes.  
13 These actions would alter the vegetation  
14 communities at the earthwork complexes  
15 and reduce overall vegetative cover in  
16 localized areas. Removal of invasive species  
17 would improve vegetation communities at  
18 the park units. Removal of non-contributing  
19 features such as roads, trails, or utility lines  
20 would allow for an increase in vegetation  
21 communities after the areas are revegetated.  
22 Construction activities would be confined to  
23 the smallest area necessary to complete the  
24 work and all areas of disturbed vegetation  
25 would be re-seeded following construction.  
26 Infestation and spread of invasive exotic  
27 plants is possible. Weeds frequently invade  
28 disturbed ground where they are easily  
29 established and outcompete native species if  
30 left unchecked. Implementing weed-control  
31 BMPs would minimize the potential for weed  
32 establishment and long-term impacts. Overall,  
33 action alternative 1 would have local long-  
34 term minor adverse impacts on vegetation  
35 from construction of trails and parking areas.  
36 Restoration actions that increase vegetation  
37 cover at the park units would have long-term  
38 beneficial effects on vegetation.

39

40 Cumulative Impacts

41 Past and ongoing management practices  
42 such as mowing and haying vegetation has  
43 altered the vegetation communities and  
44 reduced the native vegetation. The proposed

1 parking area, overlook, and trails at Hopeton  
2 Earthworks would also reduce vegetation at  
3 the park unit. The combined effects of past,  
4 present, and reasonably foreseeable future  
5 actions would result in local long-term minor  
6 adverse impacts on vegetation. The overall  
7 cumulative impacts on vegetation from action  
8 alternative 1, combined with past, present,  
9 and reasonably foreseeable future actions,  
10 would be local, long-term, minor, and adverse.

11

12 Conclusions

13 Action alternative 1 would have local long-  
14 term minor adverse impacts on vegetation  
15 from removal of vegetation and reduction  
16 of vegetation from construction of trails and  
17 parking areas. Beneficial effects on vegetation  
18 from removal of non-contributing features  
19 and restoration to native communities would  
20 be long-term. Cumulative impacts would be  
21 local, long-term, minor, and adverse. The  
22 impacts on vegetation from action alternative  
23 1 would not be significant because the  
24 impacts would not appreciably alter the  
25 vegetation communities within the park.

26

27 Action Alternative 2

28 Direct and Indirect Impacts of the Alternative

29 Action alternative 2 would have the same  
30 direct and indirect adverse and beneficial  
31 impacts on vegetation as action alternative  
32 1, except there would be slight additional  
33 adverse impacts from constructing additional  
34 trails and creating an interconnected water  
35 route between the park units. These actions  
36 would have a local short-term and long-  
37 term minor adverse impact on vegetation.  
38 Action alternative 2 would also include  
39 removal of non-contributing features  
40 including buildings, roads, and parking areas.  
41 The restoration of these areas with native  
42 vegetation communities would have a long-  
43 term beneficial effect on vegetation. Overall,  
44 action alternative 2 would have a long-term

1 beneficial effect and a local long-term minor  
2 adverse impact on vegetation.

3

#### 4 Cumulative Impacts

5 Action alternative 2 would have the same  
6 cumulative impacts as those for action  
7 alternative 1, which would be local, minor,  
8 and adverse as well as beneficial.

9

#### 10 Conclusions

11 Action alternative 2 would have local long-  
12 term minor adverse impacts on vegetation  
13 from removal of vegetation and construction  
14 of trails and parking areas. Beneficial effects  
15 from removal of non-contributing features  
16 and restoration to native communities would  
17 be long-term. Cumulative impacts would  
18 be local, long-term, minor, and adverse and  
19 long-term and beneficial. The impacts on  
20 vegetation from action alternative 2 would  
21 not be significant because the impacts  
22 would not appreciably alter the vegetation  
23 communities within the park.

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## Wildlife

### 1 Methodology

2 Potential impacts on wildlife are evaluated  
3 based on native species, their habitats, and  
4 the natural processes sustaining them within  
5 the park, as described in “Chapter 3: Affected  
6 Environment.” The NPS Organic Act, which  
7 directs parks to conserve wildlife unimpaired  
8 for future generations, is interpreted to mean  
9 that native animal life should be protected  
10 and perpetuated as part of the park’s natural  
11 ecosystem. Natural processes are relied on  
12 to control populations of native species to  
13 the greatest extent possible; otherwise, they  
14 are protected from harvest, harassment,  
15 or harm by human activities. According to  
16 NPS Management Policies 2006, restoration  
17 of native species is a high priority (section  
18 4.1). Management goals for wildlife include  
19 maintaining components and processes  
20 of naturally evolving park ecosystems,  
21 including natural abundance, diversity, and  
22 the ecological integrity of plants and animals.  
23 Short-term impacts on wildlife would last less  
24 than one year, while long-term impacts would  
25 last more than one year.

26

27 The resource-specific context for assessing  
28 impacts of the alternatives on wildlife  
29 includes:

30

31 • The contribution of wildlife to visitor  
32 experience within the park.

33

34 • The impacts of changes in vegetation  
35 or other alterations to the park units on  
36 wildlife, their habitats, and the natural  
37 processes sustaining them.

38

### 39 No Action Alternative

#### 40 Direct and Indirect Impacts of the Alternative

41 The present level of use, management,  
42 maintenance, and operations would continue.  
43 Parking areas and minimal visitor facilities  
44 would be developed at Hopewell Mound

1 Group and Hopeton Earthworks, which may  
 2 decrease overall habitat for wildlife, although  
 3 wildlife would likely find food sources and  
 4 nesting cover from nearby habitat in the park.  
 5 Overall, the no action alternative would have  
 6 a long-term negligible impact on wildlife  
 7 because of the surrounding habitat present  
 8 and minimal disturbance.

#### 10 Cumulative Impacts

11 Previous and future haying operations will  
 12 continue to have minor adverse impacts to  
 13 wildlife by reducing the cover and dietary  
 14 availability of insects and seeds required by  
 15 grassland bird species. Haying during the  
 16 peak of herpetofauna activity also increases  
 17 the rates of mortality. Prescribed burning as  
 18 a management tool can have a minor adverse  
 19 impact on wildlife by reducing wildlife  
 20 habitat, possible mortality of wildlife, and  
 21 adversely affecting insect populations. The  
 22 intensity of this adverse effect is reduced  
 23 by allowing significant adjacent patches of  
 24 native grassland to remain undisturbed.  
 25 Although other past, present, and reasonably  
 26 foreseeable future actions may have local  
 27 long-term minor adverse impacts on  
 28 wildlife, the no action alternative would have  
 29 negligible impacts on wildlife and, therefore,  
 30 would have a negligible contribution to the  
 31 cumulative impacts of other actions.

#### 33 Conclusions

34 The no action alternative would have  
 35 negligible impacts on wildlife and negligible  
 36 cumulative impacts.

#### 38 Action Alternative 1

##### 39 Direct and Indirect Impacts of the Alternative

40 Under action alternative 1, the vegetation at  
 41 the earthwork complexes would be altered  
 42 to allow for improved interpretation of the  
 43 archeological features. Removal of trees  
 44 and other woody vegetation would occur

1 in certain locations to enhance the visitor's  
 2 understanding, provide trails to the river,  
 3 and open the views. Other vegetation would  
 4 be removed for the establishment of trails or  
 5 parking areas at the earthwork complexes.  
 6 These actions would reduce the overall  
 7 wildlife habitat in the project area. Thinning  
 8 or removing vegetation would directly reduce  
 9 the food source for birds and mammals in the  
 10 park and reduce nesting and roosting cover  
 11 for birds. Since these actions would occur in  
 12 only certain locations, the birds and mammals  
 13 would likely find food sources and nesting  
 14 cover from nearby trees in the park. Removal  
 15 of non-contributing features such as roads,  
 16 trails, and utility lines and restoration with  
 17 native vegetation would increase the amount  
 18 of wildlife habitat and reduce hazards to  
 19 wildlife. Overall, action alternative 1 would  
 20 have a long-term beneficial effect and a local  
 21 long-term direct minor adverse impact on  
 22 wildlife and wildlife habitat.

#### 24 Cumulative Impacts

25 Past, present, and ongoing management  
 26 practices, such as mowing, haying, and  
 27 prescribed burning, has reduced wildlife  
 28 habitat at the park units. The proposed  
 29 parking area, overlook, and trails would also  
 30 reduce wildlife habitat at the park units and  
 31 may result in a net increase in visitor use,  
 32 which could increase disturbance to wildlife.  
 33 The combined effects of past, present, and  
 34 reasonably foreseeable future actions would  
 35 result in local long-term minor adverse  
 36 impacts on wildlife. The overall cumulative  
 37 impacts on wildlife from action alternative 1,  
 38 combined with past, present, and reasonably  
 39 foreseeable future actions, would be local,  
 40 long-term, minor, and adverse with some  
 41 beneficial effects from removal of non-  
 42 contributing features.

1 Conclusions

2 Action alternative 1 would have local long-  
3 term minor adverse impacts on wildlife from  
4 removal of vegetation and construction of  
5 trails and parking areas and beneficial effects  
6 from removal of non-contributing features to  
7 the project area. Cumulative impacts would  
8 be local, long-term, minor, and adverse. The  
9 impacts on wildlife from action alternative 1  
10 would not be significant because the impacts  
11 would not appreciably alter the wildlife  
12 habitat or reduce overall wildlife within the  
13 park.

14

15 Action Alternative 2

16 Direct and Indirect Impacts of the Alternative

17 Action alternative 2 would have similar  
18 direct and indirect impacts on wildlife as  
19 action alternative 1, but potentially could  
20 include removal of additional vegetation  
21 for marking the archeological features,  
22 constructing additional trails, and creating  
23 an interconnected water route between the  
24 park units and may result in a net increase in  
25 visitor use, which could increase disturbance  
26 to wildlife. Action alternative 2 would also  
27 include removal of other non-contributing  
28 features including buildings, roads, and  
29 parking areas, which would increase the  
30 amount of wildlife habitat in the park. Overall,  
31 action alternative 2 would have a long-term  
32 beneficial effect and a local long-term minor  
33 adverse impact on wildlife and wildlife  
34 habitat.

35

36 Cumulative Impacts

37 The past, present, and reasonably foreseeable  
38 future actions and their impacts would be the  
39 same as those for the no action alternative  
40 and action alternative 1. Past, present, and  
41 reasonably foreseeable future actions would  
42 result in local long-term minor adverse  
43 impacts on wildlife. The overall cumulative  
44 impacts on wildlife from action alternative 2,

1 combined with past, present, and reasonably  
2 foreseeable future actions, would be local,  
3 long-term, minor, and adverse and long-term  
4 beneficial.

5

6 Conclusions

7 Action alternative 2 would have local long-  
8 term minor adverse impacts on wildlife  
9 from construction of trails and parking  
10 areas and beneficial effects from removal  
11 of non-contributing features in the project  
12 area. Cumulative impacts would be local,  
13 long-term, minor, and adverse. The impacts  
14 on wildlife from action alternative 2 would  
15 not be significant because the impacts would  
16 not appreciably alter the wildlife habitat or  
17 reduce overall wildlife within the park.

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## Visitor Use and Experience

### 1 Methodology

2 Potential impacts on visitor use and  
3 experience were assessed based on changes  
4 to the existing opportunities and quality  
5 for visitors to enjoy park resources, values,  
6 and amenities. Past interpretive and  
7 administrative planning documents provide  
8 background on changes to visitor experience  
9 over time. For this analysis, visitor use and  
10 experience includes visitor understanding,  
11 satisfaction, and safety, as well as availability  
12 of visitor options. Short-term impacts on  
13 visitor use and experience would last only  
14 during project construction activities,  
15 while long-term impacts would extend  
16 beyond construction activities. Resource-  
17 specific context for assessing impacts of the  
18 alternatives on visitor use and experience  
19 includes:

- 21 • Expectations of visitors to have access to  
22 the park units.
- 24 • The contribution of the trails in the park  
25 units and parking availability in the park  
26 to the visitor experience.
- 28 • The ability of visitors to enjoy a safe  
29 experience in the park.
- 31 • The impacts of construction activities on  
32 the visitor experience.

### 34 No Action Alternative

35 Direct and Indirect Impacts of the Alternative  
36 There would be no change in the fundamental  
37 nature and quality of the visitor use and  
38 experience within the park under the no  
39 action alternative. Access to the park units  
40 would remain the same, with Hopeton  
41 Earthworks and High Bank Works remaining  
42 closed to the public. Visitors would continue  
43 to use the existing trails at the park units.  
44 Non-contributing features would remain

1 in the archeological landscape, potentially  
2 compromising the interpretive goals of the  
3 park units, but in ways visitors would not  
4 likely notice. For these reasons, the no action  
5 alternative would have a local long-term  
6 negligible adverse impact on visitor use and  
7 experience.

### 9 Cumulative Impacts

10 Past actions such as the construction of  
11 roads, recreation and visitor facilities, and  
12 other structures and routine maintenance  
13 activities have had long-term beneficial  
14 effects on visitor use and experience.  
15 Reasonably foreseeable future actions such  
16 as the construction of an overlook, trails, and  
17 parking area at Hopeton Earthworks would  
18 have beneficial effects on visitor use and  
19 experience. The expansion of the substation  
20 near Mound City would have a minor to  
21 moderate adverse impact on visitor use  
22 and experience between Mound City Group  
23 and Hopewell Mound Group. Those effects,  
24 combined with the local short-term negligible  
25 adverse impacts of the no action alternative,  
26 would result in local minor adverse  
27 cumulative impacts and beneficial cumulative  
28 effects.

### 30 Conclusion

31 The no action alternative would have local  
32 long-term negligible adverse impacts on  
33 visitor use and experience because of non-  
34 contributing features in the archeological  
35 landscape and limited access to the park  
36 units. Cumulative impacts of the no action  
37 alternative would be local, minor, and adverse  
38 and beneficial. The impacts on visitor use  
39 from the no action alternative would not be  
40 significant because the impacts would not  
41 appreciably alter these resources from the  
42 existing conditions in the park.

1 Action Alternative 1

2 Direct and Indirect Impacts of the Alternative

3 Visitor use and experience would improve  
4 from action alternative 1 by allowing  
5 limited access to Hopeton Earthworks and  
6 High Bank Works, creating more trails and  
7 parking areas at the park units, improving  
8 the interpretation of the earthwork  
9 complexes, and removing non-contributing  
10 features. Visitor use and experience may be  
11 temporarily impacted by implementation of  
12 these measures and temporary trail closures.  
13 The impacts on visitor use and experience  
14 during construction would be local, short-  
15 term, minor, and adverse. Action alternative  
16 1 would result in long-term beneficial effects  
17 on visitor use and experience because of  
18 increased access to the park units, more  
19 accurate representation of the archeological  
20 landscape, improved interpretation, and  
21 increase in trails, overlooks, and parking  
22 areas.

23  
24 Cumulative Impacts

25 The past, present, and reasonably foreseeable  
26 future actions and their impacts would be the  
27 same as those for the no action alternative.  
28 Past, present, and reasonably foreseeable  
29 future actions would have local long-term  
30 beneficial effects and parkwide short-term  
31 minor adverse cumulative impacts on visitor  
32 use and experience. Those impacts, combined  
33 with the local long-term beneficial effects of  
34 action alternative 1, would result in parkwide  
35 short-term minor adverse cumulative impacts  
36 and long-term beneficial cumulative effects.

37  
38 Conclusion

39 Action alternative 1 would have local short-  
40 term minor adverse impacts on visitor use  
41 and experience during implementation and  
42 long-term beneficial effects because access  
43 to the park units would increase, non-  
44 contributing features in the archeological

1 landscape would be removed, interpretation  
2 would be improved, and additional trails,  
3 overlooks, and parking areas would be  
4 created. When combined with past, present,  
5 and reasonably foreseeable future actions,  
6 action alternative 1 would have local and  
7 park-wide short-term minor adverse  
8 cumulative impacts and long-term beneficial  
9 cumulative effects. The impacts on visitor  
10 use and experience from action alternative 1  
11 would not be significant because the impacts  
12 would be short-term and minor and would  
13 result in overall long-term beneficial effects  
14 on visitor use and experience.

15  
16 Action Alternative 2

17 Direct and Indirect Impacts of the Alternative

18 The activities and impacts of action  
19 alternative 2 would be similar to those of  
20 action alternative 1, except there would be  
21 additional beneficial effects from marking  
22 the archeological features for improved  
23 interpretation, constructing additional trails,  
24 and creating an interconnected water route  
25 open to kayaking and canoing between the  
26 park units. There would be local short-term  
27 minor adverse impacts on visitor use and  
28 experience during implementation of these  
29 activities and long-term beneficial effects.

30  
31 Cumulative Impacts

32 The past, present, and reasonably foreseeable  
33 future actions and their impacts would be the  
34 same as those for the no action alternative  
35 and action alternative 1. Past, present, and  
36 reasonably foreseeable future actions would  
37 have parkwide short-term minor adverse  
38 cumulative impacts on visitor use and  
39 experience and long-term beneficial effects.  
40 Those impacts, combined with the impacts of  
41 action alternative 2, would result in parkwide  
42 minor adverse cumulative impacts and  
43 beneficial cumulative effects over the long-  
44 term.



## Park Operations

### 1 Conclusion

2 Action alternative 2 would have local short-  
3 term minor adverse impacts on visitor use  
4 and experience during implementation and  
5 long-term beneficial effects because access  
6 would increase to the park units, non-  
7 contributing features in the archeological  
8 landscape would be removed, interpretation  
9 would be improved, and there would be  
10 a large increase in trails and connections  
11 between the park units. Action alternative 2  
12 would have local short-term minor adverse  
13 cumulative impacts and beneficial cumulative  
14 effects. The impacts on visitor use and  
15 experience from action alternative 2 would  
16 not be significant because the impacts would  
17 be short-term and minor and would result in  
18 overall beneficial effects on visitor use and  
19 experience.

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### 1 Methodology

2 Impact analyses are based on the current  
3 description of park operations presented  
4 in “Chapter 3: Affected Environment.” Park  
5 operations include the infrastructure, staff,  
6 and maintenance activities used in the  
7 operation of the park to adequately protect  
8 and preserve vital resources and provide for  
9 an effective and safe employee and visitor  
10 experience. This includes interpretation  
11 and education, protection, planning and  
12 resource management, business services,  
13 and facility management. Short-term  
14 impacts on park operations would last only  
15 during implementation activities, while  
16 long-term impacts would extend beyond  
17 implementation activities. Resource-  
18 specific context for assessing impacts of the  
19 alternatives on park operations includes:

20

21 • Parks must operate within the constraints  
22 of the park unit-specific budget and  
23 number of staff positions that have  
24 been allocated by Congress and the NPS  
25 Director’s Office.

26

27 • Park staff are not only responsible for  
28 activities within the park, but must  
29 also provide for an effective and safe  
30 experience and protect resources within  
31 the entire park.

32

33 • Proposed treatments of the park units  
34 must not affect the ability of park staff  
35 to complete maintenance activities and  
36 ensure a safe environment.

37

### 38 No Action Alternative

#### 39 Direct and Indirect Impacts of the Alternative

40 There would be no change in the fundamental  
41 nature of park operations within the park  
42 under the no action alternative. Vegetation  
43 management would remain the same as well  
44 as the amount of trails, parking areas, and

1 other recreation facilities that would continue  
2 to require maintenance. Hopeton Earthworks  
3 and High Bank Works would remain closed  
4 to the public. For these reasons, the no action  
5 alternative would have no impact on park  
6 operations.

#### 8 Cumulative Impacts

9 Although other past, present, and reasonably  
10 foreseeable future actions may have local  
11 long-term minor adverse impacts on park  
12 operations, the no action alternative would  
13 have no impact on park operations and,  
14 therefore, would not contribute to the  
15 cumulative impacts of other actions.

16

#### 17 Conclusion

18 The no action alternative would have  
19 no impacts on park operations and no  
20 cumulative impacts.

21

#### 22 Action Alternative 1

##### 23 Direct and Indirect Impacts of the Alternative

24 Increasing the interpretation of the  
25 earthwork complexes in the park units  
26 through vegetation management, increased  
27 trails through the park units, and removal  
28 of non-contributing features would increase  
29 the park staff's ability to relay interpretive  
30 information about the park units to visitors.  
31 Additional trails would increase maintenance  
32 activities required by park staff. Removal of  
33 non-contributing features would have a short-  
34 term adverse impact on park operations  
35 by displacing facilities. Implementation of  
36 these activities would have a short-term  
37 minor adverse impact on park operations  
38 for managing and overseeing the installation  
39 of trails and other features and removal of  
40 other features. For these reasons, action  
41 alternative 1 would have parkwide long-term  
42 and short-term minor adverse impacts and  
43 parkwide long-term beneficial effects on park  
44 operations.

45

46

#### 1 Cumulative Impacts

2 Past actions such as the construction of  
3 recreation and visitor facilities and other  
4 structures have had long-term minor adverse  
5 impacts on park operations by increasing  
6 the amount of maintenance required.

7 Reasonably foreseeable future actions such  
8 as construction of an overlook, trails, and  
9 parking area at Hopeton Earthworks would  
10 have long-term beneficial and long-term  
11 minor adverse impacts on park operations  
12 by increasing the park staff's ability to relay  
13 interpretive information to visitors and  
14 increasing maintenance requirements.

15

16 Those impacts, combined with the beneficial  
17 and minor adverse impacts of action  
18 alternative 1, would result in parkwide long-  
19 term minor adverse and beneficial cumulative  
20 effects.

21

#### 22 Conclusion

23 Action alternative 1 would have long-term  
24 beneficial impacts on park operations  
25 because the park staff's ability to relay the  
26 interpretation of the earthwork complexes  
27 would increase and the use of native  
28 vegetation for interpretation would decrease  
29 the amount of mowing required. Action  
30 alternative 1 would also have parkwide long-  
31 term and short-term minor adverse impacts  
32 on park operations by increasing the amount  
33 of areas requiring maintenance through  
34 increased trails within the park units. Action  
35 alternative 1 would have parkwide long-term  
36 and short-term minor cumulative adverse  
37 impacts and beneficial cumulative effects. The  
38 parkwide long-term and short-term minor  
39 adverse impacts would not be significant  
40 because the impacts would not require hiring  
41 additional staff and would not affect the  
42 park's ability to provide an effective and safe  
43 experience or to protect natural resources.

44

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46

1 Action Alternative 2

2 The direct and indirect impacts of action  
3 alternative 2 would be the same as those for  
4 action alternative 1, except that constructing  
5 additional trails, a water route, and parking  
6 areas would increase the amount and cost of  
7 maintenance over that for action alternative  
8 1. For these reasons, action alternative 2  
9 would have parkwide long-term beneficial  
10 effects and parkwide long-term minor  
11 adverse impacts on park operations.

12

13 Cumulative Impacts

14 Past, present, and reasonably foreseeable  
15 future actions and their impacts on park  
16 operations would be the same as those  
17 for action alternative 1. Past, present, and  
18 reasonably foreseeable future actions would  
19 have parkwide long-term beneficial effects  
20 and parkwide long-term minor adverse  
21 cumulative impacts on park operations.  
22 Those impacts, combined with the parkwide  
23 long-term beneficial effects and parkwide  
24 long-term minor adverse impacts on park  
25 operations of action alternative 2, would  
26 result in parkwide long-term minor adverse  
27 cumulative impacts and parkwide long-term  
28 beneficial cumulative effects.

29

30 Conclusion

31 The impacts of action alternative 2 on park  
32 operations would be long-term and beneficial  
33 because of increased interpretation the  
34 park staff can relay to visitors, but would  
35 also be parkwide, long-term, minor, and  
36 adverse because of increased maintenance  
37 needs and costs. Action alternative 2 would  
38 have parkwide minor cumulative adverse  
39 impacts and parkwide beneficial cumulative  
40 effects. The parkwide long-term and short-  
41 term minor adverse impacts would not be  
42 significant because the impacts would not  
43 require hiring additional staff and would not  
44 affect the park's ability to provide an effective  
45 and safe experience or to protect natural  
46 resources.

## Visual Resources

### 1 Methodology

2 Potential impacts on visual resources were  
3 evaluated based on changes to the visual  
4 landscape from the visitor's perspective.  
5 Visual resources include the views from  
6 the visitor center, trails, and overlooks at  
7 each park unit, and the overall views of  
8 the mounds and surrounding area. The  
9 geographic project area for evaluating  
10 impacts on scenic resources includes those  
11 portions of the park from which visitors  
12 observe the mounds, archeological landscape,  
13 and scenic features. The archeological  
14 landscape within the park is discussed in  
15 more detail in the "Cultural Resources"  
16 section. Short-term impacts on visual  
17 resources would last less than three years,  
18 while long-term impacts would last more than  
19 three years. The resource-specific context for  
20 assessing impacts of the alternatives on visual  
21 resources includes:

- 22
- 23 • The contribution of visual resources to  
24 the visitor experience within the park.  
25
  - 26 • The contribution of visual resources to  
27 understanding the earthwork complexes  
28 within each park unit.  
29
  - 30 • The impacts of treatments within each  
31 park unit on visual resources.  
32

### 33 No Action Alternative

34 Direct and Indirect Impacts of the Alternative  
35 Minimal changes in the visual character of the  
36 park or individual park units are anticipated  
37 under the no action alternative. Various zones  
38 would be established within each park unit to  
39 direct management within those zones. The  
40 visual aspects of each park unit would remain  
41 the same under the no action alternative. The  
42 no action alternative would have a local long-  
43 term minor adverse impact on visual quality  
44 by reducing the visual interpretation of the  
45 earthwork complexes over time.

### 1 Cumulative Impacts

2 The addition of trails, overlooks, and a  
3 parking area at Hopeton Earthworks would  
4 improve the visual quality of the park unit  
5 by providing more views of the earthwork  
6 complex. Continued maintenance of the park  
7 units through mowing vegetation would  
8 provide views of the mounds but may confuse  
9 visitors as to which portions of the mowed  
10 areas are used for interpreting the locations  
11 of the earthwork complexes. The replacement  
12 of the power line poles along the western  
13 boundary of the Mound City Group would  
14 have a minor adverse impact on the viewshed.  
15 Cumulative impacts on visual resources  
16 would be long-term minor and beneficial.  
17

### 18 Conclusions

19 The no action alternative would not change  
20 the existing visual quality of the park and  
21 in the long-term would diminish the visual  
22 interpretation of the earthwork complexes  
23 because existing management causes  
24 confusion as to the locations of the earthwork  
25 complexes. Cumulative impacts on visual  
26 resources would be long-term and beneficial.  
27 Overall, the no action alternative would have a  
28 local long-term beneficial and local long-term  
29 minor adverse impact on visual resources.  
30 The impacts on visual resources from the  
31 no action alternative would not likely be  
32 significant because the impacts would not  
33 appreciably alter the visual resources from  
34 the existing conditions within the park.  
35

### 36 Action Alternative 1

37 Direct and Indirect Impacts of the Alternative  
38 The visual quality of the park units from  
39 action alternative 1 would be improved  
40 by allowing limited access to Hopeton  
41 Earthworks and High Bank Works and  
42 creating more trails at the park units, which  
43 would increase visitor access to visual  
44 features at each park unit. Improving the

1 visual interpretation of the earthwork  
 2 complexes through vegetation management  
 3 and removing non-contributing features  
 4 would also have beneficial effects on visual  
 5 resources at each park unit. Because of these  
 6 reasons, action alternative 1 would result in  
 7 local long-term beneficial effects on visual  
 8 resources.

9

#### 10 Cumulative Impacts

11 The past, present, and reasonably foreseeable  
 12 future actions and their impacts would be the  
 13 same as those for the no action alternative.  
 14 Past, present, and reasonably foreseeable  
 15 future actions would have local long-term  
 16 beneficial effects on visual resources. Those  
 17 impacts, combined with the local long-term  
 18 beneficial effects of action alternative 1,  
 19 would result in local long-term minor and  
 20 beneficial cumulative effects.

21

#### 22 Conclusion

23 Action alternative 1 would have long-term  
 24 beneficial effects on visual resources because  
 25 access to the park units would increase, non-  
 26 contributing features in the archeological  
 27 landscape would be removed, interpretation  
 28 would be improved, and additional trails  
 29 and overlooks would be created. When  
 30 combined with past, present, and reasonably  
 31 foreseeable future actions, action alternative  
 32 1 would have local long-term beneficial  
 33 cumulative effects.

34

#### 35 Action Alternative 2

##### 36 Direct and Indirect Impacts of the Alternative

37 The activities and impacts of action  
 38 alternative 2 would be similar to those of  
 39 action alternative 1, except there would  
 40 be additional beneficial effects on visual  
 41 resources and access to visual features  
 42 from marking the archeological features  
 43 for improved interpretation, constructing  
 44 additional trails, and creating an

1 interconnected water route between the park  
 2 units. These actions would improve the visual  
 3 quality of the park units by enhancing the  
 4 ability to interpret the earthwork complexes  
 5 and surrounding area. Because of these  
 6 reasons, action alternative 2 would result in  
 7 local long-term beneficial effects on visual  
 8 resources.

9

#### 10 Cumulative Impacts

11 The past, present, and reasonably foreseeable  
 12 future actions and their impacts would be the  
 13 same as those for the no action alternative  
 14 and action alternative 1. Past, present, and  
 15 reasonably foreseeable future actions would  
 16 have local long-term beneficial cumulative  
 17 effects on visual resources through increased  
 18 trails, overlooks, and vegetation management.  
 19 Those effects, combined with the impacts  
 20 of action alternative 2, would result in local  
 21 long-term minor and beneficial cumulative  
 22 effects.

23

#### 24 Conclusion

25 Action alternative 2 would have local long-  
 26 term beneficial effects because access to  
 27 the visual features of the park units would  
 28 increase, non-contributing features in the  
 29 archeological landscape would be removed,  
 30 interpretation would be improved, and  
 31 additional trails and overlooks would be  
 32 created. When combined with past, present,  
 33 and reasonably foreseeable future actions,  
 34 action alternative 2 would have local long-  
 35 term beneficial cumulative effects.

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