# Chapter 6: Impacts from Treatment Alternatives and Environmental Consequences

## 6.0 Introduction

This chapter describes the environmental consequences associated with the alternatives presented in this document. It is organized by impact topic, which distills the issues and concerns into distinct subjects for discussion analysis. NEPA requires consideration of context, intensity, and duration of adverse and beneficial impacts (direct, indirect, and cumulative) and measures to mitigate for impacts. This document is also being used to comply with the requirements of Section 106 of the NHPA. The CEQ regulations that implement NEPA require assessment of impacts to cultural as well as natural resources.

## 6.1 General Methods

This section contains the environmental impacts, including direct and indirect effects, and their significance for each alternative. The analysis is based on the assumption that the mitigation measures identified in the "Mitigation" section of this CLR/EA would be implemented for the action alternatives. Overall, the NPS based these impact analyses and conclusions on: review of existing literature and park studies; information provided by experts within the park and other agencies; professional judgment and park staff insights; and public input.

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

**Context:** Context is the setting within which an impact would occur, such as parkwide (site alternatives) in George Washington Carver National Monument; or regional (in Newton County, Missouri).

**Impact Intensity:** Impact intensity is defined individually for each impact topic. There may be no impact, or impacts may be negligible, minor, moderate, or major.

**Duration:** Duration of impact is analyzed independently for each resource because impact duration is dependent on the resource being analyzed. Depending on the resource, impacts may last for the construction period, a single year or growing season, or longer. For purposes of this analysis, impact duration is described as short-term or long-term. Impact duration is defined in a table for each resource topic.

**Type:** Effects can be beneficial or adverse. Beneficial effects are positive changes in the condition or appearance of the resource or a change that moves the resource toward a desired condition. Adverse effects are negative changes in the condition or appearance of the resource or a change that moves the resource away from a desired condition.

**Direct and Indirect Impacts:** Effects can be direct, indirect, or cumulative. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later or farther away, but

are still reasonably foreseeable. Direct and indirect impacts are considered in this analysis, but are not specified in the narratives. Cumulative effects are discussed in the next section.

**Threshold for Impact Analysis:** The duration and intensity of effects vary by resource. Therefore, the definitions for each impact topic are described separately. These definitions were formulated through the review of existing laws, policies, and guidelines; and with assistance from park staff and regional NPS staff. Impact intensity thresholds for negligible, minor, moderate, and major adverse effects are defined in a table for each resource topic.

## 6.2 Cumulative Impacts

The CEQ regulations that implement NEPA require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as impacts which result when the impact of the proposed action is added to the impacts of other present and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

### Methods for Assessing Cumulative Impacts

Cumulative impacts were determined by combining the impacts of each action alternative and the no action alternative with other past, present, and reasonable foreseeable future actions. Past actions include activities that influenced and affected the current conditions of the environment near the project area. Ongoing or reasonably foreseeable future project near the park or the surrounding region might contribute to cumulative impacts. The geographic scope of the analysis includes actions in the project area as well as other actions in the park or surrounding lands, where overlapping resource impacts are possible. The temporal scope includes actions within a range of approximately 10 years. Once identified, past, present, and reasonably foreseeable actions were then assessed in conjunction with the impacts of the alternatives to determine if they would have any added adverse or beneficial effects on a particular resource, park operation or visitor use. The impacts of past, present, and reasonably foreseeable actions vary for each resource. Cumulative impacts are considered for each alternative and are presented in the environmental consequences discussion for each impact topic.

To determine the potential cumulative impacts, the following existing and anticipated future projects at George Washington Carver National Monument and in the surrounding area were identified as contributing cumulative impacts:

- Past, present and ongoing prairie restoration projects and prescribed burns;
- Future projects associated with accessibility compliance as stipulated in the *George Washington Carver National Monument Accessibility Assessment;*
- Projects associated with turf management in specified areas of the monument;
- Projects associated with expanded interpretation;
- Projects associated with future management of woodlands;
- Ongoing and future archeological investigations; and
- Projects associated with the demolition of the former housing buildings near the monument entrance

# 6.3 Impacts to Cultural Resources and Section 106 of the NHPA

For purposes of the NEPA process, cultural resources are considered under section 106 of the National Historic Preservation Act, and specifically its implementing regulations under 36 CFR Part 800. Section 106 requires federal agencies to consider the effects of an undertaking on historic properties, and provides a process under which to implement section 106.

In this CLR/EA, impacts to cultural resources are described in terms of context, duration, intensity, and type, as described above, are consistent with the regulations of the CEQ, which implements NEPA. CEQ regulations and the NPS Conservation Planning, Environmental Impact Analysis and Decision-making (DO-12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact (e.g., reducing the intensity of an impact from major to moderate or minor). Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect, as defined by section 106, is similarly reduced. Although adverse effects under section 106 may be mitigated, the effect remains adverse. The park would coordinate with the SHPO to address mitigation measures for the preferred alternative.

# 6.4 Natural Resources

## 6.4.1 Soils

### Impact Intensity Threshold

All information on soils that would potentially be impacted at George Washington Carver National Monument was compiled and where possible, map locations of sensitive soils were compared with locations of proposed modifications associated with the alternatives. Predictions about short-and long-term site impacts were based on a comparison of soil characteristics (as described in the Newton County soil survey) and anticipated expansion efforts.

The thresholds for this impact topic are presented in Table 6-1.

**Table 6-1. Soils Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Impacts to soils would be below or at the lower levels of detection. |
| **Minor** | The impacts to soils would be detectable and small. Mitigation may be needed to offset adverse impacts and would be relatively simple to implement and likely be successful. |
| **Moderate** | The impacts on soils would be readily apparent and result in a change to soils over a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and likely be successful. |
| **Major** | The impacts on soils would be readily apparent and would substantially change the character of the soils over a large area in and out of the park. Extensive mitigation measures would be necessary to offset adverse impacts and their success could not be guaranteed. |

### Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Soils

The No Action alternative focuses on preservation of the existing character of the George Washington Carver National Monument

landscape and current interpretive programs. Under this alternative, there would be no changes to the facilities that currently accommodate visitor access and interpretation, or park administration or maintenance. No provision would be made to accommodate overflow parking beyond the use of current road margins and parking areas. No further clearing would be undertaken and current mowing and vegetation management regimens would continue. There will be continued repair of deteriorated features and systems. Current levels of erosion would continue, and possibly increase with continued visitor wear on paths and use of other areas. Existing stands of invasive plants that preclude growth of other plants with root systems with better soil holding capability may contribute to soil erosion over time, given that removal would not occur as part of this alternative. This alternative does not include construction or other activities that would alter the site as it exists today. Overall this alternative would have ***park-wide, long-term, negligible, adverse impact*** on soils.

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term, minor and adverse impacts on soils. Some of these actions include: routine utility repair, replacement, and new installation; small scale construction and excavation for fulfillment of accessibility requirements across the park; and present and future management and maintenance strategies for turf, prairie restoration, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to soils from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be park-wide, short-term, minor and adverse.

### Conclusions

The No Action Alternative would have park-wide, long-term, negligible adverse impacts on Soils. Cumulative effects would be local, short-term, minor and adverse.

## Impacts of Elements Common to the Action Alternatives on Soils

The following proposed actions would impact soils at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams – Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources
- Development of overflow parking area in the core developed area on the site of the former

residential/storage structures after planned demolition

- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road
- Expansion of the trail system to enhance interpretation of the entire site
- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)
- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementing this construction, removal of plant material, or undertaking of these natural and cultural resource management and preservation strategies would result in *short-term, minor, adverse impacts* to soils during implementation because soils would be exposed, displaced or otherwise disturbed. *Long-term, minor, adverse impacts* upon the soils would also result from displacement as well as compaction. Best management practices (BMPs) would be employed during construction, and for other activities such as tree removal, to minimize impacts to soils.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Soils

As part of an overall strategy for managing the cultural landscape of the park, this alternative recommends developing additional connections between interpretive programming and what is known about the landscape that comprised the Moses Carver farm during George Washington Carver's time on the property. Specific actions resulting from the implementation of this alternative include: clearing of woodlands not present during the Carver period; thinning and management of bottomland woodlands to depict the historic savanna-like character; expansion of the Carver Trail; and the addition of foundation outlines and waysides to interpret former Moses Carver farm features. Tree removal is anticipated to lead to soil disturbance and erosion, particularly in clearing of woodland and management of bottomland. Once new savanna-like conditions are established, soil erosion and disturbance would be abated. This alternative would have a ***local, short-term, moderate adverse impact*** on soils.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to soils from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be local, short-term, moderate and adverse.

#### Conclusion

Treatment Alternative 2 would have local, short-term, moderate adverse impacts on soils from woodland management, trail expansion, and plant and interpretive installations. Cumulative effects would be local, short-term, moderate and adverse.

### Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Soils

The focus of this alternative would be the interpretation of Carver's work and career through plants known to have been the focus of his experiments and scientific exploration. Specific actions resulting from the implementation of this alternative include: planting of a wide variety of native species, thinning of woodlands, and expansion of the trail. Tree removal is anticipated

to lead to soil disturbance and erosion, particularly in clearing of woodland. Some localized erosion could also take place during the process of introducing a large number of new plant materials to the landscape at George Washington Carver National Monument. Once new conditions are established and new plantings are stabilized, soil erosion and disturbance would be abated. This alternative would have a ***local, short-term, and minor adverse impact*** on soils.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to soils from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

### Conclusion

Treatment Alternative 3 would have local, short-term, minor adverse impacts on soils from woodland clearing for new plant installation, vegetation management, trail expansion, and plant and interpretive installations. Cumulative effects would be local, short-term, minor and adverse.

## Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Soils

This rehabilitation treatment alternative focuses on the interpretation of several features known to have been present on the Moses Carver farm during George Washington Carver's boyhood that are no longer present to convey the scale, arrangement, orientation and elements of the historic farmstead. These include field and pasture patterns of agricultural production, walnut hedgerows, the fruit and nut orchard, and a persimmon grove, as well as the farm area which would be addressed in part through physical means such as foundation outlines and mow patterns. Specific actions resulting from the implementation of this alternative are anticipated to include plantings of an orchard and persimmon grove, planting along trails and roads, and expanding the trail system. Tree removal is anticipated to lead to soil disturbance and erosion, particularly in clearing of woodland. Some localized erosion could also take place during the process of introducing a large number of new plant materials to the landscape at the monument. Once new conditions are established and new plantings are stabilized, soil erosion and disturbance would be abated. This alternative would have a ***local, short-term, and moderate adverse impact*** on soils.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to soils from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be local, short-term, moderate and adverse.

### Conclusion

Treatment Alternative 4 would have local, short-term, moderate adverse impacts on soils from woodland management, trail expansion, and plant and interpretive installations. Cumulative effects would be local, short-term, moderate and adverse.

## 6.4.2 Vegetation (Grassland and Forest)

### Impact Intensity Threshold

The comprehensive information, study, analysis, guidance and mapping of the vegetation at George Washington Carver National Monument by the Heartland Inventory and Monitoring Program, the MoRAP report, the Invasive Plant Management Plan/EA Assessment and other studies were used to consider the impacts of the alternatives on vegetation. The park manages both grassland and forest. Grasslands cover approximately 127 acres of the park. Forested areas cover approximately 61 acres and occur primarily along streams, but extend into the uplands. The picnic area and the visitor center and the administration and housing complexes are highly managed and manicured, with a large proportion of those areas planted in non-native trees and shrubs. An area of special concern within the national monument is the Harkins Woods, located in the northwest corner of the site. As shown in tree survey work, the makeup of the forest is markedly different from the rest of the national monument. In addition, several plant species have only been recorded from this area. Impact assessments were based on the expected disturbance to vegetation communities, presence and location of sensitive species, species of special concern, and invasive species. Assessments about short-and long-term site impacts were based on the anticipated effects of construction and management strategies and vegetative cover change on soil erosion, soil moisture, community stability, and wildlife.

The thresholds for change for the intensity of an impact on vegetation are defined as follows in Table 6-2.

**Table 6-2. Vegetation Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | **Grassland:** Individual species of the prairie restoration composition may occasionally be impacted, but measurable or perceptible changes in the overall species community size, integrity, or continuity would not occur.<br>**Forest:** Individual native plants may occasionally be impacted, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur. |
| **Minor** | **Grassland:** Impacts on prairie restoration composition would be measurable or perceptible, but would be localized within a small area. The viability of the community would not be impacted and the community, if managed for prairie restoration, would recover.<br>**Forest:** Impacts on native plants would be measurable or perceptible, but would be localized within a small area. The viability of the plant community would not be impacted and the community, if left alone, would recover. |
| **Moderate** | **Grassland:** Impacts would occur to a sizable segment of the prairie species composition over a relatively large area that would be readily measurable in terms of abundance, distribution, quantity, or quality. Mitigation measures to offset/reduce adverse impacts would be necessary and would likely be successful.<br>**Forest:** Impacts would occur to a sizable segment of the native plant community over a relatively large area that would be readily measurable in terms of abundance, distribution, quantity, or quality. Mitigation measures to offset/reduce adverse impacts would be necessary and would likely be successful. |
| **Major** | **Grassland:** Impacts on prairie species composition would be readily apparent and would substantially change community types over a large area, inside and outside the site. Extensive mitigation measures would be necessary to offset adverse impacts, and their success would not be ensured.<br>**Forest:** Impacts on native plant communities would be readily apparent and would substantially change vegetative community types over a large area, inside and outside the site. Extensive mitigation measures would be necessary to offset adverse impacts, and their success would not be ensured. |

## Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Vegetation

The grassland and forest vegetation identified within the current boundaries of George Washington Carver National Monument, are part of the existing landcover character and patterns. Under Alternative 1 (No Action) the current landscape patterns of spatial organization, composed of a developed subzone featuring ornamental plantings, shade trees, and turf, riparian woodlands along the stream corridors, and restored grassland prairie will be perpetuated. No further site clearing would be undertaken and current mowing and vegetation management regimens would continue. The park will continue to utilize seeding, planting, mowing, haying, and prescribed burning to maintain and restore the prairie. Treatment would focus on maintenance of existing landcover character and patterns, conservation of natural resources, and continuation of current prairie restoration strategies. Comprehensive woodland management and removal of invasive species management strategies addressed in studies by Heartland Network are not currently integrated into the current vegetation management programs or strategies. Under this alternative, woodland management is not addressed and there is no strategic comprehensive program for the removal of invasive species. Overall this alternative would have ***park-wide, long-term, minor, adverse impact*** on grassland prairie, and ***local, long-term, moderate, adverse impact*** on woodland vegetation.

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term, and minor adverse impacts on the grassland and woodland vegetation at George Washington Carver National Monument. Some of these actions include: routine utility repair, replacement, and new installation; small scale construction and excavation for fulfillment of accessibility requirements across the park; and present and future management and maintenance strategies for turf, prairie restoration, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to grassland and woodland vegetation from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be park-wide, short-term, minor to moderate and adverse.

### Conclusions

The No Action Alternative would have local and park-wide, long-term, minor to moderate adverse impacts on grassland and woodland Vegetation. Cumulative effects would be park-wide, short-term, moderate and adverse.

## Impacts of Elements Common to the Action Alternatives on Vegetation

The following proposed actions would impact vegetation at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management

- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees

- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources

- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition

- Restoration of the persimmon grove along the existing Carver Trail

- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road

- Expansion of the trail system to enhance interpretation of the entire site

- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)

- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementing some proposed construction or management strategies, or the undertaking of the restoration of the persimmon grove would result in *local, short-term, minor to moderate, adverse impacts* to woodland vegetation during implementation. Continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies would result in *park-wide, long-term , minor to moderate, beneficial impacts* to vegetation.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Vegetation

Comprehensive woodland management and removal of invasive species management strategies as well as prairie manage strategies addressed in studies by Heartland Network will be integrated into the current vegetation management procedures, expansion, and programs. Implementing some proposed construction or vegetation management strategies, or the undertaking of the restoration of the persimmon grove and orchard would result in potential impacts on grassland and woodland vegetation. Continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies would also result in potential impacts to both grasslands and woodlands.

Alternative 2 would have ***park-wide, short-term, moderate adverse impacts*** to grassland prairie and woodlands during implementation.

Alternative 2 would also have ***park-wide, long-term moderate and beneficial impacts*** to grasslands and woodlands

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Vegetation from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, moderate and adverse

during implementation and park-wide, long-term, moderate and beneficial once established.

### Conclusion

Treatment Alternative 2 would have park-wide, short-term and moderate adverse impacts and park-wide, long-term, moderate and beneficial impacts to grassland and woodland vegetation from construction of new interpretive features, enhanced interpretation, trail expansion, restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Beneficial impacts would be due to continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies. Cumulative effects would be park-wide, long-term, moderate and adverse to moderate and beneficial.

## Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Vegetation

Comprehensive woodland management and removal of invasive species management strategies as well as prairie manage strategies addressed in studies by Heartland Network will be integrated into the current vegetation management procedures, expansion, and programs. Implementing some proposed construction or vegetation management strategies, or the undertaking of the restoration of the persimmon grove and orchard would result in potential impacts on grassland and woodland vegetation. Continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies would also result in potential impacts to both grasslands and woodlands.

Alternative 3 would have ***park-wide, short-term, minor impacts*** to grassland prairie and woodlands during implementation.

Alternative 3 would also have ***park-wide, long-term minor and beneficial impacts*** to grasslands and woodlands.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Vegetation from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, minor and adverse during implementation and park-wide, long-term, minor and beneficial once established.

### Conclusion

Treatment Alternative 3 would have park-wide, short-term and minor adverse impacts and park-wide, long-term, minor and beneficial impacts to grassland and woodland vegetation from construction of new interpretive features, enhanced interpretation, trail expansion, restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Beneficial impacts would be due to continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies. Cumulative effects would be park-wide, long-term, minor and adverse to minor and beneficial.

#### Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Vegetation

Comprehensive woodland management and removal of invasive species management strategies as well as prairie manage strategies addressed in studies by Harrington (1999), Burfield (2011), and Heartland Network will be integrated into the current vegetation management procedures, expansion, and programs. Implementing some proposed construction or vegetation management strategies, or the undertaking of the restoration of the persimmon grove and orchard would result in potential impacts on grassland and woodland vegetation. Continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies would also result in potential impacts to both grasslands and woodlands.

Alternative 4 would have ***park-wide, short-term, moderate impacts*** to grassland prairie and woodlands during implementation.

Alternative 4 would also have ***park-wide, long-term moderate and beneficial impacts*** to grasslands and woodlands.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Vegetation from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, moderate and adverse during implementation and park-wide, long-term, moderate and beneficial once established.

#### Conclusion

Treatment Alternative 4 would have park-wide, short-term and moderate adverse impacts and park-wide, long-term, moderate and beneficial impacts to grassland and woodland vegetation from construction of new interpretive features, enhanced interpretation, trail expansion, restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Beneficial impacts would be due to continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies. Cumulative effects would be park-wide, long-term, moderate and adverse to moderate and beneficial.

### 6.4.3 Water Quality

#### Impact Intensity Threshold

The *NPS Management Policies 2001* (NPS 2000) state that the NPS will "take all necessary actions to maintain or restore the quality of surface waters and ground waters within the parks consistent with the Clean Water Act and all other applicable federal, state and local laws and regulation" (sec. 4.6.3)

Other considerations in assessing the magnitude of water quality impacts are the composition and effectiveness of drainages, the content of storm water runoff, and the current condition of the streams on site; Carver Branch, Williams Branch, and Harkins Branch and the condition of Williams Pond. All available existing information on water quality associated with the above resources potentially impacted by proposed actions in the alternatives was compiled and researched. Predictions about short-and long-term site impacts were based on the anticipated effects of expanded trails and vegetative cover change on soil erosion, and the potential for increased sediment loads on the streams. Also considered was the potential for actions to increase flow

quantities during storm events, and the additions of other measurable pollutants that would be detrimental to existing water quality. The thresholds for change for the intensity of an impact on water quality are defined as follows in Table 6-3.

### Table 6-3. Water Quality Impact and Intensity

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Impacts are chemical, physical, or biological effects that would not be detectable, would be well within water quality standards or criteria, and would be within historical or desired water quality conditions. |
| **Minor** | Impacts (chemical, physical, or biological effects) would be detectable but would be well within water quality standards or criteria and within historical or desired water quality conditions. |
| **Moderate** | Impacts (chemical, physical, or biological effects) would be readily detectable but would be at or within water quality standards or criteria and within historical or desired water quality conditions. |
| **Major** | Impacts (chemical, physical, or biological effects) would be detectable and would be regularly above water quality standards or criteria and within historical or desired water quality conditions. |

## Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Water Quality

There are three streams that flow through George Washington Carver National Monument and two spring branches that are completely contained within the park. Carver Branch, Harkins Branch, and Williams Branch are all tributaries of Shoal Creek. Williams Spring is currently inundated by Williams Pond. Carver Springs consists of a very short spring branch that flows into Carver Branch. Stream condition in the national monument is generally good. Protection of surface water and ground water is a management priority and currently water quality meets or exceeds all applicable water quality standards. NPS and NPS-permitted programs and facilities are currently maintained and operated to avoid pollution of surface water and groundwater. Under this alternative, this protection will continue with the current management and maintenance strategies in place. The current landscape patterns of spatial organization composed in part by riparian woodlands along stream corridors, will also be perpetuated. The Williams Pond would remain in its current configuration. Maintenance of existing water systems and features would continue as well as protection of water resources. Under this alternative, strategy for the maintenance and management of the stream banks or any expanded management or maintenance for Williams Pond would not be in place. Overall this alternative would have ***park-wide, long-term, negligible, adverse impact*** on water quality.

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term, and minor adverse impacts on water quality. Some of these actions include: routine utility repair, replacement, and new installation; small scale construction and excavation for fulfillment of accessibility requirements across the park; and present and future management and maintenance strategies for turf, prairie restoration, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to water quality from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

### Conclusions

The No Action Alternative would have park-wide, long-term, negligible adverse impacts on Water Quality. Cumulative effects would be local, short-term, minor and adverse.

## Impacts of Elements Common to the Action Alternatives on Water Quality

The following proposed actions would impact water quality at George Washington Carver

National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources.
- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition
- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road
- Expansion of the trail system to enhance interpretation of the entire site
- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)
- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementing some proposed construction or management strategies would result in *local, short-term, negligible, adverse impacts* to water quality during implementation. Proposed actions such as continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation; preservation and maintenance of conservation land uses to protect water resources; preservation, management, and interpretation of Carver Spring and the three streams – Carver, Harkins, and Williams branches; and other expanded natural and cultural resource preservation, management, and maintenance strategies would result in *long-term, moderate, beneficial impacts* to water quality.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Water Quality

There are three streams that flow through George Washington Carver National Monument and two spring branches that are completely contained

within the park. Carver Branch, Harkins Branch, and Williams Branch are all tributaries of Shoal Creek. Williams Spring is currently inundated by Williams Pond. Carver Springs consists of a very short spring branch that flows into Carver Branch. Stream condition in the national monument is generally good. Protection of surface water and ground water is a management priority and currently water quality meets or exceeds all applicable water quality standards. NPS and NPS-permitted programs and facilities are currently maintained and operated to avoid pollution of surface water and groundwater. Under Alternative 2, protection will be expanded to include the stabilization of the stream banks and preservation of landscape patterns of spatial organization composed in part by riparian woodlands along stream corridors. Management strategies will address Williams Pond as well and the springs that occur on the site. Extended monitoring for water quality will also continue. Alternative 2 would have ***park-wide, long-term, minor, and beneficial impact*** on water quality.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Water Quality from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, minor and beneficial.

### Conclusion

Treatment Alternative 2 would have park-wide, long-term and minor beneficial impacts to Water Quality from restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Cumulative effects would be park-wide, long-term, minor and beneficial.

## Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Water Quality

There are three streams that flow through George Washington Carver National Monument and two spring branches that are completely contained within the park. Carver Branch, Harkins Branch, and Williams Branch are all tributaries of Shoal Creek. Williams Spring is currently inundated by Williams Pond. Carver Springs consists of a very short spring branch that flows into Carver Branch. Stream condition in the national monument is generally good. Protection of surface water and ground water is a management priority and currently water quality meets or exceeds all applicable water quality standards. NPS and NPS-permitted programs and facilities are currently maintained and operated to avoid pollution of surface water and groundwater. Under Alternative 3, protection will be expanded to include the stabilization of the stream banks and preservation of landscape patterns of spatial organization composed in part by riparian woodlands along stream corridors. Management strategies will address Williams Pond as well and the springs that occur on the site. Extended monitoring for water quality will also continue. Alternative 3 would have ***park-wide, long-term, minor, and beneficial impact*** on water quality.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Water Quality from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, minor and beneficial.

### Conclusion

Treatment Alternative 3 would have park-wide, long-term and minor beneficial impacts to Water Quality from restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams.

Cumulative effects would be park-wide, long-term, minor and beneficial.

### Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Water Quality

There are three streams that flow through George Washington Carver National Monument and two spring branches that are completely contained within the park. Carver Branch, Harkins Branch, and Williams Branch are all tributaries of Shoal Creek. Williams Spring is currently inundated by Williams Pond. Carver Spring consists of a very short spring branch that flows into Carver Branch. Stream condition in the national monument is generally good. Protection of surface water and ground water is a management priority and currently water quality meets or exceeds all applicable water quality standards. NPS and NPS-permitted programs and facilities are currently maintained and operated to avoid pollution of surface water and groundwater. Under Alternative 4, protection will be expanded to include the stabilization of the stream banks and preservation of landscape patterns of spatial organization composed in part by riparian woodlands along stream corridors. Management strategies will address Williams Pond as well and the springs that occur on the site. Extended monitoring for water quality will also continue. Alternative 4 would have ***park-wide, long-term, minor, and beneficial impact*** on water quality.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Water Quality from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, minor and beneficial.

#### Conclusion

Treatment Alternative 4 would have park-wide, long-term and minor beneficial impacts to Water Quality from restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Cumulative effects would be park-wide, long-term, minor and beneficial.

## 6.4.4 Wildlife and Wildlife Habitat

#### Impact Intensity Threshold

Fauna of George Washington Carver National Monument are typical of old fields and disturbed woodlands in the Ozark Highlands. Wildlife consists mainly of a large variety of birds, fish, and small mammals.

Impacts on wildlife are closely related to impacts on habitat. The analysis considered whether actions would be likely to displace some or all individuals of a species in George Washington Carver National Monument or would result in loss or creation of habitat conditions needed for the viability of local or regional populations. Impacts associated with wildlife could include any change in roosting or foraging areas, food supply, protective cover, or distribution or abundance of species.

Impact analysis on wildlife and wildlife habitat was based on previous studies completed for the park. Changes in land cover, land use, management practices, and the amount of impervious surface that would occur in association with the proposed alternatives have been considered for their potential to impact wildlife and wildlife habitat at the national monument. The thresholds of change for the intensity of an impact on wildlife are defined as follows in Table 6-4.

**Table 6-4. Wildlife and Wildlife Habitat Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Terrestrial wildlife and their habitats would not be impacted, or the impacts would be at or below the level of detection and would not be measurable or of perceptible consequence to wildlife populations. |
| **Minor** | Adverse impacts on wildlife or habitat would be measurable or perceptible, but localized within a small area. For adverse impacts, the mortality of an individual animal might occur but the viability of wildlife populations would not be impacted, and the community, if left alone, would recover. |
| **Moderate** | A change to terrestrial wildlife populations or habitat would occur over a relatively large area. The change would be readily measurable in terms of abundance, distribution, quantity, or quality of population. Mitigation measures would be necessary to offset adverse impacts, and they would likely be successful. |
| **Major** | Impacts on terrestrial wildlife populations or habitat would be readily apparent, and would substantially change wildlife populations over a large area in and out of the park. Extensive mitigation would be needed to offset adverse impacts, and the success of mitigation measures could not be ensured. |

## Impacts of Alternative 1 *Preserve Existing Conditions and Continue Current Management Strategies* (No Action) on Wildlife and Wildlife Habitat

Under this Alternative 1 (No Action), there would be little change in the George Washington Carver National Monument character and management. Existing habitat would remain in place to continue to support populations of birds, mammals, and reptiles that currently use the site. There would be no changes to vegetation or new construction projects to jeopardize the important habitats on the site. Invasive plant stands are expected to increase, diminishing slightly the diversity of the plant community and thereby potential wildlife habitat. Over time, the existing successional woodland would continue to mature, and may provide additional habitat for some species of interest. This alternative would have a ***park-wide, long-term, minor, adverse impact*** on wildlife and wildlife habitat.

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term, and minor adverse impacts on Wildlife and Wildlife Habitat. Some of these actions include: routine utility repair, replacement, and new installation; small scale construction and excavation for fulfillment of accessibility requirements across the park; and present and future management and maintenance strategies for turf, prairie restoration, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to Wildlife and Wildlife Habitat from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be park-wide, short-term, minor and adverse.

### Conclusions

The No Action Alternative would have park-wide, long-term, minor adverse impact on Wildlife and Wildlife Habitat. Cumulative effects would be park-wide, short-term, minor and adverse.

## Impacts of Elements Common to the Action Alternatives on Wildlife and Wildlife Habitat

The following proposed actions would impact wildlife and wildlife habitat at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches

- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas

- Maintenance and management of Harkins Woods

- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management

- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees

- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources.

- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition

- Restoration of the persimmon grove along the existing Carver Trail

- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road

- Expansion of the trail system to enhance interpretation of the entire site

- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)

- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementing construction of overflow parking, restoration of the persimmon grove, and expansion of the trail system would result in *park-wide, short-term, minor, adverse impacts to wildlife and wildlife habitat,* because some vegetation including grasslands would be displaced, exposed or disturbed. Use of best management practices (BMPs) would be implemented during construction and other soil disturbing activities such as tree removal, to minimize impacts to wildlife habitat.

*Long term, moderate, beneficial, impacts* to wildlife and wildlife habitat would occur with the implementation of the preservation, management and maintenance strategies for conservation land use, wet prairie areas, water resources, and restoration of the grassland prairie.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Wildlife and Wildlife Habitat

Changes in land cover, land use, management practices, and the amount of impervious surface that would occur in association with the proposed alternatives have been considered for their potential to impact wildlife and wildlife habitat at the national monument. Implementing construction of overflow parking, restoration of the persimmon grove, and expansion of the trail system would impact wildlife and habitat because some vegetation including grasslands would be displaced, exposed or disturbed. Use of best management practices (BMPs) would be implemented during construction and other soil disturbing activities such as tree removal, to minimize impacts to wildlife habitat. Alternative 2

would result in ***park-wide, short-term, minor, adverse impacts to Wildlife and Wildlife Habitat.***

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Wildlife and Wildlife Habitat from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be park-wide, short-term, minor and adverse.

### Conclusion

Treatment Alternative 2 would have park-wide, short-term and minor adverse impacts to Wildlife and Wildlife Habitat from construction of new interpretive features, enhanced interpretation, trail expansion, restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Cumulative effects would be park-wide, short-term, minor and adverse.

## Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Wildlife and Wildlife Habitat

Changes in land cover, land use, management practices, and the amount of impervious surface that would occur in association with the proposed alternatives have been considered for their potential to impact wildlife and wildlife habitat at the national monument. Implementing construction of overflow parking, restoration of the persimmon grove, expansion of the trail system, and clearing or thinning of woodlands for installation of ethnobotanical plantings would impact wildlife and habitat due to short-term displacement of vegetation and expanded woodland management strategies. Use of best management practices (BMPs) would be implemented during construction and other soil disturbing activities such as tree removal, to minimize impacts to wildlife habitat. Alternative 3 would result in **park-wide, short-term, and minor adverse impacts** to Wildlife and Wildlife Habitat.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Wildlife and Wildlife Habitat from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be park-wide, short-term, minor and adverse.

### Conclusion

Treatment Alternative 3 would have park-wide, short-term and minor adverse impacts to Wildlife and Wildlife Habitat from construction of new interpretive features, enhanced interpretation, trail expansion, restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Cumulative effects would be park-wide, short-term, minor and adverse.

## Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Wildlife and Wildlife Habitat

Changes in land cover, land use, management practices, and the amount of impervious surface that would occur in association with the proposed alternatives have been considered for their potential to impact wildlife and wildlife habitat at the national monument. Implementing construction of overflow parking, restoration of the persimmon grove, expansion of the trail system, and clearing or thinning of woodlands for installation of plantings known to Carver would impact wildlife and habitat due to short-term displacement of vegetation and expanded woodland management strategies. Use of best management practices (BMPs) would be implemented during construction and other soil

disturbing activities such as tree removal, to minimize impacts to wildlife habitat. Alternative 4 would result in **park-wide, short-term, and minor adverse impacts** to Wildlife and Wildlife Habitat.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Wildlife and Wildlife Habitat from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be park-wide, short-term, minor and adverse.

### Conclusion

Treatment Alternative 4 would have park-wide, short-term and minor adverse impacts to Wildlife and Wildlife Habitat from construction of new interpretive features, enhanced interpretation, trail expansion, restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Cumulative effects would be park-wide, short-term, minor and adverse.

## 6.4.5 Rare, Threatened, and Endangered Species

### Impact Intensity Thresholds

There are no federally endangered or threatened species known to occur within George Washington Carver National Monument, although several state-listed species of special concern have been documented within the site. One rare fish species – the Arkansas Darter- has been a candidate for federal listing as a threatened or endangered species and is considered a species of conservation concern by the State of Missouri.

Impact analysis for rare, threatened and endangered species was based on informal consultation with U.S. Fish and Wildlife Service and previous studies completed for the park. Changes in land cover, land use, vegetation management practices, and the amount of impervious surface that would occur in association with the proposed alternatives have been considered for their potential to impact candidates for Federal listing and also species of concern. The thresholds of change for the intensity of an impact on rare, threatened and endangered species are defined as follows in Table 6-5.

**Table 6-5. Rare, Threatened, and Endangered Species Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Rare, threatened, or endangered species and their associated habitats would not be impacted, or the impacts would be at or below the level of detection and would not be measurable or of perceptible consequence to plant or animal populations. |
| **Minor** | Adverse impacts on plants, wildlife, or associated habitats would be measurable or perceptible, but localized within a small area. For adverse impacts, the mortality of an individual plant or animal might occur but the viability of biotic populations of concern would not be impacted, and the community, if left alone, would recover. |
| **Moderate** | A change to plant or wildlife populations or their associated habitat would occur over a relatively large area. The change would be readily measurable in terms of abundance, distribution, quantity, or quality of population. Mitigation measures would be necessary to offset adverse impacts, and they would likely be successful. |
| **Major** | Impacts on terrestrial wildlife populations or habitat would be readily apparent, and would substantially change wildlife populations over a large area in and out of the park. Extensive mitigation would be needed to offset adverse impacts, and the success of mitigation measures could not be ensured. |

### Impacts of Alternative 1 *Preserve Existing Conditions and Continue Current Management Strategies* (No Action) on Rare, Threatened, and Endangered Species

Under Alternative 1 (No Action), there would be little change in park character and management. Existing habitat would remain in place and continue to support populations of birds, mammals, reptiles and fish that currently inhabit the site and the water resources on the site. Quality of the water is most important to the identified species of fish, the Arkansas darter, as a candidate for federal listing and a species of concern in the state of Missouri. There would be no changes to vegetation or new construction projects generating expanded storm water runoff to the streams. A strategy would need to be put in place in order to address the condition of the stream banks as erosion and runoff could affect water quality and the Arkansas darter habitat.

Overall this alternative would have ***local, long-term, negligible, adverse impact*** on rare, threatened, and endangered species.

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term, and minor adverse impacts on Rare, Threatened and Endangered Species. Some of these actions include: routine utility repair, replacement, and new installation; small scale construction and excavation for fulfillment of accessibility requirements across the park; and present and future management and maintenance strategies for turf, prairie restoration, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to Rare, Threatened and Endangered Species from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

### Conclusions

The No Action Alternative would have local, long-term, negligible adverse impacts on Rare, Threatened, and Endangered Species. Cumulative effects would be local, short-term, minor and adverse.

### Impacts of Elements Common to the Action Alternatives on Rare, Threatened, and Endangered Species

The following proposed actions would impact rare, threatened, and endangered species at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources

of high quality and value, including native plant communities and water resources

- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition
- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road
- Expansion of the trail system to enhance interpretation of the entire site
- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)
- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementing construction of overflow parking, restoration of the persimmon grove, removal of invasive species, and expansion of the trail system would result in *local, short-term, minor, adverse impacts to rare, threatened and endangered species,* because some vegetation including invasive species in stream corridors would be displaced, exposed or disturbed. Use of best management practices (BMPs) would be implemented during construction and other soil disturbing activities such as tree and vegetation removal, to minimize impacts to water and terrestrial habitats of rare, threatened, and endangered species. *Long term, moderate, beneficial, impacts* to rare, threatened, and endangered species would occur with the implementation of the preservation, management and maintenance strategies for conservation land use, wet prairie areas, water resources, and restoration of the grassland prairie.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Rare, Threatened, and Endangered Species

There are no federally endangered or threatened species known to occur within George Washington Carver National Monument, although several state-listed species of special concern have been documented within the site. One rare fish species – the Arkansas Darter- has been a candidate for federal listing as a threatened or endangered species and is considered a species of conservation concern by the State of Missouri. Implementing construction of overflow parking, restoration of the persimmon grove, removal of invasive species, expanded woodland management, and stream, spring and pond management, would result in potential impacts due to displacement of vegetation along stream corridors and subsequent effects on water quality. Use of best management practices (BMPs) would be implemented during construction and other soil disturbing activities such as tree and vegetation removal, to minimize impacts to water and terrestrial habitats of rare, threatened, and endangered species. Alternative 2 would result in ***local, short-term, minor, adverse impacts to Rare, Threatened and Endangered Species.***

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Rare, Threatened, and Endangered Species from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

#### Conclusion

Treatment Alternative 2 would have local, short-term and minor adverse impacts to from construction of new interpretive features,

enhanced interpretation, trail expansion, restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Cumulative effects would be local, short-term, minor and adverse.

### Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Rare, Threatened, and Endangered Species

There are no federally endangered or threatened species known to occur within George Washington Carver National Monument, although several state-listed species of special concern have been documented within the site. One rare fish species – the Arkansas Darter- has been a candidate for federal listing as a threatened or endangered species and is considered a species of conservation concern by the State of Missouri. Implementing construction of overflow parking, restoration of the persimmon grove, removal of invasive species, expanded woodland management, and stream, spring and pond management, would result in potential impacts due to displacement of vegetation along stream corridors and subsequent effects on water quality. Use of best management practices (BMPs) would be implemented during construction and other soil disturbing activities such as tree and vegetation removal, to minimize impacts to water and terrestrial habitats of rare, threatened, and endangered species. Alternative 3 would result in ***local, short-term, minor, adverse impacts on Rare, Threatened and Endangered Species.***

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Rare, Threatened, and Endangered Species from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

#### Conclusion

Treatment Alternative 3 would have local, short-term and minor adverse impacts to from construction of new interpretive features, enhanced interpretation, trail expansion, restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Cumulative effects would be local, short-term, minor and adverse.

### Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Rare, Threatened, and Endangered Species

There are no federally endangered or threatened species known to occur within George Washington Carver National Monument, although several state-listed species of special concern have been documented within the site. One rare fish species – the Arkansas Darter- has been a candidate for federal listing as a threatened or endangered species and is considered a species of conservation concern by the State of Missouri. Implementing construction of overflow parking, restoration of the persimmon grove, removal of invasive species, expanded woodland management, and stream, spring and pond management, would result in potential impacts due to displacement of vegetation along stream corridors and subsequent effects on water quality. Use of best management practices (BMPs) would be implemented during construction and other soil disturbing activities such as tree and vegetation removal, to minimize impacts to water and terrestrial habitats of rare, threatened, and endangered species. Alternative 4 would result in ***local, short-term, minor, adverse impacts to Rare, Threatened and Endangered Species.***

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall

cumulative impacts to Rare, Threatened, and Endangered Species from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

### Conclusion

Treatment Alternative 4 would have local, short-term and minor adverse impacts to Rare, Threatened, and Endangered Species from construction of new interpretive features, enhanced interpretation, trail expansion, restoration of stream banks, management strategies for Williams Pond and the springs and streams, and management of the woodland corridors surrounding the streams. Cumulative effects would be local, short-term, minor and adverse.

## 6.4.6 Wetlands

### Impact Intensity Threshold

Several areas of George Washington Carver National Monument experience wet conditions throughout much of the year. This is true for identified wet prairie areas located in the southwest and south-central areas of the park, and are particularly notable due to the diversity of plants that are only found in damp areas. Williams Pond, although an artificially created impoundment, is a site that has become the "repository" for some of the most unique plants within the Monument site. No wetlands on the site appear on the National Wetlands Inventory (NWI) mapping conducted by the U.S. Fish and Wildlife Service.

Impact analysis on significant wet prairie areas of the site and Williams Pond was based on previous studies by Heartland I&M Network National Monument and the *Resources Management Plan* (NPS 1999). Changes in land cover, management practices, and the amount of impervious surface that would occur in association with the proposed alternatives have been considered for their potential to impact the significant prairie wet areas and Williams Pond. The thresholds of change for the intensity of an impact on wetlands are defined as follows in Table 6-6.

**Table 6-6. Wetlands Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Impacts to wetlands would be below or at the lower levels of detection. |
| **Minor** | Impacts to wetlands would be detectable and relatively small in terms of area and the nature of change. The actions would impact a limited number of individual plant or wildlife species within the wetlands. |
| **Moderate** | The impacts to wetlands would be readily apparent over a relatively small area, but the impact could be mitigated by restoring previously degraded wetlands. The action would have a measurable impact on plant or wildlife species within the wetlands, but all species would remain indefinitely viable. |
| **Major** | The impacts to wetlands would be readily apparent over a relatively large area. The action would have measurable consequences for the wetland area that could not be mitigated. Wetland species dynamics would be upset, and plant and/or animal species would be at risk of extirpation for the area. |

### Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Wetlands

There are identified wet prairie areas located in the southwest and south-central areas of the national monument, and are particularly notable due to the diversity of plants that are only found in damp areas. Williams Pond, has become the "repository" for some of the most unique plants within the Monument site. Many species of sedges and grasses, as well as forbs are found only in these areas. Under this alternative, these wetland prairie areas and Williams Pond are part of the ongoing natural resource management programs in place at George Washington Carver National Monument. Current strategies do not fully address the comprehensive management and maintenance of Williams Pond, which could result in minor disturbance to plant species around the pond. The wetland prairie areas and associated wetland plants would be preserved and protected by

current management strategies in the Prairie Restoration and Management Plan. Overall this alternative would have ***local, short-term, negligible, adverse impact*** on wetlands.

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term, and minor adverse impacts on wetlands. Some of these actions include: routine utility repair, replacement, and new installation; small scale construction and excavation for fulfillment of accessibility requirements across the park; and present and future management and maintenance strategies for turf, prairie restoration, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to wetlands from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

### Conclusions

The No Action Alternative would have local, short-term, negligible adverse impacts on Wetlands. Cumulative effects would be local, short-term, minor and adverse.

### Impacts of Elements Common to the Action Alternatives on Wetlands

The following proposed actions would impact wetlands at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources
- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition
- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road
- Expansion of the trail system to enhance interpretation of the entire site
- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)

- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementing some proposed construction or management strategies, would result in *short-term, minor, adverse impacts* to wetlands during implementation. Continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies would result in *long-term, moderate, beneficial impacts* to wetlands.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Wetlands

There are identified wet prairie areas located in the southwest and south-central areas of the national monument, and are particularly notable due to the diversity of plants that are only found in damp areas. Williams Pond, has become the "repository" for some of the most unique plants within the Monument site. Many species of sedges and grasses, as well as forbs are found only in these areas. In Alternative 2, these wetland prairie areas and Williams Pond are preserved and managed under the existing strategies for the prairie restoration. Land use in the area of the wetlands does not change in this Alternative. Alternative 2 would have a **local, short-term and negligible adverse impact** on wetlands.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Wetlands from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

#### Conclusion

Treatment Alternative 2 would have local, short-term, and negligible adverse impacts on Wetlands from established prairie management strategies. Cumulative effects would be local, short-term, minor and adverse.

### Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Wetlands

There are identified wet prairie areas located in the southwest and south-central areas of the national monument, and are particularly notable due to the diversity of plants that are only found in damp areas. Williams Pond, has become the "repository" for some of the most unique plants within the Monument site. Many species of sedges and grasses, as well as forbs are found only in these areas. Under this alternative, these wetland prairie areas and Williams Pond are part of the ongoing natural resource management programs in place at George Washington Carver National Monument. Land use in the area of the wetlands does not change in this Alternative. Alternative 3 would have a **local, short-term and negligible adverse impact** on wetlands.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Wetlands from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

#### Conclusion

Treatment Alternative 3 would have local, short-term, and negligible adverse impacts on Wetlands from established prairie management strategies. Cumulative effects would be local, short-term, minor and adverse.

### Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Wetlands

There are identified wet prairie areas located in the southwest and south-central areas of the national monument, and are particularly notable due to the diversity of plants that are only found in damp areas. Williams Pond, has become the "repository" for some of the most unique plants within the Monument site. Many species of sedges and grasses, as well as forbs are found only in these areas. In Alternative 4, the wetland prairie areas in unit 6 would be impacted by a change in prairie management. This unit will be mown hay and interpreted as part of preservation of the agrarian setting. The wetland plant diversity will be preserved, but short-term impacts may occur. Alternative 4 would have **local, short-term and minor adverse impacts** to wetlands.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Wetlands from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

### Conclusion

Treatment Alternative 4 would have local, short-term, and minor adverse impacts on Wetlands from strategies for prairie management, including the mown hayfields in unit 6. Cumulative effects would be local, short-term, minor and adverse.

## 6.4.7 Floodplains

### Impact Intensity Threshold

There are three stream branches located within George Washington Carver National Monument. There is a great potential for flooding along Carver Branch, with the extensive agricultural use within its 3-mile drainage area and the 100-foot elevation drop between its source and the park entrance. Current laws and policies require that the following conditions be achieved in the national monument: minimize destruction, loss, or degradation of wetlands and floodplains; and preserve their natural and beneficial values. NPS has adopted a policy of preserving floodplain values and minimizing potentially hazardous conditions associated with flooding (NPS 2003).

Impact analysis on significant floodplains associated with the three stream branches that occur within George Washington Carver National Monument was based on previous studies by Heartland I&M Network National Monument, the *Resources Management Plan* (NPS 1999) and numerous other natural resource studies. Changes in land cover, management practices, and the amount of impervious surface that would occur in association with the proposed alternatives have been considered for their potential to impact floodplains within the national monument. The thresholds of change for the intensity of an impact are defined as follows in Table 6-7.

**Table 6-7. Floodplains Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Changes in the ability of a floodplain to convey floodwaters, or its values and functions would be undetectable. Project would not contribute to enhancing flood events. |
| **Minor** | Changes in the ability of a floodplain to convey floodwaters, or its values and functions, would be measurable and local. Projects could contribute to the flood. The impact could be mitigated by modification of proposed facilities in floodplains. |
| **Moderate** | Changes in the ability of a floodplain to convey floodwaters, or its values and functions, would be measurable and local. Projects could contribute to the flood. The impact could be mitigated by modification of proposed facilities in floodplains. |
| **Major** | Changes in the ability of a floodplain to convey floodwaters, or its values and functions, would be measurable and widespread. Projects would contribute to the flood. The impact could not be mitigated by modification of proposed facilities in floodplains. |

### Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Floodplains

Under Alternative 1 (No Action), protection of floodplains will continue with the current management and maintenance strategies in place. The current landscape patterns of spatial organization composed in part by riparian woodlands along stream corridors and floodplains, will also be perpetuated. The Williams Pond would remain in its current configuration. Maintenance of existing water systems and features would continue as well as protection of water resources. Under this alternative, there would remain no comprehensive management strategy that would address the stabilization of the stream banks or the removal of invasive species or other dead or unhealthy vegetation within the floodplains of the streams and springs. Also under this alternative, expanded management or maintenance for Williams Pond is not addressed.

Overall this alternative would have ***local, long-term, minor, adverse impact*** on floodplains.

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term, and minor adverse impacts on floodplains. Some of these actions include: routine utility repair, replacement, and new installation; small scale construction and excavation for fulfillment of accessibility requirements across the park; and present and future management and maintenance strategies for turf, prairie restoration, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to floodplains from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be local, short-term, minor and adverse.

### Conclusions

The No Action Alternative would have local, long-term, minor adverse impacts on Wetlands. Cumulative effects would be local, long-term, minor and adverse.

### Impacts of Elements Common to the Action Alternatives on Floodplains

The following proposed actions would impact floodplains at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and

community composition found only in seasonally wet areas

- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources.
- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition
- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road
- Expansion of the trail system to enhance interpretation of the entire site
- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)
- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementing some proposed construction or management strategies, would result in *local, short-term, minor, adverse impacts* to floodplains during implementation. Continued natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies would result in *long-term, moderate, beneficial impacts* to floodplains.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Floodplains

Under Alternative 2 there would be stream bank restoration and management of corridor woodlands along the streams and into the floodplain. The current landscape patterns of spatial organization composed in part by riparian woodlands along stream corridors and floodplains, will also be perpetuated. The Williams Pond would remain in its current configuration. Maintenance of existing water systems and features would continue as well as protection of water resources. Under this alternative, there would be a comprehensive management strategy that would address the stabilization of the stream banks and the removal of invasive species or other dead or unhealthy vegetation within the floodplains of the streams and springs. Also under this alternative, expanded management and maintenance for Williams Pond is addressed. Overall this alternative would have ***local, long-term, moderate, and beneficial impact*** on Floodplains.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Floodplains from Alternative 2 in combination with past, present,

and reasonably foreseeable future actions would be local, long-term, moderate and beneficial.

### Conclusion

Treatment Alternative 2 would have local, long-term, and moderate beneficial impacts to Floodplains from expanded natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies. Cumulative effects would be local, long-term, moderate and beneficial.

## Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Floodplains

Under Alternative 3 there would be stream bank restoration and management of corridor woodlands along the streams and into the floodplain. The current landscape patterns of spatial organization composed in part by riparian woodlands along stream corridors and floodplains, will also be perpetuated. The Williams Pond would remain in its current configuration. Maintenance of existing water systems and features would continue as well as protection of water resources. Under this alternative, there would be a comprehensive management strategy that would address the stabilization of the stream banks and the removal of invasive species or other dead or unhealthy vegetation within the floodplains of the streams and springs. Also under this alternative, expanded management and maintenance for Williams Pond is addressed. Overall this alternative would have ***local, long-term, moderate, and beneficial impact*** on Floodplains.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Floodplains from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate and beneficial.

### Conclusion

Treatment Alternative 3 would have local, long-term, and moderate beneficial impacts to Floodplains from expanded natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies. Cumulative effects would be local, long-term, moderate and beneficial.

## Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Floodplains

Under Alternative 4 there would be stream bank restoration and management of corridor woodlands along the streams and into the floodplain. The current landscape patterns of spatial organization composed in part by riparian woodlands along stream corridors and floodplains, will also be perpetuated. The Williams Pond would remain in its current configuration. Maintenance of existing water systems and features would continue as well as protection of water resources. Under this alternative, there would be a comprehensive management strategy that would address the stabilization of the stream banks and the removal of invasive species or other dead or unhealthy vegetation within the floodplains of the streams and springs. Also under this alternative, expanded management and maintenance for Williams Pond is addressed. Overall this alternative would have ***local, long-term, moderate, and beneficial impact*** on Floodplains.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Floodplains from

Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate and beneficial.

#### Conclusion

Treatment Alternative 4 would have local, long-term, and moderate beneficial impacts to Floodplains from expanded natural resource management of restored grassland prairie for health, diversity, and soil and water conservation and management of woodlands to remove invasive species and other expanded natural and cultural resource preservation, management, and maintenance strategies. Cumulative effects would be local, long-term, moderate and beneficial.

# 6.5 Cultural Resources

## 6.5.1 Cultural Landscapes

### Impact Intensity Threshold

In order for a cultural landscape to be listed in the National Register, it must possess significance (the meaning or value ascribed to the landscape) and retain the integrity of those features necessary to convey its significance as well as meet one or more of National Register criteria (36 CFR 63). The character-defining features in the identified cultural landscape included spatial organization and land patterns, topography, vegetation, circulation patterns, water features, structures/buildings, and site furnishings and objects. Individual features are not examined alone, but in relation to the overall landscape. The arrangement and interrelationship of the cultural landscape's organizational elements and character-defining features provided the key to determination of potential impacts and effects of the proposed actions presented in the project alternatives. The thresholds of change for the intensity of an impact on cultural landscapes are defined in Table 6-8.

**Table 6-8. Cultural Landscapes Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Impacts would be at the lowest level of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be no adverse effect. |
| **Minor** | Alternation of a historic structure or a pattern(s) or features(s) of the landscape would not diminish the overall integrity of the resource. The determination of effect for Section 106 would be no adverse effect. |
| **Moderate** | Alteration of a historic structure or a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the resource. The determination of effect for Section 106 would be adverse effect. A programmatic agreement is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the advisory council, in accordance with 36 CFR 800.6(b). Measures identified in the programmatic agreement to minimize or mitigate adverse impacts reduce the intensity of the impact and NEPA from moderate to minor. |
| **Major** | Alteration of a historic structure or a pattern(s) of the landscape would diminish the overall integrity of the resource. The determination of effect for Section 106 would be adverse effect. Measures to minimize or mitigate adverse impacts cannot be agreed on, and the NPS and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b). |

### Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Cultural Landscapes

Alternative 1, the No Action Alternative focuses on preservation of the existing character of the George Washington Carver National Monument landscape and current interpretive programs. Visitors would continue to gain the majority of their knowledge of the life and accomplishments of Dr. Carver through the exhibits located within the visitor center and along the mile-long Carver Trail. Under this alternative, no further exploration of ways to utilize the cultural landscape as a tool for interpreting Carver's life and accomplishments would be conducted. This alternative would limit the park in its ability to explain the historical context within which George Washington Carver grew up and his efforts to get an education. This alternative would also limit the park's ability to rehabilitate the landscape and its associated structures to enhance the memorial nature of the site. This alternative would have ***park-wide, long-term, minor, adverse impact*** on cultural landscapes.

For purposes of Section 106 compliance there would be ***no adverse effect.***

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term and negligible adverse impacts on cultural landscapes. Some of these actions include: continued prairie restoration and stabilization; small scale construction and excavation for fulfillment of accessibility requirements across the park; future preservation and interpretation management and changes, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to cultural landscapes from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be local, short-term, negligible and adverse.

### Conclusions

The No Action Alternative would have park-wide, long-term, minor, adverse impacts on cultural landscapes. Cumulative effects would be local, short-term, negligible and adverse.

### Impacts of Elements Common to the Action Alternatives on Cultural Landscapes

The following proposed actions would impact cultural landscapes at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees

- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources

- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition

- Restoration of the persimmon grove along the existing Carver Trail

- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road

- Expansion of the trail system to enhance interpretation of the entire site

- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)

- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementation of rehabilitation and management strategies for land use, historic features, and integration of the cultural landscape with park-wide interpretation would be a *park-wide, long-term, major beneficial impact* on the cultural landscape. Actions common to the alternatives 2, 3, and 4 fall under the comprehensive treatment approach of rehabilitation. Under the rehabilitation treatment, stabilization, protection, and preservation of historic and natural resources are actions that must occur in order to allow for the limited accommodation of new uses.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Cultural Landscapes

This rehabilitation alternative suggests enhancing the ability of the park to tell the story of George Washington Carver's experiences by re-establishing and interpreting missing nineteenth century features and lifeways. Features anticipated to include are a persimmon grove, walnut tree fence rows, fruit orchard, the farmstead area, the rural agricultural setting, and hayfields. There would be interpretation the accurate location of the birthplace cabin and Moses Carver house and farmstead based on further research and investigation using foundation outlines and mow patterns. This alternative would also include thinning and management of woodland to depict historic savanna-like character. These activities would improve the cultural landscape and establish a clear connection between Dr. Carver's life and achievements and the historic landscape of the farm. Alternative 2 would have a **park-wide, long-term, and major beneficial impact** on the cultural landscape.

For purposes of Section 106 compliance there would be ***no adverse effect.***

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to cultural landscapes from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, major and beneficial.

### Conclusion

Treatment Alternative 2 would have park-wide, long-term and major beneficial impacts on cultural landscapes from woodland management, restoration and interpretation of former farm features, and plant and interpretive installations. Cumulative effects would be park-wide, long-term, major and beneficial.

### Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Cultural Landscapes

The focus of this rehabilitation alternative would be the interpretation of George Washington Carver's work and career through plants known to have been the focus of his experiments and scientific exploration. Plants would be featured along park trails to enhance interpretation of Dr. Carver's achievements. Thinning and clearing of woodlands would occur to allow for the planting of ethno-botanical species such as the persimmon grove, know to the young Carver on the farm and used in his later experiments. There would also be expansion of the trail system into additional acres of the property to provide interpreted ethnobotanical plantings and an interpreted environmental trail through Harkins Woods. Alternative 3 would have a **park-wide, long-term, and moderate beneficial impact** on cultural landscapes.

For purposes of Section 106 compliance there would be ***no adverse effect.***

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to cultural landscapes from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, moderate and beneficial.

#### Conclusion

Treatment Alternative 3 would have park-wide, long-term and moderate beneficial impacts on cultural landscapes from woodland management, ethnobotanical plantings and interpretation and trail expansion to include environmental interpretation in Harkins Woods. Cumulative effects would be park-wide, long-term, moderate and beneficial.

### Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Cultural Landscapes

Alternative 4 blends the concept of plantings known to Dr. Carver with site specific enhancement of the interpretive programming involving the nineteenth century Moses Carver farm know to George Washington Carver and enhanced environmental education opportunities involving trail expansion and justification for on-going prairie restoration activities to honor Dr. Carver's conservation work. This alternative focuses on interpretation of several features known to have been present on the farm during Carver's boyhood that are no longer present to convey the scale, arrangement, orientation and elements of the historic farmstead. There is also mowing of two prairie units to interpret the agrarian setting and managing riparian woodlands as gallery forests. This alternative also includes planting of a heritage fruit orchard and the persimmon grove to interpret one of the key features described by Dr. Carver from his childhood. Alternative 4 would have a **park-wide, long-term and major beneficial impact** on the cultural landscape.

For purposes of Section 106 compliance there would be ***no adverse effect.***

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to cultural landscapes from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, major and beneficial.

#### Conclusion

Treatment Alternative 4 would have park-wide, long-term and major beneficial impacts on cultural landscapes from woodland management, installation of plantings known to Dr. Carver and

interpretation and trail expansion to include environmental interpretation in Harkins Woods, and delineation and interpretation of the former farmstead of Dr. Carver's childhood. Cumulative effects would be park-wide, long-term, major and beneficial.

## 6.5.2 Historic Buildings and Structures

### Impact Intensity Threshold

NEPA impacts and NHPA section 106 effects on historic structures are assessed with reference to guidance contained in 36 CFR part 800 regarding historic properties. In general, an adverse impact or effect is recognized through a consideration of its ability to diminish or destroy the character-defining features of the historic structures, those features that convey the structure's significance. The ability of a structure to convey significance is known as integrity. As defined by the NPS, there are seven aspects of integrity: location, design, setting, materials, workmanship, feeling and association. Five of these aspects relate mainly to physical impacts or effects, such as alteration or demolition of historic structures. Physical impacts or effects on historic buildings and structures are not anticipated under any of the proposed alternatives. The thresholds of change for the intensity of an impact on historic buildings and structures are defined in Table 6-9.

**Table 6-9. Historic Buildings and Structures Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Impacts would be at the lowest level of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be no adverse effect. |
| **Minor** | Alteration of a historic structure would not diminish the overall integrity of the resource. The determination of effect for Section 106 would be no adverse effect. |
| **Moderate** | Alteration of a historic structure would diminish the overall integrity of the resource. The determination of effect for Section 106 would be adverse effect. A programmatic agreement is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the advisory council, in accordance with 36 CFR 800.6(b). Measures identified in the programmatic agreement to minimize or mitigate adverse impacts reduce the intensity of the impact and NEPA from moderate to minor. |
| **Major** | Alteration of a historic structure would diminish the overall integrity of the resource. The determination of effect for Section 106 would be adverse effect. Measures to minimize or mitigate adverse impacts cannot be agreed on, and the NPS and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b). |

### Impacts of Alternative 1 *Preserve Existing Conditions and Continue Current Management Strategies* (No Action) on Historic Buildings and Structures

Alternative 1, the No Action Alternative focuses on preservation of the existing character of the George Washington Carver National Monument landscape and current interpretive programs. Visitors would continue to gain the majority of their knowledge of the life and accomplishments of Dr. Carver through the exhibits located within the visitor center and along the mile-long Carver

Trail. Historic structures and buildings such as the Moses Carver house and the Carver family cemetery perimeter wall will continue to be preserved through continued management and maintenance strategies currently in place at the national monument. There would be no changes to historic buildings and structures under this alternative. The alternative would limit the park's ability to rehabilitate the landscape and its associated buildings and or structures to enhance the memorial nature of the site. This alternative would have ***local, long-term, negligible, adverse impact*** on historic buildings and structures.

For purposes of Section 106 compliance there would be ***no adverse effect.***

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term and negligible adverse impacts on historic buildings and structures. Some of these actions include: small scale construction and excavation for fulfillment of accessibility requirements across the park and in association with the Moses Carver house and future preservation and interpretation actions. The overall cumulative impacts to historic buildings and structures from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be local, short-term, negligible and adverse.

### Conclusions

The No Action Alternative would have local, long-term, negligible adverse impacts on historic buildings and structures. Cumulative effects would be local, short-term, negligible and adverse.

### Impacts of Elements Common to the Action Alternatives on Historic Structures

The following proposed actions would impact historic buildings and structures at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas.
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources
- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition
- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road

- Expansion of the trail system to enhance interpretation of the entire site

- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)

- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementation of construction projects such as provision for universal accessibility to the Moses Carver house and to the Carver family cemetery would be a *local, short-term, negligible adverse impact* on historic buildings and structures. Implementation of rehabilitation and management strategies for land use, historic features, and integration of historic structures and buildings with park-wide interpretation would be a *park-wide, long-term, major beneficial impact* on historic buildings and structures. Actions common to alternatives 2, 3, and 4 fall under the comprehensive treatment approach of rehabilitation. Under the rehabilitation treatment, stabilization, protection, and preservation of historic and natural resources are actions that must occur in order to allow for the limited accommodation of new uses.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Historic Buildings and Structures

The historic buildings and structures identified in Chapters 3 and 4 of this document include the Moses Carver house, the Carver family cemetery perimeter wall and the stone boundary markers in the northwest and southwest corners of the George Washington Carver National Monument. In Alternative 2, these features are preserved, managed, and maintained, with enhanced interpretation. This alternative also includes interpretation of the accurate location of the birthplace cabin and Moses Carver homestead based on further research and investigation using foundation outlines and mow patterns. Alternative 2 would have **local, long-term, moderate, and beneficial impact** on historic buildings and structures.

For purposes of Section 106 compliance there would be ***no adverse effect.***

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to historic buildings and structures from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate and beneficial.

#### Conclusion

Treatment Alternative 2 would have local, long-term and moderate beneficial impacts on historic buildings and structures from preservation, management, repair and maintenance of the building and structures and from sensitive compliance techniques for accessibility. Cumulative effects would be local, long-term, moderate and beneficial.

### Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Historic Buildings and Structures

The historic buildings and structures identified in Chapters 3 and 4 of this document include the Moses Carver house, the Carver family cemetery perimeter wall and the stone boundary markers in the northwest and southwest corners of the George Washington Carver National Monument. In Alternative 3, these features are preserved, managed, and maintained, with enhanced interpretation. Alternative 3 would have **local,**

**long-term, moderate, and beneficial impact** on historic buildings and structures.

For purposes of Section 106 compliance there would be ***no adverse effect.***

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to historic buildings and structures from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate and beneficial.

### Conclusion

Treatment Alternative 3 would have local, long-term and moderate beneficial impacts on historic buildings and structures from preservation, management, repair and maintenance of the building and structures and from sensitive compliance techniques for accessibility. Cumulative effects would be local, long-term, moderate and beneficial.

## Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Historic Buildings and Structures

The historic buildings and structures identified in Chapters 3 and 4 of this document include the Moses Carver house, the Carver family cemetery perimeter wall and the stone boundary markers in the northwest and southwest corners of the George Washington Carver National Monument. In Alternative 4, these features are preserved, managed, and maintained, with enhanced interpretation. This alternative also includes interpretation of the accurate location of the birthplace cabin and Moses Carver homestead based on further research and investigation using foundation outlines and mow patterns. Alternative 4 would have **local, long-term, moderate, and beneficial impact** on historic buildings and structures.

For purposes of Section 106 compliance there would be ***no adverse effect.***

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to historic buildings and structures from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate and beneficial.

### Conclusion

Treatment Alternative 4 would have local, long-term and moderate beneficial impacts on historic buildings and structures from preservation, management, repair and maintenance of the building and structures and from sensitive compliance techniques for accessibility. Cumulative effects would be local, long-term, moderate and beneficial.

## 6.5.3 Archeological Resources

### Impact Intensity Threshold

Section 106 of the NHPA, and its implementing regulations under 36 CFR 800, require all federal agencies to consider the effects of federal actions on cultural properties eligible for or listed in the national register. In order for an archeological/paleontological site to be listed in the national register, it must contain information likely to yield knowledge of prehistory or history, and the information must be considered important. The site or property must have characteristics suggesting the likelihood that it possesses configurations of artifacts, soil strata, structural remains, or other natural or cultural features that make it possible to test a hypothesis about events, groups, or processes in the past the bear on important research questions in the social or natural sciences or the humanities; or verify or amplify currently available information suggesting that a hypothesis is either true or false; or reconstruct the sequence of archeological cultures for the purpose of identifying and explaining continuities and discontinuities in the archeological record for a particular area.

Due to the nature of archeological projects, the presence or absence of archeological sites in any region cannot be known before initiating an archaeological field investigation. Accordingly, impacts on potential archaeological resources cannot be known beforehand. If an adverse effect on an archaeological resource is identified, all effort will be made to mitigate that adverse effect before proceeding with landscape-disturbing activities. The thresholds of change for the intensity of an impact on archeological resources are defined in Table 6-10.

### Table 6-10. Archeological Resources Impact and Intensity

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Impacts would be at the lowest level of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be no adverse effect. |
| **Minor** | Alternation of an archaeological site would not diminish the overall integrity of the resource. The determination of effect for Section 106 would be no adverse effect. Monitoring may be required if a proposed activity occurs near an archeological site. |
| **Moderate** | Alteration of an archaeological site would diminish the overall integrity of the resource. The determination of effect for Section 106 would be adverse effect. A programmatic agreement is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the advisory council, in accordance with 36 CFR 800.6(b). Measures identified in the programmatic agreement to minimize or mitigate adverse impacts reduce the intensity of the impact and NEPA from moderate to minor. |
| **Major** | Alteration of an archaeological site would diminish the overall integrity of the resource. The determination of effect for Section 106 would be adverse effect. Measures to minimize or mitigate adverse impacts cannot be agreed on, and the NPS and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b). |

### Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Archeological Resources

Various archeological inventories have been conducted within the national monument since 1953, through the most recent undertaking in 2014 of additional archeological inventories in compliance with Section 110. Additional investigations at the lithic scatter sites would be

very useful in determining site significance and providing additional information about the long history of use and occupation. The sites are visited on a regular basis to assess their condition and document whether they are being subjected to any threats or disturbances. They are all currently listed in "good" condition and are in a good state of preservation.

Under Alternative 1 (No Action), there would be no new ground-disturbing activities that would potentially affect archeological resources. Current levels of maintenance and repairs to historic buildings and structures and landscapes would continue. These activities do not typically include excavation. Because current management practices would continue and there would be no new impacts to archeological sites and artifacts, there would be a ***park-wide, long-term, and negligible adverse impact*** to archeological resources.

For purposes of Section 106, there would be **no adverse effect.**

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term and negligible adverse impacts on archeological resources. Some of these actions include: continued prairie restoration and stabilization; small scale construction and excavation for fulfillment of accessibility requirements across the park; future preservation and interpretation management and changes, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to archeological resources from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be local, short-term, negligible and adverse.

### Conclusions

The No Action Alternative would have park-wide, long-term, negligible adverse impacts on archeological resources. Cumulative effects would be park-wide, long-term, negligible and adverse.

### Impacts of Elements Common to the Action Alternatives on Archaeological Resources

The following proposed actions would impact archaeological resources at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources

- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition
- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road
- Expansion of the trail system to enhance interpretation of the entire site
- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)
- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Rehabilitation of the national monument to accommodate visitors and to improve or expand features, may require implementation of construction projects to provide for universal accessibility to the Moses Carver house and existing trails, as well as the expansion of the trail system and some vegetation removal. These activities could potentially impact archeological resources if soil disturbance results in disruption of subsurface resources. The impacts would range from negligible to moderate adverse impacts depending on whether any currently unidentified archeological resources are discovered through implementation of the proposed actions. Prior to implementation of these actions, archeological investigation would have to be conducted and any ground disturbance monitored. There are archeological resources on the site so any construction/implementation strategies could have a *long-term, negligible to moderate, adverse impact* on potential archeological resources on the site. Proposed monitoring must be in place to reduce impacts to short-term, negligible, adverse impacts and for the purposes of Section 106, no adverse effect.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Archaeological Resources

Alternative 2 would include some excavation for trail expansion, removal and thinning of woodlands, and installation of new plantings. There would be ground disturbance during demolition of former residences and the subsequent development of the area for overflow parking. This would require installation of grass pavers to stabilize the soil and re-establish ground cover on the site. Archeological investigations are integral to this alternative and would determine additional information about the farm in support of restoration efforts. Archeological investigation and research would also determine the accurate location of the birthplace cabin and Moses Carver homestead. No known archeological sites would be disturbed in this alternative. To minimize potential adverse impacts, surveys would be conducted prior to ground-disturbing activities. Monitoring for subsurface artifacts would be conducted during ground-disturbing activities on the site. In the event that archeological resources are encountered, work would be stopped immediately and the park cultural resource specialist would be contacted. If necessary the SHPO and THPO would be consulted on potential adverse impacts and additional mitigation measures.

Alternative 2 includes ground disturbing activities with the potential to encounter and adversely impact previously unknown archeological resources. Potential adverse impacts would be minimized by pre-construction surveys and monitoring in areas with high potential for artifacts. With the mitigation measures, Alternative 2 would have **local, short-term, and minor adverse impacts** on archeological resources.

For purposes of Section 106 compliance there would be ***no adverse effect.***

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to archeological resources from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, minor and adverse with mitigation measures in place.

### Conclusion

Treatment Alternative 2 would have local, short-term and minor adverse impacts on archeological resources from various ground disturbances for woodland management, installation of new vegetation, and trail expansion. Cumulative effects would be park-wide, long-term, minor and adverse with mitigation measures in place.

## Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Archaeological Resources

Alternative 3 would include some excavation for trail expansion, removal and thinning of woodlands, and installation of new plantings. There would be ground disturbance during demolition of former residences and the subsequent development of the area for overflow parking. This would require installation of grass pavers to stabilize the soil and re-establish ground cover on the site. Archeological investigations are integral to this alternative and would determine additional information about the farm in support of restoration efforts. No known archeological sites would be disturbed in this alternative. To minimize potential adverse impacts, surveys would be conducted prior to ground-disturbing activities. Monitoring for subsurface artifacts would be conducted during ground-disturbing activities on the site. In the event that archeological resources are encountered, work would be stopped immediately and the park cultural resource specialist would be contacted. If necessary the SHPO and THPO would be consulted on potential adverse impacts and additional mitigation measures.

Alternative 3 includes ground disturbing activities with the potential to encounter and adversely impact previously unknown archeological resources. Potential adverse impacts would be minimized by pre-construction surveys and monitoring in areas with high potential for artifacts. With the mitigation measures, Alternative 3 would have **local, short-term, and minor adverse impacts** on archeological resources.

For purposes of Section 106 compliance there would be ***no adverse effect.***

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to archeological resources from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, minor and adverse with mitigation measures in place.

### Conclusion

Treatment Alternative 3 would have local, short-term and minor adverse impacts on archeological resources from various ground disturbances for woodland management, installation of new vegetation, and trail expansion. Cumulative effects would be park-wide, long-term, minor and adverse with mitigation measures in place.

## Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Archeological Resources

Alternative 4 would include some excavation for trail expansion, removal and thinning of woodlands, installation of new plantings, and delineation and interpretation of the former farmstead. There would be ground disturbance during demolition of former residences and the

subsequent development of the area for overflow parking. This would require installation of grass pavers to stabilize the soil and re-establish ground cover on the site. Archeological investigations are integral to this alternative and would determine additional information about the farm in support of delineation and interpretive efforts. No known archeological sites would be disturbed in this alternative. To minimize potential adverse impacts, surveys would be conducted prior to ground-disturbing activities. Monitoring for subsurface artifacts would be conducted during ground-disturbing activities on the site. In the event that archeological resources are encountered, work would be stopped immediately and the park cultural resource specialist would be contacted. If necessary the SHPO and THPO would be consulted on potential adverse impacts and additional mitigation measures.

Alternative 4 includes ground disturbing activities with the potential to encounter and adversely impact previously unknown archeological resources. Potential adverse impacts would be minimized by pre-construction surveys and monitoring in areas with high potential for artifacts. With the mitigation measures, Alternative 4 would have **local, short-term, and minor adverse impacts** on archeological resources.

For purposes of Section 106 compliance there would be ***no adverse effect.***

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to archeological resources from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, minor and adverse with mitigation measures in place.

### Conclusion

Treatment Alternative 4 would have local, short-term and minor adverse impacts on archeological resources from various ground disturbances for woodland management, installation of new vegetation, and trail expansion. Cumulative effects would be park-wide, long-term, minor and adverse with mitigation measures in place.

## 6.6 Visual Resources

### Impact Intensity Threshold

Visual resources are the features that define the visual character of an area such as natural features, vistas, viewsheds, and architecture. The existing visual environment is what is seen by the visitor during the approach to George Washington Carver National Monument as well as what is seen by the visitor within the site itself. The visual environment impacts both the anticipation and experience at the national monument. The quality of the visual environment is a vital resource and is instrumental in setting the stage for experiencing the site. The thresholds of change for the intensity of impacts to visual resources are described in Table 6-11.

**Table 6-11. Visual Resources Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Impacts would result in barely perceptible changes to existing viewsheds |
| **Minor** | Impacts would result in slightly detectable changes to views in a small area or would introduce a compatible human-made feature to an existing developed area. |
| **Moderate** | Impacts would be readily apparent and would change the character of the visual resources in the area. The visitor would be aware of the impacts associated with the alternative and would likely express a neutral to negative opinion about the changes. |
| **Major** | Impacts would be highly noticeable and visible from a considerable distance or over a large area. The character of visual resources would change substantially. The visitor would be aware of the effects associated with the alternative and would likely express a strong negative opinion about the changes. |

### Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Visual Resources

George Washington Carver National Monument exhibits several views designed primarily for visitor enjoyment and understand of the landscape. These views were all established as part of the early development of the park and most contribute to the significance of the park landscape. The No Action Alternative focuses on preservation of the existing character of the George Washington Carver National Monument landscape and current interpretive programs. Views identified as important interpretive vistas, such as from the visitor center environs across the prairie to the west, and the views from the Carver Family cemetery across the prairie, would continue to be managed for clear sight lines. Treatment would focus on stabilization and maintenance of the current landscape and preservation of the park's commemorative features as they exist today. There would be ***park-wide, long-term, and negligible adverse impacts*** to visual resources under this alternative.

#### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have local, short-term, and negligible adverse impacts on Visual Resources. Some of these actions include: routine utility repair, replacement, and new installation; small scale construction and excavation for fulfillment of accessibility requirements across the park; and present and future management and maintenance strategies for turf, prairie restoration, and conservation and management of the streams and Williams Pond. The overall cumulative impacts to Visitor Use and Experience from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be local, short-term, negligible and adverse.

#### Conclusions

The No Action Alternative would have park-wide, long-term and negligible adverse impacts to Visual Resources. Cumulative effects would be park-wide, short-term, negligible and adverse.

### Impacts of Elements Common to the Action Alternatives on Visual Resources

The following proposed actions would impact visual resources at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Preservation, management, and maintenance strategies for perpetuation of the views and viewsheds that contribute to the National Register significance of the park
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources

of high quality and value, including native plant communities and water resources

- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition
- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road
- Expansion of the trail system to enhance interpretation of the entire site
- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)
- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementation of rehabilitation and preservation of significant historic views and viewsheds at the national monument would be a *park-wide, long-term, and moderate beneficial impact* to visual resources. Actions common to alternatives 2, 3, and 4 fall under the comprehensive treatment approach of rehabilitation. Under the rehabilitation treatment, stabilization, protection, and preservation of historic viewsheds are actions that must occur in order to preserve significant resources and allow for the limited accommodation of new uses and more visitors.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Visual Resources

Alternative 2 expands the rehabilitation and preservation of significant historic views over the George Washington Carver National Monument landscape. This includes preservation of the existing viewshed from the visitor center to prairie unit 4 and views outward from the family cemetery toward the prairie and woodlands. This alternative also creates viewsheds from the expanded trail for enhanced interpretation to mown hay fields and preservation of the agrarian setting. Alternative 2 would have ***park-wide, long-term, and major beneficial impact*** to visual resources.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Visual Resources from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, major and beneficial.

#### Conclusion

Treatment Alternative 2 would have park-wide, long-term and major beneficial impacts on Visual Resources from visual interpretation of former farm features, and plant and interpretive installations, and use of the cultural landscape for enhanced interpretation, and vistas created to mown hay areas to preserve and interpret the agrarian setting. Cumulative effects would be park-wide, long-term, major and beneficial.

### Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Visual Resources

Alternative 3 preserves significant historic views over the George Washington Carver National Monument landscape. This includes preservation of the existing viewshed from the visitor center to

prairie unit 4 and views outward from the family cemetery toward the prairie and woodlands. This alternative also creates potential views from the expanded trail for enhanced interpretation of ethnobotanical plantings. Alternative 3 would have ***park-wide, long-term, and moderate beneficial impact*** to visual resources.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Visual Resources from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, moderate and beneficial.

#### Conclusion

Treatment Alternative 3 would have park-wide, long-term and moderate beneficial impacts on Visual Resources from visual interpretation of former farm features, and plant and interpretive installations, and use of the cultural landscape for enhanced interpretation, and vistas created to mown hay areas to preserve and interpret the agrarian setting. Cumulative effects would be park-wide, long-term, moderate and beneficial.

### Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Visual Resources

Alternative 4 expands the rehabilitation and preservation of significant historic views over the George Washington Carver National Monument landscape. This includes preservation of the existing viewshed from the visitor center to prairie unit 4 and views outward from the family cemetery toward the prairie and woodlands. This alternative also creates viewsheds from the expanded trail for enhanced interpretation to mown hay fields and preservation of the agrarian setting. Alternative 4 would have ***park-wide, long-term, and major beneficial impact*** to visual resources.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Visual Resources from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, major and beneficial.

#### Conclusion

Treatment Alternative 4 would have park-wide, long-term and major beneficial impacts on Visual Resources from visual interpretation of former farm features, and plant and interpretive installations, and use of the cultural landscape for enhanced interpretation, and vistas created to mown hay areas to preserve and interpret the agrarian setting. Cumulative effects would be park-wide, long-term, major and beneficial.

## 6.7 Visitor Use and Experience

#### Impact Intensity Threshold

NPS *Management Policies 2006* state that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks, and that the NPS is committed to providing appropriate high-quality opportunities for visitors to enjoy the park. Consequently, one of the management goals at George Washington Carver National Monument is to ensure that visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of site facilities, services, and appropriate commemorative, educational, and interpretive opportunities.

Scoping input and observation of visitation patterns, combined with assessment of amenities available to visitors currently at the national monument, were used to estimate the impacts of the alternatives. Impacts on the ability of visitors to experience a full range of resources was analyzed by examining resources and objectives presented in the national monument's significance statements , as derived from its enabling legislation. The potential for change in visitor

experience proposed by the alternatives was evaluated by identifying projected increases or decreases in access, vehicular and pedestrian circulation, parking, interpretation, visitor services and other uses, and determining whether or how these projected changes would affect the desired visitor experience, to what degree, and for how long. The thresholds of change for the intensity of an impact of visitor use and experience are described in Table 6-12.

### Table 6-12. Visitor Use and Experience Impact and Intensity

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Changes in visitor experience would be below or at an imperceptible level of detection. The visitor would not likely be aware of the impacts associated with the action. |
| **Minor** | Changes in visitor experience would be detectable, although the changes would be slight. Most visitors would be aware of the impacts associated with the action, but would not likely express an opinion about the changes. |
| **Moderate** | Changes in visitor experience would be readily apparent. The visitor would be aware of the impacts associated with the action and would likely express an opinion about the changes. |
| **Major** | Changes in visitor experience would be readily apparent and severely adverse or exceptionally beneficial. The visitor would be aware of the impacts associated with the action and would likely express a strong opinion about the changes. |

### Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Visitor Use and Experience

The no action alternative would preclude the park from meeting some of the goals identified for consideration as part of the CLR treatment plan in the Purpose and Need statement and the list of management issues such as expansion of visitor parking facilities to accommodate overflow needs, clarifications of inaccuracies, such as the current location of the birthplace cabin and the conversion of fescue fields associated with the former mine site to another landcover type. Nor further exploration of ways to utilize the cultural landscape as a tool for interpreting Carver's life and accomplishments would be conducted. This alternative would also limit the park in its ability to explain the historical context within which George Washington Carver grew up and his efforts to get an education and to rehabilitate the landscape and its associated structures to enhance the memorial nature of the site.

Overall this alternative would have ***park-wide, long-term, minor, and adverse impact*** on Visitor Use and Experience.

#### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have park-wide, short-term, and negligible beneficial impacts to Visitor Use and Experience. Some of these actions include: any increased interpretation or programming of events, future mowing requirements due to turf management strategies in place or other management strategies or interpretation associated with the prairie restoration. The overall cumulative impacts to Visitor Use and Experience from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be park-wide, short-term, minor and adverse.

#### Conclusions

The No Action Alternative would have park-wide, long-term, and minor adverse impacts on Visitor Use and Experience. Cumulative effects would be park-wide, short-term, minor and adverse.

### Impacts of Elements Common to the Action Alternatives on Visitor Use and Experience

The following proposed actions would impact visitor use and experience at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Preservation, management, and maintenance strategies for perpetuation of the views and viewsheds that contribute to the National Register significance of the park
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management.
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources
- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition
- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road
- Expansion of the trail system to enhance interpretation of the entire site
- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)
- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Most of the actions common to alternatives 2, 3, and 4 such as: development of overflow parking area in the core developed area; preservation, maintenance and management of the cultural vegetation that contributes to the National Register significance of the park; expansion of the trail system to enhance interpretation of the entire site; and provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience would be a *park-wide, long-term, major beneficial impact* on the visitor experience. Actions common to the alternatives 2, 3, and 4 fall under the comprehensive treatment approach of rehabilitation. Under the rehabilitation treatment, stabilization, protection, and preservation of historic and natural resources are actions that must occur in order to allow for the limited accommodation of new uses and enhancement of the visitor experience.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Visitor Use and Experience

Alternative 2 suggests enhancing the ability of the park to tell the story of George Washington Carver's experiences by re-establishing and interpreting missing nineteenth century features and lifeways. Features anticipated to include are a persimmon grove, walnut tree fence rows, fruit orchard, the farmstead area, the rural agricultural setting, and hayfields. There would be interpretation the accurate location of the birthplace cabin and Moses Carver house and farmstead based on further research and investigation using foundation outlines and mow patterns. This alternative would also include thinning and management of woodland to depict historic savanna-like character. These activities would improve the cultural landscape and establish a clear connection between Dr. Carver's life and achievements and the historic landscape of the farm. Alternative 2 would have a **park-wide, long-term, and major beneficial impact** on Visitor Use and Experience.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Visitor Use and Experience from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, major and beneficial.

#### Conclusion

Treatment Alternative 2 would have park-wide, long-term and major beneficial impacts on Visitor Use and Experience from interpretation of former farm features, and plant and interpretive installations, and use of the cultural landscape for enhanced interpretation. Cumulative effects would be park-wide, long-term, major and beneficial.

### Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Visitor Use and Experience

The focus of Alternative 3 would be the interpretation of George Washington Carver's work and career through plants known to have been the focus of his experiments and scientific exploration. Plants would be featured along trails to enhance interpretation of Dr. Carver's achievements. Thinning and clearing of woodlands would occur to allow for the planting of ethno-botanical species such as the persimmon grove, know to the young Carver on the farm and used in his later experiments. There would also be expansion of the trail system into additional acres of the property to provide interpreted ethnobotanical plantings and an interpreted environmental trail through Harkins Woods. Alternative 3 would have a **park-wide, long-term, and moderate beneficial impact** on Visitor Use and Experience.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Visitor Use and Experience from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, moderate and beneficial.

#### Conclusion

Treatment Alternative 3 would have park-wide, long-term and moderate beneficial impacts on Visitor Use and Experience from ethnobotanical plantings and interpretation and trail expansion to include environmental interpretation in Harkins Woods. Cumulative effects would be park-wide, long-term, moderate and beneficial.

### Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Visitor Use and Experience

Alternative 4 blends the concept of installation of plantings known to Dr. Carver with site specific enhancement of the interpretive programming involving the nineteenth century Moses Carver farm know to George Washington Carver and enhanced environmental education opportunities involving trail expansion and justification for on-going prairie restoration activities to honor Dr. Carver's conservation work. This alternative focuses on interpretation of several features known to have been present on the farm during Carver's boyhood that are no longer present to convey the scale, arrangement, orientation and elements of the historic farmstead. There is also mowing of two prairie units to interpret the agrarian setting and managing riparian woodlands as gallery forests. This alternative also includes planting of a heritage fruit orchard and the persimmon grove to interpret one of the key features described by Dr. Carver from his childhood. Alternative 4 would have a **park-wide, long-term and major beneficial impact** on Visitor Use and Experience

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Visitor Use and Experience from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, major and beneficial.

### Conclusion

Treatment Alternative 4 would have park-wide, long-term and major beneficial impacts on Visitor Use and Experience from installation of plantings known to Dr. Carver and interpretation of those plantings, trail expansion to include environmental interpretation in Harkins Woods, and delineation and interpretation of the former farmstead of Dr. Carver's childhood. Cumulative effects would be park-wide, long-term, major and beneficial.

## 6.8 Park Operations

### Impact Intensity Threshold

Park operations, for this document, refers to the quality and effectiveness of the infrastructure and the ability to maintain the infrastructure used in the operation of the park in order to adequately protect and preserve vital resources and provide for an effective visitor experience.

The thresholds of change for the intensity of an impact on park operations are described in Table 6-13.

**Table 6-13. Park Operations Impact and Intensity**

| Impact Intensity | Intensity Description |
|---|---|
| **Negligible** | Impacts to park operations would be at low levels of detection and would not have a substantial impact on park operations. |
| **Minor** | The impact would be detectable but would be of a magnitude that would not have a substantial impact on park operations. If mitigation was needed to offset adverse impacts, it would be simple and likely successful. |
| **Moderate** | The impacts would be readily apparent and would result in a substantial change in park operations in a manner noticeable to staff and the public. Mitigation measures would be necessary to offset adverse impacts and would likely be successful. |
| **Major** | The impacts would be readily apparent, would result in a substantial change in park operations in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures to offset adverse impacts would be needed, would be extensive, and their success could not be guaranteed. |

## Impacts of Alternative 1 Preserve Existing Conditions and Continue Current Management Strategies (No Action) on Park Operations

Under the No Action Alternative, park operations would remain consistent with those currently being undertaken. There would be no change in current site operations or infrastructure. The Visitor Center at George Washington Carver National Monument would continue to be the primary point of visitor contact. Maintenance requirements would continue at current levels. The NPS would need to develop a strategy for the accommodation of storage needs if plans for demolition of the former residential structures goes forward. Under the No Action Alternative, there would be ***park-wide, short-term, and negligible adverse impact*** on park operations.

### Cumulative Impacts

Past, present, and reasonably foreseeable future actions would have park-wide, short-term, and minor adverse impacts Park Operations. Some of these actions include: any increased interpretation or programming of events, future mowing requirements due to turf management strategies in place or other management strategies associated with the prairie restoration. The overall cumulative impacts to Park Operations from the "No Action" alternative in combination with the past, present, and reasonably foreseeable future actions would be park-wide, short-term, minor and adverse.

### Conclusions

The No Action Alternative would have park-wide, short-term, and negligible adverse impacts on Park Operations. Cumulative effects would be park-wide, short-term, minor and adverse.

## Impacts of Elements Common to the Action Alternatives on Park Operations

The following proposed actions would impact park operations at George Washington Carver National Monument and are common to all the action alternatives:

- Management of woodlands to remove invasive species and enhance interpretation from expanded trails
- Natural resource management of restored grassland prairie for health, diversity, and soil and water conservation
- Preservation, management, and interpretation of Carver Spring and the three streams: Carver, Harkins, and Williams branches
- Maintenance and management of the wet prairie areas located in the southwest and south central areas of the national monument to promote continued diversity of species and community composition found only in seasonally wet areas.
- Maintenance and management of Harkins Woods
- Conversion of the 30-acre parcel acquired by the park in 2006 to prairie to incorporate it into the overall approach to landcover management
- Preservation, maintenance, and management of the cultural vegetation that contributes to the National Register significance of the park including: replanted walnut hedgerow along the Carver Trail near the Carver family cemetery; ornamental plantings at the park former residential complex; and the picnic grove shade trees
- Preservation and maintenance of conservation land uses in order to protect natural resources of high quality and value, including native plant communities and water resources
- Development of overflow parking area in the core developed area on the site of the former residential/storage structures after planned demolition
- Restoration of the persimmon grove along the existing Carver Trail
- Consolidation of the picnic areas into one large space in the existing picnic area north of the entrance road

- Expansion of the trail system to enhance interpretation of the entire site
- Provision of universal accessibility to all buildings and structures as well as features associated with the primary interpretive experience, following the guidelines set forth in the *George Washington Carver National Monument: Accessibility Debriefing Report and Final Report* (NPS 2014)
- Stabilization, maintenance, and considered restoration of the Carver family cemetery wall to reflect intended squared off stone stacking methods and the original eastern opening for access

Implementing the limited construction actions or undertaking the preservation, maintenance, and management strategies common to the action alternatives would result in a *park-wide, long term moderate adverse impact* to park operations, management, and infrastructure. Expanded landscape management and interpretive programs will require additional man-power as well as expanded mowing and burning regimens for the restoration of the grassland prairie and the overall land cover management at the national monument.

### Impacts of Treatment Alternative 2 (Rehabilitation of the Landscape, including Limited Restoration, For Interpretation to Memorialize the Life and Achievements of George Washington Carver on Park Operations

Alternative 2 would require expansion of park operations due to enhanced interpretation of the park to tell the story of George Washington Carver's experiences by re-establishing and interpreting missing nineteenth century features and lifeways. Features anticipated to include are a persimmon grove, walnut tree fence rows, fruit orchard, the farmstead area, the rural agricultural setting, and hayfields. There would be interpretation of the accurate location of the birthplace cabin and Moses Carver house and farmstead based on further research and investigation using foundation outlines and mow patterns. This alternative would also include thinning and management of woodland to depict historic savanna-like character. There would also be expanded operations due to mown hayfields in designed viewsheds in Alternative 2. These activities would improve the cultural landscape and establish a clear connection between Dr. Carver's life and achievements and the historic landscape of the farm, but increase the necessity for expanded park operations for landscape management and enhanced interpretation. Alternative 2 would have a **park-wide, long-term, and moderate adverse impact** on the Park Operations.

#### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Park Operations from Alternative 2 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, moderate and adverse.

#### Conclusion

Alternative 2 would have park-wide, long-term, moderate and adverse impacts on Park Operations from expanded interpretation and expanded management of woodlands, water resources, prairies, viewsheds, new trails, and changes in vegetation cover. Cumulative effects would be park-wide, long-term, moderate and adverse.

### Impacts of Treatment Alternative 3 (Interpretation and Celebration of the Life and Work of George Washington Carver Using an Ethnobotanical Approach) on Park Operations

Alternative 3 would require expansion of park operations due to enhanced interpretation of the park with a focus on George Washington Carver's work and career through plants known to have been the focus of his experiments and scientific exploration. Plants would be installed along trails to enhance interpretation of Dr. Carver's achievements. Thinning and clearing of woodlands would occur to allow for the planting of ethno-botanical species such as the persimmon grove, know to the young Carver on the farm and

used in his later experiments. There would also be expansion of the trail system into additional acres of the property to provide interpreted ethnobotanical plantings and an interpreted environmental trail through Harkins Woods. These activities would improve the cultural landscape and establish a clear connection between Dr. Carver's life and legacy as a scientist and educator but these actions will increase the necessity for expanded park operations for landscape management and enhanced interpretation. Alternative 3 would have a **park-wide, long-term, moderate, and adverse impact** on Park Operations.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Park Operations from Alternative 3 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, moderate and adverse.

### Conclusion

Alternative 3 would have park-wide, long-term, moderate, adverse impacts on Park Operations from expanded interpretation and expanded installation and management of ethnobotanical plantings, expanded management of woodlands, water resources, prairies, viewsheds, and new trails. Cumulative effects would be park-wide, long-term, moderate and adverse.

## Impacts of Treatment Alternative 4 (Honor, Commemoration, and Interpretation of the Life and Legacy of George Washington Carver by Employment of a Combination of Agricultural Heritage and Exhibits of Plants Known to Dr. Carver) on Park Operations

Alternative 4 would require expansion of park operations due to enhancement of the interpretive programming involving the nineteenth century Moses Carver farm known to George Washington Carver and enhanced environmental education opportunities involving trail expansion and justification for on-going prairie restoration activities to honor Dr. Carver's conservation work. This alternative focuses on interpretation of several features known to have been present on the farm during Carver's boyhood that are no longer present to convey the scale, arrangement, orientation and elements of the historic farmstead. There is also mowing of two prairie units to interpret the agrarian setting and managing riparian woodlands as gallery forests. This alternative also includes planting of a heritage fruit orchard and the persimmon grove to interpret one of the key features described by Dr. Carver from his childhood. Features included are a persimmon grove, walnut tree fence rows, fruit orchard, the farmstead area, the rural agricultural setting, and hayfields. There would be interpretation of the accurate location of the birthplace cabin and Moses Carver house and farmstead based on further research and investigation using foundation outlines and mow patterns. These activities would improve the cultural landscape and use it to interpret the entire life of George Washington Carver, but these actions will increase the necessity for expanded park operations for landscape management and enhanced interpretation. Alternative 4 would have a **park-wide, long-term, and moderate adverse impact** on the Park Operations.

### Cumulative Impacts

Past, present and reasonably foreseeable future actions are described under "Cumulative Impacts for Alternative 1 (No Action)." The overall cumulative impacts to Park Operations from Alternative 4 in combination with past, present, and reasonably foreseeable future actions would be park-wide, long-term, moderate and adverse.

### Conclusion

Alternative 4 would have park-wide, long-term, moderate and adverse impacts on Park Operations from expanded interpretation and expanded installation and management of plantings known to Dr. Carver, expanded management of woodlands, water resources, prairies, viewsheds, and new trails. Cumulative effects would be park-wide, long-term, moderate and adverse.

# Chapter 7: Consultation and Coordination

## 7.0 Introduction

NPS Director's Order 12 requires the NPS to make "diligent" efforts to involve the interested and affected public in the NEPA process. This chapter documents the scoping process for this CLR/EA as well as interagency consultation and coordination with Fish and Wildlife Service, the Missouri State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officers (THPO), and other natural and cultural resource agencies. Also included is the list of recipients who received notice of the project undertaking and the planned stakeholder meetings.

## 7.1 Scoping Process

### Start-Up Meeting

To officially initiate this project, a kick-off meeting was held on November 5 and 6, 2013. Project team members from Bahr Vermeer Haecker Architects, John Milner Associates, Inc., Wiss, Janney, Elstner Associates, Inc., and Historic Resources Group, Inc., met with park and regional NPS personnel at the George Washington Carver National Monument visitor center to initiate work on the CLR as part of the phase two site visit. The meeting began with introductions of park, regional office, and contractor project staff. During the meeting, Marla McEnaney introduced the purpose, goals, and methodology of the CLR, and the park identified the issues of concern to be addressed in the report. Project administration procedures were established, materials needed by the CLR team were identified, and a process for transmission determined. The park also identified the resources available to the team and any special conditions unique to the project and site. NPS personnel subsequently provided the CLR team with a tour of the park. In addition to the start-up meeting, the project team met with park maintenance and interpretive personnel to solicit their input on park management issues, goals, and concerns during meetings held during the site visit.

### Scoping

Environmental assessment scoping is an early and open process to determine the breadth of issues and alternatives to be addressed. The park staff and resource professionals of the NPS Midwest Regional Office conducted internal scoping for the CLR project at George Washington Carver National Monument. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined the likely issues and impact topics, and identified the relationship of the preferred alternative to other planning efforts at the park. Typically, both internal and public scoping is held to address these elements. From previous planning efforts and development of resource documents, the park has a well-established list of stakeholders, interested in the alternatives being proposed for the park. For this CLR/EA, the superintendent initiated public scoping on March 1, 2014.

The NHPA (16 United States Code [USC] 470 et seq.); NEPA; NPS Organic Act; NPS *Management Policies 2006*; Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making (2001); and Director's Order 28: Cultural Resources Management Guideline require the consideration of impacts on cultural resources, either listed in or eligible to be listed in, the National Register of Historic Places. The park notified the Missouri State Historic Preservation Office (SHPO) of the project by email correspondence on February 20,

2014 and there was a SHPO on-site visit April 2, 2014. The park provided the SHPO with a 75 percent draft copy of the CLR/EA. The SHPO was also sent a follow up invitational letter on April 8, 2014, for the stakeholder meeting to be held at the park on May 14, 2014. In October 2014, NPS provided the SHPO a copy of the 95 percent draft copy of CLR/EA for review and comment.

The park sent the U.S. Fish and Wildlife Service (USFWS) a scoping notice on April 8, 2014, to solicit input on threatened and endangered species concerns for the 240 acres of the park included in the CLR/EA treatment alternatives and to invite agency participation in the scoping meeting on May 14, 2014. The NPS provided the USFWS a 75 percent draft copy of the CLR/EA for review and comment.

George Washington Carver National Monument conducted initial consultation with THPOs for the United Osage Nation, the United Keetoowah Band of Cherokee Indians in Oklahoma, the Caddo Nation, and the Eastern Shawnee Tribe of Oklahoma for the purpose of developing a Programmatic Agreement between the tribes and the park. Letters were issued to the THPOs along with a draft of the agreement, inviting them to review the document and attend a follow-up consultation meeting on April 3, 2014. In the same letter, THPOs were invited to the larger stakeholder meetings at the park on May 14, 2014. A follow-up letter with notice of the stakeholder meeting date and time was sent to the THPOs on April 8, 2014, to solicit input and participation in the CLR/EA meeting. The NPS provided the THPOs a copy of the 95 percent draft CLR/EA for review and comment.

The scoping process will continue during the public review period when the 95 percent draft CLR/EA document is posted to the National Park Service PEPC site. Comments from the public will be consolidated and taken into account as the CLR/EA is finalized. Solicitation of comments will also continue during this 30-day formal review period from agencies, the Missouri SHPO, and Indian tribes. Additional comments will also be taken by mail or email to the Superintendent's office at the Park.

## 7.2 Interagency Consultation and Coordination

Interagency consultation and coordination has included: the Missouri State Historic Preservation Officer; THPOs from Osage Nation, United Keetoowah Band of Cherokee Indians, Quapaw Tribe of Oklahoma, the Miami Nation, Wyandotte Tribe, Eastern Shawnee Tribe of Oklahoma, and the Caddo Nation; U.S Fish and Wildlife Service; Missouri Department of Conservation; Natural Resources Conservation Service; and the Heartland Inventory and Monitoring Program. All were notified of the project undertaking and issued an invitation to the stakeholder meeting on May 14, 2014, to review and comment on the proposed alternatives for the George Washington Carver National Monument CLR/EA. NPS subsequently provided agency representatives with the 95 percent draft of the CLR/EA for review and comment. Their comments and letters will be included in the final CLR/EA document.

## 7.3 List of Recipients of Letters of Notice and Invitation for the Stakeholder Meetings

- Mr. Charlie Scott, U. S. Fish and Wildlife Service
- Dr. James Jackson, Biology Department, Missouri Southern State University
- Dr. Luther Williams, Provost of Tuskegee Institute
- Dr. Charles Nilon, Department of Fisheries and Wildlife Sciences, University of Missouri
- Mr. Lynn Jenkins, District Conservationist, Natural Resources Conservation Service, U.S. Department of Agriculture
- Mr. Jerid Wilkinson, Conservation Agent, Missouri Department of Conservation

- Mr. Jeff Cantrell, Education Consultant, Missouri Department of Conservation
- Mr. Rick Horton, Fisheries Management Biologist, Missouri Department of Conservation
- Mr. Nate Forbes, Forestry District Supervisor, Missouri Department of Conservation
- Mr. Mike Petersen, Private Land Conservationist
- Mr. Jon Skinner, Urban Forester, Missouri Department of Conservation
- Ms. Ronda Headland, Community Conservation Planner, Missouri, Department of Conservation
- Mr. Mike DeBacker, Heartland Inventory and Monitoring Program
- Mr. Guy Headland, Outdoor Recreation Planner, Rivers, Trails, and Conservation Assistance Program, National Park Service
- Mr. John Wingo, President, Missouri Prairie Foundation
- George Washington Carver National Monument Volunteers-in-Park
- Ms. Martha Ruhe, Landscape Architect, NPS, (retired)
- Mr. Bill Jackson, Past Park Superintendent
- Mrs. Jodie Murray Burns, Chair, Carver Birthplace Association
- Honorable Mr. Bill Reiboldt, Missouri House of Representatives, District 160
- Honorable Mr. Bill Lant, Missouri House of Representatives, District 159
- Mr. Sam Claussen, President, Missouri Archeological Society
- Mr. Charles Nodler, Archivist, Missouri Southern State University
- Dr. Gary Kremer, Director, The State Historical Society of Missouri
- Mr. Keith Zoromski, History Department, Crowder College, Neosho
- Ms. Deb Sheals, Historic Preservation Consultant
- Mr. Steve Roark, President, Newton County Tourism Council
- Mr. Jeremy Elliott-Engel, County Program Director, Newton County Extension Center
- Mr. Greg Bowman, Regional Coordinator, Ducks Unlimited
- Mr. Bob Kulp, Director, Newton County Health Department
- Ms. Pauline Charles, Past CBA Business Manager and current VIP
- Ms. Mary Jean Barker, Past CBA Business Manager and long-time VIP
- Ms. Christy Hyman, Past seasonal employee, current VIP
- Mr. Justin Hall , Past seasonal employee, current VIP
- Ms. Judith Deel, State Historic Preservation Office
- Dr. Andrea Hunter, THPO, Osage Nation
- Ms. Lisa C. Baker, Acting THPO, United Keetoowah Band of Cherokee Indians
- Mr. Everett Bandy, THPO, Quapaw Tribe of Oklahoma
- Mr. Robert Cast, THPO, Caddo Nation
- Dr. Barker Fariss, THPO Archeologist for the Osage Nation

- Mr. Scott Willard, THPO, Miami Nation
- Ms. Sherri Clemons, THPO, Wyandotte Tribe
- Ms. Jean Ann Lambert, Assistant THPO, Quapaw Tribe
- Ms. Robin Dushane, THPO, Eastern Shawnee Tribe of Oklahoma
- Ms. Megan Bui, Community Focus Group Study participant 2013
- Rev. Dr. Betty Hannah-Witherspoon, Community Focus Group participant 2013
- Ms. Susan Marshall, Community Focus Group participant 2013
- Ms. Laurie Jones, Community Focus Group participant 2013
- Ms. Barbara True, Community Focus Group participant 2013
- Rev. Young K. Yoon, Community Focus Group participant 2013
- Mr. Bob Brower, Carthage YMCA
- Mr. Jonathan Roberts, Carthage YMCA
- Mr. and Mrs. Mike Funderburgh, Park neighbor
- Mr. and Mrs. Melvin Alford, Park neighbor
- Mr. and Mrs. Jess Holler, Park neighbor
- Mr. and Mrs. Glenn Brown, Park neighbor
- Mr. and Mrs. Elza Winter, Park neighbor
- Mr. and Mrs. Bob Plummer, Park neighbor
- Mr. Darwin Morgan, Annual family reunions held at the park (Carver ancestry).
- Mr. Stephen Gilmore, Annual family reunions held at the park (Carver ancestry).
- Ms. Lauren Copple, Missouri Department of Conservation
- Mr. and Mrs. Mike and Linda Simmons, Park VIP
- Mr. and Mrs. Larry and JoAnn Carnagey, Park VIP
- Mr. Dave Henness, Park VIP
- Ms. Cecelia Miller, Park VIP
- Mr. and Mrs. Don and Denise Jessen, Park VIP
- Ms. Phyllis Chancellor, Park VIP
- Mr. and Mrs. Jerry and Barbara Hixenbaugh, Park VIP
- Dr. Robert Heth, Biology Department, Missouri Southern State University
- Ms. Lydia Kaume, Barton County Extension Center, University of Missouri
- Ms. Meg Bourne Hulsey, Art Feeds
- Ms. Courtney Bay, Ozark Center
- Ms. Jennifer Jameson, Joplin Family YMCA
- Missouri Archeological Society, Missouri State University
- Newton County Commissioners
- Chamber of Commerce, Neosho
- Chamber of Commerce, Seneca
- Chamber of Commerce, Carthage
- Chamber of Commerce, Joplin
- Convention/Visitors Bureau, Joplin
- Mr. Dave Hendrix, Neosho National Fish Hatchery

- Mr. Brad Belk, Joplin Museum Complex/Tri-State Mineral Museum
- Executive Director, Wildcat Glades Conservation and Audubon Center
- Mr. Shane Hunter, Mayor, City of Diamond
- Historical Society, Newton County
- Dr. Eulanda Sanders, Iowa State University
- Dr. Paul Teverow, History Department, Missouri Southern State University
- Dr. Steve Smith, History Department Chair, Missouri Southern State University
- Dr. Al Cade, School of Education, Missouri Southern State University
- Ms. Sandy Taylor, Superintendent, Tuskegee Institute National Historic Site
- Dr. Matthew Jenkins, Acting President, Tuskegee Institute
- Honorable Charlie Davis, United States House of Representatives
- Honorable Billy Long, United States Congressman
- Honorable Claire McCaskill, United States Senate
- Honorable Roy Blunt, United State Senate
- Honorable Ron Richard, United States Senate
- Ms. Kris Drake, Freeman Health System
- Mr. Karl Schmidt, American Heart Association
- Mr. Joseph T. Njenga, Alliance of Southwest Missouri
- Dr. Jim Horton, Southwest Center for Educational Excellence
- Ms. Julia Price-Allison, Diamond High School
- Mr. and Mrs. Bill Abernathy, Park VIP
- Mr. and Mrs. Jack and Diane Andris, Park VIP
- Mrs. Penny Graves, Park VIP
- Mr. and Mrs. Phil and Gayle O'Hare, Park VIP
- Ms. Cathy Walsh, CDA Board Member
- Mr. Gary Stubblefield, CBA Board Member
- Mr. Larry Swift, CBA Board Member
- Dr. and Mrs. Roy Shaver, CBA Board Member
- Mr. and Mrs. William and Melody Colbert-Kean, CBA Board Member
- Dr. Linda Warner, CBA member
- Mr. and Mrs. Larry and Linda James, CBA Board Member

# Chapter 8: Implementation, Phasing, and Cost Estimate for Preferred Alternative

*(This chapter to be included in final documentl)*

## 8.0 Introduction

## 8.1 Development and Implementation of the Preferred Alternative

## 8.2 Project Phasing

## 8.3 Cost Estimate

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