2.0

Description of Alternatives

2.1 Alternatives Considered, but Dismissed

2.1.1 Mixed Species Planting

Prior to selecting the alternatives, the National Park Service reviewed and considered possible options for the replacement of trees (see "Appendix A: Technical Memorandum 1" and "Appendix C: EAB Working Group Plan"). The option of replacing the single-species planting with a mixed-species planting, reflecting a forestry approach based on prioritizing increased biodiversity in the landscape, was considered. However, this approach was not developed into an alternative because the Memorial grounds are a nationally significant designed landscape, and the single-species planting has been identified as an essential character-defining feature of the design. It was determined that using mixed species for the replacement would substantially alter the appearance of the designed planting and the landscape as a whole, which could diminish the integrity of this NHL, in direct contradiction to the National Park Service stewardship mission and NHPA compliance. As a result, no alternatives were developed that utilized this approach.

2.1.2 Replacement of All Trees During a Single Planting Season

The potential alternative of replacing all of the Rosehill ash trees during a single planting season was discussed at an Alternatives Development Workshop held on October 13, 2010. This alternative was not carried forward because, although it would have accomplished most of the objectives of the project, it would have had a substantial impact on National Park Service operations and on visitor experience. In addition, there would have been no opportunity for this alternative to be phased with the construction activities associated with the design competition.

2.2 Description of Proposed Action and No Action Alternatives

2.2.1. Proposed Action

The National Park Service is evaluating strategies to remove all of the Rosehill ash trees on the Memorial grounds and replace them with a suitable tree species. Under the Proposed Action, removal and replacement of the Rosehill ash trees would be phased in coordination with implementation of the improvements and overall program that result from the design competition. As part of the Proposed Action, Memorial staff has developed a broad schedule for replanting the Rosehill ash; however, the specific replacement species and timing of that replacement have not been determined. Through a consultation and selection process (documented in Appendix A), eight candidate replacement tree species have been identified. The final selection of the species to replace the Rosehill ash will be conducted in a separate process, and the final species selection is not anticipated to alter the conclusions of this EA.

As part of the Proposed Action, the trees in the allées would be replaced in the same locations with a single species, and a second species (or multiple other species) would be used to replace the existing Rosehill ash trees along Memorial Drive and on the east side slope area. Consistency and compatibility with Kiley's original design intent would be a priority of the tree replacement process, and trees of uniform height, spread, and caliper would be selected for the allée plantings. The existing spacing and number of trees in the allées would be maintained. Tree plantings along Memorial Drive and the east side slopes could be redesigned with more latitude, as they

do not constitute character-defining features of the historic designed landscape.

At the time of the tree replacement, the existing exposed aggregate walkways would be removed, a trench-like drainage system and structural soil installed, and the paving replaced with similar exposed aggregate material that matches the existing pavement in both color and texture. The alignment, width, and layout of the walkways could be retained. Any damage to the walkways that occurred during the tree or root ball removal process would be repaired. Replacement of the walks would be conducted under a separate action associated with the design competition process and is not addressed in this EA. The design is being conducted in coordination with goals and guidance set by the Memorial's GMP and CLR.

Following removal of the trees, the trunks and branches would be chipped and disposed of within the county to prevent the spread of EAB in accordance with the Missouri Plant Quarantine Law, if applicable. A designated area with a mechanical chipping machine, temporary stockpile of wood chips, and loading area may be located on site or near the Memorial to reduce transportation of the felled trees prior to chipping. Debris would be removed and disposed of per any applicable quarantine requirements in the case of infested wood; if quarantine requirements do not apply (e.g., in the case of tree removal occurring prior to the detection of EAB on the grounds), wood chips would be removed to a local composting facility. Capacity of local facilities to handle the quantities of debris would be investigated and a more detailed plan developed prior to tree removal.

Prior to replanting the new trees, the soil in the tree pits would be amended to improve drainage. The existing metal grates on the tree pits would be removed and the tree pits would be retained as notches in the walkways. Per the guidance provided in the 2010 CLR, the metal grates would not be replaced, as they are noncontributing to the historic designed landscape and are considered incompatible. The design of improvements and changes to the tree pits is not part of the action being assessed in this EA and will be part of a separate design process.

Construction and Staging Areas: Construction areas would exist where tree removal and replacement occurs. Construction areas would move from location to location as trees are removed. Active construction areas would be cordoned off for visitor safety.

Staging areas may be located either on-site or off-site to store materials such as plants, soil, and mulch, and provide for overnight parking of construction equipment. The location of staging areas would be identified prior to construction in consideration of access, visitor circulation, and operational requirements, and in coordination with other projects to the extent practicable. The staging areas would remain in the same location for the duration of the tree removal and replacement process.

The National Park Service would provide interpretive and educational opportunities prior to, during, and after the tree removal and replacement period. Subjects for interpretation would include EAB, removal of the Rosehill ash trees, the significance of the Saarinen-Kiley design, and the role of the single-species allées in the historic designed landscape. Education about recycling materials and sustainability would be integrated into the tree replacement process. The use of "Construction Theater" is proposed as an educational opportunity and attraction for visitors. Durable canvas or fabric with large graphics depicting the Gateway Arch, the landscape, or the construction process could be used to implement a Construction Theater and provide screening for active construction and staging areas.

2.2.2. No Action Alternative

The No Action Alternative is based on the existing maintenance and management plan and practices for the Rosehill ash, and represents the continuation of existing activities and conditions. Under this alternative, the existing Rosehill ash trees would remain in place and continue to be removed on an individual basis as they decline. From 2004 to 2009, the Rosehill ash trees that were removed were not replaced because of concerns about the future potential for EAB infestation. However, the grounds crew planted 35 Rosehill Ash in the Spring of 2010 to reduce the number of missing trees in strategic locations.

Current Management Approach: The ash trees on the Memorial grounds are routinely trimmed and maintained by Memorial grounds maintenance staff. In the event that trees are damaged due to storms or have died, the grounds maintenance staff may remove limbs or the entire tree when necessary to prevent hazards to visitors. During limb or tree removal activities, grounds maintenance staff cordon off an area by erecting temporary barriers to prevent visitor access. Following the tree pruning or removal activities, these temporary barriers are removed and visitor access to the affected area is restored. Current maintenance of the sidewalks includes repair and replacement of damaged sections with matching materials, sanding down of surfaces that have been pushed up due to root growth beneath the paving, mud-jacking to level the pavement surface as needed, and replacement of the redwood spacers with new redwood spacers.

2.3 Comparison of the Alternatives

Table 2.1 summarizes the main components of the No Action Alternative and the Proposed Action, and compares the ability of these alternatives to meet the project objectives identified in "Chapter 1: Purpose and Need." As shown in the following table, the Proposed Action meets the objectives identified for this project, while the No Action Alternative does not achieve the objectives.

Table 2.2 summarizes the anticipated environmental impacts of each alternative. Chapter 3 provides a more detailed explanation of these impacts.

2.4 Cumulative Actions

CEQ regulations (40 CFR 1508.7) require an assessment of cumulative effects in the decision-making process for federal projects

Table 2.1 Alternatives Summary and Extent to which Each Alternative Meets Project Objective(s)

No Action Alternative	Proposed Action
The Rosehill ash trees would be removed as they decline and would not be replaced. The alignment, width, and location of the existing system of walks would be maintained. The tree pits would remain unaltered.	The Rosehill ash trees would be removed in a phased approach, coordinated with implementation of the design competition identified in the 2009 GMP and treatment recommendations in the 2010 CLR. The replacement trees in the allées would be a single species of uniform height, form, and caliper. The replacement trees would retain the original location and spacing in the Kiley plan as implemented. The walkways would retain their existing alignment and width, and the exposed aggregate pavement would be replaced as needed with material that matches in color and texture.
Meets Project Objective?	**Meets Project Objective?**
No. The alternative would not be consistent with the GMP/EIS or CLR because the integrity of the allée planting would be diminished or lost when the trees are removed and not replaced. Kiley's original design intent and the integrity of the NHL would potentially be diminished due to the loss of this essential character-defining feature.	Yes. The alternative would be consistent and compatible with Kiley's design intent. The integrity of the NHL would be retained through the use of a single replacement tree species that features similar caliper, height, and spread.

undergoing a NEPA analysis. CEQ defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions."

The geographic scope of the cumulative analysis includes reasonably foreseeable actions on the Memorial grounds and potential actions in the city of St. Louis or along the Mississippi River that may indirectly affect the Memorial. No reasonably foreseeable actions associated with city development plans, EAB response policies, or along the Mississippi River have been identified that would cause or contribute to cumulative effects associated with the removal and replacement of the Rosehill ash on the Memorial grounds. For the cumulative effects analysis, the design competition (Framing a Modern Masterpiece: The City + The Arch + The River 2015) has been identified as having the potential for cumulative effects when combined with the effects of the Proposed Action.

The area potentially affected by the design competition (Framing a Modern Masterpiece: The City + The Arch + The River 2015) includes a large area around the Memorial, including portions of downtown St. Louis, East St. Louis, and the Missouri and Illinois riverfronts, and has the potential to result in major changes to the Memorial grounds and these surrounding areas. The analysis of the potential impacts of the design competition will be addressed in an upcoming EIS or EA once the final design has been completed. Various elements associated with the design competition, particularly those that involve construction close to the allées, or would occur simultaneously with the tree removal and replacement process could constitute cumulative impacts with this project (The City, et al., 2011).

Table 2.2 Environmental Impact Summary by Alternative

Impact Resource	No Action Alternative	Proposed Action
Vegetation	Moderate to major adverse impact on the vegetation character of the Memorial grounds, including the loss of shade and shelter along the walks.	Short- to medium-term adverse impact by creating a warmer microclimate along the walkways. This warmer microclimate could affect turfgrass and result in increased water use. Potential long-term beneficial impact by increasing species diversity in noncontributing portions of the Memorial. Negligible long-term impact on vegetation.
Cultural Landscapes	The loss of a character-defining feature of the Memorial grounds would result in a long-term major adverse impact.	Replacement of the trees would result in short-term and medium-term moderate adverse effects. Negligible long-term impact.
Historic and Cultural Resources	The loss of a character-defining feature of the Memorial grounds would result in a long-term moderate to major adverse impact.	Replacement of the trees would result in short-and medium-term moderate adverse effects. Negligible long-term impact.
Visual and Aesthetic Resources	Gaps would appear in the designed landscape resulting in a loss of symmetrical framing and designed views to the Gateway Arch over the short to medium term. Major long-term adverse visual impacts.	Moderate short- to medium-term adverse impact, particularly on views from the north-south axis. Minor impact on east-west views. New visual elements associated with construction would be introduced to the Memorial grounds. Maintenance and parking facilities would be more visible over the short to medium term resulting in moderate adverse impacts. Negligible long-term impact.
Visitor Experience	Minor to moderate adverse impacts over the short and medium term. Moderate to major long-term adverse impact resulting from the loss of shade along the walkways, and diminished experience of viewing the Gateway Arch as it was intended.	Short-term adverse impact during the construction period. Construction could result in substantially longer detours for pedestrians. Short- and medium-term adverse impact associated with the loss of shade and increased summertime temperatures along the walkways. Negligible long-term impact.
National Park Service Operations	No additional impact unless increased staffing would be required due to increased die-off of trees.	Short- to medium-term impact resulting from increased staffing requirements to support tree removal activities and increased maintenance requirements. Negligible long-term impact, unless a taller-growing species were to be selected and specialty crews were required for trimming and maintenance.
Public Health and Safety	No additional impact unless tree die-off were to increase from current levels.	Minor short-term impact due to staging areas and increased vehicular traffic on the Memorial grounds.
Transportation and Access	No additional impact unless tree die-off were to increase from current levels.	Minor to moderate short-term impact due to increased construction and maintenance vehicle traffic on the Memorial grounds.

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