

Purpose and Need

1.1 Purpose of and Need for Action

1.1.1 Purpose

The National Park Service is considering a strategy for addressing the impact of the emerald ash borer (*Agrilus planipennis* Fairmaire) (EAB) on the historic designed landscape at the Jefferson National Expansion Memorial (“Memorial” or “Memorial grounds”). Part of this strategy will include identifying an appropriate tree species for replacing the Rosehill ash (*Fraxinus americana* ‘Rosehill’) and assessing the impacts of replacing the ash trees in the historic planting along the walks (allées) with a different species that will be in keeping with this significant designed landscape. The goals of the project include maintaining the integrity of the National Historic Landmark (NHL), retaining the character-defining features of the Memorial (including the single species tree planting along the allées), minimizing the impact on National Park Service operations, and maintaining and enhancing the visitor experience. The primary goal of the tree replacement is to maintain the significant character-defining qualities of the planting as they contribute to the Memorial’s status as a National Historic Landmark.

As part of this project, the National Park Service has identified a No Action Alternative and a Proposed Action for replacing the Rosehill ash on the Memorial grounds. The alternatives are described in detail in Chapter 2 of this Environmental Assessment (EA).

1.1.2 Need

The National Park Service is proposing action at this time to address the current state of decline of the Rosehill ash trees as well as the impending arrival of the EAB in the St. Louis metropolitan area. The Rosehill ash has been identified as a species that is susceptible to EAB damage; and it is anticipated that once the EAB becomes established in the St. Louis area, the ash trees would quickly succumb to the insect. In addition, the existing ash trees have reached maturity and due to decline, a number of trees have already been removed, leaving gaps in the character-defining landscape of the Memorial.

An EA analyzes the proposed action and alternatives and their impacts on the environment. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9). Chapter 1 of this EA describes the relationship of this project to other planning projects on the Memorial grounds, identifies the issues, and introduces the impact topics to be considered. Chapter 2 provides a description of the No Action Alternative and the Proposed Action and identifies the cumulative actions that are considered in the cumulative impact analysis. Chapter 3 describes the affected environment for each resource and the expected impacts associated with the two alternatives. Chapter 4 describes consultation and coordination activities, including stakeholder and public informational meetings that have occurred to date. Chapters 5 and 6 provide a bibliography of references consulted and a list of the document preparers, respectively.

1.2 Project Background and Scope

The Memorial is located entirely within downtown St. Louis, Missouri (see figures 1.1 and 1.2). The 91-acre Memorial sits on the west bank of the Mississippi River and occupies 40 blocks between Eads Bridge and Poplar Street (NPS, 2009), bounded on the east by Leonor K. Sullivan Boulevard and on the west by Memorial Drive, except for 2 blocks immediately west of Memorial Drive occupied by Luther Ely Smith Square and the Old Courthouse. The Memorial includes the Gateway Arch, the Museum of Westward Expansion, the grounds around the Gateway Arch, and the Old Courthouse (see figure 1.3). The Memorial is iconic due to its Modernist designed character, which is the work of master architect Eero Saarinen and master landscape architect Dan Kiley. The designed

landscape includes the single-species tree planting that frames views to the Gateway Arch along its curving walks (see figure 1.4).

The more than 900 Rosehill ash trees on the grounds of the Memorial are mature and considered to be a successful planting, both in terms of their longevity and their positive impact on the visitor experience; however, due to their age, they are currently in decline and additionally, are threatened by the impending arrival of EAB. The purpose of this EA is to examine the potential impacts of replacing the Rosehill ash trees on the designed landscape and other resources of the Memorial. The No Action Alternative would evaluate the effects of continuing the current management approach, which includes removing trees individually as they die and not replacing them.

This EA is being undertaken concurrently with the development of a major design process (Framing a Modern Masterpiece: The City + The Arch + The River 2015) that began with an international design competition and subsequent development of the winning design concept. The international design competition was held as part of the implementation of the Memorial's 2009 General Management Plan (GMP) Preferred Alternative.

1.3 Relationship to Other Planning Projects

1.3.1. General Management Plan

The National Park Service adopted a General Management Plan (GMP) for the Memorial in 2009. The impacts of the GMP were evaluated in an EIS that was prepared concurrently with the GMP. The GMP outlined a series of management zones intended to articulate and implement long-term goals for resource conditions, visitor experience, and appropriate development that could occur on the Memorial grounds. The Preferred Alternative identified in the GMP included the concept of revitalizing the Memorial through expanded programming, facilities, and partnerships. A primary element of the Preferred Alternative was an international design competition (realized as Framing a Modern Masterpiece: The City + The Arch + The River 2015) that explored various approaches for revitalizing the Memorial grounds and connections to



Figure 1.1 Regional context map.

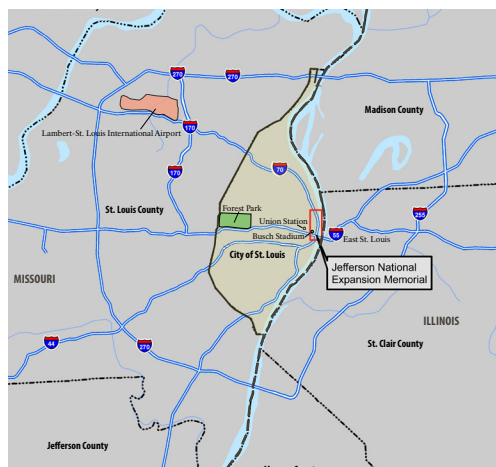


Figure 1.2 St. Louis context map.

surrounding downtown St. Louis, as well as East St. Louis, Illinois, located across the Mississippi River. The potential impacts associated with implementation of the winning design will be addressed in a separate EIS or EA (to be completed once the specific design elements have been finalized) and are not addressed in this EA.

The Preferred Alternative of the GMP directs that cultural resources at the Memorial be managed to preserve and protect these important resources. The significant cultural resources and values of the Memorial are to be protected, although sensitive rehabilitation of the designed landscape is permitted as long as the integrity of the NHL is preserved.

Rehabilitation, as defined by the Secretary's Standards for the Treatment of Historic Properties, involves protecting and maintaining the character-defining features of the significant designed landscape, but allowing the repair or replacement of deteriorated, damaged, or missing features and compatible new additions to accommodate new uses, provided they do not radically change, obscure, or destroy character-defining features. In support of the GMP, the Cultural Landscape Report (CLR) was developed

to provide definitions and guidance for the character defining features of the Memorial.

1.3.2. Cultural Landscape Report

In addition to the GMP, the Memorial completed a CLR that documents the Memorial landscape and analyzes its character-defining features. Specifically, the CLR documents the evolution of the Saarinen-Kiley plan and its implementation by the National Park Service, and describes the condition of landscape features and overall character of the Memorial grounds. The CLR evaluates the significance of the landscape based on the NHL nomination, assesses its integrity using National Register of Historic Places (National Register) standards, and identifies contributing and noncontributing features. The CLR identifies the single-species planting as a character-defining feature of the significant designed landscape of the Memorial.

The treatment recommendations noted in the CLR are intended to provide guidance for future actions, to be implemented in a way that has minimal impact on the cultural landscape of the Memorial grounds (NPS, 2010). In the treatment approach provided in the CLR, "The use of a uniform, single tree species to line and enclose the walks is retained

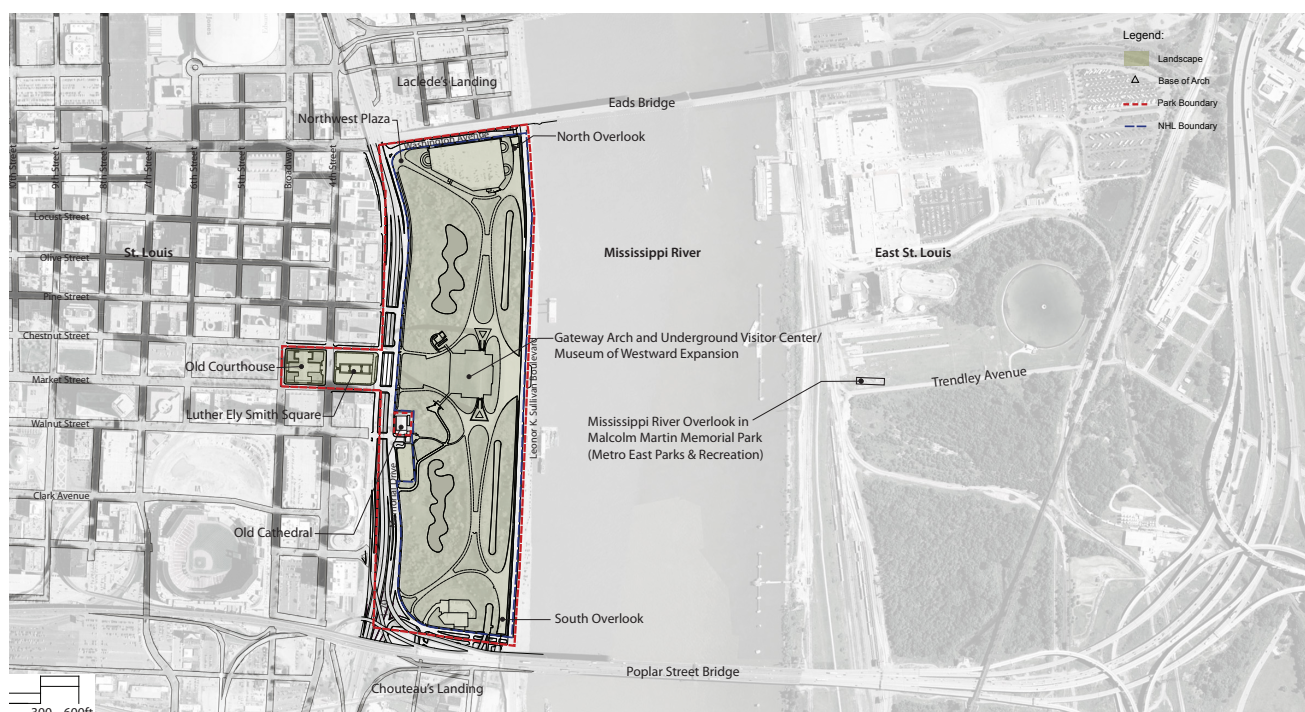


Figure 1.3 Jefferson National Expansion Memorial and its urban context.

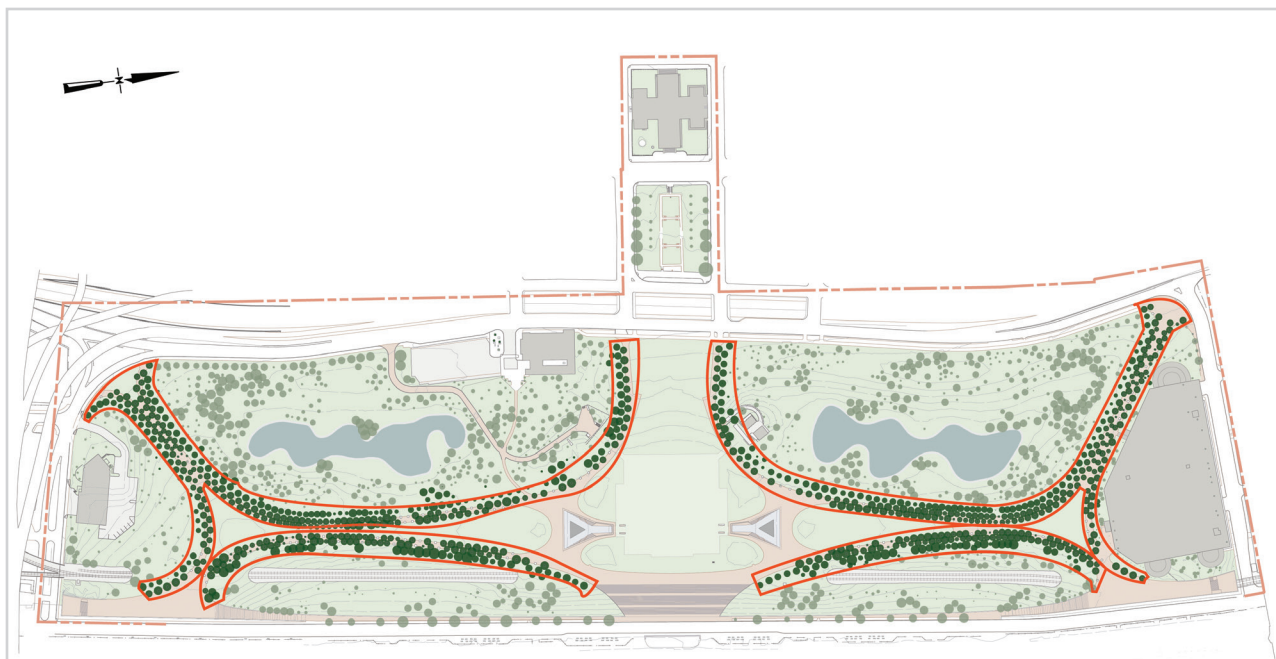


Figure 1.4 The character-defining single-species allee planting along the Memorial's walks.

and maintained, reflecting the Saarinen-Kiley design intent and the simple form-world of the Gateway Arch. This planting also strengthens the formal qualities of the pedestrian circulation system. The trees remain closely spaced, retaining the character-defining sense of enclosure along the walks that contrasts with the vertical monumentality of the Gateway Arch (NPS, 2010). Additionally, the allées are a contributing landscape feature that defines the character of the Memorial landscape. They should be retained and maintained, including the location and spacing of trees, and the use of a uniform, single-species planting of tall, relatively straight-trunked, deciduous trees, creating a continuous canopy and sense of enclosure over the walks. Maintaining the Rosehill ash cultivar (*Fraxinus americana* 'Rosehill') in particular is not as important as maintaining these formal characteristics" (NPS, 2010).

Specific actions prescribed in the CLR include the following:

- Any alteration to the essential characteristics (locations of trees, and uniform qualities of single-species planting) of the allée plantings is not recommended as it will result in diminished integrity of the

designed landscape. The spacing and locations of the trees should be faithfully maintained.

- Maintain the Rosehill ash trees in a healthy state for as long as possible by using accepted fertilizing, watering, and pruning practices. Because a single-species (and in this case, single cultivar) planting is a risky approach from a horticultural standpoint, the planting should be closely monitored for ash yellows, ash borer, and all other insects and diseases.
- If there is not a serious and immediate threat to the health of the majority of the Rosehill ash trees, replace trees in-kind as needed. [Please note that, at the time of publication of this EA, ash is no longer available for use as a replacement tree.]
- As trees are replaced, consider renovation of tree pits to ensure proper drainage and function.
- EAB has become a concern in the Midwest. Measures are being taken to prevent, mitigate, and treat EAB at the Memorial. See the Memorial's Ash Management Workgroup Recommendations and Draft Emerald Ash Borer Management Plan for more detailed information on EAB control strategies.

- When the trees deteriorate to the point that they are hazardous or losing their natural form, they should be replaced in-kind. [Please note that, at the time of publication of this EA, ash is no longer available for use as a replacement tree.]
- If there is a serious problem (such as an infestation of ash borer) that threatens the entire ash planting, replace the trees with an appropriate substitute tree, which could be another variety or cultivar of ash; or an appropriate new species, depending on the type of threat.
- The new tree should be tolerant of urban conditions, relatively pest and disease free, and aesthetically comparable in form, texture, and height to the originally proposed tulip poplar (*Liriodendron tulipifera*) tree. If site-wide replacement of Rosehill ash trees is determined to be necessary, prioritize replacement trees with a form as close as possible to Kiley's intended design form (tall, straight, upright, deciduous, and fast-growing). Consider the originally specified tulip poplar and others.
- After selecting new trees by form, weigh the different trees' hardiness and pest susceptibility, as well as maintenance requirements. Be aware that as a single-species planting on an urban site with soils of undocumented fill, no tree is likely to perform ideally; plan maintenance practices accordingly. Over its lifetime, the Rosehill ash planting has done extremely well (aside from potential borer susceptibility). Accommodations should be



Figure 1.5 Allée planting.

made for the selected trees to be maintained at a higher level of effort if that is required to keep them healthy.

- When replacing the ash trees, phase the replacement in a manner that is least intrusive to the appearance of the landscape.
- Retain the characteristic singularity of form of this planting by utilizing another single species for the allées.
- An appropriate replacement program should be developed by a qualified landscape architect, horticulturist, or arborist.

A Landscape Preservation Maintenance Plan was developed as a follow-on study related to the CLR. Its purpose was to provide detailed guidance and planning tools for maintenance of the character-defining features of landscape, with an emphasis on methods for maintaining the existing plantings, walks, and landscape structures.

According to the CLR, the character of the Memorial is defined by the repetition of sweeping, singular design gestures throughout, such as catenary curve segments, monolithic concrete structures, and formalized tree plantings, with some areas employing a uniform single species and some areas employing a limited number of species, all selected primarily for their form.

The single-species allée planting, regardless of the species of which they are composed, reflects the Saarinen-Kiley design concept for a uniform planting with precise alignment and close spacing along the walks. The curving formal walks enclosed by uniform, regularly spaced massing of trees are character defining. (see figures 1.4 and 1.5). The allée planting shapes the views along the system of walks, most notably along the north-south axis of the grounds. The uniform height of the trees in the allées creates an undulating line in the landscape that is apparent from the entrances to the Memorial. The trees are planted partly within the edges of the walks, 30 feet apart, along the outside of the walks in a third row, as well as an additional row within the paving where it widens north and south of the Gateway Arch.

The rows of trees are alternating, with trees 16 to 20 feet on center.

The use of trees closely spaced along the walks in an allée creates a defined edge and sense of enclosure. The trees form a dense overhead canopy, providing enclosure for the visitor while affording carefully controlled glimpses towards the soaring Gateway Arch. Kiley said in a 1993 interview that he intended the trees to be cathedral-like, to create an “elevated, spiritual feeling.” (NPS, 2010) The use of the same tree throughout the pedestrian path system strengthens the edge and provides visual continuity and fluidity. The dense, uniform mass of upright, straight-trunked trees planted along the walks was the strongest single feature of the Kiley planting plan. The uniform, tall trees would define the pedestrian space and conceptually strengthen the simplicity of the Gateway Arch and the surrounding site design (see figures 1.6 and 1.7).

Kiley originally specified the tulip poplar for the allées; however, during the implementation period, the National Park Service substituted the Rosehill ash. It is important to understand

that although the good qualities of the Rosehill ash were noted, no attempt was made to maintain the visual and structural qualities of the originally proposed tulip poplar. Rosehill ash, with its oval shape, upright branches, and lower-branching form, does not match the tall, straight, horizontally branching form of tree Kiley depicted in his design drawings for the Memorial landscape (see figure 1.8). Historical documentation is lacking regarding the decision making process that resulted in the selection of Rosehill ash by the National Park Service.



Figure 1.6 A rendering by Kiley of the tree character he envisioned for the planting.

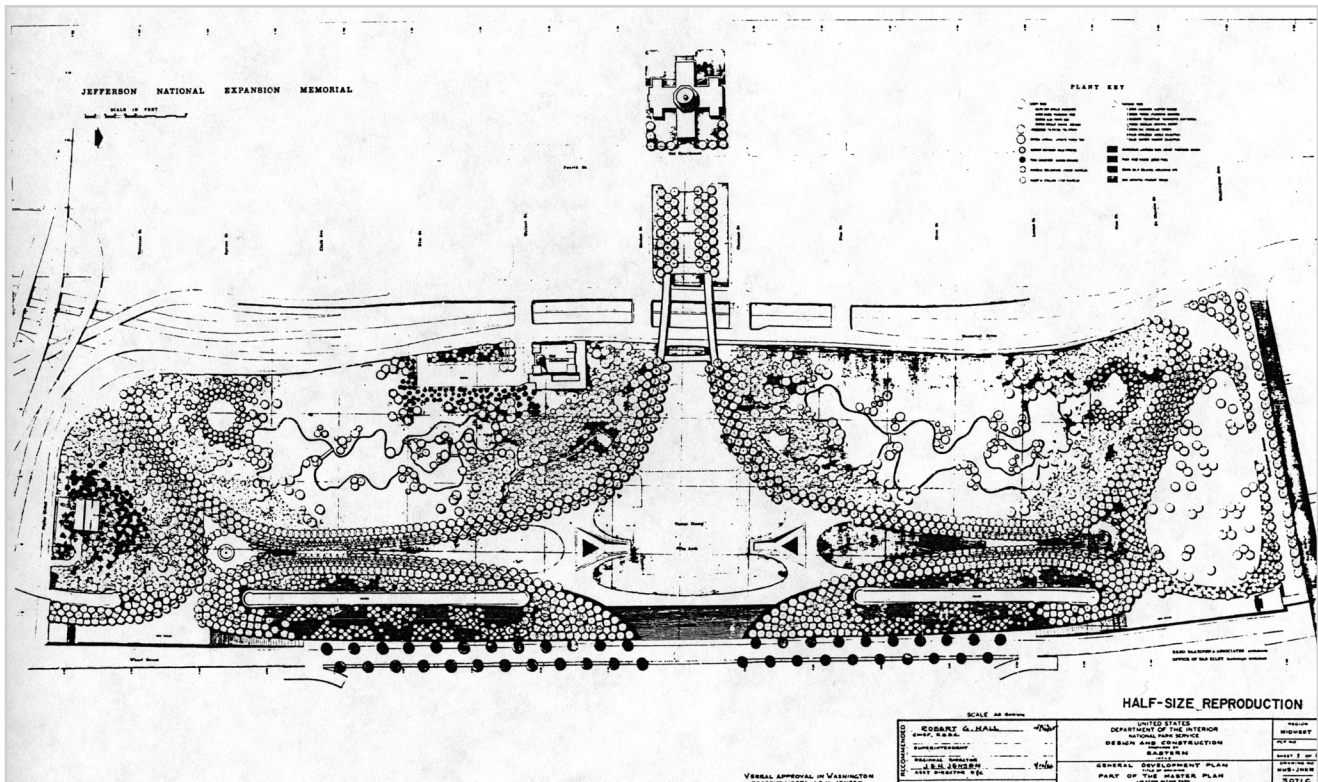


Figure 1.7 Kiley planting plan, 1964.

Therefore, the Rosehill ash, which is the focus of this EA, was not part of the original design. Like many aspects of the Memorial landscape, however, the planting as constructed is true to the Kiley/Saarinien plans, with minor modifications resulting from later interpretation by National Park Service landscape architects during the implementation period. The concept of the single-species allée, its alignment and form, the tree locations and spacing, overall massing, feeling of enclosure, and visual impact convey the original design concept. It is only the species of tree used that departs from the original design concept.

The form, alignment, curving variable width, and earthy color of the walks are all part of the Saarinen-Kiley design intention as evidenced by drawings and descriptions. The final details of the walks as implemented, including the exposed aggregate concrete and redwood spacers, are the result of the later interpretation of the original concept by National Park Service landscape architects. The trees were planted in tree pits that protrude halfway into the walks along their edges, as well as in tree pits entirely encircled by the walks.

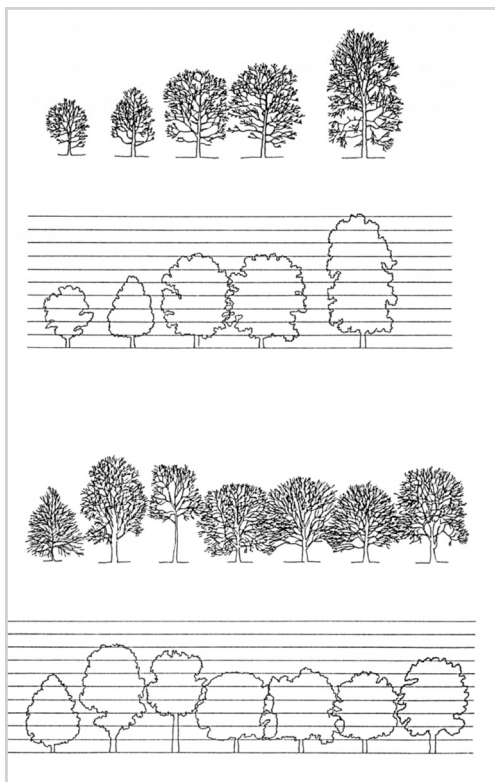


Figure 1.8 Diagram comparing trees specified by Kiley (top) and trees planted by NPS (bottom) to show the difference in form from the design intention.

Currently, the allée plantings of Rosehill ash trees are considered to be in fair condition. The trees have reached full maturity and, as such, are in a general state of decline. The poor soil and drainage conditions are affecting the health of the trees as are the grates that surround the trunks. Some trees have been girdled and damaged by the grates.

A number of the Rosehill ash trees along the allées have died and have been removed. Due to the impending threat of EAB, the National Park Service has not been replacing the ash trees since 2004. This selective removal of ash trees has created a number of gaps in the otherwise regular planting scheme. These gaps have altered the intended continuity of the walks and the experience of viewing the Gateway Arch from the allées (see figure 1.9).

Additional Rosehill ash were added by NPS along the street edge, where they serve to screen views to and noise from Memorial Drive. These plantings are not part of the Saarinen-Kiley plan. The street edge plantings are compatible with the Memorial grounds, but they do not contribute to its significance



Figure 1.9 Missing trees create gaps in the planting.



Figure 1.10 Some Rosehill ash are planted along the street edge; these are not part of the significant planting design.

(see figure 1.10). Rosehill ash are also planted on the east side slopes on either side of the Grand Staircase; again, these plantings are not contributing features of the Memorial's design significance.

1.3.3. Design Competition

The international design competition (Framing a Modern Masterpiece: The City + The Arch + The River 2015) involved a year-long review and selection process that was organized by private interests working in cooperation with the National Park Service. This design competition was envisioned as part of the Preferred Alternative of the General Management Plan. The goals of the design competition included reinvigorating the Memorial, connecting the city of St. Louis and the Memorial grounds to the Mississippi River, and developing a sustainable future while retaining the character-defining features of the NHL. A design team, led by Michael Van Valkenburgh and Associates (MVVA), was selected as the winning team. The winning design is currently undergoing refinement and will ultimately be evaluated in an EIS or EA.

1.3.4. City of St. Louis Land Use Planning and EAB Response

Planning actions at the Memorial are exempt from local planning and permitting requirements; however, the Memorial is an influential part of St. Louis' downtown fabric

and the Gateway Arch is symbolic of the city. Local planning goals, policies, and plans for circulation, land use, recreation, and cultural resources may complement the Memorial.

The St. Louis Department of Parks, Recreation, and Forestry does not currently have an adopted EAB management plan; however, the city recently began to proactively monitor for EAB through testing the wood of suspect trees removed due to declining health. The city is no longer planting ash trees and is recommending to the public that ash trees not be planted on private property. Were EAB to be detected within the city limits, the city would notify the public through press releases and information on the city's website (Personal communication, City of St. Louis Department of Parks, Recreation, and Forestry, 2011).

1.4 Issues

1.4.1 Lifespan and Current Health of Ash Trees

As of a 2009 inventory, there were a total of 956 Rosehill ash trees at the Memorial, comprising 46% of all trees on the grounds. Of the existing ash trees, approximately 870 are located in the allées, approximately 25 are located along Memorial Drive on the southwestern edge of the grounds, and approximately 60 are located along the slopes on the east side of the grounds. These 60 trees on the east side slopes encompass two groves that flank the Grand Staircase, with a few additional Rosehill ash along each of the staircases leading down to the river from the overlooks (NPS, 2010).

In general, the Rosehill ash trees on the Memorial grounds are in a state of decline (see figure 1.11). Much of the current decline can be attributed to the age of the trees and poor growing conditions. The majority of ash trees were planted in two phases of construction in 1971-72 and 1978-79, and are now approaching 40 years of age. In addition, many of the trees in the allées are planted in tree pits surrounded by paving and feature compacted soil and poor drainage conditions that typically result in a very low survival rate and lifespan for urban trees, averaging only 7-10 years (NPS, 2010). As a result of poor growing conditions, the trees may be more susceptible to disease and pestilence including bacterial leaf scorch (BLS),



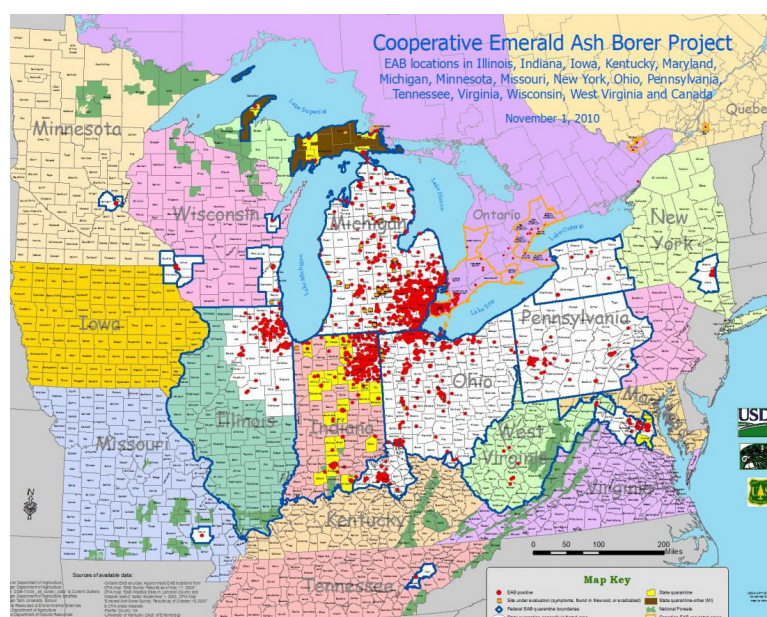
Figure 1.11 At left of this photograph, Rosehill ash planted on the slope by the grand staircase; not part of the Kiley plan, these are not considered a significant planting.

among others (see Appendix A: Technical Memorandum 1, and Appendix B: Technical Memorandum 2).

1.4.2. Emerald Ash Borer

In response to the detection of EAB in Wayne County, the state of Missouri adopted the Missouri Plant Quarantine Law (2 CSR 70-11.050), which established EAB quarantine regulations to prevent the spread of EAB to other uninfested areas of the state and to other states. Wayne County has been identified as a quarantine area since September 3, 2008. The regulation restricts the transportation of plant products from the quarantine area to other areas in Missouri. If EAB were to be detected in St. Louis County or at the Memorial, a quarantine area may be identified and the adopted quarantine regulations would apply.

Research is being conducted by local and state agencies to determine if there is an efficient and cost-effective treatment for EAB. At this time there are no insecticides that are 100% effective against EAB attacks (Missouri Department of Conservation, 2011). A parasitic wasp has been identified that attacks the egg and larval stages of EAB. Research is being conducted to determine if the parasitic wasp could be an effective method to control EAB (Missouri Department of Conservation, 2011).



with Manuka oil, which simulates a distressed ash tree (University of Maryland, 2011). The Memorial is coordinating with other local and state agencies regarding the spread of EAB in Missouri and the Midwest.

Executive Order 13112 established the National Invasive Species Council, a council of federal departments dealing with invasive species. EAB is a listed species with the National Invasive Species Council. The Proposed Action would meet the responsibilities outlined in the executive order by limiting the spread of EAB by removing the Rosehill ash as a potential vector, monitoring EAB populations, conducting research, and developing technologies for controlling EAB.

1.5 Authorizing Actions and Applicable Laws, Regulations, and Policies

Numerous authorizing actions, applicable laws, policies, and regulations apply to federally sponsored projects. This EA would address the most notable, including NEPA; the National Historic Preservation Act (NHPA), as amended; 36 CFR § 65 (National Historic Landmarks Program); Director's Orders 12 and 28; and NPS Management Policies 2006.

1.5.1 National Environmental Policy Act

A NEPA analysis is required for actions that occur on federal lands or that utilize federal funds. During the evaluation and analysis process, federal agencies are required to integrate environmental values into the decision making process by considering the environmental impacts of the proposed actions and reasonable alternatives to those actions. This EA is being prepared in response to the National Park Service proposing to remove and replace the Rosehill ash trees on the Memorial grounds.

1.5.2 National Historic Preservation Act

The National Historic Preservation Act of 1966 is legislation enacted for preserving historical and archeological sites. The purpose of the act is to protect historic properties that are significant to the nation's heritage; preserve irreplaceable heritage; maintain the legacy of cultural, educational, aesthetic, inspirational,

economic, and energy benefits for future generations; increase knowledge of historic resources in the United States; and encourage the preservation of historic resources.

NHPA Sections 106 and 110 are applicable to this action because the Memorial is listed on the National Register and has been designated as an NHL. NHLs are National Register listed properties that are not only nationally significant, but also have been determined to possess exceptional value or quality in illustrating or interpreting the heritage of the United States. The Memorial derives national significance under National Register Criterion A for its commemoration of Thomas Jefferson and others responsible for the nation's territorial expansion to the West. The Memorial is significant under National Register Criterion C for architectural and engineering merit (NPS, 2010). Because the Gateway Arch is a unique and extraordinary structure, its significance under Criterion C has perhaps overshadowed its significance for commemoration. National Register Criterion G, governing properties less than 50 years of age; and Criterion F, for sites that are primarily commemorative, may also apply.

The Memorial is considered one of the best and most significant built examples of Modern design in the United States. The landscape surrounding the Gateway Arch was designed as part of the overall Memorial, and is inextricable from the Gateway Arch as part of the design, connecting the soaring structure to its setting.

The single-species allée planting along the walks is an integral part of this nationally significant designed landscape and is a character-defining feature of the Memorial (NPS, 2009).

The National Park Service has prepared a variety of documents to support maintaining historic resources associated with the Memorial, including the GMP and CLR. These documents describe policies adopted and actions implemented to comply with NHPA.

1.5.3 NPS Director's Orders 12 and 28

The National Park Service adopted Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making, to establish the policy and procedures by

which the National Park Service enacts its responsibilities under NEPA and the National Park Service Organic Act (1916). Director's Order 12 establishes the groundwork and procedure for environmental analysis, public involvement, and making resource-based decisions; and provides direction for using interdisciplinary teams, incorporating scientific and technical information, and establishing an administrative record for actions.

Director's Order 28: Cultural Resources Management, was adopted to provide direction for the protection and management of cultural resources through research, planning, and stewardship. Director's Order 28 provides compliance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, the 1995 Servicewide Programmatic Agreement with the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers. This EA has been prepared in compliance with the applicable sections of both Director's Orders 12 and 28.

1.5.4 NPS Management Policies 2006

The NPS Management Policies 2006 is the basic policy document of the National Park Service. It is the highest of three levels of guidance documents in the NPS Directives System, which is designed to provide a framework in which a hierarchy of authorities, policy development, compliance, accountability, and enforceability is established for National Park Service management and staff. The Directives System is designed to provide clear and continuously updated information on National Park Service policy and required and recommended actions, as well as any other information that will help National Park Service management and staff manage parks and programs effectively (NPS, 2006).

Through the NPS Management Policies, parks prepare long-range comprehensive strategies for natural resource management (NPS, 2006). The strategy also describes the related activities needed to achieve desired future conditions for cultural resources,

such as historic landscapes. The research of monitoring strategies for EAB, education of stakeholders and the public about EAB, and proactive planning for EAB are examples of strategies that fulfill National Park Service Management Strategies.

In addition to determining the environmental consequences of implementing the preferred and other alternatives, NPS Management Policies 2006 requires analysis of potential effects to determine whether or not proposed actions would impair a park's resources and values.

The fundamental purpose of the national park system, established by the National Park Service Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park. That discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS Management Policies 2006). Whether an impact meets this definition depends on the particular resources that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.

An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- identified in the park's general management plan or other relevant National Park Service planning documents as being of significance.

An impact would be less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Impairment may result from visitor activities; National Park Service administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park.

Impairment findings are not necessary for visitor experience, socioeconomic, public health and safety, environmental justice, land use, and park operations, etc., because impairment findings relate back to park resources and values. The determination of impairment for the Proposed Action is found in Appendix C.

1.6 Impact Topics Considered in this EA

Memorial staff, National Park Service Midwest Region personnel, and cultural resource and NEPA specialists met on October 13, 2010, for a day-long work session to develop alternatives for replacing the Rosehill ash on the Memorial grounds in a way that would ensure the preservation of the character-defining qualities of the allée planting. National Park Service staff determined that the following resources at the Memorial would be most likely to be affected by the proposed removal of the Rosehill ash trees:

- Natural resources (vegetation)
- Cultural resources (including cultural landscapes, historic properties, and visual and aesthetic resources)

- Visitor use and experience
- National Park Service operations
- Public health and safety
- Transportation and access

1.7 Impact Topics Dismissed from Further Consideration

The following impact topics were dismissed from further consideration since it is unlikely that the project would result in impacts on these resources.

1.7.1 Socioeconomics

NPS Director's Order 12 requires consideration of potential direct and indirect impacts to the local economy, including impacts to neighboring businesses in the general project vicinity. Neither the No Action Alternative nor the Proposed Action would change local and regional land use nor appreciably impact local businesses or other agencies. Because neither alternative has the potential to impact the socioeconomic environment of the area, this resource was dismissed from further analysis.

1.7.2 Land Use

The Memorial is located on the west bank of the Mississippi River and is within the urban area of downtown St. Louis. The primary land uses at the Memorial include use as a public park for passive recreation, museum site, and interpretive uses and activities. Neither alternative would alter the existing land uses, nor add a new land use not identified in the Cultural Landscape Report (NPS, 2010). Therefore, this resource has been dismissed from further analysis.

1.7.3 Threatened and Endangered Species and Species of Special Concern

The Endangered Species Act (ESA) of 1973, as amended, requires examination of impacts on all federally listed threatened and endangered species. Section 7 of the ESA requires all federal agencies to consult with the U.S. Fish and Wildlife Service when an action authorized, funded, or carried out by the agency may affect a listed species or designated critical habitat, or is likely to jeopardize proposed species or adversely modify proposed critical habitat. NPS Management Policies 2006 (NPS, 2006) and Director's Order 77: Natural Resources Management Guidelines, also

require the National Park Service to examine potential impacts to federally listed candidate species. There are no known occurrences of threatened and endangered species or critical habitat on the Memorial grounds (NPS, 2010). Therefore, this resource has been excluded from further analysis.

1.7.4 Wildlife and Fisheries Habitat

The Fish and Wildlife Coordination Act (FWCA) was adopted to protect fish and wildlife when federal actions result in the control or modification of a natural stream or body of water. Neither alternative would alter a natural stream or body of water. The original wildlife and fisheries habitat associated with the banks of the Mississippi River was destroyed when the Memorial was originally developed. Therefore, this resource has been dismissed from further analysis.

1.7.5 Wetlands and Riparian Areas

Executive Orders 11988 and 11990 (Floodplain Management and Wetland Protection) direct the National Park Service to avoid, to the extent possible, impacts associated with modifying or occupying floodplains and wetlands. They also require the National Park Service to avoid direct or indirect support of floodplain or wetland development whenever there is a practical alternative. The Memorial is located on uplands that were previously impacted, and no wetlands would be affected by the Proposed Action. Therefore, this resource has been dismissed from further analysis.

1.7.6 Floodplains

Executive Order 11988, Floodplain Management, requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. As per NPS Management Policies 2006 (NPS, 2006) and Director's Order 77-2: Floodplain Management, the National Park Service is mandated to strive to preserve floodplain values and minimize hazardous floodplain conditions. The project area is not located within or near floodplains; the Memorial grounds are located adjacent to the Mississippi River, but are protected by a levee and raised up on fill above the projected 500-year flood level. The Proposed Action would not involve construction in floodplains, nor would it have the potential to adversely

impact floodplains. Therefore, this resource has been dismissed from further analysis.

1.7.7 Geology and Soils

NPS Management Policies 2006 (NPS, 2006) state that the National Park Service will preserve and protect geologic features and geologic processes as integral components of park natural systems. The project area is located landward of the Mississippi River and was developed on a previously impacted site. The existing natural topography was substantially modified through the placement of fill when the Memorial was initially developed. Neither alternative would affect natural geologic features or processes. Therefore, this resource has been dismissed from further analysis.

1.7.8 Ecologically Critical Areas and Wild and Scenic Rivers

The Memorial is located on a previously impacted site with designed planting areas. It was noted in the General Management Plan/EIS that ecologically critical habitat does not exist at the Memorial. Similarly, the Mississippi River in Missouri has not been designated as a Wild and Scenic River. Therefore, these resource topics have been dismissed from further analysis.

1.7.9 Water Resources

NPS Management Policies 2006, Chapter 4, mandates that the National Park Service "will perpetuate surface waters and groundwaters as integral components of park aquatic and terrestrial ecosystems." It is the policy of the National Park Service to determine the quality of park surface and groundwater resources and avoid the pollution of park waters by human activities occurring within and outside of each park. Neither alternative would impact the surface water quality or groundwater quality because the removal and replanting of individual trees would be limited to the tree pit areas. Erosion control measures would be employed around staging areas for construction materials, as needed, to prevent sediment-laden runoff from leaving the site. The planting and establishment of the replacement trees would not result in a substantial increase in water usage on the Memorial grounds, and no additional stormwater discharge to surface waters is expected. Due to the limited

potential for impacts on or discharges to water resources, this resource has been dismissed from further analysis.

1.7.10 Environmental Justice

The U.S. Environmental Protection Agency (EPA) defines environmental justice as the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Executive Order 12898, General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that all federal agencies, to the extent practicable and permitted by law, consider environmental justice effects by identifying and assessing potential disproportionate adverse human health and environmental effects of programs, policies, and activities on minority and low-income populations. Because the nature and location of the Proposed Action would not have the potential to have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in EPA (1998) and CEQ (1997) environmental justice guidance, this resource was dismissed from further analysis.

1.7.11 Native American Resources and Religious Concerns

Indian trust resources are assets held in trust by the United States for Native Americans. The U.S. Department of the Interior's (USDOI) Secretarial Order 3175: Departmental Responsibilities for Indian Trust Resources, requires that any anticipated impacts to Indian trust resources from a proposed project or action by USDOI agencies be explicitly addressed in environmental documents. A letter from the Peoria Tribe of Indians of Oklahoma submitted during the GMP/EIS process identified that the tribe did not have any documentation linking Indian Religious Sites to proposed construction at the Memorial (GMP, 2009). In addition, there are no lands within or adjacent to the Memorial held in trust by the Secretary of the Interior for the benefit of Native Americans. Therefore, this resource has been dismissed from further analysis.

1.7.12 Archeological and Paleontological Resources

Archeological resources are the tangible remains of human occupations that are no longer in use. All activities associated with the Proposed Action would occur on areas of fill that were imported during the original construction of the Memorial. Therefore, the likelihood of encountering archeological resources is considered remote and a determination of "No historic properties affected" has been made for this project. If previously unidentified cultural resources were to be discovered during project activities, work would stop in the area of discovery and the National Park Service Section 106 Coordinator would be contacted to determine the appropriate course of action. Since the Proposed Action would not involve activities in or near known archeological sites, this resource has been dismissed from further analysis.

1.7.13 Curatorial Resources and Museum Collections

NPS Director's Order 24: Museum Collections, addresses the potential for impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material). The project area is not located near any museum collection facilities; therefore, this resource has been dismissed from further analysis.

1.7.14 Hazardous Waste and Solid Waste

NPS Management Policies 2006, Chapter 9, mandates that park facilities comply with all applicable laws and regulations associated with solid and hazardous waste, hazardous materials management, and site restoration. The removal of trees is not expected to disturb known solid or hazardous materials. The storage of plant, soil, and other materials would be located in a designated staging area, and would comply with all local, state, and federal regulations for the appropriate storage and disposal of solid and hazardous waste. Therefore, this resource has been dismissed from further analysis.

1.7.15 Noise / Soundscape

In accordance with NPS Management Policies 2006 (NPS 2006) and Director's Order 47: Sound Preservation and Noise Management,

an important component of the National Park Service mission is the preservation of natural soundscapes associated with national park units. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds.

The Memorial is located in an urban setting in downtown St. Louis. The soundscape of the Memorial includes sounds generated from vehicular traffic from the bridges, I-70, and Memorial Drive; locomotives and railcars from the railroad cut; ferry and barge traffic on the Mississippi River; and aircraft on approach to or departing from Lambert-St. Louis International Airport. Noise generating activities on the Memorial grounds include routine maintenance activities and special events and performances that use amplified sound equipment and public address systems.

The removal and replacement of the Rosehill ash trees would be considered general maintenance activities. The use of chain saws and mechanized chipping machines would generate short-term noise levels that would be noticeable to visitors that are near the area of activity; however, given the generally high background noise levels, the noise generated from tree removal activities would diminish rapidly with increasing distance from the noise source. Since the noise increases would be of short duration and would be generally comparable to the noise levels generated by

current maintenance activities, this resource has been dismissed from further analysis.

1.7.16 Air Quality

The St. Louis metropolitan area is designated nonattainment for the 8-hour National Ambient Air Quality Standard (NAAQS) for ozone and for the annual NAAQS for PM_{2.5}. As a result of these nonattainment designations, the state of Missouri has prepared State Implementation Plans (SIPs) that outline steps the region will implement to achieve the NAAQS for both pollutants.

During tree removal activities, small quantities of air pollutant emissions would be generated from the use of chain saws and mechanized chipping machines. These emissions would be short term and minimal, would have a negligible impact on regional air quality, and would not interfere with the ability of the region to attain the NAAQS. Based on the limited potential impact on air quality from the Proposed Action, this resource has been dismissed from further analysis.

1.7.17 Prime and Unique Farmlands

Per the definition of prime farmland in the Federal Register, Vol.6, Parts 400-699, January 1, 2001, Section 657.5(a), there are no areas on the Memorial that are classified as prime farmland. In addition, soils in the project area are not suitable for supporting prime or unique farmland, and therefore this resource has been dismissed from further analysis.

