

LANDSCAPE *culture*

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Making it Work for APIS Light Station Landscape Care

The Apostle Islands National Lakeshore light station cultural landscapes are some of the most difficult to access in the NPS. Despite this, APIS staff and volunteers work to maintain these landscapes seasonally using a variety of creative strategies. The park’s seven historic light stations are dispersed around the outer edge of the Apostle Islands in Lake Superior. They are part of a remarkable network of 56 stations around the largest of the Great Lakes that have sought to protect shipping traffic since the 1800s. The vast number is indicative of the 2,800-mile-long shoreline and the hazardous weather on the lake. Lake Superior has some of the most unpredictable, stormiest, and coldest weather in the continental United States, with record waves and wind speed.

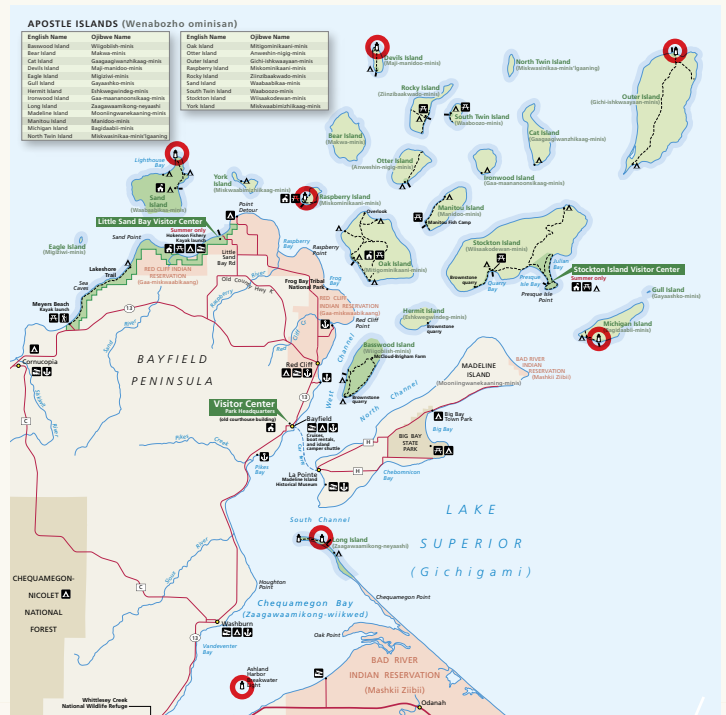
About Us

Learn more about cultural landscapes in the National Park System.

Learn more about the organizational management of NPS cultural landscapes.

Park Cultural Landscapes Program sharepoint.

For current news about NPS cultural landscapes, join us on social media:



The seven historic light station landscapes of Apostle Islands National Lakeshore are located around the perimeter of the Apostle Islands, indicated by highlights (NPS).



The Lane family and friends at the old Michigan Island Light Station and landscape, 1910–15, showing shrubs, trees, and turf in the light station landscape (NPS, Apostle Islands National Lakeshore, in Historic Resource Study.)



The Michigan Light Station in 1927 (above) showing mature landscape plantings and in the present day (below), with restored flower garden of ornamental trees, shrubs, perennials, and turf. These conditions are the result of a complex coordination effort and hard work (NPS photo).

Historically, the lives of the Apostle Islands lightkeepers and their families revolved around keeping the light lit, all night, every night, to safeguard vessels. In between storms, [family life in these landscapes](#) involved the cultivation of flower gardens, fruit trees, and vegetables. Some keepers and their wives were master gardeners and certain stations like Michigan and Raspberry Island were known for their beautiful landscapes.



An encroaching pine tree is removed from an overgrown space within the La Pointe Light Station landscape on Long Island, opening up a historic view to the lake and reducing a fuel hazard (NPS photo).

Today, these landscapes still evoke the feeling of domestic and ornamental spaces that were self-sufficient environments for the isolated residents. They contain ornamental trees, shrubs, flowers, garden beds, and turf, along with some fruit trees. During the summer, the light stations are primary destinations for park visitors that arrive by boat, kayak, or cruise service. But the remoteness of these landscapes poses unique challenges.



A debris pile is burned at Michigan Light Station under close monitoring by a Fire crew member (NPS photo).

Access by work crews, materials, and equipment is difficult and expensive. Forest vegetation that surrounds each cultural landscape exerts a continual pressure of encroachment, and there's insufficient funds for grounds crews dedicated to each island. A decade ago, the Apostle Islands light stations had become severely overgrown with encroaching vegetation.



Park staff and volunteers collaborate in maintaining the flower garden in the Michigan Island Light Station landscape, including planting and dividing perennials, pruning trees and shrubs, spreading wood chips for mulch, and watering (NPS photo).

Over the last ten years, Dave Cooper, the park's Resource Manager and Archeologist, has built a preservation maintenance program for six landscapes that uses a multi-pronged strategy. Dave combines base-funded seasonal staff with volunteers, project money, and his own elbow grease to make it work. Cyclic Maintenance project funds have supported periodic maintenance and fire crews work on fuels reduction.



Annually, a zone is brush mowed to prevent colonization of trees within a historic open space. Lightkeeper families would graze livestock and set controlled fires to retain open views to the lake (NPS photo).

Guided by Cultural Landscape Inventories and Cultural Landscape Report treatment plans, Dave calls upon the fire crews to remove woody vegetation that creeps into the landscape from the forest and to then burn the debris piles. Annually, seasonal staff brush hog areas that transition between the landscape and the forest using Billygoat brush mowers. Four of the landscapes now have their own Billygoats stored on site, which Dave calls "a godsend". Volunteers mow the turf and prune the fruit trees. The Friends of the Apostle Islands National Lakeshore non-profit organizes annual "spring cleaning" and planting of the flower and garden beds. Thanks to the dedicated staff and volunteers, in combination, these strategies produce amazing results!



Two views of the grounds of Devils Island Light Station showing before (left) and after (right) vegetation management. The "before" view from 2012 shows encroaching vegetation brush-sawn and stacked in piles, ready for burning. The "after" view from 2021 shows the historic condition of low herbaceous vegetation re-established, restoring historic views to Lake Superior (NPS photos).



The restored orchard at the Michigan Light Station showing a historic apple tree behind the young trees (NPS photo).

Do you have cultural landscapes in your park that are in danger of becoming overgrown by encroaching vegetation? Did you know that the Cyclic Maintenance project fund source supports periodic interventions to "repair" (remove dead, prune, rejuvenate and replace) historic vegetation in cultural landscapes? Let us know if you'd like guidance with project creation. Contact us at waso_cultural_landscapes_program@nps.gov.

Role of NPS Arborists, Horticulturists and Gardeners

The NPS manages 2.75-million acres of maintained landscape facilities that require recurring maintenance to serve the operational needs of parks and visitors. We also manage approximately 1000 cultural landscapes, which are a type of cultural resource but also coincide with many maintained landscape locations. As facilities and/or cultural resources, landscapes are generally composed of vegetation that needs skilled maintenance to function as intended and preserve the character of a historic place. Arborist, Horticulturist, and Gardener are three NPS position series that serve key roles in maintained landscapes and cultural landscapes. Parks with staff in these positions are having measurable success at sustaining landscapes in good condition and preserving historic integrity.

Overall, the NPS has 100 positions by classification dedicated to landscape care. Eight NPS positions are classified as Arborists, 13 as Horticulturists and 79 as Gardeners. Here’s how the positions break down by region:

Position	Legacy Region							Totals
	AKR	MWR	IMR	NCA	NER	PWR	SER	
Arborist	0	1	0	1	5	1	0	8
Horticulturist	0	0	1	5	4	3	0	13
Gardener	0	12	3	28	20	12	4	79

The number of NPS Arborist, Horticulturist and Gardener positions in parks and regional offices in March 2022, based on NPS HR data.

The specific duties of these distinct positions are described below.

Arborists

NPS Arborist positions are classified in the [5001 series of the Plant and Animal Work Group](#) and standard position descriptions are available for WG-05 Tree Worker, WG-07 Arborist (Journey Level) and WG-09 Arborist (Certified). The primary purpose of the series is the proper care and maintenance of trees in maintained landscapes, with special attention to specimen trees. Arborists perform condition assessments to determine health and vigor, diagnose disorders, perform pest management, conduct treatments, select tree species and varieties following cultural landscape preservation guidance, and perform tree planting. Knowledge of ropes, knots, rigging and hitches, the operation of equipment such as chainsaws, motorized winches and block and tackle, and climbing trees is unique to the 5001 series. The Arborist series is distinct from the Forester 0460 series, which deals

with forests as ecological systems. Foresters prepare resource management plans, collect, and analyze spatial data, and prepare environmental analyses.



NPS Arborist David Goto prepares to treat the historic orchards of MANZ with copper sulfate to protect against Fireblight. David coordinated the propagation of pear trees, cloned from the historic trees, to restore the orchard (NPS photo).

Park Arborists manage individual trees: their acquisition, propagation, cultivation, pruning, assessment, rehabilitation, preservation, and removal. They balance the high risks of public safety with the high stakes of resource protection. The consequences of failure of a hazard tree can be dire, and mature trees are frequently the oldest visible resources in a cultural landscape. For example, David Goto is an NPS Arborist at Manzanar National Historic Site. He’s familiar with every historic tree in the 640-acre cultural landscape and is responsible for monitoring their condition and taking measures to extend their lifespan. He’s a former graduate of the NPS Arborist Training Program (ATP). Since the early days of its inception, Manzanar has had an Arborist position, recognizing that trees from the Japanese American incarceration period in World War II are among the Park’s most significant cultural landscape resources. David and his predecessor in the role have saved many historic trees from severe decline and restored historic orchards, to better convey the significance and integrity of the landscape.

Horticulturists

NPS Horticulturist positions are classified in the [0437 series of the Natural Resource Management and Biological Sciences Group](#) and in the [0437 series of Resource Careers](#) for GS-05 Trainee, GS-07 Advanced Trainee, GS-09-Developmental, GS-11 Professional and GS-12 Senior Professional positions. The primary purpose of the series is landscape management in concert with natural and cultural resource programs.

Horticulturists develop and implement programs to protect and preserve the physical characteristics, biotic systems, historic character and contemporary uses of maintained landscapes and cultural landscapes. Their work integrates horticultural science, landscape planning and design, historic landscape preservation and technical plant care skills.



NPS Horticulturist Anna de Cordova conducts a class on culinary plants within a cultural landscape (NPS photo).

Park Horticulturists manage all types of plant materials: woody or herbaceous, native, or introduced. They help to develop and implement Cultural Landscape Report treatment plans and use science and design to guide maintenance for a desired landscape character. They frequently coordinate operations and serve as project managers for in-house projects and service contracts. They also coordinate volunteer programs to sustain landscape care. For example, Anna de Cordova is a Horticulturist at Roosevelt Vanderbilt National Historic Site. She manages several cultural landscapes with a variety of gardens within an overall ecosystem. She supports the park's landscape stewardship goals with best horticultural practices, manages a plant propagation program for various gardens and landscapes, monitors landscape condition, and coordinates multiple groups of staff and volunteers. She's been instrumental in implementing treatment plans and improving landscape conditions. Through her role in horticulture, her parks have engaged more staff, visitors, and volunteers with an understanding of landscape history and care. She has also developed garden education, interpretation and community partner programs that extend the value of the landscapes for the public.

Gardeners

NPS Gardener positions are classified in the [5003 series of the Plant and Animal Work Group](#) and standard position descriptions are available for WG-04

Gardener Trainee, WG-06 Gardener-Developmental and WG-08 Journey Gardener. The primary purpose of the series is the proper care and maintenance of turf, flowers, shrubs, and trees up to 15 feet tall. (By position description, trees taller than 15 feet are the responsibility of Arborists.) Gardeners serve as pesticide and fertilizer applicators, maintain irrigation systems, and may operate farm-type equipment such as tractors, rotary or flail mowers, augers, and tillers. Gardeners prune and transplant plants and remove vegetative debris and trash from landscapes.



NPS Gardener Dovie Cagle applies mulch to a plant bed to suppress weeds and reduce evaporation at Gateway Arch National Park (NPS photo).

Like Horticulturists, Gardeners deal with all kinds of plant materials, but are generally closer to daily plant care operations. They understand the objectives established by Arborists, Horticulturists, Resource Managers and Facility Managers, and they implement the work using specialized plant care techniques. Having the most direct contact with vegetation through daily operations, Gardeners greatly influence the character of landscapes and its impact on the visitor experience. Through expert knowledge and craft, Gardeners sustain fertile soils and optimize the lifespan of vegetation, while responding to changing conditions. For example, Dovie Cagle is an NPS Gardener with Gateway Arch National Park. She is currently enrolled in ATP and the GOAL Academy. As a Lead Gardener, Dovie manages other Gardeners and determines the materials and methods needed to maintain the landscape according to the CLR treatment plan. She's responsible for tools and equipment and troubleshoots on-the-ground problems. Gateway Arch has seven permanent Gardener positions that sustain the 91-acre cultural landscape following a multimillion-dollar rehabilitation completed in 2018.

Need for Specialized Roles

The numbers of classified Arborist, Horticulturist, and Gardener positions numbers do not paint the full picture of NPS landscape care, however. Many NPS employees (such as Maintenance Mechanic, Motor Vehicle Operator and Biological Technician) touch the vegetation of maintained landscapes, even though their position titles are not one of these named positions. Additionally, some NPS employees are certified Arborists but work in other positions, such as Maintenance Mechanic and Trails Worker. A few NPS Horticulturists and Gardeners are also certified Arborists. Bio Techs, Forestry Technicians, Maintenance Workers, and Laborers all pitch-in to help sustain the vegetative fabric of cultural landscapes. Their work is significant but does not replace the specialized knowledge and skills of Arborists, Horticulturists and Gardeners dedicated to these roles. It is important to have staff with knowledge of arboriculture or horticulture evaluating the work of service contractors, and to have staff with knowledge of gardening directing partners and volunteers in the techniques of landscape care. Without this specialized knowledge, management objectives are not consistently applied, and cultural landscape integrity and conditions can deteriorate.

Raising Awareness

We aim to help parks build capacity in these positions by expanding the reach of training like the Arborist Training Program and Preservation Horticulture. The next cohort of the 2-year long [Arborist Training Program](#) will begin in early FY23, and after a two-year hiatus, the week-long [Preservation Horticulture Workshops](#) will resume in FY23. We're continuing to build [Preservation Horticulture](#) training content on the Common Learning Portal and the [WASO Park Cultural Landscapes Program SharePoint](#). And the concept of Maintenance Action Teams (MATs) presents a golden opportunity. First funded as a pilot in FY21 by Legacy Restoration Funds through the Great American Outdoors Act, the MAT concept has been extended. MATs address landscapes as well as structures and monuments, providing more opportunities for skills training and the potential for new recruitment.

Overall, we need to raise awareness about the unique value of skilled landscape care positions. The roles of Arborists, Horticulturists and Gardeners are distinguished by specialized training and experience that isn't substitutable by other positions. We recognize

that it would be generally inappropriate for a motor vehicle operator to prepare historical accurate mortar for a masonry structure, but do we also recognize it would be equally inappropriate for them to be responsible for historic tree and shrub pruning? In both cases, specialized knowledge and skills are needed to complete the task. As we work to raise awareness about the advantages of skilled landscape positions throughout the NPS, please let us know if your park has training needs for arboriculture, horticulture, or gardening. Contact us at waso_cultural_landscapes_program@nps.gov.



The 91-acre designed grounds of the Gateway Arch are both a maintained landscape and a cultural landscape, significant for Modernist landscape architecture. The grounds contain several thousand trees, shrubs, and herbaceous plants along with turf managed as lawn (NPS photo).

Employee Spotlight



David Browne outside the Kennesaw Mountain National Battlefield Park Visitor Center (NPS Photo).

Name: David C. Browne

Position: WG-5 Maintenance

Park: Kennesaw Mountain National Battlefield (KEMO)

How long have you worked for the NPS?

I have worked for the NPS for just over 2 years

What is your background?

My background is forestry and heavy equipment operations. I grew up on a farm working with animals, tractors, and various equipment. My family is in forestry (growing and sale of timber). We own and operate a tree harvesting business. I was in the military for 8 years and worked in the retail world for another 8 as an operations manager.

What is your favorite part of your job?

I love the ability to work on projects, train future workers, and educating people about various activities that our park has to offer. I also love learning about the park history and teaching others.

What project are you working on?

I am currently working on developing and building two new trails within the park. I am also working to clean and maintain earthworks within the park that have been damaged by various storms.

What was your favorite experience in the park?

My favorite part of working with the park is the constant ability to be exposed to new and exciting adventures and projects.



Earthworks at Kennesaw Mountain National Battlefield Park in November 2004 (NPS Photo).

Tool of the Moment: Sonic Tomograph

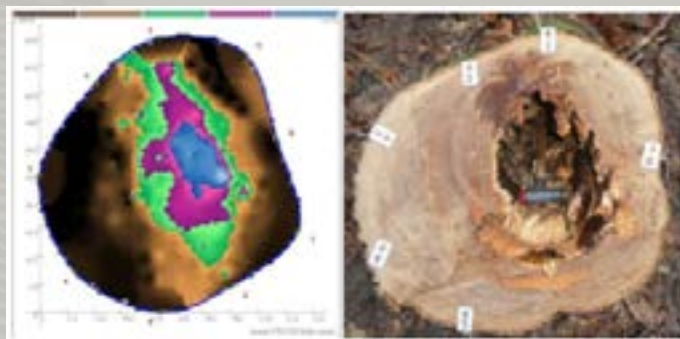
Historic trees often have partially decayed or hollow trunks. This decay is often not visible from the exterior of the tree. Therefore, to assess internal decay, arborists use specialized equipment to measure internal tree structure. One such specialized tool is a **sonic tomograph** which measures how sound waves travel through a tree to determine areas of decay and empty space (hollows).

How it works

In order to use a sonic tomograph, sensors connected to a computer are placed in a circle around a tree at the same distance from the ground. A hammer is used to tap each sensor to create sound within the trunk. The sound travels differently through areas of healthy wood, decay, and space. The sensors around the tree gather this acoustic data. The data is transferred to a computer that makes a map of the inside of the trunk. The extent of decay can then be accurately measured.

A sonic tomograph is a diagnostic tool you probably won't have within your park, but this service can be procured through a credit card purchase or a service

contract. If you have a tree that requires advanced risk assessment, contracting with a consulting arborist that has expertise in sonic tomography could provide valuable information. This tool can be used on specimen trees up to one meter in diameter to assess risk and monitor decay. Internal decay and hollows impact the stability of each tree species differently. An arborist experienced in sonic tomography will provide tree-specific recommendations based on the tomograph images and overall tree assessment.



Caption: Sonic tomograph image and tree trunk tested ([Tree Associates](#)).



Caption: Sonic tomograph sensors attached around the base of a tree ([Univ. of WA Botanic Gardens](#)).

Announcements & Publications

» [Mission 66 Campground Determination of Eligibility \(DOE\) Process and Treatment Guidelines](#). The purpose of these guidelines is to help the NPS evaluate the National Register eligibility of Mission 66 campgrounds through the completion of Determinations of Eligibility (DOEs).

» [Release of Cultural Resources in Wilderness: Guidance for Considering and Managing Historic Structures and Installations](#). The Wilderness Stewardship Reference Manual 41 (RM41) offers comprehensive guidance to National Park Service employees responsible for managing and preserving wilderness character and the wilderness resource throughout the National Park System.

Podcast Corner

Today, podcasts are abundant in the field of horticulture. Check out these plant-specific podcasts and broaden your perspective on landscape care:



» [Trees](#). Donald J. Leopold Ph.D., Distinguished Teaching Professor and Chair of the Department of Environmental and Forest Biology at ESF, offers this remarkable series of short videos on scores of different trees. Learn the basics of trees that interest you.



» [Nature Guys](#) podcast connects you to the exciting natural world right in your own neighborhood.

Upcoming Training Opportunities

[Plant Health Care for Trees](#)

Florida Chapter International Society of Arboriculture

In-person, Orlando: May 4 or Fort Myers: May 6.

[2022 Arborist Certification Course \(3 Day Course\)](#)

Mid-Atlantic Chapter International Society of Arboriculture

In-person, July 12-14.

[Natchitoches: Confluence of Cultures in the Red River Valley](#)

Alliance for Historic Landscape Preservation, NCPTT

Annual meeting, Natchitoches, LA, May 18-21.

[Tribal Consultation Webinar Series](#)

NPS Office of Native American Affairs

Online webinar series, April 12, 2022-Jan. 10, 2023.

Open to employees from all disciplines who are interested in learning more about Tribal consultation.

[BEST Preservation Workshops](#)

HPTC

Field/In-person, locations vary, April-November.

Workshop series for NPS employees at all levels in the preservation of traditionally built historic resources using problem-based and hands-on learning.

Workshops in inquiry, documentation, treatment, and maintenance.

[Guiding Principles for Field-Based Historic Preservation](#)

HPTC with Stephen T. Mather Training Center

Field/In-person, May 17-19 (FOVA), June 1-3 (GRTE).

[Orchard and Barn Workshops at Sleeping Bear Dunes National Lakeshore](#)

Sleeping Bear Dunes National Lakeshore

Field/In-person, May 6 (Pruning), June 21-24 (Barn Restoration).

Contact Kimberly Mann for information or to sign up: (231)326-4771 or kimberly_mann@nps.gov.

[Integrated Pest Management Virtual Training Series](#)

NPS Integrated Pest Management Program

Online webinar series, IPM YouTube playlist.

[Cemetery Preservation Intensive Online Course for Puerto Rico \(3 parts\)](#)

NCPTT

On-demand.