

POTENTIAL EXTENT OF AMERICAN CHESTNUT RESTORATION WITHIN THE NATIONAL PARK SYSTEM

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Abstract: A total of 128 National Park Service units and affiliated areas totaling 1.9 million acres were identified as being located within or closely bordering historic American chestnut range. Fifty two parks had historical records of American chestnut; 35 of which were aware of living remnants within their boundaries. There is widespread interest among park managers in restoring American chestnut if a blight resistant tree was available that met park objectives, was ecologically sound, and was approved by NPS policy. The strength of the Park Service in contributing to a chestnut restoration program may lie more in numbers, distribution, variety, and miles of parks rather than in surface acreage alone. These factors make the National Park Service uniquely positioned to contribute towards a rangewide restoration effort through education, interpretation, research, evaluation, and demonstration of emerging blight control and resistance technologies.

Keywords: National Park Service / Park Units / American chestnut / Restoration Potential

INTRODUCTION

The National Park Service (NPS) is a bureau of the U.S. Department of Interior with responsibility to preserve natural and cultural resources within congressionally designated areas for the enjoyment, education, and inspiration of current and future generations. There are approximately 388 units within the National Park system that collectively contain more than 83 million acres. In addition, the NPS cooperates with numerous federal, state, tribal, and local governments, private organizations, and businesses to extend benefits of resource conservation and outdoor recreation to many other public areas throughout the United States.

In May 2004, the NPS sponsored a workshop in Asheville, NC to review the ecological significance of the American chestnut (*Castanea dentata*) to eastern forests, update the status of efforts to develop blight resistant trees, and explore opportunities and risks associated with NPS involvement in future chestnut restoration programs. The initial purpose of this paper was to determine the number and size of NPS units located within historic American chestnut range so as to estimate the maximum possible extent of NPS involvement in a chestnut restoration program. Subsequent to the workshop, additional information was collected from park units on managers' knowledge of chestnut occurrence and their attitudes towards restoration. This information can be used to develop strategies and options that best utilize the unique resources of the NPS in a cooperative chestnut restoration program while meeting mandates to protect and preserve all natural and cultural resources within the National Park system.

MATERIALS AND METHODS

Identification of Park Units

National Park units located within or closely bordering historic American chestnut range were identified by overlaying American chestnut coverage data with NPS unit boundaries or point locations using

ArcGIS ArcMap 9.1 (Environmental Systems Research Institute, Redlands, CA). Eastern U.S. state and county boundary layers were obtained from The National Atlas of the United States of America (<http://nationalatlas.gov>) and historic American chestnut coverage was obtained from Little's Range and FIA Importance Value Distribution Maps (USDA Forest Service, Northeastern Research Station, http://www.fs.fed.us/ne/delaware/4153/global/littlefia/species_table.html).

A list of NPS units in the eastern U.S. was compiled from entries in NPS ParkNet (<http://www.nps.gov>), the NPS Owner's Manual (National Park Foundation 2002), and a National Park guidebook (Scott and Scott 2002). Parks were identified as individual units if they appeared on the list of "384 NPS Units" (File `dbo_NPSDirectory_places.xls`; NPS NR-GIS Metadata and Data Store; <http://science.nature.nps.gov/nrdata/>) and they were not part of another NPS administrative group. Parks within an administrative group were listed individually if all units in the group were included in the list of 384 parks, but were lumped with their administrative group if the group reported acreage from holdings not included in the 384 park list. For example, Roosevelt-Vanderbilt National Historic Site parks (ROVA) were treated individually, whereas National Capital Central parks (NACC) were treated as a single administrative unit.

Park boundary coverage and additional unit information was obtained from the NPS NR-GIS Metadata and Data Store (<http://science.nature.nps.gov/nrdata/>). Appalachian Trail coverage was obtained from the Appalachian Trail Conservancy (<http://www.appalachiantrail.org>). All data layer projections were defined as NAD 1983 UTM Zone 17N and park units in chestnut range were extracted using ArcToolbox. Park acreage was obtained either from FY2004 data reported for each unit on ParkNet (<http://www.nps.gov/parks.html>; see "Facts: Acreage" under each unit's web page) or from boundary calculations of shape files obtained from the NPS NR-GIS Metadata and Data Store (<http://science.nature.nps.gov/nrdata/>).

Questionnaire

A questionnaire requesting input on the following six questions was sent to each park unit identified as being within or closely bordering historic chestnut range (choices are in parentheses):

- 1) Were American chestnuts ever present in your park? (Yes, No, Unknown)
- 2) Are there any living American chestnuts in your park today? (Yes, No, Unknown)
- 3) Would your park be interested in restoring American chestnuts if a blight resistant form was available? (Yes, No, Unknown)
- 4) If so, for what purpose? (Ecological Restoration = large scale reforestation; Demonstration = small plots for research purposes; Education = individual trees for historic reference or public education)
- 5) If so, how many acres or how many trees would you anticipate at full restoration?
- 6) If available, and within NPS policy guidelines, would the park utilize any or all of the following products? (Pure American chestnut selected for blight resistance; American x Chinese chestnut hybridized for resistance but retaining American form; Genetically Modified American chestnut with genes inserted for blight resistance from a different plant)

Questionnaire recipients were identified through a search for managerial or natural resource staff through the NPS People and Places Directory (<http://data2.itc.nps.gov/npsdirectory/>). Affiliated areas and trails were not sent a questionnaire nor were acreages determined for those units.

RESULTS

A total of 128 National Park units and affiliated areas were identified as being within or closely bordering historic American chestnut range (Figure 1). These included 91 parks totaling 1,729,730 acres found within chestnut range, 21 parks totaling 130,686 acres bordering chestnut range, and 16 affiliated areas and trails with undetermined acreage wholly or partially within chestnut range (Table 1). Represented

within this group were 53 Historical Parks and Sites, 19 Military Parks and Battlefields, 12 National and Natural Parks, 11 Memorials and Monuments, 8 Rivers, 7 Heritage Areas, 6 Trails, 5 Recreation Areas, 3 Parkways, 2 Preserves, and 2 Seashores. Park units were found within historic chestnut range in every state except Delaware, Indiana, and Florida. Excluding affiliated areas, parks ranged in size from 1 to 521,752 acres (mean = 16,611 acres; median = 700 acres). The largest unit, Great Smoky Mountains National Park, accounted for almost one third of the total acreage found within historic American chestnut range.

Questionnaires were sent to 104 of the 128 identified units, of which 81 parks (78%) responded; 63 parks within chestnut range and 18 parks bordering chestnut range (Table 1). Of the 63 parks located within chestnut range, 44 parks (70%) had historical records of American chestnuts on park land, of which 32 parks (51%) were aware of remnant trees currently surviving on park grounds. Of the 18 parks bordering chestnut range, 8 parks (44%) had historical records of chestnut, of which 3 parks (17%) were aware of present day specimens. A total of 53 parks indicated interest in restoring American chestnut, while 11 were not interested and 17 were unsure at this time. Of those parks expressing an interest, 31 would restore for ecological restoration of forests, 38 for demonstration and research purposes, and 34 for public education (parks could respond to more than one category). An additional 7 parks expressed an interest in using American chestnuts within historical or cultural landscape restoration, which was a category omitted from the questionnaire but should have been included.

Forty parks identified a total of 79,441 acres for potential chestnut restoration and an additional possible need for 1,375 individual trees. These acres represent a total possible land area where American chestnuts could be incorporated into the forest or landscape, and no attempt was made to determine if this land was actually suitable for chestnuts or the tree density the land would support. Of the 63 parks that expressed an opinion on product type for potential restoration, all would accept a pure American selected for blight resistance. If a pure American was unavailable, 35 parks (56%) would consider using an American x Chinese hybrid and 35 parks (56%) would consider using an American chestnut with genes inserted for blight resistance from a different plant, assuming that use of the later two products were approved by NPS policy. Comments from individual parks on historical and present chestnut occurrence and attitudes towards restoration are listed in Table 1. Some comments were paraphrased for brevity.

DISCUSSION

Recent advances in hybridization and genetic engineering have opened the possibility of controlling or managing the detrimental effects of chestnut blight in North America within the next several decades. Although these advances hold great promise to restore the American chestnut to its' former ecological role in eastern forests, the risks and benefits associated with using these technologies are poorly understood. Three paths are currently available to the National Park Service: 1) the NPS can chose not to be involved in chestnut restoration at this time and wait for other federal and private organizations to develop blight control technologies which the parks can implement after full testing; 2) the NPS can allow individual parks to adopt untested chestnut restoration technologies as they become available according to the level of risk each park is willing to assume, or; 3) the NPS can take an active, coordinated role in chestnut restoration by utilizing its unique resources to help other organizations and agencies develop and test new blight control technologies. Which direction the NPS chooses may well affect the ultimate success of returning this species to its native range during the next century.

Response to this questionnaire indicates that a majority of park managers within historic chestnut range would like to restore chestnuts to their park landscape and would actively participate in a coordinated NPS restoration program. There was equal or greater interest in participating in a restoration program through education and demonstration projects as there was for actual reforestation, and numerous parks expressed interest in incorporating American chestnuts into the cultural landscape. Although all

managers would prefer using a pure American strain for restoration, there was no widespread objection to using an American x Chinese hybrid or a genetically modified tree if the product met park objectives, was ecologically sound, and was approved by NPS policy.

This study identified over 100 parks and affiliated areas in historic chestnut range with total management area of approximately 1.9 million acres. Many of these parks have both historic and contemporary records of American chestnuts within their boundaries. Although this area represents less than 1% of the 200 million acres that chestnuts once occupied in the eastern United States (see D.E. Davis, this proceedings for total historic acreage), these parks are widely distributed throughout all of historic chestnut range. Park lands may thus contain the full scope of habitat types once utilized by American chestnuts and remnant sprouts may contain the full array of remaining genetic variability of the species. The strength of the Park Service in contributing towards an American chestnut restoration program may thus lie more in numbers, diversity, and geographic distribution of parks than in total surface acreage available for reforestation. This makes the Park Service uniquely positioned to cooperate with other public and private organizations to assist in chestnut restoration through public education, interpretation, demonstration, research, and long-term product evaluation. In addition, much of the acreage under NPS management exists in trails, parkways, and river corridors that traverse virtually all historic chestnut range. These units would be ideally suited to establish locally adapted source populations of blight resistant chestnuts for pollination and seed distribution into surrounding areas.

The overall positive response to this questionnaire and enthusiasm for American chestnut restoration among park resource managers indicates the Park Service should move forward in a coordinated effort to develop a Service-wide restoration program. Possible steps include formalization of restoration policy including guidance on use of genetically engineered products in National Parks, creation of a committee or council to guide restoration efforts, identification of NPS research priorities and information needs, clarification of roles that specific parks could play in chestnut research and restoration, centralization of NEPA planning, cataloging of remnant chestnut resources on park lands for use in regionally adapted breeding programs, and establishment of formal relationships with universities, federal and state agencies, and private organizations interested in pursuing cooperative chestnut restoration programs. These steps would position the National Park Service to become a leader and showcase for American chestnut restoration, and could serve as a template for restoring other native trees facing similar ecological threats from invasive diseases and pests.

ACKNOWLEDGEMENTS

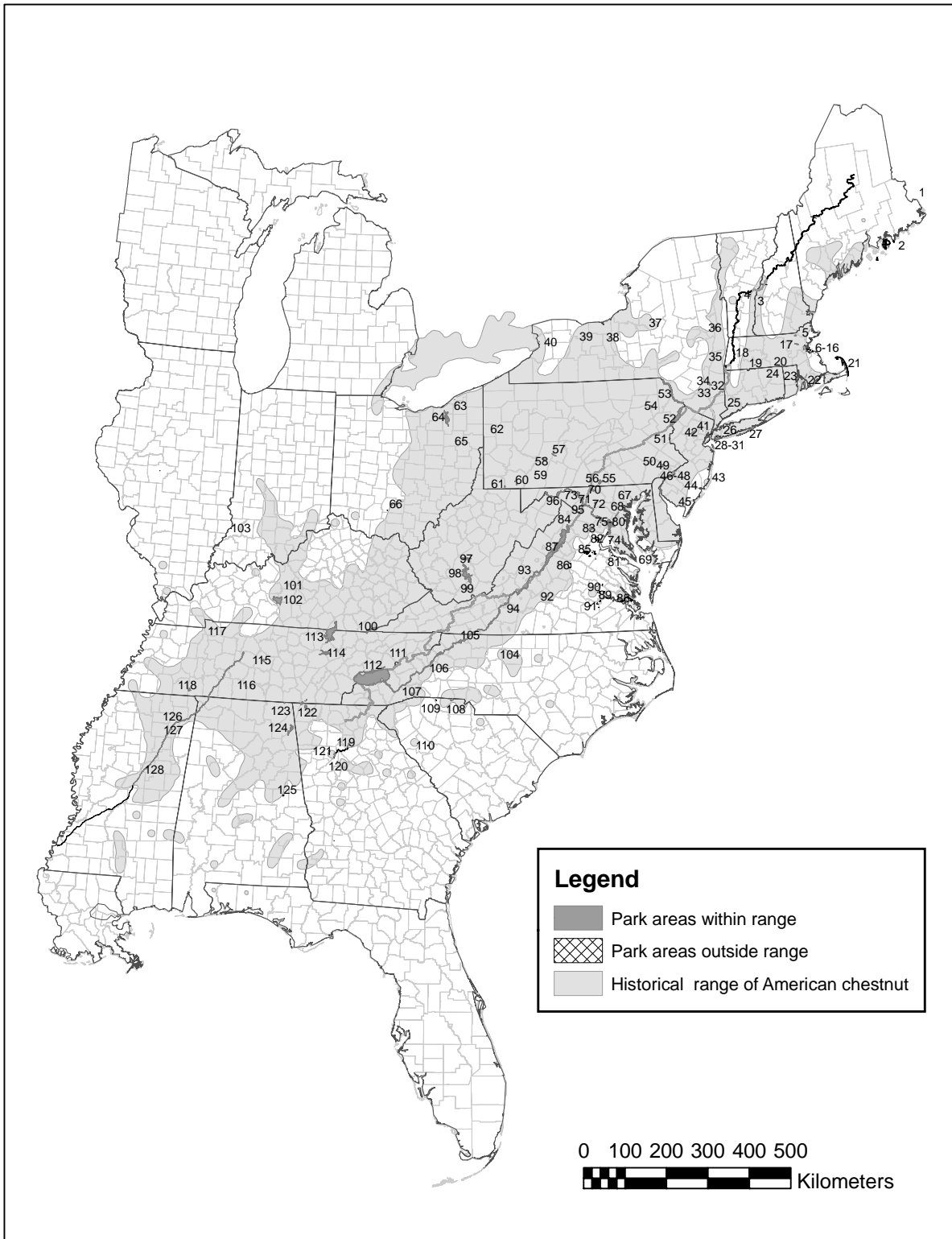
I would like to thank Sara Fitzsimmons (TACF) and Jeff Cole (USGS) for assistance in creating the chestnut range map and identifying parks, and Connie Johnson (USGS) for assistance in conducting the survey of park managers.

LITERATURE CITED

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Figure 1. National Park Service units and affiliated areas located within historic range of American chestnut. Park numbers are identified in Table 1.¹



¹ A full color, PDF version of this map is available by navigating to the following site:
<http://chestnut.cas.psu.edu/nps.htm#lellis>

Table 1. List of National Park units and affiliated areas within or immediately bordering historic American chestnut range^{1,2}.

Map #	State	Park Name	Park Acres	Historically Present?	Currently Present?	Would Park Restore?	Purpose	Potential Scope	Tree Type	Comments
PARK UNITS WITHIN CHESTNUT RANGE										
3	NH	Saint-Gaudens NHS	148	Y	Y	Y	R,D,E	75ac	A,Hp,Gp	Occasional stump sprouts. Saint-Gaudens NHS has been interested in this topic for a number of years and in 2002 hosted a public environmental education program entitled "Chestnuts in the 21st Century," featuring Dr. Sandra Anagnostakis of the Connecticut Agricultural Experiment Station, New Haven, CT. (Contact: Stephen Walasewicz, Natural Resource Manager)
6	MA	Lowell NHP	141							
9	MA	Minute Man NHP	971	Y	Y	Y	R,D,E	15-20ac	A,H,G	Minute Man NHP is about 970 acres and supports about 300 acres of upland forests. Remnant chestnut sprouts continue to inhabit perhaps 15-20 acres of the park. Ideally, it would be great to redistribute chestnuts throughout upland forests but re-establishing them on even 15-20 acres would be better than nothing. (Contact: Christopher Davis, Resource Management Specialist)
10	MA	Longfellow NHS	2							
12	MA	Boston African American NHS	1							
14	MA	John F. Kennedy NHS	1							
15	MA	Frederick Law Olmsted NHS	7							
19	MA	Springfield Armory NHS	55							
22	MA	New Bedford Whaling NHP	34							
23	RI	Roger Williams NM	5							
25	CT	Weir Farm NHS	74	Y	Y	Y	R,E	15ac	A,H	(Contact: Greg Waters, Horticulturist)
26	NY	Sagamore Hill NHS	83	Y	Y	Y	D,E	U	A,H,G	There are remains of chestnuts that regularly put up root sprouts; however, these sprouts usually grow to about 10' tall and then die (probably from the fungus). We would have to look at the Cultural Landscape Plan & the Historic Plant Inventory to determine where chestnuts were located during the historic period to get a number. There is also the question of what to do with the 40-acre woods that were originally oak & chestnut, but have had successional growth of beech and oaks to replace the chestnuts. This is a great idea, but it sounds expensive. (Contact: Amy Verone, Park Curator)
27	NY	Fire Island NS	19,579							
28	NY NJ	Gateway NRA	26,607	U	U	Y	R,D,E	1,500ac	A,H,G	(Contact: Doug Adamo, Chief Division of Natural Resources)
29	NY	Governors Island NM	23							
30	NY	Manhattan Sites	10							Includes Castle Clinton NM, Federal Hall NM, General Grant NM, Hamilton Grange NM, Saint Paul's Church NHS, and

Map #	State	Park Name	Park Acres	Historically Present?	Currently Present?	Would Park Restore?	Purpose	Potential Scope	Tree Type	Comments
										Theodore Roosevelt Birthplace NHS.
31	NY NJ	Statue of Liberty NM	58	N	N	Y	E	5-10 trees	A,H,G	Includes Ellis Island NM. Probably not on Liberty Island since we have a designed historic landscape. There might be a possibility for a few (5-10 trees) on Ellis Island though in the non-historic landscape portion of the island. Would be glad to support effort within NPS policy guidelines. (Contact: Al Farrugio, Horticulturist)
32	NY	Eleanor Roosevelt NHS	181	Y	Y	Y	D,E	U	A,H	Comments included with Home of FDR NHS. (Contact: Dave Hayes, Natural Resource Program Manager)
33	NY	Home of Franklin D. Roosevelt NHS	255	Y	Y	Y	D,E	U	A,H	We would not consider GMO as would jeopardize potential for FSC certification of Roosevelt tree plantation which we are considering at this time. Hybrid would be considered for cultural landscapes only, not native hardwood forest. (Contact: Dave Hayes, Natural Resource Program Manager)
34	NY	Vanderbilt Mansion NHS	212	Y	Y	Y	D,E	U	A,H	Comments included with Home of FDR NHS. (Contact: Dave Hayes, Natural Resource Program Manager)
35	NY	Martin Van Buren NHS	40	U	N	N				According to records, the primary trees were white pine, basswood, and black locust. There is no evidence of any chestnuts. Being a cultural landscape, we are sticking to the trees that are recorded on the site when Martin Van Buren was present. His estate was called Lindenwald for the linden/ basswood. The black locust was imported from the lower Midwest and had become one of the primary species. The farm contained apple and pear orchards, crops, hay, and/or pasture. The fence rows were cleaned regularly and there was no evidence of wood lots. Kinderhook Creek has some elms, willows, and sycamores. (Contact: Randy Ross, Facility Manager)
36	NY	Saratoga NHP	3,392	Y	Y	Y	L	100+ac	A,H,G	Yes, in the form of stump sprouts. They only get to about 1" dbh before succumbing. Would restore in important interpretive sites to better represent the 18th century forest. (Contact: Chris Martin, Resource Program Manager)
37	NY	Fort Stanwix NM	16	U	N	N				On the park's approximately 16 acres the Fort takes up the majority of space. The rest was cleared of trees for artillery/ musket kill-zone. For street frontage some flora is planned, but no chestnuts are considered. (Contact: Michael Kusch, Chief Interpretation and Resource Management)
38	NY	Woman's Rights NHP	7							
40	NY	Theodore Roosevelt Inaugural NHS	1							
41	NJ	Edison NHS	21							
42	NJ	Morristown NHP	1,711	Y	Y	Y	R	300ac	A,G	(Contact: Robert Masson, Biologist)
46	PA	Edgar Allan Poe NHS	1							
47	PA	Independence NHP	45	Y	N	Y	E	5 trees	A,H,G	To my knowledge, we will have one modern hybrid when current landscape plans are carried out. We would be interested in planting some more to develop our arboretum; however we are an urban park with no forest. (Contact: Susan Edens, Cultural Landscape Architect)
48	PA	Thaddeus Kosciuszko NMem	1							
49	PA	Valley Forge NHP	3,466	Y	N	Y	R	1,000-	A,H,G	Would need more information. We are less interested in form,

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								1,500ac		however, and more interested in filling the ecological niche chestnuts formerly occupied. (Contact: Deirdre Gibson, Chief of Planning and Resource Management)
50	PA	Hopewell Furnace NHS	848							
52	PA NJ	Delaware Water Gap NRA	68,714	Y	Y	Y	R,D	4,800-17,400ac	A,H,Gp	A 1911 timber harvest report shows that 29% of the harvest was American chestnut; a 1750-1795 witness tree record reveals that 8% were American chestnut. The Park's main interests would be to (1) replant in areas of declining hemlock stands (up to 2,800 acres), (2) plant in areas where the park is demolishing old structures (> 100 sites), and (3) areas that open up in the forest canopy as a result of natural disturbance. Extrapolation of percentages of both the witness tree report and the 1911 timber harvest to Park restoration goals indicate total acreage could vary from 4,800 to 17,400 acres at full restoration (other literature places American chestnut to be as high as 40-60% of the canopy). It would make sense to create multiple small stands of chestnuts where openings occur and over time have them spread to other areas. (Contact: Larry Hilaire, Wildlife Biologist)
53	PA NY	Upper Delaware SRR	55,575	Y	Y	Y	R,D,E	31+ac	A,H,G	One that I know of and have seen. We only own 31 acres here ourselves, and not all of that would be suitable land, but from what I understand in communicating with local foresters there is some interest among private landowners in restoration plantings. We would want to consult with local foresters and property owners, but there is some interest and we would be supportive of this if it's ecologically sound. (Contact: Don Hamilton, Natural Resource Specialist)
54	PA	Steamtown NHS	62	U	U	U	E	1-2ac	U	If any were extant, it would likely be prior to 1855. After that date, major industrial development took place within what is now the park boundary. We are basically an historic industrial park. (Contact: Christopher Ahrens, Facility Management Specialist)
55	PA	Gettysburg NMP	5,990	U	U	N				Includes: Gettysburg NCem. Gettysburg NMP is charged with maintaining a July 1-3, 1863 setting. As far as we know, American chestnut was not a component of the forests during those 3 critical days. Advertisements in newspapers from the 19th century indicate the chestnut forests were in the more mountainous northern and western parts of the county. The location of sawmills in those same locations reinforces the hypothesis that this is where the good chestnut wood was available in abundance. No mention of chestnut woodlots or groves in any Cumberland township advertisements. Some local farmers had woodlots of oak-hickory on the farm proper, but also owned "mountain land" with "good chestnut stands" (a lot of these chestnut forest plots were actually in Franklin County). There is literally no evidence to support the historic presence of chestnut within the context of our nationally significant era of 1863-1938. (Contact: Zachary Bolitho, Natural Resource Specialist)
56	PA	Eisenhower NHS	690	U	U	N				Comments included with Gettysburg NMP. (Contact: Zachary Bolitho, Natural Resource Specialist)
57	PA	Allegheny Portage Railroad NHS	1,296	Y	U	U	R	U	A,H,G	Species was found and listed as rare in 1980-82 at Allegheny Portage Railroad NHS. Not found at Johnstown Flood N Mem. Any work

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										would need to be within National Park Service guidelines. An environmental assessment/ impact statement would be required. Presently we have no sites needing to be reforested and work would further depend upon identification of suitable sites. (Contact: Kathy Penrod, Natural Resource Specialist)
58	PA	Johnstown Flood NM	164	U	N	U	R	U	A,H,G	Comments included with Allegheny Portage Railroad NHS. (Contact: Kathy Penrod, Natural Resource Specialist)
59	PA	Flight 93 NMem	1							
60	PA	Fort Necessity NB	903	Y	U	Y	R,D	30ac	A,G	This tree was the dominant species at the time of the Battle of Fort Necessity. A project to restore the forested hillsides to the historic scene would benefit greatly from the inclusion of this species. The park would be willing to establish research plantings, but fencing would have to be done to protect from deer. Would need monitoring as to success of the plantings and continued resistance. At full restoration of the Great Meadows Cultural Landscape we would want to include resistant American chestnut in with a mix of other historical species (white oak, hickories, red oaks, sugar maple, etc.) and plant an area of approximately 30 acres. This is an exciting project and I hope that we can work together to bring this most valuable species back into our region and into our historic landscape. (Contact: Connie Ranson, Natural Resource Specialist)
61	PA	Friendship Hill NHS	675	Y	U	Y	D,E,L	2-5ac	A,G	Start small with 2-5 acres of trees that could be grown and used to replace other species lost from the cultural landscape. (Contact: Connie Ranson, Natural Resource Specialist)
63	OH	James A. Garfield NHS	8	N	N	N				Since we are trying to maintain the cultural landscape, we are not interested in planting any new American chestnuts as they were not historically present on the site. (Contact: Carol Spears, Site Manager)
64	OH	Cuyahoga Valley NP	32,861	Y	Y	U	U	U	U	Present, but not fruiting. NPS DRAFT Director's Order 77-5: Genetically Modified Organisms is currently out for comment. Once finalized should provide guidance concerning use of GMOs. (Contact: Meg Plona, Biologist)
65	OH	First Ladies NHS	1	N	N	N				Comments included with James A. Garfield NHS. (Contact: Carol Spears, Site Manager)
66	OH	Hopewell Culture NHP	1,170	U	N	Y	R	30-50ac	A,H,G	Historical presence unknown. Records exist for Ross County; however this area borders the western edge of chestnuts. If possible, planting within existing woodlots would help increase the diversity of our woodlots. We also have a few areas open for tree planting, and would be interested in having chestnut in the mix. (Contact: Myra Vick, Biologist)
67	MD	Hampton NHS	62	U	N	U	L	U	A	Comments included with Fort McHenry NM&HS. (Contact: Paul Bitzel, Horticulturist)
68	MD	Fort McHenry NMHS	43	U	N	U	L	12ac	A	Likely present, as many black walnut, hickory, and Chinese chestnut are present in the park. No documentation has been found or research completed to know for sure. Park would be interested in restoring if it can be determined that American chestnut was grown here. (Contact: Paul Bitzel, Horticulturist)
70	MD	Catoctin Mountain Park	5,810	Y	Y	Y	R,D,E	U	A,Hp	(Contact: James Voight, Resource Manager)

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71	MD	Antietam NB	3,252	Y	N	Y	D	U	A,G	Includes Antietam NCem. (Contact: Joe Calzarette, Natural Resources Program Manager)
72	MD	Monocacy NB	1,647	U	U	Y	D	200ac	A,H,G	A 12-15' sprout may have existed in the late 1990's but present location is uncertain. We would be interested in some limited "demonstration" type restoration if it were available. I think the "small plot" idea would be best for us. We have a couple of contiguous forested areas that are about 100, 40, 40, and 20 acres in size that we could establish plots. (Contact: Andrew Banasik, Natural Resource Manager)
73	MD DC VA	Chesapeake & Ohio Canal NHP	19,586	U	U	U	D	1-2ac	A	(Contact: Marie Sauter, Natural Resources Management Specialist)
75	DC	National Capital Parks - Central	950							Includes Constitution Gardens Park, Fords Theatre NHS, FDR Memorial, Korean War Veterans Memorial, Lincoln Memorial, National Mall Park, National WWII Memorial, Pennsylvania Ave NHS, Thomas Jefferson Memorial, Vietnam Veterans Memorial, and Washington Monument.
76	DC MD	National Capital Parks – East	9,846	Y	Y	Y	R,D,E	U	A,G	Includes Fort Washington Park, Greenbelt Park, Piscataway Park, Frederick Douglass NHS, and Mary McLeod Bethune Council House NHS. Historically, what would be the density? Park may want to do some sites, but not others. What would be impacts to the existing forest structure if/when this species is reintroduced? Would the reintroduced species replace oaks as Sudden Oak Death syndrome takes hold here in the east? (Contact: Susan Rudy, Natural Resources Program Manager)
77	DC	Rock Creek Park	2,394	Y	Y	Y	D,E	few acres	A	Widely scattered suckers from the location of old decaying chestnut stumps or root stock. The existing small stems are uncommon in the park. Initially a few selected trees involving a few selected sites totaling only a few acres. Too many unknowns to predict the number of trees or acres that would be involved in full restoration. There is some concern on our part about changing the species makeup of the park woodlands. If blight resistant chestnuts are planted in the park and once again become the dominant tree, as was the case historically, the current dominant species like beech, oak, and poplar could be replaced. Are we managing our park for historic conditions or to maintain the current natural processes that are taking place? We would favor restoration efforts in isolated, small areas. The Park enthusiastically supports restoration efforts for the American chestnut and would assist with field research if possible. (Contact: Ken Ferebee, Natural Resource Management Specialist)
78	DC	President's Park (White House)	18							
79	VA MD DC	George Washington Memorial Parkway	7,210	Y	Y	U	R	U	A	Includes Arlington House NMem, Clara Barton NHS, LBJ Memorial Grove, and Theodore Roosevelt Island NMem. Depends how close it is to the original genotype. If it is the same we would be interested. (Contact: Brent Steury, Natural Resources Program Manager)
80	VA	Wolf Trap NP for the Performing Arts	130							

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83	VA	Manassas NBP	5,073	Y	U	Y	R	U	A,G	None found in last plant survey. We have Chinese chestnut in the Park, <i>Castanea mollissima</i> . (Contact: Bryan Gorsira, Natural Resource Program Manager)
84	VA	Cedar Creek & Belle Grove NHP	3,593							
87	VA	Shenandoah NP	199,045	Y	Y	Y	R,E	40,000ac	A,Hp,Gp	We estimate this to be approximately 40,000 acres, or 20% of the park. This estimate does not assume that the land would be restored to pure chestnut, but rather that chestnut trees have been included in the mixture of forest trees present. We anticipate that the majority of this acreage would be in backcountry areas impacted by forest-killing insects and disease; however some acreage would also be in developed areas where replacement trees were needed. GMO and hybrid may also be possibilities, depending on park service policy, tree availability, and known and perceived risks with these options. (Contact: Wendy Cass, Botanist)
88	VA	Colonial NHP	8,677							Includes Jamestown NHS, Yorktown Battlefield, and Yorktown NCem.
92	VA	Appomattox Court House NHP	1,774	Y	Y	Y	D	U	U	More information would be needed to make a decision on which product to use. (Contact: Brian Eick, Natural Resource Manager)
93	VA	Appalachian NST	227,001	Y	Y	Y	D	U	A,Hp	(Note: Map symbol displayed in VA, but trail traverses historic chestnut range in ME, NH, VT, MA, CT, NY, NJ, PA, MD, WV, VA, TN, NC, and GA) We might be interested in large scale restoration, but with 14 states to cover it would be too costly. We have more than 1600 occurrences of 300 rare, threatened, and endangered species that we are trying to protect. I presume it would be hundreds of thousands or millions of trees that would be needed for full restoration. Our Appalachian Trail corridor acreage is 270,000 acres. I cannot say how much of that acreage would be chestnut habitat. Probably the most important result of the chestnut conference in Asheville was finding that a through-hiker of the Trail had documented all chestnuts along the AT from Georgia to Maine. I believe the number of chestnuts documented was 5,000. We spoke after the Asheville conference with regard to publishing an article on chestnuts along the Appalachian Trail. (Contact: Kent Schwarzkopf, Natural Resource Specialist)
94	VA	Booker T Washington NM	239	U	N	Y	D,E	5ac	A	No scientific documentation, however, Booker T. Washington mentions chestnut trees, nuts, and burrs in his writings about his early life here on this farm. My guess is that there probably were chestnut trees here in the 19th and possibly early 20th centuries. We would need to perform a site inspection to find out what suitable acreage might be available for small plots and consult with cultural landscape representatives to find out how many trees we could place and where. Best estimate is <5 acres of plots and 15-20 individuals. (Contact: Timbo Sims, Park Ranger)
95	WV	Harpers Ferry NHP	2,504	Y	Y	U	R	2,500ac	A	Yes, but they are in very poor condition. The park may be interested but further discussion is needed on the scope of a restoration and the factors that need to be considered. 80% of the park is forested (approximately 2,500 acres). If this project is undertaken, it should be

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										coordinated and monitored by our regional natural resource stewardship office. That office has the professional expertise to evaluate this project. (Contact: Bill Hebb, Natural Resource Manager)
97	WV	Gauley River NRA	11,507	Y	Y	Y	D	U	A,H,G	Comments included with New River Gorge NR. (Contact: John Perez, Biologist)
98	WV	New River Gorge NR	72,189	Y	Y	Y	D	50ac	A,H,G	Depends on available funds, staffing, and compliance requirements, but possibly 50 acres. We have persistent chestnut sprouts in all three parks (NERI, GARI, BLUE), and would be interested in a reintroduction program. (Contact: John Perez, Biologist)
99	WV	Bluestone NSR	4,310	Y	Y	Y	D	U	A,H,G	Comments included with New River Gorge NR. (Contact: John Perez, Biologist)
100	KY	Cumberland Gap NHP	20,508	Y	Y	Y	R,D	14,000ac	A	(Contact: Ries Collier, Chief of Resource Management)
101	KY	Abraham Lincoln Birthplace NHS	345	Y	N	Y	D	3ac	A,H,G	No original chestnuts, only the new ones we have planted over the last two years. We began a chestnut restoration project through Mammoth Cave NP two years ago – so far we have replanted about 400 trees. Purpose of the project is demonstration. (Contact: Sandy Brue, Chief of Interpretation and Natural Resource Management)
102	KY	Mammoth Cave NP	52,830							
104	NC	Guilford Courthouse NMP	229	Y	N	Y	R,E,L	300 trees	A,G	(Contact: Steven Ware, Chief Ranger)
105	NC VA	Blue Ridge Parkway	93,390	Y	Y	Y	D,E	<10ac	A,H,G	It seems unlikely that American chestnut can be restored to its former glory – even with a blight resistant variety. We do not have sufficient data such as site locations or stand density to guide restoration. I suspect the funding would never be in place to undertake restoration at a landscape scale. Given that, I think the Blue Ridge Parkway could work to establish small colonies of blight resistant chestnut in appropriate habitats. Seed from these colonies could disperse via natural mechanisms to establish additional populations. I think a discussion about how to restore and the goals of restoration would be needed once a blight resistant form is developed. (Contact: Chris Ulrey, Plant Ecologist)
107	NC	Carl Sandburg Home NHS	264	Y	Y	Y	D	50 trees	A,H	(Contact: Irene Van Hoff, Forestry Technician)
108	SC	Kings Mountain NMP	3,945	Y	U	Y	D,E,L	100+ ac	A,H,G	This is of course merely a cursory interest at this point. Actual decisions that would lead to obligations would have to be made in the future and would be dependent upon financial feasibility, up-to-date species integration data, and relevant NPS policies. We look forward to hearing more information on the subject. (Contact: Chris Revels, Chief Ranger)
111	TN	Andrew Johnson NHS	17	U	N	N				ANJO has no forest areas within the site. It is a 100% cultural manicured landscape with a tree plan for the National Cemetery and Presidential Home sites. No chestnuts are known to have existed during the President's lifetime. (Contact: Mark Corey, Superintendent)
112	TN	Great Smoky Mountains NP	521,752	Y	Y	Y	R,D,E	U	A,H	Large scale ecological restoration would not be attempted until research indicates it is feasible and ecologically sound. The park is 800 square miles and chestnut was originally a part of nearly every

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	NC									forest type. (Contact: Kristine Johnson, Supervisory Forester)
113	TN KY	Big South Fork NR&RA	125,310	Y	Y	Y	R,D	25ac	A,H	Initially interested in demonstration, but potentially moving into ecological restoration at some point. Use of hybridized stock would be considered, but more information concerning tree properties is needed before we would commit. What percent purity? What are life attributes, etc.? (Contact: Bryan Wender, Botanist)
114	TN	Obed WSR	4,732	Y	N	Y	R	100ac	A	None of the park staff have seen any. Suitable habitat may be missing from the park. (Contact: Nancy Keohane, Resource Manager)
115	TN	Stones River NB	709	U	N	U	D,E	U	A	Includes Stones River NCem. It is unlikely that American chestnuts were ever prevalent here in the Central Basin of Tennessee. Our flora differs significantly from the Highland Rim and Cumberland Plateau that surround us. Our soils are considerably less acidic. As a consequence, we lack many of the tree species found in these physiographic regions. On the edges of the Central Basin where topography begins to change and in isolated pockets with more acidic soils, such as Indian and Scales Mountains, American chestnut may have been more prevalent. If further research reveals that the American chestnut was indeed a component of our forests, we would be interested in restoring this species to the park. (Note: flora differences refer to the Inner Basin, not the entire Central Basin of TN.) (Contact: Terri Hogan, Ecologist)
117	TN	Fort Donelson NB	552							Includes Fort Donelson NCem.
118	TN	Shiloh NMP	5,060	Y	Y	Y	D	U	A,H	Includes Shiloh NCem. (Contact: Marcus Johnson, Resource Management Specialist)
119	GA	Chattahoochee River NRA	9,271	Y	Y	Y	R,E	10-300ac	A,H,G	American chestnuts were and still are present within Chattahoochee River NRA. We likely would not be able to provide vast acreage for restoration, however, from 10-300 acres would be possible. While not vast, having geographic and environmental variability in the restoration sites may be advantageous; if so, then we may be able to contribute in a small way. If allowable under existing policies, we may utilize all three of the chestnut choices. (Contact: David Ek, Chief Science and Resource Management)
121	GA	Kennesaw Mountain NBP	2,884	Y	N	Y	E	1,000 trees	A,H	(Contact: Lloyd Morris, Chief Ranger)
122	GA	Chickamauga & Chattanooga NMP	9,038	U	N	U	L	U	A	Not a species listed in our Cultural Landscape Report to be used in reforestation projects. Only if the tree was originally here in 1863. CHCH does not have a Natural Resource person to manage this project. (Contact: Jim Szykowski, Cultural Resource Manager)
123	AL	Russell Cave NM	310							
124	AL	Little River Canyon NPre	13,633	Y	Y	Y	R,D	100ac	A	(Contact: Mary Shew, Resource Management Specialist)
126	MS	Brices Cross Roads NBS	1							
127	MS	Tupelo NB	1							
128	MS	Natchez Trace Parkway	51,984	Y	Y	Y	R,E	U	A	(Contact: Bill Whitworth, Natural Resources Management Specialist)

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	AL									
	TN									
PARK UNITS BORDERING CHESTNUT RANGE										
1	ME	Saint Croix Island IHS	45	U	N	N				(Contact: Linda Gregory, Botanist)
2	ME	Acadia NP	46,856	N	N	N				American chestnuts were not present in the park according to herbarium records for Hancock county. Maybe one extant population near Bucksport (same county) reported by McMahon, Jacobson and Hyland. Because the species is not historically known from Mount Desert Island (where Acadia is located) the park probably wouldn't introduce the tree. Acadia tries to maintain a policy of only planting genetically native species. (Contact: Geneva Chase, Botanist)
4	VT	Marsh-Billings-Rockefeller NHP	643	U	U	U	D,E	U	A,H	None detected in silvicultural inventories. (Contact: Christina Marts, Resource Manager)
7	MA	Salem Maritime NHS	9	Y	Y	N				We have one chestnut here that was planted about 15 years ago to replace a chestnut that died from blight years earlier. I wasn't here when the tree was removed, but I did help plant this one, which is doing well. (Contact: Tim Thornhill, Facility Manager)
8	MA	Saugus Iron Works NHS	9	U	N	Y	E	4-6 trees	A,H,G	(Contact: Daniel Noon, Biologist)
11	MA	Boston NHP	43	N	N	N				The landscapes at Boston NHP are primarily designed, historic landscapes in an urban setting. American chestnut was not present within the historic period being presented so would not be part of the palette of plants used in the park. The Historic Grounds Report for the Navy Yard and the Cultural Landscape Reports for Bunker Hill and Dorchester Heights indicate they all had American elms, lindens, maples, and other assorted trees, but no reference to American chestnut, either historically or currently. (Contact: Gene Gabriel, Facility Manager)
13	MA	Boston Harbor Islands NRA	1,482							
16	MA	Adams NHP	24	U	N	U	U	U	U	(Contact: Marianne Peak, Superintendent)
21	MA	Cape Cod NS	43,608	Y	Y	Y	D,E	U	A	I have seen only a few trees; less than 5 that I have personally observed. They are scattered throughout the Seashore but I have no idea about whether they were planted and how long ago. (Contact: Stephen Smith, Plant Ecologist)
74	MD	Thomas Stone NHS	328	Y	N	Y	R	U	A,G	Comments included with George Washington Birthplace NM. (Contact: Rick Morawe, Chief Natural and Cultural Resources Management)
81	VA	George Washington Birthplace NM	662	Y	N	Y	R	400ac	A,Gp	Possibly up to 400 acres+ (includes GEWA and THST). I do not believe we would consider hybrids at this time. Prefer to hold out for American native as per NPS management and introduction of exotic species policies. (Contact: Rick Morawe, Chief Natural and Cultural Resources Management)

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82	VA	Prince William Forest Park	19,377	Y	Y	U	D,E	U	A,G	(Contact: Jennifer Lee, Biologist)
85	VA	Fredericksburg & Spotsylvania NMP	8,374	U	U	Y	R,D	U	A,G	Includes Fredericksburg NCem. Not sure if we have any, as no systematic survey has been completed, but based on my own personal observations and people from our tree crew, we have never seen any in the park. (Contact: Gregg Kneipp, Natural Resources Manager)
89	VA	Richmond NBP	2,517	U	N	U	E	U	A	(Contact: Kristen Allen, Natural Resource Management Specialist)
90	VA	Maggie L. Walker NHS	1	U	N	U	E	U	A	Would require discussion with historians, etc. If approved within NPS Guidelines, we would be equally likely to use any product, but like the idea of a pure American the best to maintain our native genotype. Maggie Walker NHS is several city blocks worth of buildings, so it may not be a good restoration site. (Contact: Kristen Allen, Natural Resource Management Specialist)
91	VA	Petersburg NB	2,739							Includes Poplar Grove NCem.
103	IN	George Rogers Clark NHP	26	U	N	U	U	3-4 trees	U	Historic landscaping plan would need to be consulted. Our park is urban mostly manicured landscape. A few acres of the park are added to the original area and therefore would be outside of the landscaping plan. It may be possible to have a few plantings in this area. (Contact: Frank Doughman, Chief I&RM)
109	SC	Cowpens NB	842	Y	N	Y	R,D,E	U	U	We had expressed an interest in the introduction of the American chestnut back into the landscape at Cowpens and have had discussions with the folks at Great Smoky Mountains NP. Chestnuts were part of the historic landscape at Cowpens NB. (Contact: Patricia Ruff, Chief Park Ranger)
110	SC	Ninety Six NHS	1,022	Y	N	Y	E	1-2ac	A,G	Education, because of the historic use of the tree in 18th century America. (Contact: Eric Williams, Chief Park Ranger/ Historian)
120	GA	Martin Luther King, Jr. NHS	39							
125	AL	Horseshoe Bend NMP	2,040	Y	N	Y	R	300-600ac	U	Writings by William Bartram described the lands near the park in the 1770's as "having an abundance of chestnut on the hills," and Benjamin Hawkins described a 1798 Indian village three miles upstream from the park as having chestnut growing on the ridges. The park would seek policy and scientific guidance before making a decision. (Contact: Mark Lewis, Superintendent)

AFFILIATED AREAS AND TRAILS

5	Essex NHA	MA
17	Sudbury, Assabet, and Concord WSR	MA
18	Westfield WSR	MA
20	Blackstone River Valley NHC	MA, RI
24	Quinebaug & Shetucket Rivers Valley NHC	CT, MA
39	Erie Canal NHC	NY
43	New Jersey Coastal HTR	NJ
44	New Jersey Pinelands NRes	NJ
45	Great Egg Harbor NWSR	NJ
51	Delaware & Lehigh NHC	PA

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62		North Country NST								NY, PA, OH
69		Chesapeake Bay Gateways Network								MD, DC, VA, WV, PA, NY
86		Green Springs NHL								VA
96		Potomac Heritage NST								DC, MD, PA, VA
106		Overmountain Victory NHT								VA, TN, NC, SC
116		Trail of Tears NHT								AL, GA, KY, NC, TN

¹ HTR = Heritage Trail Route; IHS = International Historic Site; NB = National Battlefield; NBP = National Battlefield Park; NBS = National Battlefield Site; NCem = National Cemetery; NHA = National Heritage Area; NHC = National Heritage Corridor; NHL = National Historic Landmark District; NHP = National Historical Park; NHS = National Historic Site; NHT = National Historic Trail; NM = National Monument; NMem = National Memorial; NMHS = National Monument & Historic Shrine; NMP = National Military Park; NP = National Park; NPre = National Preserve; NR = National River; NRA = National Recreation Area; NRes = National Reserve; NS = National Seashore; NSR = National Scenic River; NST = National Scenic Trail; SRR = Scenic & Recreational River; WSR = Wild & Scenic River.

² Y=Yes; N=No; U=Unknown; R=Restoration; D=Demonstration; E=Education; L=Landscape; A=American chestnut; H=Hybrid; G=Genetically Modified; p=possible.