

**United States Department of the Interior
National Park Service**

FINIDNG OF NO SIGNIFICANT IMPACT

**Great Meadow Restoration
Acadia National Park
Hancock County, Maine**

September 2023

INTRODUCTION

The National Park Service (NPS) proposes to implement actions to improve the ecological health of Great Meadow in Acadia National Park (ACAD), Bar Harbor, Maine by restoring natural function to the wetland and Cromwell Brook. The 116-acre Great Meadow is the largest freshwater wetland complex in the park and is located within the center of the 3-square mile Cromwell Brook watershed. It is one of the most visited areas of the park, which includes sections of the Park Loop Road, Sieur de Monts Spring cultural landscape, historic trail system, and a village connector trail.

Past development and current use continue to impact the natural hydrologic function and species composition of the Great Meadow wetland system, encouraging flooding both upstream and downstream of the Meadow. Rapidly fluctuating water levels during and after high-intensity rain events damage resources, inhibit the lifecycles of native species, and encourage the growth of invasive plants.

The NPS proposes to rehabilitate the Great Meadow by replacing the Park Loop Road culvert at the outflow of Great Meadow with a 12-foot-wide box culvert, rehabilitating and rerouting the Great Meadow Loop trail, employing targeted restoration of the 116-acre wetland, restoring the stream channel, and expanding invasive plant management.

The NPS provided two opportunities for public comment during the National Environmental Policy Act (NEPA) process. The NPS accepted public comments for the Great Meadow Restoration Project during scoping from November 11 to December 10, 2022, and during release of the Environmental Assessment (EA) from April 24 to May 23, 2023. Substantive public comments received and responses by the NPS are summarized in Appendix A. Minor modifications to the EA are provided in Appendix B.

SELECTED ACTION AND RATIONALE FOR DECISION

The NPS analyzed two alternatives in detail in the EA: Alternative A – No Action and selected Alternative B – Proposed Action for implementation because it will meet the purpose and need by achieving restoration of the wetland function. The selected action not only restores natural hydrologic function impacted from past development, but also builds ecological resiliency and adaptability, boosts wildlife passage and connectivity, and improves stream channel morphology. It enhances recreational experience and safety for visitors, while reducing damage and maintenance to infrastructure and facilities found within the watershed.

The selected action includes:

- Replacing the Park Loop Road culvert at the outflow of the Great Meadow with a larger crossing that has a more natural stream design;
- Rehabilitating the Great Meadow Loop community connector trails by developing missing segments to meet accessibility standards, rerouting them to connect with the Great Meadow vista, improving wayfinding, and adding educational waysides;
- Implementing targeted restoration projects to return natural function to the 116-acre wetland;
- Restoring the Cromwell Brook stream channel and constructing a grade control weir at the transition from Great Meadow to the stream channel to mitigate high flow flood events; and
- Expanding invasive plant management and restoration with native plantings.

Details of the selected action and the no action alternatives are described in Chapter 2 of the EA.

MITIGATIONS

The Organic Act and its associated *Management Policies 2006* task the NPS with preventing impairment of park resources. This mandate gives the NPS the authority to adopt mitigation measures. The selected action includes mitigations that will help to avoid and/or minimize adverse impacts of the project to natural and cultural resources.

Resource	Issue	Mitigation, Best Management Practice, Etc.
Cromwell Brook	Stream Crossings	<ul style="list-style-type: none"> • Time-of-Year Work Restrictions. Nov 1st–April 14th (Inactive period for Northern Long-eared Bat) • Abutments 1.2 bankfull stream width. • Stream smart crossing design. • Vegetation stabilization and living shorelines. • No impounding of water. • Erosion and sediment controls. • Equipment does not operate in water.
Great Meadow Wetland	Restoration	<ul style="list-style-type: none"> • Avoid and minimize adverse effects to wetlands. • Use heavy equipment with low ground pressure. • Stabilize disturbed soils with native plants.
Trail System	Wetland Crossings	<ul style="list-style-type: none"> • Culverts minimum of 2'x3', closed bottom, embedded at least 6" to allow for natural bottom.
	Shoreland Zoning	<ul style="list-style-type: none"> • Erosion and sediment controls. • Work during low water with silt and turbidity control.
	Cultural Landscape	<ul style="list-style-type: none"> • Preserve alignment, character, and experience.
Park Loop Road	Cultural Landscape	<ul style="list-style-type: none"> • Culvert to match park's Rustic Design-style. • New features do not interfere with historic vista.

Northern Long-Eared Bats	Threatened and Endangered Species	<ul style="list-style-type: none"> No tree cutting greater than 3 inches diameter breast height (dbh) during the active season.
Glossy Buckthorn	Nonnative Invasive Plants, Soil Disturbance	<ul style="list-style-type: none"> Pre and post construction treatment. All equipment thoroughly washed off-site.

SIGNIFICANCE CRITERIA REVIEW

Potentially Affected Environment

The project area encompasses approximately 200 acres of wetlands and uplands within the Great Meadow and primary channel of Cromwell Brook watershed located in the town of Bar Harbor, Maine. The Great Meadow is in poor condition due to hydrological disturbance from past development. The wetland and surrounding uplands have the highest concentration of invasive plant species within ACAD. The Cromwell Brook habitat is fragmented due to numerous culverts, bridges, and a dam that were not designed for aquatic organism passage. The project area contains three NPS-managed cultural landscapes: Sieur de Monts Spring, the Park Loop Road, and hiking trail system.

Degree of Effects of the Action

The NPS considered the following actual or potential effects in evaluating the degree of effects (40 Code of Federal Regulations [CFR] 1501.3(b)(2)) for the selected action. As documented in the EA, the selected action has the potential for both adverse and beneficial impacts on wetlands, vegetation, wildlife habitat, and cultural landscapes (Chapter 3 of the EA). These impacts are summarized below. The NPS did not identify any significant adverse effects from implementing the selected action.

a. Beneficial and adverse, and short- and long-term effects of selected action.

The duration of impacts is measured in short-term impacts (i.e., those that occur during implementation of the action and the first three to five years following) and long-term impacts occurring over the time it takes for ecological or landscape change, which can be decades up to 100 years.

Wetlands. The selected action will have direct, long-term beneficial impacts to the 116-acre Great Meadow wetland through focused restoration of internal stressors. Construction of the 12-foot outlet culvert and weir would retain water in typical, small-scale rain events while expelling water faster in larger storm events, resulting in a more natural hydrology. Stabilized hydrology would result in long-term beneficial impacts to the development of organic matter, aid in the development of peat, and allow for a healthier, more diverse distribution and composition of plant species. The selected action will have long-term beneficial impacts to wetland function such as carbon sequestration. The cumulative impacts of the selected action when added with downstream bridge and culvert work will be long-term and beneficial.

Vegetation. The selected action will have both adverse and beneficial impacts on the health of the vegetative community within the Great Meadow. Soil disturbance associated with the activities within the selected action will contribute to the spread of invasive plants. However, there will be a long-term reduction in new invasions when these relatively small adverse impacts are added to the substantial benefits associated with native plant restoration. The cumulative impacts of the selected

action when added with downstream culvert and bridge work will be long-term and beneficial for promoting native plant species.

Wildlife Habitat. Short-term adverse and long-term beneficial impacts to wildlife habitat will result from the selected action. The introduction of the nature-like weir and restored stream channel will likely promote beaver activity, such as dam building. The increased beaver presence at the site will have short-term adverse impacts. However, beaver activities on the landscape will reflect natural conditions, contributing to the long-term beneficial impacts of predictability and stabilization of water levels in the Great Meadow. The selected action will have direct long-term beneficial impacts on habitat connectivity and overall species population health, improving migration of finfish, herptiles, and small mammals. The beneficial impacts on aquatic organism passage, when added to the cumulative impacts downstream of culvert replacements, would be long-term and beneficial.

Cultural Landscape. The selected action will have long-term adverse impacts and long-term beneficial impacts for protecting cultural landscapes and historic sites. The construction of the 12-foot culvert, along with targeted wetland restoration, will reduce the duration of flooding from large rain events, preserving the integrity of the historic Park Loop Road and trail system. Rehabilitating the natural flow of the Abbe Branch will directly reduce flooding at Sieur de Monts Spring in smaller rain events.

The selected action will change the tread materials and culverts associated with Hemlock Road. The long-term adverse impacts to trail materials and workmanship will be offset by the beneficial impacts from the reduction in flooding and erosion of the trail tread. The selected action will contribute to the long-term beneficial impacts from protecting the trail's historic alignment and the visitor experience.

The selected action will have short-term adverse impacts to Kebo Valley Golf Club in large rain events because water flow will increase though it would be steadier. However, when these relatively small impacts are added to the cumulative impacts of replacing other culverts downstream, the effect would be long-term and beneficial from the reduction of flooding events, more even flow of water along Cromwell Brook, and reduction in resource damage.

b. Degree to which the selected action affects public health and safety.

The NPS considered how implementation of the selected action will affect public health and safety during implementation. Active construction and restoration areas will be closed to the public and visitors will be rerouted around these areas. These activities must occur during the peak season, therefore fencing, flagging, and signage will be used to inform the public during implementation of the project. With implementation of these measures, the project will not affect public health or safety.

c. Effects that would violate federal, state, tribal, or local law protecting the environment.

The selected action does not threaten or violate applicable federal, state, or local environmental laws or requirements imposed for the protection of the environment.

The NPS completed informal consultation under Section 7 of the Endangered Species Act on March 7, 2023. At that time the Fish and Wildlife Service concurred with the NPS's determination that the selected action is "Not Likely to Adversely Affect" Northern Long-eared Bats. However, with the reclassification of the Northern Long-eared Bat from threatened to endangered on March 31, 2023, the

park reinitiated consultation under the Interim Consultation Framework for Northern Long-eared Bat. Consultation was concluded on August 10, 2023.

The U.S. Army Corps of Engineers issues General Permits for activities subject to jurisdictional water of the U.S. in accordance with 33 CFR 320-332. The selected action will have temporary and permanent impacts to wetlands and streams. On June 13, 2023, ACAD submitted a Maine General Permit for habitat restoration, establishment, and enhancement, as well as stream and wetland work and crossings. The U.S. Army Corps of Engineers authorized the General Permit on August 21, 2023.

In a letter to the Maine Coastal Program dated June 30, 2023, the NPS stated its determination that the project was consistent to the maximum extent practicable with the Coastal Zone Management Act of 1972 and the core laws of the Maine Coastal program. This determination is based on consultation with the Maine Department of Environmental Protection and the filing of permit applications pursuant to the Maine Natural Resource Protection Act. As of the date of this FONSI, the NPS has not received comment from the State. Therefore, pursuant to 36 CFR 930.41, the NPS presumes concurrence by the Maine Coastal Program of the consistency determination.

On January 30, 2023, the Maine State Historic Preservation Officer (SHPO) concurred with the NPS's determination that the project would have no adverse effect on historic properties. Initial consultations on the project with the four federally recognized tribes (Penobscot Nation, Passamaquoddy Tribe at Indian Township and Sipayik, Houlton Band of Maliseet, and Aroostook Band of Mi'kmaq Nation) occurred during scoping, with the formal consultation letter to the Tribal Historic Preservation Offices (THPOs) sent May 12, 2023. Only the THPO of the Mi'kmaq Nation responded, requesting notification of any findings during ground disturbance and for the NPS to consider using black ash (*Fraginus nigra*) in wetland restoration efforts.

FINDING OF NO SIGNIFICANT IMPACT

- Based on the information contained in the EA, I have determined that the selected action does not constitute a major federal action having significant effect on the human environment. Therefore, an environmental impact statement will not be prepared.
- This finding considers the Council on Environmental Quality criteria for significance (40 CFR 1501.3(b) (2022)) regarding the potentially affected environment and degrees of effects of the impacts described in the EA (which is hereby incorporated by reference) and as summarized above.

Recommended:

Kevin Schneider, Superintendent
Acadia National Park

Date

Approved:

Gay E. Vietzke, Regional Director

Date

NPS Interior Region 1 Documents appended to the FONSI include:

- Appendix A: Public Comment Response
- Appendix B: Errata
- Appendix C: Determination of Non-Impairment

APPENDIX A
Public Comment Response
for the
Great Meadow Restoration Environmental Assessment

September 2023

During preparation of the environmental assessment (EA), the National Park Service (NPS) consulted with federal and state agencies, tribes, interested and affected parties, and the general public. Interested public and agencies were provided an opportunity to review and comment on the environmental assessment during a 30-day review period from April 24 to May 23, 2023. The NPS announced the EA's availability on its Planning, Environment and Public Comment website.

The public submitted a total of 19 correspondences during the public comment period that identified six concerns. The concerns and the NPS responses identified in the correspondences from the public are addressed below.

Concern ID1: Climate Change

One commentor expressed concern that while the culvert design is 1.2 bankfull width and meets the US Geological Survey 100-year flood calculation, it does not take into consideration the increased rain and rain on snow events associated with climate change.

NPS Response:

The selected action includes a culvert designed utilizing hydraulic modeling of Cromwell Brook. The design is not sized to a specific climate scenario but does account for impacts of climate change to the region. This includes an increase in the magnitude and frequency of extreme rain events and a greater variability in patterns of wet and dry weather. To fully evaluate the potential impact of alternate designs, a detailed hydraulic model was developed incorporating hydrographs generated from hydrologic analysis, topographic data combining LIDAR data and site-specific surveys, and field observations (VHB. 2022. Hydrologic, hydraulic, and geomorphic evaluation study report: Great Meadow and Cromwell Brook Restoration Study, Acadia National Park). The model was then calibrated using existing water level data loggers within the Great Meadow and Cromwell Brook and rain gages at McFarland Hill.

The model indicated that increasing the bankfull width to 14-16 feet and constructing the culvert sized to accommodate it would cause significant increase in peak discharge rates that could increase downstream flooding. The selected design channel with 10-foot bankfull width, 12-foot span culvert, and constructed banks for terrestrial passage to meet the 1.2 bankfull width requirements per regulation and meets the project's goals without impacts to downstream infrastructure. The 6-foot vertical clearance of the box culvert is designed to accommodate larger storm events. The culvert design also incorporates stream channel and floodplain restoration to help dissipate energy from larger flood events.

The modelled design incorporates the nature-like grade control weir, which is designed to be 1 foot above the 1% annual exceedance probability peak flood elevation in the Great Meadow. Based on the model, the 14-foot-wide V-shaped outlet will maintain comparable hydrology and peak levels in normal rain events, while avoiding large increases in peak flood discharges that could result in increased flood impacts to downstream infrastructure. The overall design of the culvert, stream channel, and weir significantly improves hydraulic capacity compared to the existing culvert, reducing the impact of flooding upstream of the Park Loop Road from extreme rain events. The nature-like weir raises the wetland outlet elevation compared to the existing culvert, increasing residence time of water in the wetland, and reducing the impacts of extended drought.

The culvert design accounts for increased magnitude and frequency of storm events associated with climate change and will reduce extent and duration of flooding within the park. Additionally, the nature-like weir addresses the greater variability in weather associated with climate change by building resiliency in the system during periods of drought.

Concern ID2: Hydrology

One commentor suggested the nature-like weir would create an artificial hydrological regime and asked for more details about the Abbe Branch tributary.

NPS Response:

The existing conditions of the Great Meadow are based on human manipulations of the landscape that include artificial ditches, rerouted streams, and raised roadbeds. The Park Loop Road and culvert at the outflow of Great Meadow currently act as the primary outlet control for the wetland and are the chief factors in the existing hydrology. The selected action does not create a hydrologic regime but will modify current hydraulic conditions by reducing the severity of water fluctuations and increasing residence time for water in the wetland. The NPS modelled the changes in surface water levels and found the selected action would not change the existing wetland communities found within the Great Meadow (EA Figure 10).

The U.S. Geological Survey completed hydrologic and hydraulic analyses of Cromwell Brook and the Sieur de Monts tributary to better understand causes of flooding in the Great Meadow wetland and Sieur de Monts Spring area. (Lombard, P.J., 2017, Hydrologic and hydraulic analyses of Great Meadow wetland, Acadia National Park, Maine: U.S. Geological Survey Scientific Investigations Report 2016–5159, 39 p., <https://doi.org/10.3133/sir20165159>.) The study demonstrated that enlarging the Park Loop Road culvert would relieve flooding during 100-year flood events, but only modifying drainage around the Nature Center would reduce flooding of Sieur de Monts Springs in small 1-3-inch rain events.

The 2018 report, Wetland Restoration Plan for the Sieur de Monts Visitor Center prepared by Atlantic Resource Co, LLC identified that the small tributary stream referred to as the Abbe Branch was historically diverted westerly into culverts and pipes and contributes to flooding the Nature Center. The report recommended restoring the Abbe Branch intermittent stream to its historic alignment. The report states the stream should be approximately 4-6 feet wide bankfull width and from 1.5-2 feet in depth and have an overall gradient of 0.5%. The channel will approximate a meandering low gradient stream and is expected to move and shift within the restoration area somewhat in response to flood events over time. The stream channel will be excavated to the native soils and 6" of fine to medium

washed sand and fine gravel will be installed as a stream bed. The NPS will cut approximately 6 trees to help establish the new gradient and 200 feet of new streambed.

Concern ID3A: Aquatic Organism Passage

One commentor suggested a bridge or bottomless arch culvert be substituted for the box culvert because beaver activity is more likely to block the culvert and reduce aquatic organism passage.

NPS Response:

Due to cost, constructability, and concerns with preservation of the historic character of the Park Loop Road, the NPS dismissed a bridge from analysis while scoping the project. Compared to a bottomless arch, a four-sided box culvert allows for a larger flow and reduces the likelihood of undermining. An arch shape reduces overhead, which could impact the ability to construct and maintain the simulated stream channel and banks required for aquatic organism passage. An arch may be more likely to be blocked than a box culvert that can allow water to flow over the blockage.

The NPS also considered beaver impacts when scoping and designing the culvert. Four-sided box culverts allow beaver to construct dams without completely blocking flow. Finfish, such as brook trout, have a relatively easy time passing beaver dams (Lahr, Andrew & Clancy, Niall. 2022. Brook Trout Interactions with Beaver Ponds & Dams). Beaver activity at the site would reflect natural conditions and contribute to the predictability and stabilization of water levels in the Great Meadow (EA Section 3.3.3.3).

Concern ID3B: Aquatic Organism Passage

One commentor expressed concern about how the nature-like weir will be constructed and its potential impacts to aquatic organism passage.

NPS Response:

The nature-like weir would have a 14-foot-wide, V-shaped notch set flush with the stream bottom, with a low vegetated earthen berm on either side. Materials for the weir and associated stream channel restoration would be locally sourced boulders, cobbles, and gravel selected to replicate the natural condition of Cromwell Brook. The weir notch will be approximately 50 feet upstream of the culvert. Between the weir notch and culvert, the stream and floodplain will be restored and revegetated with native plantings. The weir acts both as a grade control to prevent head cut and simulates the natural conditions of the wetland transitioning back into a stream, with the culvert being the transition point from wetland to stream. The culvert and weir design incorporate the guidance and concepts from the US Forest Service publication "Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms" (May 2008).

Concern ID3C: Aquatic Organism Passage

One commentor inquired about protection of finfish, herptiles, small mammals, and others during construction.

NPS Response:

Construction of the culvert would occur “in-the-dry” adjacent to the existing culvert. This would allow the existing culvert to function as-is and would allow this project to be completed without the need of a cofferdam that could obstruct fish passage. Once the new culvert is completed, the existing culvert will be sealed and abandoned in place.

Concern ID4: Water Quality

One commentor recommended the EA further analyze the beneficial impacts of the Proposed Action and adverse impacts of the No Action Alternative on the water quality in the project area and downstream. Another commentor inquired about water quality downstream of the park and its impact on fish.

NPS Response:

The NPS dismissed water quality from detailed analysis in the EA because ongoing monitoring indicated that it was in good condition, and that hydrology, invasive plants, and infrastructure were the primary stressors to the wetland health (EA Section 1.4.2.2). However, restoring hydrology, managing invasive plants, and reducing buffer stressors, such as the undersized culvert or sediment inputs from roads and trails, will improve water quality as well. Improved water quality will have long-term indirect beneficial impacts to a diverse plant composition, wildlife habitat, and overall health of the wetland and downstream ecosystems.

Concern ID5: NEPA

One commentor expressed concern that the NPS did not consider a full range of alternatives, and that additional NEPA analysis will be required for future actions.

NPS Response:

On July 15, 2020, the Council on Environmental Quality (CEQ) finalized revisions to implementing regulations for NEPA (40 CFR 1500-1508). The regulation changes were intended to modernize and accelerate NEPA reviews. On April 20, 2022, CEQ partially amended the 2020 regulations (Environmental Policy Act Implementing Regulations Revision, 87 Fed. Reg. 23466). The revision states that alternatives must be technically and economically feasible and meet the purpose and need for the proposed action. The NPS used the scoping process to determine “the extent and nature of issues and alternatives that should be considered during NEPA review” (National Park Service NEPA Handbook, 2015).

The NPS held a public scoping meeting on November 16, 2022, at the YCMA of Mount Desert Island located in the Town of Bar Harbor and discussed the hydraulic and hydrologic modelling used to design the Park Loop Road culvert and the range of alternatives being considered for Great Meadow restoration. The NPS issued a press release on November 7, 2022, to announce public comment period for scoping the restoration project of November 11 to December 10, 2022. Additionally, the NPS initiated consultation with the US Army Corps of Engineers, US Fish and Wildlife Service, Maine Department of Environmental Protection, and Maine Coastal Program on November 23, 2022. During scoping, the No Action, and Proposed Action (Preferred Alternative) were developed because they meet the definition of “alternatives that are technically and economically feasible,” as defined in 40 CFR 1508.1(z).

An EA is meant to be a “concise public document” that “briefly provides sufficient evidence and analysis for determining whether to prepare an EIS or a FONSI” (40 CFR 1508.9(a)). In most cases there is no added value in analyzing a large number of alternatives if the differences are so small that they will result in essentially the same impacts, the range of alternatives for an EA can be two, the proposal and the no action alternative (National Park Service NEPA Handbook Supplemental Guidance, 2015).

Foreseeable actions taken by the NPS, such as the paving and sewer line projects described on page 37 of the EA will undergo additional NEPA analysis. These future actions were included under the cumulative analysis for the Park Loop Road per 40 CFR 1508.7 to ensure the overall effects of the direct and indirect impacts of the proposed action, when added to impacts of the past, present, and reasonably foreseeable actions were fully analyzed.

Concern ID6: Tribal Engagement

One commentor pointed out there’s a distinction between tribal co-management and co-stewardship.

NPS Response:

In EA Sections 2.2.5 Invasive Plant Management and Native Plant Restoration and 3.3.2.3 Impacts of Alternative B (Vegetation) the NPS incorrectly uses the term co-management. The term should be co-stewardship. Co-management refers to a specific legal basis that requires the delegation of some aspects of Federal decision making (Secretary’s Order No. 3342). The selected action includes collaborating with the four federally recognized tribes to identify culturally significant plants to consider for revegetation and restoration opportunities in the Great Meadow. The action being described is co-stewardship as defined in NPS Policy Memorandum 22-03, “Fulfilling the National Park Service Trust responsibility to Indian Tribes, Alaska Natives, and Native Hawaiians in the Stewardship of federal Lands and Water”. Co-stewardship refers to cooperative and collaborative engagements of bureau land managers and tribes related to shared interests in managing, conserving, and preserving natural and cultural resources under the primary responsibility of federal land and water managers. The EA is corrected from “co-management” to “co-stewardship” via errata.

APPENDIX B Errata

Great Meadow Restoration Environmental Assessment

September 2023

An errata sheet is necessary for the project because factual corrections need to be made to the *Great Meadow Restoration Environmental Assessment* (EA) and because substantive public comments must be addressed. The corrections made herein do not increase the degree of impacts described in the EA or change the determination that no significant impacts will occur under the selected alternative. Existing text to remain in the EA is found in *italics*, additions to the text are underlined, and deleted text is shown in ~~strikethrough~~.

Chapter 2, Page 18: Invasive Plant Management and Native Plant Restoration (paragraph 6).

~~Tribal Co-management~~ Co-stewardship: *In addition to ACAD's and NETN's vegetation surveys and monitoring, the park would conduct an ethnobotanical survey and consult with affiliated federally recognized tribes concerning plants of cultural significance. If species of cultural value were identified, the park would collaborate with the Tribes to consider opportunities for revegetation and restoration in the Great Meadow.*

Chapter 2, Page 19: Mitigations and Best Management Practices in Alternative B (Cromwell Brook Stream Crossings)

Time-of-Year Work Restrictions. ~~Oct 1st–July 14th~~ November 1st – April 14th (Inactive period for Northern Long-eared Bat).

Chapter 3, Page 31: Impacts of Alternative B – Proposed Action and NPS Preferred Alternative (Vegetation) (paragraph 1).

~~Tribal Co-management~~ Co-stewardship: *The ethological survey would identify if there were plants present that could provide cultural value to the Wabanaki. It would also identify plants for traditional use in the region that are not currently in the Great Meadow, but could provide ethnobotanical value in the future, especially plants that might be resilient to climate change. ~~Co-management~~ Co-stewardship of wetland provides long-term benefit for the composition of the vegetative communities as well as long-term benefit to indigenous people.*

APPENDIX C
Determination of Non-Impairment

Great Meadow Restoration Environmental Assessment

US Department of the Interior
National Park Service
Acadia National Park

September 2023

The Organic Act of 1916 directs the US Department of Interior and the National Park Service (NPS) to manage units "to conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations" (54 United States Code [USC] § 100101). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (54 USC 100101).

According to NPS Management Policies 2006 Section 1.4.5, an action is considered an impairment when its impacts "harm the integrity of Park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values". Section 1.4.5 goes on to state that, "an impact to any park resource or value may, but does not necessarily, constitute an 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 as a goal in the park's general management plan or other relevant NPS planning documents as being of significance."

An impact may 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; NPS 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.

An impairment determination is not made for subject matters such as visitor experience, public health and safety, socioeconomics, environmental justice, land use, and park operations because impairment determinations only relate to resources and values that maintain the park's purpose and significance.

This determination on impairment has been prepared for the selected action as described in this Finding of No Significant Impact.

Wetlands

The NPS Northeast Temperate Network freshwater wetland monitoring indicates the Great Meadow is in poor condition due to hydrological disturbance. Stressors impacting hydrology include invasive species cover, culverts, abandoned roads, trails, ditches, and stream channelization. This causes reduced water holding capacity, extreme drawdowns during dry periods, and protracted extent and duration of flooding during high precipitation events. These adverse conditions select for more disturbance tolerant invasive plants and inhibit organic soil development.

Actions to restore the wetland hydrology will have limited impact on the total surface water elevation during each storm interval but will retain water in smaller rain events while expelling water faster in larger events. Restoring a more natural hydrology will have long-term benefits to the health of the Great Meadow. Stabilized hydrology will result in an increase of organic matter, which will in turn also improve water holding capacity as well as increase growth and composition of native plants. Stabilized hydrology will improve long-term wetland functions such as flood mitigation and carbon sequestration.

No adverse impacts to wetlands were identified in the Environmental Assessment (EA). Therefore, the selected action will not harm the integrity of the wetland and will not impair wetland resources.

Vegetation

The Great Meadow and surrounding area are dominated by disturbance-tolerant, nonnative invasive plants that outcompete native vegetation and reduce overall species composition. The NPS's ongoing management of invasive species such as glossy buckthorn (*Frangula alnus*) continue to require a high level of effort to extricate. Combining existing treatment with targeted restoration of native plants will slow regrowth of invasive species and increase the composition of native plants, resulting in a long-term benefit to wetland health and resiliency.

Actions associated with the restoration of the wetland will cause soil disturbance that may contribute to the spread of invasive plants. To reduce the likelihood of invasion, disturbed soils will be rehabilitated with native vegetation propagated from local sources. Planting mature native vegetation will shade out new sprouts from invasive species. Impact from work associated with the project will have no significant impact to the spread of invasive plants, while planting native vegetation will have a long-term benefit for promoting native plant species.

No significant adverse impacts to vegetation were identified in the EA. Therefore, the selected action will not harm the integrity of the native plant communities and will not impair vegetation resources.

Wildlife Habitat

Cromwell Brook contains several habitats, from cold water springs and warm water impoundments to its outflow into saltwater. However, it is fragmented by culverts, bridges, and a dam that were designed to allow water to pass at intersections with roads and trails but were not designed for aquatic organism

passage. The Great Meadow also contains a broad range of habitats required for different life stages of amphibians such as spring peepers (*Pseudacris crucifer*), wood frog (*Lithobate sylvatica*), American toad (*Anaxyrus americanus*), spotted salamander (*Ambystoma maculatum*), and four-toes salamander (*Hemidactylium scutatum*). However, roads, trails, and increasing vehicle traffic all lead to increased mortality as species move between breeding and foraging habitats.

The design of the nature-like weir, culvert, and restored stream channel utilize the US Forest Service Stream Simulation guidelines for aquatic organism passage. Including aquatic organism passage design will also allow for amphibian and small mammal passage, which will lower the species' use of Park Loop Road and thus reduce mortality. Additionally, new infrastructure will allow for a more stable environment suitable for healthy wildlife populations. Water level fluctuations would be less extreme, with shorter flooding periods and better water retention during drought. Wetland animal species will experience increased success and survivability during the breeding season.

The addition of the nature-like weir, culvert, and restored stream channel will likely promote beaver dam construction within the Great Meadow. In the short term, the presence of beaver will have an adverse impact. However, over the long term beaver impacts on the landscape would reflect the natural conditions, contributing to predictability and stabilization of water levels. Beaver dams do not impede aquatic organism passage. Finfish such as brook trout (*Salvelinus fontinalis*) have a relatively easy time passing beaver dams and have been known to overwinter in beaver ponds. Actions associated with restoration of the Great Meadow will have long-term benefits from reduced habitat fragmentation.

No significant adverse impacts to wildlife habitat were identified in the EA. Therefore, the selected action will not harm the integrity of the wildlife habitat and will not impair wildlife resources.

Cultural Landscapes

Portions of the National Register of Historic Places-listed Sieur de Monts Spring, Park Loop Road, and hiking trail system lie within the Great Meadow. Trails developed by George B. Dorr such as the Jesup Path and Hemlock Road were designed to lead walkers through botanically interesting areas in and adjacent to the Great Meadow. John D. Rockefeller Jr. in collaboration with the NPS, developed the motor road system to create a motor road driving experience separate from the carriage roads. Improving the hydrology of the Great Meadow along with restoration of the streams within the watershed will have long-term benefits for the preservation of the historic structures by reducing impacts from flooding.

The addition of the nature-like weir to the vista from the Park Loop Road will have a short-term adverse impact. However, the vegetation will blend into the landscape over the long term once it has grown. Due to the nature of its design, the weir will not distract from the overall vista. The adverse impacts in changes to trail materials and workmanship will be offset by the long-term beneficial impacts from the reduction in flooding and erosion of trail materials. Actions to make the trails more sustainable will contribute to the long-term protection of the trail's historic alignment and the visitor experience. Modifications to the Park Loop Road culvert will preserve the integrity, sustainability, and use of the systems. New visitor safety elements (e.g., the vista access pathway, crosswalks, and signs) will not

cause significant adverse impact to the cultural landscape because these types of infrastructure are expected along the roadway and are present at other areas of the motor road system.

Upsizing the Park Loop Road culvert will have short-term adverse impacts to Kebo Valley Golf Course during 100-year rain events prior to the replacement of other culverts downstream. Impacts are not significant when added to the cumulative impacts of replacing other culverts downstream. The overall effect would be long-term and beneficial from the reduction of flooding events, more even flow of water along Cromwell Brook, improvements in aquatic organism passage, and reduction in resource damage.

The NPS has consulted with the Maine State Historic Preservation Officer, who concurred that the selected action would have no adverse effect upon historic properties. Therefore, the selected action will not impair cultural landscapes.

Conclusion

The adverse impacts that may result from implementing the selected action are limited in nature, will not affect natural resources or values, and not affect the listing of properties on the National Register of Historic Places, and therefore will not rise to levels that will constitute impairment. This determination is based on consideration of the park's purpose and significance, a thorough analysis of the environmental impacts described in the EA, relevant scientific studies, the comments provided by the public and others, and the professional judgment of the decision maker, as guided by the direction of the NPS' Management Policies (2006).