



Use of Electric Bicycles Within the National Park System

Programmatic Environmental Assessment

June 2023

Note to Reviewers

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1.	PURPOSE, NEED, AND ISSUES ANALYZED	3
1.1	Background.....	3
1.2	Purpose and Need for Taking Action.....	4
1.3	Issues Analyzed in this Programmatic Environmental Assessment.....	4
2.	ALTERNATIVES	4
2.1	Alternative 1: No Action	4
2.2	Alternative 2: Proposed Action (Preferred Alternative)	6
2.3	Alternatives Considered but Not Carried Forward for Detailed Analysis	8
3.	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES.....	10
3.1	Project Area	10
3.2	General Methodology and Assumptions.....	10
3.3	Soils.....	12
3.4	Vegetation	19
3.5	Visitor Use and Experience.....	24
3.6	Wildlife	31
4.	AGENCIES AND PERSONS CONSULTED	37
5.	REFERENCES CITED	38
	Appendix A: Issues and Impact Topics Considered but Not Carried Forward for Detailed Analysis	43

1. PURPOSE, NEED, AND ISSUES ANALYZED

1.1 Background

On August 30, 2019, the National Park Service (NPS) issued policy memorandum (policy) instructing park superintendents to allow electric bicycle (e-bike) use in National Park System units (park unit, or unit), in the same areas where traditional bicycles were allowed, unless superintendents determined that restrictions or closures of certain areas were warranted after taking into consideration public health and safety, natural and cultural resource protection, and other management activities and objectives. The policy instructed superintendents to comply with the National Environmental Policy Act (NEPA) and stated that the action allowing e-bikes would ordinarily fall within a categorical exclusion (CE). In December 2019, several individuals and a number of organizations including Public Employees for Environmental Responsibility (Plaintiffs), filed suit in the U.S. District Court for the District of Columbia seeking an injunction to prohibit the use of e-bikes. Plaintiffs claimed, among other things, the NPS was required to amend its regulations and prepare either an environmental impact statement or an environmental assessment pursuant to NEPA before issuing policy direction allowing e-bikes where traditional bicycles are allowed.

While the litigation was pending, on November 2, 2020, the NPS published a final rule (rule) governing use of e-bikes within the National Park System (85 FR 69175). The rule became effective on December 2, 2020. The rule superseded the 2019 policy and differed from it in several ways. The NPS used a CE to comply with NEPA for the rule. At the time the rule was published, more than 380 park units had implemented the policy, though the majority of those units did not allow bicycle use on administrative roads or trails. The rule did not require superintendents of individual park units to reconsider their previous decisions to allow or restrict e-bike use.

Plaintiffs subsequently amended their complaint to challenge certain aspects of the rule, including the NPS's use of a CE to comply with NEPA. A June 2021 NPS memorandum made clear that the policy was rescinded and directed superintendents of units where e-bikes were allowed on administrative roads or trails to reconsider those decisions under the rule. On May 24, 2022, the U.S. District Court for the District of Columbia issued an opinion finding that the Plaintiffs' challenges to the policy were moot but that the NPS had improperly relied upon a CE to comply with NEPA for the rule. The Court remanded the rule to the NPS and directed the NPS to conduct additional NEPA analysis for the rule but left the rule in place pending completion of such analysis. *Pub Emps. For Env't Responsibility v. Nat'l Park Serv. (PEER v. NPS)*, 605 F. Supp. 3d 28 (D.D.C. 2022)

1.2 Purpose and Need for Taking Action

E-bikes have become more popular in recent years and have begun appearing in National Park System units. Action is needed at this time to address this emerging form of recreation. Furthermore, this programmatic environmental assessment (PEA) is needed to address inadequacies in the NEPA compliance associated with the rule, as identified in *PEER v. NPS*, and to assess the impacts of the rule on a national level.

The purposes of taking action are: 1) to provide visitors with an additional option for accessing areas in park units that are accessible by traditional bicycles, as determined appropriate for each park unit, particularly for those who want to ride a bicycle but might not otherwise do so because of physical fitness, age, disability, or the nature of the environment; 2) to resolve regulatory uncertainty about how e-bikes are managed so that the NPS may exercise clear management authority over e-bikes, thus providing clarity to visitors and stakeholders such as visitor service providers; and 3) to comply with Secretarial Order 3376 which instructed the NPS to promulgate a rule consistent with its policy direction with respect to e-bikes.

1.3 Issues Analyzed in this Programmatic Environmental Assessment

Issues related to soils, vegetation, visitor use and experience, and wildlife are analyzed in detail in this PEA.

Issues related to air quality, cultural resources, environmental justice, soundscapes, socioeconomics, special status species, wilderness, and e-bike use on public roads and parking lots, have been dismissed from detailed analysis. These issues, and reasons for their dismissal, are addressed in Appendix A.

2. ALTERNATIVES

2.1 Alternative 1: No Action

Although the rule authorizing superintendents to allow e-bike use remains in effect, the U.S. District Court for the District of Columbia remanded the rule to the NPS to conduct additional NEPA analysis consistent with the Court's May 24, 2022 Opinion in *PEER v. NPS*. For this reason, the NPS has determined that, under the no-action alternative, it would return to the status quo prior to the 2019 policy and the rule. At that time, NPS regulations did not specifically mention e-bikes and there was no nationwide policy about the use of e-bikes in park units. Superintendents had no specific authority to allow e-bikes in park units and there was no policy direction about how to use existing authorities and regulations to manage their use. Going back to this status would result in inconsistent management of e-bike use across the National Park System. In most park units, visitors likely would be allowed to use e-bikes on public roads and parking areas where motor vehicle use is allowed. In some park units, e-bike use also could occur on some administrative roads and trails where traditional bicycles are authorized due to the lack of policy direction about how to use existing authorities to manage e-bikes.

In order to implement the no-action alternative, the NPS would undo the changes made by the rule. The NPS would remove the definition of e-bikes in 36 CFR section 1.4 and the regulations governing their use in paragraph (i) of 36 CFR. section 4.30. Traditional bicycle use would be allowed on park roads and in parking areas that are otherwise open for motor vehicle use by the public, and on administrative roads and trails that have been designated for such use. Existing regulations at 36 CFR 4.30 provide the following requirements for the designation of administrative roads and trails for bicycle use:

- Administrative roads are defined as roads that are closed to motor vehicle use by the public but open to motor vehicle use for administrative purposes. Before designating an administrative road for bicycle use, the superintendent must make a written determination that such bicycle use is consistent with protection of the park unit's natural, scenic, and aesthetic values, safety considerations and management objectives and will not disturb wildlife or park resources.
- Before allowing traditional bicycle use on a new trail completely within a developed area or on an existing hiking or horse trail, the superintendent must complete a planning document that evaluates the suitability of the trail surface and soil conditions for accommodating bicycle use, including any maintenance, minor rehabilitation or armoring that is necessary to upgrade the trail to a sustainable condition. The planning document also must consider life cycle maintenance costs, safety considerations, methods to prevent or minimize user conflict, methods to protect natural and cultural resources and mitigate impacts, and integration with commercial services and alternative transportation systems (if applicable). The superintendent also must also complete an environmental impact statement (EIS) or an environmental assessment (EA) that – for existing trails – results in a finding that bicycle use on the existing trail would have no significant impacts to resources, and determine in writing that the addition of bicycle use on the existing trail is consistent with the protection of the park unit's natural, scenic, and aesthetic values, safety considerations and management objectives and will not disturb wildlife or park resources. If an EA is prepared, the public must be notified and given at least 30 days to review and comment. The written determination must be published in the Federal Register and the public must be given at least 30 days to review and comment. After this comment period, the NPS Regional Director must approve the written determination. If either the EIS or the EA concludes that bicycle use on an existing trail may have a significant impact, the superintendent and Regional Director must document that bicycle use cannot be authorized on that trail.
- Before allowing traditional bicycle use on a new trail that requires construction activities, such as clearing brush, cutting trees, excavation, or surface treatment, the superintendent must complete the planning document, EIS or EA, and written determination that is required for existing trails, obtain the Regional Director's approval of the written determination, and then the NPS must promulgate a special regulation authorizing bicycle use on the new trail.
- New trails, whether in developed or undeveloped areas, must be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines.

Where traditional bicycles are allowed, several requirements apply to their use. The following actions would be prohibited:

- Riding off of public roads and parking areas, except on administrative roads and trails that have been authorized for bicycle use.
- Possessing a bicycle in a wilderness area established by Federal statute.
- Operating a bicycle during periods of low visibility, or while traveling through a tunnel, or between sunset and sunrise, without exhibiting on the operator or bicycle a white light or reflector that is visible from a distance of at least 500 feet to the front and with a red light or reflector that is visible from at least 200 feet to the rear.
- Operating a bicycle abreast of another bicycle except where authorized by the superintendent.
- Operating a bicycle while consuming an alcoholic beverage or carrying in hand an open container of an alcoholic beverage.
- Any violation of a non-conflicting state law that is adopted by NPS regulations.

Several other regulations that apply to motor vehicle use also would apply to the use of traditional bicycles, including regulations about traffic control devices, obstructing traffic, right of way, speed limits, unsafe operations, and operating under the influence of alcohol or drugs. Superintendents would have the authority to limit, restrict, or impose conditions on traditional bicycle use and close any road, parking area, administrative road, or trail or portions thereof based on considerations related to visitor health and safety, resource protection, or other management activities or objectives.

2.2 Alternative 2: Proposed Action (Preferred Alternative)

Under the proposed action, the NPS would implement the 2020 rule, which gives superintendents discretionary authority to allow the use of e-bikes, or classes of e-bikes, on a case-by-case basis, on park roads, parking areas, administrative roads, and trails that are otherwise open to traditional bicycle use. Superintendents are required to notify the public of all areas open to e-bike use in accordance with 36 CFR 1.7, which specifically requires identifying those areas in the superintendent's compendium.¹

Under the 2020 rule, superintendents may only allow e-bikes where traditional bicycles are allowed. This means that all of the planning, compliance, written determinations, public notice, and rulemaking required to allow traditional bicycles on administrative roads and trails described in section 2.1 above must be completed before the superintendent can allow e-bikes in the same locations. Alternatively, if the superintendent is considering traditional bicycles and e-bikes contemporaneously on administrative roads or trails for the first time, then e-bikes could be contemporaneously evaluated in the planning, compliance, determinations, public notice, and rulemaking required to allow traditional bicycles in those locations. In either case, before

¹ The compendium is a written compilation of designations, closures, permit requirements and other restrictions imposed by the superintendent under discretionary authority for a particular park unit.

allowing e-bike use anywhere in a park unit, superintendents must comply with NEPA and all other applicable laws.

The rule resolves uncertainty that existed before, about whether e-bikes were subject to existing regulations governing motor vehicles and traditional bicycles. The rule specifically excludes e-bikes from the definition of “motor vehicle” and defines an “electric bicycle” in the following manner:

Electric bicycle means a two- or three-wheeled cycle with fully operable pedals and an electric motor of not more than 750 watts that meets the requirements of one of the following three classes:

- (1) “Class 1 electric bicycle” shall mean an electric bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 20 miles per hour.
- (2) “Class 2 electric bicycle” shall mean an electric bicycle equipped with a motor that may be used exclusively to propel the bicycle, and that is not capable of providing assistance when the bicycle reaches the speed of 20 miles per hour.
- (3) “Class 3 electric bicycle” shall mean an electric bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 28 miles per hour.

The rule prohibits e-bike use in locations, including public roads and parking areas, that have not been designated by the superintendent for e-bike use. Except where use of motor vehicles by the public is allowed, the rule prohibits using the electric motor exclusively to move an e-bike for an extended period of time without pedaling. The rule applies the same operational requirements to e-bikes that apply to traditional bicycles, as explained in section 2.1 above, and adopts non-conflicting state laws governing the use of e-bikes.

Finally, similar to traditional bicycles, the rule allows the superintendent to limit, restrict or impose conditions on e-bike use, or to close any park road, parking area, administrative road, trail, or portion thereof to e-bike use, after taking into consideration public health and safety, natural and cultural resource protection, and other management activities and objectives. The superintendent must provide public notice of any such actions, including by listing them in the superintendent’s compendium. Superintendents can use this discretionary authority to establish safety measures deemed necessary to ensure that e-bikes are used in a manner that maintains a safe, enjoyable experience for all visitors. The rule allows superintendents to manage e-bikes, or particular classes of e-bikes, differently than traditional bicycles in certain locations, as warranted.

Superintendents who allow e-bike use on administrative roads and trails could establish monitoring protocols to collect data regarding e-bike impacts. NPS staff could use signs, electronic media, and handouts to educate e-bike users regarding issues such as speed, traffic awareness, mounting and dismounting e-bikes, etc. The NPS has worked with other land management agencies within the Department of the Interior to establish standard e-bike language and symbols for signage. The goal of this effort was to create a consistent visual framework indicating where e-bikes are allowed, or not allowed, on public lands managed by the

Department of the Interior. E-bike signage in park units that allow such use would have symbols that are distinct from those used to depict traditional bicycles.

2.3 Alternatives Considered but Not Carried Forward for Detailed Analysis

❖ Limit superintendent discretion to allow the use of e-bikes.

During the rulemaking process, commenters suggested a number of ways to limit superintendent discretion to allow e-bikes, or classes of e-bikes, in certain locations. These suggestions included:

- Prohibit the use of Class 2 and 3 e-bikes on non-motorized trails where traditional bicycles are allowed.
- Allow Class 1 e-bikes on administrative roads and improved surface trails, but not single-track trails.
- Allow Class 2 e-bikes only on administrative roads.
- Allow Class 3 e-bikes only in locations open to public motor vehicle traffic.
- Prohibit Class 2 and 3 e-bikes on natural surface trails.
- Prohibit the use of three-wheeled e-bikes with a combined tire tread width wider than 15 inches on trails where traditional bicycles are allowed.
- Prohibit e-bikes on trails with groomed snow that are also used by over-snow vehicles.
- Allow e-bikes only on paved trails.
- Prohibit Class 2 e-bikes on all improved surfaces and shared use trails open to traditional bicycles due to their throttle-only capabilities.

Park units vary significantly in terms of the criteria that would influence a decision to allow e-bikes. Each park unit has its own enabling legislation, unique resources that must be protected, and specific circumstances related to general visitor activity, trail infrastructure, and traditional bicycle use that must be considered prior to determining whether e-bike use should be allowed. Superintendents are most familiar with the natural and cultural resources, operating budgets, visitor use patterns, and trail conditions in the park units they manage, and therefore are in the best position to determine whether e-bikes, or specific classes of e-bikes, should be allowed where traditional bicycles are allowed.

All of the suggested “one size fits all” approaches would limit the discretion of superintendents to determine whether e-bikes should be allowed where traditional bicycles are allowed without any opportunity to evaluate whether such use is appropriate. As a result, visitors could be denied the opportunity to use e-bikes to access and enjoy park areas where such use may be appropriate. Therefore, these alternatives or alternative elements would not meet the purpose for taking action and have been dismissed from detailed analysis.

❖ Allow the use of e-bikes unless prohibited or restricted by the superintendent.

During the rulemaking process, commenters suggested the NPS allow Class 1 e-bikes anywhere traditional bicycles are allowed, without any requirement that those locations be designated by the superintendent. One commenter suggested the NPS allow seniors to use all classes of e-bikes anywhere traditional bicycles are allowed. And as discussed above, the 2019 policy directed superintendents to allow e-bike use in park units where traditional bicycles were allowed, unless superintendents determined that restrictions or closures of certain areas were warranted after taking into consideration public health and safety, natural and cultural resource protection, and other management activities and objectives. These are all examples of alternative regulatory approaches that would allow the use of e-bikes in certain respects as the default regulatory position, placing the onus on superintendents to close areas or restrict use when necessary to prevent unacceptable impacts to resources and visitors.

For the reasons discussed above, the NPS prefers a regulatory approach that allows superintendents to exercise discretion and judgment about where e-bike use may be appropriate or not. Superintendents are most familiar with the natural and cultural resources, operating budgets, and visitor use patterns in the park units they manage, and therefore are in the best position to determine whether e-bikes, or specific classes of e-bikes, should be allowed or prohibited in certain locations. Although an “open unless closed” approach would preserve the discretion of the superintendent to establish restrictions and closures on e-bike use, the NPS rejected this approach when it published the rule, which superseded and replaced the policy with a regulatory framework that prohibits the use of e-bikes in park units, including on roads and parking areas, unless locations open to traditional bicycle use are designated for e-bike use by the superintendent. The approach in the rule is more protective of park resources and visitors, which the NPS believes is appropriate given that e-bikes remain a relatively new form of recreational activity in park units. This approach is consistent with NPS Management Policies, which states that a new form of recreational activity will not be allowed within a park unit until a superintendent has made a determination that it will be appropriate and not cause unacceptable impacts.²

Specific to the alternative that would favor the use of Class 1 e-bikes only, the NPS believes that this would place too much emphasis on the class type. Trail design is more determinative of the level of impacts than the type of use (IMBA 2016; Marion and Wimpey 2007; Marion 2023).

An alternative that would allow seniors to use e-bikes where bicycles are allowed without prior designation would result in the same concerns as other “open unless closed” approaches. Plus, it would not meet the purpose for taking action because it could deny other visitors opportunities for recreation and access who may want to ride a traditional bicycle but might not be able to because of physical fitness, age, disability, or the nature of the environment.

² See 2006 NPS Management Policies, Section 8.2.2.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Project Area

The National Park System includes 424 individual units covering more than 85 million acres in all 50 states, the District of Columbia, and US territories. There are many naming designations for National Park System units including national parks, national monuments, national seashores, national battlefields, and national recreation areas, to name a few. The designations speak to the type of resources each unit contains, the experiences they offer, and the reasons for their inclusion in the National Park System. Each unit is established by an act of Congress or by presidential proclamation under the Antiquities Act, and the enabling legislation or proclamation for each unit outlines its specific purpose, resources, and values.

Some park units, like Gates of the Arctic National Park and Preserve in Alaska, preserve vast wilderness and are located in remote natural settings. Others, like Independence National Historical Park in downtown Philadelphia, Pennsylvania, and the National Mall and Memorial Parks in the District of Columbia, preserve nationally significant cultural resources and lie in the heart of an urban environment. Still others, like Great Falls Park in Virginia, are located in a suburban environment. In managing these diverse resources, the NPS is charged by its Organic Act to conserve them and to provide for their enjoyment in such a manner as will leave them unimpaired for future generations. Although the Organic Act applies System-wide, the NPS is also charged with managing each park unit consistent with its own specific enabling legislation³. The enabling legislation for some park units may prioritize certain uses or values or may specifically allow uses that are prohibited at other park units.

Because the National Park System is geographically and environmentally diverse, ranging from the Virgin Islands to Alaska, and from Guam to Maine, it includes varied environments with regard to soil types, vegetation, climate, and wildlife.

3.2 General Methodology and Assumptions

3.2.1 Scope of the Analysis

This PEA analyzes the potential programmatic national-level impacts that could occur as a result of implementing the proposed action. The proposed action would authorize superintendents to allow e-bike use on public roads, parking areas, administrative roads, and trails where traditional bicycle use also is allowed, subject to specific requirements and restrictions. The “Affected Environment” and “Environmental Consequences” are primarily focused on locations where e-bike use on administrative roads and trails could occur under the proposed action. Potential impacts of e-bikes are greater on administrative roads and trails because there is no public motor vehicle traffic in these areas. The potential impacts of e-bike

³ See 16 U.S.C. §§ 21-40c (codifying park-specific enabling legislation).

use on public roads and parking areas have been considered but dismissed from detailed analysis for the reasons provided in Appendix A.

The analysis of the no-action alternative discloses, generally, the ongoing impacts to resources on and around administrative roads and trails where e-bike use may be specifically authorized under the proposed action. As discussed in section 2.1, the no-action alternative assumes e-bike use is not specifically authorized, but could occur on administrative roads or trails in some park units. The analysis of the proposed action focuses on impacts that could occur as a result of superintendents specifically authorizing e-bike use on administrative roads and trails where traditional bicycle use also is authorized. The analysis of the proposed action assumes e-bikes would not be allowed on administrative roads or trails in the majority of park units⁴.

Although the analysis discloses impacts that could occur in individual park units generally, this PEA reaches conclusions regarding potential environmental impacts on a national-level and does not reach conclusions about impacts to specific park units.

3.2.2 Mitigation

Minimizing impacts to natural, historic, cultural, scenic, and aesthetic resources is a foundational premise of NPS management decisions. Although adverse impacts could result to soils, vegetation, wildlife, and visitor use and experience from allowing traditional bicycle and e-bike use on administrative roads and trails, sustainable trail design can mitigate impacts (IMBA 2016; Marion and Wimpey 2007; Marion 2023). When a trail is sustainably located, designed, and constructed, it can support low impact uses such as hiking and biking with minimal maintenance and with no degradation of natural resources. As discussed above, existing regulations governing the use of traditional bicycles on trails require that before allowing such use, superintendents must consider issues related to sustainable trail design. For all trails, the superintendent must complete a plan that evaluates the suitability of the trail surface and soil conditions for accommodating bicycle use. New trails must be developed in accordance with appropriate sustainable trail design principles and guidelines (see 36 CFR 4.30).

Available literature indicates that sustainable trail guidance should be flexible to consider the surrounding environment, the trail use, and users. The most important trail design attributes relate to how trails are designed and located considering the relevant topography, substrates, and drainage (Marion 2023). Marion and Wimpey (2007) define a sustainable trail as one that is "designed, constructed, and managed to accommodate its intended type, amount, and season of use to provide high quality visitor experiences while protecting the trail infrastructure and adjacent natural resources." The National Interagency "Trail Management: Plans, Projects and People" training course (Beers 2009) defines a sustainable trail as, "A trail that has been designed and constructed to such a standard that it does not adversely impact natural and cultural resources, can withstand the impacts of the intended user and the natural elements while receiving only routine cyclic maintenance and meets the needs of the intended user to a degree that they do not deviate from the established trail alignment."

⁴ At the time the 2020 rule was published, approximately 130 of the more than 400 park units in the National Park System allowed e-bikes on specific administrative roads or trails in those park units.

Design techniques such as grade reversals and rolling contour trails increase sustainability by ensuring prompt drainage of rainfall and snowmelt off the trail. Construction techniques such as retaining walls, switchbacks, stone paving, and bridges can improve trail surfaces, reduce impacts, increase sustainability, and improve the visitor experience. In 2018, the NPS published an Active Transportation Guidebook to support walking and bicycling in and around national park units (NPS 2018). This Guidebook provides references to resources with design standards and guidelines for multi-use trails.

The analysis in this PEA assumes that to some extent, the majority of trails designated for use by traditional bicycles and e-bikes under the proposed action incorporate aspects of sustainable design concepts. However, many NPS multi-use trails are significant to the historical, cultural, or environmental context of the park unit in which they are located and were designed prior to modern design guidelines and standards. In cases where adherence to sustainable design standards is not possible or is not an immediate solution, the analysis assumes that there are other options superintendents can implement to mitigate impacts, such as closures or other restrictions authorized under 36 CFR 4.30 (e.g., speed limit restrictions, e-bike class limitations, etc.) to help alleviate potential impacts.

3.2.3 Organization of This Chapter

This chapter is organized by impact topics, which represent specific resources. Under each impact topic, the “Affected Environment” is presented first and includes a description of each resource that has been carried forward for detailed analysis. The “Affected Environment” also includes ongoing trends that could have impacts on the resource. The “Environmental Consequences” sections evaluate the potential direct, indirect, and cumulative impacts that could result from the implementation of each alternative.

Note that for most impact topics, impacts of the no-action alternative are discussed in detail in the “Affected Environment” sections, because implementation of the no-action alternative would result in the same impacts and trends as described in the “Affected Environment.” This approach takes into consideration direction from the Council on Environmental Quality (CEQ) that NEPA documents shall be analytic, concise, and no longer than necessary to comply with NEPA (40 CFR 1502.2), and is consistent with direction from CEQ that states that agencies “may contrast the impacts of the proposed action and alternatives with the current and expected future conditions of the affected environment in the absence of the action, which constitutes consideration of a no-action alternative” (85 FR 43323).

3.3 Soils

3.3.1 Affected Environment - Soils

The National Park System contains a myriad of administrative roads and trails in park units, consisting of thousands of miles System-wide. The most popular uses of trails are walking and hiking. Traditional bicycle use and horseback riding also occur on a limited number of specifically designated administrative roads and trails in some park units. Some administrative roads and trails where bicycle use is allowed also allow horseback riding. While traditional bicycle use is a popular recreational activity in a number of park units, a majority of park units do

not allow bicycle use on trails. In park units where administrative roads exist, they are used by park unit staff for various purposes, including motor vehicle use.

Many administrative roads and trails throughout National Park System that allow traditional bicycle use are paved. Others consist of dirt, gravel, or other aggregate material. Specific soil characteristics can vary depending on a park unit's location, climate, and trail management practices. In general, the following soil types occur on trails and in some cases, administrative roads, throughout the National Park System:

- Meadows and grasslands typically have grassy or turf soils. These soils are generally stable and easy to walk or bike on. Excessive foot or bicycle traffic on grassy trails can result in soil compaction.
- In arid or desert regions, soils are typically composed of sand, gravel, and small rocks. These soils can be firm and stable, but also challenging to walk or bike on due to uneven surfaces and loose rocks.
- Mountainous or rocky terrains often have uneven and steep surfaces. The soil in such areas may be a mix of rocks, gravel, and shallow topsoil. These soils require careful navigation due to the rugged terrain and can be more physically demanding to walk or bike on.
- Coastal regions and dune areas may have sandy soils. Sandy soils are loose and can be challenging to navigate, especially when steep slopes are involved. Footing can be less stable, and it may require more effort to walk or bike on these soils.
- Forested areas in many cases have loamy soils. They have good water retention capabilities and are generally more stable than sandy or clay soils. Loamy soils are often more pleasant to walk or bike on due to their moderate texture and stability.
- Areas with higher moisture content may traverse clay or silt soils. These soils can become sticky and slippery when wet, making them more challenging to walk or bike on during or after rainfall. In drier conditions, clay soils can become compacted and hard.
- Wet or marshy environments can have muddy soil conditions, especially during or after rainfall. Muddy soils can be slippery, making them more difficult to traverse. Walking on muddy soils can lead to soil erosion and impact an administrative road or trail's overall condition.

Administrative roads and trails where bicycle use is allowed often have specific characteristics to minimize impacts to soils, including:

- Effective drainage, which prevents excessive water accumulation and helps maintain trail and road integrity, especially during or after rainfall. Well-drained soils reduce the chances of creating muddy or erosion-prone sections.
- Erosion resistance, which is important to prevent soil loss, maintain trail width, and minimize sediment runoff.
- Firm and compacted soils to withstand the impacts of bike tires. Firm soils offer better traction and reduce the risk of slipping or sinking. Controlled soil compaction helps create a surface that can withstand bicycle traffic without excessive wear and tear.

- Stable soils that are able to support the weight of bicycles and riders. Stable soils minimize the risk of accidents and provide a solid surface for cyclists to ride on.
- Other sustainable trail design features, as discussed in section 3.2.2.

Any type of use, including hiking, biking, and horseback riding, can affect the condition of soils. Hiking and bicycle use have been found to have similar impacts to soil exposure (Thurston and Reader 2001). Bicycle use on administrative roads and trails can result in erosion and soil compaction. Soil erosion causes gullies and can cause impacts immediately adjacent to the trail corridor by exposing tree roots. Erosion of trail materials can also dry out the soil substrate adjacent to trails, which is critical to ground cover, grasses, and understory plant health and success, causing further impacts and trail widening. Soil compaction can adversely impact soil attributes such as bulk density and decrease pore space, which could indirectly affect vegetation through poor root growth. Soil loss and soil disturbance, including compaction, from hiking and bicycle use varies from trail to trail, depending on factors such as the level of use, types of soil, slope, plant community, design of the trails, presence of erosion control features, intensity of storms, and level of maintenance. Muddiness and trail widening can also occur as a result of bicycle use, especially on flat terrain and wet soils (Marion et al. 2011). Horseback riding can cause considerable damage to soils due to the horse's weight being transferred to the ground through the hooves, which are relatively sharp points, and cause displacement of the soil and subsequent erosion (Newsome et al. 2004; Pickering et al. 2010). Researchers have found that horseback use can contribute considerably more to soil loss than hiking and bicycle use (Olive and Marion 2009; Wilson and Seney 1994). In addition, motor vehicle use by park unit staff on unpaved administrative roads can cause impacts to soils, including erosion and compaction.

Under 36 CFR 4.30, traditional bicycles may not be allowed on an existing trail if such use would cause a significant impact. Superintendents mitigate impacts to soils on administrative roads and trails in their specific park unit by incorporating aspects of sustainable trail design features, conducting trail maintenance activities, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30, as appropriate.

Unauthorized off-trail or off-road bicycle use (hereinafter referred to as "off-trail" use) can result in greater adverse impacts than on-trail use to soils (Marion and Wimpey 2007). The extent of damage from unauthorized off-trail bicycle use depends somewhat on the soil type which varies by park unit. However, at least one study found that quick recovery could be expected when the off-trail use ceased, and the impacts of off-trail use from bicycles were similar to off-trail impacts from hiking (Thurston and Reader 2001). While unauthorized off-trail use can occur in some instances, it has not been reported as a widespread problem of concern in park units that allow bicycle use.

Impacts to soils from hiking, bicycle use, and horseback riding are considered to be "localized," meaning they are typically confined to soils on and around specific administrative roads and trails in park units where traditional bicycle use is authorized, and do not have a geographic or shared ecological nexus to soils in other park units. Furthermore, administrative roads and trails that allow traditional bicycle use typically have limited connectivity with other National Park System trails. Hiking, bicycle use, and horseback riding on administrative roads and trails where

bicycle use is allowed have not resulted in any “national-level” collective impacts to soils across the National Park System.

Increasing numbers of visitors in park units and climate change are trends that could impact soils on administrative roads and trails that allow traditional bicycle use. An increase in the number of visitors using administrative roads and trails where bicycle use is allowed could exacerbate impacts such as erosion, compaction, and trail widening. However, studies have shown that the most damage to soils occurs with initial traffic and that the per capita increase in further impact diminishes rapidly with increasing subsequent traffic (Marion and Wimpey 2007). Climate change could cause trail characteristics in park units to change over time. For example, some park units may have more or less moisture, and changing temperatures could affect soil characteristics such as erosion and muddiness. Depending on the specific temperature and precipitation changes experienced by individual park units, adverse impacts to soils on administrative roads and trails that allow traditional bicycle use could either be exacerbated or minimized. Adverse impacts to soils resulting from an increased number of visitors or from climate change can be mitigated by incorporating additional aspects of sustainable trail design features, adapting trail maintenance activities conducted by specific park units, and/or by implementing closures or other restrictions authorized under 36 CFR 4.30.

3.3.2 Environmental Consequences of the No-Action Alternative - Soils

Under the no-action alternative, soils on administrative roads and trails that allow traditional bicycle use would continue to experience impacts from hiking, bicycle use, and horseback riding as described above in the “Affected Environment,” including erosion, compaction, muddiness, and trail widening. Soils on administrative roads would also continue to be impacted by ongoing motor vehicle use by park staff. Traditional bicycle use would continue to occur under the existing regulations at 36 CFR 4.30 and as discussed in section 2.1, e-bike use could occur on some administrative roads or trails in some park units where traditional bicycles are authorized. Impacts to soils on administrative roads or trails where e-bike use occurs would be similar to those described under the proposed action (section 3.3.3).

Impacts to soils from traditional bicycle and in some cases, e-bike use, could only occur on a relatively small number of trails within the National Park System, in specific park units that authorize traditional bicycle use on those trails. While in the future some park units may designate existing administrative roads or trails for traditional bicycle use, establish new trails that allow traditional bicycle use, or allow additional uses on administrative roads or trails such as horseback riding, impacts related to those actions would be similar to the impacts described under the “Affected Environment.”

As described above, unauthorized off-trail use has not been reported as a widespread problem of concern by park units that allow traditional bicycle use, and there is no indication it may become a widespread issue under the no-action alternative. In the relatively rare instances where such use occurs, soils would be expected to recover quickly upon cessation of the off-trail activity (Thurston and Reader 2001).

Impacts to soils would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, and/or implementing trail or area closures or other restrictions on traditional bicycle use authorized

under 36 CFR 4.30. In addition, impacts to new trails would be mitigated because new trails would be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines.

Consistent with the discussion in the “Affected Environment,” impacts to soils from hiking, traditional bicycle use, and horseback riding would continue to be “localized,” and would not cause impacts that have a geographic or shared ecological nexus to soils in other park units. Because of this, and because administrative roads and trails that allow traditional bicycle use typically have limited connectivity with other national park system trails, the no-action alternative would not result in any “national-level” collective impacts to soils across the National Park System.

Cumulative Impacts

As discussed above, the ongoing impacts of the no-action alternative would not result in any “national-level” effects to soils. There are no other past, present, or reasonably foreseeable future actions that have had, or would potentially have impacts to soils on administrative roads and trails across the National Park System. Therefore, there would not be any “national-level” cumulative impacts to soils as a result of implementing the no-action alternative.

Conclusion

Overall, soils on administrative roads and trails that allow traditional bicycle use would remain in a state similar to existing conditions. Bicycle use would continue to be prohibited on the majority of trails in the National Park System. Impacts to soils would remain “localized,” and would not cause impacts that have a geographic or shared ecological nexus to soils in other park units. The no-action alternative would not result in any “national-level” collective impacts to soils across the National Park System.

3.3.3 Environmental Consequences of the Proposed Action - Soils

Under the proposed action, the NPS would provide superintendents with the discretion to allow e-bike use on administrative roads and trails where traditional bicycle use is also allowed. Existing regulations require that, prior to allowing bicycles (and therefore prior to allowing e-bikes), the superintendent determine that traditional bicycle use is consistent with the protection of the park unit’s natural, scenic, and aesthetic values, safety considerations and management objectives and will not disturb wildlife or park resources. In addition, before designating existing trails for bicycle use (and therefore before designating existing trails for e-bike use), superintendents are required to consider sustainable trail design features and determine that no significant adverse impacts would occur as a result of traditional bicycle use. The regulations require new trails that would allow traditional bicycle use (and therefore could allow e-bike use) to be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines.

As noted in section 3.2.1, at the time the 2020 rule was published, approximately 130 of the more than 400 park units in the National Park System allowed e-bikes on specific administrative roads or trails in those park units. Some park units may allow bicycles on administrative roads or existing trails for the first time in the future, or build new bicycle trails, but it is unlikely that a

significant number of park units would do so. Therefore, under the proposed action, e-bike use could only occur on a limited subset of administrative roads and trails where traditional bicycle use is authorized in specific units of the National Park System. As discussed in the “Affected Environment” and under the analysis of the no-action alternative, traditional bicycles would continue to be prohibited on the majority of trails within the National Park System. Consequently, e-bike use would be prohibited on most trails as well.

Allowing superintendents to authorize e-bike use on administrative roads and trails where traditional bicycles are allowed would result in impacts to soils on administrative roads and trails in the form of erosion, compaction, muddiness, and trail widening, similar to what would occur under the no-action alternative. The available literature regarding the difference in impacts between e-bikes and traditional bicycles concludes that while there is a perception that e-bikes result in more impacts to trail surfaces than traditional bicycles, observed effects indicate that there is no significant difference in impacts to soils between e-bikes and traditional bicycles (Nielson et al. 2019; IMBA 2016). Although the IMBA study was focused on class 1 e-bikes and the proposed action would give superintendent’s the discretion to allow class 2 and class 3 e-bikes where traditional bicycles are also allowed, trail design is more determinative of the level of impacts than the type of use (IMBA 2016; Marion and Wimpey 2007; Marion 2023).

The addition of e-bikes could increase the number of visitors using designated administrative roads and trails within specific park units to a limited degree. While an increase in users could exacerbate impacts to soils, studies have shown that the most damage to soils occurs with initial traffic and that the per capita increase in further impact diminishes rapidly with increasing subsequent traffic (Marion and Wimpey 2007). Furthermore, increases in use from e-bikes would only be seen on a relatively small subset of trails that allow traditional bicycle use, because superintendents would only be authorized to allow e-bike use on administrative roads and trails where traditional bicycle use is authorized, and even then, superintendents could choose to designate only a subset of those locations for e-bike use. Some e-bike users also could potentially travel farther distances than they otherwise could on a traditional bicycle (MacArthur et al. 2014), thereby creating the possibility that more remote portions of administrative roads and trails could be impacted than would be the case with traditional bicycle use.

As is the case with traditional bicycles under the no-action alternative, unauthorized off-trail use of e-bikes could result in greater adverse impacts to soils than use on authorized trails, and with the potential for some e-bike users to travel farther distances, off-trail use could occur in areas it would not occur if only traditional bicycles were allowed. However, unauthorized off-trail e-bike use has not been reported as a problem of concern by park units that allow e-bikes, and there is no indication it may become a widespread issue under the proposed action. In the relatively rare instances where such use occurs, soils would be expected to recover quickly upon cessation of the off-trail activity (Thurston and Reader 2001).

Under 36 CFR 4.30, traditional bicycles may not be allowed on an existing trail if such use would cause a significant impact and may only be allowed on trails where soils could accommodate traditional bicycles. Thus, the rule would only authorize superintendents to allow e-bike use on existing trails where traditional bicycles do not have significant adverse impacts. Based on available data, the NPS expects the use of e-bikes and traditional bicycles on trails would not cause significant adverse impacts if significant adverse impacts would not occur from

traditional bicycle use alone. Impacts to soils would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30. In addition, impacts to new trails would be mitigated because new trails would be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines. Park units that allow e-bike use on administrative roads and trails could establish monitoring protocols to collect data regarding e-bike impacts, which could provide park unit-specific data that could help park managers adjust management strategies as needed, thereby further mitigating impacts.

Similar to the no-action alternative, impacts to soils from hiking, traditional bicycle use, horseback riding and, in this case, e-bike use, would be “localized,” and would not cause impacts that have a geographic or shared ecological nexus to soils in other park units. Because of this, and because administrative roads and trails that would allow e-bike use typically have limited connectivity with other National Park System trails, the proposed action would not result in any “national-level” collective impacts to soils across the National Park System.

Cumulative Impacts

As discussed above, the proposed action would not result in any “national-level” effects to soils. There are no other past, present, or reasonably foreseeable future actions that have had, or would potentially have impacts to soils on administrative roads and trails across the National Park System. Therefore, there would not be any “national-level” cumulative impacts to soils as a result of implementing the proposed action.

Conclusion

Overall, e-bike use within the National Park System would only occur on a limited number of administrative roads and trails where 1) traditional bicycle use is allowed; and 2) the superintendent has decided to allow e-bikes, or specific classes of e-bikes. E-bikes would not be allowed on administrative roads or trails in the majority of park units. Impacts to soils would be substantially similar to those expected under the no-action alternative. Compared to the no-action alternative, there is the potential for slightly greater impacts to soils within a given park unit, due to the potential for increased numbers of visitors using e-bikes on administrative roads and trails and traveling farther distances than they would otherwise travel on traditional bicycles. These impacts, however, would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30. Impacts to soils would be “localized,” and would not have a geographic or shared ecological nexus to soils in other park units. The proposed action would not result in any “national-level” collective impacts to soils across the National Park System.

3.4 Vegetation

3.4.1 Affected Environment - Vegetation

The National Park System includes more than 400 park units, each of which contain a rich diversity of vegetation types. Many park units feature several overlapping types of vegetation due to their diverse landscapes and climates. In general, park units contain the following types of vegetation:

- Alpine regions are typically found at high elevations where conditions are harsh. Alpine wildflowers, grasses, and lichens are common, and trees are typically scarce.
- Coastal vegetation is typically adapted to saline conditions. Marsh grasses, mangroves, and coastal shrubs are common in these areas.
- Desert vegetation is adapted to withstand harsh, dry conditions and infrequent rainfall. Cacti, creosote bushes, and yuccas are common in these areas.
- Forest and woodland vegetation includes a variety of deciduous and coniferous trees, along with a diverse understory of shrubs, ferns, and herbaceous plants.
- Grassland vegetation includes a range of grass species, with interspersed wildflowers and occasional trees or shrubs.
- Mountain vegetation includes coniferous forests (spruce, fir, and pine trees) at lower altitudes, while tundra vegetation like dwarf shrubs, grasses, and lichens dominate above the tree line.
- Temperate rainforest vegetation includes old-growth forests with moss-covered trees such as Douglas firs, Western hemlocks, and Sitka spruces, along with a dense understory of ferns and other plants.
- Tropical rainforest vegetation includes lush vegetation with diverse species of ferns, palms, flowering plants, vines, and hardwood trees, some of which are unique to these areas.
- Wetland areas include a range of aquatic and semi-aquatic plants, such as lily pads, cattails, and mangroves.

Any type of use, including hiking, biking, and horseback riding may result in impacts to vegetation. Hiking and traditional bicycle use have been found to have similar impacts on vegetation loss (Thurston and Reader 2001). Vegetation loss can occur on administrative roads and trails where bicycle use is allowed due to trampling, which in turn can lead to long term shifts in plant composition. The amount of vegetation loss can depend on the type and amount of use (Marion 2023). It can also depend on the type of vegetation that is trampled. Low growing vegetation, grasses, and sedges are more resistant than broad-leafed herbs and forbs (Cole 1995a, 1995b). Typically, impacts such as vegetation loss and changes in plant composition are confined to within a few meters of the associated trail (Marion 2023). Hiking and traditional bicycle use can result in similar short-term impacts to understory vegetation with regard to plant density in deciduous forests (Thurston and Reader 2001; Marion and Wimpey 2007). Hiking, bicycle use, and horseback riding can all introduce and disperse non-native plants and plant

pathogens (Pickering et al. 2010; APHIS 2023; NISIC 2023; Newsome et al. 2004, 2008). Horseback riding can damage vegetation through grazing, trampling, and introduction of non-native organisms and has been found to result in substantially more vegetation loss compared to hiking and mountain biking (Newsome et al. 2004; Thurston and Reader 2001; Newsome et al. 2008). In addition, motor vehicle use by park unit staff on unpaved administrative roads can cause impacts to vegetation, including trampling and dispersal of non-native seeds and plant pathogens.

Under 36 CFR 4.30, traditional bicycles may not be allowed on an existing trail if such use would cause a significant impact. Superintendents mitigate impacts to vegetation on and near administrative roads and trails in their specific park unit by incorporating aspects of sustainable trail design features, conducting trail maintenance activities, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30, as appropriate. Impacts related to non-native seed and plant pathogen dispersal can be mitigated by encouraging bike cleaning between rides, control of non-native species at trailheads and increasing visitor awareness in areas of concern (Weiss et al. 2016).

Unauthorized off-trail bicycle use can result in greater adverse impacts than on-trail use to vegetation (Marion and Wimpey 2007). However, at least one study found that quick recovery could be expected when the off-trail use ceased, and the impacts of off-trail use from bicycles were similar to off-trail impacts from hiking (Thurston and Reader 2001). Off-trail use has not been reported as a widespread problem of concern in park units that allow bicycle use.

Impacts to vegetation from hiking, bicycle use, and horseback riding are considered to be “localized,” meaning they are typically confined to vegetation on and around specific administrative roads and trails in park units where bicycle use is authorized, and do not have a geographic or shared ecological nexus to vegetation in other park units. Furthermore, administrative roads and trails that allow traditional bicycle use typically have limited connectivity with other National Park System trails. Hiking, bicycle use, and horseback riding on administrative roads and trails where bicycle use is allowed have not resulted in any “national-level” collective impacts to vegetation across the National Park System.

As visitation to park units increases, there is the potential for the impacts discussed above to increase on administrative roads and trails that allow traditional bicycle use from increased use of those areas. Furthermore, climate change could increase or decrease the potential for adverse impacts to vegetation, depending on the specific temperature and precipitation changes experienced by each park unit. Adverse impacts to vegetation resulting from an increased number of visitors or from climate change can be mitigated by incorporating additional aspects of sustainable trail design features, adapting trail maintenance activities conducted by specific park units, and/or by implementing closures or other restrictions authorized under 36 CFR 4.30.

3.4.2 Environmental Consequences of the No-Action Alternative - Vegetation

Under the no-action alternative, vegetation on and adjacent to administrative roads and trails where bicycle use is allowed would experience the same impacts from hiking, bicycle use, and horseback riding as described in the “Affected Environment,” including vegetation loss from trampling and dispersal of non-native seeds and plant pathogens. Vegetation on administrative roads would also continue to be impacted by ongoing motor vehicle use by park unit staff.

Traditional bicycle use would continue to occur under the existing regulations at 36 CFR 4.30 and as discussed in section 2.1, e-bike use could occur on some administrative roads or trails in some park units where traditional bicycles are authorized. Impacts to vegetation on and around administrative roads or trails where e-bike use occurs would be similar to those described under the proposed action (section 3.4.3)

Impacts to vegetation from traditional bicycle and in some cases, e-bike use, could only occur on a relatively small number of trails within the National Park System, in specific park units that authorize traditional bicycle use on those trails. While in the future some park units may designate existing administrative roads or trails for traditional bicycle use, establish new trails that allow traditional bicycle use, or allow additional uses on administrative roads or trails such as horseback riding, impacts related to those actions would be similar to the impacts described under the “Affected Environment.”

Unauthorized off-trail use has not been reported as a widespread problem of concern by park units that allow bicycle use, and there is no indication it may become a widespread issue under the no-action alternative. In the relatively rare instances where such use occurs, vegetation would be expected to recover quickly (Thurston and Reader 2001).

Impacts to vegetation would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30. In addition, impacts to vegetation on or around new trails would be mitigated because new trails would be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines. Impacts related to non-native seed and plant pathogen dispersal could be mitigated by encouraging bike cleaning between rides, control of non-native species at trailheads, and increasing visitor awareness in areas of concern (Weiss et al. 2016).

Consistent with the discussion in the “Affected Environment,” impacts to vegetation from hiking, traditional bicycle use, and horseback riding would continue to be “localized,” and would not cause impacts that have a geographic or shared ecological nexus to vegetation in other park units. Because of this, and because administrative roads and trails that allow traditional bicycle use typically have limited connectivity with other National Park System trails, the no-action alternative would not result in any “national-level” collective impacts to vegetation across the National Park System.

Cumulative Impacts

As discussed above, the ongoing impacts of the no-action alternative would not result in any “national-level” effects to vegetation. There are no other past, present, or reasonably foreseeable future actions that have had, or would potentially have impacts to vegetation on or around administrative roads and trails across the National Park System. Therefore, there would not be any “national-level” cumulative impacts to vegetation as a result of implementing the no-action alternative.

Conclusion

Overall, vegetation on and around administrative roads and trails that allow traditional bicycle use would remain in a state similar to existing conditions. Bicycle use would continue to be prohibited on the majority of trails in the National Park System. Impacts to vegetation would remain “localized,” and would not cause impacts that have a geographic or shared ecological nexus to vegetation in other park units. The no-action alternative would not result in any “national-level” collective impacts to vegetation across the National Park System.

3.4.3 Environmental Consequences of the Proposed Action - Vegetation

Under the proposed action, the NPS would provide superintendents with the discretion to allow e-bike use on administrative roads and trails where traditional bicycle use is also allowed. Existing regulations require that, prior to allowing bicycles (and therefore prior to allowing e-bikes), the superintendent determine that traditional bicycle use is consistent with the protection of the park unit’s natural, scenic, and aesthetic values, safety considerations and management objectives and will not disturb wildlife or park resources. In addition, before designating existing trails for bicycle use (and therefore before designating existing trails for e-bike use), superintendents are required to consider sustainable trail design features and determine that no significant adverse impacts would occur as a result of traditional bicycle use. The regulations require new trails that would allow traditional bicycle use (and therefore could allow e-bike use) to be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines.

As noted in section 3.2.1, at the time the 2020 rule was published, approximately 130 of the more than 400 park units in the National Park System allowed e-bikes on specific administrative roads or trails in those park units. Some park units may allow bicycles on administrative roads or existing trails for the first time in the future, or build new bicycle trails, but it is unlikely that a significant number of park units would do so. Therefore, under the proposed action, e-bike use would only occur on a limited subset of administrative roads and trails where traditional bicycle use is authorized in specific units of the National Park System. As discussed in the “Affected Environment” and under the analysis of the no-action alternative, traditional bicycles would continue to be prohibited on the majority of trails within the National Park System. Consequently, e-bike use would be prohibited on most trails as well.

Allowing superintendents to authorize e-bike use on administrative roads and trails where bicycles are allowed would result in impacts to vegetation on and around administrative roads and trails in the form of vegetation loss from trampling and dispersal of non-native seeds and plant pathogens, similar to what would occur under the no-action alternative. Although there is a limited information that directly looks that the differences in impacts to vegetation from e-bikes versus traditional bicycle use, available literature shows that bicycle impacts are similar to hiking and less damaging than equestrian and motorized uses, and when it comes to impacts to vegetation the primary issue is not the type of use, but the way the trail is designed and constructed (IMBA 2016; Marion and Wimpey 2007; Marion 2023).

The addition of e-bikes could increase the number of visitors using specific administrative roads and trails within specific park units to a limited degree. While an increase in users could exacerbate impacts to vegetation, studies have shown that the most damage to vegetation

occurs with initial traffic and that the per capita increase in further impact diminishes rapidly with increasing subsequent traffic (Marion and Wimpey 2007). Furthermore, increases in use from e-bikes would only be seen on a relatively small subset of trails that allow traditional bicycle use, because superintendents would only be authorized to allow e-bike use on administrative roads and trails where traditional bicycle use is authorized, and even then, superintendents could choose to designate only a subset of those locations for e-bike use. Some e-bike users could potentially travel farther distances than they otherwise could on a traditional bicycle (MacArthur et al. 2014), thereby creating the possibility that more remote portions of administrative roads and trails could be impacted than would be the case with traditional bicycle use.

As is the case with traditional bicycles under the no-action alternative, unauthorized off-trail use of e-bikes could result in greater adverse impacts to vegetation than use on authorized trails, and with the potential for some e-bike users to travel farther distances, off-trail use could occur in areas it would not occur if only traditional bicycles were allowed. However, unauthorized off-trail e-bike use has not been reported as a problem of concern by park units that allow e-bikes, and there is no indication it may become a widespread issue under the proposed action. In the relatively rare instances where such use occurs, vegetation would be expected to recover quickly (Thurston and Reader 2001).

Under 36 CFR 4.30, traditional bicycles may not be allowed on an existing trail if such use would cause a significant impact. Thus, the rule would only authorize superintendents to allow e-bike use on existing trails where traditional bicycles do not have significant adverse impacts. Based on available data, the NPS expects the use of e-bikes and traditional bicycles on trails would not cause significant adverse impacts if significant adverse impacts would not occur from traditional bicycle use alone.

Impacts to vegetation would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30. In addition, impacts to vegetation on or around new trails would be mitigated because new trails would be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines. Impacts related to non-native seed and plant pathogen dispersal could be mitigated by encouraging bike cleaning between rides, control of non-native species at trailheads and increasing visitor awareness in areas of concern (Weiss et al. 2016). Park units that allow e-bike use on administrative roads and trails could establish monitoring protocols to collect data regarding e-bike impacts, which could provide park unit-specific data that could help park managers adjust management strategies as needed, thereby further mitigating impacts.

Similar to the no-action alternative, impacts to vegetation from hiking, traditional bicycle use, horseback riding and, in this case, e-bike use, would be “localized,” and would not cause impacts that have a geographic or shared ecological nexus to vegetation in other park units. Because of this, and because administrative roads and trails that would allow e-bike use typically have limited connectivity with other National Park System trails, the proposed action would not result in any “national-level” collective impacts to vegetation across the National Park System.

Cumulative Impacts

As discussed above, the proposed action would not result in any “national-level” effects to vegetation. There are no other past, present, or reasonably foreseeable future actions that have had, or would potentially have impacts to vegetation on or around administrative roads and trails across the National Park System. Therefore, there would not be any “national-level” cumulative impacts to vegetation as a result of implementing the proposed action.

Conclusion

Overall, e-bike use within the National Park System would only occur on a limited number of administrative roads and trails where 1) traditional bicycle use is allowed; and 2) the superintendent has decided to allow e-bikes, or specific classes of e-bikes. E-bikes would not be allowed on administrative roads or trails in the majority of park units. Impacts to vegetation would be substantially similar to those expected under the no-action alternative. Compared to the no-action alternative, there is the potential for slightly greater impacts to vegetation within a given park unit, due to the potential for increased numbers of visitors using e-bikes on administrative roads and trails and traveling farther distances than they would otherwise travel on traditional bicycles. These impacts, however, would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30. Impacts to vegetation would be “localized,” and would not have a geographic or shared ecological nexus to vegetation in other park units. The proposed action would not result in any “national-level” collective impacts to vegetation across the National Park System.

3.5 Visitor Use and Experience

3.5.1 Affected Environment - Visitor Use and Experience

The National Park System contains a myriad of administrative roads and trails in park units, consisting of thousands of miles System-wide. The most popular uses of trails are walking and hiking. Traditional bicycle use and horseback riding also occur in some park units, on a limited number of specifically designated administrative roads and trails. Some administrative roads and trails where bicycle use is allowed also allow horseback riding. While traditional bicycle use is a popular recreational activity in a number of park units, a majority of park units do not allow bicycle use on trails. In park units where administrative roads exist, they are used by park unit staff for various purposes, including motor vehicle use.

Bicycling is a low-impact exercise that offers a wide range of physical and mental health benefits. It can provide cardiovascular benefits, increase muscle strength and flexibility, decrease stress, and improve overall mental well-being. Bicycle use in National Park System units advances the NPS’s “Healthy Parks Healthy People” goals to promote park units as a health resource. Bicycle users of all skill levels and ages enjoy riding on administrative roads and trails for scenery, exercise, and adventure. From leisurely rides to challenging alpine climbs, bicycle use on specifically designated administrative roads and trails offers spectacular

opportunities to access and enjoy resources in areas National Park System units where such use is authorized.

While there are a number of benefits from bicycle use, two primary safety concerns persist regarding bicycle use in park units – the potential for accidents or injuries, and user conflicts (Osbaldeston 1998; Cessford 1995). Although accidents and injuries do occur, such instances are relatively uncommon, suggesting that fears are typically related to anticipation of potential threats rather than real, dangerous experiences (Cessford 1995).

Conflicts among trail users can result from differences in activity “styles” and associated perceptions. Conflicts can occur between walkers, bicyclists, and horseback riders. For example, conflicts between horseback riders and other user groups can include presence of manure, increased incidence of insects attracted to manure, introduction of smells and the sight of horses and associated infrastructure (Newsome et al. 2008). Trail user conflict is described as “goal interference attributed to another’s behavior” (Jacob and Schreyer 1980), and can arise over issues such as trail displacement, right of way, speed, and environmental impacts (Cessford 2002). Education and liaison programs, coupled with shared trails, have the potential to mitigate conflicts between different users (Goeft and Alder 2001). Effective management of user conflicts can be achieved by modifying behaviors and trail designs. Strategies such as education, enforcing trail etiquette, diverse trail styles, speed-controlling design features, user distribution tactics, and providing ample sight distance and passing opportunities can result in a more harmonious experience for all users.

Under 36 CFR 4.30, traditional bicycles may not be allowed on an existing trail if such use would cause a significant impact. Impacts related to accidents injuries, and user conflicts are mitigated by adherence to sustainable trail design principles, trail maintenance activities undertaken by specific park units, and/or closures or other restrictions authorized under 36 CFR 4.30. Because bicycle use is not allowed on most trails in park units, in many cases visitors who experience or perceive a conflict with bicycle users or other forms of recreation where bicycles are authorized, such as horseback riding, can choose to recreate in other locations in park units they are visiting, including other trails that do not allow these recreational uses.

Activities such as hiking, traditional bicycle use, and horseback riding on administrative roads and trails have not resulted in any “national-level” collective impacts to visitor use and experience across the National Park System. Nor have impacts from motorized use on administrative roads. Impacts to visitor use and experience from those uses on administrative roads and trails are considered to be “localized,” meaning impacts are typically confined to the park unit that an individual is visiting, at the time they visit. Although some individuals may visit a number of park units that allow bicycle use and other forms of recreation such as horseback riding on administrative roads or trails, that does not result in “national-level” impacts to visitor use and experience because those individuals experience only a limited number of the more than 400 park units in the National Park System, and have the opportunity in most of those units to recreate in locations that do not allow bicycle use or horseback riding. Further, those individuals may be present on a trail or administrative road when no bicycles or horses are present, even though they are allowed.

As visitation to park units increases, there is a potential for conflicts to increase on administrative roads and trails from increased use of those areas. Furthermore, climate change

could increase or decrease the potential for adverse impacts to trail conditions, depending on the specific temperature and precipitation changes experienced by each park unit. Impacts to trail conditions could impact the quality of visitor experience for those who recreate on administrative trails and roads. Adverse impacts to visitor use and experience resulting from an increased number of visitors or from climate change can be mitigated by incorporating additional aspects of sustainable trail design features, adapting trail maintenance activities conducted by specific park units, by implementing closures or other restrictions authorized under 36 CFR 4.30, and/or by taking other actions related to visitor use patterns under their general discretionary authority in 36 CFR 1.5.

3.5.2 Environmental Consequences of the No-Action Alternative - Visitor Use and Experience

Under the no-action alternative, traditional bicycle use would continue to occur under the existing regulations at 36 CFR 4.30 and as discussed in section 2.1, e-bike use could occur on administrative roads or trails in some park units. Impacts to visitor use and experience from visitors hiking, using traditional bicycles, and riding horses, as described under the “Affected Environment” would continue, as would impacts from motor vehicle use on administrative roads. Opportunities to use traditional bicycles and horses on specific, designated administrative roads trails in some park units would remain. Visitors who choose to use traditional bicycles on designated administrative roads and trails would continue to experience associated health benefits, and would continue to have opportunities to access and enjoy resources in areas of park units that allow such use. Instances of accidents and injuries would continue to occur at similar rates and under similar circumstances, as would conflicts between visitors who use administrative roads and trails where traditional bicycle use is authorized. Impacts to visitor use and experience where e-bike use occurs would be similar to those described under the proposed action (section 3.5.3). In addition, conflicts could result from uncertainty about the ability to use e-bikes.

As described in section 2.1, the no-action alternative assumes that the rule has not been promulgated and that there is no nationwide policy about the use of e-bikes. Under the no-action alternative, superintendents would have no specific authority to allow e-bike use in park units and no policy direction about how to use existing authorities to manage e-bikes. This would result in inconsistent management of e-bike use across the National Park System. In most park units, visitors would likely be allowed to use e-bikes on public roads and parking lots where motor vehicle use is allowed. In some park units, e-bike use also could occur on some administrative roads and trails where traditional bicycles are authorized. While superintendents could use their general discretionary authority in 36 CFR 1.5 to define e-bikes and establish operating requirements, this would occur on a park-by-park basis without any uniformity across the National Park System. This would create confusion for visitors, adversely affecting visitor use and experience. The absence of signage specifically addressing e-bike use could result in additional confusion regarding whether signs allowing traditional bicycle use apply to e-bike use and thus whether e-bike use would be allowed in those areas.

Impacts to visitor use and experience related to traditional bicycle and in some cases, e-bike use, could only occur on a relatively small number of trails within the National Park System, in specific park units that authorize traditional bicycle use on those trails. While in the future some park units may designate existing administrative roads or trails for traditional bicycle use,

establish new trails that allow traditional bicycle use, or allow additional uses on administrative roads or trails such as horseback riding, impacts related to those actions would be similar to the impacts described under the “Affected Environment.”

Impacts to visitor use and experience would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, implementing trail or area closures or other restrictions authorized under 36 CFR 4.30, and/or by taking other actions related to visitor use patterns under their general discretionary authority in 36 CFR 1.5. Superintendents would have the ability to actively manage user conflicts between hikers, bikers, and horseback riders, and could also implement education strategies. Visitors who decide they do not want to use an administrative road or trail where bicycle or horse use is authorized because they experience or perceive a conflict with those users could choose to recreate in other locations of a park unit they are visiting, including in many cases, other administrative roads or trails that do not allow such uses. Conflicts regarding uncertainty related to the ability to use e-bikes in a specific park unit could be mitigated through use of the superintendent’s compendium to establish definitions, areas for their use, and operating requirements, but the regulatory ambiguity discussed above would complicate and possibly deter such compendium actions.

Consistent with the discussion in the “Affected Environment,” impacts to visitor use and experience from hiking, bicycle use, and horseback riding would continue to be “localized,” because they would be confined to the park unit that an individual is visiting, at the time they visit. Because of this, and because bicycle use would continue to be prohibited on the majority of trails in the National Park System, the no-action alternative would not result in any “national-level” collective impacts to visitor use and experience across the National Park System.

Cumulative Impacts

As discussed above, the ongoing impacts of the no-action alternative would not result in any “national-level” effects to visitor use and experience. There are no other past, present, or reasonably foreseeable actions that would potentially have impacts to visitor use and experience across the National Park System. Therefore, there would be no “national-level” cumulative impacts as a result of implementing the no-action alternative.

Although some individuals may visit a number of park units that allow bicycle use and other forms of recreation such as horseback riding on administrative roads or trails, that would not result in “national-level” cumulative impacts to visitor use and experience because those individuals would experience only a limited number of the more than 400 park units in the National Park System, and would have the opportunity in most of those units to recreate in locations that do not allow bicycle use or horseback riding.

Conclusion

Overall, visitor use and experience in specific park units that allow traditional bicycle use on administrative roads and trails would continue to be affected in the same ways discussed under the “Affected Environment,” from uses such as hiking, traditional bicycle use, and horseback riding. Bicycle use would continue to be prohibited on the majority of trails in the National Park System. Uncertainty about the ability to use e-bikes could result in confusion and conflict

between visitors. Impacts to visitor use and experience would remain “localized,” and the no-action alternative would not result in any “national-level” collective impacts to visitor use and experience across the National Park System.

3.5.3 Environmental Consequences of the Proposed Action - Visitor Use and Experience

Under the proposed action, the NPS would provide superintendents with the discretion to allow e-bike use on administrative roads and trails where traditional bicycle use is also allowed. Existing regulations require that, prior to allowing bicycles (and therefore prior to allowing e-bikes), the superintendent determine that traditional bicycle use is consistent with the protection of the park unit’s natural, scenic, and aesthetic values, safety considerations and management objectives and will not disturb wildlife or park resources. In addition, before designating existing trails for bicycle use (and therefore before designating existing trails for e-bike use), superintendents are required to consider sustainable trail design features and determine that no significant adverse impacts would occur as a result of traditional bicycle use. The regulations require new trails that would allow traditional bicycle use (and therefore could allow e-bike use) to be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines.

As noted in section 3.2.1, at the time the 2020 rule was published, approximately 130 of the more than 400 park units in the National Park System allowed e-bikes on specific administrative roads or trails in those park units. Some park units may allow bicycles on administrative roads or existing trails for the first time in the future, or build new bicycle trails, but it is unlikely that a significant number of park units would do so. Therefore, under the proposed action, e-bike use would only occur on a limited subset of administrative roads and trails where traditional bicycle use is authorized in specific units of the National Park System. As discussed in the “Affected Environment” and under the analysis of the no-action alternative, traditional bicycles would continue to be prohibited on the majority of trails within the National Park System. Consequently, e-bike use would be prohibited on most trails as well.

Visitors in park units where e-bike use is authorized would experience impacts on specific administrative roads or trails where e-bikes are authorized from other visitors who may be hiking, using traditional bicycles, or riding horses. Visitors would also experience impacts from motor vehicle use on administrative roads. These impacts would be similar to what would occur under the no-action alternative. This includes health benefits, opportunities to access and enjoy resources in specific areas of park units, risk of accidents and injuries, and potential conflicts. However, these impacts would be slightly greater due to the addition of e-bikes, which could increase the number of visitors using administrative roads and trails where e-bikes are allowed within specific park units to a limited degree. Increases in use from e-bikes would only be seen on a relatively small subset of trails that allow traditional bicycle use, because superintendents would only be authorized to allow e-bike use on administrative roads and trails where traditional bicycle use is authorized, and even then, superintendents could choose to designate only a subset of those locations for e-bike use.

E-bikes provide similar health benefits as traditional bicycles. They provide moderate-intensity physical activity, less intense than traditional cycling but more than walking and can improve cardiorespiratory fitness in physically inactive individuals (Bourne et al. 2018). Both e-bike and

traditional bicycle users can experience improved cognitive function and mental health, with a potentially larger effect for e-bike users (Leyland et al. 2019). One study found that experienced mountain bikers using e-bikes retained most of their exercise response (94%), exceeding the thresholds for cardiovascular fitness. Participants in that study perceived e-bike use as a positive activity (Hall et al. 2019).

E-bike users, especially older users and those with physical limitations, use them to travel further distances, ascend hills with less effort, and reduce overall physical strain (MacArthur et al. 2014; Castro et al. 2019). Many e-bike users consider e-bikes to be an “equalizer” allowing them to keep up with a spouse, friend or family member who is a faster cyclist (Popovich et al. 2014). Contributing factors to e-bike adoption include increased convenience, reduced physical exertion, fun, and reduced reliance on a vehicle. Barriers to e-bike adoption include cycling infrastructure and road safety, regulation, and stigmatization (Leger et al. 2019).

Conflicts among visitors who recreate on administrative roads and trails where e-bike use would be authorized would continue to result from differences in activity “styles” and associated perceptions. Conflicts could increase in some park units to some degree due to the increase in visitors on administrative roads and trails where e-bike use is allowed, and from the use of e-bikes themselves, which may travel at higher speeds than traditional bicycles. Studies have found that users of trails who aren’t familiar with e-bikes often indicate a preference not to share those trails with e-bikes. However, most of these users did not realize that they were actually using the trail alongside e-bikes and upon gaining exposure to e-bikes, many trail users’ apprehensions regarding them tend to diminish (Nielson et al. 2019).

Existing literature with regard to e-bike safety suggests that e-bike use on administrative roads and trails could result in slight increases in risks of accidents and injuries in compared to the no-action alternative, but the literature primarily focuses on e-bike use on roads rather than trails and therefore is not conclusive. One study found that e-bike users on roads rode faster than traditional bicycle users and that braking and sharp deceleration were higher when riding an e-bike than when riding a traditional bicycle. The study also found that e-bike users required more reactive braking maneuvers when riding e-bikes and that decelerations during sharp braking were higher for e-bikes than traditional bicycles (Huertas-Leyva et al. 2018). Another study indicated that e-bike users and traditional bicycle users on roads demonstrated a similar degree of involvement in traffic conflicts, with no notable disparity overall except for intersections and that the rate of speed prior to an incident was typically higher for e-bikes than traditional bicycles (Petzoldt et al. 2017). A study that looked at the differences in e-bike classes with regard to safety found that Class 3 e-bikes share a comparable crash risk with Class 1 e-bikes, although the injuries sustained tend to be somewhat more severe when crashes occur. The study found that Class 1 e-bikes exhibit a marginal speed advantage over traditional bicycles, averaging 3.0 km/hr (1.86 mi/hr) faster, leading to marginally higher rates of safety incidents and necessitating more safety-focused maneuvers. It also found that Class 3 e-bikes, on the other hand, travel at speeds higher than traditional bicycles, approximately doubling the average speed. However, the authors concluded that it is unclear whether e-bikes are safer or more hazardous than traditional bicycles, and under what specific conditions (Cherry and MacArthur 2019). One study that examined e-bike use on roads and shared paths found that on shared-use paths traditional bicycle users travel faster than e-bike users (Langford et al. 2015). The same study revealed that, in terms of safety behaviors such as riding in the correct direction, complying with stop

signs, and adhering to traffic signals, e-bike riders exhibited a pattern almost identical to those riding traditional bicycles.

Compared to the no-action alternative, visitors who want to ride a bicycle on administrative roads and trails in park units, but might not otherwise do so because of physical fitness, age, or convenience would experience beneficial impacts if they could obtain an e-bike, are capable of using one, and that use is allowed. Conversely, visitors who experience or perceive a conflict with e-bike users and therefore may decide they do not want to use an administrative road or trail where e-bike use is authorized, would be adversely affected. Because the NPS would implement the 2020 rule there would be specific rules about the use of e-bikes on trails in park units where bicycles are allowed, which would represent a beneficial impact to all visitors compared to the no-action alternative.

Adverse impacts to visitor use and experience would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, implementing trail or area closures or other restrictions authorized under 36 CFR 4.30, and/or by taking other actions related to visitor use patterns under their general discretionary authority in 36 CFR 1.5. Park units that allow e-bike use on administrative roads and trails could establish monitoring protocols to collect data regarding e-bike impacts, which could provide park unit-specific data that could help park managers adjust management strategies as needed, thereby further mitigating impacts. Superintendents would have the ability to actively manage user conflicts between hikers, bikers, horseback riders, and e-bike users, and could also implement education strategies. Visitors who decide they do not want to use an administrative road or trail where bicycle, horse, or e-bike use is authorized because they experience or perceive a conflict with those users could choose to use other areas of a park unit they are visiting, including in many cases, other administrative roads and trails that do not allow such uses.

Similar to the no-action alternative and consistent with the discussion in the “Affected Environment,” impacts to visitor use and experience from hiking, traditional bicycle use, horseback riding and, in this case, e-bike use, would be “localized,” because they would be confined to the park unit that an individual is visiting, at the time they visit. Because of this, and because most park units within the National Park System would not allow e-bike use, the proposed action would not result in any “national-level” collective impacts to visitor use and experience across the National Park System.

Cumulative Impacts

As discussed above, the proposed action would not result in any “national-level” effects to visitor use and experience. There are no other past, present, or reasonably foreseeable actions that would potentially have impacts to visitor use and experience across the National Park System. Therefore, there would not be any “national-level” cumulative impacts as a result of implementing the proposed action.

Although some individuals may visit a number of park units that allow bicycle use and other forms of recreation such as horseback riding and traditional bicycle use on administrative roads or trails, that would not result in “national-level” cumulative impacts to visitor use and experience because those individuals would experience only a limited number of the more than 400 park

units in the National Park System, and would have the opportunity in most of those units to recreate in locations that do not allow e-bike use, horseback riding, or traditional bicycle use.

Conclusion

Overall, e-bike use within the National Park System would only occur on a limited number of administrative roads and trails where 1) traditional bicycle use is allowed; and 2) the superintendent has decided to allow e-bikes, or specific classes of e-bikes. E-bikes would not be allowed on administrative roads or trails in the majority of park units. Visitor use and experience would be affected in a manner similar to the no-action alternative, including health benefits, opportunities to access and enjoy resources in specific areas of park units, risk of accidents and injuries, and potential conflicts. Impacts could be slightly greater than the no-action alternative within some park units due to the addition of e-bikes. However, impacts would be mitigated by adherence to sustainable trail designs, trail maintenance, implementation of closures of portions of trails or other restrictions as authorized under 43 CFR 4.30, and/or by superintendents taking other actions related to visitor use patterns under their general discretionary authority in 36 CFR 1.5. Active conflict management and education strategies could also be used to mitigate impacts. Implementation of the 2020 rule would provide regulatory certainty to visitors, removing ambiguities that would exist under the no-action alternative. Impacts to visitor use and experience would be “localized,” and would not result in any “national-level” collective impacts to visitor use and experience across the National Park System.

3.6 Wildlife

3.6.1 Affected Environment - Wildlife

National Park System units span across different types of environments, including deserts, coasts, forests, mountains, and prairies, which host a diverse array of wildlife species. Each park unit includes unique ecosystems that support a variety of habitats for its resident wildlife, playing an important role in conservation efforts. Wildlife in park units include invertebrates, amphibians, reptiles, birds, and mammals.

Many administrative roads and trails within the National Park System are located in or near wildlife habitats. Bicycle use on administrative roads and trails can result in temporary displacement of wildlife and modification of wildlife behavior in the immediate vicinity of the administrative road or trail. Bicycle use has been found to result in similar impacts to wildlife as hiking and other non-motorized uses (Marion and Wimpey 2007). In general, the impact of trail uses such as hiking, traditional bicycle use and horseback riding on wildlife depends on a variety of factors, including the species present, the intensity and timing of trail use, and the behavior of trail users. Although wildlife may avoid trails where bicycle use is allowed, wildlife may quickly recolonize a trail use area after use has ended, for example, during periods of low to no use or when a park unit is closed (Naylor et al. 2009; Wisdom et al. 2018). Wildlife may habituate to frequently repeated disturbance along trails and roads (Miller et al. 2020, Naylor et al. 2009, Taylor and Knight 2003). This may depend on the species, habitat, and predictability of the recreational activity time and location (Miller et al. 2020). In some instances, habituation can result in uses having little to no impacts (Marion and Wimpey 2007). Unauthorized off-trail

use can result in greater adverse impacts than on-trail use to wildlife (Taylor and Knight 2003; Miller et al. 2020). However, off-trail use has not been reported as a widespread problem of concern in park units that allow bicycle use. Motor vehicle use by park unit staff on administrative roads can also cause impacts to wildlife such as displacement and avoidance.

Under 36 CFR 4.30, traditional bicycles may not be allowed on an existing trail if such use would cause a significant impact. Superintendents mitigate impacts to wildlife on and near administrative roads and trails in their specific park unit by incorporating aspects of sustainable trail design features, conducting trail maintenance activities, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30, as appropriate. Educating visitors regarding proper etiquette with regard to wildlife viewing and encounters can also be highly effective for mitigating impacts to wildlife (Marion and Wimpey 2007).

Impacts to wildlife from hiking, traditional bicycle use, and horseback riding on administrative roads and trails are considered to be “localized,” meaning they are typically confined to areas on and around specific administrative roads and trails where bicycle use is authorized, and do not have a geographic or shared ecological nexus to wildlife in other park units. Hiking, bicycle use, and horseback riding on administrative roads and trails where bicycle use is allowed has not resulted in any “national-level” collective impacts to wildlife across the National Park System.

As visitation to park units increases, there is a potential for the impacts discussed above to increase on administrative roads and trails from increased use of those areas. Furthermore, climate change could increase or decrease the potential for adverse impacts to wildlife, depending on the specific temperature and precipitation changes experienced by each park unit. Adverse impacts to wildlife resulting from an increased number of visitors or from climate change can be mitigated by incorporating additional aspects of sustainable trail design features, adapting trail maintenance activities conducted by specific park units, implementing closures or other restrictions authorized under 36 CFR 4.30, and by educating visitors regarding proper etiquette with regard to wildlife viewing and encounters.

3.6.2 Environmental Consequences of the No-Action Alternative - Wildlife

Under the no-action alternative, wildlife in specific park units where traditional bicycle use is authorized on administrative roads and trails would continue to experience the same impacts from hiking, bicycle use, and horseback riding as described above in the “Affected Environment,” including temporary displacement and modification of behavior. Wildlife on and around administrative roads would also continue to be impacted by ongoing motor vehicle use by park unit staff. Traditional bicycle use would continue to occur under the existing regulations at 36 CFR 4.30 and as discussed in section 2.1, e-bike use could occur on some administrative roads or trails in some park units where traditional bicycles are authorized. Impacts to wildlife on administrative roads or trails where e-bike use occurs would be similar to those described under the proposed action (section 3.6.3).

Impacts to wildlife from traditional bicycle and in some cases, e-bike use, could only occur on a relatively small number of trails within the National Park System, in specific park units that authorize traditional bicycle use on those trails. While in the future some park units may designate existing administrative roads or trails for traditional bicycle use, establish new trails that allow traditional bicycle use, or allow additional uses on administrative roads or trails such

as horseback riding, impacts related to those actions would be similar to the impacts described under the “Affected Environment.”

As discussed above, unauthorized off-trail use has not been reported as a widespread problem of concern by park units that allow bicycle use, and there is no indication it may become a widespread issue under the no-action alternative.

Impacts to wildlife would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30, as appropriate. Educating visitors regarding proper etiquette with regard to wildlife viewing and encounters can also be highly effective for mitigating impacts to wildlife (Marion and Wimpey 2007). In addition, impacts to wildlife on or around new trails would be mitigated because new trails would be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines and would avoid sensitive wildlife habitat. Educating visitors regarding proper etiquette with regard to wildlife viewing and encounters can also be highly effective for mitigating impacts to wildlife (Marion and Wimpey 2007).

Consistent with the discussion in the “Affected Environment,” impacts to wildlife from hiking, traditional bicycle use, and horseback riding would continue to be “localized,” and would not cause impacts that have a geographic or shared ecological nexus to wildlife in other park units. Because of this, and because administrative roads and trails where bicycle use is allowed typically have limited connectivity with other National Park System trails, the no-action alternative would not result in any “national-level” collective impacts to wildlife across the National Park System.

Cumulative Impacts

As discussed above, the ongoing impacts of the no-action alternative would not result in any “national-level” effects to wildlife. There are no other past, present, or reasonably foreseeable future actions that have had, or would potentially have impacts to wildlife on or around administrative roads and trails across the National Park System. Therefore, there would not be any “national-level” cumulative impacts to wildlife as a result of implementing the no-action alternative.

Conclusion

Overall, wildlife on and around administrative roads and trails that allow traditional bicycle use would remain in a state similar to existing conditions. Bicycle use would continue to be prohibited on the majority of trails in the National Park System. Impacts to wildlife would remain “localized,” and would not cause impacts that have a geographic or shared ecological nexus to related wildlife in other park units. The no-action alternative would not result in any “national-level” collective impacts to wildlife across the National Park System.

3.6.3 Environmental Consequences of the Proposed Action - Wildlife

Under the proposed action, the NPS would provide superintendents with the discretion to allow e-bike use on administrative roads and trails where traditional bicycle use is also allowed. Existing regulations require that, prior to allowing bicycles (and therefore prior to allowing e-bikes), the superintendent determine that traditional bicycle use is consistent with the protection of the park unit's natural, scenic, and aesthetic values, safety considerations and management objectives and will not disturb wildlife or park resources. In addition, before designating existing trails for bicycle use (and therefore before designating existing trails for e-bike use), superintendents are required to consider sustainable trail design features and determine that no significant adverse impacts would occur as a result of traditional bicycle use. The regulations require new trails that would allow traditional bicycle use (and therefore could allow e-bike use) to be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines.

As noted in section 3.2.1, at the time the 2020 rule was published, approximately 130 of the more than 400 park units in the National Park System allowed e-bikes on specific administrative roads or trails in those park units. Some park units may allow bicycles on administrative roads or existing trails for the first time in the future, or build new bicycle trails, but it is unlikely that a significant number of park units would do so. Therefore, under the proposed action, e-bike use would only occur on a limited subset of administrative roads and trails where traditional bicycle use is authorized in specific units of the National Park System. As discussed in the "Affected Environment" and under the analysis of the no-action alternative, traditional bicycles would continue to be prohibited on the majority of trails within the National Park System. Consequently, e-bike use would be prohibited on most trails as well.

Allowing superintendents to authorize e-bike use on administrative roads and trails where bicycles are allowed would result in impacts to wildlife on and around administrative roads and trails similar to what would occur under the no-action alternative, including temporary displacement of wildlife and modification of behavior. Bicycle use has been found to result in similar impacts to wildlife as hiking and other non-motorized uses (Marion and Wimpey 2007; Taylor and Knight 2003). The available literature regarding the difference in impacts between e-bikes and traditional bicycles concludes there is no significant difference in impacts to wildlife between e-bikes and traditional bicycles (Nielson et al. 2019).

The addition of e-bikes could increase the number of visitors using specific administrative roads and trails within specific park units to a limited degree. Increases in use from e-bikes would only be seen on a relatively small subset of trails that allow traditional bicycle use, because superintendents would only be authorized to allow e-bike use on administrative roads and trails where traditional bicycle use is authorized, and even then, superintendents could choose to designate only a subset of those locations for e-bike use. Some e-bike users could potentially travel farther distances than those users otherwise could on traditional bicycles (MacArthur et al. 2014; Miller et al. 2020), thereby creating the possibility that wildlife in more remote portions of park units accessible by administrative roads and trails that allow e-bikes could be impacted more than would be the case under the no-action alternative.

As is the case with traditional bicycles under the no-action alternative, unauthorized off-trail use could result in greater adverse impacts to wildlife than use on authorized trails, and with the

potential for some e-bike users to travel farther distances, off-trail use could occur in areas it would not occur if only traditional bicycles were allowed. However, unauthorized off-trail e-bike use has not been reported as a problem of concern by park units that allow e-bikes, and there is no indication it may become a widespread issue under the proposed action.

Under 36 CFR 4.30, traditional bicycles may not be allowed on an existing trail if such use would cause a significant impact. Thus, the rule would only authorize superintendents to allow e-bike use on existing trails where traditional bicycles do not have significant adverse impacts. Based on available data, the NPS expects the use of e-bikes and traditional bicycles on trails would not cause significant adverse impacts if significant adverse impacts would not occur from traditional bicycle use alone.

Similar to the no-action alternative, impacts to wildlife would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, and/or implementing trail or area closures or other restrictions authorized under 36 CFR 4.30. In addition, impacts to wildlife on or around new trails would be mitigated because new trails would be developed and constructed in accordance with appropriate sustainable trail design principles and guidelines and would avoid sensitive wildlife habitat. Educating visitors regarding proper etiquette with regard to wildlife viewing and encounters can also be highly effective for mitigating impacts to wildlife (Marion and Wimpey 2007). Park units that allow e-bike use on administrative roads and trails could establish monitoring protocols to collect data regarding e-bike impacts, which could provide park unit-specific data that could help park managers adjust management strategies as needed, thereby further mitigating impacts.

As is the case with traditional bicycles, impacts to wildlife from hiking, traditional bicycle use, horseback riding and, in this case, e-bike use under the proposed action would be “localized,” and would not cause impacts that have a geographic or shared ecological nexus to wildlife in other park units. Because of this, and because administrative roads and trails that would allow e-bike use typically have limited connectivity with other National Park System trails, the proposed action would not result in any “national-level” collective impacts to wildlife across the National Park System.

Cumulative Impacts

As discussed above, the proposed action would not result in any “national-level” effects to wildlife. There are no other past, present, or reasonably foreseeable future actions that have had, or would potentially have impacts to wildlife on or around administrative roads and trails across the National Park System. Therefore, there would not be any “national-level” cumulative impacts to wildlife as a result of implementing the proposed action.

Conclusion

Overall, e-bike use within the National Park System would only occur on a limited number of administrative roads and trails where 1) traditional bicycle use is allowed; and 2) the superintendent has decided to allow e-bikes, or specific classes of e-bikes. E-bikes would not be allowed on administrative roads or trails in the majority of park units. Impacts to wildlife would be substantially similar to those expected under the no-action alternative. Compared to the no-

action alternative, there is the potential for slightly greater impacts to wildlife within a given park unit, due to the potential for increased numbers of visitors using e-bikes on administrative roads and trails and traveling farther distances than they would otherwise travel on traditional bicycles. These impacts, however, would be mitigated by superintendents incorporating aspects of sustainable trail design features, conducting trail maintenance activities in their specific park unit, implementing trail or area closures or other restrictions authorized under 36 CFR 4.30, and by educating visitors regarding proper etiquette with regard to wildlife viewing and encounters. Impacts to wildlife would be “localized,” and would not have a geographic or shared ecological nexus to wildlife in other park units. The proposed action would not result in any “national-level” collective impacts to wildlife across the National Park System.

4. AGENCIES AND PERSONS CONSULTED

Personnel from the NPS Washington Office, park units, and the Department of the Interior were consulted during the preparation of this EA.

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Appendix A: Issues and Impact Topics Considered but Not Carried Forward for Detailed Analysis

The CEQ NEPA regulations state that agencies should prepare concise EAs (40 CFR 1508.1(h)), identify significant environmental issues that deserve study, and deemphasize insignificant issues, discussing “other than significant issues” only briefly (40 CFR 1500.4(i); 1502.2(b)). Section 4.2(E) of the NPS NEPA Handbook states that issues should only be carried forward for detailed analysis for the following reasons:

- The environmental impacts associated with the issue are central to the proposal or of critical importance.
- A detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives.
- The environmental impacts associated with the issue are a big point of contention among the public or other agencies.
- There are potentially significant impacts to resources associated with the issue.

The NPS NEPA Handbook states that if the considerations above do not apply to an issue, the issue should be dismissed from detailed analysis. The following resources were dismissed from detailed for the reasons described below.

Air Quality

Compared to conventional motor vehicles, e-bikes emit significantly fewer pollutants. Increasing e-bike usage and correspondingly reducing car usage could lead to a decrease in emissions of pollutants such as nitrogen oxides, sulfur dioxide, and particulate matter, all of which can degrade air quality and harm human health (MacArthur et al. 2014). If e-bikes were to replace car usage for in-park transport, local air quality would be expected to improve (McQueen et al. 2019).

However, under the alternatives carried forward for detailed analysis, e-bike use would only occur in certain areas of some park units, and would not occur on a scale that would replace a meaningful number of cars for in-park transport. Overall, e-bike use under the alternatives considered in the PEA would have minimal impacts to air quality in park units locally, and would not have discernable “national-level” impacts to air quality within the National Park System. Therefore, impacts to air quality have been dismissed from detailed analysis in this PEA.

Cultural Resources

Available data indicates that several park units that allow e-bike use identified potential impacts to historic properties, historic districts, cultural landscapes, or archaeological sites as potential concerns, and most noted that impacts would be minimal or were mitigated. Available data also indicates that no park units that allow e-bike use determined that impacts would result in an adverse effect under Section 106 of the National Historic Preservation Act (NHPA). Park units reported reaching a finding of no adverse effect, no historic properties affected, or no potential to cause adverse effects.

While unauthorized e-bike use has the potential to affect undocumented off-trail archeological resources, such use has not been reported as a problem of concern by park units that allow e-bikes, and there is no indication it may become a widespread issue under the alternatives carried forward for detailed analysis. Any e-bike use on roads and parking lots would not be expected to result in meaningful impacts to cultural resources because those areas are already impacted routinely by motor vehicles which are heavier and louder than e-bikes.

Superintendents are familiar with the cultural resources in park units they manage, and would have the ability under the alternatives carried forward for detailed analysis to implement trail or area closures or other restrictions authorized under 36 CFR 4.30, as appropriate. This would allow superintendents to avoid or minimize impacts to cultural resources within specific park units where e-bike use occurs.

Park units that do not currently allow e-bike use but allow e-bike use in the future or that allow e-bikes in areas where e-bikes are not currently authorized would evaluate impacts to cultural resources on a case-by-case basis and comply with the NHPA as appropriate. Adverse impacts to cultural resources would be minimal and “localized,” meaning they would typically be confined to areas within the specific park units where e-bike use occurs, and would not cause impacts that have a geographic or shared ecological nexus to wildlife in other park units. There would not be any “national-level” collective impacts to cultural resources across the National Park System. Therefore, impacts to cultural resources have been dismissed from detailed analysis in this PEA.

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, provides that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.” A minority population exists within an affected area when either the minority population exceeds 50%, or the minority population is meaningfully greater than the minority population of the general population (CEQ 1997).

When viewed from a nationwide perspective, there are no identifiable environmental justice communities that would be affected from implementation of the alternatives carried forward for detailed analysis. Environmental justice has therefore been dismissed as an impact topic in this PEA because the actions proposed would not have disproportionately high and adverse human

health or environmental effects on minority and low-income populations at a national level. Park units that allow e-bike use in the future would evaluate environmental justice issues on a park-specific basis.

Soundscapes

E-bikes have an electric motor which can emit a low steady whine when engaged. While sound emitted by e-bikes has the potential to impact wildlife and visitors, e-bikes are not likely to cause the sort of sound-related impacts that would result in harm to wildlife behavioral patterns or create conflicts with visitors seeking a natural and quiet experience. A literature review intended to inform policy discussions and decisions for the quickly growing e-bike market in four of Colorado's northern Front Range open space programs concluded, "[g]iven that e-bikes are very similar to traditional bicycles in terms of noise, trail effect, and speed, it is fair to say that their effect on wildlife [and their] habitats would be similar to other non-motorized bicycles" (Nielson et al. 2019). The literature review also found that trail users were likely to have concerns about noise caused by e-bikes; however, since the literature review found few impacts from e-bikes, the authors observed that "public perception surrounding e-bikes' [noise, trail surface, and speed] effect[s] may be at odds with observed effects." Although the effects of noise on wildlife differ across taxonomic groups and reactions to sound are different for every visitor, e-bike use under the alternatives carried forward for detailed analysis would not affect the natural soundscape in park units where such use is allowed, in a meaningful way above and beyond the use of traditional bicycles.

Superintendents would have the ability under the alternatives considered to avoid or minimize impacts to soundscapes within specific park units where e-bike use occurs by implementing trail or area closures or other restrictions authorized under 36 CFR 4.30, as appropriate.

Impacts to soundscapes from implementation of the alternatives carried forward for detailed analysis would be minimal and "localized," meaning they would typically be confined to areas within the specific park units where e-bike use occurs, and would not cause impacts that have a geographic or shared ecological nexus to wildlife in other park units. Furthermore, no "national-level" effects to soundscapes would occur from implementation of the alternatives under consideration. Therefore, impacts to soundscapes have been dismissed from detailed analysis in this PEA.

Socioeconomics

The option to use e-bikes in park units could cause some individuals to purchase an e-bike and in certain park units, visitors could use e-bikes rented from private companies for short periods of time. However, the limited use of e-bikes on a small number of trails that would occur in specific park units under the alternatives carried forward for detailed analysis would not result in discernable "national-level" socioeconomic effects. Therefore, socioeconomic impacts have been dismissed from detailed analysis in this PEA.

Special Status Species

Available data indicates that a small number of park units that allow e-bike use noted the presence of threatened or endangered species near administrative roads or trails that could allow e-bike use under the alternatives carried forward for detailed analysis. However, most reported that impacts would be minimal, could be mitigated, and would be similar to impacts from traditional bicycle use. Only one park unit had the need to initiate consultation under the Endangered Species Act that was directly related to e-bike use. A few park units noted that impacts to threatened or endangered species that could occur from e-bike use were already covered under a prior ESA consultation resulting from a previous planning process. Overall, impacts to special status species are expected to be of a similar type to those discussed in sections 3.4 (Vegetation) and 3.6 (Wildlife).

Superintendents are familiar with the special status species in park units they manage, and would have the ability under the alternatives considered to implement trail or area closures or other restrictions authorized under 36 CFR 4.30, as appropriate. This would allow superintendents to avoid or minimize impacts to special status species within specific park units where e-bike use occurs.

Park units that do not currently allow e-bike use but allow e-bike use in the future or that allow e-bikes in areas where e-bikes are not currently authorized would evaluate impacts to special status species on a case-by-case basis and comply with the ESA as appropriate. Adverse impacts to special status species are expected to be minimal and “localized,” meaning they are typically confined to areas within the specific park units where bicycle use is authorized, and would not cause impacts that have a geographic or shared ecological nexus to other special status species in other park units. There would not be any “national-level” collective impacts to special status species across the National Park System. Therefore, impacts to special status species have been dismissed from detailed analysis in this PEA.

Wilderness

E-bikes could not be authorized for use in wilderness areas under the alternatives carried forward for detailed analysis because possessing a bicycle or e-bike in a wilderness area established by Federal Statute is prohibited by 36 CFR 4.30. Furthermore, the Wilderness Act prohibits the use of mechanical transport, a term that includes e-bikes. Therefore, e-bike use could not be authorized in wilderness areas designated under the Act (16 U.S.C. 1133(c)). Because NPS Management Policies treat other categories of wilderness (eligible, study, proposed, and recommended) as designated wilderness e-bikes could also not be authorized for use in any of those areas (2006 NPS Management Policies, Section 6.3.1). Because e-bikes would not be used in designated wilderness areas or other categories of wilderness areas managed by the NPS under the alternatives considered, impacts to wilderness have been dismissed from detailed analysis.

E-bike Use on Public Roads and Parking Lots

Under both alternatives carried forward for detailed analysis, e-bike use would occur on roads and in parking lots where bicycle use is authorized. Impacts from e-bike use on roads and parking lots would be minimal because those areas are already impacted routinely by traditional

bicycle use, which has similar impacts as e-bike use, and by motor vehicles which are heavier, faster, and louder than e-bikes. There would be no meaningful difference in impacts among the alternatives and impacts from the use of e-bikes on roads and parking lots would not result in any “national-level” impacts. Therefore, impacts from the use of e-bikes on roads and parking lots have been dismissed from detailed analysis in this PEA.