



Department of Commerce Boulder Laboratories

Campus Master Plan Environmental Assessment

April 2026

Campus Master Plan

Final Environmental Assessment

April 2026

National Institute of Standards and Technology

Boulder, Colorado

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Certification Related to Page Limits

NIST hereby certifies the following:

- NIST has considered the factors mandated by NEPA.
- This EA represents NIST's good-faith effort to prioritize documentation of the most important considerations required by the statute within the congressionally mandated page limits.
- This prioritization reflects NIST's expert judgment.
- Any considerations addressed briefly or left unaddressed were, in NIST's judgment, comparatively not of a substantive nature that meaningfully informed the consideration of environmental effects and the resulting decision on how to proceed.

Certification Related to Deadline

NIST hereby certifies the following:

- This EA represents NIST's good-faith effort to fulfill NEPA's requirements within the Congressional timeline.
- Such effort is substantially complete.
- In NIST's expert opinion, it has thoroughly considered the factors mandated by NEPA.
- In NIST's judgment, the analysis contained herein is adequate to inform and reasonably explain NIST's final decision regarding the proposed federal action.

Abstract:

The Department of Commerce (DoC) has developed a 20-year Master Plan for the DoC Boulder Laboratories Campus located in Boulder, Colorado. The need for the Master Plan, and the campus improvements prescribed therein, is driven by both institutional policy and the inability of existing facilities and infrastructure to support current and projected mission requirements at the DoC Boulder Laboratories Campus.

Two alternatives were considered in detail in the Environmental Assessment. The Proposed Action would implement the DoC Boulder Laboratories Master Plan to guide the physical development of the campus to advance the agency's mission-related goals over the next 20 years. The Master Plan emphasizes quality and collaborative research in addition to efficient operations. The Master Plan addresses current campus needs and delineates future development. When and if funding becomes available, DoC would execute new construction, additions, renovation, demolition, landscape improvements, utility improvements, and circulation improvements under the Master Plan. The No-Action Alternative would continue current DoC operations and would not implement the Master Plan. The No-Action Alternative would ultimately result in a site that would no longer support the advanced research requirements of DoC and would render much of the campus obsolete. DoC's preferred alternative is the Proposed Action alternative.

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Abbreviations, Acronyms, and Symbols

ACHP	Advisory Council on Historic Preservation	MS4	Municipal Separate Storm Sewer System
APE	area of potential effects	NAAQS	National Ambient Air Quality Standards
APEN	Air Pollutant Emission Notice	NCAR	National Center for Atmospheric Research
BGEPA	Bald and Golden Eagle Protection Act	NdD	Nederland
BMPs	best management practices	NHPA	National Historic Preservation Act
BSHED	NIST Boulder Safety, Health, and Environment Division	NIST	National Institute of Standards and Technology
BVCP	Boulder Valley Comprehensive Plan	NO ₂	nitrogen dioxide
CAA	Clean Air Act	NOA	Notice of Availability
CCR	Code of Colorado Regulations	NOAA	National Oceanic and Atmospheric Administration
CDPHE	Colorado Department of Public Health and Environment	NOx	nitrogen oxides
CDR	construction, demolition, and renovation	NPDES	National Pollutant Discharge Elimination System
CFR	Code of Federal Regulations	NPS	National Park Service
CGP	Construction General Permit	NRCS	Natural Resources Conservation Service
CO	carbon monoxide	NSPS	New Source Performance Standards
CSA	Combined Statistical Area	NTIA	National Telecommunications and Information Administration
CTL	Communications Technology Laboratory	NWI	National Wetlands Inventory
Cu	Boulder, bouldery-Sylvandale complex	OAAM	Office of Acquisition and Agreements Management
CUP	Central Utility Plant	OAHP	Office of Archaeology and Historic Preservation
CWA	Clean Water Act	OFPM	Office of Facilities and Property Management
CWPP	Community Wildfire Protection Plan	OISM	Office of Information Systems Management
dba	decibel	OSHA	Occupational Safety and Health Administration
DoC	Department of Commerce	OSMP	Open Space & Mountain Parks
EA	Environmental Assessment	PCBs	polychlorinated biphenyls
EAB	emerald ash borer	PM	particulate matter
EISA	Energy Independence and Security Act	PM _{2.5}	particulate matter with a diameter of 2.5 micrometers or less
EO	Executive Order	PM ₁₀	particulate matter with a diameter of 10 micrometers or less
ES	equipment structure	PML	Physical Measurement Laboratory
ESA	Endangered Species Act	POV	privately owned vehicle
ESC	erosion and sediment control	RHA	Rivers and Harbors Act
GCR	General Conformity Rule	SF	square foot
GrF	Goldvale, bouldery-Rock outcrop complex	SGCN	species of greatest conservation need
GSA	General Services Administration	SHPO	State Historic Preservation Officer
GSF	gross square feet	SIP	State Implementation Plan
HVAC	heating, ventilation, and air conditioning	SO ₂	sulfur dioxide
IPaC	Information for Planning and Consultation	SWMP	stormwater management plan
ITL	Information Technology Laboratory	Te	Terrace Escarpments
kg	kilogram	USEPA	U.S. Environmental Protection Agency
MBTA	Migratory Bird Treaty Act	USFWS	U.S. Fish and Wildlife Service
MML	Material Measurement Laboratory	VOC	volatile organic compound
MOA	Memorandum of Agreement		

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Executive Summary

Background

The 206-acre Department of Commerce (DoC) Boulder Laboratories Campus, located in Boulder, Colorado, is home to research programs of the National Institute of Standards and Technology (NIST), the National Oceanic and Atmospheric Administration (NOAA), and the National Telecommunications and Information Administration (NTIA). A total of 1,767 research scientists, engineers, administrators, and support personnel work in 35 buildings and structures at the campus, of which 30 are occupied buildings. The campus is situated within a strikingly beautiful setting with Kohler Mesa and the Flatirons as a backdrop to the buildings and landscape. The entrance and buildings are oriented toward the east, bordering on Broadway (Colorado State Highway 93). The remainder of the property is surrounded by residential development and recreational land, with a cemetery bordering the campus at the north. The land gently rises toward the west, culminating in a steep rise to Kohler Mesa at the western end of the property. Two ephemeral water bodies transect the site: Skunk Creek and Anderson Ditch, an irrigation channel. Much of the property is designated Open Space, protected from development under a Memorandum of Agreement with the City of Boulder together with an association of Native American tribes.

Purpose and Need for Action

The Master Plan analyzed in this Environmental Assessment (EA) reflects DoC's vision for the physical development of the campus and for a flexible strategy for implementation. DoC is ever evolving and needs flexible, integrative, and collaborative support spaces to effectively promote scientific research. The overall purpose of the Master Plan analyzed in this EA is to guide fulfillment of the following objectives:

- Create a comprehensive and coordinated framework for physical development of the campus;
- Develop appropriate facilities and infrastructure for the evolving and advancing scientific research;
- Respect the campus location, historic context, and agreements with the local community and Native American tribes;
- Encourage collaboration and interaction among the laboratories and researchers, with welcoming facilities and staff amenities;
- Accommodate interchange with the public and outside colleagues, using both conference facilities and technology;
- Create an attractive campus, respecting both the research and the researchers;
- Promote good stewardship of the natural environment, and support and advance the sustainable design goals of DoC, NIST, NOAA, and the General Services Administration;
- Prioritize safety, especially addressing the growing risk for wildfires; and
- Develop a plan for gradual change, that is complete at each step

The need for the Master Plan, and the campus improvements prescribed therein, is driven by both institutional policy and the inability of existing facilities and infrastructure to support current and projected mission requirements. DoC requires that its agencies have a physical master plan for their sites, reflecting both the anticipated special needs of the user groups and the impact of its activities on the surrounding community. Master plans aid DoC planners in their decision-making while accommodating changing circumstances and agency priorities.

Proposed Action

The Proposed Action is a Master Plan to guide the physical development of the campus to advance the agency's mission-related goals over the next 20 years. The Master Plan emphasizes quality and collaborative research in addition to sustainable and efficient operations. The Master Plan addresses current campus needs and delineates future development through phasing packages. Full implementation of the Master Plan would increase the employee population by approximately 7% from its current population of 1,767 to 1,886 by 2035 and would result in a net increase in facility space by approximately 11%.

DoC would implement new construction, additions, renovation, demolition, landscape improvements, utility improvements, and circulation improvements under the Master Plan. The Master Plan would focus on a core center of the campus and associated green space used to connect existing, renovated, and new laboratories. The Master Plan also involves the consolidation of administrative buildings and support facilities at the western end of the campus green. Aging, deteriorating, and some temporary buildings would be phased out and replaced by updated facilities.

No-Action Alternative

The No-Action Alternative would not implement the Master Plan and would maintain the present course of action at the campus by continuing ongoing research, management, and maintenance activities. The No-Action Alternative would ultimately result in a site that would no longer support the advanced research requirements of DoC and would render much of the campus obsolete. The No-Action Alternative would not meet the purpose and need criteria for the campus. As a result, DoC considers the No-Action Alternative to be less desirable than the Proposed Action.

Decision to be Made

Based on environmental analysis and other considerations, DoC will decide whether to proceed with the Proposed Action or the No-Action Alternative. The EA scope is confined to issues and potential environmental consequences relevant to this decision.

Summary of Environmental Effects and Mitigation Measures

Construction, renovation, and demolition activities associated with the Proposed Action would result in temporary impacts to certain resource areas, including vegetation, wildlife, topography, soils, surface water, stormwater management, solid and hazardous waste, transportation, air quality, visual resources, and noise. However, direct temporary impacts would be limited to the developed portion of the campus. The Proposed Action would also result in some continuing impacts due to operation of the new facilities and the modest increase in DoC personnel over the course of 20 years. Long-term impacts would occur due to commuting of additional campus personnel; road and parking reconfigurations within the campus; improved wildfire resilience; increases in utility demand, waste generation, air emissions, light trespass, and noise due to operation of new buildings; modifications to historic resources; and changes to viewscales. Impacts would be minimized through adherence to applicable federal, state, and local permits, regulations, and agreements; incorporation of typical construction best management practices; and coordination and/or consultation with regulatory agencies and stakeholders.

The No-Action Alternative would not result in temporary impacts, demolition activities, or other improvements under the Master Plan.

Introduction

2.1 Campus Background

The 206-acre Department of Commerce (DoC) Boulder Laboratories Campus, located in Boulder, Colorado, is home to research programs of the National Institute of Standards and Technology (NIST), the National Oceanic and Atmospheric Administration (NOAA), and the National Telecommunications and Information Administration (NTIA). A total of 1,767 research scientists, engineers, administrators, and support personnel work in 35 buildings and structures at the campus, of which 30 are occupied buildings.

The roughly L-shaped campus, donated to DoC by the Boulder Chamber of Commerce in 1950, is situated within a strikingly beautiful setting with Kohler Mesa and the Flatirons as a backdrop to the buildings and landscape. The site was considered ideal for the measurement science and research that NIST conducted, and its close proximity to University of Colorado promised outstanding scientific resources. The entrance and buildings are oriented toward the east, bordering on Broadway (Colorado State Highway 93). The remainder of the property is surrounded by residential development and recreational land, with a cemetery bordering the campus at the north. The land gently rises toward the west, culminating in a steep rise to Kohler Mesa at the western end of the property. Two ephemeral water bodies transect the site: Skunk Creek and Anderson Ditch, an irrigation channel. Much of the property is designated *Open Space*, protected from development under a Memorandum of Agreement (MOA) with the City of Boulder together with an association of Native American tribes.

The three DoC agencies with programs situated at the DoC Boulder Laboratories Campus are described below.

NIST promotes U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. NIST occupies 28 buildings, including five major

buildings at the campus (Buildings 1, 2, 3, 24, and 81), and manages the remaining buildings with the exception of the two NOAA facilities (Buildings 33 and 34). NIST has four laboratory components located here: Communications Technology Laboratory (CTL), Information Technology Laboratory (ITL), Material Measurement Laboratory (MML), and Physical Measurement Laboratory (PML). These laboratories, together with administrators and support groups, have approximately 846 employees and affiliates on campus. Research is conducted in the areas of materials reliability, opto-electronics, quantum electronics and physics, time and frequency, and electromagnetics.

NOAA at Boulder conducts research in atmospheric and space sciences, with approximately 849 employees and affiliates, including General Services Administration (GSA) operations and management personnel. NOAA occupies Buildings 33 (David Skaggs Research Center) and 34 (Solar Observatory). These two buildings, the associated parking areas, and the grounds immediately adjacent (totaling about 15 acres) are managed by GSA. Three research, forecasting, and information programs share these facilities: the Office of Oceanic and Atmospheric Research, the National Weather Service, and National Environmental Satellite Data and Information Services.

NTIA is principally responsible for advising the President on telecommunications and information policy issues. It has one laboratory headquartered at the campus, the Institute for Telecommunication Sciences. This group, with approximately 72 people, researches cutting-edge areas of telecommunication technology, principles, and applications. They work closely with PML's time and frequency research components and with CTL.

Figure 2-1 and Figure 2-2 illustrate the location and general features, respectively, of the DoC Boulder Laboratories Campus. Table 2-1 provides basic information regarding each of the buildings at the campus. Refer to the Master Plan for more background about the history, evolution, and facilities of the campus.

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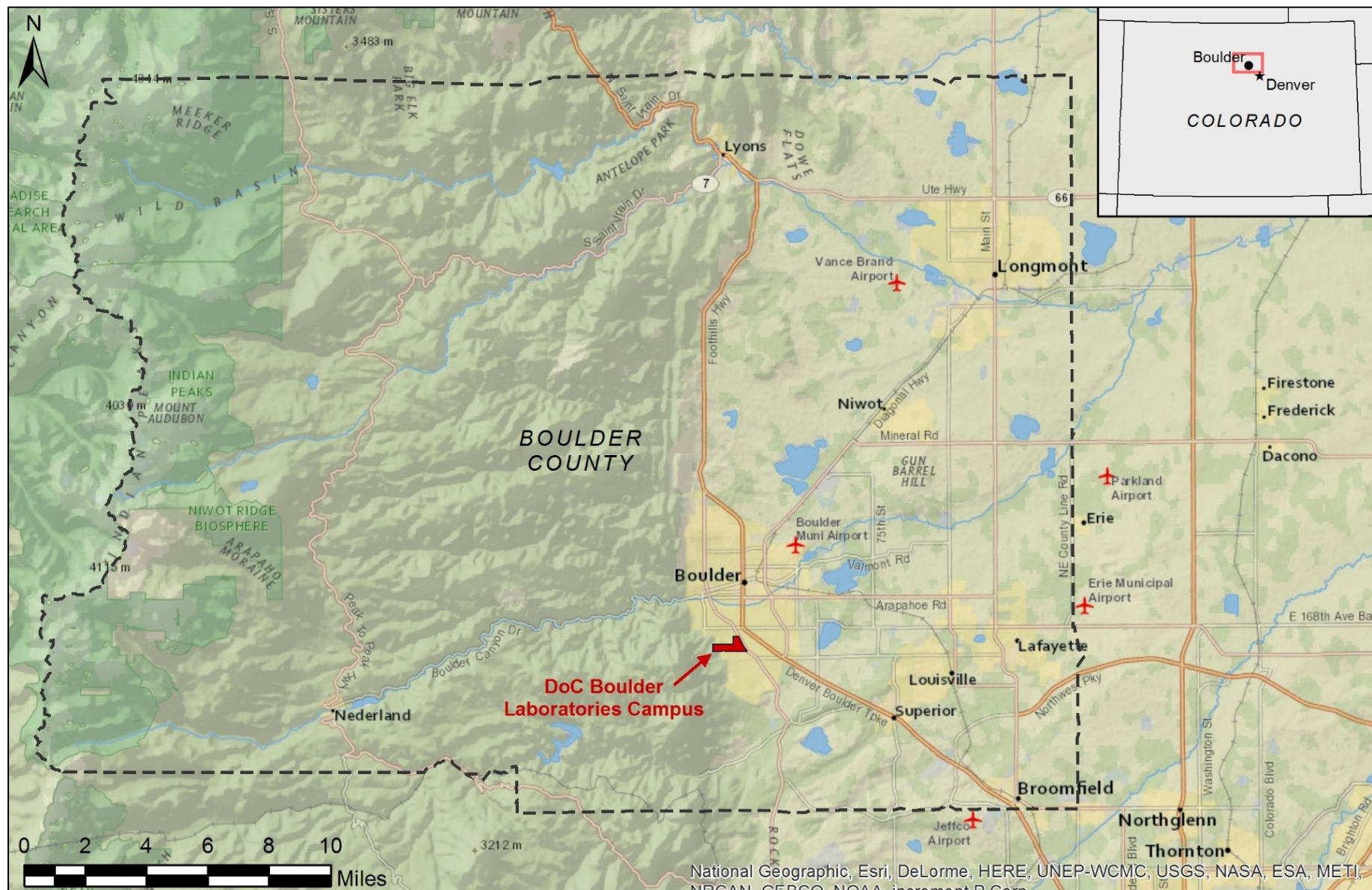


Figure 2-1. Location of DoC Boulder Laboratories Campus within Boulder County, Colorado

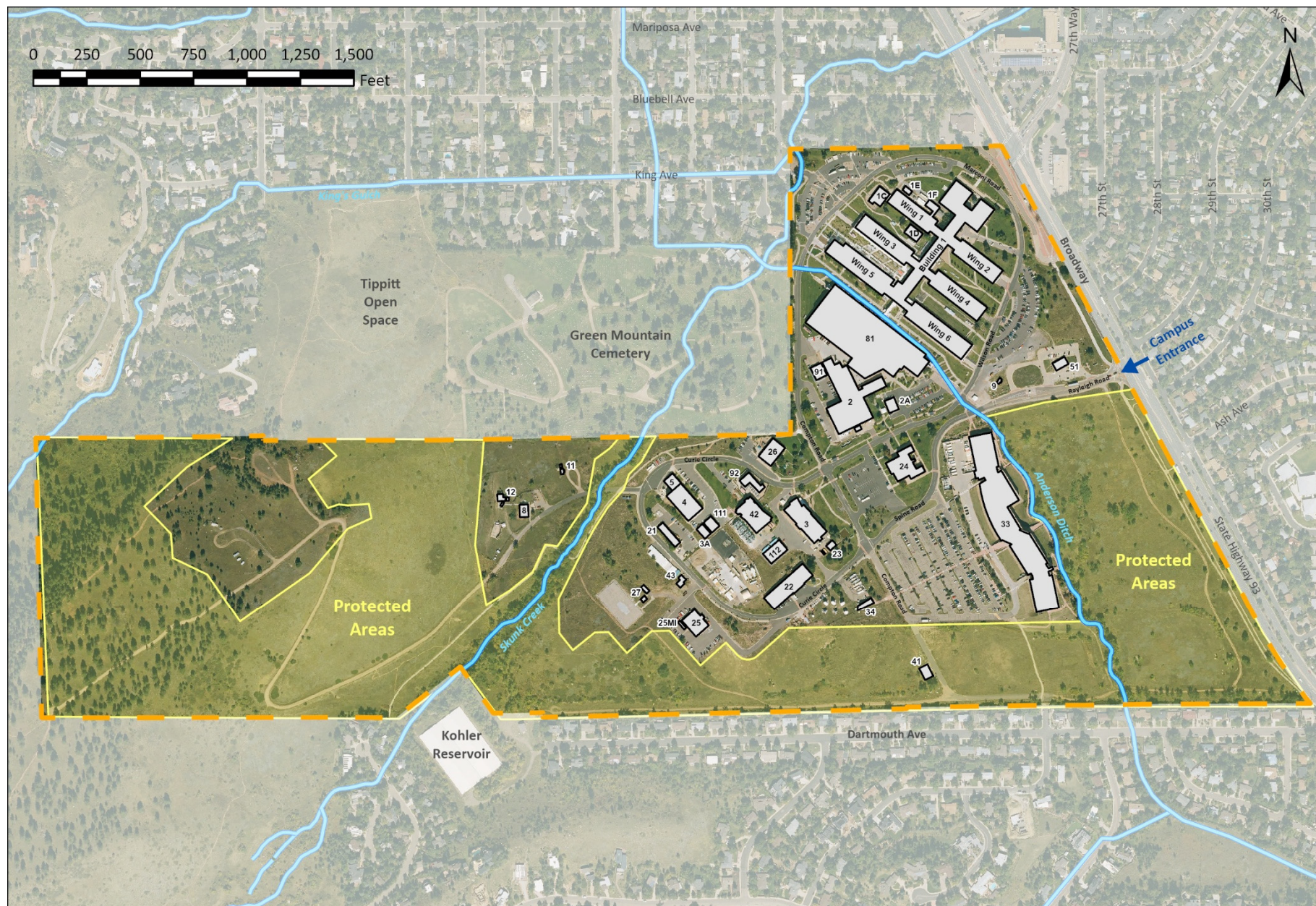


Figure 2-2. Overview of DoC Boulder Laboratories Campus

Table 2-1. Summary of Campus Buildings

Building Number and Name		Size (GSF)	Stories	Completed	Occupants	Spaces
1	Radio Building (Wings 1–6 + Spine)	343,453	1–5	1954	Various Labs and Admin.	Labs, Offices; Public; Support
1C	Annex	4,648	1	1989	PML, CTL	Offices (research)
1D	Annex	3,456	1	1992	PML	Offices (research)
1E	Annex	ES	-	-	-	Mechanical Equipment
1F	Annex	ES	-	-	-	Mechanical Equipment
2	Cryogenic	70,829	3	1951	PML; MML	Labs; Offices (research)
2A	Cryogenic Annex	2,880	1	1989	PML	Labs; Offices (research)
3	Liquefier Building	51,822	3	1952/2018	CTL	Labs; Support
3A	OFPM Annex	2,160	1	1989	OFPM	Offices (admin)
4	Camco	15,795	1	1951	OFPM	Offices (admin)
5	Camco Annex	3,149	1	1951	OFPM; OISM	Offices (admin); Lab
8	Cryogenic Mesa Test	2,400	1	1953	MML	Labs
9	Gas Meter Building	ES	-	1958	-	Water Pump Equipment
11	Ionospheric Observatory	466	1	1958	NOAA	Labs
12	Hydrogen Test Facility	1,446	1	2010	MML	Lab, Support
21	Maintenance Garage	3,999	1	1963	OFPM	Support; Offices (admin/support)
22	Warehouse	17,530	1	1964	NOAA	Support (Shipping and Receiving, Warehouse)
23	Hazardous Materials	984	1	1989	OSHE	Support
24	Plasma Physics	32,773	3	1967	CTL; PML; MML	Labs; Offices (research)
25	Maintenance Shop	8,306	1	1966	OFPM	Support (workshops); Offices (support)
25MI	Building 25 Annex	525	1	-	OFPM	Offices Support
26	Childcare Center	7,776	1	1989	OFPM manages	Support/Public (Classrooms)
27	High Frequency Field	1,045	1	1992	CTL	Lab (Antenna testing w/ RF Shielding)
41	High Speed Switch	ES	-	-	-	Electrical Equipment
42	Central Utility Plant	45,844	3	2005	OFPM	Support (Utility); Offices (support)
43	HazMat	1,200	1	2025	OISM	Hazardous Material Temporary Storage
51	Security Center	1,470	1	2006	Mgmt. Resources	Support (Visitor Screening)
81	Katharine Blodgett Gebbie Laboratory	209,209*	1	2012	PML; CTL; MML OFPM	Labs; Offices (research); Conference
91	Construction Research	3,561	1	2008	OISM	Offices (admin)
92	Computing Facility	4,055	1	2018	OFPM	Equipment
111	Building 4 Annex	2,821	1	2011	OAAM	Offices (admin)
112	Butler Building	5,795	1	2011	OFPM	Support (storage)
-	Concourse	1,234	1	2012	-	Connector—Buildings 1 and 81
	NIST Total	850,631*				
33	David Skaggs Research Center	415,973	4	1999	NOAA	Labs; Offices; Public (Cafeteria, Multi-purpose, Display, Fitness)
34	NOAA Solar Observatory	incl. above	1	1999	NOAA	Lab
	Site Total	1,266,604				

Source: DoC, 2025

* NIST lists Building 81 at a total of 286,674 GSF, but 77,465 is interstitial space (walk-on ceiling) and not counted as occupiable gross square feet (DoC, 2025).

Acronyms: CTL (Communications Technology Laboratory); ES (equipment structure); MML (Material Measurement Laboratory); NIST (National Institute of Standards and Technology); NOAA (National Oceanic and Atmospheric Administration); OAAM (Office of Acquisition and Agreements Management); OFPM (Office of Facilities and Property Management); OISM (Office of Information Systems Management); OSHE (Office of Safety, Health, and Environment); PML (Physical Measurement Laboratory).

2.2 Purpose and Need for Action

The DoC Boulder Laboratories Campus Master Plan analyzed in this Environmental Assessment (EA)—hereafter referred to simply as the Master Plan—reflects DoC’s vision for the physical development of the campus and for a flexible strategy for implementation.

DoC is ever evolving and needs flexible, integrative, and collaborative support spaces to effectively promote scientific research. The overall purpose of the Master Plan analyzed in this EA is to guide fulfillment of the following objectives:

- Create a comprehensive and coordinated framework for physical development of the campus;
- Develop appropriate facilities and infrastructure for the evolving and advancing scientific research;
- Respect the campus location, historic context, and agreements with the local community and Native American tribes;
- Encourage collaboration and interaction among the laboratories and researchers, with welcoming facilities and staff amenities;
- Accommodate interchange with the public and outside colleagues, using both conference facilities and technology;
- Create an attractive campus, respecting both the research and the researchers;
- Promote good stewardship of the natural environment, and support and advance the sustainable design goals of DoC, GSA, NIST, and NOAA;
- Prioritize safety, especially addressing the growing risk for wildfires; and
- Develop a plan for gradual change, that is complete at each step.

The need for the Master Plan, and the campus improvements prescribed therein, is driven by both institutional policy and the inability of existing facilities and infrastructure to support current and projected mission requirements. DoC requires that its agencies have a physical master plan for their sites, reflecting both the anticipated special needs of the user groups and the impact of its activities on the surrounding community.

Master plans aid DoC planners in their decision-making while accommodating changing circumstances and agency priorities. The most recent campus master plan, prepared in 2017, is outdated and no longer reflects the physical development goals and plans of the campus.

While DoC commissioned the Master Plan in response to institutional policy, the campus improvements prescribed therein are needed to address real deficiencies with the existing facilities, infrastructure, and organization, including the following:

- Modernized laboratory space (including improved environmental control) and flexible, integrative, and collaborative space is needed to promote advancing research;
- The current campus layout does not have a unifying vision of organization;
- Existing conditions lack a centrally located quality meeting place for collaboration between researchers, resulting in limited effective collaboration opportunities;
- Administrative functions throughout the facility are housed in seven separate buildings, creating inefficiencies in collaboration, coordination, and overall logistical correspondence;
- Existing conditions, including visitor screening requirements and campus layout, make it difficult for the public to access the facility; and
- Circulation and screening conflicts result in congestion at the entrance to the campus and the Security Center where badging and vehicle screening occurs.

Refer to the Master Plan for additional discussion of these facility, infrastructure, and organizational deficiencies that drive the need for the DoC Boulder Laboratories Campus Master Plan.

2.3 Scoping

DoC conducted internal scoping as part of the Master Plan process to ensure the development of concepts addressed concerns for the campus and considered components of interest to stakeholders. As part of the scoping process, a questionnaire was circulated to all campus employees, including contractors, to solicit feedback regarding existing conditions and issues that are of interest to be considered in the Master Plan. Interviews

with NOAA, NTIA, NIST subject matter experts, and all NIST organizational units were also conducted.

Selection of Master Plan Concept

The DoC held a public meeting during the 2017 Master Plan development process at which the community commented on the 2025 Master Plan concept.

DoC developed four preliminary Master Plan concepts to meet the purpose and need for action (Section 2.2). These preliminary concepts are described in detail in Section 4.6 (Master Plan Development) of the Master Plan. Using input received during the scoping period, DoC developed a

final concept based mostly on Concept B Campus Core, with minor variations. Key elements selected for inclusion in the final concept include demolition of Building 24; a central landscaped green; creation of a main gathering place; relocation of the Childcare Center to a more central location; removal of the central road; improvements to the campus entrance and screening; expansion of Building 34; consolidation of management staff and services; and siting infrastructure to encourage collaboration, efficiency, and flexibility. The resulting concept, described in Section 3.1 (Proposed Action), was selected as the Master Plan and is evaluated in this EA. DoC determined that the potential environmental impacts associated with the four preliminary concepts would likely be similar to those associated with the final concept selected as the Master Plan.

Alternatives

3.1 Proposed Action

The Proposed Action is a Master Plan to guide the physical development of the campus in order to advance the agency's mission-related goals over the next 20 years. The Master Plan emphasizes quality and collaborative research. The Master Plan addresses current campus needs and delineates future development through phasing packages. The core concept of the Master Plan includes a linear arrangement of connected laboratories and amenities, joined by a central landscaped green. The Master Plan improves campus flow and harbors an integrated space for research and collaboration. Full implementation of the Master Plan would increase the employee population by approximately 7% from its current population of 1,767 to 1,886 by 2035.

Full implementation of the Master Plan would result in a net increase in facility space by approximately 11%, from 1,266,604 gross square feet (GSF) to 1,407,947 GSF. The Master Plan would focus on a core center of the campus and associated green space used to connect existing, renovated, and new laboratories. The Master Plan also involves the consolidation of administrative buildings and support facilities at the western end of the campus green. Aging, deteriorating, and some temporary buildings would be phased out and replaced by updated facilities. Partial or entire realization of the Master Plan will depend on DoC priorities, government policy decisions, as well as budgetary considerations. The Master Plan represents neither the pre-approval of any individual project nor the pre-approval of the particular needs of specific programs to be accommodated on the campus. The financing of such projects and programs must be addressed within the annual DoC budget process and congressional budget approval. Furthermore, the Master Plan is not a commitment for the agency to build these facilities within a specific timeframe.

3.1.1 Components of the Proposed Action

Below is a summary of the new construction, demolition, and other improvements that DoC would execute under the Master Plan. Figure 3-1 presents the vision for the campus following completion of all components of the Master Plan. Refer to the Master Plan for additional details regarding the scope of facility improvements.

New Construction, Additions, Renovation, and Demolition

- **Building 1 Renovation.** This continuation of an ongoing phased renovation and upgrade program would involve improvements to the central spine and three of the building's six wings (Wings 1, 2, and 4). These improvements would include complete interior renovation, utility system replacement, recladding, the addition of utility galley space, and structural upgrades to meet seismic requirements. The initial phases of the Building 1 renovation and upgrade programs—renovation of Wings 3, 5, and 6—have been completed.
- **Building 3 Repurposed.** Renovations to Building 3 were previously completed in 2018 to repurpose and expand the building to serve as CTL headquarters. This project would construct an addition to Building 3 to consolidate and house laboratory space for CTL.
- **Building 34 Renovation and Expansion.** This renovation and expansion project would preserve, repurpose, and expand Building 34 to better serve the National Weather Service.
- **Improved Conference Facilities.** Though the largest conference center on the campus can currently seat 500 attendees, NIST anticipates that most future conferences held on campus would accommodate fewer than 150 people due to video conferencing capabilities and occur in either Building 81 or Building 1. This project would improve the conference facility in Building 81 by creating a security separation between the conference area and the laboratory. The project would also improve the conference facility in

Building 1 by providing additional support facilities, including accessible restrooms and a breakroom.

- Campus Green and Pedestrian Way. This component would provide a linear campus green and pedestrian promenade to connect buildings and improve the pedestrian experience, with a tree-covered plaza as the focal point at the center of the green. This would also integrate a range of social spaces and green infrastructure into the physical design.
- Security Center Modification. The Master Plan proposes to expand and renovate the existing Security Center to ease congestion and improve efficiency. The vehicle screening area would also be modified by separating the screening area for trucks and private cars and reconfiguring the turning or reject drive. The Security Center modifications would also include creation of a dedicated screening area for visitors and delivery vehicles, a new guard booth with a truck turnaround located farther west beyond the rejection lane for vehicle screening, and a visitor parking lot near the entrance accessible to staff and visitors without screening.
- New NIST Replacement Research Buildings. This component would involve the construction of new research facilities, linking new facilities to the central green space. New laboratories would provide the flexibility, infrastructure, and controlled environments necessary for advanced research. Building 2, Building 2A, and laboratories in Building 24 would be replaced with three planned research buildings (Building A, Building B, and Building 3 Addition).
- New Management Resources Center. This new facility would consolidate NIST's management and facility support groups to increase functional and physical efficiency. This consolidated facility would replace 10 small and/or temporary buildings. The facility would be located along Curie Circle at the western end of the campus green.
- Childcare Center Replacement. This new facility would replace the existing Childcare Center and would be designed to meet the GSA Child Care Center guidelines. The new Childcare Center would be located closer to the building entrance to prioritize easier access for parents and safer evacuation in case of emergency or wildfire.
- New Parking Garage. This new structured parking facility adjacent to Building 81 and the proposed Building A would replace parking removed to accommodate other development (see Demolition below).
- New Coffee Bar. The Master Plan proposes a coffee bar near the campus core and opening onto the campus green to attract campus employees, strengthen the pedestrian experience, and foster a greater sense of community among DoC staff. The coffee bar would be a public zone for both staff and visitors and would be included in the construction of Building A.
- Demolition. This component would involve the demolition of 16 small, temporary, obsolete, and/or inefficient buildings throughout the campus, resulting in a total of 169,457 GSF of demolition. Construction of new facilities (e.g., the new Childcare Center) would also necessitate the removal of certain existing surface parking lots.
- Retained Research Buildings. The David Skaggs Research Center, Katharine Blodgett Gebbie Laboratory, and smaller specialty research buildings, including the Hydrotest Facility, would be retained.



Figure 3-1. Master Plan

Landscape Plan

Major design features and themes under the Landscape Plan include the following:

- Development of a Campus Green – A corridor that integrates green infrastructure and a variety of outdoor gathering spaces into the physical design.
- Construction of a Central Promenade – A pedestrian promenade that extends west from the main campus arrival plaza to the main entrance of Building 3.
- Achievement of an Activated Campus – Activation of outdoor spaces accomplished by providing for a wider range of social spaces and recreational amenities.
- Integrated Stormwater Management – A central meadow that provides an ecologically rich, visually striking landscape feature; functions as a high-performance green infrastructure system; and filters stormwater runoff.
- Visitor Entry Landscape – A NIST visitor entry plaza to be located adjacent to the proposed Building A that emphasizes a welcoming, functional, and visually cohesive arrival experience.

The Landscape Plan also provides design language that prescribes a contemporary design aesthetic that expresses DoC's technological mission and a naturalistic aesthetic that reflects the natural setting with ecologically functional native plantings. Planting guidelines take the setting of a ponderosa pine savannah into consideration and encourage replacement of much of the water-intensive lawns that currently surround the campus buildings with drought-tolerant meadow grasses and clustered evergreens characteristic of native woodland vegetation while supporting wildfire mitigation strategies. A vegetative gradient that transitions from the wild landscape to the developed portion of the campus is proposed to enhance ecological cohesion, improve microclimate comfort, and incorporate wildfire and wind mitigation strategies. The Landscape Plan also provides recommendations for the design of hardscapes, architectural elements, furnishings, lighting, signage and wayfinding, and structured and ornamental planting zones. Furthermore, the Landscape Plan identifies key landscape-related wildfire mitigation strategies to be incorporated into the Master Plan.

Utility Framework Plan

The Utility Framework Plan prescribes the following:

- Extension of the existing Central Utility Plant (CUP) services (e.g., provision of chilled water, steam, and compressed air) to the new and renovated NIST laboratory buildings under the Master Plan;
- Provision of the Childcare Center with either dedicated heating and cooling systems independent of the campus systems or alternately connected to the campus steam and chilled water system;
- Provision of the NOAA Laboratory and the Security Center with dedicated independent heating and cooling systems; and
- Extension of normal electrical power and data communications services from the campus distribution systems.

The Utility Framework Plan also prescribes reduction of energy demand, selection of energy efficient equipment and systems, and provision of a clean renewable energy supply by promoting design strategies including natural ventilation, high-performance building envelopes, lighting and plug load reductions, air- and water-side energy savings, and consideration of solar energy and geothermal systems.

Circulation Plan

The Master Plan proposes the following changes to the campus circulation system under the Circulation Plan:

- The central roadway between Buildings 3 and 81 would be eliminated with the construction of the new research buildings.
- The central roadway's extension, Curie Circle, would be reconfigured with the relocation and construction of the Childcare Center.
- The roadways and screening areas surrounding the Security Center would be reconfigured to improve traffic associated with visitors and screenings.
- Compton Road, the north-south roadway dividing the central campus green, ideally would be limited to bicycle, pedestrian, and emergency traffic to preserve the central part of the campus as a more pedestrian and bicycle-oriented space.
- The intersection of Rayleigh Road, Wilson Road and Lawrence Road would be reconfigured as a typical 4-legged stop-controlled

intersection to provide better clarity for visitors and employees as they enter and exit the campus.

The Circulation Plan also describes additional and reconfigured parking on site to address existing and future parking needs. Overall, the Circulation Plan builds upon the Master Plan's vision for a central landscaped green accessible to pedestrians and bicyclists as well as for reduced onsite traffic and congestion.

Wildfire Planning

The Master Plan recognizes that wildfire planning, preparedness, and mitigation must be incorporated into implementation of the Master Plan due to increasing wildfire risks. As a broad planning document that provides a development framework, the Master Plan identifies interventions required for the site, buildings, and infrastructure to mitigate the threat of wildfire. While the Master Plan does not identify operational or policy actions related to wildfire mitigation, it does provide planning recommendations for the campus, including the recommendation that NIST initiate a detailed analysis and implementation plan for wildfire policy and facility improvements. The Master Plan also includes recommendations for upgrades in existing buildings to serve as shelter-in-place areas, as well as shelter-in-place requirements for new building construction.

Additionally, the Master Plan provides recommendations to create a defensible space, manage vegetation, and implement fire-resistant landscape design strategies, including the following:

- Reducing vegetative fuel loads;
- Establishing strategic fire and fuel breaks along high-risk zones;
- Controlling invasive plant species;
- Regularly maintaining green spaces near buildings; and
- Placing water sources in strategic locations to support fire response capabilities.

¹ In 2025, NIST constructed a new 1,200 square foot (SF) hazardous materials storage facility (Building 43) at the west end of Curie Circle. The functions of Building 23 are

3.1.2 Phasing of the Master Plan

Phasing for the implementation of the Master Plan involves an integrated approach that meets short-term needs and also provides steps for redevelopment and consolidation of the campus in the future. Phasing for the Master Plan is flexible, because most of these packages could be implemented independently of the others, and in the order that responds to DoC mission, policy and funding. The Master Plan components are all needed to satisfy functional and physical facility needs and therefore are shown as a continuum of construction rather than in structured phases.

Some components of the Master Plan would be implemented in packages together. The Master Plan anticipates that research building improvements, including Building 1 renovations and the Building 3 addition, would be prioritized for implementation. Refer to Chapter 9 (Implementation Planning) in the Master Plan for an overview of prescribed phasing packages. Prior to initiating any of the projects, DoC would develop plans to ensure that sufficient space is available for construction vehicle parking and material staging areas during that phase. These plans would prioritize the use of previously developed areas such as the sites of demolished buildings and vacated parking lots.

3.2 No-Action Alternative

The No-Action Alternative would not implement the Master Plan. The No-Action Alternative would maintain the present course of action at the campus by continuing ongoing research, management, and maintenance activities.¹ The No-Action Alternative would ultimately result in a site that would no longer support the advanced research requirements of DoC and would render much of the campus obsolete. The No-Action Alternative would not affect the number of employees at the campus. Section 4 (Affected Environment and Environmental Consequences) discusses the potential environmental impacts and consequences of the Proposed Action and the No-Action Alternative. The No-Action Alternative would not meet the purpose and need criteria defined in Section 2.2 (Purpose and Need for Action). As a result, DoC considers the No-Action Alternative to be less desirable than the Proposed Action.

currently being migrated to Building 43, and Building 23 will then be demolished. Construction of Building 43 proceeded independently of the Master Plan.

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Affected Environment and Environmental Consequences

4.1 Land Use and Socioeconomics

4.1.1 Land Use and Wildfire Resilience

Land Use

Affected Environment

Local government entities operating in the Boulder region provide planning and development services. These include the Boulder County Land Use Planning Division and the City of Boulder Planning Board. The City of Boulder and Boulder County implement the Boulder Valley Comprehensive Plan (BVCP), which guides planning and development within the Boulder Valley. The BVCP includes policies related to growth, development, neighborhood character, transportation, utilities, and other areas. The BVCP also defines current and desired future land use patterns for the region. According to the BVCP, the DoC Boulder Laboratories Campus includes Public Use as well as Open Space land use designations.

Open space areas are an integral feature of the City of Boulder as well as the DoC Campus. Open space surrounding the campus includes Tippitt Open Space to the north and Boulder Mountain Park along the western border. These areas are popular for recreational activities, including hiking and biking.

The City of Boulder's open spaces are managed by the Open Space & Mountain Parks (OSMP). The Department preserves and manages over 46,000 acres, including 155 miles of trails with an estimated 5.5 to 6.25 million visits each year (City of Boulder, 2025c, 2025d).

Open space covers about half of the land on campus, approximately 104 acres, and includes areas protected under two agreements. The April 1995 Programmatic Agreement with the Tribes and the 1998 First Amended MOA defined protected

areas, development zones, and research zones. NIST and the City of Boulder collaborate on preserving the protected area, which begins at Broadway in front of Building 33 (David Skaggs Research Center) and continues across the southern section and western third of campus. A secondary research area is included in this area at the top of Kohler Mesa.

Trails and open space on the campus are extensions of the trail and recreation system off campus. See Figure 4-1 for an illustration of the trail network. This network connects to trails in the adjacent off-campus recreation areas – Boulder Mountain Park to the west and Tippitt Open Space to the north. Kusch Road, a NIST service road, is a soft surface hiking trail that passes through the protected area and connects the campus road system to Kohler Mesa and Boulder Mountain Park. Four Pines Trail, also a soft surface hiking trail, extends off Kusch Road and joins Boulder Mountain Park to Tippitt Open Space.

The City of Boulder also maintains a public designated bicycle route throughout the campus that is part of a city-wide system. Most of the roads on campus are part of this network, with the route beginning at the Broadway entrance. It continues along Rayleigh Road and Curie Circle. At the connection between Kusch Road and Curie Circle, the bicycle route then connects to the Skunk Canyon Path, a city multi-use path.

The city maintains two multi-use paths on campus that are designated for non-motorized users such as pedestrians and bicyclists. One path follows along Broadway at the eastern border of the campus and is separated from the street. It connects to the designated bicycle route at the campus entrance and continues along Broadway in either direction. The second multi-use path, Skunk Canyon Path, follows Skunk Creek and connects to the designated bicycle route at Curie Circle.

Refer to the Master Plan for additional information about relevant regional plans and agreements as well as existing land use designations on campus.

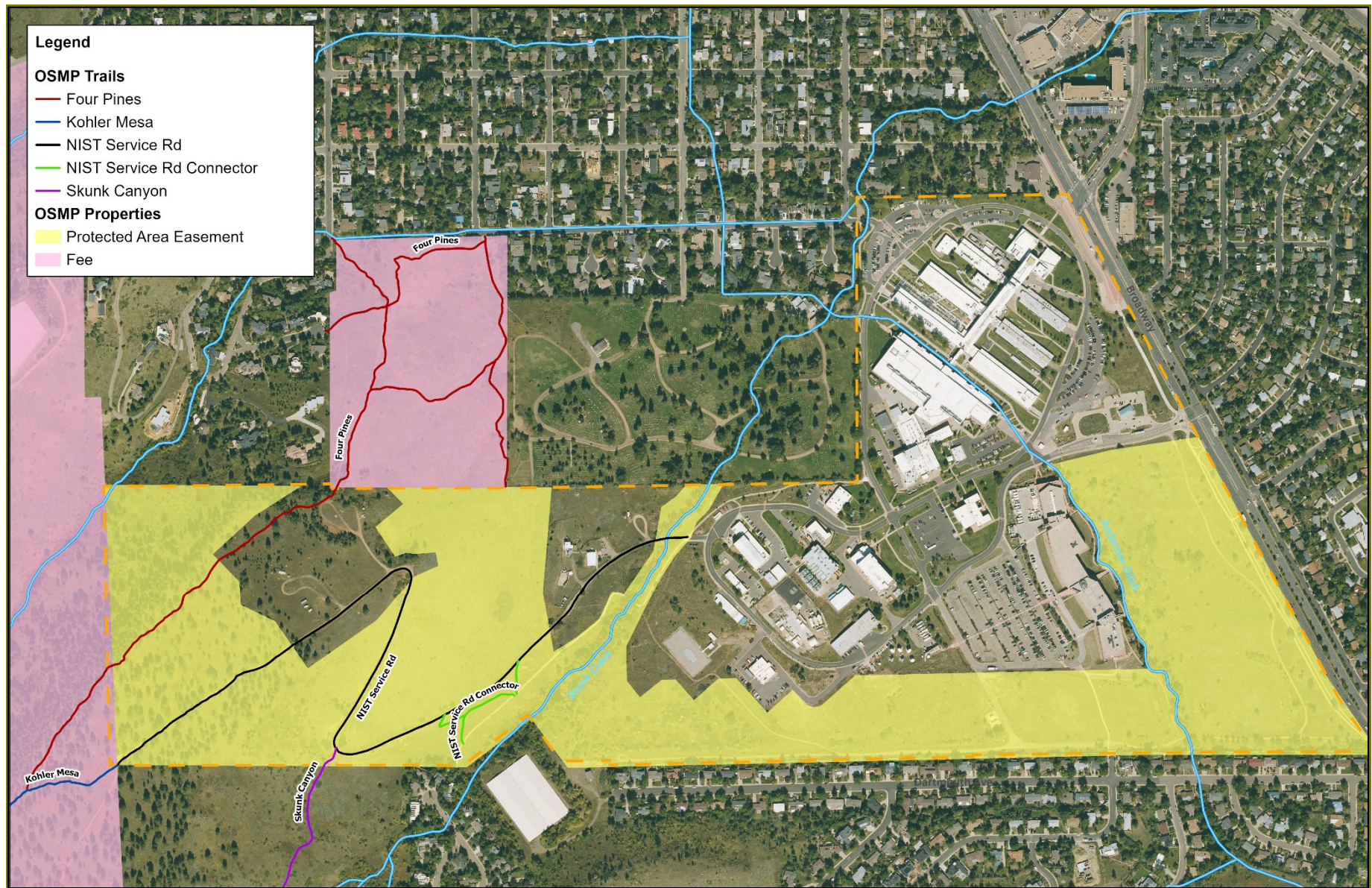


Figure 4-1. City of Boulder Managed Trails and Properties

Wildfire Resilience

Wildfires have occurred in the Boulder area throughout its history. However, increased vegetation density, steep terrain, hot temperatures, drought, high winds, and increased development have resulted in more numerous, larger, more destructive fires in recent years (Boulder County, 2025b). Fuel, topography, and weather are the three main factors that influence wildfire severity and the burn potential of an area (Boulder Office of Emergency Management, 2022). Some wildfires have occurred near and have threatened the campus in recent years, including the Marshall Fire in 2021 and the National Center for Atmospheric Research (NCAR) Fire in 2022. The Marshall Fire was located approximately 2.5 miles southwest of the campus and burned approximately 6,200 acres, destroyed over 1,000 structures, and resulted in the death of one person and another being reported missing (Boulder County, 2025b). The NCAR Fire was located approximately 1 mile southwest of the campus and burned approximately 190 acres (Boulder County, 2025b).

Wildfire resilience and mitigation planning efforts occur at the city and county level. The Boulder County 2022 – 2027 *Boulder Hazard Mitigation Plan* was developed to protect people and property from hazards, reduce liability exposure, and reduce hazard response and recovery costs (Boulder Office of Emergency Management, 2022). The plan identifies wildfires as a highly likely hazard with a significant geographic extent, critical severity, and overall high hazard significance due to its widespread potential impacts (Boulder Office of Emergency Management, 2022). The plan also includes goals and recommended measures for improving wildfire resilience. The City of Boulder also developed a Community Wildfire Protection Plan (CWPP) to reduce wildfire risks and potential impacts to people, property, natural resources, and cultural resources. Many stakeholders were engaged in the CWPP development process, including local residents; land use managers; fire managers; and local, state, and federal government representatives (City of Boulder, 2024c). The CWPP estimates the wildfire risk in different areas, with greatest wildfire hazards occurring on vertical slopes with high fuel loadings (e.g., steep forest slopes), and provides a planning framework for implementing wildfire mitigation measures (City of Boulder, 2024c). The CWPP maps most of the developed portion of the campus as being outside of the wildfire hazard area; however, the protected areas are mapped as moderate to high wildfire hazard areas in terms of likelihood and severity (City of Boulder, 2024c).

Portions of the campus and much of the surrounding area, particularly Kohler Mesa and the Flatirons to the west, have been identified as having

a high potential fire intensity under high to extreme weather conditions, which could result in a substantial potential for harm or damage to life and property (Colorado State Forest Service, 2025). The DoC Boulder Laboratories Campus has certain emergency response procedures in place, including annunciation alert systems and evacuation methods; however, as discussed in Section 2.2 (Purpose and Need for Action), better wildfire resilience and mitigation is needed.

Environmental Consequences – Proposed Action

Implementation of the Master Plan would create an organized and cohesive campus identity by replacing and consolidating aged, small, and scattered buildings. Consolidation of research buildings would better frame the campus green. Specifically, through this improved land use, the Master Plan would allow for better connectivity, provide a stronger campus identity, and encourage collaboration amongst employees.

The Master Plan would not impact land use designations on the campus and would be consistent with the current institutional land use on the campus. The Master Plan would not impact open space, protected areas, or recreational areas. Campus open space would be maintained in a natural state. The Master Plan would not include any development in the protected area. Any proposed developments would occur only in the Development Zone and would comply with the above-referenced agreements.

The Master Plan would have no impacts on zoning or regional planning outside the campus. The campus is expected to remain consistent with the county planning and zoning regulations.

Temporary construction-related noise levels would be minor and would not affect the recreational use of nearby parks and open spaces; refer to Section 4.11 (Noise Levels) for more information. Air emissions from operations and construction activities would not be expected to affect ambient air quality within nearby parks and open spaces; refer to Section 4.8 (Air Quality) for more information.

The Master Plan would not impact public trails located within the protected area on campus, as per the agreements described earlier. Trails leading to off-campus recreation areas, as well as multi-use trails and the designated bicycle route areas, would remain the same.

The Master Plan is designed to improve circulation on campus for pedestrians. In addition to creating more direct connections and better flow, the Master Plan promotes development of a cohesive wayfinding

plan to improve visibility and clarity of signage, which would improve navigation and safety for pedestrians.

The Master Plan would affect the designated bicycle route within the campus by removing a portion of Curie Circle that connects to Rayleigh Road, essentially replacing it with a pedestrian promenade. This promenade would be accessible to bicyclists but would not be part of the designated bicycle route, which would still lead to the campus entrance via Curie Circle, Spine Road, and Rayleigh Road. In addition to these Master Plan elements, OSMP is considering an undesignated, unpaved path along the southern campus boundary to provide an additional alternative bicycle route leading to Broadway.

During construction, trails and/or pedestrian pathways may be temporarily closed or rerouted during construction. Once construction is completed, the usability of the trails would return to pre-construction status.

This Master Plan is intended to align with and further the Boulder County and City of Boulder wildfire resilience efforts. For example, the Master Plan's landscape strategy incorporates strategic spacing between structures and vegetation and prioritizes fire-resilient species. While the Master Plan provides shelter-in-place recommendations and outlines preliminary design criteria for new buildings, the Master Plan also recommends that NIST complete a detailed study that evaluates the campus and buildings for preparedness, safety, and shelter-in-place solutions. Refer to the Master Plan and Section 3.1 (Proposed Action) for additional information regarding recommendations on wildfire resilience planning.

By increasing the campus' overall wildfire resilience and strengthening the evacuation and shelter-in-place protocols, the Master Plan would align with both the County's and the City's Community Wildfire Protection Plans.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not impact land use; would not affect open spaces or trails on, or in the vicinity of, the DoC Boulder Laboratories Campus; and would not improve the campus' wildfire resiliency or response protocol.

4.1.2 Social and Economic Resources

Affected Environment

Social Resources

The Denver-Aurora-Greeley Combined Statistical Area (CSA) is home to nearly 62% of Colorado's resident population although it covers less than 13% of the state's total land area (U.S. Census Bureau, 2023). It is the seventeenth most populous of the 181 CSAs in the United States (U.S. Census Bureau, 2024).

The City of Boulder has a population of about 108,000, with a projected increase to 147,000 by 2040 (City of Boulder, 2024a). Boulder residents are younger than the county, state, and national rates, with the median age of the city at 29.2 years. The population of residents 65 or older (12.2%) is also smaller compared to the state (15.0%) and national rates (16.7%) (BCEC, 2024a).

The Boulder Valley School District has 56 schools, with approximately 28,000 students and 4,000 employees. Residents of the City of Boulder tend to be highly educated. According to the Boulder Economic Council, the percentage of residents with a bachelor's degree or higher education attainment is almost twice that of national levels (BCEC, 2024a).

Housing availability for Boulder City and County is relatively low, with lower vacancy rates (around 7%) than for the state or the nation (around 8%) (BCEC, 2024a). Nearly 55% of housing is renter-occupied, which is notably higher than county (~38%), state (~34%), and national (~35%) rates (BCEC, 2024a). The high number of renters is likely due to the number of University of Colorado Boulder student renters.

Economic Resources

The City of Boulder estimates that there were 106,000 jobs in the city as of 2024. About 40% of these jobs are held by city residents whereas 60% are held by commuters. Trends indicate that the city will have about 120,000 jobs by 2040 (City of Boulder, 2024a).

Generally, the unemployment rate for Boulder County and the city trended up in 2020, sometimes exceeding 10%. Unemployment rate then fell through 2022, and have both risen to 4.7% in January 2025 (BCEC, 2024b). This is slightly higher than the national unemployment rate of 4% (U.S. Bureau of Labor Statistics, 2025).

The median household income in the City of Boulder is nearly \$76,000, which is slightly below the national average (~\$78,000) and substantially below the county (~\$95,000) and state (~\$93,000) averages (BCEC, 2024c). This contrasts with 2017 patterns, when the median household income for city residents was higher than that of the nation, and the percentage of households earning \$200,000 or more per year was double that of the national levels (DoC, 2017).

NIST and NOAA are major employers within the City of Boulder (BCEC, 2024b). Federally funded labs in County and City provided employment for nearly 3,600 people in 2024 (BCEC, 2025). Of those, the DoC Boulder Laboratory Campus employed a total of 1,767 people (DoC, 2025).

Environmental Consequences – Proposed Action

Implementation of the Master Plan would provide for improved research facilities and thus would support continued advancement of measurement standards and technology, thereby benefitting the national economy. Improvements to research facilities would further NIST’s mission to promote industrial competitiveness on a national level.

The Master Plan would have minor long-term economic benefits. The proposed campus reorganization and updated facilities would provide an economic benefit by improving productivity and available resources at the DoC Boulder Laboratories Campus. The increase in staff of approximately 120 over the next 10 years would marginally improve employment levels and would not displace existing jobs in Boulder County.

Master Plan-related construction may also result in temporary minor impacts on the population and the availability of housing, due to construction workers who might temporarily relocate to the area. During construction of the Master Plan elements, construction jobs and related incidentals would temporarily add to the local economy.

The Master Plan would have minimal impacts on population, housing, and education trends in the area. The projected increase of approximately 120 staff over the next 10 years is considered minor and would not negatively impact social or economic resources in the area. Any staff increases would likely benefit the local economy and job market.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would have no effects on social and economic resources. Jobs and population growth would continue as projected in the region. The No-Action Alternative would result in no improvements to employment or income in the area.

4.2 Biological Resources

4.2.1 Vegetation

Affected Environment

Vegetation plays an important role in ecosystem function, such as by slowing stormwater runoff and allowing water to soak into the ground to replenish aquifers; helping to maintain water quality of nearby waterways by filtering sediment and pollutants from runoff; preventing erosion; providing shade, which reduces heat island effect and stormwater runoff temperatures that affect aquatic habitats; and providing habitat for a variety of organisms. However, the type, condition, and density of vegetation influences wildfire risks and can act as a fuel source.

While the developed portion of the campus contains mostly mowed grass and ornamental vegetation, the freshwater forested/shrub wetland located along Skunk Creek contains more natural habitat conditions and native vegetation. Wetland buffers are present along portions of Skunk Creek. The City of Boulder Municipal Code, Chapter 3, Item 9-3-9 restricts certain actions, such as some construction and landscaping activities, within wetland buffers. Refer to Section 4.4.1 (Surface Water) and Section 4.4.3 (Wetlands), respectively, for additional information.

A 12-foot buffer restricting tree plantings is also present along most of Anderson Ditch. However, the tree buffer is not currently maintained along the portion of Anderson Ditch that runs east and south of Building 33. Trees line this portion of Anderson Ditch, which pose a hazard to the ditch because debris (e.g., leaves and branches) can block drainage grates, roots can compromise the banks of the ditch, and the trees absorb water from the ditch through their roots, thereby limiting the amount of water in the ditch.

The Endangered Species Act (ESA) was enacted in 1973 to protect species in danger of extinction. This act requires federal agencies to ensure that their actions will not jeopardize the continued existence of any threatened

or endangered species or result in the destruction or adverse modification of the critical habitat associated with these species.

As part of this EA, DoC utilized the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool to obtain records of ESA-listed or proposed threatened or endangered species with the potential to occur on the campus. The IPaC Unofficial Species List, obtained on December 15, 2025, indicates that two species of threatened plants have the potential to occur in the vicinity of the campus: Ute ladies'-tresses (*Spiranthes diluvialis*) and western prairie fringed orchid (*Platanthera praeclara*) (Appendix A) (USFWS, 2025a). No endangered flora is expected to occur in the vicinity of the campus.

The emerald ash borer (EAB), a federally quarantined, invasive tree pest responsible for the death or decline of millions of ash trees in 25 states, has been confirmed within the City of Boulder (Boulder County, 2025a). In order to prevent the spread of the EAB, the Colorado Department of Agriculture has enforced quarantine on the movement of ash tree products and related firewood out of Boulder County (Boulder County, 2025a). DoC has identified ash trees on the campus.

Environmental Consequences – Proposed Action

Construction activities associated with the implementation of the Master Plan, especially the proposed NOAA Building 34 expansion and Building 3 addition, would result in limited impacts to vegetation (grasses and ornamental trees) at the campus. Native grasses, trees, and similar drought- and fire-resistant vegetative species, however, would be re-seeded in the disturbed areas following completion of construction activities to the extent feasible. The site of Building 25 and its associated parking lot would also be revegetated following demolition activities. Some existing vegetation would be removed to create firebreaks around buildings intended to be used as shelter-in-place facilities. The size of vegetative areas that would be disturbed varies by Master Plan phasing package. Some of the phasing packages add vegetated pervious surface while others reduce it. Implementation of the Master Plan would minimize impacts on vegetation by consolidating facilities within previously developed areas. Refer to Section 4.5.3 (Stormwater Management) for additional information regarding pervious surface area at the campus.

Implementation of the Master Plan is not expected to impact rare, threatened, or endangered plant species or vegetation in stream buffers or wetlands on the campus because areas proposed for development predominantly consist of non-native grasses and forbs.

The Master Plan would improve the urban landscape and wildfire resilience due to replacement of water-intensive, non-native invasive vegetative species with drought- and fire-resistant native species. As such, vegetation prescribed under the Master Plan would require less irrigation than the existing non-native vegetation. The Master Plan also prioritizes planting layouts and species that could slow fire spread, protect structures, provide windbreaks, and reduce ladder fuels near buildings. The urban landscape would also be improved by planting additional trees to provide cover and shade throughout the campus in association with the pedestrian walkways and campus green. Under the Master Plan, a pedestrian promenade would be the basis for connecting Building 81 on the north end of the campus to Building 3. The Master Plan also recommends diversifying the canopy by gradually removing ash trees, thus eliminating habitat for the invasive EAB, and replacing them with other native deciduous species (DoC, 2025). Hardwood tree removal would be managed in such a way as to prevent the spread of the EAB.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not result in the disturbance of vegetated areas. However, the No-Action Alternative would not result in any improvements regarding urban landscape, invasive species, and wildfire risks.

4.2.2 Wildlife

Affected Environment

The DoC Boulder Laboratories Campus contains habitat for a variety of wildlife, especially in the upland and undeveloped portions of the campus. This wildlife is protected by federal, state, and local laws and ordinances.

The ESA affords protections to threatened and endangered wildlife, while the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) specifically afford protection to birds. The MBTA prohibits actions specifically directed at the taking or killing of migratory birds, their nests, or their eggs unless permitted by the USFWS. BGEPA also makes any intentional or unintentional activity that results in the taking of eagles unlawful unless permitted by the USFWS. To meet USFWS requirements under the Fish and Wildlife Conservation Act, USFWS published the *Birds of Conservation Concern 2021* report, which includes listings of bird species of conservation concern throughout the Nation,

including some that are not otherwise protected under the MBTA (USFWS, 2021).² Several species of migratory birds inhabit Kohler Mesa and Enchanted Mesa within 1 mile of the campus (W. Keeley, personal communication, May 15, 2025).

In addition to the above federal protections, Colorado Parks and Wildlife designates species as state endangered or state threatened, and also maintains a State Wildlife Action Plan that identifies species of greatest conservation need (SGCN) and habitats to be prioritized for conservation (Colorado Parks and Wildlife, 2015), with Tier I being the highest priority.

Due to recent and severe declines in pollinators (such as honeybees) and the potential for devastating effects on ecosystems and the economy, President Barack Obama issued a Presidential Memorandum on June 20, 2014 requiring that executive departments and agencies (including DoC) take immediate measures to support pollinators (The White House, 2014). Prescribed measures include planting pollinator-friendly vegetation and increasing flower diversity in plantings, limiting mowing practices, and avoiding the use of pesticides in sensitive pollinator habitats.

As part of this EA, DoC utilized the USFWS IPaC tool to obtain records of sensitive wildlife with the potential to occur on the campus. The IPaC Resource List, obtained on December 15, 2025, indicates that ESA-listed and proposed threatened and endangered animals, as well as migratory birds, have the potential to occur in the vicinity of the campus (USFWS, 2025a). Refer to Appendix A for a copy of the IPaC Resource List, which includes the Unofficial Species List and a list of migratory bird species potentially present on the campus. Refer to Table 4-1 for a list of state and federally listed threatened and endangered species that have the potential to be present on the campus.

Vegetative buffers along Anderson Ditch and Skunk Creek may provide habitat for various wildlife species on the campus. No federally listed species are expected to occur in the immediate vicinity of the campus (W. Keeley, personal communication, May 15, 2025). The Preble's meadow jumping mouse has been successfully trapped in the area along Bear Canyon Creek (W. Keeley, personal communication, May 23, 2025). While Bear Canyon Creek is considered occupied habitat for the Preble's meadow jumping mouse, the riparian area along Skunk Creek within the

Boulder Laboratories Campus is not expected to provide habitat for the species (W. Keeley, personal communication, May 15 and 23, 2025). The trees along Skunk Creek may also provide potential habitat for the tricolored bat. Skunk Creek is shallow and ephemeral, indicating that the creek likely does not provide habitat for a diverse aquatic wildlife assemblage. Refer to Section 4.4.1 (Surface Water) and Section 4.4.3 (Wetlands), respectively, of this report for additional information.

Table 4-1. Threatened and Endangered Wildlife Species that Could be Present or Otherwise Impacted by Activities on the Campus

Species	Conservation Status ^{a,b}
Birds	
Piping plover (<i>Charadrius melodus</i>)	Federally threatened; state threatened
Least tern (<i>Sternula antillarum</i>)	State endangered
Whooping crane (<i>Grus Americana</i>)	Federally endangered; state endangered
Burrowing owl (<i>Athene cunicularia</i>)	State threatened
Amphibians	
Boreal toad (<i>Anaxyrus boreas</i>)	State endangered
Fishes	
Common shiner (<i>Luxilus cornutus</i>)	State threatened
Pallid sturgeon (<i>Scaphirhynchus albus</i>)	Federally endangered
Mammals	
Preble's meadow jumping mouse (<i>Zapus hudsonius preblei</i>)	Federally threatened; state threatened
Tricolored bat (<i>Perimyotis subflavus</i>)	Federally proposed endangered
Insects	
Monarch butterfly (<i>Danaus plexippus</i>)	Federally proposed endangered
Suckley's Cuckoo Bumble Bee (<i>Bombus suckleyi</i>)	Federally proposed endangered
Western Regal Fritillary (<i>Argynnis idalia occidentalis</i>)	Federally proposed endangered

Source: a – (USFWS, 2025a); b – (Colorado Parks and Wildlife, 2025)

² EO 14270, *Zero-Based Regulatory Budgeting to Unleash American Energy*, requires federal agencies to set conditional sunset dates for regulations that may affect energy production, including regulations issued pursuant to MBTA, BGEPA, and ESA. Therefore, it is possible that the regulations governing the implementation of these acts may change over the 10-year master planning horizon. For example, on April 11, 2025, the U.S. Department of the Interior issued a memorandum updating the interpretation of MBTA applicability such that

the MBTA prohibitions do not apply to accidental or incidental taking or killing of migratory birds. However, the interpretation of applicability tends to evolve over time; therefore, as individual projects are reviewed for implementation, DoC will ensure that they are considering the current interpretation for applicability and whether that would result in the need for any impact avoidance measures or BMPs.

The western area of the campus is located within the “Group Two Natural Ecosystem Zone,” which is considered important in providing ecosystem connections and buffers. Wildlife corridors for the open space parks are located to the west of the campus but are not located on the campus.

Campus staff occasionally observe mountain lions and bobcats near the western edge of the developed portion of campus, while coyotes, foxes, and raptors are routinely seen foraging within the protected area near the prairie dog colony (discussed below). Other wildlife frequently seen around the developed portion of campus include deer, rabbits, and pigeons. Bears have also been observed outside of the campus near Skunk Canyon (W. Keeley, personal communication, May 15, 2025).

An extensive black-tailed prairie dog habitat is present within the protected area south of the NOAA facilities (Figure 4-2). Prairie dogs are ecosystem engineers that change the land to make it safer and more comfortable for their family groups. Prairie dog-modified landscapes provide food and shelter for many native wildlife species, including burrowing owls, black-footed ferrets, hawks, and eagles. Colorado Parks and Wildlife considers the black-tailed prairie dog to be a state special concern species (Colorado Parks and Wildlife, 2025). In 2005, the Boulder City Council adopted a final wildlife protection ordinance that emphasizes minimization of human-prairie dog conflicts through non-lethal, non-removal methods. Available survey data suggest that the prairie dog colony on the campus has become more fragmented over time as shown in Figure 4-2. NIST staff indicate that the prairie dog colony has resulted in some damage to campus infrastructure in the vicinity of Building 25.



Figure 4-2. Prairie Dog Habitat at the DoC Boulder Laboratories Campus

OSMP staff indicate that the following Tier I SGCN may occur within approximately 1 mile of the campus: golden eagle (*Aquila chrysaetos*), fringed myotis (*Myotis thysanodes*), Preble’s meadow jumping mouse, Townsend’s big ear bat (*Corynorhinus townsendii*), and little brown bat (*Myotis lucifugus*) (W. Keeley, personal communication, May 19, 2025). In addition, the following Tier II SGCN may occur within 1 mile of the campus: peregrine falcon (*Falco peregrinus*), lazuli bunting (*Passerina amoena*), Mexican spotted owl, prairie falcon (*Falco mexicanus*), Virginia’s warbler (*Leiothlypis virginiae*), Albert’s squirrel (*Sciurus aberti*), and hoary bat (*Lasiurus cinereus*) (W. Keeley, personal communication, May 19, 2025). The nearest documented raptor nest site is a peregrine falcon nest located approximately 0.9 miles west of the campus (W. Keeley, personal communication, May 5, 2025). A golden eagle nest also exists approximately 1 mile from the edge of the campus (W. Keeley, personal communication, May 5, 2025). Additionally, Cooper’s hawks have been known to nest on Kohler Mesa (W. Keeley, personal communication, May 5, 2025). No other known raptor nests, including bald eagle nests, are located within 1 mile of the campus. Raptors are known to occasionally roost and forage within the campus, including within the prairie dog colony.

Environmental Consequences – Proposed Action

Implementation of the Master Plan could result in minor impacts on wildlife. The temporary reduction in grassy vegetated areas discussed in Section 4.2.1 (Vegetation) represents a minor reduction in potential wildlife and pollinator habitat. The Master Plan aims to minimize impacts on wildlife by consolidating facilities within previously developed areas. Much of the affected grassy areas to be disturbed under the Master Plan are routinely landscaped and offer less foraging and habitat value than other vegetated areas (e.g., large contiguous tracts and stream buffers) around the campus. The size of vegetated areas that would be disturbed varies by Master Plan phasing package; some of the phasing packages add vegetated pervious surface while others reduce it. Refer to Section 4.5.3 (Stormwater Management) for additional information regarding pervious surface area at the campus.

The Master Plan would avoid disturbance within the boundaries of the prairie dog colony located in the protected area. However, certain Master Plan elements outside the protected area would be located in close proximity to and potentially within the colony (e.g., the NOAA Building 34 expansion and the demolition of Building 25 and the associated parking lot). Given that prairie dog colonies are dynamic and colony growth on an annual basis is common, the colony boundaries could expand over the course of the Master Plan. Prior to implementing these projects, DoC would reassess the colony boundaries to determine whether a potential conflict exists with the planned construction or demolition. If such a conflict exists, DoC would follow the decision-making process outlined in the city's prairie dog protection ordinance to emphasize the use of non-lethal, non-removal methods for resolving the conflict.

As discussed in Section 4.2.1 (Vegetation), non-native vegetation throughout the campus would be replaced by native grasses, evergreens, and other native drought- and fire-resistant vegetation to mimic native savannah vegetation and improve wildfire resilience. Ash trees removed from the property would be managed to prevent the spread of the EAB. In addition, the Master Plan calls for planting additional trees to provide cover and shade throughout the campus. Replacement of non-native plants with native vegetation, planting of additional trees, and creation of the central meadow would ultimately improve wildlife and pollinator habitat.

While minimal tree removal is anticipated for construction activities associated with the Master Plan, the removal of some trees may temporarily affect migratory bird populations and pollinators on the campus. As individual projects are reviewed for implementation, DoC

would ensure that they are considering the current interpretation for MBTA applicability and whether that would result in the need for any impact avoidance measures or best management practices (BMPs).

Noise emissions from the construction activities conducted under the Master Plan may disturb wildlife in and around the project sites, including nesting migratory birds; however, these impacts would be temporary. As explained in Section 4.1.1 (Noise Levels), after the completion of construction, negligible changes in operational noise levels on the campus would be expected due to minor upgrades and expansions to campus facilities.

As discussed in Section 4.4.1 (Surface Water) and Section 4.4.3 (Wetlands), implementation of the Master Plan could result in minor impacts on campus streams and wetlands due to runoff from construction sites. Runoff to streams could include sediment or other contaminants, which have the potential to adversely impact aquatic organisms that dwell in the streams. As discussed in Section 4.5.3 (Stormwater Management), DoC would implement stormwater management and pollution prevention measures during construction to reduce impacts on aquatic species that inhabit the campus streams.

The use of heavy machinery for construction, renovation, and road reconfiguration projects may create dust, noise, and vibrations that may temporarily disturb wildlife. Activities in close proximity to Skunk Creek, particularly the modifications to Curie Circle in the 100-year floodplain, may result in potential impacts to Preble's meadow jumping mouse and tricolored bat, though effects would not be expected to be adverse. Impacts to other rare, threatened, or endangered species are unlikely due to the lack of suitable habitat within the project areas. Potential impacts to threatened and endangered species would require further evaluation in the future on a project-by-project basis as individual project plans are more clearly defined. If, during the course of planning or implementation of any of the project elements in the Master Plan, threatened or endangered species are discovered on the campus, DoC would consult with USFWS and implement appropriate mitigation measures.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not result in any impacts on wildlife or habitat. The potential to improve the campus by enhancing habitats for native wildlife and pollinators, however, would also not be realized under the No-Action Alternative.

4.3 Topography, Geology, and Soils

4.3.1 Topography

Affected Environment

Topography indicates the relative position and elevation of natural and man-made features within an area. Changes to the topography of an area can affect surface and subsurface water pathways and quantities, result in increased sedimentation, impact stormwater runoff, and ultimately affect water quality in nearby waterways and wetlands. Topography can also influence viewscape, landscape, noise trespass, and land use.

The lowest points on campus (5,405 feet) are at the northeast and southeast corners near Broadway. The main campus entrance along Broadway is at a slightly higher elevation of about 5,410 feet. The slope increases rapidly to the west of Skunk Creek, rising along Kohler Mesa to an elevation of 5,910 feet. The Flatirons formations are approximately 1.5 miles west of the central area of development at the campus.

The developed portion of the campus is generally gently sloping, rising at a slope of approximately 5% from the northeast corner of the campus to Building 25, with some areas adjacent to buildings at approximately 10-30% slopes. South of NOAA Laboratory Building 34 (i.e., the site of a proposed expansion), the ground drops away from the site at a slope of approximately 10 to 30%, leading down to a densely vegetated swale.

Figure 4-3 illustrates the topographic contours in the vicinity of the campus. Refer to Master Plan Exhibit 102 for the percent slope.

Environmental Consequences – Proposed Action

Implementation of the Master Plan would result in localized changes to the site topography. These impacts would be minor, since construction would predominantly occur in developed areas. However, grading and excavating for the construction of new facilities may be necessary, and fill may be required to stabilize the site for the NOAA Laboratory expansion under the Master Plan. Implementation of the Master Plan may cause minor changes in drainage patterns in the immediate vicinity of the new facilities and may trigger an application for, and coverage by, a city-issued grading permit. The Master Plan would result in no impacts on Kohler Mesa. For a discussion on the impacts of the Master Plan on viewscales, refer to Section 4.10.1 (Viewscales).

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not involve grading or fill activities, and therefore, would not impact topography at the campus.

4.3.2 Geology and Soils

Affected Environment

The geologic character of an area is defined by the rocks, sediments, and land features present and the forces affecting them. These geologic features provide the parent material for overlying soils through weathering and supplying of minerals and nutrients. Alterations to the physical makeup of an area can lead to soil contamination, soil erosion, and detrimental impacts on water bodies in or near the area.

The physical characteristics of soil can affect the suitability of the site for development and discan present various pollution and safety concerns upon disturbance, such as high water erosion rates and emissions of particulate matter. These concerns may require the establishment of mitigation and precautionary measures.

The predominant soil map unit on the campus is Nederland (NdD), which covers over 80% of the site (NRCS, 2025). NdD soils are deep, well-drained, moderately permeable soils formed in very cobbly and gravely alluvium. These soils, which allow slow to medium runoff, are generally conducive to development although the presence of stones and cobbles can impede some excavations. According to the National Cooperative Soil Survey, urban housing and development projects often take place on NdD soil (NRCS, 2003). NdD soils typically occur on 1 to 12% slopes and have a minor erosion hazard (NRCS, 2025; USDA, 1975).

Additional soils map units present on the campus include Boulder, bouldery-Sylvandale complex (Cu) soils (about 17% of the site), Terrace Escarpments (Te) soils (less than 1% of the site), and Goldvale, bouldery-Rock outcrop complex (GrF) soils (less than 1% of the site) (NRCS, 2025). The Cu soils on campus are primarily exclusive to the protected areas west of Skunk Creek. Further, Cu, Te, and GrF soils are not present in the developed portion of the campus (NRCS, 2025).

The Farmland Protection Policy Act of 1981 (7 U.S.C. §§ 4201 et seq.) aims to minimize the impact of federal actions on farmland and its conversion to nonagricultural uses. Accordingly, federal actions affecting soils with high agricultural potential require consultation with the Natural Resources Conservation Service (NRCS). None of the soil types within the

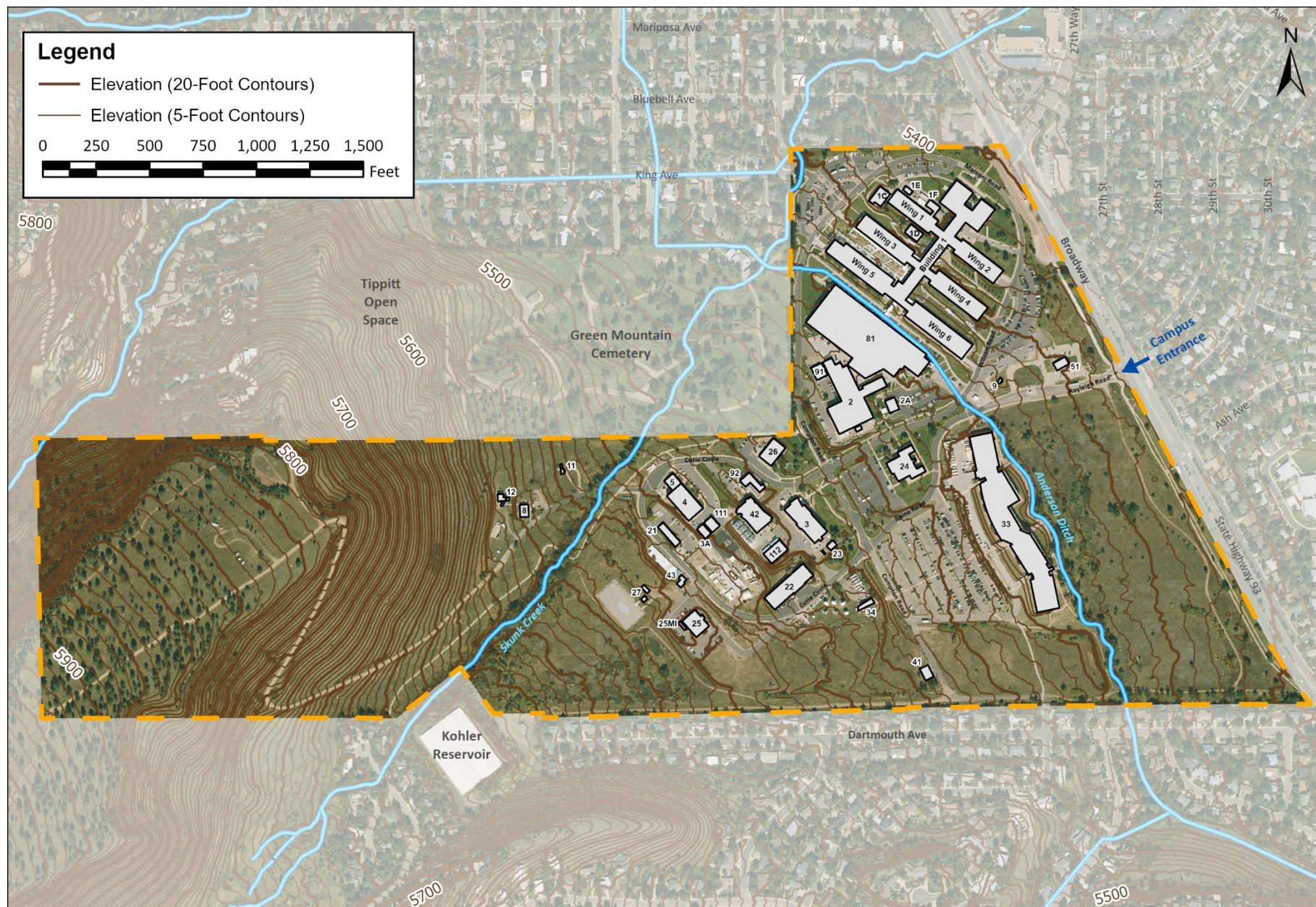


Figure 4-3. Topographic Contours at the DoC Boulder Laboratories Campus

campus are characterized as prime or unique farmland. Additionally, the campus is located within an urbanized area and is therefore not subject to the Farmland Protection Policy Act (USEPA, 2025a).

Environmental Consequences – Proposed Action

The Master Plan would result in moderate soil disturbance associated with construction, demolition, and renovation projects that would impact previously disturbed soil. Soil surface and subsurface compaction may result from heavy machinery traffic around the campus as a result of Master Plan implementation. As noted in Section 4.3.1 (Topography), the Master Plan would require minimal grading since construction primarily occurs in previously developed areas. However, construction of the NOAA Laboratory expansion and stormwater meadow would be expected to require soil relocation due to excavation and construction activities in undeveloped and/or steeply sloped areas.

As mentioned in Section 4.5.3 (Stormwater Management), construction activities under the Master Plan would need to ensure coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges for Construction Activity in Colorado (COR10000F) and compliance with the terms of the Municipal Separate Storm Sewer System (MS4) Permit COR042002. This requires the development of a stormwater management plan (SWMP) for the campus that outlines prevention and control measures to control the quality of stormwater discharged to storm drains and eventually into waters of the United States. DoC would implement erosion and sediment control (ESC) measures during earth disturbance to minimize impacts on soil and water resources. Coverage under the campus' MS4 Permit also requires the installation of post-construction green infrastructure for projects that either disturb 1 acre or greater of land or are part of a plan of development exceeding 1 acre. Due to the permeable nature of the soil and associated infiltration rates, post-construction green infrastructure that focuses on capturing and emphasizing stormwater infiltration should be assessed at the campus and deployed where feasible. Due to the lack of extensive grading, the soil characteristics (e.g., relatively low susceptibility to erosion by water and wind), and the use of ESC measures, the potential for extensive soil erosion under the Master Plan would be minimal.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not result in construction or demolition activities and thus would not result in additional soil disturbance or potential soil contamination, erosion, or compaction.

4.4 Water Resources

4.4.1 Surface Water

Affected Environment

Natural conditions (e.g., interactions with soil, sediments, rocks, groundwater, and the atmosphere) and human activities can impact the quality of surface water by affecting its chemical, physical, and biological characteristics. Human actions that may affect surface water quality include agricultural, industrial, and urban activities. Stormwater runoff from surrounding watersheds directly impacts surface water quality.

Federal surface water regulations, including the Clean Water Act (CWA), Safe Drinking Water Act, and the Rivers and Harbors Act (RHA), focus on rights to water usage and the protection of water quality. The City of Boulder Municipal Code, Chapter 3, Item 9-3-9 includes regulations for development within streams, wetlands, and water bodies.

The campus is located within the 440-square mile Boulder Creek Watershed. Skunk Creek and Anderson Ditch both enter Bear Canyon Creek and flow to Boulder Creek. Boulder Creek empties into Saint Vrain Creek and ultimately discharges to the South Platte River. Boulder Creek and its tributaries include diversions that remove water from streams for various uses including industrial, agricultural, and municipal purposes. Reservoirs are also used to store water since streamflow in Boulder Creek is primarily supplied by snowmelt and varies seasonally depending on snowpack (Murphy, 2006).

Sections of Skunk Creek and Anderson Ditch, both of which are intermittent waterbodies, run through the campus. Skunk Creek extends in a northeasterly direction through the middle of the campus. The stream channel varies in width from 5 to 15 feet (1.5 to 4.6 meters), contains a gravel and cobble bed, and follows a riffle and pool sequence (U.S. General Services Administration (GSA), 1996). Anderson Ditch is an irrigation ditch, located near the eastern border of the site, and extends to Bear Canyon Creek at Table Mesa Drive and Broadway and flows generally southerly. The ditch proper is approximately 5 feet (1.5 meters) wide, and its southern half flows parallel to Broadway. NIST is one of the shareholders in the Anderson Ditch Company, which owns and operates Anderson Ditch. Release of water through the ditch is controlled upstream, and based on discharge data, water is diverted to the ditch generally from April through October (Colorado Department of Natural Resources, 2025). The campus also encompasses a portion of a freshwater

forested/shrub wetland; refer to Section 4.4.3 (Wetlands) for additional information.

The Colorado Department of Public Health and Environment (CDPHE) 303(d) list of impaired waters defines segments of streams and rivers within the Boulder Creek subbasin as impaired for *E. coli*, selenium, arsenic, lead, iron, silver, copper, manganese, and macroinvertebrates (CDPHE, 2023). Bear Canyon Creek, located approximately one mile south of the campus, is 303(d) listed for not supporting designated uses for aquatic life and water supply due to impairments from silver and arsenic, respectively (CDPHE, 2023; USEPA, 2024a). Stream segments within the campus, however, are not identified as impaired water bodies (CDPHE, 2023).

As discussed in Section 4.5.3 (Stormwater Management), stormwater on the campus is currently managed using a combination of constructed and natural detention areas to encourage infiltration prior to discharge. Rainwater collection is not permitted on the campus.

Environmental Consequences – Proposed Action

Implementation of the Master Plan would have the potential to impact surface waters due to runoff from construction activities and changes in the quality and quantity of post-construction stormwater runoff. DoC would implement ESC measures during all construction activities to prevent sediment transport to Skunk Creek and Anderson Ditch. The renovation and construction activities under the Master Plan would provide an opportunity for the design and implementation of improved post-construction stormwater management techniques such as green infrastructure. This opportunity creates the potential to improve the overall quality of surface waters, groundwater, and stormwater at the campus.

The increased campus population under the Master Plan could result in an overall increase in the volume of wastewater discharged to the City of Boulder sanitary sewer system, which ultimately discharges to Boulder Creek following treatment by the city. This potential increase should not affect water quality within Boulder Creek as the city would continue treating the sanitary wastewater in accordance with the applicable CDPHE permit. Also, increased cooling loads under the Master Plan could result in an increased volume of wastewater discharged to the campus stormwater system, portions of which discharge to Skunk Creek and Anderson Ditch. DoC would continue to comply with the applicable Municipal Separate Storm Sewer System (MS4) permit for these discharges.

Refer to Sections 4.5.2 (Wastewater) and 4.5.3 (Stormwater Management) for additional discussion of discharges to surface waters.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would have no impact on surface waters. However, the No-Action Alternative would also not implement green infrastructure or improve existing stormwater management practices to meet the intent of local, state, and federal rules and regulations.

4.4.2 Groundwater

Affected Environment

Groundwater is the most prevalent source of available freshwater that supports potable, agricultural, and industrial uses, especially in areas that lack access to surface water resources. Groundwater quality is impacted by natural resources (e.g., soil, sediments, rocks, surface waters, and the atmosphere) as well as anthropogenic activity (e.g., by agriculture and industry).

Based on a geotechnical investigation conducted in 2021, groundwater in the north-central portion of the campus was encountered at 7.5 to 18 feet below ground surface. Groundwater levels under the campus fluctuate seasonally and rise during the spring and summer due to snowmelt and runoff from the Flatirons. Campus staff indicate that a high water table can occasionally limit stormwater infiltration rates. Building 1 (Wings 5 and 6) and the CUP each have a sump pump that runs year-round to eliminate groundwater intrusion into the buildings. The site utility tunnel also has sump pits.

Surface topography is typically an indicator of groundwater flow, with groundwater flowing from higher to lower elevations. Based on the topography of the campus, groundwater is generally expected to flow from the southwestern area of the campus to the northeastern and southeastern corner of the campus, towards Broadway.

The campus does not receive its domestic water from onsite wells and is not located within 1,000 meters of a designated sole source aquifer (USEPA, 2025a). Sources for the City of Boulder's potable water include Barker Reservoir, North Boulder Creek and Carter Lake (City of Boulder, 2025a). Boulder's potable water is not supplied by a groundwater source (City of Boulder, n.d.). For more information regarding potable water at the campus, refer to Section 4.5.1 (Potable Water Supply).

Environmental Consequences – Proposed Action

Implementation of the Master Plan would not impact groundwater consumption.

Construction and demolition activities associated with implementation of the Master Plan have the potential to impact groundwater. DoC would implement appropriate pollution prevention and erosion and sediment control measures during the implementation of the Master Plan to avoid spills and exposure of groundwater to contamination.

Renovation and construction activities under the Master Plan provide an opportunity for the installation of green infrastructure and the implementation of advanced stormwater management techniques, including the central meadow and post-construction green infrastructure near the parking areas, which may contribute to enhanced groundwater recharge during storm events.

Environmental Consequences – No-Action Alternative

Under the No-Action Alternative, there would be no change in groundwater consumption and no potential for impacts during construction. Stormwater management improvements and subsequent enhanced groundwater recharge on the campus would also not be realized under the No-Action Alternative.

4.4.3 Wetlands

Affected Environment

Wetlands provide important ecological services, such as filtering nutrients, sediment, and pollutants from surface and groundwater; absorbing excess floodwater and rainwater; protecting shorelines from erosion; and providing habitat for numerous plants and animals.

Wetlands are federally protected by Section 404 of the CWA, Executive Order (EO) 11990 (*Wetland Protection*), RHA, and applicable local regulations and permit programs such as Chapter 9-3-9: Stream, Wetland & Water Body Protection of the City of Boulder Municipal Code. EO 11990, implemented in 1977 and amended by EO 12608 in 1997, also protects wetlands and their associated ecosystem services.

The National Wetlands Inventory (NWI) is USFWS' wetland classification system identifying wetlands throughout the U.S. However, the NWI is based on aerial imagery rather than field surveys and therefore may not reflect current conditions depending on the date and quality of the

imagery. The NWI identifies Skunk Creek and Anderson Ditch as riverine wetlands, with a 4.8-acre forested/shrub wetland located along Skunk Creek and a 2-acre forested/shrub wetland east of Building 33 along Anderson Ditch (USFWS, 2025b). Additionally, the City of Boulder has conducted field visits to develop a dataset of regulated wetlands within city boundaries. While the city's dataset does not include the DoC Boulder Laboratories Campus since it is federal property, it does indicate that the wetlands along Skunk Creek exiting the campus in Green Mountain Memorial Park Cemetery are "low functioning" in terms of ecological value, and the portion entering the campus to the southwest is identified as "high functioning" (City of Boulder, 2024b). As discussed in Section 4.2.1 (Vegetation), the City of Boulder Municipal Code, Chapter 3, Item 9-3-9 restricts certain actions, including certain construction and landscaping activities, within wetland buffers. High functioning wetlands have more restrictions and require a 25-foot inner buffer and a 25-foot outer buffer (50-foot total buffer), while low functioning wetlands are less restrictive with a 25-foot buffer. Additionally, the city's dataset does not identify wetlands along any portion of Anderson Ditch (City of Boulder, 2024b).

Wetland delineations were not conducted as part of this EA.

Environmental Consequences – Proposed Action

Construction, demolition, and renovation activities under the Master Plan would not occur within wetlands or wetland buffers. Construction-related runoff would be unlikely to enter the wetlands surrounding Skunk Creek or the portion of Anderson Ditch that is identified in NWI as a wetland.

Construction of the new Management Resources Center, research buildings, Childcare Center, and other future structures would increase impervious surfaces on the campus and—without installation of green infrastructure such as the proposed central meadow or use of the detention basins—could result in long-term changes in the quantity of stormwater runoff discharged to Anderson Ditch, which could carry pollutants to the portion of Anderson Ditch that is identified in NWI as a wetland. However, as discussed in Section 4.5.3 (Stormwater Management), DoC would employ green infrastructure to comply with federal requirements and EOs for sustainable stormwater management and ESC measures to reduce the potential for discharge of sediment or contaminant-laden stormwater to the wetland.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not impact wetlands.

4.4.4 Floodplains

Affected Environment

Floodplains perform important natural functions, including moderating peak flows, maintaining water quality, recharging groundwater, and preventing erosion. In addition, floodplains provide wildlife habitat, recreational opportunities, and aesthetic benefits. The 100-year floodplain is defined as an area that is subject to a 1% or greater chance of flooding in any given year. The 500-year floodplain is defined as an area that is subject to a 0.2% chance of flooding in any given year.

To protect floodplains and minimize future flood damage, the federal regulations at 44 Code of Federal Regulations (CFR) 9 and EO 11988 (as amended by EOs 12148 and 13807) restrict development within the 100-year floodplain. Under EO 11988, all federal agencies must 1) determine if any of their actions would occur within a floodplain, 2) evaluate the potential effects of these actions, 3) analyze alternatives to these actions, 4) provide public notice for actions proposed in the floodplain, and 5) protect new construction in a floodplain with floodproofing.

The currently effective boundaries of the 100-year floodplain within the campus include the northern portion of Curie Circle but no permanent structures. The currently effective boundaries of the 500-year floodplain within the campus include Buildings 1C, 1D, and 1E; a portion of Wings 1, 3, and 5 of Building 1; and the parking lot and portion of Compton Road to the north of Building 1. No structures on the campus are located within the current conveyance zone (the area equivalent to a 0.5-foot rise floodway) or the high hazard zone (the portion of the 100-year floodplain where flood depths equal or exceed 4 feet) (FEMA, 2025).

Floodplain concerns also apply to Anderson Ditch. During their review of the 2017 Draft Master Plan and Draft EA, the City of Boulder commented that Anderson Ditch had been identified as being over capacity during two-year and five-year storm events, based on stormwater modeling and master planning efforts.

Environmental Consequences – Proposed Action

Implementation of the Master Plan would involve the reconfiguration of Curie Circle (the portion north and northwest of Buildings 4 and 5) within the 100-year floodplain. This would trigger permitting or consultation with Boulder Planning and Development Services Center, specifically requiring coverage under a Floodplain Development Permit issued by the City. No other new construction, demolition, or renovations proposed under the

Master Plan would occur within the 100-year floodplain. Within the 500-year floodplain, implementation of the Master Plan would involve demolition of Buildings 1C and 1E (thus reducing overall footprint within the floodplain), renovation of Wing 1 of Building 1, and no construction of new facilities. No construction, demolition, or renovations would occur within the conveyance zone or high hazard zone. Furthermore, new facilities constructed under the Master Plan would be sited and designed properly to avoid impacts to floodplains and ensure consistency with federal regulations and EOs.

As discussed in Section 4.5.3 (Stormwater Management), the Master Plan would result in an overall reduction in impervious surfaces within the campus. In addition, the Master Plan would incorporate a stormwater drainage system that can be designed to ensure no net increase in runoff from the campus to Skunk Creek or Anderson Ditch. DoC would continue to comply with the applicable MS4 requirements for post-construction runoff control, including requirements to meet water quality capture volume and infiltration standards. Therefore, the Master Plan would not contribute to flooding concerns in the Skunk Creek floodplain or elsewhere near the campus.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not involve any impacts or changes in activities within the 100-year floodplain, 500-year floodplain, conveyance zone, or high hazard zone. Existing infrastructure and facilities within the floodplain would remain subject to flood risk.

4.5 Utilities and Infrastructure

4.5.1 Potable Water Supply

Affected Environment

Potable water is supplied to the DoC Boulder Laboratories Campus by the City of Boulder. In fiscal year 2022, the total water consumption at the campus was approximately 31.5 million gallons. Domestic water use by occupants, cooling tower make-up water, boiler feed water, and process/laboratory water are the primary drivers of potable water consumption at the campus. In laboratories that are not served by the campus chilled water system, personnel use a constant flow of domestic water for chilling. The Campus has a goal to reduce water consumption by approximately 25% from 2007 levels. In 2014, NIST completed a project to convert the entire campus to low flow fixtures to reduce water consumption in existing buildings.

The existing potable water piping system is approximately 50% loaded and is in a loop configuration which adds capacity and provides an adequate level of system redundancy. While a leak study has not been performed, due to the age of the system, portions are nearing or at the end of their useful life; as a result, there is a high probability of leaks occurring in the system. Additionally, during the City of Boulder's maintenance on one of the campus feeds, it was recently observed that the water supply to the CUP was inadequate—likely due to tuberculation of the main water distribution loop.

Environmental Consequences – Proposed Action

The Master Plan is expected to generate an overall minor increase in potable water demand that would be approximately proportional to increases in the campus staff and facility square footage. However, eliminating all single pass cooling equipment, including consolidating laboratory space and connecting the laboratories to the chilled water system, would reduce the use of domestic water for chilling purposes. Other approaches would include installing package systems such as air-source heat pumps to produce chilled water.

New potable water lines would need to be installed to connect new facilities with the existing potable water infrastructure. The potable water piping in Building 1 would be replaced during renovations. The Master Plan also recommends that DoC repair and line all underground piping to minimize leaks and construct and connect a second water supply to the CUP.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not increase potable water consumption. Under the No-Action Alternative, DoC would not repair and line underground piping; therefore, the likelihood of water leaks along the old lines would increase over time as the existing infrastructure continues to age.

4.5.2 Wastewater

Affected Environment

Sanitary, industrial, and other wastewater generated at the DoC Boulder Laboratories Campus is primarily discharged to the City of Boulder sanitary sewer system for treatment. DoC holds an industrial discharge permit (Permit No. 2021-4) from the City of Boulder that limits the allowable discharge of pollutants from research laboratories, offices, and

support facilities (City of Boulder, 2021). Permit No. 2021-4 covers discharges from all NIST buildings on the campus. GSA does not have a permit for industrial discharges from NOAA-occupied buildings on the campus. The CUP discharges wastewater associated with equipment washdown, blowdown from boilers, cooling tower maintenance, and cleaning associated with the closed-loop chilled water system. The laboratories in Building 81 dispose of inorganic acids and bases to a waste neutralization system, which then discharges to the sanitary sewer system. There is also a scrubber that treats gases from the chemical vapor deposition processes in Building 81.

The industrial discharge permit requires that NIST complete quarterly wastewater sampling and reporting. According to the four 2024 quarterly reports, the campus discharged between approximately 118,000 to 169,000 gallons per day of wastewater to the sanitary sewer system. Based on these data and an assessment of topographical features, the existing sanitary sewer system has sufficient capacity.

As discussed in Section 4.5.3 (Stormwater Management), the campus also holds a NPDES permit from the U.S. Environmental Protection Agency (USEPA), which allows the discharge of air conditioning condensate, irrigation water, water line flushes, potable water, and emergency firefighting discharges to the stormwater system but does not allow discharges associated with industrial or construction activities for which permitting under the EPA Construction General Permit is required.

Environmental Consequences – Proposed Action

The Master Plan is expected to result in an overall minor increase in wastewater generation due to increased campus population and increased cooling loads. The generation of wastewater would increase in conjunction with the increases in potable water use described in Section 4.5.1 (Potable Water Supply). DoC would evaluate wastewater generation associated with new or modified laboratory activities to determine if the industrial discharge permit needs to be modified.

Under the Master Plan, DoC would install new sanitary sewer lines to connect new facilities with the existing sanitary sewer infrastructure.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not increase wastewater discharge at the DoC Boulder Laboratories Campus and would not impact the existing wastewater infrastructure.

4.5.3 Stormwater Management

Affected Environment

Impervious surfaces collect and accumulate pollutants and, during high storm events, these pollutants are quickly washed off and rapidly delivered to aquatic systems. Monitoring and modeling studies have consistently indicated that urban pollutant loads are directly related to watershed imperviousness. Pervious surfaces allow for the absorption of stormwater and ultimately allow for recharging of the groundwater table.

The campus has several existing stormwater features to detain stormwater and promote its infiltration into the ground, including two detention basins with extensive infiltration capacity that rarely exhibit standing water. Stormwater generally flows from southwest to northeast across the campus. Stormwater that does not infiltrate on site is collected and transported via underground piping to the MS4 outfalls or is carried off site by Anderson Ditch, Skunk Creek, or a drain at the southeastern corner of the campus. Stormwater transported to the MS4 outfalls is discharged to Skunk Creek just north of the campus where the creek flows under Broadway. Stormwater carried by Anderson Ditch, Skunk Creek, and the southeastern drain later enters Bear Canyon Creek off site.

The USEPA retains NPDES permitting and enforcement authority for federal facilities located in the State of Colorado. In accordance with the authority under the CWA, the USEPA issued DoC a permit (Permit No. COR042002) authorizing the discharge from all MS4 outfalls to receiving waters including Skunk Creek and Anderson Ditch and other associated waters of the United States within the exterior boundaries of the campus. The MS4 permit requires that the permittee design for and provide funding for the installation of permanent post-construction stormwater control measures designed to retain, detain, infiltrate or treat stormwater discharge from newly developed and redeveloped sites that disturb greater than or equal to 1 acre of land (whether individually or as part of a larger common plan of development) in a manner that is consistent with Control Measure Design Standards. Note, however, that Colorado Water Rights prohibit the collection of rainwater at the campus. The MS4 permit also requires DoC to develop and implement an SWMP that includes stormwater management and control techniques and other provisions to control the discharge of pollutants from the MS4.

DoC must comply with Section 438 of the Energy Independence and Security Act of 2007 (EISA 2007). Under EISA 2007, federal agencies must "use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically

feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow" for any project with a footprint greater than 5,000 SF. Guidance on how to meet EISA 2007 is provided in the *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (EPA, 2009).

DoC also maintains spill prevention, control, and countermeasure plans for tanks, generators, and transformers to reduce the risk of water quality impacts from leaks or spills that could result in pollutants being transported to waterways via stormwater.

Environmental Consequences – Proposed Action

Temporary Construction Impacts

Under the Master Plan, construction and demolition activities at the campus would disturb land, creating the potential for erosion and sediment-laden discharges to Skunk Creek, Anderson Ditch, and the MS4 outfalls. DoC would develop all appropriate ESC and stormwater plans, and obtain all necessary permits, to ensure that these potential impacts are minimized during earth disturbance.

The MS4 permit requires that both DoC and the construction contractor obtain appropriate permit coverage for regulated construction activities under the USEPA General Permit for Discharges from Construction (Construction General Permit or CGP). The MS4 permit defines "regulated construction activities" as development and re-development that results in a land disturbance of greater than or equal to 1 acre, whether individually or as part of a larger common plan of development. Demolition and construction projects identified in the Master Plan meet this definition and would be subject to permitting under the CGP. Per the requirements of the CGP, the construction contractor would develop a stormwater pollution prevention plan, including temporary BMPs for sediment and erosion control during construction activities. Additionally, temporary BMPs implemented during construction would meet the design, installation, and maintenance specifications of the Mile High Flood District *Urban Storm Drainage Criteria Manual*. The permit also requires the permittee to consult with appropriate city, county, and/or drainage district staff regarding the redevelopment or development project. Additionally, DoC would prepare a SWMP detailing how development under the Master Plan would meet the requirements of the campus MS4 permit.

Long-Term Stormwater Management

The implementation of the Master Plan would replace impervious surfaces throughout the campus with the installation of post-construction green infrastructure and other stormwater control measures that would provide opportunities for improved stormwater management. Under the Master Plan, DoC would create a central meadow between the proposed Buildings A and B. Stormwater runoff from surrounding buildings and paved areas would be directed toward the meadow, where it would be slowed, filtered, and partially absorbed by the soil and plant roots, with the remainder conveyed to the underground MS4. Stormwater runoff from the developed portion of the campus would therefore continue to flow to Anderson Ditch, Skunk Creek (both directly and via the MS4), and Bear Canyon Creek (via the drain in the southeastern corner of the campus). Figure 4-4 illustrates the stormwater conveyance network proposed under the Master Plan. Relative flow volumes of stormwater discharged to each receiving body would change depending on which phases of the Master Plan get constructed. Throughout implementation of the Master Plan, the efficacy of the stormwater detention basins, smaller detention features, vegetative swales, and piping conveying stormwater to the MS4 may need to be assessed and upgraded to support modifications to the campus, as needed.

When designing the proposed parking garage adjacent to Building 81, DoC would also plan for the installation of green infrastructure in compliance with federal policies and ensure that the selected stormwater management approach does not result in a net increase the amount of runoff to Skunk Creek. For example, this could be accomplished by primarily directing runoff from the garage to the central meadow and by incorporating additional green infrastructure as necessary. Additionally, DoC would ensure the central meadow would be designed not only to manage the potential for increased stormwater flows from proposed development, but also to allow for control of the discharge rate to the MS4 system through design features such as check dams. The proposed stormwater conveyance network also emphasizes the use of the two large detention basins to manage runoff from new development located south

of the proposed meadow. The goal of this approach is to decrease the overall flow rate of stormwater runoff into Anderson Ditch from developed areas within the campus.

Under the Master Plan, various green infrastructure would be installed at the parking lot near the proposed Security Center. Creation of the central meadow and the incorporation of various green infrastructure would have minor net improvements to stormwater quality. In order to comply with federal requirements for sustainable stormwater management, the proposed Master Plan would likely need to incorporate additional stormwater management green infrastructure and control measures beyond those currently identified in the Master Plan. This may include a combination of infiltration technologies such as raingardens, bioswales, and infiltration trenches installed throughout the campus. Regardless of the combination of green infrastructure chosen for implementation under the Master Plan, DoC would ensure that green infrastructure is properly designed and maintained to mitigate the potential health and nuisance concerns associated with the detention of standing water. Stormwater plans and designs would specifically document compliance with the design requirements identified in the campus MS4 permit.

Implementation of the Master Plan would reduce the amount of impervious areas on the DoC campus from approximately 2,244,000 SF to approximately 2,126,692 SF. The reduction in impervious surfaces may result in minor benefits to stormwater management, including decreasing stormwater flow and soil erosion during rain events and improving runoff water quality and groundwater recharge.

Environmental Consequences – No-Action Alternative

Implementation of the No-Action Alternative would not involve construction, renovation, or demolition; therefore, no additional stormwater impacts would occur at the campus. The No-Action Alternative would not improve existing stormwater management practices to meet the intent of local and federal rules and regulations regarding management of stormwater.



Figure 4-4. Proposed Stormwater Conveyance Network under the Master Plan

4.5.4 Energy Use

The electrical infrastructure at the DoC Boulder Laboratories Campus provides the energy needed to operate the facilities on campus, while heating and cooling systems consume energy sources in the form of electricity and fossil fuels.

Based on typical primary uses for electricity, the main uses are generally for cooling equipment and pumps at the CUP; cooling at individual buildings; and powering fans, plug loads, and lighting. Building 41 houses the automatic source high-speed transfer switch for two incoming medium voltage feeds from Xcel Energy, which provides electricity service to the entire campus. The total capacity of each feeder is approximately 11 megavolt-amperes. Peak electrical demand was registered in July 2025 to be approximately 7.1 megavolt-amperes.

Chilled water is primarily used for cooling buildings and possible process loads in labs. The CUP contains four 1,500-ton chillers with an installed capacity of 6,000 tons, derated to an available capacity of 4,500 tons.

A distribution service provides high-pressure natural gas from the off-site connection to the CUP. At the CUP, normal pressure gas piping—government-owned after the meter—connects to the high-pressure main and distributes normal pressure natural gas throughout the campus. Natural gas is primarily used to produce steam at the CUP and for heating at some buildings. Steam is supplied from the CUP and distributed to campus buildings for space heating and, in some cases, for domestic hot water or process loads. The CUP contains three boilers rated at 900 boiler horsepower (BHP) each. The total installed CUP heating capacity is 2,700 BHP (93,000 pounds per hour of steam capacity); however, the available capacity of the CUP is 1,800 BHP (approximately 62,000 pounds per hour) with two boilers operating and the third boiler considered fully redundant.

Refer to the Master Plan for additional information about energy use on campus.

Environmental Consequences – Proposed Action

The Master Plan is expected to result in a substantial increase in electrical demand (approximately 50%) and heating demand (approximately 58%) at the DoC Boulder Laboratories Campus over the next 20 years due to the increase in personnel and operation of lighting systems, laboratory equipment, and heating, ventilation, and air conditioning (HVAC) systems associated with the new buildings. Projects implemented under the Master

Plan would not require extensive modifications to the existing electrical distribution network. New emergency generators would be installed to support operations in the new buildings. Approximately five emergency generators at buildings to be demolished under the Master Plan (Buildings 2, 4, 5, 21, and 25) would be either removed or repurposed to support new operations.

To help ensure campus energy security and promote cost effectiveness, the Master Plan recommends that site-wide projects incorporate energy conserving and solar technologies (if compatible with facility and operational requirements) that will continue to evolve over the life of the Master Plan. Despite the increase in electrical demand, inefficient small and temporary buildings would be replaced by new and renovated buildings featuring improved energy efficiency. DoC would target net-zero energy use for both the Childcare Center and the Management Resources Center. Furthermore, the Master Plan includes solar photovoltaic energy systems on selected building roofs (Management Resources Center and Childcare Center) and over parking areas, as well as a solar panel field on the former site of Building 25 after it is demolished. The solar energy systems would reduce the quantity of electricity consumed from the grid and help the planned consolidated support facility achieve net-zero energy consumption.

Under the Master Plan, the existing CUP would supply the new and renovated NIST laboratory facilities with chilled water and steam. Based on conceptually estimated heating and cooling loads, the CUP would have the capacity to support the existing and new buildings proposed under the Master Plan at a reduced level of equipment redundancy. The Childcare Center and the Management Resources Center would be either provided with dedicated heating and cooling systems or connected to the campus steam and chilled water system. DoC estimates that the Master Plan would increase the CUP cooling demand by approximately 109% and the CUP heating demand by 58%. No upgrades to CUP infrastructure are needed to support the planned heating and cooling loads.

Increases in heating and cooling demand would be offset somewhat by replacement of inefficient and under-insulated small and temporary buildings with new buildings featuring improved insulation and HVAC efficiency. DoC would use natural and passive ventilation, heat recovery systems, and decoupled ventilation/cooling, where feasible, to improve HVAC energy efficiency. The existing buildings to be retained in the rest of the campus would continue to have dedicated HVAC systems.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not impact electrical infrastructure, heating and cooling systems, or demand. Under the No-Action Alternative, DoC would not incorporate any energy conserving technologies to help ensure campus energy security and promote cost effectiveness.

4.6 Solid and Hazardous Waste

Affected Environment

Solid waste is defined as any garbage, refuse, sludge, or other discarded material including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, agricultural, or community activities. USEPA defines hazardous waste as a solid waste that exhibits a characteristic of ignitability, corrosivity, reactivity, or toxicity, or is specifically listed as a hazardous waste.

Hazardous and nonhazardous solid wastes are regulated by federal, state, and Boulder County laws. The Resource Conservation and Recovery Act authorizes USEPA to control hazardous waste from “cradle to grave.” This lifecycle includes the generation, transportation, treatment, storage, and disposal of waste. USEPA has delegated authority to CDPHE to implement hazardous waste regulations and oversight. As a result, CDPHE has developed solid waste regulations (6 Code of Colorado Regulations [CCR] 1007-2) and hazardous waste regulations (6 CCR 1007-3). In addition, the USEPA’s *Guidelines for Thermal Processing of Solid Wastes* (40 CFR 240) and *Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste* (40 CFR 243) provide specifications for the treatment and disposal of municipal solid waste.

Facilities at the DoC Boulder Laboratories Campus generate various types of hazardous, non-hazardous, and universal wastes (which are hazardous wastes that are very commonly used and have less stringent disposal requirements). Due to the quantity of hazardous waste generated, the campus meets the definition of a small quantity hazardous waste generator, defined by 40 CFR 262 as a facility that generates between 100 and 1,000 kilograms (kg) of hazardous waste and less than 1 kg of acutely hazardous waste in a month. Rarely, the DoC Boulder Laboratories Campus operates as an episodic large quantity generator, typically when more than 1 kg of acutely hazardous waste is generated or when a construction project generates hazardous waste for a short time.

According to the cross services agreement, one of NIST’s responsibilities at the campus includes hazardous and regulated waste management. As a component of this responsibility, NIST has overseen the storage of waste in Building 23, which has been the central accumulation area for hazardous waste. This two-room building has secondary containment systems to collect waste in the event of a leak or spill. Hazardous waste is stored in cabinets or in drums, while radioactive materials are stored in a dedicated safe. In 2025, NIST constructed a new 1,200 square foot (SF) hazardous materials storage facility (Building 43) at the west end of Curie Circle, replacing the existing Building 23. [Construction of Building 43 is not part of the Proposed Action evaluated in this EA.] Building 43 is only the hazardous waste central accumulation area, and chemicals and other hazardous materials will not be received at or distributed from Building 43. The functions of Building 23 are currently being migrated to Building 43. Building 23 will then be demolished as part of the Master Plan.

Approximately 50 satellite hazardous material storage locations are present on campus surrounding laboratory rooms. The NIST Boulder Safety, Health, and Environment Division (BSHED) coordinates requests for the collection and transfer of hazardous and universal wastes to Building 23 by a third-party contractor approximately two times per week. The BSHED has developed standard operating procedures and specific criteria for the collection, labeling, and transportation of hazardous and universal waste generated at the campus (NIST, 2016). The third-party contractor then transfers the waste to permitted treatment, storage, disposal or recycling facilities about every two weeks and retains proper documentation.

Solid non-hazardous waste from the campus is collected and disposed of at a local landfill. Construction contractors are responsible handling construction debris in accordance with CDPHE regulations for solid and hazardous waste. The current hazardous waste management contract does not include wastes generated by construction activities. Requirements for managing construction waste are included in NIST OFPM’s contract template.

Asbestos is present in several buildings on campus, including Building 1. During renovation projects, the construction contractor typically conducts asbestos surveys and removal on a project-by-project basis.

DoC reviewed available databases for solid and hazardous waste sites in the general area around the DoC Boulder Laboratories Campus. USEPA’s NEPAAssist, Cleanups in My Community, Envirofacts, and Enforcement and Compliance History Online tools were used to search environmental databases such as the National Priorities List database; Brownfields

Properties; Superfund Enterprise Management System; and Resource Conservation and Recovery Act Information database. This review revealed that there are no nearby solid or hazardous waste sites with potential to impact the campus.

Environmental Consequences – Proposed Action

The implementation of the Master Plan would generate construction and demolition waste, which would require collection, staging, and removal from the campus. Wastes would be handled and disposed of in accordance with CDPHE regulations and with NIST OFPM contracts. Recycling of construction and demolition debris would be implemented to the extent practicable. Demolition of older facilities may involve the removal of materials containing polychlorinated biphenyls (PCBs), lead, or asbestos. Disposal methods would be addressed under the construction permit, including the cost of sampling, transporting, and discharging of said wastes to an appropriate facility in compliance with CDPHE regulations. Non-hazardous waste management, including its packaging, transportation, and disposal, would also adhere to requirements in the current NIST OFPM contract.

Operations in the various proposed administrative, support, and laboratory facilities would be expected to generate similar types of wastes as existing operations within the campus; however, the quantity of these wastes could increase slightly, given the projected increase in staff and operational space.

The recent construction of Building 43 and future demolition of Building 23 contribute similar, minor cumulative effects for solid waste generation and will improve hazardous waste management at the campus. Building 43 will modernize the hazardous waste central accumulation building and will include more exterior storage for drums with secondary containment. Construction of Building 43 has enabled the future demolition of Building 23 and therefore the future expansion of Building 3.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would result in no changes in the generation, storage, or disposal of solid or hazardous waste. The No-Action Alternative would not involve the removal of hazardous building materials including asbestos, lead, and PCBs.

4.7 Transportation

Affected Environment

The DoC Boulder Laboratories Campus has a single vehicular entrance located on Broadway (Colorado State Highway 93) which is used by all employees and visitors. Two loop roads branch off from the entrance to form the primary vehicular circulation pattern for the campus. One loop, consisting of Compton Road and Marconi Road, circles the majority of the laboratory buildings. The second loop, known as Curie Circle, provides access to the NOAA building parking area and to the western portion of the campus. Parking areas are distributed throughout the campus. There are currently 1,389 parking spaces on campus. Per agreements with the City of Boulder and a collective of Native American Tribes, the total number of parking spaces allowed on campus is restricted to 1,802.

Visitor vehicles are screened at the Security Center located at the campus entrance. Congestion is a problem in this area, and space and maneuvering room are limited.

The City of Boulder has an effective public transportation system and robust bicycle path network. Both of these serve the campus and many DoC employees use public transportation or the bicycle paths to commute to work.

Refer to the Master Plan for additional information about existing transportation systems serving the campus.

Environmental Consequences – Proposed Action

Under the Master Plan, the number of campus staff would increase by approximately 120 people over the next 10 years. This increase would be expected to only slightly increase commuting via privately owned vehicles (POVs) and public transportation. While the Master Plan anticipates an increase in personnel, there would be a potential reduction in intra-campus POV use due to consolidation of facilities within the campus and improved pedestrian circulation.

The Master Plan would include two major circulation changes to the campus. The first involves removing the central roadway between Building 3 and Building 81 and slightly reconfiguring the western portion of Curie Circle to provide a cleaner “loop” for vehicles around the developed portion of the campus. With installation of a widened walkway, this change would promote the central part of campus as a more pedestrian and bicycle-oriented space. The second major change involves renovating the existing Security Center to address existing inefficiencies in security

screening processes. The new separate screening areas for trucks and private cars and the new guard booth location with turnaround space for rejected or lost vehicles would reduce vehicular congestion and bottlenecks at the campus entrance.

Several existing parking areas, including the existing parking lot where the new Childcare Center would be placed, would be consolidated into one new parking garage near proposed Building 81 that would serve employees. Additionally, as part of the Security Center renovations, a new visitor parking lot (which effectively replaces the existing screened parking lot east of Building 1) would reduce existing congestion in the screening process by providing unscreened parking for staff and visitors not entering any buildings. The total number of parking spaces throughout the campus would increase modestly to an estimated 1,463 under the Master Plan but would remain well below the 1,802 limit established by the agreement with the City and Tribes.

The Master Plan would result in temporary increases in traffic and congestion during construction, reconfiguration, and demolition activities. To reduce disruptions to vehicular access within the campus, the central roadway would only be removed after surrounding building construction is complete. Construction activities could also temporarily affect parking availability by closing off lots or occupying lots with construction vehicles and equipment. DoC would coordinate construction activities and create temporary parking and staging areas to ensure that vehicles are not forced to park off campus, park in grassy areas, or cause other impacts due to a temporary lack of parking capacity. DoC would also ensure any temporary disruptions to normal bicycle and pedestrian pathways are mitigated with clear signage and detours as needed.

Under the Master Plan, the majority of campus employees would continue to work within a five-to-ten-minute walk of the bus stops or the campus entrance on Broadway. Some buildings, such as the Childcare Center, would be relocated closer to the campus entrance on Broadway and parking lots. Walking to this building from Broadway would therefore take less time than under existing conditions.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not impact the local transportation network or traffic levels and would not change vehicle use or parking availability within the campus. There would be no improvement, however, to campus ingress or vehicle circulation within the campus.



The No-Action Alternative would not impact public transportation facilities or ridership and would not affect commuters who bike or walk to the campus.

4.8 Air Quality

Affected Environment

National Ambient Air Quality Standards

The Clean Air Act (CAA) designated the USEPA the authority to set National Ambient Air Quality Standards (NAAQS) to limit the concentration of pollutants considered harmful to public health and the environment (40 CFR Part 50). The NAAQS regulate six specific pollutants, commonly referred to as “criteria pollutants” that include ozone, particulate matter (PM), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (USEPA, 2024b). The NAAQS limit PM levels according to particle size, with separate standards for coarse (PM₁₀) and fine (PM_{2.5}) particulate matter. USEPA publishes updates to the NAAQS in the Federal Register as well as on its website (USEPA, 2024b).

If a region’s air pollutant concentrations are not in violation of the NAAQS, the area is considered to be in *attainment*. For areas USEPA designates as *nonattainment*, USEPA defines the exceedance severity in a range of categories from *marginal* to *severe*. A *nonattainment* designation requires that a region submit a State Implementation Plan (SIP) that addresses how the NAAQS will be met in a future year. USEPA later determines whether the region has met the SIP goals, and if so, USEPA may change the designation from nonattainment area to *maintenance* area. Boulder County is a severe nonattainment area for 8-hr ozone (2008 standard), serious nonattainment area for 8-hr ozone (2015 standard), and maintenance area for CO and PM₁₀ (USEPA, 2025b). The CAA General Conformity Rule (GCR) requires that federal actions taking place in nonattainment areas must conform to the region’s SIP to reduce nonattainment pollutant(s). The Colorado Air Quality Control Commission has approved a SIP for ozone for the Denver Metro Area, which includes Boulder County, as well maintenance plans for CO and PM₁₀. Boulder County is in attainment for PM_{2.5}, SO₂, NO₂, and lead.

Under Regulation No. 3, “Stationary Source Permitting and Air Pollutant Emission Notice Requirements,” the CDPHE Air Pollution Control Division requires that facilities submit an Air Pollutant Emission Notice (APEN) when there is a significant change in emissions. Since Boulder County is an ozone nonattainment area, a change in VOC or NO_x emissions of one ton or 5%, (whichever is greater) above the level reported on the last

APEN submission would be considered a significant change (CDPHE, 2015). The APEN form also serves as the Application for Construction Permit for applicable emission units. The DoC Boulder Laboratories Campus is permitted as a synthetic minor source due to its potential to emit more than 25 tons of ozone precursors (NO_x) per year. As such, NIST is required to limit emissions from its permitted sources by staying within the limits on operating hours or fuel consumption specified in the synthetic minor permit. Addition of new sources would require stricter limitations on operating hours or fuel consumption for other sources.

Land development activities of at least 25 contiguous acres or more than six months in duration also would require an APEN and may be required to obtain an air permit depending on estimated emissions. In addition, a start-up notice must be submitted thirty days prior to beginning a land development project that exceeds size and duration limits identified in the EPA Construction General Permit.

Emission Sources

Operations at the campus generate air emissions from multiple sources, including onsite stationary sources (boilers, generators, fume hoods) and mobile sources (vehicles). The CDPHE Air Pollution Control Division has issued NIST a construction permit (Permit No. 09BO0159) that covers 7 boilers, 6 natural gas-fueled water heaters, 7 diesel emergency generators, and 11 natural gas-fueled emergency generators. The construction permit serves as a minor source operating permit and establishes annual emissions limits of PM, nitrogen oxides (NO_x), volatile organic compounds (VOCs), and CO for the three CUP boilers and NO_x limits for the other permitted emission sources. The construction permit also sets annual operating time limits (for 7 units) and natural gas consumption limits (for 24 units).

Some of the largest onsite stationary emission sources include three natural gas-fired boilers at the CUP (Building 42) for steam generation. The boilers produce emissions of NO_x, CO, VOCs, SO₂, and PM during regular operation. All 18 emergency generators are subject to the New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII) and all 7 boilers are subject to NSPS for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR Part 60 Subpart Dc). NIST staff indicate that natural gas consumption from permitted units is well below the allowable limits defined in the construction permit.

Of the 18 emergency generators, seven are diesel fired and are subject to operating time limits (144 hours per year, per unit). Three of these diesel generators are subject to "Tier 2" USEPA emission standards for nonroad

engines above 750 hp, which establish emission limits for multiple pollutants, including CO, PM, and NO_x. The 11 natural gas-fired emergency generators are subject to fuel consumption limits.

Other minor stationary emissions sources include fuel storage tanks and fume hoods. Fume hoods provide ventilation for laboratory spaces in multiple buildings, including a clean lab in Building 81 that uses acetone.

Mobile emission sources associated with campus activities include personal vehicles for ongoing employee commuting to and from work, as well as intra-campus travel, and grounds maintenance equipment and vehicles.

Environmental Consequences – Proposed Action

The Master Plan would have the potential to directly and indirectly affect air quality at the DoC Boulder Laboratories Campus as a result of the following:

- Onsite stationary sources: Changes in operation of boilers (including replacing existing, outdated boilers) and emergency generators, and new or relocated laboratory activities.
- Off-site emissions: Changes in campus electricity demand from the grid.
- Mobile sources: Changes in employee commuting.
- Temporary activities: Construction, demolition, and renovation activities.

The following subsections describe these air quality impacts in more detail.

Onsite Stationary Sources

Under the Master Plan, there is expected to be a minor increase in air emissions of NO_x, CO, VOCs, SO₂, and PM from boilers at the CUP as utility service from the CUP is expanded to new facilities. The existing boilers have adequate capacity to service a potential increase in steam load from the new facilities. The CUP boiler output and fuel consumption are expected to increase proportionally with the steam load changes. Operation of the boilers would comply with the existing (or subsequent) operating permit. Increased air emissions from the CUP boilers or boilers associated with newly constructed buildings would be partially offset by removal of multiple boilers from facilities that would be demolished and the construction of more energy-efficient facilities. The boilers would

continue to use low-NO_x burners in compliance with Reasonably Available Control Technology requirements.

The Master Plan would install new generators at each proposed facility to provide redundant backup power during emergencies. Emissions associated with these new generators would be offset by the elimination of emissions from emergency generators at facilities that would be demolished under the Master Plan. Thus, it is expected that changes in emergency generator fuel consumption and the associated emissions would be negligible. The existing emergency generators would continue to comply with applicable emission standards. The permitted emission units are not expected to exceed the operational or emission limits established in the permit. Where required, DoC would submit an APEN for new emission units or for applicable changes in operations of existing equipment.

It is expected that changes in VOC emissions due to the installation of additional fume hoods in various labs would be negligible.

Off-site Emissions

Increases in the electricity demand at the DoC Boulder Laboratories Campus could increase off-site indirect emissions generated by power sources supplying the electrical grid. The buildings on the campus, as well as the towers and chillers at the CUP associated with chilled water production, are electric powered and consume electricity from the grid, thus contributing to indirect emissions. DoC estimates that the Master Plan would increase the overall electrical demand on the campus by approximately 50%. This could potentially result in increased fuel consumption by the sources that supply electricity to the regional network and lead to off-site increases in air emissions. Operation of the proposed solar field would help offset some of the increases in electricity usage and associated off-site air emissions.

Mobile Sources

The Master Plan would increase the number of personnel commuting to and working at the DoC Boulder Laboratories Campus by approximately 7% (from 1,767 to 1,886) over the course of a 10-year period. Emissions from vehicle use are expected to increase by approximately this same percentage, or potentially by a lower percentage, assuming a continued growth in the adoption of low-emission vehicles. Refer to Section 4.7 (Transportation) for details regarding the expected changes in vehicular use resulting from the Master Plan.



Temporary Activities

Construction, demolition, and renovation (CDR) activities required for the Master Plan would result in temporary minor emissions of NO_x, VOC, CO, PM, and SO₂ from the use of on-road vehicles, such as delivery vehicles, tractor trailers, and dump trucks, as well as nonroad construction vehicles, such as excavators, cranes, track loaders, backhoes, and bulldozers over the course of an approximately 10-year period.

CDR activities often cause fugitive dust (PM) emissions that could have a temporary impact on local air quality. Dust emissions during building construction are associated with land clearing, ground excavation, grading, and the construction of the building itself. Emissions may vary substantially from day to day, depending upon the level of activity, specific type of activity, and weather conditions. The quantity of dust emissions from construction operations is proportional to the area of land where the activity is taking place, as well as the level of construction activity.

DoC is required to use all practical measures or operating procedures necessary to minimize fugitive dust, per Section III.D of Colorado Air Quality Control Commission's Regulation No. 1, "Emission Control for Particulate Matter, Smoke, Carbon Monoxide, and Sulfur Oxides." DoC would use the recommended best practices outlined in the *Fugitive Dust Best Management Practices* guide developed by Boulder County Public Health, where appropriate (BCPH, 2016). DoC may be required to obtain an APEN from CDPHE depending on the size of the construction/demolition site and duration of activity. DoC would follow dust suppression guidelines included in permit requirements.

If any lead-containing materials, asbestos-containing materials, or equipment that contains ozone-depleting substances are encountered during construction, DoC would remove and dispose of these materials and equipment in accordance with all applicable regulations to ensure air quality is not impacted.

GCR Analysis and Emissions Summary

This EA does not include a detailed quantification of the emissions expected from construction and operational activities under the Proposed Action to determine whether they would exceed *de minimis* levels and trigger a SIP conformity determination. In 2017, a detailed review was conducted for the 2017 Master Plan and determined that emissions under that plan would be well below the *de minimis* level for each of Boulder County's nonattainment or maintenance criteria pollutants and their precursors (NO_x, VOCs, CO, and PM₁₀). The scope of the 2017 Master Plan and potential for emissions was comparable to the current Master

Plan. For example, the 2017 Master Plan involved approximately 154,000 SF of demolition and 319,000 SF new construction, while the current Master Plan would involve approximately 169,500 SF of demolition and 311,000 SF of new construction. Additionally, the 2017 Master Plan planned for 212 new staff, while the current Master Plan anticipates approximately 120 new staff over the next 10 years. Therefore, NIST has determined that emissions under this Master Plan will also be well below *de minimis* and updated emissions estimates are therefore not necessary.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would result in no changes in campus air quality compared to the baseline. The existing emissions-producing operations would continue at their current locations in accordance with the installation's minor source operating permit and applicable standards.

4.9 Cultural and Historic Resources

4.9.1 Architectural Resources

Affected Environment

To ensure the protection of historic properties, the U.S. Congress passed the National Historic Preservation Act (NHPA) in 1966 and then amended the NHPA in 1976, 1980, and 1992. The NHPA established the Advisory Council on Historic Preservation (ACHP) and authorized the creation and maintenance of the National Register of Historic Places ("the National Register"). The National Register is composed of districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. Properties considered eligible for inclusion in the National Register are typically at least 50 years old; must possess the integrity of location, design, setting, materials, workmanship, feeling, and association; and must meet at least one of four National Register Criteria for Evaluation (NPS, 2002).

Section 106 of the NHPA, which is implemented under 36 CFR 800, requires federal agencies to consider the effects of undertakings (i.e., actions) on any historic property. An adverse effect is anything that could alter the historic fabric (i.e., characteristics) that makes the property eligible. Examples of adverse effects may include changes to the property or alterations to landscape, noise levels, visual characteristics, traffic patterns, or land use near the property, depending on how these changes specifically impact the property.

The NHPA also authorized the creation of a State Historic Preservation Officer (SHPO) for each state. The SHPO participates in statewide historic preservation planning and surveying activities; nominates properties for the National Register; provides advice, assistance, training, and public outreach; and participates in Section 106 undertaking reviews. In Colorado, the Office of Archaeology and Historic Preservation (OAHP, a division of History Colorado) serves as the SHPO.

Additionally, the OAHP administers its own program for properties that are of significance to American history and culture. The Colorado State Register of Historic Properties ("the Colorado State Register") includes all properties from the National Register that are located in Colorado, plus additional properties that are considered significant in Colorado history and culture. Properties listed in the Colorado State Register are afforded certain regulatory protections.

The City of Boulder Historic Preservation program has also identified local landmarks and historic districts that have been determined to have a special character and historic, architectural, or aesthetic interest or value to the city. There are currently 10 historic districts and 200 individual landmarks, totaling over 1,300 designated properties. All exterior changes to a designated property require design review and approval through a Landmark Alteration Certificate (City of Boulder, 2025b).

The majority of buildings at the DoC Boulder Laboratories Campus were constructed between 1989 and 2013 and thus are less than 50 years old. The following features at the campus are more than 50 years old: Building 1, Building 2, Building 3, Building 4/5, Building 8, Building 9, Building 11, Building 21, Building 22, Building 24, Building 25, and Anderson Ditch. Anderson Ditch has been determined eligible for listing in the National Register for its representation of early irrigation efforts in Boulder County. Building 1 is also eligible for listing in the National Register under Criteria A and D, and NIST and OAHP entered into a programmatic agreement in 2020 regarding the management and treatment of Building 1.

All other buildings on the campus that are more than 50 years old have been determined to be ineligible for the National Register. This includes Building 24, though DoC is awaiting written concurrence from OAHP on this determination. In addition, none of the buildings on the campus that are less than 50 years old appear to satisfy the National Register criterion for exceptional significance.

Additional historic properties are found in the vicinity of the DoC Boulder Laboratories campus. The Mount St. Gertrude Academy, Chautauqua Auditorium, and Colorado Chautauqua Park are all located northwest of

campus within a mile of the campus boundary and are listed in both the National Register and Colorado State Register. The Nelson House, which is listed on the Colorado State Register, and the University Place, 16th Street, and Floral Park local historic districts are also within a mile of the campus boundary to the northwest.

Environmental Consequences – Proposed Action

Renovation activities under the Master Plan would affect historic Building 1. Any such renovations would be governed by the NHPA, the 2020 programmatic agreement regarding the management and treatment of Building 1, and the *Secretary of the Interior's Standards for Rehabilitation* (36 CFR 67).

Compliance with the 2020 programmatic agreement for renovations to Building 1 would satisfy DoC's requirements under the NHPA. For all other components of the Master Plan, early in the planning stage, DoC would consider whether the undertaking is a type of activity with the potential to affect historic properties (e.g., Anderson Ditch). For undertakings with potential effects, DoC would comply with Section 106 of the NHPA by defining the area of potential effects (APE); identifying historic properties within the APE; determining whether the effects to those historic properties would be adverse; and seeking OAHF concurrence on the determination. If necessary, DoC would consult with OAHF to resolve adverse effects via an MOA. However, based on the concepts presented in the Master Plan, DoC anticipates making a determination of "no adverse effects to historic properties" for all components of the Master Plan. This includes consideration of off-campus historic properties that are listed on the National Register or the Colorado State Register.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not involve direct or indirect impacts on potentially historic properties at the campus or in the surrounding area. Therefore, there would be no adverse effect to historic resources.

4.9.2 Archeological Resources

Affected Environment

Archeological resources are material remains of past life or activities. Some examples include pottery, bottles, weapons, tools, rock carvings, gravesites, and other evidence of prior inhabitation. Archeological sites that retain sufficient integrity may be eligible for the National Register under Criterion D.

In 1993, GSA sponsored a cultural resource survey conducted by the National Park Service's Interagency Archeological Services at the 55-acre project site for the planned NOAA facilities and associated fiber optic cable corridor in the southern portion of the campus. The survey identified Anderson Ditch as the only cultural resource in the project area. Another cultural resources survey in 1989 identified two prehistoric sites along the planned fiber optic cable corridor to the southwest of the current NOAA facilities area; these sites are now a tribal protected area. The surveys also identified several boulders and rock piles, but concluded that these rock piles were of recent origin and the result of early agricultural endeavors and field clearing activities that occurred after the campus was dedicated in 1954 (Butler, 1993).

Extensive development and fill throughout the central core of the campus have extensively altered the ground surface and significantly reduced the potential for encountering archeological resources during earthwork. The area south of NOAA Laboratory Building 34 (i.e., the site of a proposed expansion) is not currently developed but is adjacent to previously developed areas and may be composed of fill from previous construction activities.

Environmental Consequences – Proposed Action

The Proposed Action would not involve any earth disturbance within tribal protected areas, archeologically sensitive areas, or any previously identified archeological sites. The Proposed Action would not adversely affect any archeological sites listed or eligible for listing on the National Register.

Environmental Consequences – No-Action Alternative

Under the No-Action Alternative, DoC would not perform any earth disturbance. The No-Action Alternative would not adversely affect any archeological sites listed or eligible for listing on the National Register.

4.10 Visual Impacts

4.10.1 Viewscapes

Affected Environment

Viewscapes are affected by physical characteristics, including vegetation, which may conceal or complement views; building characteristics, such as height and architectural features; and topography. Development projects have the potential to modify viewscapes by changing one or more of these physical characteristics.

The viewscape of the campus is characterized by the stunning backdrop of Kohler Mesa and the Flatirons and is therefore of great interest to members of adjacent communities, and to occupants of vehicles travelling by on Broadway. To ensure preservation of the treasured viewscape, DoC and the City of Boulder established an MOA in May 1998 to formalize an understanding that no DoC buildings may exceed a height of 55 feet above ground level and that new construction will not obstruct views of the top one-third of Kohler Mesa (formerly known as Long Mesa) for a person standing on Broadway. The top one-third of the mesa is defined as the mesa visibility line at an elevation of 5,704.4 feet above sea level. Under the MOA, buildings shall not intrude on the view protection plane from

Broadway assuming the eye level at 5,400 feet above sea level. Figure 4-5 demonstrates the view of the campus, Flatirons, and Kohler Mesa from Broadway.

Environmental Consequences – Proposed Action

The MOA described above reduces the potential for visual impacts on adjacent residential neighborhoods by ensuring that views of the Flatirons and Kohler Mesa will remain largely unobstructed. Construction of new, replaced, or renovated buildings and structures under the Master Plan would comply with the MOA and therefore minimize the impact of the Master Plan on the viewscape. Buildings would not exceed 55 feet in height and would not obstruct visibility of the top one-third of Kohler Mesa when viewed from Broadway. Construction equipment may temporarily impact the viewscape from surrounding areas.

The Proposed Action would improve the viewscape on the campus by replacing dated buildings with new buildings designed to incorporate the natural aesthetic of the surroundings. While the placement and orientation of the research buildings may not allow full views of the Flatirons by spectators within, the design and locations of shared-use facilities (e.g., conference rooms and coffee bar) would strive to facilitate views of the Flatirons as well as aesthetically pleasing landscaped green areas. The construction of the campus green would allow sweeping views towards the Flatirons from within the campus.



Figure 4-5. View of the Campus, Flatirons, and Kohler Mesa from Broadway

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not impact viewscales. The No-Action Alternative would also not enhance the viewscape on the campus and its surroundings. Older, dated buildings would remain and would not be replaced with newer, more aesthetically pleasing architecture.

4.10.2 Light Pollution

Affected Environment

Exterior lighting enhances the safety and security of people and property when used for parking lots, roads, buildings, and pathways. Exterior lighting may also be used to emphasize features of architectural and historic significance and to enhance the enjoyment of outdoor areas. Excessive and inappropriate exterior lighting, however, can generate light pollution. DarkSky International identifies four main elements of light pollution (DarkSky International, 2025):

- Urban Sky Glow – the brightening of night sky over inhabited areas, reducing the visibility of stars.
- Light Trespass – light falling where it is not intended, wanted, or needed.
- Glare – excessive brightness that can cause visual discomfort and decreased visibility.
- Clutter – bright, confusing, and excessive groupings of light sources. Clutter contributes to urban sky glow, light trespass, and glare.

Several standards and guidelines exist for designing effective and appropriate exterior lighting systems, such as: The International Dark-Sky *Outdoor Lighting Code Handbook* (version 1.14, December 2000/September 2002), the Illuminating Engineering Society *Lighting Handbook* (tenth edition, 2011), the United States Green Building Council *Lighting Requirements*, and *LEED Reference Guide for Green Building Design and Construction* (updated August 2020).

In 2003, the City of Boulder codified outdoor lighting standards that are designed to reduce light pollution, promote energy conservation, and improve safety and security (City of Boulder, 2025e). All new multi-unit

dwelling and non-residential projects must comply with the ordinance. Objectives of the ordinance include the following:

- Establishing maximum allowable lighting levels based on zoning and use.
- Minimizing light/dark contrast by requiring uniform lighting.
- Requiring all light in excess of 2,400 lumens to be “white light.”
- Requiring full cut-off light fixtures and shielding to reduce glare, light pollution, and light trespass.

Overhead streetlights are installed throughout the campus along streets, pathways, and parking lots for safety and security purposes. This lighting is directed downward and complies with the City of Boulder outdoor lighting ordinance.

Environmental Consequences – Proposed Action

The Master Plan is not expected to generate any substantial changes in light trespass outside the campus boundary from new exterior lighting. The Proposed Action would incorporate a sustainable design approach. Redesigned lighting features would be energy efficient and would minimize impacts on light pollution.

The Proposed Action could result in minor temporary impacts on light trespass due to use of supplemental lighting (e.g., temporary portable lighting) during construction activities. DoC would conduct construction activities during daylight hours, primarily to limit noise during off hours. Temporary construction lighting may be used to illuminate work areas in the nighttime to ensure safety and security at unoccupied work sites. If applicable, DoC would mitigate this temporary lighting by ensuring construction contractors direct lighting away from the campus boundary whenever feasible.

The construction, renovation, or replacement of new facilities and parking areas under the Master Plan would require the installation of additional lighting systems for these areas to ensure that the safety and security of the campus is maintained. To minimize light pollution impacts, DoC would ensure that all new exterior lighting systems installed under the Master Plan are directed and sized appropriately, with full cut-off luminaires for streetlights; are designed in accordance with current Illuminating Engineering Society and Dark Sky International guidance and the Boulder County Outdoor Lighting Ordinance; and generate light with a color temperature that is appropriate for reducing nighttime light

pollution. Some of the new facilities under the Master Plan, such as the NOAA Building 34 expansion, would be visible from private residences on Dartmouth Avenue along the southern boundary of the campus. When designing these facilities, DoC would evaluate whether additional design and landscaping measures would be necessary to mitigate light trespass into adjacent residential properties.

Reflected sunlight from solar panels installed under the Master Plan would have the potential to cause glare, creating a potential nuisance in the vicinity of the campus if the panels are not sited and designed appropriately. When designing specific solar panels under the Master Plan, DoC would ensure that the designs incorporate glare reduction measures (e.g., anti-reflective coatings and textured glass) and that the panels are sited in a manner to avoid creating excessive glare within or outside of the campus.

Some new buildings constructed under the Master Plan may feature skylights and windows, thus increasing the potential for light trespass from interior lighting. This potential for light trespass would be mitigated through the continued use of automatic lighting controls for appropriate spaces. Similar to existing operations, interior lighting would be reduced after hours and would turn off when spaces are not being used.

Environmental Consequences – No Action Alternative

The No-Action Alternative would not impact lighting at the campus. The No-Action Alternative would also not incorporate any elements of a sustainable design approach and would therefore not have potential to reduce existing light pollution from the campus. There would be no improvements to existing interior or exterior campus lighting.

4.11 Noise Levels

Affected Environment

Noise is generally measured using the A-weighted decibel scale (dBA), a logarithmic scale that accounts for the sensitivity of the human ear across the frequency spectrum. Table 4-2. Perception of Noise compares decibel noise levels, common noise sources, and the relative perception of these noise levels.

Table 4-2. Perception of Noise

Noise Level (dBA)	Common Noise Source	Subjective Evaluation
70	Outdoors in a commercial area.	Loud
60	Average of normal speech three feet away.	Moderate
50	Open office background noise.	
40	Quiet suburban environment at night.	Faint
30	Quiet rural environment at night.	
20	Concert hall background noise.	Very Faint
10	Human breathing.	
0	Threshold of hearing or audibility.	Inaudible

Source: (NIH, 2009)

The Occupational Safety and Health Administration (OSHA) regulates workplace noise with standards for two different types of noise: constant and impulse. The OSHA limit for constant noise is 90 dBA for eight hours; however, the National Institute for Occupational Safety and Health recommends a constant noise limit of 85 dBA for eight hours to minimize occupational noise induced hearing loss. The OSHA maximum sound level for impulse noise is 140 dBA. In areas where workplace noise exceeds these limits, employers must provide workers with personal protective equipment to reduce noise exposure.

State and local government agencies regulate community noise. As summarized in Table 4-3. Colorado State Maximum Permissible Noise Levels, noise standards set by the state under the Colorado Noise Statute 25-12-103 limit the sound levels at 25 feet or further from the property line for residential, commercial, and industrial zones. The DoC Boulder Laboratories Campus is primarily surrounded by residential areas with a small commercial area to the northeast.

Table 4-3. Colorado State Maximum Permissible Noise Levels

Levels for Receiving Noise Areas	Daytime (7:00 a.m. – 7:00 p.m.)	Nighttime (7:00 p.m. – 7:00 a.m.)
Residential	55 dBA	50 dBA
Commercial	60 dBA	55 dBA
Light Industrial	70 dBA	65 dBA
Industrial	80 dBA	75 dBA

Between 7:00 am and 7:00 pm, permitted noise levels listed in Table 4-3 may be exceeded by 10 dBA for up to 15 minutes per any one-hour

period. Construction projects are subject to the maximum permissible noise levels specified for industrial zones pursuant to any applicable construction permit. Boulder County also issued a noise ordinance (Ordinance No. 92-28) that reiterates the maximum permissible noise levels established by the State.

Ambient noise levels at the campus are affected by noise generated both onsite and offsite. Minor noise associated with vehicular traffic on nearby roads, such as Broadway, is the primary source of noise in the area immediately surrounding the campus. The main sources of noise generated onsite and in proximity to the Proposed Action include the following (in decreasing order of noise level):

- Temporary construction activities.
- CUP operations (i.e., generators, boilers, cooling towers, and chillers).
- HVAC equipment and emergency generators at individual buildings.
- Grounds maintenance activities (i.e., lawn mowers and leaf blowers).
- Cars and other vehicles.

NIST staff occasionally receive complaints from neighbors due to noise from temporary construction activities. DoC works to actively address noise concerns as they arise.

Environmental Consequences – Proposed Action

Under the Master Plan, the overall change to operational noise levels is expected to be negligible. The upgrade and expansion of facilities would introduce new minor noise sources on campus, including new laboratory activities, air-handling units, exhaust fans, and emergency generators. Increased steam and chilled water output at the CUP is not expected to generate a noticeable increase in noise inside or outside the facility. Workers within the CUP would continue to wear appropriate hearing protection in areas with noise-producing equipment.

While the NOAA Building 34 expansion would result in development closer to the campus boundary, the activities in this building would be largely administrative in nature with minimal potential for operational noise impacts. As the Building 34 expansion project enters the design phase and additional details become available regarding potential noise-generating activities, DoC would evaluate whether additional design and landscaping measures would be necessary to mitigate noise trespass into adjacent residential properties.

Construction activities associated with the Master Plan would temporarily increase environmental noise levels in the vicinity of the project sites, primarily due to the use of heavy equipment. Equipment that may be used includes backhoes, bulldozers, and excavators. Construction equipment noise emission levels generally range between 74 to 101 dBA at a distance of 50 feet from the source, depending on the type of equipment (FHWA, 2014). The construction noise would be temporary and would dissipate as the distance from the source increases. Thus, it is expected that residents in surrounding neighborhoods and visitors to the adjoining cemetery would not experience noise louder than the applicable noise limit. To further limit impacts on nearby residences, DoC would limit construction activities to normal daytime working hours (beginning no earlier than 7:00 a.m.).

Construction personnel would take the necessary precautions (e.g., hearing protection) to ensure that they would not be exposed to noise louder than the OSHA standard of 90 dBA for 8 hours.

Under the Master Plan, the ambient noise levels at DoC Boulder Laboratories Campus would remain within Colorado and Boulder County noise thresholds. Furthermore, any minor change in noise levels is not expected to affect the character of the site.

Environmental Consequences – No-Action Alternative

The No-Action Alternative would not affect ambient or interior noise levels associated with routine activities. The No-Action Alternative would not generate any temporary noise associated with construction activities.

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List of Agencies and Persons Consulted

Agency: U.S. Fish and Wildlife Service

Reason: Use of IPaC tool for potential presence of threatened or endangered species, critical habitat, and migratory birds, in the campus vicinity.

Agency: City of Boulder Open Space & Mountain Parks

Reason: Wildlife observations in the campus vicinity.

Agency: History Colorado, Office of Archaeology and Historic Preservation

Reason: Potential impacts on historic resources.

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APPENDIX A IPaC Resource List

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IPaC

U.S. Fish & Wildlife Service

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Boulder County, Colorado



Local office

Colorado Ecological Services Field Office

📞 (303) 236-4773

📠 (303) 236-4005

MAILING ADDRESS

Denver Federal Center

P.O. Box 25486

Denver, CO 80225-0486

PHYSICAL ADDRESS

1 Denver Federal Center

Bldg 53 Room Fw100}

Denver, CO 80225-0001

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see [FAQ](#)).
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Preble's Meadow Jumping Mouse <i>Zapus hudsonius preblei</i> Wherever found There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/4090	Threatened

Tricolored Bat *Perimyotis subflavus*

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/10515>

Proposed Endangered

Birds

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> This species only needs to be considered if the following condition applies: • Project includes water-related activities and/or use in the N. Platte, S. Platte, and Laramie River Basins which may affect listed species in Nebraska. There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6039	Threatened
Whooping Crane <i>Grus americana</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/758	Endangered

Fishes

NAME	STATUS
Pallid Sturgeon <i>Scaphirhynchus albus</i> Wherever found This species only needs to be considered if the following condition applies: Water use or contamination may adversely affect the species. Within the Platte River basin, depletions may adversely affect the species. These affects must be considered even outside occupied range. See local FWS office for more information. No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7162	Endangered

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> Wherever found There is proposed critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee <i>Bombus suckleyi</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10885	Proposed Endangered
Western Regal Fritillary <i>Argynnis idalia occidentalis</i> Wherever found No critical habitat has been designated for this species.	Proposed Threatened

Flowering Plants

NAME	STATUS
Ute Ladies'-tresses <i>Spiranthes diluvialis</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2159	Threatened
Western Prairie Fringed Orchid <i>Platanthera praecleara</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1669	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act ² and the Migratory Bird Treaty Act (MBTA) ¹. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>

- Nationwide avoidance and minimization measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

There are Bald Eagles and/or Golden Eagles in your [project](#) area.

Measures for Proactively Minimizing Eagle Impacts

For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the [National Bald Eagle Management Guidelines](#). You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to [Bald Eagle Nesting and Sensitivity to Human Activity](#).

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

If disturbance or take of eagles cannot be avoided, an [incidental take permit](#) may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the [Do I Need A Permit Tool](#). For assistance making this determination for golden eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

Ensure Your Eagle List is Accurate and Complete

If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the [Supplemental Information on Migratory Birds and Eagles](#), to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Jul 31
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Dec 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (●)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

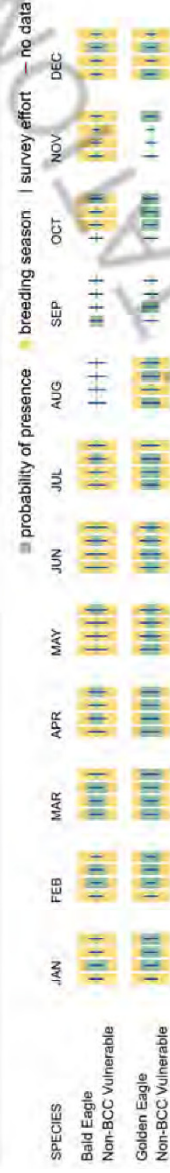
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle ([Bald and Golden Eagle Protection Act](#) requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the [RAIL Tool](#) and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA)¹ prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases [birds of concern](#), including [Birds of Conservation Concern \(BCC\)](#), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the [Nationwide avoidance and minimization measures for birds](#) document, and any other project-specific avoidance and minimization measures suggested at the link [Measures for avoiding and minimizing impacts to birds](#) for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the [Supplemental Information on Migratory Birds and Eagles document](#), to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Jul 31
Broad-tailed Hummingbird <i>Selasphorus platycircus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 25 to Aug 21
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Ferruginous Hawk <i>Buteo regalis</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6038	Breeds Mar 15 to Aug 15

Breeds Dec 1 to Aug 31

Golden Eagle *Aquila chrysaetos*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1680>

Grasshopper Sparrow *Ammodramus savannarum perpallidus*

Breeds Jun 1 to Aug 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/8329>

Lesser Yellowlegs *Tringa flavipes*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9579>

Lewis's Woodpecker *Melanerpes lewis*

Breeds Apr 20 to Sep 30

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9408>

Long-eared Owl *asio otus*

Breeds Mar 1 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3931>

Northern Harrier *Circus hudsonius*

Breeds Apr 1 to Sep 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/8350>

Pinyon Jay *Gymnorhinus cyanocephalus*

Breeds Feb 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9420>

Red-headed Woodpecker *Melanerpes erythrocephalus*

Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (1)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

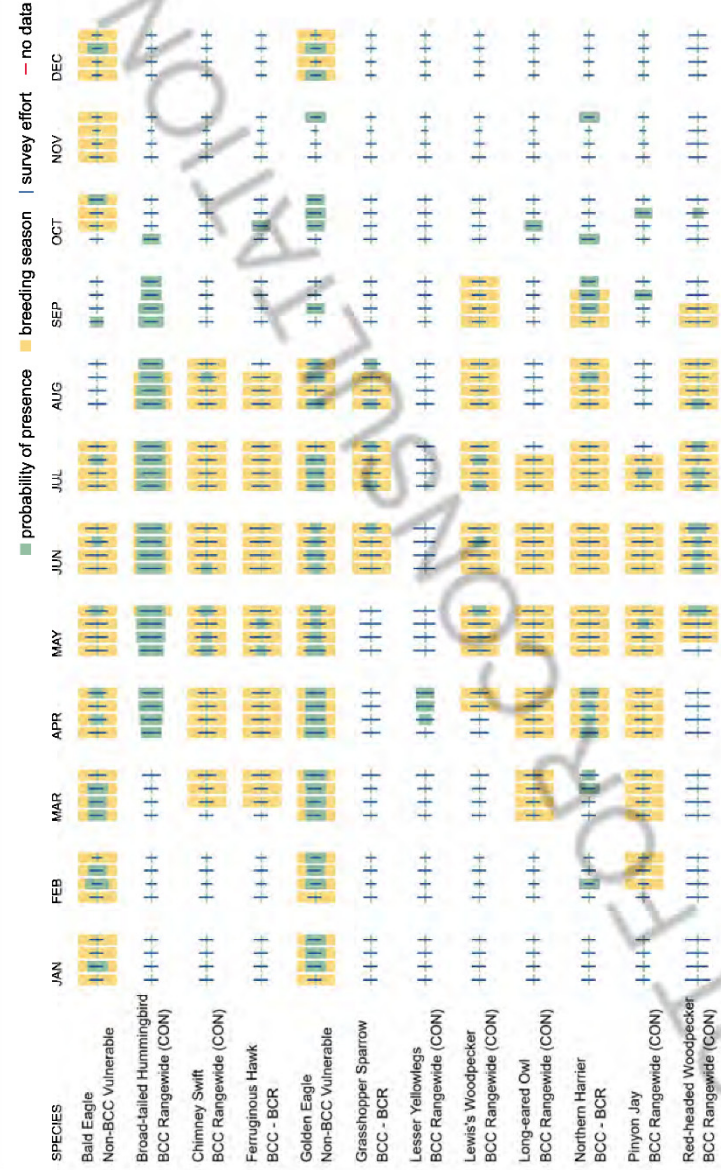
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Avoidance & Minimization Measures for Birds](#) describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. [Additional measures or permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the [Bald and Golden Eagle Protection Act](#) and those species marked as "Vulnerable". See the FAQ "What are the levels of concern for migratory birds?" for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle ([Bald and Golden Eagle Protection Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the [Avian Information Locator \(AIL\) Tool](#).

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for the **species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the [RAIL Tool](#) and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangeswide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Bald and Golden Eagle Protection Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ "Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project, not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

The number of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE

[R4SBCX](#)

[R4SBC](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and

nearshore coastal waters. Some deepwater reef communities (coral or tubercled worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

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