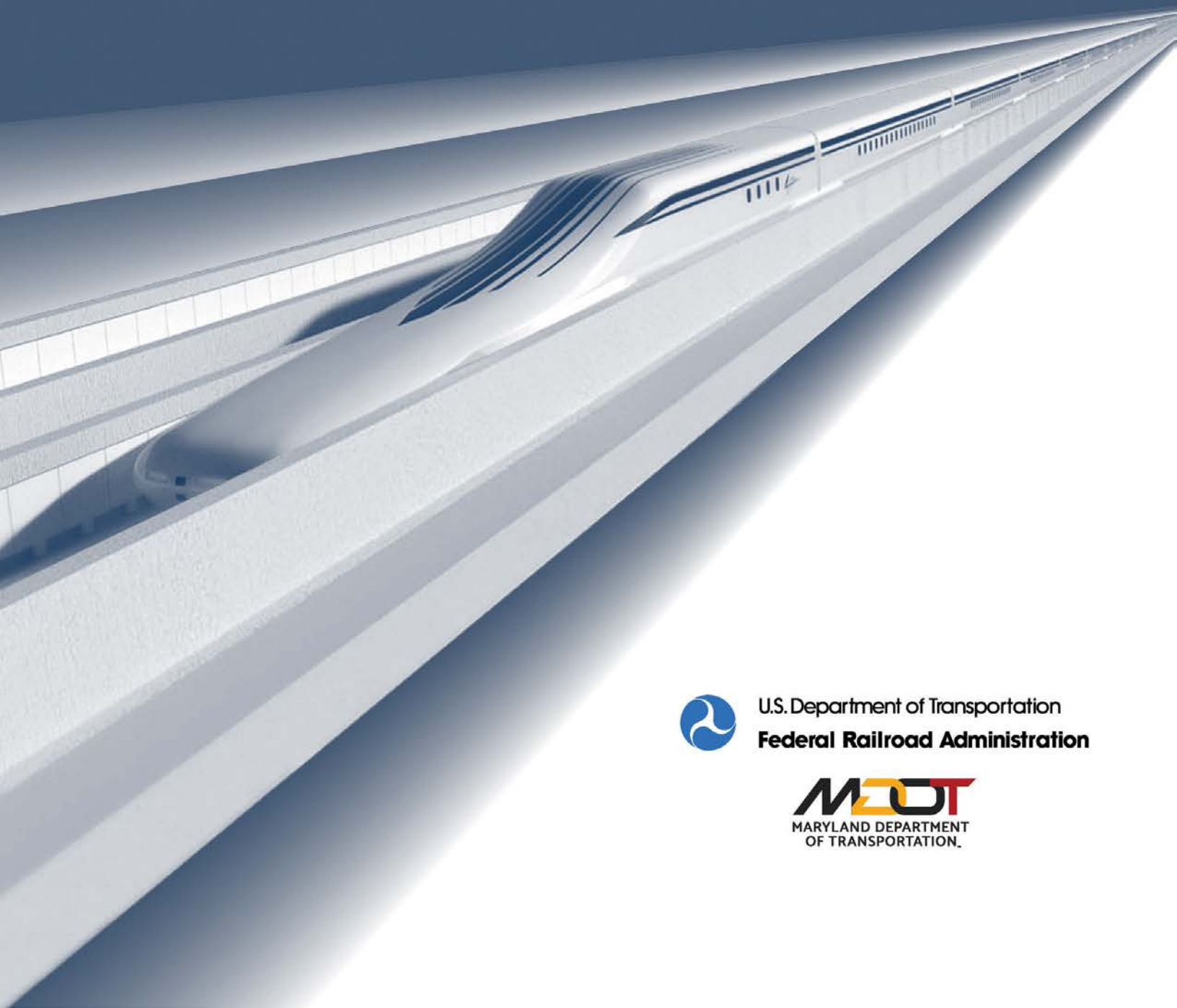
Section 4.12

Ecological Resources

BALTIMORE-WASHINGTON SUPERCONDUCTING MAGLEV PROJECT

DRAFT ENVIRONMENTAL IMPACT STATEMENT AND SECTION 4(f) EVALUATION



U.S. Department of Transportation
Federal Railroad Administration

MARYLAND DEPARTMENT OF TRANSPORTATION

4.12 Ecological Resources

4.12.1 Introduction

This section describes the regulatory context and methodology the Federal Railroad Administration (FRA) used to evaluate the Superconducting Magnetic Levitation Project (SCMAGLEV Project) effects to ecological resources and minimization and mitigation measures that would reduce impacts to these resources. This study of ecological resources includes an analysis of the relationships between living things and their environment. The Natural Environmental Technical Report (NETR) with supplemental detail is provided in Appendix D.7. FRA has included the following dominant resources in this analysis:

- **Forest** – As defined by the Maryland Department of Natural Resources (MDNR), a forest is "a biological community dominated by trees and other woody plants covering a land area of 10,000 square feet or greater."[1]
- **Forest Interior Dwelling Species (FIDS) Habitat** – Habitat supporting bird species that depend upon large, contiguous forested habitat to successfully breed and produce sustainable populations.
- **Terrestrial and Aquatic Wildlife** – Species living on land and species living in waters.
- **Rare, Threatened, or Endangered (RTE) Species** – Species that may be the rarest or the most in need of conservation (at the Federal and/or state level), which are provided a designated status under the Endangered Species Act (ESA) of 1973 and/or granted additional protections by the government. Critical habitats for RTE species are also protected.
- **Sensitive Species Project Review Areas (SSPRA)** – State-wide database developed and maintained by the MDNR Wildlife and Heritage Service (WHS) to aggregate and portray state and locally significant habitat areas, often including habitat for RTE species.

4.12.2 Regulatory Context and Methodology

4.12.2.1 Regulatory Context

In accordance with the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 et seq., the Council on Environmental Quality (CEQ) regulations, 40 C.F.R. Parts 1500 - 1508, and FRAs Procedures for Considering Environmental Impacts, 64 Fed. Reg. 28545 (May 26, 1999), FRA assessed both construction period (short-term impacts) and long-term impacts of the Build Alternatives on wildlife and vegetation in the SCMAGLEV Project Affected Environment. FRA's analysis of ecological resources considered

[1] Maryland Department of Natural Resources (MDNR). 1997. *State Forest Conservation Technical Manual*, Maryland Department of Natural Resources, Third Edition, 1997.

comments received by state and Federal agencies, specifically the United States Fish and Wildlife Service (USFWS) and MDNR through coordination meetings, and considers the various applicable laws and regulations governing ecological resources, including but not limited to:

- ESA 16 U.S.C. § 1531 et seq
- Maryland Forest Conservation Act regulations and Nongame and Endangered Species Conservation Act of 1975, COMAR 08.03.08
- Fish and Wildlife Coordination Act, 16 U.S.C. § 661-667e; Bald and Golden Eagle Protection Act, 16 U.S.C. § 668-668c; and Migratory Bird Treaty Act, 16 U.S.C. § 703-712. May require approval of the Migratory Bird Conservation Commission.
- Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801 et seq
- Executive Orders 13112 (Feb. 3, 1999), and 13751 (Dec. 5, 2016)

Additional discussion regarding ESA Section 7 consultation with USFWS is provided in Section 4.12.5.

4.12.2.2 Methodology

FRA analyzed ecological resources within the SCMAGLEV Project Affected Environment to evaluate the presence of vegetated communities and specifically the condition of forests (including FIDS habitat), terrestrial and aquatic wildlife and habitat, and RTE species and habitat. FRA defined the SCMAGLEV Project Affected Environment for ecological resources as the limits of operational/physical disturbance impact area, as well as the construction related impact area, which includes additional areas of temporary disturbance required for construction activities. These impact areas comprise the overall limit of disturbance (LOD) of the SCMAGLEV Project Build Alternatives which includes all surface and subsurface elements, and FRA included an additional 30-foot buffer around the LOD to be consistent with the area evaluated for specific wetland and water resources and capturing the adjacent habitat that may be affected by the SCMAGLEV Project. FRA qualitatively evaluated permanent and temporary impacts as well as direct and indirect effects to these resources, with additional quantitative analysis conducted for forest, FIDS habitat, and SSPRA impacts. To conduct this evaluation, FRA sought information via the following resources:

- Federal and state statutes; local and regional agency policies and ordinances; published Geographic Information Systems (GIS) databases; and aerial imagery.
- Results of FRA field visits conducted between 2018 and 2020 to characterize habitat types within the SCMAGLEV Project Affected Environment. FRA identified upland field/meadow, scrub-shrub, and forested habitats, in addition to wetlands and waterways, all of which support common terrestrial and aquatic wildlife.

- Federal and state resource agency correspondence and meetings, which yielded agency input regarding species and habitats monitored for conservation located within or adjacent to the SCMAGLEV Project Affected Environment (see Appendix D.7 NETR Agency Correspondence).
- Available regional transportation project published NEPA documents.

The USACE's Public Interest Review considers fish and wildlife values to aid their evaluation of projects that have submitted a permit application. FRA has considered these values and provided an evaluation of impacts in Section 4.12.4 Environmental Consequences.

In accordance with Section 7 of the ESA, FRA queried the USFWS Information for Planning and Consultation (IPaC) online system to identify federally listed RTE species and their habitats within the SCMAGLEV Project Affected Environment. FRA contacted MDNR WHS to identify any known occurrences of state listed RTE species and their associated habitats within the SCMAGLEV Project Affected Environment. FRA reviewed MDNR GIS data for SSPRA locations and accessed Maryland Biological Stream Survey (MBSS) data to assess aquatic habitat for waterways within and adjacent to the SCMAGLEV Project Affected Environment. Although wetlands and waterways habitat are discussed in this section, impacts to these resources were specifically addressed in Section 4.11 Wetlands and Waterways. Similarly, because the variability of water quality is highly correlated with the quality of and impacts to vegetated habitats, this section is also supported by Section 4.10 Water Resources.

4.12.3 SCMAGLEV Project Affected Environment

Ecological resources within the SCMAGLEV Project Affected Environment include terrestrial and aquatic habitats associated with forests (including FIDS habitat), fields/meadows, scrub-shrub areas, aquatic environments, and SSPRAs (including RTE species habitat). **Table 4.12-1** provides a summary of habitat types and their quantified presence within each SCMAGLEV Project Build Alternatives Affected Environment.

FRA identified forest as the dominant ecological resource in the portions of the SCMAGLEV Project Affected Environment in Prince George's County and Anne Arundel County, including deciduous and coniferous vegetative communities, with several areas of FIDS habitat (described in more detail below). FRA identified forest fragments or hedge rows as more common on the fringes of densely developed areas, often surrounding existing transportation systems and commercial/industrial businesses. Forested fragments and hedge rows include wooded areas, but do not meet the MDNR size and composition criteria of a forest.

Forested habitats, including forest fragments, and FIDS habitat are somewhat more prevalent in the SCMAGLEVE Project Affected Environment of Build Alternatives associated with alignments J (at 581 to 663 acres for forests, and 490 to 573 acres for FIDS habitat) than in those associated with alignment J1 (at 519 to 618 acres for forests, and 397 to 475 acres for FIDS habitat).

Table 4.12-1: Presence of Habitat Types within the SCMAGLEV Project Affected Environment

Build Alternative	Forest (acres)	FIDS (acres)	Shrub-Scrub (acres)	Field (acres)	Aquatic (linear feet)*	SSPRA (acres)**
J-01	627	530	100	493	37,371	295
J-02	602	490	108	602	41,859	381
J-03	663	573	100	502	40,910	430
J-04	606	529	88	487	38,348	306
J-05	581	490	96	595	42,837	392
J-06	642	573	88	496	41,887	441
J1-01	618	461	29	486	38,363	291
J1-02	540	397	34	595	40,077	356
J1-03	596	475	26	494	39,256	392
J1-04	597	461	17	480	39,341	302
J1-05	519	397	22	589	41,054	367
J1-06	575	475	14	487	40,234	403

* Aquatic habitat is presented above as a function of linear feet of waterways, as presented in Section 4.11 Wetlands and Waterways.

** SSPRAs are not a specific habitat type, but instead can include any of the above listed habitat types. They are included in the table to indicate their presence in the SCMAGLEV Project Affected Environment.

Areas of roadway right-of-way (ROW) and utility crossings largely consist of meadow and scrub-shrub vegetation, which include low lying woody and herbaceous vegetation, no greater than 20 feet in height. Other areas of meadow habitat include fallow and maintained agricultural and recreational fields. On average, the SCMAGLEV Project Affected Environment for Build Alternatives associated with alignment J include 75 percent more scrub-shrub habitat than those associated with alignment J1. Acreage of field/meadow habitat across Build Alternatives is similar for those associated with alignments J and J1.

Aquatic habitats occur within the waterways (and adjacent wetland and floodplain systems) as identified in Section 4.11 Wetlands and Waterways. Depending on the Build Alternatives, linear feet of aquatic habitat ranges from approximately 37,00 to 42,000, with slightly more habitat areas occurring within Build Alternatives associated with the BARC West and BARC Airstrip TMF options.

The SCMAGLEV Project Affected Environment consists of areas of urbanized land with habitat fragments and roadside edges of larger forest systems. Noxious weeds and invasive species typically occur in, and often dominate, these disturbed habitat areas; however, interior areas of large, unfragmented forests and vegetated corridors typically exhibit little to no invasive species presence or dominance. FRA did not catalog noxious and invasive species within the project LOD. However, FRA does address the threat of

contaminating functioning native plant-based habitats through project-related disturbance and fragmentation in Section 4.12.4.

4.12.3.1 Forests and Forest Interior Dwelling Species Habitat

Forests and forest fragments are common throughout the SCMAGLEV Project Affected Environment and provide nesting, foraging, and refuge for wildlife including birds, fish, mammals, insects, reptiles, and amphibians. Forested riparian corridors provide wildlife passages and are the optimal vegetative cover for meeting water quality goals (see Section 4.12.3.2 for more information on wildlife habitat and Section 4.10 Water Resources for more information on water quality). MDNR identifies mesic mixed hardwood and Coastal Plain oak-pine forests as the primary forested wildlife habitats within the SCMAGLEV Project Affected Environment.[2] In addition to functioning as habitat, forests help to enhance water quality and air quality and promote human health and recreation. According to the USFWS, important communities of chestnut oak (*Quercus montana*) and other mature native tree species of substantial size (greater than 24 inches diameter at breast-height) have been identified on Patuxent Research Refuge (PRR) lands.

Depending on the Build Alternatives, the SCMAGLEV Project Affected Environment includes 31 to 39 existing forest conservation areas (one in Prince George's County and 38 in Anne Arundel County), which provide compliance with the Maryland Forest Conservation Act (FCA). These areas are preserved and/or reforested areas under long-term protective easements for compensation for forest impacts. Forest conservation easements are maintained at the state and county levels. Additionally, there is a Maryland Environmental Trust Easement that occurs at the eastern end of the MD 198 trainset maintenance facility (TMF). This easement is associated with high quality forested habitat identified for conservation. With continued design and refinement of alternatives the Project Sponsor will complete a Forest Stand Delineation (FSD) and survey for specimen trees, which are defined as trees having a diameter measured at 4.5 feet above the ground of 30 inches or more, or trees having 75 percent or more of the diameter of the current state champion tree. During field investigations between 2018 and 2020, FRA observed specimen trees within the SCMAGLEV Project Affected Environment, commonly consisting of tulip poplar (*Liriodendron tulipifera*), northern red oak (*Quercus rubra*), and white oak (*Quercus alba*). Required compliance with the FCA is discussed in greater detail in Section 4.12.5.

FIDS depend upon large, contiguous forest to successfully breed and produce sustainable populations. FIDS include migratory songbirds, warblers, the barred owl, and various hawks and woodpeckers. According to a Critical Area Commission for the

[2] MDNR. 2015. *Maryland State Wildlife Action Plan.* Annapolis, Maryland. Available at: https://dnr.maryland.gov/wildlife/Pages/plants_wildlife/SWAP_Submission.aspx

Chesapeake and Atlantic Coastal Bays guidance document[3], FIDS habitat includes a forest tract that meets either of the following conditions:

- Greater than 50 acres in size and containing at least 10 acres of forest interior habitat (forest greater than 300 feet from the nearest forest edge); or
- Riparian forests that are, on average, at least 300 feet in total width and greater than 50 acres in total forest area. The stream within the riparian forest must be perennial.

Historically, there has been an overall decline of bird species populations dependent on FIDS habitat and acreage of this habitat type in the Mid-Atlantic Region. FRA identified areas of forest and FIDS habitat most notably adjacent to the Baltimore-Washington Parkway (BWP) within the National Park Service (NPS) property, Beltsville Agricultural Research Center (BARC), PRR, Fort George G. Meade, City of Greenbelt properties, and north of MD 198 on and in the vicinity of the MD 198 TMF site. Other notable areas of forest and FIDS habitat are located along Veterans Parkway (MD 410), at National Aeronautics and Space Administration (NASA) property at Goddard Space Flight Center (GSFC) and at NASA land leased from BARC, at county parks and open spaces (Springfield and Maryland City Parks, and Tipton Airport), at Patuxent River Park, and within Washington Suburban Sanitary Commission (WSSC) property. FRA used the MDNR FIDS GIS database to map areas of FIDS.[4] FIDS identified in PRR include, but are not limited to, warblers and thrushes such as the Kentucky warbler (*Geothlypis formosa*), Nashville warbler (*Leiothlypis ruficapilla*), Swainson's thrush (*Catharus ustulatus*), wood thrush (*Hylocichla mustelina*), and northern parula (*Setophaga americana*). In a letter dated August 5, 2020, USFWS indicated the presence of other "sensitive terrestrial and aquatic communities associated with forest such as vernal pools, sphagnum bogs, and heath communities."

4.12.3.2 Terrestrial and Aquatic Wildlife

The SCMAGLEV Project Affected Environment contains multiple habitat types ranging from small, vegetated fragments with marginal resource value to large habitat corridors with exceptional resource value that support common and rare wildlife. Migrating and resident birds, including FIDS and raptors, are dependent on small and large areas of vegetation for foraging and nesting. A diversity of terrestrial and aquatic fauna is reliant on vegetated riparian habitats for uninterrupted access to resources within waterways and adjacent wetlands and uplands. During field investigations, FRA identified upland field/meadow, scrub-shrub, and forested habitats, in addition to wetlands and waterways, all of which support common terrestrial and aquatic wildlife. The MDNR Environmental Review Unit (ERU) identified the following aquatic resources and habitat

[3] Critical Area Commission (CAC) for the Chesapeake and Atlantic Coastal Bays. 2000. *A Guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area*. Available at: http://dnr2.maryland.gov/education/Documents/tweetyjune_2000.pdf

[4] MDNR. 2013. Maryland Living Resources - Forest Interior Dwelling Species. Feature Service Link: https://geodata.md.gov/imap/rest/services/Biota/MD_LivingResources/FeatureServer/10

within the SCMAGLEV Project Affected Environment: anadromous fish habitat from tidal waters into major stream systems; black bass and largemouth bass fisheries in the tidal areas; American eel habitat; and stocked trout management areas. According to MBSS data, most rivers and streams intersecting the SCMAGLEV Project are characterized as supporting fish and benthic macroinvertebrate communities with high pollutant/impact tolerance. Other streams were noted to support several sensitive fish and benthic species or have suboptimal instream habitat and poor amounts of stable substrate for benthic species colonization. A study completed at PRR in 2009 also indicated relatively poor biological health of streams based on benthic macroinvertebrate populations; however, the study did show good habitat scores with most of the land cover identified as pervious and forested. This study concluded that the biological communities in these streams may still be recovering from past impacts on the property prior to PRR ownership[5] as this correlation is not necessarily what is expected.

MDNR WHS identified two large Nontidal Wetlands of Special State Concern (NTWSSC) and great blue heron (GBH) colonies near the Little Patuxent River, Patuxent River, and Beaverdam Creek crossings. An additional GBH colony occurs within the SCMAGLEV Project Affected Environment in the vicinity of the MD 198 TMF. The NTWSSCs support common and RTE species. Smaller wetlands present within the SCMAGLEV Project Affected Environment include vernal pools critical for amphibian breeding and nesting, and emergent, forested, and marsh wetlands that support a wide variety of aquatic and terrestrial wildlife. As discussed in Section 4.10 Water Resources, MDNR identified the Little Patuxent as a Stronghold Watershed, a designation for "watersheds around the State that are the most important for the protection of Maryland's aquatic biodiversity. These locations are the places where rare, threatened, or endangered species of fish, amphibians, reptiles or mussels have the highest numbers."[6]

The USFWS IPaC report states that there are migratory birds of conservation concern protected under the Migratory Bird Treaty Act within the SCMAGLEV Project Affected Environment but did not identify critical habitats or fish hatcheries. Potential impacts to PRR, which encompasses a diversity of habitats, would necessitate coordination with PRR, a designated National Wildlife Refuge as discussed in Section 4.7 Recreational Facilities and Parklands and Appendix F Section 4(f) . At PRR, USFWS manages vegetation beneath the Baltimore Gas and Electric (BGE) right-of-way (ROW) to promote and maintain scrub-shrub habitat, which functions as necessary habitat for shrub-nesting bird species. USFWS has noted that, in addition to FIDS species, PRR forests support active communities of bats, and has also identified that management of PRR habitats for pollinator species is a high priority for the Refuge. See Appendix D.7 NETR Agency Coordination for PRR species and habitats of concern.

[5] Anne Arundel County Department of Public Works Bureau of Engineering Watershed, Ecosystem, and Restoration Services. 2009. *Assessment of the biological health of streams on the Patuxent Research Refuge within Anne Arundel County, Maryland*.

[6] https://dnr.maryland.gov/streams/Pages/streamhealth/Maryland-Stronghold-Watersheds.aspx

Information obtained from the Maryland Bird Conservation Partnership online mapping program indicates two assigned bald eagle nest locations less than one mile of the SCMAGLEV Project Affected Environment. Bald eagles do not rely on large tracts of forest as FIDS do, instead they can often be found along a forest edge, usually near a water source such as a lake, marsh, or coastline. Although bald eagles are no longer considered an RTE species, Maryland continues to survey existing nesting sites and promote sound design practices to limit the effects of development to habitat and to limit disturbance during nesting season.

4.12.3.3 Rare, Threatened, and Endangered (RTE) Species

Several habitats that support RTE species exist in the SCMAGLEV Project Affected Environment, most notably in larger natural forested tracts in Anne Arundel and Prince George's Counties as described previously. Through the IPaC report and coordination with USFWS and MDNR WHS, FRA has identified the following Federal and state listed species and habitats:

- Northern long-eared bat (*Myotis septentrionalis*): This Federally listed threatened species is identified through the IPaC report and requires live and standing dead hardwood trees for summer roosting habitat.
- Swamp pink (*Helonias bullata*): This Federally and state listed plant species is identified through the IPaC report and specifically identified by MDNR WHS as occurring in the Harmans area in Anne Arundel County. According to MDNR WHS (October 22, 2020 letter), this species typically occurs in "perennially saturated nontidal wetland habitat, including forested wet depressions, spring seeps, bogs, wet meadows and margins of small streams, but has very specific hydrological requirements."
- American peregrine falcon (*Falco peregrinus anatum*): This state-listed species is identified by the MDNR WHS as In Need of Conservation and occurring at a nest site in downtown Baltimore.
- Little Patuxent River and Vicinity:

  Dorsey Run forms the headwaters of the Little Patuxent River and supports two state-listed Threatened fish species, glassy darter (*Etheostoma vitreum*) and American brook lamprey (*Lethenteron appendix*), both "found in the sandy, gravelly river bottom and spawn in the riffles" (MDNR WHS October 22, 2020 letter).

  The segment of the Little Patuxent River within and downstream of the SCMAGLEV Project Affected Environment also supports the glassy darter and American brook lamprey, as well as white catfish (*Ameiurus catus*), which is identified by DNR WHS as possibly rare, and fifteen RTE dragonfly species.
- Patuxent River and Vicinity:

  Upstream and downstream of the SCMAGLEV Project Affected Environment, the Patuxent also supports American brook lamprey and is designated as a

Stronghold watershed due to presence and abundance of glassy darter populations.

An extensive NTWSSC at PRR along the Patuxent River provides habitat for state-listed species: ten odonate (dragonfly and damselfly) species, two RTE fish species, and one RTE plant species.

A globally rare natural community (coastal plain oak floodplain forest) occurs within the SCMAGLEV Project Affected Environment west of the BWP, north of the Patuxent River.

- Beaverdam Creek and Vicinity:

  In the area of the BARC West TMF, MDNR has identified two RTE plant species, white fringed orchid (*Platanthera blephariglottis* var. *blephariglottis*) and northern pitcher-plant (*Sarracenia purpurea*), both associated with high quality wetlands. This area also supports the American brook lamprey and three RTE odonate species.

  A highly globally rare/imperiled woodland community (pine barrens pine-oak woodland) occurs east and west of the BWP. The Beaverdam Creek NTWSSC extends east and west of the BWP along Beaverdam Creek and Beck Branch. Within and adjacent to the SCMAGLEV Project Affected Environment, this NTWSSC provides habitat for three RTE odonate species, one RTE fish species, white fringed orchid, a globally critically imperiled natural community (coastal plain-piedmont acidic seepage swamp), and a globally imperiled natural community (coastal plain-piedmont acidic seepage fen).

  The area of the BARC Airstrip TMF also falls within the drainage area of another NTWSSC near Telegraph Road, which supports three RTE odonate species.

  Additional RTE species observations on BARC property within one mile of the SCMAGLEV Project Affected Environment include a state-listed endangered odonate species and nine other RTE plant species.

In addition to the RTE species identified by USFWS and MDNR above, PRR staff notified FRA of the presence of vernal pools, spring-fed wetland complexes, and forest stream complexes containing RTE and other at-risk plant and animal species. Yellow lance (*Elliptio lanceolate*), a Federally endangered mussel species, has been found in surveys of the Patuxent River on the PRR property. Spotted turtle (*Clemmys guttata*), which is a petitioned species for listing, and eastern box turtle (*Terrapene carolina carolina*), a designated species of greatest conservation need, have also been known to use the habitats within PRR. Refer to RTE and coordination letters with detailed information in Appendix D.7 NETR Agency Correspondence.

In addition to those species identified above, BARC staff notified FRA of the presence of unique forest communities supporting pitch pine (*Pinus rigida*) and dwarf chinquapin oak (*Quercus prinoides*).

Based on published information from previous regional transportation projects, the following RTE plant species have been documented in the area associated with the long-term construction laydown area near MD 200 and I-95: state-endangered low rough aster (*Eurybia radula*) and state-threatened long-stalk greenbrier *(Smilax pseudochina).* Due to the presence of these species, a protective easement is in place. With receipt of additional MDNR coordination, these species and protections can be confirmed.

RTE species are typically associated with high quality, contiguous habitats and are sensitive to habitat disturbance and fragmentation. Therefore, potential RTE species habitat, beyond those areas identified above, may occur within the SCMAGLEV Project Affected Environment in large undeveloped areas and corridors, as illustrated in Appendix B.3 Natural Resources Mapping Atlas, including aquatic and upland forested areas near Fort Lincoln Park; along the Anacostia River and its adjacent floodplain parks (including Bladensburg South Park), along Veterans Highway near Martins Wood Park, south of the southern tunnel portals, between BARC and PRR, on Fort George G. Meade military base, along Stony Run and tributaries south of Baltimore-Washington International Thurgood Marshall Airport (BWI Marshall Airport), and along the Patapsco River and its adjacent floodplain parks. As Build Alternatives are refined, the Project Sponsor will coordinate with MDNR and USFWS to identify areas for more detailed surveys for RTE and sensitive species and habitats.

Sensitive Species Project Review Area

SSPRAs are state and locally significant habitat areas including RTE species and their habitats, Natural Heritage areas, colonial water bird sites, NTWSSCs, habitat protection areas, areas subject to Critical Area review, and geographic areas of concern. Species and resources are categorized into one of four SSPRA Groups depending on their level of regulation and protection. Groups 1 and 2 contain species that are officially regulated, with federally listed threatened or endangered species classified as Group 1, and state-listed species and their habitats classified as Group 2. Group 3 includes species or resources of concern to MDNR that lack a Federal- or state-regulated status. Group 4 includes areas with bald eagle nests and suitable surrounding habitat. Because SSPRA are designated by the MDNR, none are identified in Washington, D.C.

FRA identified the following SSPRAs within the SCMAGLEV Project Affected Environment, as illustrated on mapping in Appendix B.3:

- Baltimore City: A Group 2 SSPRA, likely associated with the peregrine falcon nest site, is located in the area proposed as the Camden Yards Station.
- Anne Arundel County: A Group 1 SSPRA is near the SCMAGLEV Project's intersection with Ridge Road (MD 713) which is likely associated with the swamp pink site. A Group 2 SSPRA is near the SCMAGLEV Project's intersection with the Little Patuxent River north of MD 198 (TMF site) and its intersection with PRR property just south of MD 198, likely associated with the NTWSSC downstream of the SCMAGLEV Project. This Group 2 SSPRA also intersects the headwaters

and wetlands on the Fort George G. Meade property. A small Group 3 SSPRA is also located at the eastern end of the MD 198 TMF along the Little Patuxent River.

- Anne Arundel and Prince George's County boundary: A large Group 2 SSPRA is partially within PRR, likely associated with the NTWSSC along the Patuxent River.
- Prince George's County: A large Group 2 SSPRA encompasses much of the BARC property, north of Powder Mill Road to south of Beaver Dam Road, including a portion of Springfield Park, likely associated with the NTWSSC along Beaverdam Creek. Another larger Group 2 SSPRA intersects the long-term construction laydown area near MD 200 and I-95, likely associated with state-listed plant species identified during previous regional transportation project coordination.

4.12.4 Environmental Consequences

FRA evaluated the potential impacts to ecological resources as a result of the Build Alternatives. FRA concluded that impacts would occur in areas with surface disturbance to forests and other habitat components. The greatest potential direct impacts would occur in areas where permanent structures would replace habitat, in areas of vegetation removal or alteration of habitat (e.g., shading of normally open areas or forest fragmentation), and destruction of individual plants or animal habitats during construction. These impacts can be permanent, such as fill in wetlands, or temporary, such as alterations of habitat during construction that can be re-established when construction ends.

Indirect impacts include degradation of water quality or hydrologic changes on aquatic organisms. Indirect impacts also include effects of habitat disturbance, such as vegetation clearing and noise, on habitats and species beyond those immediately within and adjacent to the SCMAGLEV Project LOD. FRA considered some of these effects to be temporary and identified appropriate measures the Project Sponsor will apply to mitigate indirect impacts.

FRA examined operational impacts that would result from ongoing, routine, and occasional activities associated with the SCMAGLEV Project and related services, as well as short-term impacts during SCMAGLEV Project construction. FRA's analysis focused on the following potential impacts:

- Changes in migration patterns and accessibility of habitat to fish, wildlife, or sensitive species.
- Current conditions of natural habitats and their proximity to the SCMAGLEV Project and how that could change important habitat characteristics (for example, water and air quality, noise and vibration, and water resources).

- The type and amount of habitat and potential impacts by direct removal, filling, hydrological interruption, or other means.
- Sensitivity of ecological conditions that may rely on soil type, quality, or characteristics specific to the area.

4.12.4.1 No Build Alternative

Under the No Build Alternative, the SCMAGLEV Project would not be built and no impacts related to the construction or operation of the SCMAGLEV would occur. However, other planned and funded transportation projects would continue to be implemented in the area and could result in effects to ecological resources including disturbance to forest, FIDS habitat, RTE species, and habitat for other flora and fauna.

4.12.4.2 Build Alternatives

The Build Alternatives would result in direct and indirect impacts to ecological resources. The subsections below describe potential SCMAGLEV Project impacts to forests and FIDS habitat, terrestrial and aquatic wildlife, and RTE species.

Summary of Build Alternative Impacts

- Build Alternatives J-01 through J-06 would result in forest, FIDS, and other sensitive species habitat impacts at PRR, a National Wildlife Refuge. Build Alternatives J1-01 through J1-06 would not result in impacts to PRR.
- Build Alternatives J1-01 through J1-06 would result in an estimated 40 acres of forest habitat impacts on City of Greenbelt property and an estimated 5 to 16 acres of forest impacts on MNCPPC park property, depending on the Build Alternatives. Build Alternatives J-01 through J-06 would not result in impacts to these properties.
- The three TMF options would result in substantial impacts to forest, FIDS habitat, and SSPRAs. The BARC Airstrip TMF option would be the least impactful, with just under 100 acres of forest impact and approximately 93 acres of FIDS habitat. The other TMF options (BARC West and MD 198) would each impact over approximately 150 acres of forest and FIDS habitat. For SSPRAs, the MD 198 TMF would result in the fewest impacts at 59 acres, and BARC West would result in the greatest impacts at 157 acres.
- All Build Alternatives would impact forest, FIDS habitat, and SSPRAs along NPS property, but those associated with the Build Alternatives J1 would incur greater impacts (46 to 47 acres) to SSPRAs than those associated with the Build Alternatives J (31 to 35 acres).

Forest and Forest Interior Dwelling Species

Clearing of forest and mature trees, even if replanted, would result in long-term impacts to adjacent and surrounding forest resources. Re-establishment of contiguous forest requires decades of woody and herbaceous plant growth and species succession, which can be undermined by competition from invasive vines and trees adapted to such

disturbances. Adjacent forested areas not cleared as part of the SCMAGLEV Project may convert to fragmented forest unsuitable for FIDS. Edge forest habitat, while supportive of common avian and other wildlife species, allows for the introduction of invasive birds and plants that reduce the viability of FIDS habitat.

With the removal of forest and FIDS habitat, noise associated with the operation of trains and ancillary facilities may also negatively affect FIDS species, which are adapted to interior forests buffered from the sounds of transportation and other human activities. Increased anthropogenic noise has the potential to disrupt typical species behavior, such as vocal communication and foraging, and result in reduced species abundance and fitness.[7] Potential noise mitigation measures are discussed in Section 4.17 Noise and Vibration. Similar impacts may result from increased light pollution, which refers to the introduction of artificial light into these newly denuded forests. These species effects are discussed below.

An indirect impact of forest and FIDS habitat loss is the potential for change in species composition and a decrease in biodiversity, with a less complex vegetative structure. This change may result from increased light and wind or a decrease in humidity. There is then the potential for a ripple effect to other species in the area, both flora and fauna. These changes can make the ecosystem more vulnerable to invasive species and introduce more competing or predatory edge species. According to the CAC guidance, FIDS can help control insect numbers, insects that can prove harmful to human health, such as those which may carry disease. Refer to Appendix D.7 NETR impact summary tables for a numerical breakdown of the impacts to forest and FIDS proposed per each Build Alternative with the individual alignment, station and TMF options and the following subsections describe these impacts.

The quantitative analysis of forest and FIDS provides acreage within the LOD of surface features only, which includes elevated viaduct and piers, transition portals and areas of cut and cover, maintenance-of-way (MOW) and fresh air/emergency egress (FA/EE) facilities, miscellaneous systems features, and TMFs. FRA recognizes however that FIDS may be impacted beyond these limits in many areas beyond the LOD, as much as 300 feet, as noted previously is the favorable forest conditions for FIDS. Refer to Appendix D.7 NETR for more detailed qualitative and site-specific description of potential FIDS impacts.

FRA will consider Site Design Guidelines published by the CAC for protection, minimization, and mitigation for the loss of FIDS habitat. It is anticipated that there would be an adverse effect on forest and FIDS as a result of the SCMAGLEV Project, however minimization and mitigation measures are viable as described further in Section 4.12.5.

[7] A synthesis of two decades of research documenting the effects of noise on wildlife. Available at https://doi.org/10.1111/brv.12207. Accessed 9/4/20.

Alignments

Forest clearing, grading, and land development associated with the alignments would directly remove forest and FIDS habitat. Build Alternatives J alignments would have approximately 30 percent more impacts to forests and approximately 50 percent more impacts to FIDS habitat than Build Alternatives J1 alignments. See Appendix D.7 NETR impact summary tables for additional calculations on public property (primarily Federal and local properties), which generally encompass the largest areas of contiguous forest. Distinguishing factors for impacts to forest and FIDS include the following:

- The greater forest and FIDS impact with the Build Alternatives J alignments is largely due to the amount of contiguous forest impacts proposed on PRR (only impacted by the Build Alternatives J alignments) and Fort George G. Meade / NSA properties (larger impacts from Build Alternatives J alignments). Forest impacts on Fort George G. Meade property would diminish and fragment the forested buffer and wildlife corridor that separates the military base from the BWP.

- Although Build Alternatives J1-01 through J1-06 have less overall forest and FIDS habitat impacts, only the Build Alternatives J1 alignments would result in forest clearing on City of Greenbelt property (approximately 40 acres) and at Maryland City and Patuxent River Parks in Anne Arundel County and Prince George's County, respectively.

- Local property/park impacts with the Build Alternatives J1 alignments are smaller in size and existing acreage than the larger Federal properties and would experience a greater percent loss of forest per property, and remove existing forest buffers between more residential land uses and the existing transportation corridor along BWP.

- Approximately 12.5 acres of forest would be removed from Maryland City Park for the MOW associated with J1-01 through J1-04. The same acreage of forest impact is proposed to NPS property for the MOW for J-01 through J-04.

- Although all Build Alternatives result in considerable impacts to contiguous forests on NPS and BARC properties, the alignments in these locations are closely associated with the existing forest edges along the BWP. FRA's intent with alignment selection along the existing transportation corridor was that it would decrease the acreage of forest impact required and attempt to avoid greater fragmentation.
- All Build Alternatives would result in impacts to forest conservation easements.
  - Those associated with Build Alternatives J1 alignments would result in greater acreage of impacts (approximately nine to 13 acres, versus approximately three to six acres from those associated with J alignments), specifically due to impacts from the portal, stormwater management facility, construction

laydown, and other SCMAGLEV Project elements proposed in Maryland City Park in Anne Arundel County.

– Despite the greater acreage of impacts, Build Alternatives J alignments would result in impacts to nine to 10 forest conservation easement parcels versus seven to 10 parcels for Build Alternatives J1 alignments.

Stations

The four stations associated with the Build Alternatives would not impact FIDS habitat, as the stations are in primarily unforested or already forest fragmented areas. However, between the Baltimore-area station options, the Cherry Hill Station would impact approximately 24 acres of forest and forest fragments, which is three times the impact associated with the Camden Yards Station. No forest impacts are associated with the Mount Vernon Square East or BWI Marshall Airport stations, and none of the four stations would impact forest conservation easements.

TMFs

All three TMF options would require extensive clearing of over 90 acres of forest and FIDS habitat. A comparison of the impacts includes the following:

- MD 198 and BARC West TMFs each have about 60 percent more forest impacts than the BARC Airstrip TMF.
- MD 198 and BARC West TMF are roughly comparable in their proposed FIDS habitat impacts of between 150 to 180 acres, respectively. The BARC Airstrip TMF results in fewer impacts to FIDS habitat (92 to 93 acres).
- The MD 198 TMF would result in approximately 20 acres of permanent impact to a Maryland Environmental Trust Easement.
- The MD 198 TMF would result in impacts to three to four forest conservation easements.

Both direct and indirect effects of deforestation as a result of any TMF have been discussed previously in Sections 4.10 Water Resources and 4.11 Wetlands and Waterways as well as detailed within this section below. In summary, these effects include, but are not limited to, forest fragmentation, changes in biodiversity, invasive species introduction, weather effects such as sunlight and wind, precipitation and stormwater, alteration in water chemistry and quality, and human effects from noise and artificial light.

Terrestrial and Aquatic Wildlife

The Build Alternatives would directly impact terrestrial and aquatic resources, including a diverse array of habitats for terrestrial and aquatic wildlife, primarily through the removal of habitat for the proposed above-ground structures. Removal of vegetation would temporarily (if restored post-construction) or permanently (if not) remove specific

forest, scrub-shrub, wetland and/or meadow habitats critical for the nesting, foraging, and refuge of migratory birds, raptors, reptiles, amphibians, bats, pollinator species, mammals, and other faunal species. Permanent fragmentation of habitat resulting from clearing and construction may undermine the viability of some wildlife populations and allow for the establishment and/or dominance of invasive species in areas currently valued for their native species communities. Indirect effects of the SCMAGLEV Project include potential changes in water quality, which could adversely affect state-monitored fisheries and further degrade benthic habitat in the major streams and tributaries within and downstream of the SCMAGLEV Project Affected Environment. Short-term and long-term displacement of plant and animal species would result in further loss of species diversity, which can disrupt food webs and create the potential for undesirable species introduced to the environment.

Fencing would be installed along discrete segments of the proposed ROW, including at tunnel transition portals, open cut sections, restricted areas associated with stations and facilities, other sensitive aboveground locations, and as needed for safety. Fencing proposed in low-development areas could impact wildlife habitat access and movement.

The effects of increased noise may affect not only FIDS that require a greater depth of forested habitat described previously, but other terrestrial and aquatic species. Some species are affected by increased noise in how they search for food, avoid predators, or seek a mate for reproduction. Species may have to adjust their vocal behaviors to adapt to the increased human sounds in their surroundings, which has the potential to affect their populations. Additional details regarding potential noise and/or vibration effects are included in Appendix D.7 NETR. Additionally, the effects of light pollution may affect species in areas where forest clearing has occurred and there has been an introduction to artificial lights. Humans and wildlife perceive light differently. Artificial light may also disrupt critical behaviors and cause physiological changes in wildlife.[8] These effects can be difficult to measure and regulate, however there are studies that can provide guidelines to support design measures to reduce light pollution.

The following subsections describe terrestrial and aquatic wildlife impacts of the alignments, stations, and TMF, which generally align with the impact discussions associated with forest impacts, RTE impacts, and wetland and water resources impacts presented in Section 4.10 Water Resources and Section 4.11 Wetlands and Waterways.

Alignments

Build Alternatives J alignments would result in greater overall habitat impacts than those associated with the Build Alternative J1 alignments, primarily because it has a longer above-ground viaduct and includes direct impacts to PRR, in addition to BARC, NPS, and Fort George G. Meade/NSA properties, all large areas of existing natural

[8] Australian Government Department of the Environment and Energy Department of Biodiversity, Conservation and Attractions. National Light Pollution Guidelines for Wildlife. January 2020 Version 1.0.

communities. The direct loss of habitat causes a direct loss of species who may rely on that habitat. Additional impacts of the proposed alignments include the following:

- Permanent clearing of forest canopy along the Build Alternatives J alignments at PRR may result in detrimental effects in areas supporting vernal pools, where USFWS staff and wetland delineation field assessments identified the presence of such habitat. This may affect the breeding success of local amphibian populations, particularly for species only adapted to a shaded environment.

- Build Alternatives J alignments would impact non-forested areas of PRR, particularly the BGE ROW that is managed for shrub-dependent bird species and pollinators.

- An assigned bald eagle nest is located approximately 2,000 feet from a proposed FA/EE associated with all Build Alternatives located immediately north of the Patapsco River and south of I-895. The alignment is located underground at this location. Existing noise levels near I-895 is 72 to 75 decibels (dBA). Future operational noise as evaluated and presented in greater detail in Section 4.17 Noise and Vibration, is estimated to be approximately 66 dBA, with temporary construction noises for the FA/EE reaching approximately 70 to 74 dBA. Therefore, the FA/EE is not anticipated to impact this resource, as the proposed structure would be located in an existing area of industrial and commercial development. The National Bald Eagle Management Guidelines advise against blasting within 0.5 miles of bald eagle nests during the breeding season. If blasting would be required for any construction, which would be assessed during future ground/geotechnical investigations, these impacts would be re-evaluated.

- Build Alternatives J alignments would directly impact the NTWSSC located on PRR, southeast of the viaduct crossing of the Patuxent River, with potential impacts to a GBH colony site.

- All Build Alternative alignments would directly impact the NTWSSC located on BARC property, associated with Beaverdam Creek. With the placement of piers potentially within these sensitive habitats and clearing of vegetation (including forests, as discussed above) for construction needs and potential continuing maintenance needs along the alignment, a direct impact would result to NTWSSC sensitive species.

- Water-related impacts associated with Build Alternatives J alignments crossing the Little Patuxent River upstream of the Patuxent River NTWSSC could result in indirect adverse effects to sensitive species and habitats.

- Impacts to waterways from the Build Alternative alignments may include shading of wetlands and streams by overpassing structures, increased sunlight from riparian vegetation removal, and potential waterway relocations necessary at various locations, such as for the Build Alternatives J alignments portal area at

Fort George G. Meade. These impacts may induce changes to water quality and hydrology due to grading, which could impact aquatic organisms and plant communities dependent on pre-construction hydrologic conditions.

Stations

The Mount Vernon Square East and BWI Marshall Airport Stations would have no impacts on terrestrial and aquatic wildlife, as these stations are in areas of urbanized land uses and impervious surfaces, not located near terrestrial and aquatic wildlife habitats.

Impacts to habitats associated with the Cherry Hill Station and Camden Yards Station would likely include shading of wetlands and streams by overpassing structures, increased sunlight from riparian vegetation removal, potential waterway relocations, and loss of remnant forest and hedgerow habitats. Features associated with both Baltimore area stations occur adjacent to the Gwynns Falls and Patapsco River (Middle Branch) and may result in impacts to remnant vegetative and aquatic habitats associated with these waterbodies.

TMFs

All three TMFs would impact diverse terrestrial and aquatic habitats primarily through clearing, grading, and creation of impervious surface. Each TMF proposes at least 90 acres of forest habitat removal and at least 20 acres of wetland impacts, including impacts to NTWSSC and other sensitive species habitats. Forest and water-related impacts associated with and surrounding tributaries at each TMF site could result in indirect adverse effects to sensitive species and habitats, with the same adverse impacts noted previously. Although the BARC Airstrip may result in 50 to 60 percent fewer acres of forest and FIDS habitat removal, this TMF option would result in the largest impact to the Beaverdam Creek NTWSSC, including disruption to the system's forested headwaters with new developed impervious surface.

Rare, Threatened, and Endangered Species

While efforts would be made to avoid and minimize impacts to RTE species and their habitats, each Build Alternative removes, fragments, disturbs, and/or otherwise affects sensitive wildlife habitats, specifically:

- Northern long-eared bat: Depending on the proximity of SCMAGLEV Project forest removal activities, locations of summer roosting areas may be directly or indirectly affected through immediate loss of forest or the presence of adjacent temporary construction disruption or new structures.
- Swamp pink: The Project Sponsor will avoid impacts to the swamp pink population and associated wetland hydrology near the Harmans area.
- Peregrine falcon: Project activity in downtown Baltimore is not expected to exceed typical noise or disturbance conditions associated with the nesting area.

- At PRR, BARC, and within NTWSSCs supporting RTE plant, odonate (dragonfly), and fish species, SCMAGLEV Project disturbance may result in direct impacts to rare natural communities and species populations that rely on forested uplands and wetlands, vernal pools, or riparian areas during any part of their life cycles, specifically:

  RTE fish, odonate, and mussel species associated with Dorsey Run, Little Patuxent River, Patuxent River, Beaverdam Creek, and/or associated tributaries are particularly sensitive to sedimentation and siltation, disturbance to sand/gravel stream bed conditions, changes in hydrology, water quality degradation, increased stream temperatures, and loss of riparian vegetation. SCMAGLEV Project disturbance, including forest clearing, runoff from permanent structures, and stream crossings would result in direct and indirect impacts to RTE fish populations.

  RTE odonate species associated with these waterways are “considered highly sensitive to changes in hydrology and water quality, especially during their aquatic larval stages,” according to MDNR WHS (October 22, 2020 letter). Important habitat elements include streambed habitat and riffles, small headwaters for life cycle migratory patterns, and perching areas along the shoreline.

- RTE plant species and globally rare natural communities associated with wetland hydrology, most notably along the Patuxent floodplain and throughout the BARC property, are particularly vulnerable to direct impacts from SCMAGLEV Project elements that will result in direct removal of vegetation, filling surface water areas, altering above and below ground hydrology, or contributing runoff to these areas. RTE plant species and globally rare natural communities associated with upland areas would also experience direct impacts resulting from vegetation removal and potentially from changes in grade.

Refer to agency correspondence in Appendix D.7 NETR for a list of all species that may be impacted by the project, as identified by the resource agencies. The SSPRAs that intersect the surface components of the Build Alternatives are closely associated with sensitive species and habitats described above (FIDS, NTWSSCs, RTE species, fisheries). Temporary and permanent impacts to SSPRAs are presented in Appendix D.7 NETR impact summary tables. RTE species are of particular concern as their declining populations or limited habitat may already be threatened. Therefore, the SCMAGLEV Project requires continued coordination with MDNR, National Marine Fisheries Service (NMFS), and USFWS, including ESA Section 7 consultation, to refine impacts, construction and design best management practices (BMPs), and mitigation plans, as discussed in Section 4.12.5. FRA anticipates that specific species surveys would be required throughout the SCMAGLEV Project LOD and/or specifically on identified properties within the LOD.

Alignments

Surface disturbances associated with the viaduct crossings of the Little Patuxent River, the Patuxent River (at the NTWSSC), and Beaverdam Creek (at the NTWSSC) have the potential to adversely impact RTE species of odonates, fish, and an aquatic plant.

- The MDNR WHS identified 14 species and potentially two GBH colonies that may be impacted due to Build Alternatives J alignments crossing the Little Patuxent River. This would potentially be avoided by Build Alternatives J1 alignments that tunnels under the river, avoiding surface disturbance.
- All Build Alternatives include a proposed access road across Dorsey Run in the vicinity of Fort Meade, which would require vegetation removal and may result in impacts to water quality and habitat.
- Additional species of concern identified by USFWS may also incur detrimental impacts from Build Alternatives J alignments, largely through PRR property.
- The MDNR WHS identified 13 noted species that the existing NTWSSC associated with the Patuxent River may support as well as a GBH site. All Build Alternatives have the potential to impact these species. The MDNR WHS states that Build Alternatives J alignments would directly impact part of a population of state-listed rare dragonfly species. Refer to Appendix D.7 NETR Agency Correspondence for additional details.
- Build Alternatives J1 alignments would directly impact the globally rare coastal plain oak floodplain forest natural community, located north of the Patuxent River.
- Impacts to the two RTE species identified at the long-term construction laydown area near MD 200 and I-95 may result from construction activities.

Stations

MDNR WHS does not anticipate adverse impacts to the peregrine falcon nest site in Baltimore City from construction or operational activity associated with the SCMAGLEV Project, including the Camden Yards Station. RTE species and SSPRAs are not present at any other station.

TMFs

The MD 198 TMF would convert a large area of vegetated habitats, wetlands, and waterways within the SSPRA and upstream of the Little Patuxent NTWSSC into permanent surface features, resulting in the risk for habitat removal and localized species eradication. Direct impacts to the Little Patuxent River may threaten populations of RTE fish and odonate species. MDNR indicates the location of a GBH colony overlapping with the LOD of this TMF.

Likewise, construction of both BARC TMFs would have similar effects on the Beaverdam Creek NTWSSC, globally rare natural communities, unique forest

communities supporting pitch pine and dwarf chinquapin oak, and associated RTE species and GBH colonies. The BARC Airstrip TMF could result in greater threat to species as it impacts the headwaters to this waterway and its associated wetland and riparian habitat buffers. Fill within or adjacent to the North Branch of Beaverdam Creek associated with the BARC West TMF could result in degradation of aquatic and riparian habitat sufficient to disrupt the local occurrence of American brook lamprey. Construction of either TMF on BARC property would result in grade changes, which would alter surface hydrology associated with sensitive species and habitats within and adjacent to the SCMAGLEV Project LOD. Groundwater and surface water changes, sedimentation, and nutrient runoff resulting from project elements may degrade suitable habitat for populations of White Fringed Orchid and acidic seepage fen and swamp communities, which are highly sensitive to these types of disturbances.

4.12.4.3 Short-term Construction Effects

The Build Alternatives have the potential for short-term impacts to ecological resources during construction, including degradation of FIDS habitat. Construction activities for viaduct piers, tunnels, and other structural components of the project would require temporary access, laydown/staging areas, and launching of tunnel boring machines and construction equipment. This results in additional habitat clearing and human activity, including the introduction of additional noise in sensitive habitats.

Temporary stream crossings for construction access would have short-term impacts to aquatic wildlife, including some species of fish, odonates and mussels. Temporary disturbance to streambed habitat and hydrology may result from the use of stream diversions, temporary culverts, and other standard construction and access elements. The Project Sponsor would adhere to in-stream and near-stream BMPs and time of year restrictions for in-stream work.

Construction of the MD 198 TMF, BARC TMFs, and Build Alternatives J over the Patuxent River would potentially impact GBH colony sites. GBH colonies are sensitive to human activity, especially during the breeding season, and may disband if disturbed by nearby development.

4.12.5 Potential Minimization and Mitigation Strategies

4.12.5.1 Minimization

FRA has determined that the SCMAGLEV Project would impact ecological resources, including forest and FIDS; terrestrial and aquatic species and their habitats; and RTE species and habitats. The following section provides measures that the Project Sponsor has taken and will take to minimize impacts.

Following DEIS publication and selection of a Preferred Alternative, FRA will continue targeted coordination with USFWS, NPS, BARC, MDNR, NMFS, and other stakeholders in identifying future studies and coordinating impact avoidance, minimization, and

mitigation efforts. FRA will continue ESA Section 7 consultation with USFWS and will also coordinate with the Migratory Bird Permit Office regarding the potential for bald eagle nesting sites and the need for an eagle conservation plan prior to the FEIS. To reduce the likelihood of an eagle take, additional consideration for implementation of carrion removal protocol will be addressed, as train strikes are a known source of mortality for bald eagles. Eagles tend to be struck when attempting to feed on remains of carrion.

FIDS habitat, other terrestrial and aquatic habitats, and RTE species and habitats (including SSPRAs) generally occur within the same largely forested areas within the SCMAGLEV Project LOD. Therefore, impacts to one of these sensitive resources is typically associated with impacts to one or more of the other resources, often also overlapping with NTWSSC. As a result, the Project Sponsor will have the opportunity to minimize impacts to multiple sensitive habitats when forest, FIDS or other sensitive habitat is avoided. Likewise, the Project Sponsor may have a compounded mitigation requirement in areas supporting multiple sensitive habitats.

An Invasive Species Control and Management Plan will be required for construction and operational activities on PRR property and anticipated within NPS, BARC, and other Federal lands. Similarly, the Critical Area Commission Site Design Guidelines will be considered, and invasive plant treatments considered for all project activities located within the Chesapeake Bay Critical Area.

To minimize bisecting large areas of intact sensitive habitats, Build Alternatives J-01 through J-06 and J1-01 through J1-06 were located as close to existing transportation corridors as possible. In addition, large portions of the SCMAGLEV Project have been designed as guideway tunnels, with 75 to 83 percent of the Build Alternatives located in tunnel. As a result, habitats and sensitive species associated with the Anacostia River and Patapsco River crossings have been avoided. Additionally, based on agency input, the Project Sponsor revised the location of an ancillary facility to avoid impacts to the federally threatened swamp pink and extensive wetlands in the Harmans area of Anne Arundel County, as detailed in Section 4.11 Wetlands and Waterways.

Although the SCMAGLEV Project would span across or tunnel beneath major waterways and their tributaries to avoid impacts to aquatic and riparian habitats, temporary construction-related instream activities may be necessary, as outlined in Section 4.11 Wetlands and Waterways. Build Alternatives largely avoid fisheries resources and migration paths associated with major stream systems and/or high-quality Tier II Waters (Anacostia, Patuxent, and Patapsco Rivers, Beaverdam Creek, Baltimore Harbor and tributaries) by tunneling below or spanning over the systems. FRA has considered Environmental Site Design (ESD) in planning and placement of piers to avoid and minimize impacts to wetlands and waterways to the extent possible. Because of the sensitive nature of these systems and their ecological surroundings, further ESD and additional BMPs to avoid greater impacts would be included during final design.

Short-term effects have less opportunity for indirect impacts compared to long-term effects because the Project Sponsor will employ specific construction related BMPs, per regulatory requirements and coordination with regulatory agencies, including:

- Complying with time-of-year restrictions associated with streams, and for nesting and breeding habitats associated with sensitive species, including FIDS and GBH colonies.
- MDNR recommended a February 15 through June 15 time of year restriction for the protection of anadromous fish and yellow perch spawning activities. Minimizing impacts to active GBH colonies would require implementing a one-quarter-mile buffer around each colony and avoiding disturbance activities during the breeding season (February 15 through July 31, during any year). During final design, the Project Sponsor will conduct further coordination with MDNR to refine restrictions on allowable activities within this buffer.
- USFWS recommended time of year restrictions for breeding migratory birds (April through August) and breeding wintering birds (November through February) for forest clearing activities.
- Continued observation of bald eagle nesting sites and compliance with National Bald Eagle Management Guidelines, including buffer recommendations, as appropriate to any findings.
- Developing construction sequencing to minimize effects to the same location continuously.

Incorporating detailed erosion and sediment control (ESC) BMPs, including performing frequent inspection of BMPs to ensure their optimal performance and revegetating temporarily disturbed areas as soon as possible. Because many of the sensitive species and habitats identified by USFWS and MDNR are associated with wetland and waterway habitats, MDNR has requested strict adherence to all appropriate BMPs for sediment and erosion control during any ground disturbance or instream work, to minimize siltation that could adversely affect RTE aquatic species located upstream and downstream of the SCMAGLEV Project.

The Project Sponsor will also incorporate detailed stormwater BMPs into the final design and throughout all phases of construction to further minimize impacts to forests, habitats, and sensitive species. The location of permanent stormwater management features associated with the alignments are proposed within or adjacent to areas already proposed for surface disturbance. The Project Sponsor will approach design and development of TMFs, stations, and ancillary facilities with the goal of avoiding and minimizing impacts to forests, habitats, and sensitive species and will optimize opportunities to incorporate beneficial ESD to meet (and exceed where feasible) water quality-related requirements. The Project Sponsor will implement supplemental protection measures based on MDNR recommendations to prevent changes to wetland and stream hydrology and water quality and implementing environmentally sensitive

design to manage stormwater in a way that mimics natural infiltration (see Section 4.10 Water Resources for more discussion on stormwater).

Construction staging areas and access roads would coincide with existing infrastructure, where feasible, to minimize impacts to natural areas and therefore potential habitat. An existing gravel access road in the PRR/BGE ROW could be used during construction of the SCMAGLEV Project to minimize impacts, if agreeable by BGE. The Project Sponsor will also coordinate with the USFWS to identify and implement a designated route in existing access roads and maintenance locations of PRR, and with other landowners on properties with existing ecological resources to avoid impacts to habitats to the greatest extent practicable.

FRA will implement, as feasible, specific efforts to reduce FIDS habitat impact. Although no FIDS habitat impacts would occur within the Critical Area, FRA's impact minimization will consider the CAC Site Design Guidelines, which include but are not limited to:

- Limiting forest clearing to the minimum footprint of disturbance necessary;
- Maintaining forest canopy closure over access roads;
- Avoiding forest clearing during FIDS breeding seasons;
- Reestablishing forest cover using native tree and shrub species; and,
- Targeting forest reestablishment along riparian corridors, in gaps of existing forest, and abutting existing FIDS habitat.

Build Alternatives J-01 through J-06 would require more ecological coordination and surveys due to impacts at PRR. The Project Sponsor will coordinate with USFWS to conduct required surveys during the appropriate time of year to determine species presence/absence. USFWS has requested the following efforts to aid in identifying feasible avoidance, minimization, and mitigation measures for resources within and adjacent to the Project LOD:

- acoustic surveys and mist-netting for northern long-eared bat;
- surveys in the Patuxent River for yellow lance;
- large-diameter tree surveys; and
- delineation of vernal pools and wetlands that may support RTE species.

USFWS also requested further assessment of the risk of collisions with birds, forest bats, and migrating pollinators, and opportunities to preserve forest edges and other vegetative buffer zones. Additionally, in coordination with USFWS, FRA may be required to locate sensitive species, such as spotted or box turtles, and consider relocation of individuals prior to construction, with the understanding that species relocation poses disease transmission risks. The NPS has indicated that bat surveys should be more comprehensive, to include all declining bat species such as tricolored, Indiana, big brown, and little brown. NPS has also indicated that seeps and springs

should be added to the list of surveys to aid in identifying feasible avoidance, minimization and mitigation measures. These habitats support a variety of species, including potential RTE species.

To eliminate or greatly reduce the impacts to birds due to direct strikes with moving rail cars, FRA examined mitigation techniques such as a form of shroud or hood over the guideway to prevent birds from accessing the vicinity of the moving train. Similarly, techniques such as bat gates can be considered at tunnel openings to prevent bats from entering.

Upon identification of a preferred alternative, the Project Sponsor will consider further details regarding fence design and siting in coordination with resource agencies and landowners to address concerns over wildlife passage and habitat fragmentation.

4.12.5.1 Mitigation

Impacts to forest resources would require compliance with the Maryland FCA. As previously noted, the Project Sponsor will conduct a full FSD and specimen tree survey to identify forest stand impacts, specimen trees, priority retention areas, and reforestation requirements. The Project Sponsor will prepare a Forest Conservation Plan (FCP) to identify areas of forest retention, reforestation, afforestation, and long-term protective measures, such as easements. The Project Sponsor will mitigate for forest loss with onsite and offsite forest mitigation, with emphasis on expanding FIDS habitat in the region. Mitigation of impacts to forests would also include additional requirements associated with impacting existing forest conservation easements and tree conservation plans, if such areas cannot be avoided. Impacts to state and county-level forest conservation easements would require additional mitigation and coordination with MDNR and county agencies. These often require a greater mitigation ratio be applied to those areas. The Project Sponsor will also coordinate with MDNR and the Maryland Environmental Trust regarding impacts to forest conservation easements. Additionally, property owners may require additional or separate mitigation for vegetation removal. The United States Secret Service would require a minimum 1:1 replacement for lost forest habitat with similar habitat.

The Project Sponsor will continue to coordinate with agencies and consider the following additional mitigation strategies during final design and construction planning, which both overlap and supplement strategies presented in Sections 4.10 Water Resources and 4.11 Wetlands and Waterways:

- Onsite re-establishment of forest habitat, where feasible, including planting of trees of appropriate mature height under the guideway to provide contiguous canopy while maintaining the 13-foot clearance beneath the structure
- Offsite plantings to expand and restore forests, FIDS, and riparian habitats within the watersheds
- Onsite and offsite wetland mitigation, whether through banking or permittee-created wetlands within the watersheds

- Tidal marsh restoration within or near the Baltimore Harbor, Patapsco River, and/or Anacostia River
- Onsite and offsite restoration of degraded stream reaches associated with the major river systems
- Coordination with USFWS to determine compensatory mitigation value and restoration opportunities for unavoidable impacts to large-diameter trees and areas of FIDS habitat encroachment at PRR. This analysis would consider ecological functions lost such as nesting habitat, carbon sequestration, oxygen production, seed production (forest regeneration or wildlife food resource), stormwater retention, and groundwater recharge. The loss of these functions may be determined to have a dollar value applied and compared for example to the new artificially created municipal systems that may be required.
- Coordination with MDNR and county and local municipalities to identify ecological restoration priorities and consider funding agency and nonprofit community greening, water quality, and/or environmental education projects and programs
- Purchasing of intact forest and/or wetland complexes for placement in perpetual easement
- Invasive species management of onsite and adjacent habitats
- Funding ecological research and restoration at PRR and BARC