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SUMMARY

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Wildlife Corridors: Background and Issues for Congress

Species need connectivity between habitats to seek out sources for food and shelter and, in some cases, to adapt to environmental stressors and climate change. One method of increasing ecological connectivity is to create wildlife corridors. *Wildlife corridors* are components of the landscape that are managed to create or improve ecological connectivity for one or more species. These corridors allow species to move between areas of their habitat, thereby lowering the effects of habitat fragmentation in natural and urban settings. In May 2023, the White House Council on Environmental Quality issued guidance for federal agencies to promote ecological connectivity across terrestrial, marine, and freshwater habitats, as well as across airspaces (e.g., for birds), to sustain biodiversity and enable species to adapt to changing environmental conditions.

Several federal agencies support wildlife corridors through their activities and programs. Federal activities related to wildlife corridors often include connecting fragmented habitats through corridors, removing obstructions, or constructing wildlife crossings and fish passages. Federal agencies also research and document the migration routes of certain species, leading to maps of species' movements. Some federal agencies have created wildlife corridors on lands they manage, and some federal agencies support wildlife corridors that traverse federal and nonfederal lands. In these cases, federal agencies collaborate with states and other stakeholders to establish and manage wildlife corridors. State and local governments also create and manage wildlife corridors and crossings; at least 13 states have enacted legislation or issued direction to support wildlife corridors and crossings. In addition, some Indigenous peoples have taken advantage of federal financial and technical assistance to conserve wildlife through wildlife corridors crossing their lands and waters.

Support for wildlife corridors might vary depending on the costs and benefits of these corridors' implementation and management. Some stakeholders support efforts to create and manage wildlife corridors because these corridors can improve the conservation of species and biodiversity. Other stakeholders support wildlife corridors because they can enhance populations of game animals popular for hunting and fishing. Still other stakeholders oppose certain wildlife corridors because of their potential to restrict land use and lead to the spread of predators (e.g., wolves, grizzly bears) or invasive species. Some others may not support some wildlife corridors due to their cost of implementation, effect on infrastructure (e.g., dams), and maintenance costs.

Over the past few Congresses, several bills have been introduced with the aim of establishing or supporting wildlife corridors on federal and nonfederal lands. For example, some bills would have authorized appropriations for certain agencies to provide grants to nonfederal stakeholders to create wildlife corridors and implement other conservation activities. Congress has authorized and funded wildlife corridor activities, including fish passage and wildlife crossing projects, through supplemental and annual appropriations. Congress may consider several issues related to the design, funding, and implementation of wildlife corridors in debates on wildlife corridors. Some issues include (1) the organization of federal efforts to create and implement wildlife corridors; (2) supporting nonfederal efforts to create wildlife corridors; (3) coordination among federal, state, tribal, and private stakeholders; (4) the level of financial assistance for wildlife corridors; and (5) support for science on wildlife corridors.

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Introduction

Fish and wildlife species generally inhabit ranges where they can seek and obtain food, shelter, protection, and sites for reproduction. Some species' ranges cover vast areas of land and water to allow for movements and migrations.[1] For example, the home range of a female grizzly bear is approximately 130 to 360 square kilometers (km^2) in the contiguous United States.[2] As another example, anadromous salmon are born in freshwater streams; migrate to saltwater regions, where they grow; and return to freshwater streams, where they spawn.[3] Migratory birds rely on corridors or flyways that connect breeding and wintering grounds as they navigate across vast landscapes during migrations.[4] Human development (e.g., roads, dams, cities, agriculture), habitat loss, ecosystem changes, invasive species (e.g., plant species), and climate change, among other factors, fragment species' range and can obstruct or alter migration routes essential to species' life histories.[5]

Habitat fragmentation decreases *ecological connectivity*, which is the extent of the "unimpeded movement of species and the flow of natural processes that sustain life on Earth."[6] Scientists assert that connectivity between habitats is necessary for species to seek out food sources and, in some cases, adapt to environmental stressors (e.g., wildfire) and climate change.[7] Land and water resource managers often strive to increase ecological connectivity for species to help them adapt to changing conditions and conserve their populations.

One method of increasing ecological connectivity is creating or protecting wildlife corridors. *Wildlife corridors* are distinct components of landscape that are geographically linked to improve ecological connectivity for species.[8] Corridors allow species to move between areas of their habitat, thereby lowering the effects of habitat fragmentation. Wildlife corridors can support one species or groups of species. Corridors can encompass a continuous stretch of land or waterway, or several distinct sites along a migration route. **Figure 1** shows examples of various types of wildlife corridors.

[1] Susan Morse, "Wildlife Corridors," U.S. Fish and Wildlife Service (FWS), 2021, https://www.fws.gov/story/wildlife-corridors#.

[2] FWS, "Grizzly Bear," https://www.fws.gov/species/grizzly-bear-ursus-arctos-horribilis.

[3] Alaska Department of Fish and Game, "Documenting and Protecting Salmon Streams Anadromous Waters Atlas and Catalog," https://www.adfg.alaska.gov/index.cfm?adfg=wildlifenews.view_article&articles_id=717.

[4] The United States has four main flyways: the Pacific, Atlantic, Mississippi, and Central flyways. FWS, "Migratory Bird Program Administrative Flyways," https://www.fws.gov/partner/migratory-bird-program-administrative-flyways.

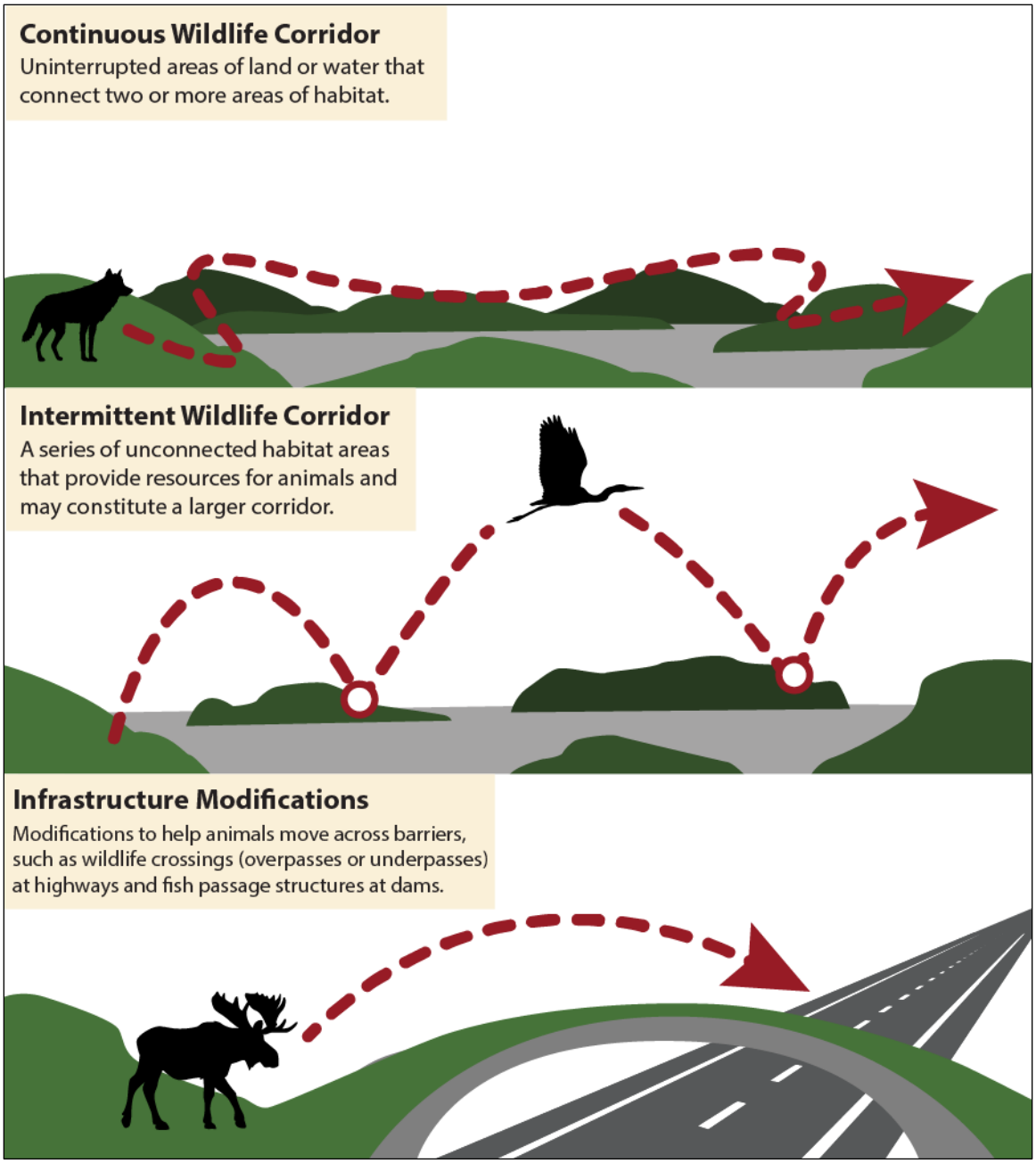
[5] Jodi A. Hilty et al., *Corridor Ecology: Linking Landscapes for Biodiversity Conservation and Climate Adaptation* (Washington, DC: Island Press, 2019). Hereinafter, Hilty et al., *Corridor Ecology.*

[6] Convention on Migratory Species, *Improving Ways of Addressing Connectivity in the Conservation of Migratory Species*, Resolution 12.26, 2020, https://www.cms.int/sites/default/files/document/ cms_cop13_crp26.4.4_addressing-connectivity-in-conservation-ofmigratory-species_e_0.docx.

[7] See, for example, Carrie A. Schloss et al., "'No Regrets' Pathways for Navigating Climate Change: Planning for Connectivity with Land Use, Topography, and Climate," *Ecological Applications*, vol. 32, no. 1 (October 6, 2021), e02468.

[8] Compare wildlife *corridors* with wildlife *crossings* - manmade linkages that helps animals navigate barriers such as roads. Wildlife *crossings* may be located within wildlife *corridors* that connect fragmented habitats.

Figure 1. Types of Wildlife Corridors



Source: Adapted by the Congressional Research Service from Citizens for Los Angeles Wildlife, "Wildlife Corridors and Habitat Connectivity," https://www.clawonline.org/wildlifecorridors.

According to multiple scientists, corridors may provide several benefits for species and ecosystems, including the following:

- Increased landscape connectivity in regions with fragmented habitat
- Greater *biodiversity*[9]

[9] Some experts define *biodiversity* as "the number of different species occurring in the same location," whereas others (continued...)

- Increased gene flow among populations of the same species
- Greater ability to adapt to environmental changes
- Reconnecting species to their former or new habitat
- Fewer incidences of human-wildlife conflicts, such as wildlife-vehicle collisions on roads[10]
- Supporting ecosystem processes and services such as increased seed dispersal and nutrient and water flows[11]

Wildlife corridors can help species adapt to climate change. For example, one study asserted that 41% of land areas in the United States have enough connectivity to allow species to migrate in response to changing temperatures over the next 100 years.[12] Implementing new wildlife corridors to facilitate movement between all natural areas could increase this percentage to 65%, according to the study.[13] Wildlife corridors also can benefit humans by enhancing ecosystem services (e.g., the spread of agricultural pollinators) and recreational opportunities for fishing and hunting.[14]

Wildlife corridors also may have detrimental effects on species under certain conditions. For example, corridors may facilitate the spread of invasive species and wildlife diseases between ecosystems.[15] Corridors might allow unwanted predators or nuisance species to cross ecosystems and biomes.[16] In addition, corridors may allow unwanted disturbances, such as wildfires, to spread more readily.

Some scientists contend that *edge effects* on plants and wildlife could increase within a corridor. An *edge* is an abrupt transition between two ecological communities (e.g., farmland next to a forest). Edges can be detrimental to some species, because they may expose these species to predators, limit their cover, or have other influences.[17] Corridors tend to have higher edge-to-area ratios than natural ecosystems, which can disproportionately affect species.[18]

Wildlife corridors also may be detrimental to humans in some instances. For example, wildlife corridors might allow nuisance species to spread more readily and may allow certain species to disturb human activities (e.g., grizzly bears attacking livestock).

Several federal departments and agencies support wildlife corridors through their activities and programs. Some federal agencies advance wildlife corridors, for example, by improving

may define it as "the variety of life and its processes," including with respect to the variety of living organisms, their genetic differences, the communities and ecosystems in which they occur, and their ecological and evolutionary processes. Don C. DeLong Jr., "Defining Biodiversity," *Wildlife Society Bulletin*, vol. 24, no. 4 (Winter 1996), pp. 738-749.

[10] For greater detail on the benefits of wildlife corridors, see Hilty et al., *Corridor Ecology*.

[11] Ruth DeFries et al., "Landscape Connectivity for Wildlife and Water: The State of the Literature," *Current Landscape Ecology Reports*, August 9, 2023.

[12] Jenny L. McGuire et al., "Achieving Climate Connectivity in a Fragmented Landscape," *Proceedings of the National Academy of Sciences*, vol. 113, no. 26 (2017), pp. 7195-7200.

[13] Ibid.

[14] Hilty et al., *Corridor Ecology*.

[15] Nick M. Haddad et al., "Potential Negative Effects of Corridors," *Conservation Biology*, vol. 28, no. 5 (August 12, 2014), pp. 1178-1187.

[16] Ibid. *Nuisance species* are either native or non-native species that cause ecological or economic harm.

[17] Ibid.

[18] William F. Laurance and Eric Yensen, "Predicting the Impacts of Edge Effects in Fragmented Habitats," *Biological Conservation*, vol. 55, no. 1 (1991), pp. 77-92.

connectivity in fragmented habitats, removing habitat obstructions, and constructing wildlife crossings and fish passages on land and waters they manage. Federal efforts also include studying and mapping the migration routes of certain species and evaluating the effectiveness of various corridor projects. In addition, federal agencies support corridors through federal-state partnerships or grants to create and maintain corridors crossing nonfederal land.

Some in Congress are interested in wildlife corridors because these corridors improve the conservation of species and biodiversity.[19] Others in Congress, and some stakeholders, support wildlife corridors because they can enhance populations of game animals that are popular for hunting or fishing;[20] for example, the Theodore Roosevelt Conservation Partnership asserts that implementing wildlife corridors "is the top conservation issue for hunting and fishing organizations."[21] Some other stakeholders might oppose wildlife corridors because of the land use restrictions such corridors might impose or other negative ecological consequences.[22] Further, some stakeholders might not support corridors due to their potential costs; for example, some wildlife corridor projects that involve creating wildlife crossings, removing dams, or creating fish passage structures could cost millions or even billions of dollars.[23]

Congress has authorized and funded wildlife corridor activities, including fish passage and wildlife crossing projects, through supplemental and annual appropriations. The Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) and the budget reconciliation measure commonly known as the Inflation Reduction Act (IRA; P.L. 117-169) provided funding for corridor conservation and enhancement, aquatic connectivity, transportation infrastructure, and habitat restoration. Over the past few Congresses, several bills have been introduced with the aim of establishing wildlife corridors. Some bills would have authorized appropriations for certain agencies to provide grants to nonfederal stakeholders to create wildlife corridors and implement other conservation activities.[24]

This report provides background on wildlife corridors and selected examples of federal, state, private, and Indigenous (or tribal) activities that support wildlife corridors.[25] The report discusses

[19] U.S. Congress, Senate Committee on Environment and Public Works, Subcommittee on Fisheries, Water, and Wildlife, *Challenges and Opportunities to Facilitate Wildlife Movement and Improve Migration Corridors*, hearing, 118th Cong., 1st sess., November 14, 2023. Hereinafter, Senate EPW Committee, *Challenges and Opportunities to Facilitate Wildlife Movement* hearing.

[20] For example, see Testimony of Madeleine West, Center for Public Lands Director, Theodore Roosevelt Conservation Partnership, in Senate EPW Committee, *Challenges and Opportunities to Facilitate Wildlife Movement* hearing.

[21] Ibid.

[22] Scientists note that wildlife corridors might have undesirable effects, such as facilitating the spread of invasive species, disease, and predators. Lesley Evans Ogden, "Do Wildlife Corridors Have a Downside?," *BioScience*, vol. 65, no. 4 (February 19, 2015), p. 452.

[23] For example, the Wallis Annenberg Wildlife Crossing near Los Angeles, CA, costs approximately $92.0 million. California Dept. of Transportation, US-101 – Wallis Annenberg Wildlife Crossing at Liberty Canyon, https://dot.ca.gov/caltrans-near-me/district-7/district-7-projects/d7-101-annenberg-wildlife-crossing.

[24] For example, in the 118th Congress, S. 1804, H.R. 4689, and H.R. 178 would have established a fund to provide financial assistance to federal, state, tribal, and local agencies for conservation projects (including for fish and wildlife corridors) in regions where renewable energy projects are located on federal lands.

[25] The term *Indigenous* is not consistently defined in the international or domestic legal context. Some entities, such as the United Nations, have developed general guidelines for identifying Indigenous peoples based on various factors (see United Nations, "Who Are Indigenous Peoples?," fact sheet, https://www.un.org/esa/socdev/unpfii/documents/5session_factsheet1.pdf). Throughout this report, the term *Indigenous peoples* is used to refer to a diverse set of people in the United States that may be known by a variety of terms. For example, a federally recognized tribe (hereinafter, *Tribe*) is one that is recognized as having a government-to-government relationship with the United States that makes the Tribe generally "eligible for the special programs and services provided by the United States to Indians because of (continued...)

issues related to wildlife corridors that Congress might consider when conducting oversight or debating legislation.

Federal Policies and Activities on Wildlife Corridors

This section provides a summary of executive branch guidance on wildlife corridors to federal agencies. It also provides selected examples of federal agency programs and activities that address wildlife corridors and connectivity.[26]

Federal Policy: Council on Environmental Quality

In May 2023, the White House Council on Environmental Quality (CEQ) issued guidance to federal agencies on ecological connectivity and wildlife corridors.[27] The guidance establishes a policy for federal agencies to promote ecological connectivity across terrestrial, marine, and freshwater habitats, as well as across airspaces (e.g., for birds), to sustain biodiversity and enable species to adapt to changing environmental conditions. The guidance directs federal agencies to consider wildlife connectivity and corridors in the following three ways:

1. **Agency Planning and Decisionmaking.** Federal agencies are to consider wildlife connectivity and corridors early in project and activity planning and decisionmaking. Several best practices are listed that support this goal, including the following: establishing connectivity and corridors as a programmatic goal; creating plans that increase corridors' resilience to climate change; removing or modifying barriers to wildlife movements; and building infrastructure (e.g., wildlife crossings) to support corridors.
2. **Science and Data, Including Indigenous Knowledge.** Federal agencies are to use the best available science and data, including Indigenous knowledge,[28] to inform planning and decisionmaking on wildlife connectivity and corridor-related activities and projects.
3. **Collaboration and Coordination.** Federal agencies should collaborate and coordinate with other federal agencies, states, *federally recognized tribes* (hereinafter, *Tribes*), territories, local governments, and private stakeholders.[29]

their status as Indians" (25 C.F.R. §83.2). For an overview of Alaska Natives, see CRS Report R46997, *Alaska Native Lands and the Alaska Native Claims Settlement Act (ANCSA): Overview and Selected Issues for Congress*, by Mariel J. Murray.

[26] The selected examples do not constitute a comprehensive review of all federal programs indirectly or directly addressing wildlife corridors.

[27] Brenda Mallory, "Memorandum for Heads of Federal Departments and Agencies: Guidance for Federal Departments and Agencies on Ecological Connectivity and Wildlife Corridors," Executive Office of the President, Council on Environmental Quality (CEQ), March 21, 2023, https://www.whitehouse.gov/wp-content/uploads/2023/03/230318-Corridors-connectivity-guidance-memo-final-draft-formatted.pdf. Hereinafter, Mallory, "Guidance for Federal Departments and Agencies on Ecological Connectivity and Wildlife Corridors."

[28] The guidance defines *Indigenous knowledge* as "a body of observations, oral and written knowledge, innovations, practices, and beliefs developed by Tribes and Indigenous Peoples through interaction and experience with the environment" (Mallory, "Guidance for Federal Departments and Agencies on Ecological Connectivity and Wildlife Corridors," p. 4). For direction on incorporating indigenous knowledge, federal agencies are to follow Arati Prabhakar and Brenda Mallary, "Guidance for Federal Departments and Agencies on Indigenous Knowledge," Executive Office of the President, CEQ, November 30, 2022, https://www.whitehouse.gov/wp-content/uploads/2022/12/OSTP-CEQ-IKGuidance.pdf.

[29] Mallory, "Guidance for Federal Departments and Agencies on Ecological Connectivity and Wildlife Corridors."

The guidance directs federal agencies to implement this policy within set timeframes and to submit a progress report to CEQ. For example, the guidance directs agencies to implement the guidance through agency regulations, guidance, and other means, and specifies that agencies were to have new or updated policies on connectivity and corridors by the first quarter of 2024.[30]

Federal Department and Agency Activities on Wildlife Corridors

U.S. Department of the Interior

The Department of the Interior (DOI) and several agencies—including the Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (FWS), National Park Service (NPS), and U.S. Geological Survey (USGS)—engage in federal wildlife corridor initiatives. Secretarial Order 3362 guides some wildlife corridor activities implemented by DOI, as outlined below.[31] In addition, as part of its conservation mandate, FWS is a key agency involved in supporting wildlife corridor projects, and it cooperates with other federal land management agencies when the habitats and migration routes of species intersect with lands and waters under the jurisdiction of those agencies.[32]

Secretarial Order 3362

In 2018, the Secretary of the Interior signed Secretarial Order 3362, "Improving Habitat Quality in Western Big Game Winter Range and Migration Corridors" (hereinafter referred to as *the Order*). The Order directed BLM, FWS, and NPS to develop collaborative partnerships with 11 western states to improve the winter range and migration corridor habitats of big game species such as Rocky Mountain elk, mule deer, and pronghorn antelope through landscape-level conservation projects.[33] In addition, the Order directed USGS to provide scientific assistance (e.g., mapping capabilities) to state wildlife agencies and federal land managers on big game winter range and migration corridors. In developing these partnerships, the Order directed federal agencies (e.g., USGS) to provide assistance, such as mapping, while recognizing the states' authorities to conserve and manage these big game species.[34] The Order also aims to respect the rights of private landowners through voluntary agreements that allow for the conservation of lands and their use as wildlife corridors.[35]

[30] Ibid. As of the publication of this report, CRS was unable to find evidence that the U.S. Department of the Interior (DOI) had issued any updated wildlife corridors policies, although it has funded wildlife corridor projects (see, for example, DOI, "Interior Department Announces Nearly $12 Million to Protect and Restore Western Wildlife Habitats and Migration Corridors," press release, March 26, 2024, https://www.doi.gov/pressreleases/interior-department-announces-nearly-12-million-protect-and-restore-western-wildlife). The U.S. Department of Agriculture (USDA) issued Secretarial Memorandum 1077-013 (see the "Secretarial Memorandum 1077-013" section of this report).

[31] DOI, Secretarial Order 3362, "Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors," 2018, https://www.doi.gov/sites/doi.gov/files/uploads/so_3362_migration.pdf.

[32] 16 U.S.C. §668dd(a)(2).

[33] The named western states are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. DOI, *Secretarial Order 3362: Improving Habitat Quality in Western Big Game Winter Range and Migration Corridors—Implementation Progress Report*, August 2020, p. 2. Hereinafter, DOI, *Secretarial Order 3362 Implementation Report*.

[34] Ibid., p. 2. For an example of U.S. Geological Survey (USGS) mapping assistance, see USGS, *Ungulate Migrations of the Western United States, Volume 2*, USGS Scientific Investigations Report 2022-5008, 2022, pp. 1-160, https://doi.org/10.3133/sir20225008.

[35] Ibid.

Secretarial Order 3362 built upon on several existing FWS programs and approaches. For example, the Order is based on the FWS Migratory Bird Joint Ventures Program, which aims to create partnerships between federal and nonfederal entities in a "voluntary, nonregulatory, and nonthreatening manner."[36] In that program, FWS uses scientific data and information to identify ideal areas for big game corridors and then asks the respective state fish and wildlife agencies to determine the highest priority areas for corridors within this sample.[37] The state-federal partnerships then develop an action plan to implement habitat conservation activities in the identified priority areas.[38] According to DOI, all 11 western states listed in the Order already participate in the FWS program and have action plans.[39]

In addition, some of the opportunities to create and enhance wildlife corridors announced in the Order are managed through existing FWS programs, such as the Partners for Fish and Wildlife program. The Order also established the Improving Habitat Quality in Western Big Game Migration Corridors and Habitat Connectivity Program, which supports the Western Big Game Seasonal Habitat and Migration Corridor Fund. That fund is administered by the National Fish and Wildlife Foundation (NFWF).[40] According to DOI, in the first two years of the Order (2018-2020), 40 partners for Fish and Wildlife program projects and 27 NFWF grants supported wildlife corridors across the 11 western states.[41] For more information on NFWF, see the **text box** below.

National Fish and Wildlife Foundation

The National Fish and Wildlife Foundation (NFWF) facilitates federal and nonfederal efforts to establish wildlife corridors by managing grant programs that fund corridor creation and maintenance. For example, NFWF provides grants for wildlife corridors through the Western Big Game Seasonal Habitat and Migration Corridors Fund, a public-private partnership program between NFWF, the Department of the Interior (DOI), the U.S. Department of Agriculture (USDA), and private corporations. The fund supports projects focused on various activities, including protection of private lands through conservation easements, rangeland improvement, invasive weed mitigation, and removal of fencing and other migration barriers. Eligible applicants include federal, state, and local government agencies; federally recognized tribes (hereinafter, *Tribes*); and nonprofit organizations. Projects must be located in geographic areas prioritized by states or Tribes within the 11 states listed in DOI Secretarial Order 3362 to be eligible for funding.

In addition, the Biden Administration and NFWF attempted to coordinate public and private funding for voluntary conservation and ecosystem restoration projects through the America the Beautiful Challenge. Through this program, NFWF offers a single grant application for funding aggregated from DOI (through the U.S. Fish and Wildlife Service), USDA (through the Natural Resources Conservation Service and Farm Service Agency), the Department of Defense, and Native Americans in Philanthropy, as well as private philanthropy. In 2024, NFWF expects to award $119 million for large-scale, locally led projects that address shared priorities spanning public, tribal, and private lands. One of the listed priorities is to expand habitat connectivity.

Sources: National Fish and Wildlife Foundation Establishment Act (16 U.S.C. §§3701-3710); NFWF, "Western Big Game Seasonal Habitat and Migration Corridors Fund," https://www.nfwf.org/programs/rocky-mountain-rangelands/western-big-game-seasonal-habitat-and-migration-corridors-fund; NFWF, "America the Beautiful Challenge," https://www.nfwf.org/programs/america-beautiful-challenge; NFWF, "America's Ecosystem Restoration Initiative: America the Beautiful Challenge 2024 Request for Proposals,"

[36] FWS, "Migratory Bird Joint Ventures," https://www.fws.gov/partner/migratory-bird-joint-ventures; DOI. *Secretarial Order 3362 Implementation Report*, p. 4.

[37] FWS, "Migratory Bird Joint Ventures," https://www.fws.gov/partner/migratory-bird-joint-ventures.

[38] DOI, *Secretarial Order 3362 Implementation Report*, p. 6.

[39] Ibid., p. 8.

[40] DOI, "Secretary Haaland Announces Progress Toward Conservation and Restoration of Wildlife Corridors and Habitat Connectivity," press release, April 7, 2022, https://www.doi.gov/pressreleases/secretary-haaland-announces-progress-toward-conservation-and-restoration-wildlife. Hereinafter DOI, "Secretary Haaland Announces Progress."

[41] DOI, *Secretarial Order 3362 Implementation Report*, p. 13.

https://www.nfwf.org/programs/america-beautiful-challenge/americas-ecosystem-restoration-initiative-america-beautiful-challenge-2024-request-proposals.

Note: Native Americans in Philanthropy is a nongovernmental organization that promotes philanthropy in Native communities, supporting leadership development, education, research, and partnerships with funders and philanthropic organizations. For more information, see https://nativephilanthropy.org.

U.S. Fish and Wildlife Service

FWS engages in wildlife corridor projects that aim to maintain habitat connectivity, improve fragmented habitats, or expand habitats of threatened and endangered species through several programs outlined below.[42] FWS also supports partnerships to create networks of connected landscapes to provide benefits to ecosystems and communities.[43] In addition, FWS provides assistance to state agencies to plan and track restoration projects in wildlife corridors.[44]

- **Partners for Fish and Wildlife Program.** Through this program, FWS works collaboratively with private landowners and partners (through voluntary efforts) to restore, enhance, and protect habitat for *federal trust species*, defined at 16 U.S.C. §3772(1).[45] These efforts may include projects that support habitat connectivity and migration corridors. For example, for FY2025, the Biden Administration requested funding to support migration corridors and landscape connectivity, including ongoing work to create big-game migration corridors in 11 western states initiated through Secretarial Order 3362.[46]
- **Coastal Program.** FWS administers the Coastal Program to work with public and private partners on projects to conserve habitats and improve habitat connectivity in coastal watersheds. The program provides technical and financial assistance to projects to improve resilience to habitat degradation and provide corridors for federal trust species and other priority species.[47]
- **Migratory Bird Program.** This program aims to conserve migratory bird species and their habitat through partnerships and regional, national, and international management plans, including the North American Waterfowl Management Plan which implements an agreement between the United States, Canada, and Mexico to conserve waterfowl and their habitat.[48] The program

[42] FWS, *Budget Justifications and Performance Information: Fiscal Year 2025*, DOI, 2024, p. HC-4, https://www.fws.gov/sites/default/files/documents/2024-03/fy2025-508-fws-greenbook_revised-pex-4.pdf. Hereinafter, FWS, *Budget Justifications and Performance Information: Fiscal Year 2025*. FWS may provide support for wildlife corridors as an eligible activity under various programs. Agency priorities, the nature of projects, and the availability of funding may vary, meaning it is not always clear which projects and programs supported wildlife corridors in any given year. For these reasons and others, the programs listed here should not be considered necessarily comprehensive.

[43] Ibid., p. SA-2. For instance, FWS works with the Native American Fish and Wildlife Society to support wildlife corridor projects on tribal lands, among other activities.

[44] For example, FWS collaborated with the Nevada Department of Wildlife to develop an application to track restoration projects in mule deer migration corridors in northern Nevada. Ibid., p. SA-12.

[45] In the context of the Partners for Fish and Wildlife Program (16 U.S.C. §3772(1)), the term *federal trust species* means "migratory birds, threatened species, endangered species, interjurisdictional fish, marine mammals, and other species of concern." FWS, *Budget Justifications and Performance Information: Fiscal Year 2025*, p. EX-12.

[46] Ibid., p. HC-7.

[47] FWS, *Coastal Program Handbook*, December 2021, https://www.fws.gov/sites/default/files/policy/files/Coastal-Program-Handbook.pdf; see also FWS, "Coastal Program," https://www.fws.gov/program/coastal.

[48] FWS, *Budget Justifications and Performance Information: Fiscal Year 2025*, p. MB-17; FWS, "North American (continued...)

primarily uses Migratory Bird Joint Ventures, a network of partnerships between federal, tribal, state, and local governments and nonfederal entities that collaborate to conserve migratory bird habitats. These habitats can contribute to wildlife corridors for birds, also called *avian corridors* or *flyways*.[49] For example, the Sonoran Joint Venture has supported the wildlife corridor between the Santa Rita Mountains and the Patagonia and Huachuca Mountains in Arizona.[50]

- **National Fish Passage Program.** FWS collaborates with states, Tribes, and private stakeholders to improve *fish passage* by removing aquatic barriers such as dams, eliminating public safety hazards, and restoring river ecosystems.[51] This program provides grants for fish passage improvement projects. It also provides technical and planning assistance for projects to improve fish passage. In addition to annual discretionary appropriations, the IIJA provided $200 million over five years to this program to remove barriers to fish passage. For information about interagency coordination on fish passage, see the **text box** below.

Ecological Connectivity with Fish Passage

Fish passage is the ability of fish or other aquatic species to move through an aquatic system among all habitats necessary to complete their life cycles. Certain infrastructure may act as barriers that fragment aquatic habitats, which in turn restrict the movement of aquatic species and limit their access to areas essential to their survival and reproduction. Examples of these barriers include dams, berms, dikes, certain culverts, and water diversions. Fish passage projects aim to restore aquatic connectivity at these places of restriction. Fish passage projects may include adding an element for fish to transverse the infrastructure (e.g., fish ladder; see **Figure A**), modifying or replacing the infrastructure to enable operable passage (e.g., culvert redesign; see **Figure B**), or removing the infrastructure barrier completely (e.g., dam removal; see **Figure C**). The federal government has invested in fish passage projects at infrastructure it owns and manages, and it has supported nonfederal projects that improve fish passage. Some of these programs target fish passage broadly; funding for other programs may focus on specific activities, such as dam or culvert removal, and may have alternative objectives (e.g., dam safety). Some agencies also may provide technical assistance specific to their expertise to entities interested in pursuing fish passage projects. In addition to regular funding, the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) provided an influx of funding for such activities that are administered by numerous agency programs. Following enactment, a National Fish Passage Bipartisan Infrastructure Law workshop was held to increase coordination for fish passage. The workshop resulted in the creation of an Interagency Fish Passage Task Force composed of 13 federal agencies that continue to meet regularly and maintain an Interagency Fish Passage Portal to share information, funding, and resources to improve fish passage and aquatic connectivity projects.

Waterfowl Management Plan," https://www.fws.gov/partner/north-american-waterfowl-management-plan; FWS, *Migratory Bird Program Strategic Plan*, March 20, 2019, pp. 7-8, https://www.fws.gov/sites/default/files/documents/migratory-bird-strategic-plan-2019.pdf.

[49] *Avian corridors* or *flyways* are routes that connect breeding and wintering grounds for birds, thereby guiding birds as they navigate across vast landscapes during migrations. The United States has four main flyways: the Pacific, Atlantic, Mississippi, and Central flyways. FWS, "Migratory Bird Program Administrative Flyways," https://www.fws.gov/partner/migratory-bird-program-administrative-flyways.

[50] For more information on this project, see https://sonoranjv.org/restoring-water-flow-montezuma-quail/.

[51] Multiple fish species migrate and move between rivers and the ocean to spawn and seek shelter and food. The ability of fish to conduct these activities is referred to as *fish passage*. Some stakeholders assert that wildlife corridors for fish are improved by removing barriers and restoring habitat to improve fish migration in rivers. For more information, see the National Fish Passage Program at https://www.fws.gov/program/national-fish-passage. Also see CRS Report R46946, *Dam Removal: The Federal Role*, by Anna E. Normand.

Examples of Fish Passage Projects

Sources: U.S. Fish and Wildlife Service, "Working Together to Restore Rivers, Streams, and Wetlands," https://www.fws.gov/story/interagency-fish-passage-task-force. Picture credits: Figure A, Office of Habitat Conservation, National Oceanic and Atmospheric Administration, "NOAA Works with Partners to Develop State-of-the-Art Fish Passage," https://www.fisheries.noaa.gov/feature-story/noaa-works-partners-develop-state-art-fish-passage.; Figure B, K. Liebich, "Alaska's Largest Fish Passage Culvert Frees Tyonek Creek," U.S. Fish and Wildlife Service, https://www.fws.gov/story/alaskas-largest-culvert-frees-tyonek-creek; Figure C, National Park Service, "Glines Canyon Dam on the Elwha River, During the Dam Removal Process," https://www.usgs.gov/media/images/glines-canyon-dam-elwha-river-during-dam-removal-process.

Notes: For more information on federal programs and activities assisting fish passage, see the "Interagency Fish Passage Portal," https://interagency-bil-fish-passage-project-1-fws.hub.arcgis.com/; CRS Report R46946, Dam Removal: The Federal Role, by Anna E. Normand; and CRS Report R47263, *Ecosystem Restoration in the Infrastructure Investment and Jobs Act: Overview and Issues for Congress*, coordinated by Anna E. Normand and Pervaze A. Sheikh.

Bureau of Land Management

BLM supports wildlife corridors through various policies, programs, and activities. For example, BLM's policy memorandum entitled "Habitat Connectivity on Public Lands" aims to help BLM ensure habitats for fish, wildlife, and plants on its lands are interconnected.[52] To implement this policy memorandum, BLM is working with state and tribal wildlife managers and other stakeholders to develop standardized habitat connectivity datasets to help inform land use and conservation projects on public lands.[53]

BLM supports wildlife corridors using various funding sources. For instance, BLM's Wildlife Habitat Management sub-activity receives discretionary appropriations in annual Interior, Environment, and Related Agencies appropriations laws.[54] This account funds a broad array of conservation projects, including the development of wildlife and habitat inventories to identify and assess migration corridors and habitat connectivity issues. In addition to annual discretionary appropriations, BLM uses funding from the IIJA and the IRA for an initiative that aims to restore wildlife habitat, including habitat for wildlife corridors.[55] This initiative includes 21 *Restoration Landscapes* across 11 western states.[56] For example, one of these Restoration Landscapes focuses

[52] BLM, "Habitat Connectivity on Public Lands," November 18, 2022, https://www.blm.gov/policy/im-2023-005-change-1.

[53] Bureau of Land Management (BLM), *Budget Justifications and Performance Information: Fiscal Year 2024*, p. V-74, https://www.blm.gov/sites/default/files/docs/2024-03/FY25%20Greenbook%20Budget%20Justification%20508.pdf.

[54] The Wildlife Habitat Management sub-activity is located under BLM's Wildlife Habitat Management and Aquatic Resources activity (Ibid., p. V-73. See also BLM, "Wildlife Program," https://www.blm.gov/programs/fish-and-wildlife/wildlife#:~:text=The%20BLM%20manages%20wildlife%20habitat,our%20national%20and%20state%20partnerships).

[55] BLM, "Restoration for Resilience," https://www.blm.gov/restoration-landscapes.

[56] The 21 Restoration Landscapes are areas selected for their ecological need for restoration, importance to (continued...)

on restoring river corridors in the Upper Salmon River in Idaho that support habitat for salmon, steelhead, bull trout, lynx, wolverines, and grizzly bears, among other species. Projects in the Upper Salmon River corridor are intended to restore riparian habitat, improve stream connectivity, and enhance whitebark pine stands.[57] Certain federal land management agencies, such as BLM, also can use funding from the Land and Water Conservation Fund to support wildlife corridors, as explained in the **text box** below.

The Land and Water Conservation Fund and Wildlife Corridors

The Land and Water Conservation Fund (LWCF) serves as a source of funding for land acquisition by four federal land management agencies—the Forest Service (FS), National Park Service (NPS), U.S. Fish and Wildlife Service (FWS), and Bureau of Land Management (BLM). These federal agencies have used LWCF funding to acquire lands that provide habitat connectivity benefits, among other purposes. For example, in 2021, BLM used LWCF funding to acquire 2,831 acres of privately owned land northeast of the Aravaipa Canyon Wilderness in Arizona. This acquisition opened public access to 30,000 acres of formerly inaccessible BLM lands and improved habitat connectivity for wildlife across BLM, FS, and Arizona State trust lands in the Santa Teresa Mountains. Similarly, in 2022, FWS used LWCF funds to acquire a 7,760-acre conservation easement on the eastern front of the Rocky Mountains in Montana to protect habitat for several species of migratory birds and conserve a movement corridor for grizzly bears. For FY2025, NPS requested funding to acquire a 640-acre land parcel in Grand Teton National Park, in part to increase the viability of wildlife corridors for threatened and endangered species.

Sources: For additional information on the LWCF, see CRS In Focus IF12256, *Land and Water Conservation Fund (LWCF): Frequently Asked Questions*, by Carol Hardy Vincent. BLM, "The BLM Completes Land Acquisition to Improve Conservation, Wildlife Habitat, Recreation Access in Southeast Arizona," press release, November 1, 2021; FWS, *Budget Justifications and Performance Information: Fiscal Year 2024*, p. LA-13; and NPS, *Budget Justifications and Performance Information: Fiscal Year 2025*, p. LASA-GAOA-11.

National Park Service

NPS has supported wildlife corridors as part of its statutory mission to conserve park resources.[58] NPS's *Management Policies* require the agency to engage in "cooperative conservation beyond park boundaries," including by "establishing native wildlife corridors, and providing essential habitats adjacent to or across park boundaries."[59] An August 2024 policy memorandum by the NPS Director affirmed the agency's commitment to enhancing ecological connectivity, stating that "NPS managers and staff at all levels are expected to embrace the significance of the [National Park] System as an anchor for landscape conservation and ecological connectivity."[60] This includes support of migrating animals through protected corridors and stopover sites.[61] NPS also promotes a "Connected Conservation" community of practice, fostering partnerships with

communities, and potential for creating partnerships (BLM, "Biden-Harris Administration Announces $161 Million for Landscape Restoration," press release, May 31, 2023, https://www.blm.gov/press-release/biden-harris-administration-announces-161-million-landscape-restoration). Ten of the 11 western states in Secretarial Order 3362 are covered by this program.

[57] BLM, "BLM's Restoration Landscapes," https://storymaps.arcgis.com/stories/6966af5d6f584f8b80f102d391671a3f.

[58] The National Park Service's (NPS's) statutory mission under its 1916 Organic Act is to "conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (54 U.S.C. §100101(a)).

[59] NPS, *Management Policies 2006*, Sections 1.6 and 4.1.4.

[60] NPS Policy Memorandum 24-02, "Landscape and Seascape Conservation and Ecological Connectivity Through Cooperative Conservation," August 19, 2024, https://www.nps.gov/subjects/policy/upload/PM_24-02.pdf.

[61] Ibid., p. 2.

other federal agencies, tribes, state and local governments, and nongovernmental organizations to enhance wildlife connectivity.[62]

Within the NPS budget, the agency's Natural Resource Stewardship appropriation supports programs and offices such as the Biological Resources Management division, which works with individual parks and federal and nonfederal partners (e.g., states) to conserve species and habitats through identification and conservation of wildlife corridors.[63] NPS also reportedly has used funding from the IIJA and the IRA for projects supporting wildlife corridors.[64]

Multiple National Park System units have undertaken individual projects to build wildlife corridors and remove barriers to wildlife connectivity.[65] For example, at Santa Monica Mountains National Recreation Area in Southern California, NPS partnered with the California Department of Transportation to retrofit drainage culverts to serve as wildlife crossings under a state highway.[66] At Saguaro National Park in Arizona, NPS removed unneeded boundary fences to facilitate wildlife connectivity.[67]

U.S. Geological Survey

USGS conducts earth and ecosystem science to inform decisionmaking and has conducted science related to wildlife corridors, including on species movement and migration to inform land and water resource managers.[68] Prompted by Secretarial Order 3362, USGS established in 2018 the Corridor Mapping Team—a state-tribal-federal partnership that develops standard techniques for mapping migration corridors and makes migration maps publicly available.[69] As of 2024, the Corridor Mapping Team included representatives from 11 western state wildlife-management agencies as well as from multiple tribal and federal agencies.[70] In addition, USGS leads the Breeding Bird Survey, which is a cooperative effort between USGS and Environment Canada's Canadian Wildlife Service to monitor the status and trends of over 400 North American bird species and their populations.[71] USGS also studies the effectiveness of fish passage design at dams and maintains the Dam Removal Information Portal, a tool to explore trends in dam

[62] NPS, "Connected Conservation," https://www.nps.gov/subjects/connectedconservation/index.htm.

[63] NPS, *Budget Justifications and Performance Information: Fiscal Year 2025*, p. ONPS-15. Also see NPS, "Biological Resources Division," https://www.nps.gov/orgs/1103/index.htm.

[64] Kurt Repanshek, "How the National Park Service Is Working to Protect Ecological Corridors," *National Parks Traveler*, April 20, 2023, https://www.nationalparkstraveler.org/2023/04/how-national-park-service-working-protect-ecological-corridors.

[65] See discussions of NPS projects at Golden Gate National Recreation Area (https://www.nps.gov/places/000/wildlife-corridors.htm), Yosemite National Park (https://www.nps.gov/yose/getinvolved/ackersonmeadow.htm), Mojave National Preserve (https://www.nps.gov/articles/000/bighorn-and-big-rail-can-be-friends.htm), and Gateway National Recreation Area (https://www.nps.gov/articles/gateway-lights-the-way-for-pollinators.htm).

[66] NPS, "Caltrans and NPS Retrofit Project Helps Wildlife Cross Highway 118," press release, April 14, 2021, https://www.nps.gov/samo/learn/news/caltrans-and-nps-retrofit-project-helps-wildlife-cross-highway-118.htm.

[67] NPS, "Wildlife Connectivity: Removing Barriers for Wildlife," https://home.nps.gov/sagu/learn/nature/wildlife-connectivity.htm.

[68] Among other aims, USGS provides scientific information to support the management of water, energy, mineral, ecosystem, and land resources and to mitigate risks from natural hazards. For more information on USGS, see CRS In Focus IF12620, *The U.S. Geological Survey (USGS): Background and FY2025 Appropriations*, by Anna E. Normand.

[69] Matthew Kauffman et al., *Ungulate Migrations of the Western United States, Volume 3*, U.S. Geological Survey Scientific Investigations Report 2022-5088, 2022, https://doi.org/10.3133/sir20225088.

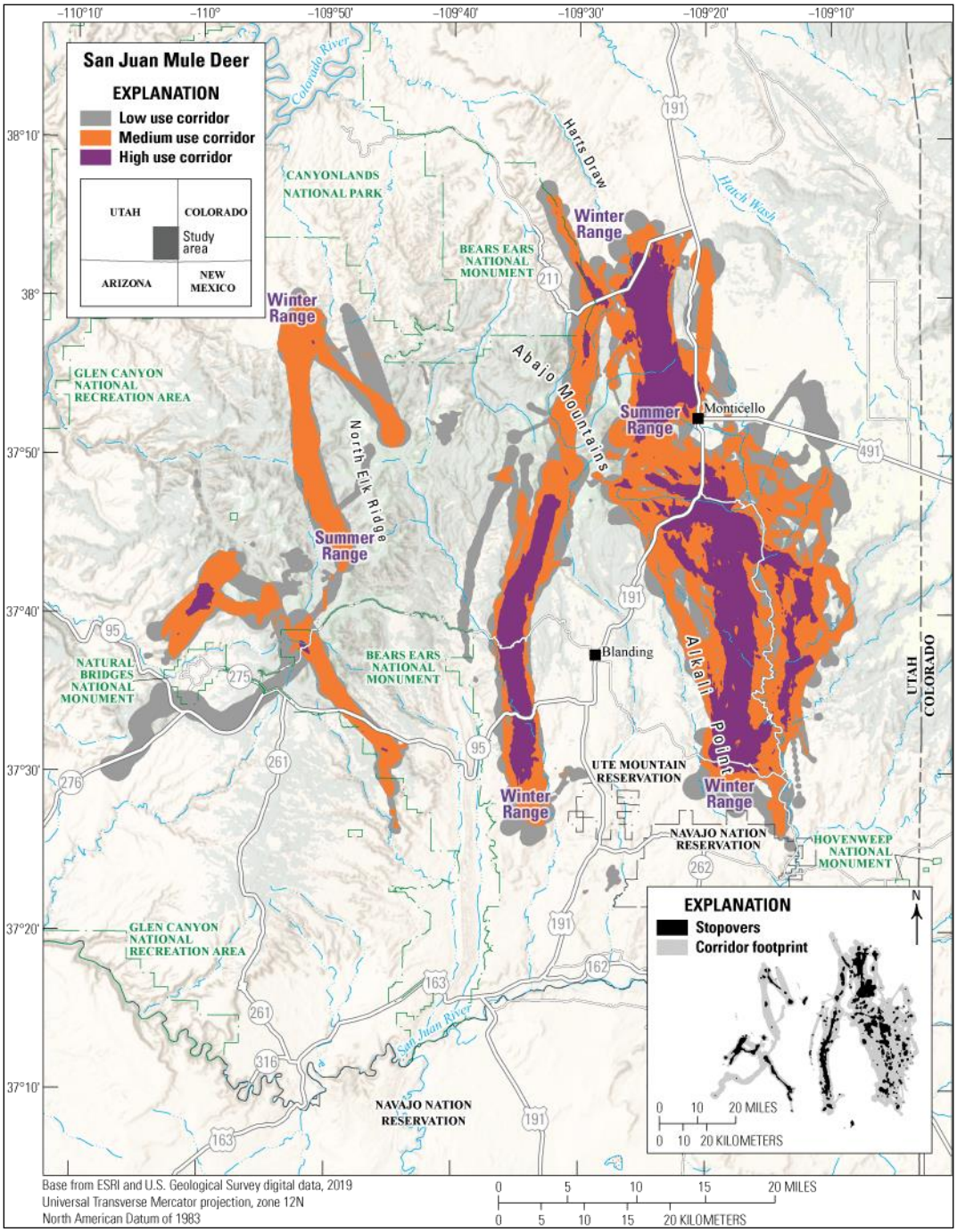
[70] USGS, "New Big Game Migration Maps Support Conservation Planning Across the West," https://www.usgs.gov/news/national-news-release/new-big-game-migration-maps-support-conservation-planning-across-west.

[71] Aaron T. Pearse et al., *U.S. Geological Survey Migratory Bird Science, 2020–21*, U.S. Geological Survey Circular 1480, 2021, https://doi.org/10.3133/cir1480.

removal science.[72] See **Figure 2** for an example of a USGS map that shows the migration corridors and stopovers of the San Juan mule deer herd.

[72] USGS, Dam Removal Information Portal (DRIP), https://data.usgs.gov/drip-dashboard/; USGS, "USGS Fish Passage Research Helps Fish Get to Spawning Grounds," May 25, 2018, https://www.usgs.gov/news/featured-story/usgs-fish-passage-research-helps-fish-get-spawning-grounds.

Figure 2. San Juan Mule Deer Migration Mapping



Source: Matthew Kauffman et al., 2022, *Ungulate Migrations of the Western United States, Volume 3*, U.S. Geological Survey Scientific Investigations Report 2022-5088, 2022, p. 114, https://doi.org/10.3133/sir20225088.

Notes: This map shows the migration corridors and stopovers of the San Juan mule deer herd from its winter range (generally in lower elevations of the Alkali Point and Harts Draw areas) to its summer range (generally in higher elevations in the Abajo Mountains). The Utah Division of Wildlife Resources, Utah Department of Transportation, San Juan County, Sportsman for Fish and Wildlife, and others collaborated to determine priorities for reducing wildlife-vehicle collisions along the stretches of highway within these corridors. As a result, six wildlife crossing structures and approximately seven miles of highway fencing have been constructed on U.S. Highway 191 near Monticello, UT.

U.S. Department of Agriculture

Several U.S. Department of Agriculture (USDA) agencies, including the Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), and FS, have programs that support wildlife corridors and connectivity on federal and nonfederal lands. The programs on nonfederal lands are voluntary and typically provide federal incentives to alter land use or implement specific conservation measures.

Secretarial Memorandum 1077-013

On October 21, 2024, USDA announced a coordinated effort within the department to improve terrestrial wildlife habitat connectivity and corridors.[73] The effort directs NRCS, FSA, FS, and the Animal and Plant Health Inspection Service through a secretarial memorandum to

- incorporate considerations of habitat connectivity and corridors into existing programs, planning processes, and assessments;
- improve coordination, compatibility, and delivery of USDA programs and planning processes to improve outcomes for connectivity;
- increase coordination with states, tribes, and other federal departments; and
- establish a USDA Terrestrial Wildlife Habitat Connectivity and Corridors Committee.[74]

The secretarial memorandum is one of several ongoing efforts within USDA agencies in which existing programs and resources are coordinated around the creation and protection of wildlife habitat corridors and connectivity. The following sections discuss selected agency-specific programs and project examples.

Natural Resources Conservation Service

NRCS is the lead USDA agency for agricultural conservation programs that provide financial and technical assistance to private landowners to make land improvements and address natural resource concerns. NRCS administers several voluntary conservation programs that address wildlife habitat connectivity, among other resource concerns. These programs, and examples of wildlife corridor activities conducted through them, are outlined below.[75]

- **Environmental Quality Incentives Program (EQIP).** EQIP provides financial and technical assistance to private agricultural producers and landowners to plan and install structural, vegetative, and land management practices on working farm, ranch, and forested lands.[76] Eligible producers enter into contracts to

[73] USDA, "USDA Announces Department-Wide Effort to Support Terrestrial Wildlife Habitat Connectivity," press release, October 21, 2024, https://www.usda.gov/media/press-releases/2024/10/21/usda-announces-department-wide-effort-support-terrestrial-wildlife.

[74] USDA, "Conserving and Restoring Terrestrial Wildlife Habitat Connectivity and Corridors in the United States," Secretary's Memorandum 1077-013, October 21, 2024, https://www.usda.gov/directives/sm-1077-013. Hereinafter, USDA, Secretary's Memorandum 1077-013.

[75] For more information on these Natural Resources Conservation Service (NRCS) programs, see CRS Report R47478, *Agricultural Conservation and the Next Farm Bill*, by Megan Stubbs.

[76] Examples of practices related to wildlife corridors and connectivity that can be funded through the Environmental Quality Incentives Program (EQIP) include riparian forest buffer establishment, upland and wetland wildlife habitat management, and aquatic organism passage. For additional information on these practices, see USDA, NRCS, "Conservation Practice Standards," https://www.nrcs.usda.gov/resources/guides-and-instructions/conservation-practice-standards.

receive a percentage of the cost to implement conservation practices in accordance with an EQIP plan. Ten percent of EQIP funds are targeted to practices benefiting wildlife.[77] NRCS uses EQIP to enroll private agricultural land in contracts that implement corridor-related practices, as part of broader federal initiatives that focus on wildlife corridors, such as the Working Lands for Wildlife initiative, further described below.[78]

- **Conservation Stewardship Program (CSP).** CSP provides financial and technical assistance to agricultural producers to maintain and improve existing conservation systems and to adopt additional conservation activities in a comprehensive manner on a producer's entire operation. CSP provides an annual payment for installing new conservation activities and maintaining existing activities, as well as supplemental payments for adopting specific conservation practices. Wildlife corridor development is one of several wildlife habitat enhancement practices eligible under CSP.[79]
- **Regional Conservation Partnership Program (RCPP).** This program leverages federal conservation funding for specific geographic areas and resource concerns through partnership agreements for state, multistate, or watershed-scale projects. Project areas are defined by eligible partners and are selected through a national competition. In FY2023, 16 RCPP projects totaling $216 million in funding were awarded for the protection and restoration of wildlife corridors.[80]
- **Agricultural Conservation Easement Program (ACEP).** ACEP provides financial and technical assistance through two types of easements: agricultural land easements that limit nonagricultural uses on productive farm or grass lands, and wetland reserve easements that protect and restore wetlands. Easements impose a permanent or long-term land-use restriction on the land in exchange for

[77] 16 U.S.C. §3839aa-2(f)(2). Ten percent of EQIP's authorized mandatory funding level in FY2024 is $202.5 million, less sequestration. EQIP is authorized to receive $2.025 billion annually from mandatory sources through FY2031. For more information on EQIP funding, see CRS Report R47478, *Agricultural Conservation and the Next Farm Bill*, by Megan Stubbs.

[78] In addition to other federal initiatives described in this section (i.e., Working Lands for Wildlife and Joint Chiefs' Landscape Restoration Partnership), EQIP contracts also are used in NRCS Landscape Conservation Initiatives (LCI), which represent larger multistate projects that center on air, water, soil, or wildlife habitat concerns. For example, the Longleaf Pine Initiative uses EQIP and Conservation Stewardship Program (CSP) contracts in the Southeast to restore longleaf pine forests. Priority is given to areas that create corridors between existing stands. For more information on the Longleaf Pine Initiative, see USDA, NRCS, "Longleaf Pine Initiative," https://www.nrcs.usda.gov/programs-initiatives/longleaf-pine-initiative. For information on NRCS LCI projects areas, see USDA, NRCS, "Landscape Conservation Initiatives," https://www.nrcs.usda.gov/programs-initiatives/landscape-conservation-initiatives.

[79] USDA, NRCS, "Conservation Enhancement Activity E512J: Establish Wildlife Corridors to Provide Habitat Continuity or Access to Water," July 2022, https://www.nrcs.usda.gov/sites/default/files/2022-11/E512J_July_2022.pdf. For a list of all eligible CSP enhancements and bundles, see USDA, NRCS, "CSP Enhancements and Bundles," https://www.nrcs.usda.gov/programs-initiatives/csp-conservation-stewardship-program/csp-enhancements-and-bundles.

[80] Examples of Regional Conservation Partnership Program (RCPP) projects with wildlife corridor components funded in FY2023 include the Iowa Wildlife Federation's Connecting Wildlife Habitat by Integrating Conservation Corridors on Working Lands; the Grand Traverse Band of Ottawa and Chippewa Indians' Tribal Stream and Michigan Fruitbelt Collaborative; and the Bluegrass Land Conservancy's Kentucky River Palisades Watershed Protection Project. For all FY2023 RCPP awards, see USDA, NRCS, "Regional Conservation Partnership Program 2023 Awarded Projects," https://www.nrcs.usda.gov/programs-initiatives/rcpp-regional-conservation-partnership-program/regional-conservation.

federal funding. Both easement types under ACEP have been used to fund wildlife habitat corridor projects.[81]

NRCS also coordinates and participates in other federal initiatives that direct the above federal conservation programs toward addressing specific resource concerns, such as wildlife habitat.

- **Working Lands for Wildlife (WLFW).** WLFW is an ecosystem-based approach to delivering agricultural conservation programs. It centers on a focal wildlife species that is used as a barometer of successful habitat restoration and creation.[82] WLFW is administered through a series of multistate planning documents referred to as *frameworks*. These frameworks are developed by NRCS, with federal and nonfederal partners, and include specific actions and programs to be used, as well as measurable restoration goals.[83] In addition to providing funding, WLFW offers regulatory predictability to agricultural producers that take actions to conserve declining species on their lands through USDA conservation programs.[84] Through WLFW, NRCS partners with the FWS to provide regulatory predictability under the Endangered Species Act (P.L. 93-205), in which no matter the legal status of selected species, producers can continue agricultural production on their land with an NRCS conservation plan in place.
- **Joint Chiefs' Landscape Restoration Partnership.** This partnership is a collaboration between NRCS and FS for conducting landscape restoration activities to mitigate wildfire risk, protect water quality and quantity, and improve wildlife habitat on eligible private, tribal, state, and federal lands.[85] Ecological connectivity and wildlife corridor conservation are two of several evaluation criteria for project selection.[86]

[81] For example, see USDA, NRCS, "Conservation Florida, NRCS Permanently Protect 527-Acre XL Ranch Lightsey Cove Within Florida Wildlife Corridor," press release, May 22, 2023, https://www.nrcs.usda.gov/conservation-basics/conservation-by-state/florida/news/conservation-florida-nrcs-permanently; USDA, NRCS, "USDA Invests $11 Million in Partnerships to Restore Wetlands, Support Historically Underserved Producers," press release, November 3, 2021, https://www.nrcs.usda.gov/news/usda-invests-11-million-in-partnerships-to-restore-wetlands-support-historically-underserved.

[82] For additional information on the Working Lands for Wildlife initiative and current project areas, see USDA, NRCS, "Working Lands for Wildlife," https://www.nrcs.usda.gov/programs-initiatives/working-lands-for-wildlife.

[83] The current and planned WLFW frameworks include specific actions and goals related to corridors and habitat connectivity. There are currently three WLFW frameworks: Great Plains Grasslands Biome Framework; Sagebrush Biome Framework; and Northern Bobwhite, Grasslands, and Savannas Framework. Four additional WLFW frameworks are planned or ongoing: Western Migratory Big Game Framework, Eastern Deciduous Forest Framework, Eastern Aquatic Connectivity Framework, and Southeastern Pine Ecosystem Framework. For more information, see USDA, NRCS, "Frameworks for Conservation Action," https://www.nrcs.usda.gov/resources/guides-and-instructions/frameworks-for-conservation-action.

[84] 16 U.S.C. §3844(p)(3). The WLFW initiative was created as an NRCS initiative in 2010 before being expanded and codified by Congress in the Agricultural Improvement Act of 2018 (2018 farm bill; §2407 of P.L. 115-334). WLFW can include NRCS-administered conservation programs and the Conservation Reserve Program (CRP) administered by the Farm Service Agency (FSA).

[85] 16 U.S.C. §6592d.

[86] Examples of corridor-related projects include the FY2024 Interconnecting the Coastal and Upland Endemic Species Ecosystems in Puerto Rico and the FY2023 Piedmont Watershed Restoration in South Carolina. For additional information and current and past projects, see USDA, NRCS, "Joint Chiefs' Landscape Restoration Partnership," https://www.nrcs.usda.gov/programs-initiatives/joint-chiefs-landscape-restoration-partnership.

Farm Service Agency

FSA administers the Conservation Reserve Program (CRP), which provides annual rental payments, usually over 10 years, to agricultural producers to replace crops on highly erodible and environmentally sensitive land with long-term resource-conserving plantings. FSA also provides cost-share assistance to help offset the costs associated with installing the conservation practices associated with the CRP contract. Offers to enroll land in CRP are made through different types of signups and enrollment options.[87] To establish wildlife corridors, FSA is able to prioritize CRP enrollment opportunities through specific signup types, such as Grassland CRP, and certain projects under CRP sub-programs, such as the Conservation Reserve Enhancement Program and State Acres for Wildlife Enhancement.[88] This prioritization provides greater weight to applications during the enrollment process if the land is located in an area with critical wildlife habitat and possible increased payments for specific land if it is enrolled in the program. FSA also partners with NRCS on WLFW frameworks, which also contribute to the creation of wildlife corridors.

U.S. Forest Service

FS often addresses the development and management of wildlife corridors in the National Forest System in land and resource management plans (*forest plans*).[89] The agency's 2012 planning rule, which governs land management planning in the National Forest System, included requirements for evaluating, maintaining, or restoring connectivity.[90] Several forest plans have explicitly considered wildlife corridors. For example, as specified in the forest plan for the Bridger-Teton National Forest, FS is partnering with the State of Wyoming and other stakeholders to restore and conserve a wildlife corridor through the forest that connects pronghorn sheep's summer range in Grand Teton National Park with their winter range in the Green River Valley of Wyoming.[91]

FS also may support wildlife corridor activities on nonfederal lands through cooperative activities and grants for forest protection and management. For example, the Forest Legacy Program uses both land purchases and permanent conservation easements "to protect important forest areas from development and fragmentation."[92] In 2024, the program supported a conservation easement in Montana that "adds vital connectivity" for grizzly bear, Canada lynx, and bull trout on land

[87] For additional information about CRP and enrollment options, see USDA, FSA, "About the Conservation Reserve Program (CRP)," https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program.

[88] Examples of corridor-focused State Acres for Wildlife Enhancement (SAFE) projects include the Iowa Gaining Ground SAFE (see https://www.fsa.usda.gov/tools/informational/fact-sheets/state-acres-wildlife-enhancement-iowa-gaining-ground-safe) and the Oregon Columbia Plateau Mule Deer SAFE (see https://www.fsa.usda.gov/tools/informational/fact-sheets/state-acres-wildlife-enhancement-oregon-columbia-plateau-mule-deer).

[89] Forest plans establish the framework for guiding project-level planning and decisionmaking within a unit of the National Forest System.

[90] 36 C.F.R. 219.9. See also U.S. Forest Service (FS), "Habitat Connectivity and Migration Corridors in National Forest System Planning and Decisions," August 19, 2022, https://largelandscapes.org/wp-content/uploads/2022/09/Habitat-Connectivity-and-Migration-Corridors-in-National-Forest-System-Planning-and-Decisions.pdf.

[91] FS, "Decision Notice & Finding of No Significant Impact Pronghorn Migration Corridor Forest Plan Amendment," May 31, 2008, https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_063055.pdf.

[92] FS, "Forest Legacy Program Implementation Guidelines," p. 5, https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/15541-forest-service-legacy-program-508.pdf.

that borders forested federal and state lands, "contributing to the integrity of the forest landscape."[93]

During the Biden Administration, USDA and FS leadership issued various guidance for FS agency staff to consider in regard to wildlife corridors. For example, in 2022, FS issued a memorandum directing staff to consider the impacts of FS actions on ecological connectivity and wildlife corridors and to seek opportunities to support corridors and connectivity in management and collaboration.[94] Previously, a 2021 USDA secretarial memorandum directed FS to incorporate consideration of terrestrial wildlife habitat connectivity and corridors into relevant planning processes, programs, and assessments, including forest plans, fuels reduction and wildfire crisis planning, and voluntary conservation programs.[95]

U.S. Department of Commerce

The National Oceanic and Atmospheric Administration (NOAA), within the U.S. Department of Commerce, manages and conducts science for most marine and anadromous species in the United States. As outlined below, NOAA and partners also support activities related to wildlife corridors.

National Oceanic and Atmospheric Administration

Anadromous species such as salmon and sturgeon migrate between freshwater and marine ecosystems during their lifecycles. Some salmon species, for example, travel hundreds of miles through rivers to reach their spawning grounds, maneuvering around or over dams and culverts. Wildlife corridors for fish can be improved by removing barriers and restoring habitat to improve fish migration in rivers. NOAA's National Marine Fisheries Service (NMFS) administers grant programs that aim to improve fish passage for migrating species. Some examples of programs are summarized below.

- **Fish Barrier Removal Grants**. NMFS supports fish passage projects focused on restoring habitat access for migratory fish such as Atlantic and Pacific salmon, steelhead trout, striped bass, Atlantic sturgeon, river herring, and other species.[96] Two programs, the Restoring Fish Passage Through Barrier Removal and Restoring Tribal Priority Fish Passage Through Barrier Removal programs, have supported efforts to restore fish habitat, decommission dams, and remove or remediate other barriers to fish migration in U.S. watersheds.[97]
- **Regional Fish Habitat and Passage Grants**. The Pacific Coastal Salmon Recovery Fund supports salmon recovery in the states of Alaska, California,

[93] Forest Legacy Program, "Forest Legacy 2024 Funded Projects," https://www.fs.usda.gov/managing-land/private-land/forest-legacy/program/fy24-funded-projects.

[94] Letter from Chris French, Deputy Chief, National Forest System, to Regional Foresters, August 19, 2022, https://largelandscapes.org/wp-content/uploads/2022/09/Habitat-Connectivity-and-Migration-Corridors-in-National-Forest-System-Planning-and-Decisions.pdf.

[95] USDA, Secretary's Memorandum 1077-013, p. 6.

[96] National Oceanic and Atmospheric Administration (NOAA), "Restoring Fish Passage Through Barrier Removal Grants," https://www.fisheries.noaa.gov/grant/restoring-fish-passage-through-barrier-removal-grants. See also NOAA, National Marine Fisheries Service (NMFS), "Habitat Restoration Under the Bipartisan Infrastructure Law and Inflation Reduction Act," https://www.fisheries.noaa.gov/national/habitat-conservation/habitat-restoration-under-bipartisan-infrastructure-law-and-inflation-reduction-act.

[97] NOAA, "Fish Passage Projects Recommended for Funding," https://www.fisheries.noaa.gov/national/habitat-conservation/fish-passage-projects-recommended-funding.

Idaho, Nevada, Oregon, and Washington.[98] Some grants aim to improve habitat and migratory routes for salmon.[99] In addition, NOAA's Mitchell Act Program Grants fund fish passage projects for juvenile Pacific salmon and steelhead.[100] NMFS also supports habitat restoration projects aimed toward the recovery of Atlantic salmon through Atlantic Salmon Habitat Restoration Partnership Grants.[101] Funds support projects that seek to improve fish passage and connectivity in salmon freshwater spawning and rearing habitats, as well as projects that focus on barrier removal.[102]

NOAA also administers programs to increase habitat connectivity and restoration for marine species. For example, the Transformational Habitat Restoration and Coastal Resilience Grants program aims to sustain fisheries, recover threatened and endangered species, and restore habitat. Further, it aims to support efforts to reconnect rivers to their historical floodplains.[103] The above programs also complement efforts by NOAA and partners to address and carry out habitat science, restoration, and connectivity, such as through grants, technical assistance, and the NOAA-wide Habitat Blueprint and its associated Habitat Focus Areas in specific locations throughout the United States.[104] Additional complementary efforts regarding water resource management that may support wildlife corridors are discussed in the **text box** below.

Supporting Corridors Through Water Resource Management

Rivers, streams, lakes, and estuaries are often considered natural corridors that provide key migration routes for fish, support the range of riparian species, and provide floodplain habitats that support other wildlife. Maintaining regional-scale aquatic connectivity is challenging due to the natural branching of aquatic networks and infrastructure fragmenting these networks. For example, systems of federal and nonfederal dams have diminished connectivity in large river basins in the United States.

To address this connectivity challenge, some efforts have focused on improving *environmental flows*, which refer to waterbody flows that create the conditions needed to sustain aquatic ecosystems. For example, the Sustainable Rivers Project, a partnership between the U.S. Army Corps of Engineers (USACE) and The Nature Conservancy, has supported modifying operations at USACE dams to enhance environmental flows while still providing for the authorized purposes of the water resource projects. Started in 2002, the effort has since resulted in modified water resource project operations in over 40 river systems affecting over 12,000 river miles.

Another effort to modify water resource infrastructure to improve habitat and wildlife connectivity is implementing *levee setbacks*. Relocating a levee farther away from a river bank can restore surface water

[98] NOAA, "Pacific Coastal Salmon Recovery Fund," https://www.fisheries.noaa.gov/grant/pacific-coastal-salmon-recovery-fund.

[99] NOAA, "Notice of Funding Opportunity, Pacific Coastal Salmon Recovery Fund (Annual Appropriations, IIJA Funds, and IRA Funds)," Funding Opportunity Number: NOAA-NMFS-WCRO-2024-2008271, 2023, pp. 1-37, https://www.grants.gov/search-results-detail/351310.

[100] This program has helped open over 7,000 miles of habitat through 112 fish passage projects throughout Oregon, Washington, and Idaho. NOAA, "How the Mitchell Act Supports Fisheries," 2022, https://media.fisheries.noaa.gov/2022-03/mitchell-act-fact-sheet.pdf.

[101] NOAA, "Atlantic Salmon Habitat Restoration Partnership Grants," https://www.fisheries.noaa.gov/grant/atlantic-salmon-habitat-restoration-partnership-grants. Hereinafter, NOAA, NMFS, "Atlantic Salmon Habitat Restoration Partnership Grants."

[102] NOAA, "Notice of Funding Opportunity, FY 2024 Atlantic Salmon Habitat Restoration Partnership Grants," Funding Opportunity Number: NOAA-NMFS-HCPO-2024-25198, 2024, pp. 1-24, https://grants.gov/search-results-detail/352093.

[103] NOAA, NMFS, "Habitat Restoration Under the Bipartisan Infrastructure Law and Inflation Reduction Act," https://www.fisheries.noaa.gov/national/habitat-conservation/habitat-restoration-under-bipartisan-infrastructure-law-and-inflation-reduction-act.

[104] NOAA, "NOAA Habitat Blueprint," https://www.habitatblueprint.noaa.gov/; NOAA, "Habitat Focus Areas," https://www.habitatblueprint.noaa.gov/habitat-focus-areas/.

connectivity between a body of water and a portion of its floodplain, while still providing flood risk reduction benefits. Some stakeholders advocate implementing levee setbacks at federal levees and federal support for nonfederal levee setbacks; however, implementation has been limited due to various challenges, including the lack of available land to acquire and the cost to acquire the land.

Sources: USACE, "Sustainable Rivers," https://www.hec.usace.army.mil/sustainablerivers/; USACE, Engineer Research and Development Center, *Overview of Levee Setback Projects and Benefits*, July 2017.

U.S. Department of Transportation

Transportation infrastructure can present a movement barrier for many species and can increase wildlife mortality, particularly at roads and railroads. For example, when animals attempt to cross roads, there are risks to both the animals and the humans using the roads. The Department of Transportation (DOT) reports that each year in the United States, there are more than 1 million collisions involving wildlife and vehicles.[105] In addition, culverts, bridges, and pipelines may present challenges for species movement.[106] These elements of transportation infrastructure may restrict water flow and species passage, particularly for aquatic species. The IIJA authorized and appropriated funding for two new DOT programs, administered by the Federal Highway Administration, to address these issues.

- **National Culvert Removal, Replacement, and Restoration Grant Program.** This program provides competitive grants to help state, local, or tribal governments remove, repair, and replace culverts and weirs that can prevent fish passage and impair aquatic connectivity.[107] For example, culverts can be altered by reducing the steepness of the culvert, lowering water velocity, and increasing water depth, allowing fish to pass.[108]
- **Wildlife Crossings Pilot Program (WCPP).** The WCPP provides competitive grants to state, local, and tribal governments; metropolitan planning organizations; regional transportation authorities; and federal land management agencies for projects that reduce wildlife-vehicle collisions and improve habitat connectivity for terrestrial and aquatic species.[109] The WCPP supports both

[105] Marcel P. Huijser et al., *Wildlife-Vehicle Collision Reduction Study: Report to Congress*, U.S. Department of Transportation (DOT), FHWA-HRT-08-034, August 2008, p. 23, https://www.fhwa.dot.gov/publications/research/safety/08034/08034.pdf.

[106] Culverts generally consist of pipes that pass water under infrastructure, such as roads, to protect them from erosion or flooding. DOT, Federal Highway Administration, "About Aquatic Organism Passage (AOP)," https://www.fhwa.dot.gov/engineering/hydraulics/culverthyd/aquatic/culvertaop_about.cfm.

[107] 16 U.S.C. §6703. The Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) authorized to be appropriated $800 million for each of FY2022 through FY2026. For more information, see the program page at https://www.fhwa.dot.gov/engineering/hydraulics/culverthyd/aquatic/culvertaop_grants.cfm and the program fact sheet at https://www.fhwa.dot.gov/bipartisan-infrastructure-law/culverts_fact_sheet.cfm. On June 25, 2024, DOT announced the availability of at least $196 million for FY2023 grants. For information about the FY2023 grant opportunity, see https://grants.gov/search-results-detail/355106.

[108] NOAA, *Fish Passage Solutions on the West Coast: Culverts, Tidegates, and Fish Screens*, 2019, https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/fish-passage-solutions-west-coast-culverts-tidegates-and.

[109] 23 U.S.C. §171(b). The IIJA established the Wildlife Crossings Pilot Program (WCPP), authorizing a total of $350 million over five years (FY2022-FY2026) for competitive grants.[109] In 2023, the WCPP provided $110 million in grants for 19 projects in 17 states, including 4 tribal projects. The provision defined Tribes to also include Native villages and Alaska Native Corporations as those terms are defined in the Alaska Native Claims Settlement Act (43 U.S.C. §1602). See DOT, Federal Highway Administration, *Wildlife Crossings Pilot Program FY 2022-2023 Selections*, November 25, 2024, https://highways.dot.gov/federal-lands/wildlife-crossings/pilot-program/fy-2022-2023-selections.

construction (e.g., engineering activities, infrastructure improvement) and non-construction (e.g., hot spot analysis of wildlife-vehicle collisions, mapping, roadside warning signs) projects on roads.[110] The WCPP also may improve habitat connectivity of certain species by funding projects to construct wildlife crossing overpasses or underpasses. In addition, the IIJA directed DOT to conduct a study of methods to reduce collisions between motorists and wildlife, including analyzing methods to improve habitat connectivity for terrestrial and aquatic species.[111]

State and Private Programs for Wildlife Corridors

Several state and private efforts support wildlife corridors and crossings. In many cases, states collaborate with private foundations and the federal government to create and manage corridors and crossings (e.g., western states under Secretarial Order 3362). According to the National Conference of State Legislatures, at least 12 states have enacted legislation or issued executive orders to support wildlife corridors and crossings: California, Colorado, Florida, Nevada, New Hampshire, New Mexico, Oregon, Utah, Vermont, Virginia, Washington, and Wyoming.[112] Some examples of state-led initiatives are provided below.

- **California.** The State of California and the Wallis Annenberg Foundation are collaborating with local groups to build the largest wildlife crossing in the country. U.S. Highway 101 is a barrier to migrating mammals such as mountain lions, bobcats, gray foxes, coyotes, and mule deer that traverse the Simi Hills and Santa Susana Mountains. The Wallis Annenberg Wildlife Crossing, under construction, is to be a vegetated bridge crossing over the highway. It will be approximately 210 feet long and 175 feet wide and is expected to cost $92 million.[113] California also has passed a law directing local governments to consider wildlife connectivity in their planning. (See textbox below.)

California Room to Roam Act

In 2024, California passed a law to require local governments to consider wildlife connectivity in their general plans for development. The Room to Roam Act requires considerations for fish, wildlife, and habitat connectivity in state and local plans for infrastructure projects and land management. Under the law, state and local staff must identify and analyze potential project impacts to connectivity, permeability, and natural landscape areas; identify and study wildlife passages; consider impacts of wildlife barriers and aim to minimize and mitigate them; and consider options to remove barriers to wildlife connectivity and restore habitat. The impact of the law could be widespread, according to some stakeholders. The law's enforcement provisions go into effect in 2028.

Source: California Assembly Bill no. 1889, Chapter 686, and John O'Meara, "Room to Roam Act Becomes Law," Nossaman LLP, *Endangered Species Law and Policy* (blog), October 3, 2024, https://www.endangeredspecieslawandpolicy.com/gov-newsom-signs-californias-room-to-roam-act-into-law-requiring-wildlife-connectivity-considerations-in-land-use-planning.

[110] DOT, Federal Highway Administration, "Wildlife Crossings Program," https://highways.dot.gov/federal-lands/wildlife-crossings/pilot-program. Hereinafter, DOT, "Wildlife Crossings Program."

[111] 23 U.S.C. §172.

[112] National Conference of State Legislatures, *Wildlife Migration Corridors*, September 2022, https://www.ncsl.org/environment-and-natural-resources/wildlife-migration-corridors#:~:text=The%20protection%20of%20wildlife%20corridors,%2C%20Virginia%2C%20Washington%20and%20Wyoming.

[113] Caltrans, "US-101—Wallis Annenberg Wildlife Crossing at Liberty Canyon," State of California Department of Transportation, 2023, https://dot.ca.gov/caltrans-near-me/district-7/district-7-projects/d7-101-annenberg-wildlife-crossing.

- **Florida**. The Florida Wildlife Corridor is a state effort to create a corridor within a defined area of over 18 million acres (of which 10 million acres are protected lands and waters) to support the migration of wildlife and plants.[114] Affected species include the Florida panther, gopher tortoise, manatee, red-cockaded woodpecker, swallow-tailed kite, and black bear. Florida passed a law in 2021 to support the creation of this corridor, including funding land acquisition and easements.[115]
- **Wyoming**. Wyoming has established a state initiative for designating wildlife corridors to protect mule deer and pronghorn sheep that also aims to protect landowner rights and accommodate multiple-use opportunities.[116] A state executive order lays out a process that involves identifying a corridor; fielding public comments on the proposed corridor; drafting a risk and opportunity assessment of the corridor for the species; seeking approval from the Wyoming Fish and Game Commission; and, lastly, the governor issuing a determination to designate the corridor.[117]

Some wildlife corridors are largely created through private efforts. For example, the Yellowstone to Yukon Conservation Initiative aims to connect wildlife corridors and habitats across the U.S.-Canada border.[118] The initiative has created more than 117 underpasses, overpasses, and fencing structures to support wildlife crossings; organized the conservation of 2,000 km^2 of private land in wildlife corridors to support movements between protected areas; and decommissioned stretches of road to restore natural areas.[119]

Indigenous Support for Wildlife Corridors

Many Indigenous peoples in the United States have expressed interest in establishing wildlife corridors on their lands because species migrating across their lands often hold cultural and economic significance.[120] Traditionally, many Indigenous peoples cultivated and ate a wide variety of foods; many may continue to rely on the surrounding environment as a source of food and materials for daily life (i.e., *subsistence*).[121]

Some Indigenous peoples have used federal financial and technical assistance opportunities to support wildlife conservation, including wildlife corridors. In 2022, DOI announced $2.5 million in grants to seven states and three Tribes to implement Secretarial Order 3362.[122] One of these Tribes, the Tolowa Dee-ni' Nation, is working to increase habitat connectivity and improve

[114] For more information, see Florida Department of Environmental Protection, *Florida Wildlife Corridor*, https://floridadep.gov/sites/default/files/Florida_Wildlife_Corridor.pdf.

[115] Florida Statute §259.1055 (2023), http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0200-0299/0259/Sections/0259.1055.html.

[116] State Executive Order 2020-1, "Wyoming Mule Deer and Antelope Migration Corridor Protection by Governor Mark Gordon," https://drive.google.com/file/d/1gJFmPzhPrh2y7N6xpB5gxROCLFIo93Ly/view.

[117] Ibid.

[118] Yellowstone to Yukon Conservation Initiative, https://y2y.net/.

[119] Ibid.

[120] See Native American Fish and Wildlife Society (NAFWS), "Initiatives- Habitat Connectivity," https://www.nafws.org/initiatives/tribal-wildlife-corridors/.

[121] For an overview of the significance of subsistence to Alaska Natives, see CRS Report R47511, *Subsistence Uses of Resources in Alaska: An Overview of Federal Management*, by Mark K. DeSantis and Erin H. Ward.

[122] DOI, "Secretary Haaland Announces Progress."

habitat quality for elk in California by restoring prairie and oak woodland habitat.[123] In FY2022, 33 Tribes received FWS Tribal Wildlife grants for various projects that address wildlife corridors.[124] For example, the Pueblo of Santa Ana received funding to monitor mountain lion predation patterns and wildlife corridor use on the Tribe's lands.[125] Using funding provided in 2023 by the Bureau of Indian Affairs' Tribal Climate Resilience Annual Awards Program, the Ahtna Intertribal Resource Commission plans to hire its first habitat restoration biologist focused on improving waterways and designing wildlife corridors within the Ahtna Territory of southcentral Alaska.[126]

In addition to support from DOI, Tribes have received DOT WCPP funding. For example, in FY2022-FY2023, the Stillaguamish Tribe in Washington State was awarded $8.5 million to design and construct a wildlife overpass with fencing on State Route 20.[127]

Issues for Congress

A variety of issues regarding wildlife corridors may be of continuing interest to Congress. For example, Congress might evaluate whether the federal government should implement a single wildlife corridor program for all federal efforts or whether federal agencies should maintain their individual programs. Congress also might consider if or how the federal government may address coordination among federal, state, tribal, and private stakeholders when developing and implementing wildlife corridors; whether the level of federal financial assistance available for wildlife corridors is appropriate; and whether federal support for scientific research into mapping and creating wildlife corridors is achieving the desired results.

Organizing Federal Efforts to Implement Wildlife Corridors

Congress might consider several options for organizing federal efforts to implement and manage wildlife corridors. Federal efforts to support wildlife corridors currently are implemented by individual federal departments and agencies with varying objectives that focus on certain species or ecosystems. For example, the Secretary of the Interior prioritizes wildlife corridors for big game species in Secretarial Order 3362;[128] and USDA follows Secretarial Memorandum 1077-013 to guide and coordinate several of its programs that may address wildlife corridors.[129] Other federal agencies have authorities and appropriations to support infrastructure modifications, such as building wildlife crossings and fish passage structures to increase habitat connectivity.

Options for organizing federal efforts to implement wildlife corridors could include (1) continuing to authorize multiple agencies to create and implement wildlife corridors within their jurisdictions; (2) authorizing a single agency to develop a program to create and manage wildlife

[123] National Fish and Wildlife Foundation, "Western Big Game Seasonal Habitat and Migration Corridors Fund," March 30, 2022, https://www.nfwf.org/sites/default/files/2022-04/NFWF-WesternBigGameMigration-20220330-GS.pdf.

[124] DOI, FWS, "FY2022 Tribal Wildlife Grants Awards Summaries," https://www.fws.gov/sites/default/files/documents/077646%20FY%202022%20TWG%20Awards%20with%20Summaries_0.pdf.

[125] Ibid.

[126] Bureau of Indian Affairs, Branch of Tribal Climate Resilience, "FY2023 Annual Awards Summary," p. 16, https://www.bia.gov/sites/default/files/media_document/2023_annual_awards_summary.pdf.

[127] DOT, "Federal Highway Administration's Wildlife Crossings Pilot Program," p. 4, https://highways.dot.gov/media/48761.

[128] DOI, "Secretary Haaland Announces Progress."

[129] USDA, Secretary's Memorandum 1077-013.

corridors across all federal lands; and (3) establishing criteria to designate wildlife corridors and establish a national wildlife corridor system. Congress also might consider a combination of these options, depending on the objectives and types of wildlife corridors contemplated. A discussion of each option is provided below.

Multiple Agencies Addressing Wildlife Corridors

Under a status quo option, programs to implement wildlife corridors would continue to be authorized within individual agencies. Some stakeholders might assert that this approach would enable individual agencies to use their technical expertise to efficiently manage their lands to implement wildlife corridors. Further, agencies might be able to support wildlife corridors through ongoing management activities on the lands they manage. An example is the integration of conservation, habitat connectivity, and wildlife corridors in USDA programs discussed in Secretarial Memorandum 1077-013.

At the same time, some might contend that this approach would result in wildlife corridors with varied and inconsistent objectives and characteristics. For example, some wildlife corridor initiatives might focus only on supporting game animals, whereas others might focus only on conserving endangered and threatened species. In addition, some stakeholders argue that congressional oversight of federal wildlife corridor activities is challenging because various agencies are conducting such activities.

Single Agency Addressing Wildlife Corridors

Previous legislation has proposed authorizing a single federal department or agency to create a program to coordinate the design, implementation, and maintenance of wildlife corridors across all federal lands.[130] Stakeholders that favor this approach contend that a single federal program could strategically identify habitat connectivity and wildlife corridors across federal lands, which could increase support for wildlife, recreation, ecosystem services, and climate adaptation nationwide.[131] Over time, a single program might build institutional expertise in planning and maintaining wildlife corridors, increase efficiency for implementing and managing projects, and allow for greater consistency in implementing wildlife corridors. Under this model, Congress could focus oversight and consider appropriations for a single program rather than track and fund multiple initiatives at several agencies.

Some in Congress might be opposed to consolidating authority in one department or agency. For example, some may contend that a program within an agency could be less effective if implementing wildlife corridors across multiple jurisdictions, especially if it is not adequately resourced compared with the scale of lands and projects under its purview. Further, some might assert that a single agency may not have the expertise to address challenges of implementing wildlife corridors in various ecosystems (e.g., aquatic, terrestrial) or around infrastructure. In addition, some may contend that given the varied statutory missions and authorities governing federal lands and programs, wildlife corridors might be more efficiently managed and integrated into multiple existing agency programs and plans. For example, Congress authorized DOT to

[130] For example, in the 116th Congress, the Wildlife Corridors Conservation Act of 2019 (S. 1499 and H.R. 2795) would have established a federal National Wildlife Corridors System administered by the Secretary of the Interior.

[131] Letter from Edward O. Wilson, University Professor Emeritus and Honorary Curator in Entomology, Harvard University, to Members of Congress, December 6, 2016, https://beyer.house.gov/uploadedfiles/scientistsletter_6_december_2016.pdf.

implement a pilot project to fund and study wildlife crossings across highways, in part, due to the department's expertise with roadways and infrastructure.[132]

Wildlife Corridor Designation and System

Another option for Congress could be to establish a national wildlife corridor system that includes designated wildlife corridors created by multiple federal agencies. Under this concept, Congress might authorize federal agencies to designate areas on federal and nonfederal lands (e.g., through easements or agreements with nonfederal land owners) as wildlife corridors as long as the areas meet certain criteria and a definition of a wildlife corridor. These criteria could include certain permitted and prohibited activities in a wildlife corridor; for example, actions that create barriers within a wildlife corridor could be prohibited, such as road building, urban and agricultural development, and possibly fencing. In the 118th Congress, H.R. 9776 would have implemented this approach by authorizing the Secretaries of various departments, such as DOI, to designate wildlife corridors on federal lands and waters.[133] The bill also would have required land use and management plans to be created for each wildlife corridor.

Designated wildlife corridors could be organized into a national wildlife corridor system, potentially similar to the National Wilderness Preservation System, which supports designated wilderness areas on federal lands.[134] A federal framework for designated wildlife corridors could provide consistent standards and prohibitions and similar management objectives across federal lands. Further, a wildlife corridor system could facilitate congressional oversight.

Some in Congress might oppose land-use restrictions stemming from designated wildlife corridors. Wildlife corridor designations might reduce development options (e.g., natural resources extraction, farming and ranching, some recreation) on federal lands surrounding communities, potentially leading to lost economic opportunities.[135] For example, some restrictions in designated wildlife corridors might limit recreation such as hiking, snowmobiling, and hunting. Further, standardizing objectives and prohibitions for activities within wildlife corridors might decrease the flexibility of federal land managers to tailor wildlife corridors to achieve particular goals, such as to protect specific species or groups of species. Alternatively, Congress might consider addressing wildlife corridors one at a time rather than across an entire system. Some stakeholders may advocate to reduce federal involvement in designating wildlife corridors and instead shift more responsibility to states, Tribes, or other nonfederal entities.

Federal Support for Nonfederal Efforts to Implement Wildlife Corridors

Another option for Congress could be to reduce federal involvement in wildlife corridors and instead support state, tribal, and private-led initiatives to implement wildlife corridors. Some stakeholders contend that state fish and wildlife agencies have local knowledge of wildlife and

[132] The Federal Highway Administration is conducting studies to develop best practices for creating wildlife crossings to reduce wildlife vehicle collisions and improve habitat connectivity.

[133] H.R. 9776, §201, in the 118th Congress.

[134] For more information, see CRS Report R41610, *Wilderness: Issues and Legislation*, by Anne A. Riddle, Katie Hoover, and Eric P. Nardi.

[135] For example, some have asserted that creating a wildlife corridor, or a wildlife corridor network, "inevitably" reduces the area available for timber harvesting (Denys Yemshanov et al., "Exploring the Tradeoffs Among Forest Planning, Roads and Wildlife Corridors: A New Approach," *Optimization Letters*, June 4, 2021, p. 2, https://www.fs.usda.gov/nrs/pubs/jrnl/2021/nrs_2021_yemshanov_002.pdf).

fish movements that is important for mapping and creating wildlife corridors.[136] Further, some stakeholders note that states have the primary responsibility for managing wildlife on state lands and can facilitate collaboration with local, tribal, and federal entities.[137] In addition, some might argue that interstate wildlife corridors may be best implemented through state-to-state cooperation. Private entities also can participate in efforts to create wildlife corridors. Congress might choose to minimize federal involvement in wildlife corridors and support nonfederal efforts to create wildlife corridors through grant programs and technical assistance. In addition, Congress might consider supporting wildlife corridors on private agricultural, range, and forested lands through USDA's existing voluntary conservation programs.[138]

Some stakeholders argue that the implementation of wildlife corridors on private lands should be through a nonregulatory and voluntary approach.[139] In the 118th Congress, H.R. 8836 would have taken this approach through a grant program. In addition, H.R. 7221 would have authorized managers to identify and map habitat connectivity areas to aid in the creation of wildlife corridors.[140]

Congress also has debated ways to support tribal wildlife corridors. First introduced in the 116th Congress, the Tribal Wildlife Corridors Act of 2019 (companion bills H.R. 5179 and S. 2891) would have permitted Tribes to nominate land under their jurisdiction to become tribal wildlife corridors. The bills also would have directed DOI to establish criteria for determining whether nominated lands qualify as tribal wildlife corridors, including criteria for restoring historical habitat.

There may be disadvantages to relying solely on nonfederal initiatives. For example, some stakeholders note that state and tribal wildlife agencies may lack the scientific data, analysis, and mapping resources to identify and create wildlife corridors.[141] Further, if large amounts of land in a state are managed by the federal government, the benefits of state or tribal-led initiatives might be diminished because the lands they manage might be limited or insufficient to create a viable wildlife corridor. For wildlife corridors that traverse state boundaries, some might contend that federal efforts may better facilitate cooperation among states and other stakeholders for implementing wildlife corridors.[142] Congress also might consider a hybrid approach that involves federal, state, and other nonfederal stakeholders coordinating efforts, as discussed below.

Coordination Among Federal, State, Indigenous, and Private Stakeholders to Implement Wildlife Corridors

Establishing and managing wildlife corridors across federal and nonfederal lands or waters crossing different jurisdictions likely would require coordination among stakeholders to be

[136] Rob Ament et al., *Wildlife Connectivity: Opportunities for State Legislation*, Center for Large Landscape Conservation, 2021, https://www.ncelenviro.org/app/uploads/2021/07/Wildlife-Connectivity-Opportunities-for-State-Legislation-Report.pdf.

[137] Ibid.

[138] See opportunities in the "U.S. Department of Agriculture" section of the report.

[139] Testimony of Stephen Guertin Deputy Director for Policy, U.S. Fish and Wildlife Service, in U.S. Congress, Senate Indian Affairs Committee, *Legislative Hearing to Receive Testimony on S. 2610 & S. 2891*, 116th Cong., March 4, 2020.

[140] H.R. 7221, §2(d), in the 118th Congress.

[141] Testimony of Stephen Guertin Deputy Director for Policy, U.S. Fish and Wildlife Service, in U.S. Congress, House Natural Resources Committee, Water, Wildlife, and Fisheries Subcommittee, *Legislative Hearing on H.R. 2795 and H.R. 3742*, 116th Cong., October 17, 2019.

[142] A potential example would be maintaining migration corridors for salmon that cross multiple states.

effective. Further, it means that projects to establish and maintain such wildlife corridors would have to comport with the underlying laws, policies, and objectives of stakeholders within each corridor. Under this option, Congress might consider how to support coordination between federal and nonfederal entities to create and manage wildlife corridors on federal and nonfederal lands and waters. Further, Congress might consider how to increase coordination among federal agencies working on wildlife corridors.

If Congress decides to facilitate federal and nonfederal cooperation on wildlife corridors crossing multiple jurisdictions, Congress might consider whether certain federal agencies need additional authorities to carry out this cooperation. For example, FS is specifically authorized to enter into cooperative agreements to conduct work on nonfederal lands for the protection, restoration, and enhancement of fish and wildlife habitat, among other purposes.[143] Congress has debated providing this authority to other agencies that currently lack authority to enter into cooperative agreements with nonfederal stakeholders. For example, H.R. 7221 in the 118th Congress would have authorized the Secretary of Agriculture to enter into cooperative agreements with various stakeholders to carry out provisions related to wildlife corridor conservation.[144] Further, S. 4953 and H.R. 8836 in the 118th Congress would have directed the Secretaries of the Interior, Agriculture, and Transportation to coordinate federal actions and funding for wildlife corridor and habitat connectivity programs authorized by the bill and to improve federal coordination with states, Tribes, and nongovernmental entities.[145]

Congress also might consider specific authorizations for certain federal agencies to purchase easements from willing landowners to help create wildlife corridors. Certain USDA and FS programs already use easements, but other agencies might seek specific authorization to acquire easements.

As an alternative, Congress might consider using a private-sector entity such as NFWF to coordinate wildlife corridor initiatives that involve federal and nonfederal entities. NFWF aims to create cooperative partnerships between federal and private entities.[146] For private entities unwilling to interact directly with the federal government, working through NFWF could provide an alternative to work on federal wildlife corridor initiatives. Further, NFWF might help form coalitions of landowners willing to participate in wildlife corridor initiatives with the federal government.

Another option could be to authorize a wildlife corridor task force with federal and nonfederal members. A wildlife corridors task force could

- identify opportunities to leverage federal resources with state or local resources to create or expand wildlife corridors;
- facilitate partnerships between federal and state governments to work on wildlife corridors being implemented by state governments;[147]

[143] P.L. 105-277, §323 as amended.

[144] H.R. 7221, §2(e), in the 118th Congress.

[145] S. 4953, §9(c) in the 118th Congress.

[146] For more on NFWF, see CRS Report R44740, *National Fish and Wildlife Foundation (NFWF): History, Function, and Funding*, by Christopher R. Field and Eva Lipiec.

[147] States are actively authorizing projects that support habitat connectivity. As of April 2024, 32 bills in 17 states had been introduced to increase habitat connectivity for fish and wildlife. National Caucus of Environmental Legislators, "States Are Bridging the Wildlife Habitat Gap with New Funding and Infrastructure in 2024," April 10, 2024, https://www.ncelenviro.org/articles/states-are-bridging-the-wildlife-habitat-gap-with-new-funding-and-infrastructure-in-2024/.

- create a strategic plan or action plan to organize federal efforts to implement wildlife corridors;
- provide technical assistance and scientific resources to nonfederal stakeholders for wildlife corridors; and
- solicit and address recommendations from stakeholders on how to improve wildlife corridors.

A further potential role for a federal task force on wildlife corridors could be to organize federal agency activities. Under this option, a federal task force could focus on reducing overlap, facilitating partnerships among agencies, and producing a federal plan for implementing wildlife corridors. A task force also could provide Congress a single entity to address for oversight. For example, under the Great Lakes Restoration Initiative, there is a federal task force that creates an action plan every four years to guide restoration and coordinates work among federal agencies to implement the plan.[148]

Multi-stakeholder efforts that focus on coordination may pose several challenges. For example, if consensus from all task force members is needed for activities to progress, one task force member could slow or stop implementation of wildlife corridors. Several other matters also could delay or complicate implementation of wildlife corridors, such as obtaining funding and acquiring land or easements in the wildlife corridor from various stakeholders. For example, certain stakeholders might not want to sell their land for a wildlife corridor, whereas other stakeholders adjacent to a wildlife corridor might object to restrictions that could affect their property or property value (e.g., restrictions on hunting that might lower recreational value). These disagreements could lead to excluding lands from the wildlife corridor, which might render the corridor less effective for wildlife than if the lands were included.

Funding for Wildlife Corridors

Federal funding for wildlife corridors is appropriated to several federal departments and agencies (see "Federal Policies and Activities on Wildlife Corridors"). Discretionary funding for wildlife corridors is provided to federal agencies through annual appropriations laws and supplemental appropriations. For example, the IIJA and the IRA provided funding to DOI, DOC, and DOT, among other agencies, for wildlife corridors, crossings, and associated projects.[149]

It is challenging to determine how much federal funding, in aggregate, is provided for wildlife corridors, making it difficult for Congress to assess whether federal funding is adequate or should be increased or reduced. To assess how much funding is being appropriated to wildlife corridors, Congress might consider directing the Office of Management and Budget or another federal entity to create a crosscut budget.[150] A crosscut budget is often used to present budget information from two or more agencies whose activities are targeted at a common policy goal.[151]

[148] See 33 U.S.C. §1268(c)(7).

[149] For more information, see CRS Report R47263, *Ecosystem Restoration in the Infrastructure Investment and Jobs Act: Overview and Issues for Congress*, coordinated by Anna E. Normand and Pervaze A. Sheikh.

[150] This sentiment is also shared by some stakeholders; see American Wildlife Conservation Partners, Letter to the House of Representatives Urging the Support of Wildlife Migration Corridors and Seasonal Ranges, specifically to Honorable Tom Cole, Congressman et al., May 13, 2024, https://drive.google.com/file/d/18sm39kCHDe3XKta7eZzjqMYGUA9aHFYX/view?usp=drive_link. Hereinafter, American Wildlife Conservation Partners, Urging the Support of Wildlife Migration Corridors.

[151] For more information, see CRS Report RL34329, *Crosscut Budgets in Ecosystem Restoration Initiatives: Examples*
(continued...)

Some stakeholders contend that federal efforts to create and maintain wildlife corridors are inconsistently funded and underfunded; these stakeholders support increased funding for wildlife corridors.[152] Some assert that Congress should provide resources and collaborative efforts for wildlife corridors through legislation.[153] For example, some Tribes have expressed support for federal efforts to establish and fund tribal wildlife corridors through a centralized program, claiming that many Tribes have limited access to funding for science planning and other capacity building to address wildlife and habitat connectivity.[154] In the 118th Congress, S. 1804, H.R. 4689, and H.R. 178 would have established a fund to provide financial assistance to federal, state, tribal, and local agencies for conservation projects (including for fish and wildlife corridors) in regions where renewable energy projects are located on federal lands.[155] Other stakeholders have argued that funding for wildlife corridors should be provided without fiscal year limitation so that multiyear projects can be implemented with consistent funding levels (according to some stakeholders, wildlife corridors can take several years to develop and adjust before they are effective).[156] In contrast, annual appropriations for wildlife corridors may allow Congress to exercise greater oversight over programs, since Congress would need to consider whether and how much to fund the program each fiscal year.

If Congress determines existing programs that support wildlife corridors (e.g., Partners for Fish and Wildlife under FWS) are underfunded, it might consider increasing appropriations or creating a Grant program have been proposed for nonfederal entities (e.g., Partners for Fish and Wildlife under FWS) to receive funding for wildlife corridors. Under a grant program, Congress might consider requiring nonfederal stakeholders to provide a cost share for federal grants, which would lower the financial burden on the federal government and increase nonfederal resources and commitment for wildlife corridors. For example, under S. 4953, introduced during the 118th Congress, nonfederal stakeholders would provide no less than 10% of the amount of a grant to fund projects to improve or conserve habitat in areas where wildlife is migrating or moving.[157]

Some in Congress might contend that federal funding is sufficient and that funding for wildlife corridors should come primarily from state, local, and private initiatives, as discussed above. Congress also could increase resources for wildlife corridors without increasing appropriations by directing agencies to prioritize wildlife corridors in existing conservation and habitat restoration programs and management plans. For example, the 2023 CEQ guidance established a policy for federal agencies to promote ecological connectivity that directed federal agencies to consider wildlife connectivity and corridors through agency planning and decisionmaking, among other efforts. This approach also was proposed by Congress in H.R. 8104 in the 118th Congress, which

and Issues for Congress, by Pervaze A. Sheikh and Clinton T. Brass. Crosscut budgets can assist in making data from multiple agencies more understandable and could be used to inform congressional oversight committees, participating agencies, and stakeholders. A crosscut budget may be used to track funding for a theme such as wildlife corridors, list program accomplishments, measure progress toward achieving program goals, or compare similar activities conducted by various agencies.

[152] American Wildlife Conservation Partners, Urging the Support of Wildlife Migration Corridors.

[153] Ibid. See companion bills H.R. 4995 and S. 2705 introduced in the 118th Congress.

[154] NAFWS, "Native American Fish and Wildlife Society Resolution No. 19-002, Support for the Protection of Wildlife Corridors," https://nafws.org/wp-content/uploads/2021/03/Resolution_for_Support_for_the_Protection_of_Wildlife_Corridors.pdf.

[155] S. 1804 and H.R. 4689 in the 118th Congress would have established a Treasury fund administered by the National Fish and Wildlife Foundation.

[156] Some stakeholders have asserted that consistent funding for multiyear projects should be a priority. See testimony of Madeleine West, Theodore Roosevelt Conservation Partnership, in Senate EPW Committee, *Challenges and Opportunities to Facilitate Wildlife Movement* hearing.

[157] S. 4953, §4, in the 118th Congress.

would have made restoring and enhancing habitat connectivity and wildlife migration corridors a priority resource concern for funding under the RCPP.[158]

Science of Wildlife Corridors

Congress might consider how federal agencies and others can use science to implement and maintain wildlife corridors. To accomplish this aim, managers need to understand wildlife movements and migrations, map wildlife corridors, evaluate the effectiveness of wildlife corridor implementation, and anticipate changes in wildlife movements due to natural and man-made disturbances (e.g., climate change, development, wildfires).[159]

Some stakeholders report challenges with gathering and developing accurate data, such as tracking wildlife migration and extrapolating migration data from local areas to broader regions.[160] They advocate for increased mapping and research to create corridors and identify challenges to migration (e.g., fencing).[161] Bills have been introduced to provide financial assistance for research to increase knowledge of wildlife corridors and technical support to help managers implement and maintain wildlife corridors. For example, in the 118th Congress, H.R. 8836 would have proposed establishing a DOI research program to fund state and tribal migration research. Similarly, H.R. 9776 would have directed USGS to establish and maintain a habitat connectivity area mapping and science program.

Congress might consider creating an electronic clearinghouse for migration studies that would track all species of interest and make the data available to all stakeholders. Electronic tracking exists for some species; for example, the Atlas of Ungulate Migration is an interactive website that collects and reports tracking data collected and submitted by scientists from multiple countries.[162] Its objective is to give wildlife managers and other stakeholders access to wildlife movement data as they consider implementing projects that might restrict the movement of ungulates.[163]

NOAA and NMFS currently support projects related to identifying, designating, and conserving *essential fish habitat* and *habitat areas of particular concern*.[164] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§1801 et seq.) provided NOAA and Regional Fishery Management Councils with authorities to protect certain marine environments and habitats of importance to particular fishery species (primarily in federal waters).[165] NMFS has supported studies focused on understanding species' habitat requirements throughout their life histories, including projects examining habitat connectivity and fish passage among NMFS

[158] H.R. 8104, §2(b), in the 118th Congress. For more information, see CRS Report R40763, *Agricultural Conservation: A Guide to Programs*, by Megan Stubbs.

[159] Hilty et al., *Corridor Ecology*.

[160] Ibid.

[161] Marcia Argust et al., *How to Conserve Wildlife Migrations in the American West*, The Pew Charitable Trusts, October 2022, https://www.pewtrusts.org/-/media/assets/2022/10/how_to_conserve_wildlife_migrations.pdf.

[162] Global Initiative on Ungulate Migration, "Atlas of Ungulate Migration," https://gagecarto.github.io/giumMap/?et_rid=977220332&et_cid=5344163.

[163] Ibid.

[164] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §1802(10), defines *essential fish habitat* (EFH) as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." *Habitat areas of particular concern* are a subset of EFH that are especially vulnerable to degradation and represent high-priority conservation and management areas. NOAA, NMFS, "Magnuson-Stevens Act Provisions; Essential Fish Habitat (EFH)," 67 *Federal Register* 2343-2383, 2002.

[165] 16 U.S.C. §§1801 et seq.

regions.[166] Congress may wish to evaluate these types of projects and decide whether to support further federal efforts to assess and restore fish habitats by NMFS and partners (e.g., FWS), such as by building on those included in the National Fish Habitat Partnership Program (16 U.S.C. §§8201-8213) and the Coastal Habitat Conservation Program (16 U.S.C. §§8301-8305).[167]

USGS maps wildlife migrations and analyzes habitat connectivity. USGS's Corridor Mapping Team creates maps of animal movements to show migration routes for big game (e.g., deer, elk, pronghorn sheep).[168] Further, USGS researchers analyze options for a national network of protected areas in the United States that could support wildlife migration.[169] Congress might consider whether expanding USGS's role to conduct science and provide technical assistance on a wider scale that involves other federal agencies and nonfederal stakeholders would better meet congressional objectives. For example, in the 118th Congress, S. 4953 would have directed the USGS Corridor Mapping Team to map movements of wildlife, research and assess movement areas, and provide technical assistance to states and Tribes to map and publish migration routes.[170] In addition, the bill would have directed USGS to submit an annual report on analysis of mapped migration corridors, seasonal habitats, and habitat connectivity areas.[171]

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[166] NOAA, "Habitat Conservation: Science," https://www.fisheries.noaa.gov/topic/habitat-conservation/science.

[167] National Fish Habitat Partnership, "National Fish Habitat Partnership," https://fishhabitat.org/.

[168] Matthew Kauffman et al., *Ungulate Migrations of the Western United States, Volume 4*, U.S. Geological Survey Scientific Investigations Report 2024-5006, 2024, https://doi.org/10.3133/sir20245006.

[169] R. Travis Belote et al., "Identifying Corridors Among Large Protected Areas in the United States," *PLoS ONE*, vol. 11, no. 4 (2016).

[170] S. 4953, §§7 and 8, in the 118th Congress.

[171] S. 4983, §8, in the 118th Congress.

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