EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL ON ENVIRONMENTAL QUALITY
WASHINGTON, D.C. 20503

March 21, 2023

MEMORANDUM FOR HEADS OF FEDERAL DEPARTMENTS AND AGENCIES

FROM: Brenda Mallory
Chair

SUBJECT: Guidance for Federal Departments and Agencies on Ecological Connectivity and Wildlife Corridors

I. Introduction

A. Background

Policymakers are recognizing the importance of ecological connectivity (connectivity) and wildlife[1] corridors (corridors) as human development degrades, eliminates, and fragments habitats, and as climate change alters environmental conditions. Connectivity is the degree to which landscapes, waterscapes, and seascapes allow species to move freely and ecological processes to function unimpeded.[2] Corridors are distinct components of a landscape, waterscape, or seascape that provide connectivity.[3] Corridors have policy relevance because they facilitate movement of species between blocks of intact habitat, notably during seasonal migrations or in response to changing conditions. Connectivity and corridors are important across terrestrial, marine, and freshwater environments, as well as across airspaces. Increasing connectivity is one of the most frequently recommended climate adaptation strategies for biodiversity management.[4] Connectivity allows wildlife to access needed resources and facilitates fundamental ecological processes. Furthermore, connectivity promotes climate adaptation and resilience by enabling wildlife to adapt, disperse, and adjust to changes in the quality and distribution of habitats, including climate-driven shifts in species' geographic ranges. Since connectivity is vital to ecosystem health and functions, it is significant to humans as well and supports the strong cultural and spiritual connections that communities have to nature. Maintaining connected habitats also can help sustain ecosystem services (i.e., benefits that flow from nature to people), such as flood risk reduction, extreme heat mitigation, health and public safety, access to nature, hunting and fishing, livelihoods, and subsistence.

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[1] In this guidance, all references to "wildlife" are inclusive of fish and other aquatic organisms.
[2] United Nations Environment Programme. (2019). Frontiers Report 2018/19 Emerging Issues of Environmental Concern. https://wedocs.unep.org/handle/20.500.11822/27541.
[3] Ament, R., R. Callahan, M. McClure, M. Reuling, and G. Tabor. (2014). *Wildlife Connectivity: Fundamentals for conservation action.* Center for Large Landscape Conservation: Bozeman, Montana. https://largelandscapes.org/wp-content/uploads/2019/05/Wildlife-Connectivity-Fundamentals-for-Conservation-Action.pdf
[4] Heller, N.E., and E.S. Zavaleta. (2009). *Biodiversity management in the face of climate change: a review of 22 years of recommendations.* Biological conservation 142, no. 1: 14-32.

B. Purpose and Intended Use

This guidance establishes a policy for Federal agencies to promote greater connectivity across terrestrial, marine, and freshwater habitats, as well as across airspaces, to sustain the tremendous biodiversity that exists in the U.S. and enable wildlife to adapt to fluctuating environmental conditions, including those caused by climate change. To the maximum extent practicable, Federal agencies are expected to advance the objectives of this guidance by developing policies, through regulations, guidance, or other means, to consider how to conserve, enhance, protect, and restore corridors and connectivity during planning and decision-making, and to encourage collaborative processes across management and ownership boundaries.[5] Any existing corridor and connectivity policies or related policies should be updated as needed to align with the objectives in this guidance. Federal agencies should have new or updated policies ready to implement by the first quarter of 2024 and make their policies publicly available. Federal agencies should also actively identify and prioritize actions that advance the objectives set forth in this guidance.

Within 180 days of release of this guidance, Federal agencies should submit a progress report to the White House Council on Environmental Quality:

1. Outlining steps that have been or will be taken to create, update, or implement policies to align with this guidance;
2. Identifying actions that have been or will be taken to advance the objectives set forth in this guidance;
3. Where possible, describing how science and data have been or will be used to develop performance measures and metrics to assess how agency actions are affecting connectivity.

To support Federal agencies in developing or updating these policies, this memo, developed through an interagency working group,[6] provides guidance on how connectivity and corridors could be considered in the areas of agency planning and decision-making, science and data, and collaboration and coordination. The guidance is intended to provide clarity and consistency so that Federal agencies can better coordinate with each other and with stakeholders and partners engaged in corridor and connectivity stewardship efforts.

States, Tribes, territorial, and local governments are essential partners to Federal agencies and are frequently leading the way on connectivity and corridor efforts, often working with non-governmental organizations, academia, and private landowners to spur on-the-ground change. Thirteen states have statutes or executive orders recognizing the importance of and need to

[5] Federal agencies are encouraged to consider how to advance the objectives of this guidance on Federal lands and waters and through Federally authorized or funded activities that occur outside of those boundaries. However, this guidance does not impose any new regulation outside of the boundaries of Federal lands and waters.

[6] The interagency working group included U.S. Department of Agriculture (USDA), represented by the National Resources Conservation Service (NRCS) and U.S. Forest Service; Department of Commerce, represented by National Oceanic and Atmospheric Administration; Department of Defense; Department of Energy; Department of the Interior, represented by the Fish and Wildlife Service, Office of the Secretary of the Interior; Department of Transportation; Environmental Protection Agency; Smithsonian Institution; and within the White House, the Office of Management and Budget, the Office of Science and Technology Policy, and the Council on Environmental Quality.

protect and restore connectivity and wildlife corridors.[7] Consistency and coordination across Federal agencies regarding corridors and connectivity will enable Federal agencies to better support and integrate States, Tribes, territorial, and local governments' efforts. Improving coordination and consistency in Federal agencies' approach to connectivity and corridors also will enable Federal agencies to better engage with private landowners and other non-Federal entities that play a critical role in conservation, restoration, and expansion of wildlife corridors and landscape, waterscape, and seascape connectivity.

The Bipartisan Infrastructure Law and the Inflation Reduction Act provided significant investments in corridor conservation and enhancement, aquatic connectivity, transportation infrastructure, and habitat restoration. Thoughtful planning of these investments as well as coordination among Federal agencies and with non-Federal partners, including through existing fora[8] or existing conservation or recovery plans,[9] are non-regulatory measures that can demonstrably improve conservation, adaptation, and resilience outcomes for threatened and endangered species and for other species before they become imperiled. By improving how Federal agencies approach connectivity and corridors, the Federal Government can catalyze efforts involving multiple partners, provide resources, and foster consistency, continuity, and certainty, thereby better supporting States, Tribes, territories, and local governments, non-profit organizations, and private landowners and enhancing collaboration with other nations to advance conservation objectives.

II. Considerations for Connectivity and Corridors

Federal agencies' authorities to implement, authorize, and fund actions that conserve, enhance, protect or restore connectivity and corridors vary widely. Federal agencies should, consistent with their statutory authorities and specific missions, incorporate the objectives in this guidance into agency actions to the maximum extent practicable and should consider connectivity and corridors across terrestrial, marine, and freshwater environments, and airspaces. Depending on the area under consideration, more than one of these environments may be present. Different environments demand appropriate and unique strategies and considerations for conserving, enhancing, protecting, and restoring connectivity and corridors.

[7] California, Colorado, Florida, Massachusetts, Nevada, New Mexico, New Hampshire, Oregon, Utah, Vermont, Virginia, Washington, and Wyoming.

[8] Examples of existing fora for coordination include the Western Governors Association and the Landscape Conservation Joint Task Force, which is led by the U.S. Fish and Wildlife Service and the Association of Fish and Wildlife Agencies.

[9] Examples of existing conservation or recovery plans include Migratory Bird Joint Ventures and their plans such as the Saltmarsh Sparrow Conservation Plan; Western Association of Fish and Wildlife Agencies' Sagebrush Conservation Strategy; NRCS Working Lands for Wildlife Conservation Frameworks for Great Plains and Sagebrush, and for Bobwhite Quail; Collaborative Landscape Conservation Designs such as Southeast Conservation Adaptation Strategy and Nature's Network; state-driven conservation efforts such as State Wildlife Actions Plans, Coastal Master Plans, and the State Action Plans for Big Game Migrations; Tribal Conservation Priorities; and local collaboratives such as the Black-foot Challenge, the Great Lakes Indian Fish and Wildlife Commission, Crown of the Continent Landscape Conservation Design, Salmon Superhighway, Sacramento Valley Salmon Recovery Program, Southeast Conservation Blueprint, and the Sentinel Landscapes Partnership Program.

This guidance seeks to leverage innovation across Federal missions and budgets while supporting consistent Federal action on connectivity and corridors in the following areas:

- Agency planning and decision-making
- Science and data, including Indigenous Knowledge[10]
- Collaboration and coordination

The following sections describe considerations for Federal agencies as they take steps to advance the objectives of this guidance. Federal agencies should address these considerations in policies created, updated, or implemented to align with this guidance and should also incorporate these considerations into other relevant agency actions.

A. Agency planning and decision-making

Connectivity and corridors are not only relevant to the actions of natural resource management agencies, but also to numerous agencies whose actions, including project authorizations and/or funding and planning, siting, operation, and maintenance of investments, may impact habitat intactness and the ability of organisms and ecological processes to move or occur freely. Examples of focal areas where connectivity and corridors should be considered early in planning, funding, and decision-making include, but are not limited to:

- Community and Tribal resilience planning
- Disaster planning and response
- Energy development planning and permitting, and energy infrastructure management
- Federal urban and land use planning
- Forest and rangeland planning and management
- Hard rock mining and mineral exploration and development planning and permitting
- Military infrastructure installation and operation
- Ocean planning
- Port management and development
- Public land planning and management
- Recreation and tourism management
- Telecommunications infrastructure and management
- Transportation planning and use management (including aviation)
- Water and wastewater infrastructure and management
- Voluntary conservation program planning

Federal agencies should consider how their actions can support the management, long-term conservation, enhancement, protection, and restoration of year-round habitat, seasonal habitat, stopover habitat, wildlife corridors, watersheds, and other landscape/waterscape/seascape

[10] In this guidance, the terminology "science and data" is inclusive of Indigenous Knowledge, which is 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. White House Office of Science and Technology Policy and White House Council on Environmental Quality. (2022). *Guidance for Federal Departments and Agencies on Indigenous Knowledge.* https://www.whitehouse.gov/wp-content/uploads/2022/12/OSTP-CEQ-IK-Guidance.pdf

features and processes that promote connectivity. Connectivity and corridors should factor into high-level planning and decision-making at Federal agencies as well as into individual decisions that lead to well-sited and planned projects. It is important to consider how connectivity and corridors can be promoted early in planning processes, including how they are addressed in existing programs and authorities and the early planning stages of funding decisions, environmental reviews, and project siting. The objective is to build consideration of connectivity and corridors into the early steps of these processes to facilitate easy implementation. Clear policy direction and early consideration can help avoid conflicts between multiple uses in advance and drive development to areas with fewer conflicts.

Best Practices: Agencies should seek to incorporate these best practices into planning and decision-making as they take steps to advance the objectives of this guidance:

- Elevating the conservation, enhancement, protection, and restoration of connectivity and corridors as a programmatic goal
- Planning at the scale of landscapes, waterscapes, or seascapes rather than at the scale of an individual project
- Applying ecosystem-based conservation, enhancement, protection, and restoration strategies, including using nature-based solutions[11]
- Advancing plans and actions that improve the resilience of corridors to climate change or that conserve corridors needed to facilitate climate adaptation
- Engaging meaningfully with local communities so that they have a voice in planning, authorization, and funding decisions
- Designing infrastructure to facilitate wildlife movement, ecosystem processes, and ecosystem services
- Restoring habitat to remove and prevent reestablishment of invasive species, and to promote native ecological communities
- Avoiding or minimizing adverse impacts that would fragment habitat identified as a priority for connectivity or corridors, and where not possible, offsetting or compensating for these impacts
- Removing, modifying, or avoiding the installation of barriers to wildlife movement along migratory routes
- Rehabilitating habitat damaged by natural or human impacts to facilitate continued connectivity
- Producing science, data, and tools on connectivity through research, collaborations, and partnerships that are readily applicable to land, water, ocean, and resource management
- Using criteria related to connectivity and corridors to inform decisions related to budgeting, project selection, or grant eligibility

[11] Nature-based solutions are actions to protect, sustainably manage, or restore natural or modified ecosystems to address societal challenges, simultaneously providing benefits for people and the environment. White House Council on Environmental Quality, White House Office of Science and Technology Policy, White House Domestic Climate Policy Office. (2022). *Opportunities for Accelerating Nature-Based Solutions: A Roadmap for Climate Progress, Thriving Nature, Equity, and Prosperity. Report to the National Climate Task Force.* https://www.whitehouse.gov/wp-content/uploads/2022/11/Nature-Based-Solutions-Roadmap.pdf

Performance measures and metrics: To assess how their actions are affecting connectivity, Federal agencies are encouraged to use science and data to develop performance measures and metrics, where appropriate. Regular evaluation of performance measures and metrics can serve as a checkpoint for Federal agencies to gauge their impacts on connectivity and consider updates to policies and actions that could improve the ability to conserve, enhance, protect, and restore corridors and connectivity. Additionally, performance measures and metrics can be useful for a general assessment of whether and how Federal agencies collectively are promoting greater connectivity across terrestrial, marine, and freshwater habitats, as well as airspaces.

Baseline information: Federal agencies should appropriately assess the public lands and waters they manage for connectivity and corridors values. Agencies should then incorporate consideration of connectivity and corridors into the guidance for planning, siting, operation, and maintenance of Federal investments, including renewable energy development and infrastructure. In carrying out large-scale planning required by statutory mandates,[12] Federal agencies should consider updating inventories of Federal resources under their associated management plans to assess connectivity and corridors. Such inventories can inform project siting decisions, protective designations, and where to carry out habitat restoration to enhance or restore connectivity between blocks of intact habitat. Federal agencies also should explore opportunities to support Tribes, States, territories, and local governments in efforts to inventory and plan within their respective jurisdictions.

Funding: Federal funding processes can greatly influence corridors and connectivity. Federal agencies should consider how to make their opportunities for grants, contracts, cooperative agreements, and other forms of financial assistance more supportive of projects related to connectivity and corridors by trying to make funds available for these purposes and using available authorities and flexibilities to streamline delivery. Additional considerations may include evaluating the use of public-private partnerships for delivering funding, coordinating funding approaches across multiple Federal agencies, adjusting timelines for securing funds and completing projects, evaluating match requirements where appropriate, and supporting individuals and organizations, particularly smaller, more localized entities, as they apply for Federal funds.

Proactive approaches: Connectivity and corridors are a consideration for Federal agency planning, permitting, funding or decision-making when proposed actions and projects will conserve, enhance, protect, or restore connectivity and corridors. Federal agencies are encouraged to adopt proactive approaches in developing their proposed actions and projects, and to incorporate project siting and design elements that conserve, enhance, protect, or restore connectivity and corridors. Federal agencies should not limit engagement in restoration activities only to circumstances when restoration serves as a mitigation strategy to compensate for adverse impacts from projects or actions. Instead, Federal agencies should consider where there are opportunities in their programs and policies to carry out restoration with the objective of promoting greater connectivity.

[12] Examples of relevant statutory mandates that include large-scale planning are the Federal Land Policy and Management Act, 43 U.S.C. §§ 1701 *et seq.*, and the National Forest Management Act, 16 U.S.C. §§ 1600 *et seq*.

Federal agencies involved in planning, permitting, funding or decision-making outside the boundaries of Federal lands and waters also should incorporate proactive consideration of corridors and wildlife-friendly infrastructure design and management practices. For instance, engaging in early coordination and collaboration can help reduce adverse impacts on wildlife, habitat, and ecological processes and promote corridors and connectivity. Furthermore, early coordination and collaboration can have the added benefit of accelerating permitting for Federal investments. Federal agencies also should explore opportunities to support Tribes, States, territories, and local governments in efforts to inventory and plan within their respective jurisdictions.

Mitigation: Connectivity and corridors are a consideration for Federal agency planning, permitting, funding, or decision-making when potential actions and projects may adversely impact connectivity and corridors, including decisions to authorize or fund projects proposed by other entities. In these instances, Federal agencies should rely on a mitigation hierarchy that first seeks to avoid and minimize adverse impacts to the maximum extent practicable. For adverse impacts that cannot be avoided or minimized, offsets, or compensatory mitigation, should be applied. Offsets require replacing or providing equivalent ecological functions and services to those that are lost elsewhere on the same landscape, waterscape, or seascape, through the restoration, establishment, enhancement, or preservation of resources with commensurate functions and services and that provide additional benefits. During the review of major Federal actions under the National Environmental Policy Act of 1969, 42 U.S.C. § 4331 *et seq*., (NEPA), agencies should consider and be transparent about the positive or negative impacts of proposed actions and alternatives on connectivity and corridors. Through the NEPA review process, Federal agencies can consider measures to advance corridors and connectivity as components of proposed actions, alternatives to proposed actions, or mitigation for proposed actions' effects. The NEPA process also provides the opportunity for Federal agencies to seek input from and create partnerships with entities with special expertise in connectivity and corridors, such as Federal, State, Tribal, territorial, and local government agencies, private landowners, academia, and non-governmental organizations.

B. Science and data

Types of science and data: To the maximum extent possible, Federal agencies should consider the types of science and data, including Indigenous Knowledge, relevant to their work involving connectivity and corridors. Federal agencies should address how the best available science and data will inform planning and decision-making, and consider approaches to identify and address gaps in available science and data. Agencies should appropriately account for applicable legal requirements, including the Information Quality Act[13] and the Foundations for Evidence-Based Policymaking Act,[14] as well as Federal agency-specific regulations, policies, or guidance regarding data quality and best available scientific information. To identify the relevant best available science and data, agencies should consider datasets produced by researchers in government agencies, academic institutions, and non-profit organizations. Relevant best available science and data may rely on or consider robust spatial modeling techniques that are easily interpretable, provide estimates of error that fall within acceptable ranges, and are

[13] Pub. L. No. 106-554, 114 Stat 2763, § 515 (codified at 44 U.S.C. §§ 3504(d)(1), 3516).
[14] Pub. L. No. 115-435, 132 Stat. 5529 (codified in Titles 5 and 44 of the U.S. Code).

appropriate given Federal agency objectives. Federal agencies should consider interagency collaboration and partnerships with connectivity experts in academic institutions, non-profit organizations, Tribal and Indigenous communities, and State agencies. Science and data that may be relevant to Federal agencies' work on connectivity and corridors, to the extent allowed by law, include but are not limited to:

- Existing and potential future ecosystem functions, wildlife habitats, movement patterns, and migration routes[15]
- Locations of transportation and other infrastructure
- Use of lands, rivers, and ocean and coastal waters by wildlife and humans
- Transportation and energy usage (e.g., flight paths, shipping channels, barge traffic, road volumes at various time steps)
- Climate change projections relevant to species, habitats, and ecological processes
- Ecosystem service access and use locations (e.g., tourism visitation, hunting, fishing usage, subsistence usage access locations, water extraction points, flood risk zones)
- Assessments that may indicate natural and human-induced risk or threat level to components of connectivity
- Identification of existing barriers or blockages to connectivity that could be removed
- Impacts of industrial activity near migratory routes and any corresponding beneficial effects of seasonal cessation of activity timed with wildlife movement patterns

Sharing of science and data: Science and data sharing between institutions and agencies at multiple levels may foster a more comprehensive understanding of connectivity and corridors; facilitate prioritization of areas for conservation, enhancement, protection, and restoration; and result in more informed decision-making. Federal agencies should consider how to enhance efforts to share science and data to promote connectivity and corridors. Agencies should promote data sharing, including actions to make it easier for non-Federal entities, such as Tribes, States, territories, private landowners, local governments, project applicants, and non-governmental organizations, to access science and data owned or hosted by a Federal agency. Agencies should undertake these efforts to the maximum extent allowed by law and consistent with privacy protections and protections for sensitive or proprietary information. As appropriate, Federal agencies should consider working with partners to make it easier for a Federal agency to access and incorporate non-Federal science and data meeting applicable data quality standards, while still protecting Indigenous Knowledge and other sensitive information. Some actions that may facilitate Federal agency access to non-Federal science and data on connectivity and corridors include: revising data criteria, making funds available for agreements with external developers to purchase or use non-Federal data, and increasing collaboration with non-Federal developers to meet Federal needs. Finally, Federal agencies should consider how to work with partners to identify barriers and develop solutions to enable more efficient sharing of science and data, both to meet the requirements of the Geospatial Data Act of 2018,[16] and to improve sharing

[15] An example of Federal science and data relevant to migration routes is "Ungulate Migrations of the Western United States," a series of maps of big game migration corridors developed by the U.S. Geological Survey, in partnership with State and Tribal wildlife agencies.
[16] 43 U.S.C. §§ 2801 *et seq*.

of non-geospatial science and data. These data sharing coordination and collaboration efforts should continue as Federal agencies develop tools based upon the science and data.

Indigenous Knowledge: Indigenous Knowledge can provide a valuable view of the interconnectedness of environments and can offer important insights into past and present aspects of connectivity and corridors. Indigenous Knowledge can also inform current and future efforts to conserve, enhance, protect, and restore connectivity. Federal agencies should follow the *Guidance for Federal Departments and Agencies on Indigenous Knowledge*, issued by the White House Office of Science and Technology (OSTP) and the White House Council on Environmental Quality (CEQ) in December 2022,[17] and any Federal agency-level policies issued pursuant to that guidance, to appropriately consider Indigenous Knowledge throughout the planning and implementation of actions that are likely to impact connectivity and corridors.

C. Coordination and collaboration

Ecological processes and wildlife movement are not limited by jurisdictional boundaries. Therefore, Federal agencies should seek active collaboration and coordination with other Federal agencies, Tribes, States, territorial, and local governments, as well as stakeholders to facilitate landscape, waterscape, and seascape-scale connectivity planning and management, and consider appropriate collaboration with other nations. Prioritization and strategic alignment of connectivity efforts across partners improves the effectiveness of each entity's activities and enables larger-scale conservation, enhancement, protection, or restoration to occur. The benefits of improved coordination and collaboration include cost effectiveness, improved outcomes, increased public support, and the sharing and leveraging of knowledge, funding, technical expertise, and other resources.

Federal agencies should support strategic collaborations and partnerships to advance work on connectivity and corridors. This may include further enhancing coordination and collaboration both among Federal agencies and with Tribes, States, territories, other nations, private landowners, local governments, and non-governmental organizations. Establishing consistent standards and expectations for external engagement can facilitate interactions between Federal agencies and external groups. The following sections touch on some entities that can be valuable partners to Federal agencies, but this is not intended to be an exhaustive list of who Federal agencies should consider coordinating and collaborating with on connectivity and corridors efforts.

Intra- and interagency coordination and collaboration: Federal agencies should promote both intra- and interagency coordination and collaboration, to ensure that planning and information regarding connectivity and corridor efforts are not siloed within individual agencies or within distinct programs within a single agency. Where appropriate, Federal agencies should identify programs within a Federal agency and across Federal agencies that, when aligned, will lead to a more holistic approach to advancing connectivity and corridor work on a given landscape, waterscape, or seascape. Federal agencies with investments on Federal lands or in Federal waters adjacent to designated areas that may have conservation outcomes (e.g., National Park

[17] The guidance is available at https://www.whitehouse.gov/wp-content/uploads/2022/12/OSTP-CEQ-IK-Guidance.pdf

System units, national monuments, national forests and grasslands, national marine sanctuaries, national estuarine research reserves, wilderness areas, national wildlife refuges, etc.) should explore collaborative opportunities to enhance connectivity across jurisdictional boundaries. Interagency collaboration provides a way for Federal agencies to share resources, experience, and technical capacity and to learn from each other. Federal agencies should support and promote the development of fora for interagency collaboration.

Tribes, States, *territories, local governments, and other nations*: The considerations set forth in this guidance are intended to inform Federal agency actions that will be supportive of Tribal, State, territorial, local, and international efforts to manage lands and waters for connectivity. Tribes and States are the primary managers of healthy wildlife populations that are not under Federal jurisdiction. Federal agencies have primacy over efforts to protect and conserve threatened and endangered species populations and are primarily responsible for managing Federal lands and waters. Federal agencies should encourage collaboration with Tribes, States, territories, and local governments to improve consideration of conservation benefits in decision-making, in particular to support healthy wildlife populations and thereby avoid the need for Federal species management. Federal agencies are encouraged to work through existing collaborative efforts to facilitate and support Tribes, States, territories, and local governments' efforts to promote connectivity and corridors. Additionally, Federal agencies should consider where there may be opportunities to engage in international coordination and collaboration to promote greater connectivity that cuts across political boundaries.

Academia and non-profit organizations: Academic institutions and non-profit organizations with a conservation, natural resource, land or water use, or information development focus may have expertise or information on connectivity and corridors. These organizations may also have stronger relationships with local communities than some Federal agencies. Federal agencies should encourage collaborations with academic institutions and appropriate conservation non-profit organizations, and Federal agencies should consider and identify policy changes that facilitate new collaborations with these types of entities. Federal agencies that have limited experience working on connectivity and corridors should give consideration to how initiating these types of collaborations could help round out gaps in research, technical expertise, and connections with local communities.

Regional collaboratives: Across the nation, there are many regional collaboratives focused on large-scale landscape, waterscape, and seascape conservation. These collaboratives are adept at supporting local priorities with a regional perspective, identifying shared priorities, developing desired outcomes, and creating ecosystem-based plans to achieve collaborative goals. Often, these collaboratives include representatives from Federal agencies. Federal agencies should consider the most effective way to participate in regional collaboratives, taking into account how the agency could assist the collaboratives in their work and how the collaboratives' efforts could inform projects or programs within the agency.

Private working lands and the private sector: Private landowners play a critically important role in efforts to conserve, enhance, protect, and restore connectivity and corridors. Other parts of the private sector, including companies focused on ecological restoration or those that use public lands, may also be important partners in these efforts. Federal agencies should consider opportunities to engage with private landowners and the private sector to develop a shared vision

for this work. It is important to consider not only voluntary conservation and protection strategies, but also private landowners' management and restoration objectives to support connected lands and waters. Federal agencies should consider opportunities to support voluntary connectivity conservation work by private landowners[18] and, as appropriate, offer financial or technical assistance to landowners to support connectivity conservation goals. Often, intermediary partners that have strong relationships with local communities and dedicated staffing for coordination and outreach to private landowners, such as land trusts or non-profit organizations, can help implement and operationalize partnerships and policy goals. Federal agencies should consider how existing efforts to support voluntary corridor and connectivity conservation work by private landowners could be expanded and whether efforts could be developed or adjusted to further incentivize participation. Several existing Federal agency efforts focus criteria and guidance on conservation objectives at the parcel or individual landowner scale. Additional guidance, criteria, preference points, or other adjustments could be made to help place voluntary individual actions within the context of larger landscapes, waterscapes, and seascapes, and increase the contributions of these efforts to corridor and connectivity benefits.

III. Summary

This guidance encourages Federal agencies to promote greater connectivity across terrestrial, marine, and freshwater habitats, as well as across airspaces, to sustain biodiversity and to enable wildlife to adapt to fluctuating environmental conditions, including those caused by climate change. Federal agencies are expected to advance the objectives contained in this guidance by developing or updating policies to conserve, improve, protect, and restore corridors and connectivity in planning and decision-making frameworks, and to encourage collaborative processes across management and ownership boundaries. By highlighting considerations related to connectivity and corridors that Federal agencies should be accounting for in their planning and decision-making, this guidance promotes a consistent Federal approach to advancing efforts on connectivity and corridors. Providing clarity and consistency in how Federal agencies address connectivity and corridors can help direct and leverage future Federal investments and avoid conflicts between multiple uses, and will enable Federal agencies to better support and integrate with work spearheaded by non-Federal partners. Ultimately, this guidance seeks to strengthen on-the-ground efforts on connectivity and corridors to produce benefits for wildlife and human communities alike.

[18] Examples of these Federal agency efforts include Working Lands for Wildlife (USDA NRCS), Regional Conservation Partnership Program (USDA NRCS Service), Partners for Fish and Wildlife and Coastal Program (U.S. Fish and Wildlife Service), Forest Legacy Program (U.S. Forest Service), Conservation Reserve Program (Farm Service Agency), Community-Based Restoration Program (National Oceanic and Atmospheric Administration), and the Sentinel Landscapes Partnership Program (Department of Defense, Department of the Interior, and USDA).