NATIONAL ACADEMY OF PUBLIC ADMINISTRATION®

Steward Natural Resources and Address Climate Change: An Agenda for 2021

Academy Election 2020 Project

Working Group:
Steward Natural Resources and Address Climate Change

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ABOUT THE ELECTION 2020 PROJECT

The Academy formed a series of Working Groups of its Fellows to address Grand Challenges in Public Administration. These Groups were charged with producing one or more papers to advise the Administration in 2021 (whether reelected or newly elected) on the key near-time actions that should be taken to begin addressing Grand Challenges. This is a paper of the Working Group for Steward Natural Resources and Address Climate Change. It includes these Fellows' recommendations for first steps that the Administration can take to begin addressing this Grand Challenge in 2021.

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STEWARD NATURAL RESOURCES AND ADDRESS CLIMATE CHANGE: AN AGENDA FOR 2021

A REPORT OF AN ACADEMY WORKING GROUP

NATIONAL ACADEMY OF PUBLIC ADMINISTRATION
ELECTION 2020 WORKING GROUP:
STEWARD NATURAL RESOURCES AND ADDRESS CLIMATE CHANGE

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THE CHALLENGE

America's natural resources—including our public lands—are a rich heritage that have made enormous contributions to our economy, health, environment, and society. It is critical that the public, nonprofit, and private sectors effectively steward natural resources and protect the environment for ourselves and future generations. As a nation, we have made significant progress reducing air and water pollution, managing waste materials and preserving threatened species and habitat. In the early 1970s Congress enacted the modern environmental legal system that delivered these changes from which we currently benefit, and now we must determine how best to meet the significant challenges of the 21st century. Climate change and habitat stress from development are major "force multipliers" creating deeper challenges. They are also national security threats. For example, a report from the Under Secretary of Defense in 2019 on climate change stated: "The effects of a changing climate are a national security issue with potential impacts to Department of Defense (DoD or the Department) missions, operational plans, and installations." Beyond the direct impact of climate change on U.S defense installations, it is already destabilizing sensitive and vulnerable regions around the world.

Given the litany of disasters in late summer 2020—all related in some way to climate change—it is more important than ever that we rise to the occasion:

- The Western United States are on fire, with over 8 million acres burned by over 100 fires in 10 states as of October 1, 2020 (Interagency Fire Center)
- The 2020 Atlantic hurricane season is breaking records, with 21 named storms as of mid-September 2020—second only to the 2005 hurricane season.
- Sea levels are continuing to rise and the frequency of sunny day flooding is increasing in coastal areas.
- 2020 is on track to be the warmest year globally since records started in 1880. With that, 8 of the hottest years since 1880 will have been in the last decade. (NOAA)

- The entire world, including the United States, has suffered from the global COVID-19 pandemic. The United States has over 8 million cases and over 220,000 deaths.

Climate change and changing ecosystems are critical factors in these seemingly disparate disasters. For example, the destruction of natural resources and ecosystems is closely connected to disease outbreaks. "As the global wildlife trade persists and human activities expand deeper into tropical forests, humans are increasing their exposure to wild animals and the diseases they may carry. When mining and logging degrade or destroy wildlife habitats, animals are forced into different or smaller areas increasing their likelihood of becoming stressed or sick. They are also more likely to come into contact with people and domestic animals, driving the transmission of disease from wildlife to humans. We know that wildlife species threatened by exploitation or habitat loss are more likely to be sources of disease, and new research suggests that outbreaks of animal-borne illness will become more frequent due to the accelerating destruction of nature."[1]

Similarly, because weather is frequently hotter, forests are drier and more susceptible to burning—which is especially concerning as more Americans live in communities near forests (the wildland-urban interface). As noted by the Environmental Defense Fund:

> Rising temperatures, a key indicator of climate change, evaporate more moisture from the ground, drying out the soil, and making vegetation more flammable. At the same time, winter mountain snowpacks are melting about a month earlier, meaning that the forests are drier for longer periods of time. Meanwhile, shifting meteorological patterns can drive rain away from wildfire-prone regions, a phenomenon scientists discovered in California and have linked to human-made climate change.

These are immense challenges, and the nation needs to take more aggressive action to address them. This Working Group on Steward

[1] See https://www.conservation.org/stories/impact-of-covid-19-on-nature.

Natural Resources and Address Climate Change was tasked with identifying specific near-term actions that the Administration in 2021 (whether reelected or newly elected) could take to address this Grand Challenge. The actions proposed here are necessary and important steps, though not nearly sufficient to effectively deal with the scope of the Academy's Grand Challenge itself. They are steps that can enhance the nation's ability to address the challenge, but other more ambitious actions will be necessary and are not the focus of this paper.

The Working Group believes that significant actions should be taken at the domestic and international levels by the Administration in 2021 (whether reelected or newly elected) to adequately address this Grand Challenge. These efforts require major improvements to current law and regulatory practices, and they can be achieved only if new and innovative partnerships with the private sector and between the federal, state, tribal and local governments are established. To mitigate climate change, the country needs to engage the world in strong diplomatic efforts to reduce global emissions. This Working Group report does not attempt to identify the robust and ambitious legislative and regulatory efforts needed to fully address the Grand Challenge. This set of recommendations are geared toward early action while larger plans and policies are debated and developed.

The Working Group's recommendations are intended to help the Administration as it gets started in 2021. If the Administration does not seek to undertake comprehensive action in this area, it still may wish to implement some elements of these recommendations. Alternatively, if the Administration in 2021 seeks much more comprehensive legislative and regulatory changes, it will have time before such an ambitious program is enacted, in which case the Working Group's proposed actions could be implemented early in 2021 as foundational elements of a broader set of actions.

The Working Group foresees significant economic and health advantages that can accrue from these actions, and the jobs associated with sustainable natural resources and clean energy investments can help with economic recovery from the coronavirus pandemic.

WHAT THE FEDERAL GOVERNMENT IS DOING NOW

Climate change and pollution are having negative impacts on oceans and their ecosystems and are changing temperatures and rainfall patterns on land. As demand rises for resources and while fossil fuels continue to be extracted, communities throughout the United States must reconcile strongly held, but sharply differing, views regarding jobs, habitat protection, private property rights, open space, recreation, and cultural values.

Since the passage of major federal pollution control laws in the 1960s and 1970s, the United States has reduced the release of many pollutants into the country's air, water, and land. Despite this progress, emerging health and environmental threats must be addressed. In addition to protecting natural resources, the nation must address new and emerging environmental issues, especially greenhouse gasses, which contribute to climate change and the loss and fragmentation of habitats. For example, while domestic greenhouse gas emissions have slightly decreased recently with the retirement of coal power generation, they are still higher than they were in 1990. The recent decline is positive but insufficient to avoid significant future adverse effects on public health, ecosystems, and infrastructure due to climate change. Other key emerging issues include the rising levels of persistent chemicals and plastics, including microplastics and pharmaceuticals, in our food and our drinking water extracted from oceans, rivers, and lakes.

FEDERAL RESEARCH AND DEMONSTRATIONS ON CLIMATE SOLUTIONS AND TECHNOLOGY

While there are agency plans to expand and coordinate climate solutions to reduce greenhouse gas emissions, this Working Group notes that additional actions need to be taken to fully implement these plans.

Key activities in this area include:

- **USDA Climate Hubs.** A series of workshops were held that culminated in a report (2016) that points out opportunities within USDA programs to reduce greenhouse gas emissions and increase carbon sequestration. In 2017, the Caribbean Climate Hub responded to Hurricanes Irma and Maria, which damaged 30 million of Puerto Rico's trees, by training the island's producers and manufacturers on sustaining and improving the viability of forestry and agricultural production, soil and water resources, and food security given climate variability and change. The Northern Plains Climate Hub developed the Grassland Productivity Forecast, an online tool that enables ranchers to predict the amount of vegetation on rangelands. Over the course of five years, the Climate Hubs have provided technical expertise to more than 17,000 people through hundreds of webinars and podcasts; 410 peer-reviewed publications and 690 other papers; education of more than 15,000 youth through more than 50 events; and formal curricula for a wide range of people including K-12 students and USDA staff.

- **D.O.E Advanced Research Projects Agency-Energy (ARPA-E)** funds projects that develop new ways to generate, store, and use energy in an effort to reduce greenhouse gas emissions. These projects advance clean energy use and can potentially bring said practices into commercial use. Since 2009, ARPA-E has provided approximately $2 billion to transformative energy and technology projects.

- **US Geological Survey Climate Adaptation Science Centers** is a network of collaborative science centers that provide data and tools on the informational needs of natural and cultural resource managers to understand the impacts of climate change on fish, wildlife, ecosystems, and the communities they support.

- **Green Racing.** This program, sponsored by the EPA, DOE, and Society of Automotive Engineers (SAE) International, uses motorsports competitions to promote the development of cleaner, fuel efficient technologies that can be used in consumer vehicles. The program prompts the motorsport industry to use clean fuels to gain the highest performance with the lowest environmental impact.

- **National Labs**. The US Department of Energy houses 17 national laboratories. These labs are conducting significant research and demonstrations on critical energy and climate change solutions technology. As examples:
    - The National Renewable Energy Lab, as its name implies, is at the forefront of breakthroughs needed to continue the acceleration of renewable energy deployment.
    - The Idaho National Lab has important demonstration capacity for advanced nuclear development.
    - The Oak Ridge National Lab conducts important research on carbon capture and fossil fuel efficiency and
    - The Pacific Northwest National Lab is looking closely at building efficiency. These labs continue to provide high value.

- **Council on Environmental Quality (CEQ)** was established in the Executive Office of the President by the National Environmental Policy Act of 1969 (NEPA), and it oversees the implementation of this act. The CEQ coordinates federal environmental efforts and advises the President on national and international environmental policy matters. Furthermore, the CEQ works closely with agencies and other White House offices to develop environmental policies.

Natural Infrastructure

As noted by other Working Groups in previous Election 2020 reports, there appears to be widespread agreement in the United States that the nation has a significant need for additional investments in infrastructure. The most recent Infrastructure Report Card from the American Society of Civil Engineers (ASCE), which gives the nation's infrastructure overall a grade of D+. In their scoring, a D is considered poor; a C, mediocre; a B, Good; and an A, Exceptional. Table 1 shows the grade for 16 different categories of infrastructure. Rail scores the highest, with a B. No other category scores higher than a C+.

Infrastructure Category and Grade	
Aviation: D	Parks and Recreation: D+
Bridges: C+	Ports: C+
Dams: D	Rail: B
Drinking Water: D	Roads: D
Energy: D+	Schools: D+
Hazardous Waste: D+	Solid Waste: C+
Inland Waterways: D	Transit: D-
Levees: D	Wastewater: D+

Table 1. Infrastructure Report Card

Investments in these areas can deliver significant economic, environmental, and social benefits. Although infrastructure investments

are a generally acknowledged need, there are disagreements about exactly how much is needed, how it should be funded, and what its focus should be. This Working Group was not charged with evaluating national infrastructure needs or recommending a new national infrastructure program or a specific investment level. However, if the Administration and Congress in 2021 choose to undertake major investments in American technology, research and development, manufacturing, and infrastructure, they should link that investment strategy to the role of natural systems in supporting alternative approaches to infrastructure, such as coastal risk reduction, water purification, flood management, and other purposes. A growing body of research suggests such infrastructure, either in combination with traditional "hard infrastructure" such as levees and sea walls, or as a "whole solution" can be cost-effective and efficient, while providing multiple benefits beyond the direct infrastructure services.

For example, one 2015 study by The Nature Conservancy and CH2M Hill studied the costs and benefits of investing in varied flood risk-reduction projects in Howard Beach, Queens, NY. The study analyzed the cost-benefit of two natural infrastructure projects, two hybrid natural and grey infrastructure projects, and one grey infrastructure project as alternatives. The study found that a hybrid project, in that case, could provide the greatest community flood protection, while also bringing environmental benefits.

The federal government over many Administrations has made modernizing the infrastructure permitting process a cross-agency priority by enlisting a core group from the Office of Management & Budget (OMB), the Council on Environmental Quality (CEQ), the Federal Permitting Improvement Steering Council (FPISC) that is partnering with the Departments of Energy, Defense, Homeland Security, Agriculture, Interior, and others. In the Obama Administration, the Council on Jobs and Competitiveness helped to develop a Presidential Memo to the agencies on expediting permitting processes. The goal of expediting reviews struggles to balance the need to create predictable timelines with, at the same time, assuring social and environmental impacts are adequately considered and mitigated when not avoidable. On July 16, 2020, the Council on

Environmental Quality finalized its National Environmental Policy Act (NEPA) rules, imposing time and page limits on environmental impact statements (EISs). But, with a lack of policy convergence on the balancing of time and page limits with the need to fully disclose potential impacts, litigation is likely. More work is recommended to build needed policy convergence. Other major permitting processes, including state actions, still need coordination. At the end of Q3 of FY 2020 (April - June), an OMB scorecard showed 48 major infrastructure projects (MIPs) being tracked on the permitting dashboard.

Currently, a number of federal agencies have undertaken interagency efforts to use natural infrastructure to promote climate resilience. Significant examples include:

- **Green Infrastructure Collaborative.** In 2014, EPA joined with other federal agencies, nongovernmental organizations, and private-sector entities to form the Green Infrastructure Collaborative, a network-based learning alliance created to help communities more easily implement green infrastructure. Other agency partners include U.S. Department of Agriculture, U.S. Department of Defense, U.S. Department of Energy, U.S. Department of Housing and Urban Development, U.S. Department of the Interior, and U.S. Department of Transportation. Additional partners in the Collaborative include: National Association of Clean Water Agencies, Natural Resources Defense Council, Low Impact Development Center, and Association of State and the Interstate Water Pollution Control Administrators. The Collaborative works together and shares resources, tools, and research to advance green infrastructure implementation.

- **National Coastal Zone Program.** This voluntary partnership between the federal government and U.S. coastal and Great Lakes states and territories was authorized by the Coastal Zone Management Act (CZMA) of 1972 to address national coastal issues. The program is administered by NOAA. Key elements of the program include protecting natural resources, managing development in high hazard areas, giving development priority to

coastal-dependent uses, prioritizing water-dependent uses, and coordinating state and federal actions. Each state prepares and submits reports evaluating their accomplishments within the program roughly every two years.

- The **Engineering with Nature Program** at the Army Corps of Engineers begin in 2010 to align natural and engineering processes with a goal of collaboratively delivering "economic, environment, and social benefits." In January of 2019, this program launched its Engineering With Nature book, "An Atlas," which brings attention to successful projects and inspires readers with the possibilities that come from engineering with nature. The Army Corps of Engineers also recently launched a partnership with the University of Georgia to establish the Network For Engineering With Nature. The $2.5 million award will help develop a "clearinghouse for tools, products and outreach for researchers and practitioners" from a wide variety of organizations. EWN also launched its Engineering With Nature Podcast.

- **Gulf Coast Ecosystem Restoration Council** was established by the RESTORE Act in July 2021. The Council works to restore the Gulf Coast's natural ecosystem that was previously disrupted by the Deepwater Horizon oil spill, and ultimately, to improve the region's climate resiliency. The Gulf Coast Ecosystem Restoration Council is a state and federal intergovernmental body made up of governors and federal agency secretaries and serves as a model for governmental coordination in this area.

Renewable Energy Siting Decisions

Federal agencies are promoting renewable energy siting and decarbonization by funding state, local, and community projects. The next step could be more action within or administered directly by the federal government. The next Administration, whether re-elected or new, should consider re-introducing approaches pioneered by the Department of the Interior regarding siting of renewables on federal lands using a large-scale spatial planning approach such as was applied in a collaborative effort

with the State of California in the Desert Renewable Energy Conservation Plan. Recent research by The Nature Conservancy also demonstrates significant potential for siting renewable energy on degraded, reclaimed mine land sites.

Key activities and examples in this area include:

- **EPA Brownfield Program** empowers states, communities, and other stakeholders to work together to assess, safely clean up, and sustainably reuse brownfields. This is accomplished through different grants. Other federal agencies provide financial and technical assistance to communities for brownfields and land revitalization projects. Several other key agencies have programs that support the conversion and restoration of brownfields:

    - **USDA Response and Restoration Programs (R&R):** USDA R&R assists and serves as the point of contact for communities needing assistance with Brownfields projects. USDA is also a key federal partner in the national Brownfields program that is managed by the EPA.

    - **U.S. Department of Transportation:** The Federal Highway Administration funds research to understand how transportation infrastructure can facilitate the redevelopment of brownfields. Consequently, several states, including New Jersey, Oregon, and Missouri, are using federal highway funds to redevelop brownfields while improving the transportation system.
    - **U.S. Department of Labor:** The agency's mission and discretionary grants often support local redevelopment efforts that require workers who are trained to clean and redevelop brownfields. The job training grants and technical assistance issued to states and localities by the DOL often end up subsidizing the conversion of brownfields.

- **U.S. Department of Housing and Urban Development:** the agency provides nationwide block grants for community development, which can be and are often used to clean and repurpose brownfields.

- **Department of Health and Human Services, Office of Community Services:** the agency provides job training grants which often create jobs in brownfield cleanup. U.S. HHS also provides grants to community development corporations that can repurpose brownfields.

- **EPA Superfund Sites:** Officially known as the Comprehensive Environmental Response, Compensation and Liability Act, Superfund gives the EPA the funds and authority to clean abandoned or improperly managed sites that have been contaminated with hazardous waste. There are superfund sites in almost every state, and there are seventy-five sites that are producing or planning to produce renewable energy. Superfund sites have great potential for siting renewable energy technology, and they help communities create jobs and diversify the economy.

- Although most production of both fossil fuel and renewable energy sources take place on land, the federal government also maintains vital oversight responsibilities for both forms of offshore production. Major reorganization of responsible federal units within the Department of Interior occurred after the 2010 Deepwater Horizon disaster, and a 2017 Academy study examined progress and enduring challenges facing the Bureau of Safety and Environmental Enforcement as oil and gas production appeared likely to increase and expand to a broader set of coastal regions. However, BSEE also maintains formal authority for offshore siting of wind turbines and many coastal states have begun to both study the potential for this source and also design supportive policy.

Forest and Ecosystem Health

The federal government has four agencies responsible for managing approximately 610 million acres of public land held by the U.S. government:

- Bureau of Land Management (BLM): 248 million acres (10.5 percent of all land in the country);

- U.S. Forest Service (USFS): 193 million acres (8.5 percent);

- U.S. Fish and Wildlife Service (USFWS): 89 million acres (3.9 percent); and

- National Park Service (NPS): 84 million acres (3.7 percent of the country).

This means that federal agencies can have a significant impact on climate change based on the way that they manage public lands under their control. Key activities and examples in forest and ecosystem health include:

- **Cooperative Forestry Unit**. The USDA Forest Service works closely with partners to enhance and maintain forests across watersheds and ecosystems, both on private and public land, for the benefits they provide to the American people by leveraging additional resources and fueling innovation. The Cooperative Forestry Unit consists of several individual programs, most of which require a government or organization to propose a project for which they need funding. The programs promote conservation of landscapes and wildlife, protect cultural heritage (tribes), enhance community resilience, and provide technical assistance. Programs include the Urban and Community Forest Program, Community Forest, and the Open Space Conservation Program

- **National Cohesive Wildland Fire Management Strategy.** The U.S. Forest Service and other federal, tribal, state, and local partners work together to promote resilient landscapes, fire adapted

communities, and safe and effective wildfire response. The federal partners include the Bureau of Land Management, Bureau of Indian Affairs, U.S. Fish and Wildlife Service, National Park Service, U.S. Fire Administration (FEMA), Department of the Interior Office of Aviation Services, National Weather Service, and the U.S. Military.

- **National Wildlife Refuge Comprehensive Conservation Plans.** Local communities, state conservation agencies, and partners such as Defenders of Wildlife play an active role in working with wildlife refuges to develop their comprehensive conservation plans (CCPs). The National Wildlife Refuge System Improvement Act of 1997 mandates that every wildlife refuge complete such a plan every 15 years, as needed. In developing these CCPs, refuges create a framework to improve the condition of habitats and restore the ecological integrity of the refuge. CCPs lay the groundwork to shape the future of wildlife conservation in America. Federal partners include the National Wildlife Refuge System, governed by the U.S. Fish and Wildlife Service.

- **National Park Service Management Plans.** These plans provide basic guidance for how the 421 park units (including large national parks as well as smaller cultural sites) on 85 million acres in all 50 states carry out their statutory responsibilities for protecting park resources unimpaired for future generations while providing for visitor use and enjoyment. The Service develops many different types of plans, such as general management plans, wild and scenic river plans, wilderness plans, and others.

- **EPA National Estuary Program.** The EPA has designated 28 estuaries as National Estuary Programs (NEPs) in accordance with section 320 of the 1987 Clean Water Act. The purpose of the designation is "to protect and restore the water quality and ecological integrity" of these 28 nationally significant estuaries. NEPs partner with state and local agencies, universities, and individual nonprofits. Each estuary develops and implements a Comprehensive Conservation and Management Plan (CCMP) and receives funding, guidance, and technical assistance from the EPA. Examples of NEPs include the San Francisco Estuary Partnership,

the Massachusetts Bay National Estuary Program, and the San Juan Bay Estuary Program. NEPs involve community members to tailor their CCMP to the local context.

- **BLM National Landscape Conservation System.** The National Landscape Conservation System (NLCS) oversees 873 federally recognized areas that span 35 million acres, or 10% of the 258 million total acres managed by the Bureau of Land Management (BLM). The NLCS defines its mission as conserving, protecting, and restoring these nationally significant landscapes. These areas can be designated as one of 10 units, including national monument, wilderness area, national historic trail, and forest reserve. The system was created by an administrative order of the Secretary of the Interior in 2000, codified by an act of Congress in 2009.

Federal Grants

Key grants and programs in this area include:

- The **Indian Environmental General Assistance Program (GAP)** authorizes EPA to provide grants to federally recognized tribes for planning, developing, and establishing environmental protection programs in Indian country, and for developing and implementing solid and hazardous waste programs on tribal lands. In 2020, EPA released the GAP Success Stories web app that highlights environmental progress made using this program.

- **EPA Grants to States and Tribes** cover a variety of purposes relating to climate change, including for air quality, transportation, climate change, indoor air and other related topics.

- The **BIA Tribal Resilience Program,** through the Bureau of Indian Affairs (BIA), provides resources to federally recognized Tribal Nations and Alaska Native Villages for projects and training programs that promote climate resilience and curtail harmful environmental trends. The program also includes a specific initiative to encourage tribes to pursue ocean and coastal resiliency. In 2020, the BIA Tribal Resilience Program awarded a

little over $14 million in funds for 159 projects, including drought resiliency workshops in the Choctaw nation and an evaluation of the Kuskokwim Watershed.

- The **U.S. Fish and Wildlife Service Cooperative Endangered Species Conservation Fund**, established in the Endangered Species Act, provides grants to states and territories that engage in voluntary conservation projects for endangered species. This program funds conservation actions taken on non-Federal lands. USFWS recognizes that successfully protecting endangered species depends on cooperative efforts with landowners and communities on private lands, but these grants are given to states because states play an integral role in beginning these local efforts.

- The **U.S. Fish and Wildlife Service State Wildlife Grant Program** provides funds to state fish and wildlife agencies so they may formulate and implement programs that benefit wildlife and their habitats, including species that are not hunted or fished. Grants can be used to address a variety of conservation efforts, such as research, species restoration, habitat management, and monitoring, that are identified in a State's Wildlife Action Plan. SWG funds can also be used to update, revise, or modify a State's Plan. Congress appropriates funds for the SWG Program annually.

- The **U.S. Fish and Wildlife Service Tribal Wildlife Grant Program** allocates funds to federally recognized tribal governments so they may formulate and implement programs that benefit wildlife and their habitats, especially wildlife that is of significant importance in Native American culture. The funds are provided through the annual appropriation from the Land and Water Conservation Fund.

- The **U.S. Fish and Wildlife Service National Coastal Wetlands Conservation Grant Program** annually provides millions of dollars to coastal states, Great Lakes states, and U.S territories so that they may restore and enhance coastal wetland ecosystems.

These grants are funded through the Sport Fish Restoration and Boating Trust Fund. The coastal states and territories eligible for this program include states such as Delaware, Michigan, Washington, Texas, South Carolina, and New York. The National Wetlands Conservation Grant Program was founded on the understanding that coastal wetland conservation is critical to the well-being of wildlife and coastal communities for future generations. In accordance with this mission, USFWS awarded $18 million to support 22 projects in 10 coastal states in 2020. State and local governments, private landowners, conservation groups, and other partners contributed more than $12.2 million in supplementary funds to these projects. These projects represent 8,000 acres of coastal wetlands and adjacent upland habitats.

- The **North American Wetlands Conservation Act (NAWCA**, enacted in 1989, authorized the USFWS to provide matching grants to wetlands conservation projects in the United States, Canada, and Mexico. NAWCA was passed, in part, to support activities of the North American Waterfowl Management Plan, an international plan to protect the upland habitats of migratory birds in North America. Therefore, NAWCA grants are intended to increase bird populations and wetlands, while also supporting local economies. Wetlands protected by NAWCA provide climate resiliency measures, such as flood control and reducing coastal erosion. Projects and funding under this program are reviewed by the North American Wetlands Conservation Council and the Migratory Bird Conservation Commission, both established by NAWCA. In the past two decades, the North American Wetlands Conservation Act "has funded over 3,000 projects totaling $1.83 billion in grants."

- The **U.S. Forest and Wildlife Service Partners for Fish and Wildlife Program** provides technical and financial assistance to landowners who are voluntarily restoring and enhancing wildlife habitat on their land. Since the program was established in 1987, it has helped approximately 50,000 landowners to finish 60,000

restoration projects. Because private land-owners manage more than two-thirds of America's land, this program recognizes the importance of private landowners to the health of the country's fish and wildlife.

- The **National Oceanic and Atmospheric Administration Coastal Resilience Grants Program**, administered by NOAA's National Ocean Service and NOAA Fisheries, awards funding to projects that build resilient U.S. coastal communities and ecosystems. U.S. states and territories, higher education institutions, nonprofit and for-profit organizations, Native American tribes, and local governments are eligible for this grant program. In March of 2020, the 2020 Emergency Coastal Resilience Fund was added to this program. This emergency fund aided projects that received presidential disaster declarations related to Hurricanes Florence and Michael, Typhoon Yutu, and the coastal California wildfires in 2018.

RECOMMENDATIONS FOR STEWARDING NATURAL RESOURCES AND ADDRESSING CLIMATE CHANGE

The Administration in 2021 will have a significant opportunity to move forward with strategies, programs, and initiatives to improve stewardship of natural resources and address climate change. This Working Group recommends that the initial actions of the Administration in 2021 should rest on the pillars of expanding federal research and demonstration on climate solutions and technology, embracing natural infrastructure to promote climate resilience, expediting renewable energy siting decisions, enhancing forest and ecosystem health, and improving interagency and intergovernmental coordination. Existing laws provide authority for recommendations here. For example, the Clean Air Act following EPA's endangerment finding and the Supreme Courts's ruling in *Massachusetts v. EPA*, requires the consideration of greenhouse gasses as pollutants and consequently allows provisions in permitting programs to provide requirements for efficiency and greenhouse gas

controls/minimization. In addition, EPA is required under the Clean Air Act, to develop standards for greenhouse gas emissions from mobile sources, such as passenger vehicles and trucks.

The Working Group recognizes that coordination across the many federal programs is essential for progress on natural resource stewardship and climate solutions and therefore offers an overarching recommendation. There have been many approaches to enhance and focus coordination. The Executive Office of the President (EOP) is made up of many coordinating councils including for example the National Economic Council, the National Security Council, the Domestic Policy Council, the Council on Environmental Quality and the Office of Science and Technology Policy. All of these councils have significant portfolios in their areas but have three things in common:

1. They are designed to coordinate involved cabinet and subcabinet agencies.
2. They have strong interests in natural resources and climate change; and
3. They themselves are managed by the President's Chief of Staff (COS).

Creating another council or appointing another individual coordinator would be creating a peer to these councils. That can be helpful, and was helpful in the past, but a stronger approach would utilize the existing chain of command, make the COS directly responsible for these councils, and create a new Deputy Chief of Staff for Climate Change. As we outline below in all of the areas of recommendation, enhanced interagency coordination and collaboration among federal agencies will be key to progress. Hence, this recommendation underpins all of our additional recommendations below.

The Working Group also recognizes that a more comprehensive set of actions will be required to truly address climate change both domestically and internationally. The recommendations presented here

should be seen as a starting point for a longer-term agenda to deal with this Grand Challenge.

RECOMMENDATION 1: Optimize and Expand Federal Research and Demonstration on Climate Solutions and Technology to Reduce Greenhouse Gas Emissions

The Administration in 2021 should enhance federal research on climate solutions and technology by:

- **Empowering and effectively resourcing such agencies as ARPA-E, DOE National Labs, NASA, NOAA, USDA Climate Hubs, and EPA** to ensure that the nation has the needed basic research capacity and can conduct demonstrations on climate solutions and technology.

- **Strongly supporting and enhancing coordination between the National Labs, housed in the Department of Energy.** These Labs have the capacity to deliver meaningful and timely research on, and demonstration of, climate solutions. Extending relations with universities will further enhance the opportunities.

- **Under the auspices of the President's COS office, assuring coordination in research and demonstration** with federal land management in the areas of resilience planning and adaptation, batteries, carbon capture, hydrogen, advanced nuclear, manufacturing improvements, advanced renewable technology, and power grids.

- **Conducting research to identify the most effective innovative land management approaches** to enhance adaptation and resilience, and to ensure that the nation's forests are a net sink of greenhouse gas emissions.

- **Conducting research, building on many existing efforts, to take advantage of recent technological advances**—drones, satellites, and other techniques—to build a more reliable measurement system, particularly as the United States seeks to expand natural gas export markets but faces growing concerns about methane release levels from potential importers with rigorous climate regimes. Methane releases from oil and gas production on both public and private lands are an example of where stronger federal science and demonstration efforts can accelerate action. Major advances in technology that can detect and measure methane releases have not yet been transferred into federal and state agency practice and represent important opportunities for the United States to begin to develop world-class capacity to accurately measure methane losses and target strategies to minimize waste.[2]

- **Increasing outreach to land grant colleges and others** that are working on natural resources and climate solutions research. This should include bringing universities with strengths in community planning and social sciences more completely into the discussions on technology. Focus on equity and community impacts to assure just transitions and benefits are equitably distributed.

[2] These releases remain an ongoing challenge and provide an opportunity for constructive federal oversight. Methane has more than 25 times the global warming capacity of carbon dioxide during its first century in the atmosphere and is estimated to have triggered one-quarter of the global warming that has already occurred. It also contributes to air quality concerns that include volatile organic compounds. Moreover, methane is the constituent element of natural gas and so its direct release into the atmosphere through venting or conversion into carbon dioxide through flaring represent the permanent waste of a natural resource that has energy value and a loss of royalty and state severance tax revenue. A diverse set of studies in the past several years confirm that methane releases from the oil and gas sector greatly exceed reported data, including the vast reserves of the Bakken and Permian Basins where gas production can rapidly supplant oil output and often lacks proper measurement and capture capacity for sale and ultimate use to minimize waste.

- **Advancing agricultural sequestration strategies** through practices that improve soil health and retain and store more carbon.[3]

- **Conducting federal research on technologies that will provide the nation with net reduction options** for greenhouse gasses (bioenergy with carbon capture, for example or direct air capture).[4]

- **Beginning the development of a systematic inventory of orphan wells and a constructive intergovernmental plan** to pursue closure to reduce climate, air quality, and safety risks from these facilities.[5]

RECOMMENDATION 2: Embrace Natural Infrastructure as a Key Contributor to Climate Resilience

The Administration and Congress in 2021 should take the following steps:

- **Create a career SES-level working group to address climate resilience and natural infrastructure** under the auspices of the

[3] Improving soil health on U.S. agricultural land holds the potential for achieving meaningful conservation and economic benefits, as well as mitigating the growing threat of climate change. The Conservancy scientific analysis suggests that managing for soil health serves as a nexus for achieving increased production while reducing the societal and environmental impacts of the current U.S. row crop production system. For more information, see this Nature Conservancy report on pathways to improving soil health; https://www.nature.org/content/dam/tnc/nature/en/documents/rethink-soil-executive-summary.pdf

[4] Given that many of the decarbonized energy scenarios rely on some sort of carbon removal strategy, it is critical that these technologies be ready in the next decade.

[5] Currently, neither state nor federal governments have been able to develop robust programs to seal orphan wells, abandoned units that continue to release methane for decades after production ends. The recent proliferation of oil and gas-sector bankruptcies raise additional questions about long-term site stewardship. Varied government estimates of the current number of orphan wells ranges from a half million to more than three million.

Deputy Chief of Staff for Climate Change recommended earlier, taking stock of the many federal programs that touch on the topic and enhancing effectiveness through coordination and enhanced information sharing.

- **Utilize recovery programs** under the Stafford Act to help communities make natural infrastructure enhancements following disasters and apply what is being learned before another disaster.

- **Sustain and enhance the Army Corps of Engineers' initiative on Engineering with Nature.** The Administration has a great opportunity to learn from these efforts and apply these ideas to other existing federal planning and land management actions.

- **Provide additional funding for the conservation reserve programs**[6] of at the USDA Natural Resources Conservation Service[7] and the Department of the Interior.

- **Establish incentives in federal procurement programs through the General Services Administration**, for the use of lower carbon products.

- **Develop tools through a multi-agency effort to assess and address the disproportionate impact of climate change** on

[6] The Conservation Reserve Programs provides financial incentives through payments, to keep highly erodible and ecologically sensitive farmlands out of production to provide a broad set of complementary conservation objectives, including carbon sequestration. https://sustainableagriculture.net/blog/climate-and-ag-in-2016/ https://www.fsa.usda.gov/Internet/FSA_File/606586_hr.pdf

[7] For example, the Natural Resources Conservation Service (NRCS) issues grants that support large-scale demonstration projects that will accelerate the adoption of new and innovative approaches to reduce greenhouse gas (GHG) emissions and promote carbon sequestration on America's private lands.

frontline communities and those historically marginalized in planning processes.

- **Develop a labeling program for carbon content** (like calories) and natural resource attributes of major products, including, for example, the carbon required to make the product.[8]

- **Build on efforts of the Restore Council created after the BP oil spill**, which includes resilience for climate change as one of its criteria, in deciding which projects to fund.

- **Begin the development of a strategy and near-term steps for a long-term grid modernization** that will develop and implement the needed charging infrastructure to allow for the electrification of transportation, integrate variable renewable energy into electricity grids, and enhance opportunities for energy efficiency through the use of advanced technology.

- **Play an active role in supporting climate-resilient planning** for new projects and for adapting existing ones by expanding and utilizing Community Development Block Grants. Many of the impacts of climate change pose direct threats to critical infrastructure in water, energy, transportation, and communications. Among these threats are the effects of extreme weather and heat, flooding, and sea level rise.

RECOMMENDATION 3: Coordinate and Expedite Renewable Energy Siting Decisions to Accelerate Decarbonization of the Power Sector, including a focus on siting on degraded lands

The Administration and Congress in 2021 should take the following steps:

[8] Such Environmental Product Declarations are beginning to be developed (for example, see California's Buy Clean program or the International EPD concepts https://www.environdec.com/What-is-an-EPD).

- **Utilize spatial planning** to efficiently and effectively identify low-impact areas, lands previously modified for agriculture, infrastructure, and other development activities, that can serve as renewable energy sites. Key low-impact area sites include superfund sites, reclaimed mine lands, orphan wells, and brownfields, all of which can be used to avoid or minimize conflict and accelerate the clean energy transition.[9]

- **Strengthen coordination with state, local, and Tribal siting programs** to ensure that federal, state, and local decisions work together to advance the goal of enhancing renewable energy siting decisions.

- **Establish renewable energy projects and related essential infrastructure (such as transmission lines) as high priorities** within existing interagency efforts to accelerate infrastructure projects and investment.

- **Utilize biodiversity offsets to enhance habitat.** In the United States, under section 404 of the Clean Water Act, government agencies are required to mitigate the disturbance or destruction of wetland, stream, or endangered species habitat. Biodiversity offsets are "measurable conservation outcomes designed to compensate for adverse and unavoidable impacts of projects" such as the building of new infrastructure, according to the International Union for Conservation of Nature (IUNC). The goal of any biodiversity offset is to achieve No Net Loss (NNL) or even a Net Gain (NG) in biodiversity. Through a system known as "mitigation banking," developers may buy and sell credits that permit such projects. More common in the realm of habitat enhancement is voluntarily developed offsetting, whereby industrialists choose to

[9] There is a good discussion of what types of lands constitute low-impact areas comes from the Nature Conservancy's report: https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_CleanAndGreen_Full

offset the impacts of projects with other habitat enhancing mechanisms. Federal agencies should seek to foster greater connections with industry leaders to encourage such voluntary offsets.

- **Expand efforts to expeditiously complete any needed impact reviews for offshore permitting for large-scale wind turbines.** Offshore renewable energy projects have unique siting and permitting challenges. As discussed earlier in this paper, the Department of Interior's Bureau of Safety and Environmental Enforcement will need to accelerate the diversification of its expertise and capacity to deal with the growing potential and demand for a more varied set of ocean-based energy production in future decades, especially large-scale wind.

- **Continue to provide financial incentives**, including production tax credits and investment tax credits, for renewable energy infrastructure.

RECOMMENDATION 4: Undertake a National Effort to Enhance Forest Health to Build Resilience to Wildfire, Enhance Natural Carbon Storage, and Strengthen Habitats

Through effective management of our public lands, the nation has the opportunity to conserve nature and slow deforestation; enhance reforestation; enhance protection and restoration of wetlands, grasslands and other ecosystems; and enhance their carbon sequestration capacities. The EPA Greenhouse Gas inventory shows the important role land use plays as a "sink" for carbon. In 1990, total greenhouse gas emissions were 6,437 million metric tons (MMT). Carbon sinks were 853 MMT making the net emissions 5,583 MMT a 13% reduction. In 2018 (the latest inventory) total emissions rose to 6,676 MMT with carbon sinks dropping to 773 MMT or 11%, so net emissions were 5,903 MMT. We are losing ground on sinks and the recent wildfires are likely making that even more

problematic. We need to focus on both reducing emissions and increasing sinks to get to net zero by mid-century.

The Administration and Congress in 2021 should take the following steps:

- **Reinvigorate and strengthen collaboration on forest health and wildland fire management through the Wildland Fire Leadership Council**, an interagency and federal, state, Tribal and local group. There are many tools to use, including the Shared Stewardships and "Good Neighbor Authority" under the 2014 Farm Bill that allows state, tribal and federal land managers to work together in a focused and shared set of actions.

- **Provide significant financial and institutional support to the National Cohesive Wildland Fire Management Strategy** and increase its focus on carbon sequestration. It is critical that coordination between state, tribal and federal forest managers find the balance of management approaches that maximize forest carbon sequestration while minimizing forest fire risk. Growing the sink capacity to cover the increasing emissions from wildfires is an essential ingredient for growing the carbon sink capacity of U.S. land.

- **Make use of the USFS Coordination and Expand Shared Stewardship Agreements.** In the U.S., about 56 percent of forest lands are privately owned, but that varies from region to region. For example, the 62,000 square mile Chesapeake Watershed is 60 percent forested, and 80% of that is privately owned, with the bulk of the forest lands being in 5 states: NY, PA, MD, VA and DE. Forest land managers face a range of urgent challenges, among them catastrophic wildfires, more public demand, degraded watersheds and epidemics of forest insects and disease – all exacerbated by increasing climate change impacts. The USDA Forest Service is using a Shared Stewardship Strategy that has a

structured, outcome-based framework to set priorities with partners to improve forest conditions. This effort can be expanded and can increase its focus on forest carbon sequestration capacities. Congressional attention to increased funding will create significant incentives for expanding these stewardship agreements.

- **Manage federal forest land to become more resilient to wildfire and a net absorber of carbon.** All of the 155 National Forests must have a management plan. Coordinating with partners under the Shared Stewardship efforts is essential, but the foundation of many of those partnerships with state and private land owners will be the management plans for the National Forests. Building fire management and carbon sequestration goals into the plans along with habitat and recreational uses will be essential.

- **Authorize a USDA third party certification system to ensure the credibility of the accounting for the carbon sequestration of soil and vegetative land** such as forests. This will apply to forests, wetlands, grasslands and actively farmed and ranched lands. USDA should accelerate its work now on this effort and coordinate with other agencies like DOI and EPA as well as land grant colleges and universities. Congress has been active in this area with as-yet-unenacted bills such as the Grow Carbon Solutions Act. Getting private capital to flow to lands that increase carbon sequestration is vital, and credibility in the generated "credits" will accelerate the markets.

RECOMMENDATION 5: Improve Federal Coordination Across Federal Agencies and with States, Tribes, and Local Governments

To maximize both the effectiveness and efficiency of climate change mitigation efforts, the Administration in 2021 should leverage, modify, and rework existing programs and streams of funding between the federal government to states and tribes. Attempts to combat climate

change are not limited to allocating new funds because, with adaptations, current federal grants and infrastructure can lend themselves to reductions in emissions, carbon sequestration, and conservation of natural resources. Slowing the effects of climate change requires action from almost every industry, sector, and level of government.

The Working Group recommends that the Administration 2021 take the following steps:

- **Use the full authority of the Executive Office of the President** through the new Deputy Chief of Staff for Climate Change and new SES-level council to coordinate across the federal agencies.

- **Encourage or require that states and regions add greenhouse gas emissions to their decisions about funding eligibility under the Congestion Mitigation and Air Quality Improvement Program (CMAQ)**. Under the Federal Highway Administration, CMAQ "provides a flexible funding source to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act." When choosing projects to fund, state and Tribal governments can consider ancillary benefits such as greenhouse gas reduction, but these environmental benefits alone do not constitute eligibility for CMAQ. By allowing states and regions to award CMAQ funds only to projects that meet the jurisdiction's greenhouse gas emission standards, this existing program could facilitate more extensive climate change mitigation without additional appropriations.

- **Expand support for non-academic organizations to engage in natural resource and climate change research** through the National Institute of Food and Agriculture (NIFA). NIFA issues grants to states for climate change research relating to forest conservation and sustainable agriculture. However, the research must be conducted through land-grant institutions. Issuing these research grants to companies in the auto industry, oceanic conservation groups, or other non-academic organizations may lead to deeper, diverse knowledge and practical implementation of research findings.

- **Diversify the location of federal assistance by dividing the use of these funds between public and private lands**, leading to more innovative proposals and broader beneficiaries of climate improvements.

CONCLUSION

The Academy has identified stewarding our natural resources and tackling climate change as a Grand Challenge in Public Administration. Addressing this challenge will require a major national effort led by the federal government. States, tribes, cities and businesses all have significant responsibilities to their citizens, employees and customers. The ingredient of national leadership is essential to make it all work. The Working Group's recommendations can help the Administration in 2021 get started quickly. These recommendations can guide individual departments and agencies to take steps that will immediately help the United States address its urgent natural resources and climate change challenges.

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