

THE INVASIVE SPECIES THREAT: PROTECTING WILDLIFE, PUBLIC HEALTH,
AND INFRASTRUCTURE

Wednesday, February 13, 2019

United States Senate

Committee on Environment and Public Works

Washington, D.C.

The committee met, pursuant to notice, at 10:06 a.m. in room 406, Dirksen Senate Office Building, the Honorable John Barrasso [chairman of the committee] presiding.

Present: Senators Barrasso, Carper, Cramer, Braun, Sullivan, Boozman, Ernst, Cardin, Gillibrand, and Van Hollen.

STATEMENT OF THE HONORABLE JOHN BARRASSO, A UNITED STATES
SENATOR FROM THE STATE OF WYOMING

Senator Barrasso. Good morning. I call this hearing to order.

Today we will consider the scourge of invasive species, the species that threaten our communities and how we can most effectively combat them. This hearing will also continue the Committee's work to support successful efforts to conserve wildlife, build infrastructure, and protect the public health. Invasive species have significant impacts on all three of these areas.

Few issues are more bipartisan than the need to protect our communities from invasive species. Invasives are non-native species whose introduction causes harm to the local economy and the environment, and to human health. More than 5,000 invasive species exist in the United States. They cause more than \$120 billion of economic damage each year.

According to the U.S. Fish and Wildlife Service, "every region of the United States has invasive species problems." "Invasive species can be found," they say, "from Alaska to Louisiana and from Maine to Texas." They go on, "They can be found in our forests, fields, and wetlands, and in our streams, rivers, and bays, and even off of our coastlines."

Each year, hundreds of millions of dollars are spent in an

attempt to eradicate invasive species, and each year new threats for invasives immerge.

Like the rest of the Country, Wyoming finds itself coping with an extensive and expensive invasive species problem. Cheatgrass consumes vast amounts of water, degrades valuable soil and habitat, fuels catastrophic wildfires, and displaces vegetation, turning vibrant prairie communities into monocultures, leaving only cheatgrass as far as the eye can see.

Russian olive trees take over riparian areas across the State, absorbing massive amounts of water that would otherwise be used for wildlife and native species. The West Nile virus is transmitted by mosquitoes that infect birds and mammals, including humans. It is an invasive species according to the U.S. Department of Agriculture.

West Nile virus is the leading cause of mosquito-borne illness in humans in the United States. In 2018, 2,544 cases of West Nile virus were recorded and reported in 49 States, including Wyoming. West Nile virus affects horses, dogs, and other animals, and causes millions of dollars in losses associated with the treatment of the infection and even death.

The environmental costs of invasive species are real as well. According to the National Wildlife Federation, 42 percent of threatened or endangered species are at risk because of invasives. West Nile virus threatens species like the sage

grouse, which Wyoming and many other States are working hard to protect. The problem of invasive species is rampant and requires action.

Last Congress, this Committee examined innovative solutions to control invasive species, with the goal of improving wildlife conservation efforts. We heard about cutting-edge technologies to more effectively control invasive species, from smart fish passage systems to keep invasive species out, to DNA technologies that detect invasives earlier.

Together with Ranking Member Carper and several other Committee members, I introduced the Wildlife Innovation and Longevity Driver Act, called the WILD Act, to support efforts to combat invasive species in several ways, including by reauthorizing the Partners for Fish and Wildlife Program and by requiring Federal agencies to coordinate when planning and implementing invasive species-related activities. The WILD Act also incentivizes the development of cutting-edge technologies by establishing cash prizes for technological innovation in invasive species management.

In 2017, the WILD Act passed the Senate by unanimous consent. Last month, we reintroduced the WILD Act and last week we again reported this important bill unanimously from the Committee. Yesterday this bill passed the Senate as part of the Omnibus Public Lands package. I look forward to seeing it

passing in the House and being signed into law.

I look forward to hearing from our three witnesses today on what tools will be most helpful in protecting our wildlife, our infrastructure, and public health from the scourge of invasive species.

I would now like to turn to my friend and Ranking Member, Senator Carper, for his opening statement.

[The prepared statement of Senator Barrasso follows:]

STATEMENT OF THE HONORABLE THOMAS R. CARPER, A UNITED STATES
SENATOR FROM THE STATE OF DELAWARE

Senator Carper. Thanks, Mr. Chairman.

Before I introduce Joe Rogerson, my staff actually was kind enough to Google the Troggs, who came up with a great record called Wild Thing.

Senator Barrasso. Wild Thing. You owe me \$10. I told you he was going to talk about Wild Thing today.

[Laughter.]

Senator Carper. And the Troggs' original name was --

Senator Barrasso. I get \$100 if you sing.

Senator Carper. -- the Beatles.

[Laughter.]

Senator Carper. Wouldn't that be great? The Beatles. They changed their name to the Troggs. They would never get anywhere with that name.

Senator Barrasso. We could sing together.

Senator Carper. We could

Senator Barrasso. Let's not.

[Laughter.]

Senator Carper. Never let the Nation's business get in the way of some fun.

Joe, thanks for joining us. Terry and Slade, thank you all for coming today.

I want to thank our staffs for the work that they have done in preparing for this hearing.

Mr. Chairman, since our last hearing on invasive species in March of 2017, our Committee has worked across the aisle -- most people think we don't work across the aisle, but we actually do it pretty well in this Committee -- to try to address these challenges that these species create for our health, create for our infrastructure, create for native wildlife.

The WILD Act, which we reported out from our Committee last week, directs Federal agencies to manage proactively for invasive species and it creates a new Genius Prize, a Genius Prize to spur innovation in managing invasive species.

I am proud of our Committee's ongoing work on the WILD Act, and a lot of other things, too, and I urge its swift passage and enactment into law by this Congress.

Our 2018 Water Resources Development Act, which we enacted, the authorship of the Chairman and myself, and input from a lot of people on this panel and other places, too, affectionately known as WRDA, also included provisions to target invasive species in specific States, including the Asian carp in the Great Lakes.

Unfortunately, invasive species are still prevailing and wreaking havoc across our Nation. Delaware hosts both aquatic and terrestrial invasive species, such as catfish, crayfish, and

insects. Specifically, the Delaware Department of Agriculture has recently reported Spotted lantern flies sightings. These destructive insects could harm agriculture industries throughout our region.

The emerald ash borer also made its way to Delaware in 2016, and this kind of jewel beetle -- that is what it is called, a jewel beetle -- is not a welcomed jewel by those of us in the Diamond State. This beetle's path of destruction is broad, already causing the rapid decline of five species of North American ash trees across 35 States.

Ash wood is a valuable commodity for many reasons. It is used in baseball bats, among other items. This week, as pitchers and catchers of major league baseball teams across America are reporting for spring training, given that many of the bats those teams will be swinging come from ash trees in the United States, if we want to strike a blow for America's national pastime, we could start by making sure that this pesky beetle is called out on strikes and tossed out of the game for good.

Ash trees are also important in their ecosystems. Those trees filter air, mitigate stormwater runoff, sequester carbon, and they provide habitat for native moth, butterfly, and insect species.

Sadly, ash trees are not the only species that have

declined significantly due to invasive species. According to the National Wildlife Federation, invasive species have contributed to the decline of over 40 percent of threatened and endangered species, over 40 percent.

We have to do more to quell the growing threat of invasive species, and that includes addressing root causes. To that end, I would be remiss if I did not mention the role of climate change in the spread of invasive species. The Fourth National Climate Assessment, issued by 13 Federal agencies just last November, recognizes that climate change is causing conditions that may favor invasive species over native species.

As warming temperatures cause native species' ranges to shift, experts believe invasive species may come to occupy many new areas. For example, the Asian tiger mosquito, which carries West Nile and Zika viruses, may well expand into the Northeast in coming years. Climate change is an existential threat to our Nation and to our World, and the spread of invasive species is just one symptom of that problem and challenge.

In addition to considering root causes, there are creative ways we can adapt to deal with invasive species. A few months ago, I visited an Agricultural Research Service unit on the campus of the University of Delaware in Newark, Delaware, where I think Joe was a student and I was a graduate. We were both graduate students there at different times. He was there before

me.

Researchers at this facility study beneficial insects and are exploring options for releasing these natural predators where invasive species are present. The research takes many years to ensure that releasing new species will not have unintended consequences. When this method is successful, we can alleviate the need to eradicate invasive species in less environmentally friendly ways.

In conclusion, let me just say that each State is different. We face different challenges and hold different ideas regarding how to address invasive species, so I want to thank each of our witnesses for sharing your perspectives with us today. With your help and the help of other stakeholders and colleagues, I hope we can identify some new opportunities for bipartisan collaboration to combat invasive species.

We appreciate your leadership and interest, and I appreciate very much your leadership and interest here, Mr. Chairman.

[The prepared statement of Senator Carper follows:]

Senator Carper. I want to, if I could, at this time, just give a brief introduction of Joe Rogerson. Can I do that?

Senator Barrasso. Please do.

Senator Carper. Thank you.

This is the PG version.

Mr. Rogerson. Oh, boy.

Senator Carper. Joe was born in Maryland. What is it, Boonsboro?

Mr. Rogerson. Yes, sir.

Senator Carper. In the western end of the State?

Mr. Rogerson. Yes.

Senator Carper. He couldn't get into any schools in Maryland; he got wait-listed to all those schools, so he had to go to West Virginia University, where the president was Gordon Gee, who is the president again.

Gordon Gee was honored this week. He has been president of West Virginia University twice, Ohio State twice, Brown, Vanderbilt, and Colorado, and I think two nights ago, in Washington, D.C., he was honored as the outstanding college president in America. He is so good at raising money, he would walk into a room full of alum and they would pull out their wallets. For that and other reasons he has received this honor, and you have been honored to go to a school where he was your president and he is again.

But I am pleased to introduce Joseph to work for the Delaware Division of Fish and Wildlife since 2005. Came to Delaware to get his master's degree and found his master, a woman named Alison, who is the mother of their two children. They are almost five and seven years old. The seven-year-old goes to a charter school that I actually, as governor, helped to create, so it is a small world in Delaware.

Joseph oversees the implementation of Delaware's Wildlife Action Plan. He is also active in the Northeast Association of Wildlife Agencies in the Atlantic Coast joint venture. He received his bachelor's at WVU, master's degree at the University of Delaware in wildlife ecology, and we are just grateful that you are all here, and thank you, Joseph, for joining us.

Thank you.

Senator Barrasso. Thank you, Senator Carper.

We also have joining us Terry Steinwand, who is the Director of the North Dakota Game and Fish Department.

Senator Cramer, I invite you to introduce him, if you would like.

Senator Cramer. Thank you, Mr. Chairman.

Thank you, Terry, for being with us today.

It is a great honor to be able to introduce Terry. I have known Terry a long time. We worked together in State

government, prior to my coming here.

Terry is the truest of North Dakotans. He grew up on a grain farm near Garrison, North Dakota, in McLean County. Garrison is important for lots of reasons, not the least of which is it is the namesake of the Garrison Dam, which creates what we call Lake Sakakawea; people around here call her Sacagawea. Born in the outdoors and a fan of the outdoors, and now a protector of the outdoors.

Terry started his work at the Department of Game and Fish in North Dakota well over 30 years ago as a fisheries biologist and then eventually becoming the head of fisheries. Then, in 2006, our colleague, former Governor John Hoeven, appointed him to be the director of the agency. Since then, two more governors thought it was such a good idea, they have appointed him. I don't know if he is going to retire or die there, but we are glad you are there, Terry.

Terry brings an important perspective as an outdoorsman, a biologist, well educated at the University of North Dakota in fish and wildlife management and biology, with a master's degree in biology. He also brings an important perspective of how important collaboration and cooperation is among agencies and outdoorsmen and stakeholder groups.

We are grateful you are here, Terry. As you can probably tell from the earlier banter, we are a friendlier legislature

than the one you have to go back in Bismarck tomorrow, shall we say. With that, I am grateful you are here. Thank you. We welcome you.

Senator Barrasso. Thank you very much, Senator Cramer.

To the witnesses, your full written testimony will be made part of the official hearing record today, but I ask you to try to keep your statements to five minutes so that we have time for questions. We all do look forward to the testimony.

I would like, at this time, to introduce the witness from Wyoming who is here, Mr. Slade Franklin. He has served as the Weed and Pest State Coordinator at the Wyoming Department of Agriculture since 2004. In this role, Mr. Franklin has developed statewide invasive species management programs that have been integral to protecting the health of Wyoming's ecosystem.

He organizes, chairs, and facilitates groups concerned about invasive species, like the Wyoming Annual Grasses Task Force and the Wyoming Interagency Weed and Pest Working Group. He has chaired the Western Weed Coordinating Committee and the State Weed Coordinators Alliance.

In 2015, I was pleased that the Secretary of Interior agreed to my recommendation to appoint Mr. Franklin to serve as a member of the Invasive Species Advisory Committee. As a member of that Committee, Mr. Franklin provides information and

advice on invasive species-related issues to the National Invasive Species Council, which coordinates efforts to address invasive species issues at the national level.

Mr. Franklin has represented Wyoming well as a member of the Invasive Species Advisory Committee. I know we will all benefit from hearing about his extensive experience in fighting invasive species in Wyoming and the challenges that they pose to our State's wildlife, our infrastructure, and our public health.

Mr. Franklin, it is a privilege to welcome you here today as a witness before the Environment and Public Works Committee. Thank you for traveling to Washington, as well, when the legislature is in session at home. We are delighted to have you here with us today.

Mr. Franklin, please proceed with your testimony.

STATEMENT OF SLADE FRANKLIN, WEED AND PEST STATE COORDINATOR,
WYOMING DEPARTMENT OF AGRICULTURE

Mr. Franklin. Chairman Barrasso, thank you for the welcome. Ranking Member Carper, as well as other members of the Committee, thank you for the opportunity to speak with you today. As mentioned, my name is Slade Franklin. I serve as the Weed and Pest Coordinator at the Wyoming Department of Ag. For the past 15 years I have been working on the issue of invasive species in the State of Wyoming, the western region, and the United States.

Through my experiences, I have gained insight to the difficult task of managing invasive species. The extent of the problem is not just limited by industry, by location, or by economic impacts. Urban communities deal with the issue as much as the rural communities. Species like zebra and quagga mussels can impact water supplies for livestock and municipalities both. The impacts to the Country from invasive species are economically staggering.

Additionally, we are becoming more aware of the impact to our native wildlife. In the State of Wyoming and the Great Basin, invasive grasses such as cheatgrass and medusahead rye are altering critical habitat for sage grouse and mule deer by transitioning sage brush communities from a 50-year fire cycle to a 3-year fire cycle. The Bureau of Land Management reported

that in the last 20 years 74 percent of Department of Interior acres burned were on range lands, and 80 percent of those 12 million acres were on cheatgrass-invaded range lands.

In 2016, the Invasive Species Advisory Committee published a paper outlining the problem invasive species presents for the Country's infrastructure. The Committee reviewed four main categories: power systems, water systems, transportation systems, and housing. The Committee identified existing potential threats to each of the categories due to invasive species that range from mussels to insects, to animals such as burrowing iguanas and nutria. ISAC concluded that Federal agencies currently lack the authority necessary to effectively prevent, eradicate, and control invasive species that impact the human-built environment.

Invasive species not only impact infrastructure, they utilize it. In 1896, U.S. Department of Agricultural botanist Lester Dewey was requested by Congress to research how western States could eradicate the invasive weed Russian thistle. Russian thistle had been introduced in South Dakota through contaminated flax seed, and it quickly established itself throughout the West and Midwest. Some of you may recognize Russian thistle as the tumbling tumbleweed costarring in every western movie ever made.

In his report back to Congress, Dr. Dewey noted, "Next to

the railroad yards and the waste land in cities and villages, the roadsides are the most important avenues for the introduction of new weeds and for the propagation of old ones. They should, therefore, be watched with special care.”

Roads and rail lines are still one of the primary avenues by which invasive species move. We have watched invasive weeds such as yellow star thistle, an invasive plant that has infested over 14 million acres in California, creep its way east to Wyoming by following the interstates and highways.

Introduced terrestrial pathogens and diseases, such as West Nile virus, can have a direct impact on human health. In Wyoming, the first confirmed case of West Nile virus was reported in 2002. Since then, Wyoming, Montana, North Dakota, and South Dakota have some of the highest average annual incidents of West Nile virus or neuroinvasive disease reported to the CDC. The neuroinvasive disease can lead to encephalitis and meningitis, and, in extreme cases, death. Between 1999 and 2017, over 2,000 deaths had been reported to the CDC due to the West Nile neuroinvasive disease, with an additional 137 deaths reported in 2018.

As daunting as the task of managing invasive species can be, successful management is realistic and achievable through partnerships involving Federal, State, and county agencies, nongovernment organizations, land grant universities, and,

critically important, the private landowner. In the same 1896 USDA bulletin, Dr. Dewey states, "In nearly all cases, the landowner can do the work at much less cost than it can be done by public authorities." Federal and State government partners contribute greatly through their jobs and are deeply appreciated, but agricultural producers are passionate and financially motivated. Their livelihoods depend on healthy ecosystems.

The U.S. Fish and Wildlife Service's Partners for Wildlife and the U.S. Forest Service's State and Private Forestry Programs are essential tools in rewarding landowners in their habitat and weed management efforts that protect critical wildlife.

We need to continue moving the dialogue on invasive species forward as to what role we can play in improving success by identifying what resources are already in place and what additional resources are needed. Just less than 50 percent of Wyoming is managed by Federal agencies, and some of the most concerning infestations of terrestrial weeds occur on these public lands. When cross-jurisdictional programs are developed, local experts should be empowered by the respective Federal agencies to make critical time-sensitive decisions.

Capacity can be improved through policy and legislative changes, but it also needs to be improved through funding.

Invasive species programs have often relied on grants and short-term funding sources, which are helpful for immediate or initial treatments, but do little to assist with long-term program stability. Additionally, we need to improve funding for research and development in programs such as USDA-ARS and land grant universities such as the University of Wyoming.

New funding is not the only solution. In 2017, the National Interagency Fire Center reported firefighting costs were \$2.9 billion to fight fires across 10 million acres. This works out to a cost of \$290 per acre. The landscape scale herbicide treatment of cheatgrass costs, at most, \$60 an acre. Yet, agencies are only treating a fraction of the known infested acres. If the medical adage "prevention is better than the cure" is true, it may be time Federal agencies review how current firefighting funds are utilized and change the paradigm.

Chairman Barrasso, thank you again for the invitation to speak with your Committee. I would like to close by congratulating you on receiving the 2018 Wyoming Weed and Pest Council's Guy Haggard Award. We appreciate all the work you have done in helping bring national attention to this issue.

I look forward to your questions.

[The prepared statement of Mr. Franklin follows:]

Senator Barrasso. Thank you for your testimony.

Mr. Steinwand.

STATEMENT OF TERRY STEINWAND, DIRECTOR, NORTH DAKOTA GAME AND
FISH DEPARTMENT

Mr. Steinwand. Thank you, Mr. Chairman, Ranking Member Carper, and members of the Committee. I didn't write anything down; I like to adlib stuff. I will add right upfront that I am more of an expert on the aquatic side of invasives. We do deal with the terrestrial side also, but I will let the colleagues on either side of me deal with it.

I wish Ranking Member Carper were here, because he mentioned the emerald ash borer as being a devastating insect, and it absolutely is. But I just read an article last week, and I don't know if this is verifiable, if there is research, but out of Minnesota there was an article that stated once it hits 20 below, it starts affecting the larvae of emerald ash borer, which are right under the bark of the tree. Once it hits 30 below, 90 percent of the larvae are killed.

Well, being from North Dakota, we don't have emerald ash borer, and I would like to say that it is probably because we have 40 to 50 below temperatures up in North Dakota. That is not necessarily true; we have been relatively lucky.

Also, Mr. Chairman, you also mentioned about the monotypic stands, and I think you were probably referring to cheatgrass. That is also true in the aquatic world. Eurasian watermilfoil, curly leaf pond weed, we do have those in North Dakota, and they

form these monotypic stands and it hurts the aquatic side of it, too. My colleague, Mr. Franklin here, mentioned about the wildfires with cheatgrass. We don't have wildfires in the aquatic ecosystem, but what happens is they take over, they become a monotypic stand; it reduces the diversity of the vegetation and therefore reduces the forage species, insects for other sports species and other potentially endangered species.

Senator Cramer mentioned I am a farm boy. I am not a boy anymore, I am a lot older than that; I qualify by Social Security, but I love what I do, so I don't plan on taking Social Security for a while. But being a farm boy analogy, my dad never planted the same crop on the same land year after year, and it was for disease issues. I think we can say the same thing. You have that monotypic stand, you lose that diversity.

On any invasive species, if it can be found early, that is when your chances of eradicating it or controlling it are absolutely the best, or certainly enhanced in most cases. This really takes aggressive and sometimes constant monitoring of the landscape, again, whether it is the aquatic or the terrestrial ecosystem. Of course, that requires people and funding.

I just want to give you some examples of what do in North Dakota. We monitor high-value, high-risk areas. Again, Senator Cramer mentioned the Lake Sakakawea and Garrison Reservoir. We monitor that frequently with our colleagues from the Corps of

Engineers, local sportsmen's groups, so on and so forth.

We also contract with local college students in the eastern part of the State to have students go out and check boaters in some of these high-risk areas. It is not mandatory check in North Dakota, but check them, tell them how to check for vegetation and drain their live wells and their bilge water; and, at the same time, educate and inform them, because that has been our attitude. Education and information is maybe the best tool we have.

I will also give you some examples of what we don't catch early. Everybody has heard of the common carp. It has been in the United States since the 1800s, and my German ancestors brought it over because they were homesick for what they had back in Europe. We have problems with that in many places. In waterfall areas it can cause problems by rooting up the vegetation in their spawning activities. It does the same for the fishery side; they tend to take up that biomass, so it is almost impossible to control. We have controlled it with rotenone applications to kill it, but it is not specific to carp, so it kills the rest of the fish species.

One we did catch in time is the Eurasian watermilfoil. It was first found in a little sidewater of the Cheyenne River, which is in east central North Dakota, and we were a little concerned, but what we did is we have done surveys on where the

highest risk areas they come from, and it undoubtedly came from Minnesota at that point in time. We had found a small lake in southeastern North Dakota that was a real hotspot for Minnesota anglers to go to. Within two years, we had Eurasian watermilfoil there. What we did, we worked with the local water board, we drew down what was called Dead Colt Creek, trying to freeze it out because the literature said that will work. Then, the following spring we applied it with an herbicide. We did that for two years; it was eradicated and we have not found it there ever since.

Another issue we think we have caught in time is silver carp, a form of Asian carp. In 2011, there was a tremendous flood all across North Dakota. It actually moved up the James River from South Dakota into North Dakota and hit a dam, Jamestown Reservoir or Jamestown Dam, and we have been monitoring it very closely. We have not found any reproduction. We put some regulations in place that does not allow the public to take small fish out of there for bait to use in other waters, and, so far, we have not found it in any further places. There are big adults, but they are just getting larger.

Another one we think we have caught in time, and it is not just us, we worked with the North Dakota Department of Agriculture, is palmer amaranth. The first occurrence in North Dakota was found this last August. And if you don't know

anything about palmer amaranth, it is a species of pigweed that grows very aggressively, about 2 to 3 inches a day, can have a stem about that big, and produce up to a million seeds in the seed head. We coordinated with the Department of Agriculture right around the start of hunting season in North Dakota, and we figured if we could have thousands of boots on the ground in the form of hunters looking for those areas, then they could pull them in time, figure out exactly what it was; and, to our knowledge, there have been no further occurrences of that in North Dakota.

Zebra mussel, we do have it in North Dakota. That is one that we anticipated it coming because it was coming to a tributary of the Red River, which forms the border between North Dakota and Minnesota. We had found larvae for about four years, just not very many of them, the veligers, but in 2016, all of a sudden, we found adult zebra mussels. Not much you can do without very, very extensive means to take care of that, but we do know it is there, and we put some special regulations in place to ensure that water from the Red River does not move anyplace westward further into North Dakota.

I have gone over my time here, but I guess my advice is the sooner we can catch something like that, the better off you are. And if you can contain it to a general area, the better off you are. Once it gets out of control, spreads and spreads and

spreads, it becomes more expensive and there is more damage.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Steinwand follows:]

Senator Barrasso. Appreciate your testimony. Thank you,
Mr. Steinwand.

Mr. Rogerson.

STATEMENT OF JOE ROGERSON, PROGRAM MANAGER FOR SPECIES
CONSERVATION AND RESEARCH, DELAWARE DIVISION OF FISH AND
WILDLIFE

Mr. Rogerson. Good morning. I would like to thank each of you for the opportunity to visit and meet with you to discuss a very real and significant problem that affects our entire Country and not just my home State of Delaware: invasive species. My name is Joe Rogerson, and I oversee Delaware's Species Conservation and Research Program within the Delaware Department of Natural Resources and Environmental Controls Division of Fish and Wildlife.

My comments today will focus primarily on the impacts of invasive species on native wildlife and their habitats, but I would remiss if I didn't point out that the impacts of invasive species often equal, and in some instances have more significant impacts to, public health and safety, our economy, commercial industries, agricultural producers, hunters, anglers, wildlife watchers, and many other groups. I have seen reports estimating the total impact of invasive species across our Country to exceed more than \$100 billion annually, so this is a very real and significant problem, as invasive species affect many facets of our lives.

Invasive species are a leading driver of biodiversity loss and, in many instances, are one of the primary factors that

result in a listing of many of the Country's threatened and endangered species. State wildlife action plans serve as the blueprints for conserving our Nation's fish and wildlife and preventing species from becoming endangered.

In 2005, each State, territory, and the District of Columbia submitted their plan for approval to the U.S. Fish and Wildlife Service as a condition for receiving funding through the State and Tribal Wildlife Grant Program. The plans were recently updated with the latest science and information to guide conservation of over 12,000 species in greatest conservation need across the Country. Along with identifying the species in greatest conservation need, each State identified threats and associated actions that could be implemented to reverse each threat.

Recently, the content of each State's wildlife action plan in the northeast region was summarized. Of the 2,918 species of greatest conservation need within the region, pollution and development were the most frequently cited threats, with invasive species closely following as one of several additional regional threats. States currently don't have sufficient resources to tackle all of the threats outlined within their wildlife action plans, so we are unable to fully address threats facing fish and wildlife populations from invasive species.

Following an Executive Order signed by then President

Clinton in 1999 to establish the National Invasive Species Council, the nongovernmental Delaware Invasive Species Council was also formed that same year. The mission of the 120-member DISC is to protect Delaware's ecosystems by preventing the introduction and reducing the impact of invasive species.

DISC works closely with natural resource managers, biologists, and stakeholders to reduce invasive plants and animals, and to promote native habitats. In 2017, I was part of Delaware's Ecological Task Force, which identified many threats that contribute to the decline and, in some cases, extirpation of native fish, wildlife, and plants in Delaware. Invasive species are one of the leading threats identified by the Task Force, in addition to pollution and habitat loss.

Based on the recommendations of the Task Force, Delaware's General Assembly established the Delaware Native Species Commission in 2018 to bolster State efforts to reverse the trend of native plant and animal decline within our State. Of the more than 6,500 invasive species known to occur in the U.S., I would like to list a few invasive species that are or may become significant challenges in my home State of Delaware.

Control of invasive species in Delaware and the surrounding region has been initiated in the response to the invasion of Phragmites and nutria within our wetlands, northern snakehead fish and hydrilla plants within our waters, and Asian tiger

mosquitoes that are a threat to transmit Zika and West Nile virus in our communities. More recently, efforts have been or soon will be taken in Delaware to monitor for lionfish, Spotted lanternflies, and the Asian longhorned tick, as well as bats that have been identified with a non-native fungus that causes the debilitating White-nose Syndrome which has decimated populations of some species of bats across the Country, particularly in the northeast.

Along with a written copy of my oral statement today, I have included an appendix within the written statement that includes more in-depth information on the species I just described, but I would like to talk about some of the work being done back in Delaware and a very good example of an invasive species control project that is occurring currently on the Delmarva Peninsula.

The control of Phragmites is a major priority in Delaware to reduce the impact of this highly invasive plant that outcompetes and replaces our native wetland plants, severely degrading these wetland habitats. An aggressive control program has been initiated in Delaware since 1976 and, to date, more than \$6 million has been spent by my agency to control this species. While far from being eradicated, we have been successful at reducing the amount of Phragmites in Delaware, which has helped to restore the biodiversity and functions of

our wetlands. Control of other invasive plant and animal species has required countless hours of agency staff time and funding, and the help of volunteers to combat invasive species across Delaware, including within our State-owned wildlife areas, forests, and parks.

From where we sit today, we don't have to travel far to see an example of a highly successful program to combat an extremely detrimental introduced invasive species. Nutria, a semi-aquatic rodent native to South America, were introduced to the Chesapeake Bay region in the mid-1900s. Prolific breeding habits and a voracious and destructive feeding behavior caused extensive destruction of wetlands which, if left unchecked, would have compromised the Chesapeake Bay. A federally-supported Chesapeake Bay Nutria Eradication Project initiated in the early 2000s helped turn the tide of this invasive and destructive rodent, effectively eliminating all known nutria populations from over a quarter million acres of wetlands on the Delmarva Peninsula, with current efforts focused on removal of residual animals.

A study completed by the Maryland Department of Natural Resources reported that, without decisive action, more than 35,000 acres of Chesapeake Bay wetlands could be destroyed by nutria in 50 years. The predicted impact of nutria destruction to Maryland's economy was dire, with losses exceeding \$35

million annually. Maryland watermen would have been hit hardest from the loss of tidal wetland fish and shellfish nursery areas that help replenish important and productive Chesapeake Bay fisheries.

The study illustrated the economic costs to the citizens of Maryland and the entire Chesapeake Bay in terms of dollars lost to commercial fisheries, recreational fisheries, hunting, wildlife viewing, and related industries. Damage to the ecological services provided by healthy wetlands, such as storm protection, flood control, and water purification would have made the overall destruction even greater than the economic findings indicated.

As of 2016, all of the known nutria populations have been removed from over a quarter million acres on the Delmarva Peninsula. The project is currently implementing efforts to verify eradication and remove any residual animals. The Chesapeake Bay Nutria Eradication Project is a classic example of how an invasive species can be controlled and, in this case, potentially eradicated with adequate funding and staff resources.

Hopefully, all of us recognize that invasive species are a significant problem facing our Country. There are steps that individual States can do and have done to prevent invasive species from becoming established or spreading into new areas,

but many of these species cause problems across State lines and over large geographic areas, which is where the Federal Government could further help tackle this problem.

While not referring to invasive species, Benjamin Franklin's quote "an ounce of prevention is worth a pound of cure" couldn't ring more true in terms of how we handle invasive species, since it is more costly to deal with invasive species once they become established than it is to prevent them from entering in the first place.

A couple examples of proactive species prevention include increased invasive species surveillance on the goods and imports arriving in our Country to prevent their introduction to the wild and some States restricting the possession of certain invasive fish and wildlife species to minimize the chance of their introduction into the wild. Furthermore, some States have restricted and planting of certain species of invasive ornamental trees and shrubs that have the propensity to rapidly spread in the new areas and outcompete native plants.

Another example of some prevention includes regulations in some jurisdictions that establish weed-free forage programs for agricultural producers to minimize the spread of invasive and noxious weeds.

There are many other similar programs to prevent or minimize the chance of new invasive species from entering the

Country and preventing those that are already here from spreading into new areas. Unfortunately, the invasive species genie is out of the bottle. In addition to needing an ounce of prevention to prevent further introductions, we also need a pound of cure to control these species that are already here. Dedicated funding and personnel are needed to control and, in some cases, eradicate invasive species.

I again would like to thank each of you for giving me the opportunity to meet with you today to talk about the important issue of invasive species, and I look forward to additional opportunities and actions to combat them.

With that, I would gladly take any questions you may have. Thank you.

[The prepared statement of Mr. Rogerson follows:]

Senator Barrasso. Well, thank you.

I appreciate the testimony from all of you.

Since you quoted Ben Franklin, we will head to Mr. Franklin for some thoughts.

Mr. Franklin. No relation.

Senator Carper. Mr. Chairman, can I just say something?

Senator Barrasso. Please.

Senator Carper. I apologize to our witnesses. We all serve on a bunch of different committees, and the Homeland Security Committee has just been meeting and marking up a bunch of bills and nominated, and they needed somebody for a quorum, so I apologize for slipping out, but I read your testimony and just look forward to asking some questions.

Thank you.

Senator Barrasso. Thank you, Senator Carper.

Mr. Franklin, like most of the west, Wyoming has serious problems with cheatgrass. You mentioned it can cause catastrophic fires. It has been aggressive in crowding out, sometimes eliminating, native grasses that are important to so many species, including the sage grouse. I think you said in your testimony it has taken the fire cycle from 50 years down to 3. It is the first to move in after a fire or other disturbance, and it is incredibly hard and difficult to get rid of. Conservative estimates indicate that it has taken over 100

million acres across the west.

Can you talk about the environmental ripple effects of when a species like this takes over an area?

Mr. Franklin. The unique thing about cheatgrass and how it has been able to really take over those rangelands, is it is a winter annual, so what people don't understand sometimes in that, in the winter in Wyoming, November and December, that is when it is greening up. Then it becomes dry and dies out in June, when a lot of the other native species are just starting to green up, so it is in that process, that timeline variation with our perennial plants that causes the fire cycle.

What we find with cheatgrass, and I think you mentioned in your question, is it likes fire and it creates fire, so it takes out all those native species that sage grouse specifically deals with and creates this monoculture, and then that fire cycle is a continuing process; and with that continuous process we see the acres increase simply because that seed production in that fire is making it go farther out.

We have seen some mass effects on our sage grouse habitat, which is critical to Wyoming and to the Country, and also on our mule deer habitat, so what we really try to do is get out there after the fires as much as anything and do treatments so we can help give those perennials the opportunity to come back that those species are depending on.

Senator Barrasso. I would also like to ask about specific economic impacts in terms of ranching in Wyoming. Canada thistle affects almost every county in our State, it degrades the quality of forage for livestock by crowding out native vegetation. Ranching is so very important to us at home. Can you talk about the economic impacts that invasive species are causing to rangelands in Wyoming?

Mr. Franklin. One of the species the Director from North Dakota and I were talking about before we started this is leafy spurge. It is a species that does impact North Dakota and does impact Wyoming; impacts a lot of those Rocky Mountain States. Back, I believe, in about 1999 there was a leafy spurge task force that looked into the economic impacts of just that single weed, and what they came up with is, annually, the States of South Dakota, North Dakota, Wyoming, and Montana lose \$144 million in production and for control costs just from that species alone.

The unique thing about leafy spurge, or one of the more concerning things, is it is poisonous to livestock, so there are incidents where people have been put out of business in the ag industry simply because of this weed being present on their lands.

Senator Barrasso. I wanted to turn to West Nile virus. You mentioned it was discovered in 1937 and first detected in

the United States in 1999. It is found today in every county in Wyoming. Per capita, Wyoming is among the highest number of cases of West Nile virus in the United States.

I was just visiting with Senator Cramer about a friend that I served in the Wyoming State Senate with and you were working for the Department at the time, State Senator Bob Peck. Bob Peck, multi-award-winning American politician, journalist, editor, publisher, and Wyoming State Senator; published newspapers around the State. The Riverton Rangers and The Family talks about his death. The cause of death on March 6, 2007, while I was still in the State Senate: West Nile virus. So, one of our State senators felled by West Nile virus.

Can you talk a bit about the invasive species, how they become not just an environmental or an economic threat, but also a public health threat?

Mr. Franklin. Wyoming is a small State, and I think if you talk to anyone in our State, they know someone who has been impacted by West Nile virus. I know a couple people myself who had the virus back, I think, somewhere around maybe 2005, 2006, and they still have neurological effects from that virus, so it is not something that just goes away overnight, and certainly there are deaths that lead to it.

We are a little more unique in Wyoming because we don't have *Aedes aegypti* mosquitoes, which carry the Zika virus, we

just deal with the *Culex tarsalis* mosquito. The program we run in our State, the *Culex tarsalis* is a later summer species, so we are able to, through monitoring on the local level, determine when *Culex tarsalis* is mostly prevalent and when the potential for West Nile virus is there, so we really try to target that species based on when it is going to be most active.

But it is always a difficult battle because public perception on mosquito control programs is, there is variation. When you see an airplane, for instance, flying over a municipality, some people just don't like that. In Wyoming, we do a lot of that with larva sighting, though, so it is a matter of, I think, with the West Nile virus program and mosquito programs, a lot of education still needs to be done in the public.

Senator Barrasso. Thank you, Mr. Franklin.

Senator Carper.

Senator Carper. Again, thanks so much for joining us and for your testimony. A lot of times, here in Washington, the press tends to focus on our differences. You would think we never agree on anything and never get anything done, but actually I hope this week that we will prove them that is not always the case.

Let me just ask a question with that in mind. In listening to your testimonies and talking to each other a little bit

earlier today, what are some areas that you see agreement, common ground on these issues?

Slade Franklin, relative, descendant of Ben?

Mr. Franklin. I think you heard in all three of our testimonies the importance of early detection, rapid response, and the importance of getting on some of these new species as quickly as possible; the economics of saving the money by getting it early, compared to doing what we are doing now with cheatgrass.

At least in Wyoming, one thing that we are looking at very closely is medusahead rye, which is a big problem in Nevada. A lot of people consider it worse than cheatgrass. We found it in our State and we are trying to an early detection and rapid response program because we know the economics of doing that now makes more sense than waiting until it gets to the point with cheatgrass.

Senator Carper. Thanks. That is a good point.

Terry?

Mr. Steinwand. I don't think I can add anything to what Mr. Franklin said.

Senator Carper. Oh, come on, I bet you can. We have never had a witness say that.

[Laughter.]

Mr. Steinwand. I am never at a loss for words, I guarantee

you.

Senator Carper. Again, areas of common ground.

Mr. Steinwand. Oh, absolutely. Absolutely.

Senator Carper. Just go ahead and mention one or two.

Mr. Steinwand. West Nile virus. I guess I bring that up because it is a human health issue, but it is also a wildlife issue. Our sage grouse population was doing very good until 2008, when there was a West Nile outbreak in our sage grouse population and it just crashed. We are actually trying to reestablish that population.

Senator Carper. Are you really? Was it wiped out?

Mr. Steinwand. Pardon me?

Senator Carper. Was it largely wiped out?

Mr. Steinwand. No, just drastically reduced. We went to 350 males to less than 100 within a year. Actually, through the graces of Wyoming Game and Fish Department right now, we are actually translocating some hens and some chicks and some males into North Dakota; have for two years and are going to for three more years, so there is more to it than that.

I think it is collaboration amongst everyone, different agencies. Wildlife and invasive species don't know political parties, they don't know sociopolitical boundaries, so I think collaboration is really the key.

Senator Carper. All right. Thank you, sir.

Joseph?

Mr. Rogerson. I was going to reiterate those two points.

Senator Carper. Go ahead, reiterate them.

Mr. Rogerson. As I concluded with, early detection is key, and a rapid response both from an effectiveness and efficiency from a funding standpoint are critical; and I think improved communication not just within individual States, but between States. Invasive species can come at us from any different direction in a whole multitude of manners; they can swim upstream, downstream, come from the air, they can come from a car, they can come from the bottom of someone's shoes as they walk in from the last time they wore them in another State.

So oftentimes these species can make great jumps geographically, and if it is a species that, in Delaware, we are not familiar with dealing with, having those improved communication lines that if that was a Nebraska kind of thing, for us to know how we should respond and that kind of thing I think is important, and I think we could all agree that we could get this pretty much anyway.

Senator Carper. Thank you.

I think each of you, in your testimony, mentioned funding at some point. We are, as you know, wrestling with funding legislation to fund the Federal Government for the balance of the fiscal year. I hope we will make some progress on that

today and tomorrow.

Do your States have the financial resources that they need to fully address invasive species? Do you believe the Federal Government has a role to play in better meeting your funding needs?

Joe, I will just go to you first.

Mr. Rogerson. I would say, no, we do not have adequate funding needs to address all of our invasive species. It seems to be we receive more of them rather than getting rid of them faster than we are able to bring new ones in, so constant challenges even from just educational capacity and what we should be doing and looking for, so, no, we are certainly challenged from a funding standpoint.

I think the Federal Government does have a role to help with that. Many of these species cross State borders. Delaware, as you know, is a very small State, and some of these species could come from the north down the Delaware River or any way from a port from overseas or anything, so I do think the Federal Government does have a role to help States, particularly those that cross State borders and have large geographic problems.

Senator Carper. Thank you.

Terry?

Mr. Steinwand. Thank you. Like Mr. Rogerson said, there

never seems to be adequate funding. We are actually asking for more funding through the State legislature, actually through fishing license fees in North Dakota as we speak.

In terms of does the Federal Government have a role, I would say yes, but it is primarily a State role also. The Federal nexus that I can think of right now would probably be primarily Corps of Engineers. Again, Senator Cramer mentioned Lake Sakakawea. A typical reservoir doesn't stay at a stable level, it goes up and down, and as it goes down you have noxious weeds such as Canada thistle primarily showing up on shorelines, and there never seems to be enough funding for the Corps of Engineers to handle that because it may provide some wildlife habitat, but it certainly provides more of a problem for surrounding landowners.

Senator Carper. Okay, thanks.

Mr. Franklin, I may come back to you later on the same question.

Thanks so much.

Senator Barrasso. Senator Cramer.

Senator Cramer. Thank you.

Thank all three of you for your testimony and being here. This is really quite fascinating. I think what I will do is I will just maybe expand a little bit on what you are talking about right now on Senator Carper's questions.

I will come to you first, Terry. With regard to the Federal Government's role, if not monetary, and clearly there is some in terms of just cleaning up our own house, although I will resist the temptation to talk about the Corps having too much land and perhaps they should give you some more of it to do the right thing with, but that aside, you talked a lot about collaboration early on, particularly in the context of the amaranth and the collaboration with the Agriculture Department obviously using the outdoorsmen as the boots on the ground, as you called them, during the hunting season and how important that was.

From a Federal perspective, obviously, you have Federal partners that do the very same things you do, or similar, are there things we could either do from a policy standpoint, in terms of guidance or rules or just behavior that the Federal Government or the Federal agencies you work with could be doing differently to be more cooperative; and, as policymakers, especially things that we should be changing to help them in that?

Mr. Steinwand. Thank you, Senator Cramer, that is an excellent segue or excellent question. We do routinely collaborate quite extensively with State partners, Federal partners, private partners, one I will say is the U.S. Fish and Wildlife Service, for more disease issues, more than anything,

at the national fish hatcheries, but also we coordinate with the Ecological Services Branch in terms of terrestrial vegetation as much as anything.

I don't think, at least in North Dakota, we need any policy changes because the collaboration is there.

In terms of the Corps of Engineers, again, on aquatic species, particularly zebra mussel monitoring, they help us tremendously. We just don't have enough people to get around and monitor all those areas, and the local Corps of Engineers office in Riverdale, North Dakota helps out. Whenever they pull out a dock or a fishing pier, which you can't leave in North Dakota because of the ice issues, they are checking those; they are going around to municipalities, areas they deal with. The same with the Bureau of Reclamation, which I know this Committee doesn't deal with, but the Bureau of Reclamation equally helps us out.

So, in terms of Federal agencies, I wouldn't say more funding helps, and I wouldn't even say policy, because the people that we work with in North Dakota are very, very good to work with.

Senator Cramer. Thanks for that.

Mr. Franklin, anything different to add?

Mr. Franklin. Collaboration is really important in Wyoming when you talk about that many acres of Federal land. We have

BLM, Forest Service, Department of Defense, Bureau of Indian Affairs, so the collaboration is important. What we find is we have good people on the ground, but sometimes they don't have the resources actually to act upon that.

There are things with NEPA that could be improved. The ability to do categorical exclusions for new insipient populations and treatments would be helpful. We also see, for instance, between the Federal agencies on their approval process or risk assessments for new herbicides or new management tools, some can do that fairly quickly, some take several years and millions of dollars to do the risk assessment.

These are some of the issues I know we are working on with Federal agencies and trying to mitigate those, but there are some places with that policy that we really could use some help to give those land managers for those agencies better ability to react.

Senator Cramer. And is that more profound in Wyoming because I think you stated in your testimony that roughly 50 percent is Federal ownership?

I know, Terry, in North Dakota it is like less than 4 percent, I think. That is probably one of the significant differences.

Mr. Franklin. Right. I would think so.

Senator Cramer. Sir, do you have anything to add to that?

Mr. Rogerson. I do not. I would say that, in Delaware, we are very much a private land driven State; we have not that much Federal land compared to my counterparts to the right. We do have a good relationship with our Federal and State partners. Our Delaware Invasive Species Council is a very active group.

I would say some areas where we are lacking is education and understanding from the general public, particularly of the invasive plants. It is nice to see a nice grove of Bradford pears that was an early successional field, and to think that is a native species in the spring, when it is just a monoculture of beautiful white flowers, when, in reality, you have outcompeted those species, outcompeted the native plants and shrubs that should be there.

The Spotted lanternfly is an example of a new species that came here, so efforts to improve detections of these critters that are coming in from reports and other places I think is still necessary. That has the potential to tremendously impact our orchards and peach production and grapes around the States.

So, I think there are areas that we can improve, but we are doing the best we can with the resources that we have.

Senator Cramer. Excellent.

Thank you all.

Senator Barrasso. Thank you.

Senator Cardin.

Senator Cardin. Thank you, Mr. Chairman.

Mr. Rogerson, it is always nice to have a Marylander on the panel, so thank you for being here. I know that Senator Carper is claiming you as a person from Delaware, but we will let him do that for today.

I also appreciate the fact that you brought the nutria issue and the fact that the investments we made in eradicating the nutria, there are still some signs, but basically under control, has returned greater dividends for our economy. Nutrias are interesting animals; they were originally brought into our region because of their fur used for coats, until they recognized they were just big rats and women didn't want to wear rat coats. So, the nutrias were then released into the wild, and they multiplied and destroyed a lot of wetlands. Blackwater National Wildlife Refuge is an example of an area that was very badly damaged as a result of the nutria population.

We acted here in Congress, we passed the Nutria Eradication Act. It was also well balanced geographically, because they had the problems in some of our southern States, Louisiana, so we were able to get the right political mix to get that passed and it is a success story, so I want to take what we learned from the nutria, that if we invest in dealing with invasive species control, it can not only help our environment, but help our economy as well.

We are having challenges in the Chesapeake Bay because of the salinity of water changing with the amount of rainfall that we have had. We find that there are catfish invasive species that are thriving much stronger than they would otherwise be able to do because we have warmer seasons. The invasive plants are much stronger that we need to deal with.

The question I have for you is what type of public investment should we be making in the Chesapeake Bay region in order to be able to duplicate the success that we had on nutria for the other invasive species. I understand there are somewhere around 200 invasive species in the Chesapeake Bay region. Clearly, we have challenges in the region on invasive species.

Mr. Rogerson. Thank you. And if it earns me any brownie points, not only am I from Maryland, I worked on the Nutria Eradication Program before I came to Delaware Fish and Wildlife, so I was there for about a year.

I think one of the reasons the nutria project was so successful was the original folks involved didn't set out to just try and control nutria, which would then have this long-term, we are going to lower populations down, but now we are going to have to fund and address this for decades and decades in the future, because if we stop there is going to be more of them.

So, they hit it aggressively and said we are going to get rid of nutria from the Delmarva Peninsula. It is going to cost a little more money upfront initially to hit it hard with that full-frontal force, but, in the end, it is going to pay dividends because they will be gone and we don't have to have long-term monitoring teams and stuff out there in the future.

It has been a couple years since they found an animal, which is amazing. Many folks didn't think it was going to be possible. But there are still areas, leaving no stone unturned because of how prolific breeders they are.

So, I think with the number of species you talked about in terms of in the Chesapeake Bay would be prioritizing which ones do we think we can get a handle on now, which ones are most detrimental to our resources. You know, nutria impacted the environment not only from our wetland integrity to handle sea level rise and storm surges and things like that, but also our economy. If you like crab cake sandwiches, you didn't like nutria, because they were going to impact the nursery habitats for our blue crabs and stuff like that.

So, I would say reviewing what species you have and then prioritizing where you should focus those efforts, because you are probably not going to be able to hit all 200 of them with the same force.

Senator Cardin. Is there a mechanism in the Chesapeake Bay

program for doing that with invasive species? I am not aware of a ranking as to where we should put our priorities, nor am I aware of a real effort being made collectively within the Chesapeake Bay region on invasive species. I know we do have programs to eradicate invasive species, but I am not aware of such a coordinated effort.

Mr. Rogerson. I am familiar with our Delaware Invasive Species Council, from my State. I would presumably venture to guess that there is one in Maryland. It is an unfunded, at least regulated by the State standpoint in Delaware, so we have identified our most important things. Our challenge in Delaware comes from acquiring all the resources we need to put boots on the ground. What we try and do is educate folks to the problem so that then, perhaps, they can implement the actions and find the resources that they need to be able to handle it.

Senator Cardin. I would just point out invasive species do not know geographic borders.

Mr. Rogerson. Absolutely. Yes.

Senator Cardin. Thank you. We will look at whether we can provide some guidance within the watershed on this area.

Thank you for your testimony.

Mr. Rogerson. Thank you.

Senator Barrasso. Thank you, Senator Cardin.

Senator Braun.

Senator Braun. A subject dear to my heart, back in the late 1980s I started investing in timber ground, and invasive species was not even mentioned up until probably 15 years ago, and then I have stuff like bush honeysuckle start showing up, stealth grass, of course, the emerald ash borer for midwestern timber, and I think that is 8 percent of all the trees in Indiana, pretty well taken them all out.

I am interested because this seems to be a problem that is so massive. Does it make sense and can you bring in natural enemies and counterpunches that come from the places where this stuff originates, or is that opening up a Pandora's box of further complications? Because, to me, unless you are kind of have an involvement in it, like I do, most people don't know the difference between a bush honeysuckle and a native plant, or stealth grass and grasses that grow here natively.

What about that idea? Then I want to get one other question. Anybody that feels comfortable, weigh in on it.

Mr. Franklin. We are big supporters of biocontrol in the State of Wyoming; we think it is a great opportunity to help balance, maybe, in some cases some of these invasive species with the native vegetation. The Wyoming Weed and Pest Council actually puts money into research for new biocontrol agents in our State, so we are putting county and State funds into that kind of research because we feel it is a great opportunity.

We were talking, just before this testimony, about leaf beetles on leafy spurge, because the herbicides available for leafy spurge are minimal and have very little effect in some cases, so the leaf beetle actually can go in and do a great job of balancing the leafy spurge within those ecosystems.

So, I would say, from Wyoming's perspective, that is one place we really could support and expand, is the biocontrol agents.

Senator Braun. And is that finding a native biocontrol? Is all this stuff unchecked, where it comes from? Like cheatgrass, does that dominate the landscape from wherever it originates?

Mr. Franklin. It does not. So, what we do is our research, what Wyoming funds for research is actually in Switzerland, and they go out and actually look in the native landscapes where these plants are and look for native bugs that impact them or eat them. And then it is a pretty lengthy process in terms of researching whether it will work or not, and also to get those biocontrol agents approved. So, it is not simply a matter of going over, finding it, and bringing it back, you know, on a boat; there is an approval process. Speaking of the genie getting out of the bottle, there is a pretty lengthy approval process to help monitor that.

Mr Steinwand. Mr. Franklin did a tremendous job, but I

would add to that that biocontrol is a preferred method over herbicides, but you have to be careful of the unintended consequences. And, again, Mr. Franklin kind of alluded to the fact that there needs to be research. Using the flea beetle and leafy spurge as an example, there was a tremendous amount of research done on that, because what happens when they control or eradicate the intended plant? What are they going to go to next, an unintended plant and get something you really don't expect? So there has to be some background and some research before we go that route totally.

Mr. Rogerson. I agree that biocontrols do have their merits. I know the University of Delaware Ag Department does quite a bit of research on biocontrols. And to your point earlier about these species, where they come from, are they pervasive and out of control over there, if you think about the natural world that is here, and the plants and animals and insects that are all connected together, every plant has a group of insects that it supports; it also has some insects that feed on it, and everything works together.

When you take these species that aren't native to those areas and drop them in, they lack, oftentimes, those controls that keep them in check here, so then they are able to dominate our landscapes that are here, and that is why, when you see these animals moved around these great distances, you see them

kind of potentially explode, given the right species and the right condition.

Senator Braun. Thank you.

Have you found that these species naturally climax or start to feather out, or do they just keep exploding into the local environment? And have we had many instances of where something here actually that is native starts to knock it back, or would that be the exception rather than the rule? For anybody.

Mr. Franklin. I think you are specifically asking about invasive species, right?

Senator Braun. Yes.

Mr. Franklin. So, there are invasive species that come in that have value to some degree. I think some of the non-native grasses that do have a grazing value to them, so maybe we are less likely to focus on them as we are the ones that have no value. So, there are a lot of invasive species out there and there are some that are lower priorities and should be prioritized lower than the ones that have that economic or agricultural impact.

Mr. Steinwand. I would add that the hallmark of an invasive species is typically tremendous, tremendous growth of that population if left unchecked to begin with, and then stabilizes to some level below that somewhere in the future. I would hopefully not contradict what you are saying, but, to some

extent, Kentucky bluegrass, which is a great ornamental grass for lawns across the Nation, has created a little bit of a problem in North Dakota when it invades our native prairies. We have found that if we get heavy grazing pressure when it is still less than 30 percent of that landscape, we can control it, but, if not, once it gets above 30 percent, it tends to take over that native prairie, thus reducing pollinator diversity, so on and so forth, and very little wildlife value.

Mr. Rogerson. And I will mention that not every non-native species that comes here is invasive and causes problems. For example, where nutria were introduced in Blackwater and Cambridge area, during that same time period sika deer were brought over from Thailand I believe is where they are from, and certainly they do impact the agricultural producers and farmers over there from a crop damage standpoint. They did not have the same ecological impacts that nutria did.

So, it depends on the life history traits of that species that is brought over here and things like that that is going to determine whether it becomes an invasive species and becomes a problem for us.

Senator Braun. Thank you.

Senator Barrasso. Thank you, Senator Braun.

I have one last question to Mr. Steinwand. We talked about invasive mussels and things that are happening underwater. The

quagga and the zebra mussels have had enormous destructive powers, from clogging pipes and reservoirs to destroying the motors of private recreational boats. We have here a poster board of zebra mussels on a motor.

Can you share some advice that you might have to inform Wyoming in terms of our future efforts to prevent the spread of quagga and zebra mussels based on your experience in dealing with this in North Dakota?

Mr. Steinwand. Thank you, Mr. Chairman. I believe I mentioned it in my written testimony and my oral testimony. As good as Wyoming Game and Fish Department is, I am guessing they already do this, but I don't know, again, given limited resources, first of all, try to find out where the pathways, what are the most likely high-risk pathways for that to come into Wyoming and then concentrate your forces on them. If you can prevent it from coming in, again, I think we have all said that that is the best route to go.

Senator Barrasso. Thank you.

Senator Carper. I have one question for Joe and then a question for our panel to close it out.

I mentioned in my opening statement, I talked a little bit about climate change. I think most people, when they think about climate change, in Delaware we think about sea level rise. We are a small State. We are sinking and the oceans around us,

as Joe knows, are rising. Not too far from where I live, my neighbor here, Ben Cardin, to my left, from Maryland, one of the places he represents is Ellicott City. We saw a lot of rain in Delaware last year, probably twice as much as we normally get, and damaged our crops quite a bit. A lot of the farmers ended up just plowing their crops under because we had so much rain. They just kept planting and replanting, and finally kind of gave up and turned to crop insurance. So, we think about that.

We think about wildfires, all these wildfires out west, where one of my sons lives, wildfires bigger than Delaware. But we don't often think of invasive species and what effect, if any, climate change has on invasive species, and I would just ask Mr. Rogerson whether or not climate change is a consideration in the Department of Natural Resources and Environmental Control's management of invasive species. And, if so, would you share some thoughts with us on how Delaware might be adapting and some examples of possible implications in our State and maybe even implications for other States?

Mr. Rogerson. Yes. At DNREC, we take climate change into a whole host of considerations that we are working on, not just invasive species, due to many of the reasons you just pointed out. Just a quick example, as I said earlier, invasive species can come at us from any different direction, not just necessarily as we think of things getting warmer and stuff. As

an example, lionfish, lionfish are a tremendous problem in offshore reefs and places particularly more in the southern part of the Country. Currently, our water temperatures in the wintertime seem to be too cold for that species to persist here, but they have been found as far north as Rhode Island and north of us, so just proactive monitoring efforts, knowing that things are going to move and increased coordination with our southern counterparts.

Asian tiger mosquito, as pointed out, having the potential to carry Zika and West Nile. I can attest that I have had invasions over the years of tiger mosquitos in my neighborhood, and they are voracious predators and feeders out in the yard, and you can't play outside with the kids, so we do have a very modern and --

Senator Carper. Do repellants work with those?

Mr. Rogerson. Say that again?

Senator Carper. Repellants, the kind of repellants we use for most mosquitos?

Mr. Rogerson. They seem to, at least in my yard, when they are out and around, I am inside kind of thing, or certainly wearing long-sleeved barriers kind of thing to get through. I mean, they are much larger than our normal mosquitos, and their feeding habits and such, they are not a fun one to have around; not that any of them are.

Furthermore, with climate change, sea level rise, the host of factors that come with it, those all put stresses on our native plant and animal communities; and you throw in invasive species on top of them, which typically the ones that we see aggressively get out of hand or be strong competitors are the ones that dominate those sites and areas that have been disturbed where our native plants don't do as well, so I think that can lend itself to being a further problem in the future.

Senator Carper. All right, thank you.

Last question, if I could, on regional collaboration. In Delaware, we are big on the four Cs, communicate, collaborate, cooperate, and civility, in order to get us to consensus. That is what we try to do.

I was encouraged, with that in mind, by some of the regional collaboration that you all have mentioned here today to us, including the Chesapeake Bay Nutria Eradication Project and the Western Governors Association Invasive Mussel Forum.

How do you think Congress and the Federal Government could better support these regional efforts and others? Go ahead.

Mr. Steinwand. If I might, you did mention the Western Governors Association. Of course, that is North Dakota and to the west. I think supporting the policies that that group has come up with, which is truly a bipartisan effort, supporting those policies and working together. We serve, not myself, but

staff serves on a minimum of three regional invasives council to more share information such as we are doing here, to innovate to the extent possible. I don't mean this as a denigrating remark, but if we can get by with not having to spend any Federal money on this and just cooperation and policy, to me, that would be the greatest win.

Senator Carper. Okay. Thanks.

Others, please, Franklin and Joe? We will close it up. Slade?

Mr. Franklin. I would reiterate the Western Governors Association just did a bunch of workshops on invasive species, and they are working on some ideas on policies, and I think there is a place maybe for Congress to look at what those ideas coming out of that are.

Certainly, ISAC, the committee I am on, works on some policy ideas that would be well work Congress looking at. ISAC has been around for, I think, 10, 15 years, and there are some great whitepapers discussing not just the funding issue, but a lot of the policy issues that may be worthwhile looking at.

Senator Carper. Okay, thank you.

Joseph, you get the last word.

Mr. Rogerson. I agree, I think any kind of improved coordination between the States, particularly Delaware, where we are, as I said before, being small. The Spotted lanternfly is

yet another example of nobody expected it to come here and it showed up, so I think the Government can help us with keeping species out through better inventory of goods and things coming into the Country, as well as the fact that these species, many of them do cross State borders and State lines and stuff, being facilitators, perhaps, between the States to work together.

Senator Carper. All right.

Mr. Chairman, one of the issues that is dividing my staff sitting behind me is the Spotted lanternfly. The S in Spotted lanternfly is, of course, capitalized, but the question is how about that L in lanternfly. Some say capitalize; others say not. What do you say?

Mr. Rogerson. I would have to look at my testimony to see what my Department of Agriculture folks said to me.

[Laughter.]

Senator Carper. Well, to be continued. Those will be questions for the record.

Thank you all.

Senator Barrasso. Well, thank you, Senator Carper.

Thank you to the witnesses.

As you had mentioned, Senator Carper, there are so many different conflicting committees going on today that some of the members weren't able to get here, so they may submit written questions, so I would ask that you please respond to those. The

hearing record is going to be open for two weeks, but I think all of us want to just thank all of you for your time and your testimony today. It has been a tremendous hearing.

Senator Carper. Mr. Chairman, could I ask for a unanimous consent request to ask unanimous consent to enter into the record written testimony and letters from stakeholders, as well as other supplemental materials?

Senator Barrasso. Without objection.

Senator Carper. Thank you.

[The referenced information follows:]

Senator Barrasso. The hearing is adjourned.

[Whereupon, at 11:25 a.m. the committee was adjourned.]