

INVASIVE SPECIES

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ural waters. Additionally, the general public needs to be educated about the threats posed by release of non-native nuisance species. Use of non-native fish as bait also presents a heightened opportunity for their release into the environment.

In summary, we have learned a great deal about the necessary safeguards that need to be in place in Maryland and nationally to prevent additional outlays of limited funds to protect our waterways. This introduction of northern snakeheads resulted in a great expenditure of time and money by the Maryland Fisheries Service, exacerbated by erroneous information we received early in the process, as well as media reports that were sustained throughout the summer. While the snakehead generated a lot of media attention we face non-native species introduction regularly in Maryland.

Mr. Chairman, this concludes my testimony. Thank you for the opportunity to be here today. And I look forward to answering any questions.

[The prepared statement of Ms. Stevenson appears at the conclusion of the hearing.]

Mr. PUTNAM. Thank you very much, Ms. Stevenson. The Chair recognizes Dr. Scott Miller, the chairman of the Department of Systematic Biology with the National Museum of Natural History with the Smithsonian Institution. Welcome.

STATEMENT OF SCOTT MILLER, CHAIRMAN, DEPARTMENT OF SYSTEMATIC BIOLOGY, NATIONAL MUSEUM OF NATURAL HISTORY, SMITHSONIAN INSTITUTION, WASHINGTON, DC

Mr. MILLER. I would like to focus my remarks today on the identification and information needs that underpin the kinds of management issues that we have heard about from the previous speakers. As we know there is a number of invasive species that have been in the news, even just in recent months. We have examples of many of these actually in our display in the next room.

By their nature, invasive species challenge traditional disciplinary and geographic boundaries in the way that we traditionally have studied and managed forestry, fisheries, wildlife issues because invasive species can come from any place on the planet and they can be any kind of organism. Both the National Invasive Species Council and the Global Invasive Species Program have been significant steps forward in bringing people together across these traditional country disciplinary and habitat sort of structured boundaries.

Systematics or taxonomy is one of the basic tools that allows us to describe biological diversity, provides us with a historical framework for understanding relationships and points of origin of species which are very important in control strategies like biological control. And it allows us to offer communication of knowledge. If it very important to get the name right on something because if you are doing, say a risk assessment of whether you are going to allow impartation of a species or not, whether it is a good species or a bad species depends frequently on your point of view.

An example is Jackson's Chameleon, which is an invasive species in Hawaii, but a protected rare species in east Africa. *Cactoblastis* moth, which is a bio-control success story if you are trying to get

rid of cattle on your ranches, but if you grow cactoblastic in Mexico it is an agricultural pest.

This organism in this slide is the Cassava mealybug which was introduced to Africa in the 1980's and threatened to basically collapse the staple food source of much of Africa's population. Biological control efforts for it were totally unsuccessfully because initially someone had the identification wrong and once it was correctly identified there was, in fact, a successful biological control campaign carried out.

To be proactive we need to know what is already present in the United State so that we can manage those, but we also need to know what is present in other countries that we may wish to manage the flow of, and again, accurate identification is necessary for that.

Looking briefly at research and management needs in this area we need to make information about invasive species, or potentially invasive species, how to recognize them and what they do for a living, widely available not only within the United States, but internationally. We need to provide better identification aides to people who may be on the front line of particular issues. Whether they be farmers or quarantine personnel. We need to provide better foundations for the authoritative identification services that are provided for example by Federal agencies that are partnered with the Smithsonian and some State agencies, such as the Florida Department of Agriculture. Better training and support, and targeted research in areas that are problematic.

For example, we are facing a huge influx of immature insects that we are not able to accurately identify in cut flowers and horticultural products that are being imported in increasing numbers from growing industries in Africa and Latin America.

And finally, a word from my sponsor, the Smithsonian's Natural Museum of Natural History provides the sort of worldwide reference collections and expertise that can help with these issues; especially because the National Biological Collection is really operated as a partnership with laboratories from the Department of Agriculture, Commerce, Defense, and Interior, to provide the identification and research capacities to address these issues. Thank you.

[The prepared statement of Mr. Miller appears at the conclusion of the hearing.]

Mr. GOODLATTE [presiding]. Are there questions of the first panel? Mrs. Clayton.

Mrs. CLAYTON. I thank the gentleman for recognizing me. This is an area obviously I am learning in, and probably as we all are becoming aware of how interconnected we are as a, should I say as a nation, but as people of a global earth. The globalizational commerce has made us almost one area. I am not sure if I understand. I think I understand because Mr. Scott has said that an invasive species is a non-indigenous, meaning it was not here. I do not know if it means it was not here for a given period of time or, help me out with that. Is it, is someone cataloging all the insects or species from what point to what point because some of the, we have seen reoccurrence of some of these invasions that we thought we had eradicated. So help me understand what it basically means thoroughly.

Mr. MILLER. Invasive species basically refers to a species that is expanding its range outside of its normal habitat. Most of the invasive species that we are talking about here have come to this country from some other country, but it is also possible to have something that because of climate change, or land management practices say, is a native species in a given State. But expands its range into feeding on plants that it did not feed on before or whatever, and becomes a nuisance in itself.

Mrs. CLAYTON. OK. That is helpful. The ones that you have on your third slide, it is referred a lot about the snakeheads as well as the West Nile virus. Is there any commonality among those in terms of environmental, any commonality in terms of how the invasion or the introduction to our shores? Some of them, for instance, in my county we have just had several incidents of West Nile in birds, but we also had some in deer. And the introduction is said to be first a mosquito to us, but actually the carrier is a bird and birds do travel from one continent, I guess, to another if you live in Florida, I guess. But I am just trying to get a handle on that.

Mr. MILLER. There is not a general issue really that unites all of the invasive species. There are general issues that unite some of them. For example, in the marine environment ballast water has been identified as a mechanism of transferring. You start to see certain patterns. Or in agriculture there are certain issues, or for example the issue I mentioned of we know that immature insects are coming in on cut flowers from eastern southern Africa through Amsterdam into the United States. So there are certain similarities in pathways. There are certain similarities in biology, but as you mentioned with the West Nile, example, if you do not understand the full life history of this thing that the disease requires multiple organisms in order to carry out its life cycle. Then you cannot begin to plan a control strategy.

Mrs. CLAYTON. Well, through agriculture, through our, Mr. Tenny, in our emergency funding I think there was some additional monies for APHIS where we were to provide monies to States to help them to provide the infrastructure so they would have the capacity to address; and again, North Carolina had started an effort of the foot-and-mouth disease. And they were concerned about, obviously the cattle and introduction, and putting in an emergency system if something should happen. But equally as important they were trying to put in a system across the board that would be educational and would be preventive. Their last communication with us, I do not think they had gotten the check, or did not know how the funds were being used. Do you know anything about that?

Mr. TENNY. I am going to defer to Dr. Butler on that. I think he can give you a more precise answer than I might.

Mrs. CLAYTON. All right. I apologize for that. I should have responded to Dr. Butler. Yes, Dr. Butler, I apologize. Your name is here and it was not in disrespect to you. I apologize. Yes, sir.

Mr. BUTLER. Yes, ma'am, we have provided money through APHIS from emergency appropriations we received early in this year to States to allow them go through test exercises, through preparedness exercises, for them to assess their vulnerabilities if you will. And many of those States have gone through those exercises with their own funds. If there is a problem in them not receiving

the funds directly in North Carolina I will be happy to check on that when I get back to the Department.

Mrs. CLAYTON. I would appreciate that. Between the agencies of the panel, how do you now coordinate? How do you use the information at the Smithsonian with what you do in Interior? And does Interior and Agriculture work with the States in Maryland and Florida? Give us an example of that.

Mr. TATE. May I respond?

Mrs. CLAYTON. Sure.

Mr. TATE. The largest, the greatest source of cooperation is the National Invasive Species Council in things like, Maryland is very effective in Invasive Species Council and our relationships with the State. Our relationship on the snakehead could not have advanced as well or as effectively as it did without the help of the State of Maryland. So we did our part with the Lacey Act and they did their part and carried much of the burden for the species in terms of dollars spent. But as I emphasized in my testimony we also cooperate with many non-governmental organizations. And in the case of the snakehead I named a couple that were helpful and there is always a danger when you name a couple and you forget somebody else. But that kind of cooperation is the way we effectively take the dollars appropriated for us and make them work for us.

Mrs. CLAYTON. The State of Maryland, is there something more that you would like to see the Federal Government do?

Ms. STEVENSON. No. We are very supportive of the final listing of snakehead species. And I think that we need to continue to work together to identify these animals as they are coming in. As Dr. Miller stated earlier the knowledge base is really the key here, is identifying the animals as they are coming in, and identifying whether or not they are a nuisance. As was stated earlier, there are some non-native species that are acceptable to be existing in our State and in other States. But the key is for us to pull our knowledge base and identify which of these species are a nuisance species. So I think that we are on the right track and we do appreciate the cooperation and collaboration between Federal and State agencies. At this point the State agencies are not capable of really looking at this from a broad perspective so we are taking our piece of it in terms of the State legislative statutes that are needed and working with the Federal Government to ensure that we can look at this from a broader perspective.

Mrs. CLAYTON. The Smithsonian representative, how do you share your knowledge with the other agencies, or is there a mechanism for distributing that information?

Mr. MILLER. We share our knowledge in a variety of ways, through the standard scientific channels, through the Federal agencies that work directly with us in the same building; and through mechanisms like the National Invasive Species Council. There is not yet a sort of a one-stop shopping invasive species database on the web that the people can go to, yet there is discussion amongst our agencies as to how to create that, but it is something that we are looking forward to being involved in in the future.

Mrs. CLAYTON. OK. Thank you.

Mr. PUTNAM. I think the lady from North Carolina and since no one is standing in line to take an additional 5 minutes, we are certainly going to be generous with our questions. With Maryland and Florida, how would you rate the Federal Governments effectiveness at airport and seaport border and security and controls in terms of preventing the introduction of plants, pests, and diseases from entering the country?

Ms. RIHERD. I think with the resources they have they are doing a good job. I think it is just an insurmountable task. There is so much coming into the country. The amount of cargo that is coming in has increased significantly. The number of passengers coming into the United States has increased as well. I do not believe that their resources are keeping pace with the growth in imports into the United States But there have been a number of reviews of the system, the most recent one being in 1999, safeguarding American plant resources. That involves stakeholder input. They recommended over 300 improvements that could be made to the system and the USDA is in the process of implementing those recommendations. And I think that will go a long way to improving the overall system, but I think they do a good job with the resources that they have available to them.

Mr. PUTNAM. Ms. Stevenson.

Ms. STEVENSON. I would agree. I think given the resources I think they are doing an acceptable job. With respect to aquatics species we need to remember that many of these species are coming in legally. That it is legal, it was legal this summer to import snakehead fish in the live seafood market. So the problem is not limited to ports, which seems like an insurmountable task of identifying what is coming in through ports and airports, but also to, once you have identified those animals to then prevent the importation of those animals. As I said, many of them are coming in legally, but they are being placed in natural waterways, which is illegal.

Mr. PUTNAM. Were both of you familiar with the Smithsonian's work on this?

Ms. STEVENSON. Yes.

Ms. RIHERD. Yes.

Mr. PUTNAM. Dr. Butler, the States are picking up an awful large tab to control, eradicate, inspect, and detect plant, pests, and diseases. That is really a Federal responsibility. Some States being sentinel States, which have been identified in your safeguarding study bear a larger share of the burden. What criteria do you use to distribute resources and how are they allocated around the country?

Mr. BUTLER. Congressman, I am not sure if I know the specific criteria. I know that in the \$328 million we received earlier this year we, I believe, provided each State with \$50,000 to allow them to assess their preparedness and exercises. We also used a formula based on livestock operations. And in the first amount of money we received from the Department of Defense we distributed that, three-quarters for those that had the largest number of livestock, 25 percent for plants. So we wanted to emphasize our livestock laboratories, our veterinary medical diagnostic laboratories, et cetera; and secondarily, the plant pathology labs in States.

Mr. PUTNAM. How frequently do you and your colleagues across the Federal Government meet with Customs, Fish and Wildlife, Interior, the myriad of other agencies that have people on the ground in our ports, airports and seaports, how frequently do you all meet to compare notes on improving our level of effectiveness?

Mr. BUTLER. Those ports, I believe there is an ongoing relationship between those, head of those agencies that, for instance, this summer when I was with you in Florida they talked about monthly meetings where they would assess the activities of each of those Federal agencies. So I assume that is a model, minimum of monthly, to have those discussions, implementing new technologies, sharing information about transportation, who is coming in, who is coming out, et cetera. So I believe those are frequent discussions.

Mr. PUTNAM. You will also recall from that hearing in Tampa that no one could identify a time when they had ever coordinated a joint ship boarding exercise.

Mr. BUTLER. Yes, sir, I do.

Mr. PUTNAM. Ms. Riherd, the State of Florida certainly has an awful lot of inbound international flights, cargo, and passengers. The foot-and-mouth disease used to be Agriculture's problem and since last September 11 it has suddenly become a national security issue. It was my understanding at that time that because of a shortage of Federal resources, the number of State veterinaries were marshaled into the effort to increase the inspections. Could you elaborate on that if that was the case and how the coordination worked?

Ms. RIHERD. That is correct. A number of State veterinaries were called upon to assist in that effort. There was a lot of concern about visitors coming back in, particular to livestock shows. I know they had a large horse show in the Ocala area. And not just the State veterinaries, but even in our division of plant industry we provided inspectors to try to make sure that there were appropriate foot baths in place to disinfect people who might be inadvertently bringing in the disease. So that, I think was a cooperative effort and hopefully was successful.

Mr. PUTNAM. With regard to the funding that each of you from the States have said that you believe that the Federal Government is doing the best they can with the resources they have. Have Interior or APHIS requested new monies over the past several years?

Ms. RIHERD. Yes, they have. I am privileged to serve as a member of the National Plant Board of Directors and that represents State regulatory agencies involved in plant protection issues. We meet several times a year with our counterparts and the U.S. Department of Agriculture and I know that they have requested additional funding for pest detection, particularly is of key concern right now.

Mr. PUTNAM. Dr. Butler.

Mr. BUTLER. That is correct.

Mr. PUTNAM. Has anyone put together a plan that would say that for, that establishes goals for an outcome? That we all, everybody agrees that with the resources we have we are doing the best job we can. Well, the best job that we can is only 2 percent of cargo containers being inspected physically and about 1 percent of cruise passengers. Well, that is not acceptable to anybody, but if every-

body agrees that that is the best that we can do with the money that we have then what percentage should be our goal? And what will it cost us to get to that percent? And I would like to know what that acceptable percentage is. Is half good enough? Is it a fourth? Is it 100 percent? What is it?

Mr. BUTLER. Those are excellent questions, Congressman. The two documents I will reference that were briefly mentioned is a safeguard and review that was completed on our plants with a great deal of input from the Plant Board in 1999, and one completed in 2000, on our animal assessments. In these two documents I believe there are some goals established. Now whether we have increased the percentage, or say we need to reach a 100 percent, or 50 percent, I am not certain. I think that is going to depend somewhat on the port and on somewhat the disease that we might be looking for, whether it is a plant disease or an animal disease; but you raise excellent questions about what percentage is acceptable.

Mr. PUTNAM. Are there percentages in that?

Mr. BUTLER. Without reading this, or a quick review, I do not see any, but I am sure that as they set the goals, your colleague from Florida, I am sure had some input on this so she might know the answer on the plant side.

Mr. PUTNAM. Dr. Tate.

Mr. TATE. The purpose of our cross-cut budget exercise is to develop those kinds of performance based goals that will potentially answer exactly what you are asking.

Mr. PUTNAM. So there is no plan?

Mr. TATE. I cannot say that there is no plan. The activities that you are referring to are largely the responsibility of the Department of Agriculture. We do have some Fish and Wildlife agents looking at certain things under laws the Department of Interior is responsible for.

Mr. PUTNAM. Sir, with all due respect, that is precisely the kind of attitude that we are trying to get away from with homeland security. It is everybody's problem. And the way that we have gotten into the situation we are in is that Fish and Wildlife looks for endangered species smuggling. They are looking at the turtle that is coming in from West Africa, but it is Ag's job to look at the turtles belly to find an African hard water tick. And then it is somebody else's job to look at a racehorse that is coming, but it is agricultures job to look for the screwworm on the belly of that horse. Customs is looking for drugs and they do not bother to report to anybody when they see a pile of food laying in the back corner of a cargo container that has who knows what growing in it.

You have just identified the major problem that is causing the States to have to pick up a \$100 billion dollar a year tab and is resulting in loss of production, a threat to public health, an undermining of consumer confidence in the food supply because it is always somebody else's problem. And nobody seems to have identified a plan with specific outcomes on where we need to be. And I would submit that where we need to be has changed since last September 11.

Mr. TATE. You are correct, of course, and for that reason we are developing exactly that plan through the cross-cut budget exercise which is performance based.

Mr. PUTNAM. Does the gentleman from Virginia have questions? I will turn the chair back over to you, Mr. Chairman.

Mr. GOODLATTE. Mr. Tenny, I would like to take some of your time for a moment to let people understand what you have to go through procedurally to satisfy various environmental statutes before management action can be taken in dealing with some of these invasive species. And I would like to know how much delay that brings to the process. How much cost it adds to the process? How frequently your decisions are challenged by various extreme groups that tie the process up in court, and what actions you think the Congress could take to streamline the process?

Mr. TENNY. Thank you Mr. Chairman. I think the very first thing I would like to do is draw the committee's attention to a report that was prepared by the Forest Service in June 2002. The process predicament I believe that you are familiar with. You have probably looked at it. It identified, systemically the challenges that the Agency has to face in order to meet the procedural requirements of laws and regulations, and in some cases, self-inflicted process, in order to make timely and effective management decisions.

The Agency identified three things in particular. The first was analysis, which was often times excessive, relative to the decisions they were making. Secondly, was ineffective public involvement which gets right to the question that you raised about the extent to which appeals, litigated, and so forth. And then the third was our own business practices, our own internal management procedures, which can also be a hindrance.

If I want to address this question fully I have to transgress a little bit the boundaries of the scope of the hearing because we also have a number of species that are native species that are also invasive. Species like the southern and the mountain, and the western pine beetles for example, and other species that are also very, very significant in terms of their impact. And I can take some of these as an example to identify some of the challenges that we face.

When you are talking about containment or eradication of a species, you are talking about, invasive species, especially if it moving aggressively, you are talking about taking a landscape approach and looking at a containment strategy. It is not altogether different than how you would prosecute a fire in some respects. NEPA frequently requires a site-specific analysis. And as you undergo the site-specific analysis to undertake a project to do something that you are really looking at, at a landscape scale, that adds significant time and process to what you are trying to do.

There are instances when a single decision that requires an environment impact statement, for example, can take upwards of 2 to 4 years to conduct. The Forest Service is also required to meet the requirements of the Appeals Reform Act of 1992, which is a process that is extraordinary in government relative to other agencies. That adds an additional time element to every decision and frank-

ly, from the assessment of the Forest Service encourages end of the process confrontation as opposed to upfront collaboration.

With respect to projects that were designed to reduce our natural fuels within the Forest, the Forest Service did recently do a study of the number of appeals that the Agency received on those types of projects. That does not go specifically to, and only to, the types of treatments that affect, or that would help contain or eradicate invasive species; but there are plenty of instances when they are invasive species that are implicated in those types of projects. But the Agency found that roughly half of its projects were being appealed. That process adds additional time to the equation.

And then there is also litigation. When you have a project litigated the issue is not necessarily the number, or percent of the projects being litigated, it is the impact of a court decision on future projects. Frequently a court decision will simply add another layer of requirement or process to future projects. Sometimes litigation outcomes catch managers unawares, so that a decision made in one of the country by a Federal District Court could impact a decision made by a land manager in another part of the country. And if that land manager is not aware then that challenge can also prevent that project from going forward. And it is sort of an ongoing and difficult cycle that our land managers face.

And ultimately, obviously, the most important underlying issue is that if we do not address the issues in a timely enough manner then we are going to be stuck with a far more problematic situation that we might otherwise have been able to overcome. If we were able to get a decision made on the ground, get it done quickly, and effectively to prevent the kind of outbreaks that we are seeing in some parts of the country.

Mr. GOODLATTE. Thank you. Dr. Miller, I apologize for having to step out when you were giving your testimony. So if I ask something you already said, I apologize, but I take it your Agency's function at the Smithsonian is in a consultative role providing expertise, scientific expertise, to those who are combating these pests, or do you actually get involved out in the field?

Mr. MILLER. The Smithsonian's role is basically maintaining the national collection of biological specimens, which is used to underpin a variety of identification and research. And there are some research projects that we undertake ourselves, including marine pathways research at the Smithsonian Environment Research Center and systematics research at the museum here on the mall.

But we also have, we basically run the national collection as a cooperative of venture with systematics laboratories from four Federal agencies, Agriculture, Defense, Commerce, and Interior. And support as a joint activity a variety of more applied activities, including the backstopping of identifications from port identifiers and from States, and from all nature of activities.

Mr. GOODLATTE. Dr. Butler, I understand that the, and perhaps Dr. Tate would respond to this too, I understand that some questions have already been asked about the Department of homeland security. This is directed to Dr. Butler, a compromise with fashion here in the House with regard to the role of the Animal, Plant, and Health Inspection Service and the role of the Department of Agriculture in continuing to have control over a portion of that agency,

and a portion going to the Department of Homeland Security. Do you think that that Department of Homeland Security legislation, beyond that particular APHIS compromise, coordinates amongst these four different departments that have a role in this area? I mean, will they the lead in that, or are we still going to have this bifurcated situation that we have today?

Mr. BUTLER. Well, the creation of the new department would have the lead. In agriculture we would still have the linkage to train those inspectors to link them back to our infrastructure, to link them back to the State, regulatory network, et cetera. But the Department of Homeland Security, is my understanding, would have the lead on that.

Mr. GOODLATTE. Will they work directly with the States as well to coordinate this? It would seem to me that that would be very efficient when you are talking about preventing a species from getting into the country.

Mr. BUTLER. I do not know if that issue has been resolved. I know that in hearing from the State Departments of Agriculture, obviously there are comfortable with the relationship they have had for many years working with USDA. Whether they will work, the new department will work directly with their States, I am not sure.

Mr. GOODLATTE. Dr. Tate, do you have anything to add to that?

Mr. TATE. I do not have any particular comments except to say that the Department of Interior and the President's plan is little involved beyond its current activities.

Mr. GOODLATTE. Do you think it needs to be?

Mr. TATE. According to the President's plan it does not.

Mr. GOODLATTE. There is a political answer for you. What is your personal view of that?

Mr. TATE. I do not think I have a personal view.

Mr. GOODLATTE. Very well. Well, Mrs. Clayton, do you have any other questions that you want to ask?

Mrs. CLAYTON. I do. Dr. Tate has testified before. He has been through this before so he knows not to give his opinion here. But at any rate, what was the response after, from the Department of Agriculture after 9/11 in terms of the potential, of intentionally—part of the concern in North Carolina and other parts of the country is understood that people were a little fearful of sometime accidental invasion of pests or organisms, and then the intentional invasion of pests and organisms. And I know part of the fear was, rather it was a tourist, accidentally coming back from certain areas, having these accidental or someone intentionally, so there was some concern of trying to restructure. Maybe that is too strong a word, but reinforce the current structure to be more responsive in prevention and giving an education. Where is APHIS in that response? Are you just waiting to see what happens with homeland security and say, well, given our role there we will find out?

And the second part of the question is we are trying to protect ourselves from what may be invasion from others. Is there a dialog going on with the U.S. involvement at the World Trade Organization that talks about controlling? How do we control this given, we need coordination within our own country, but we also need coordination international because this is an issue that I think if we are

going to continue to trade, we are going to continue to send our fruits and vegetables abroad. And I suspect we are going to be continuing receiving flowers and things from various countries here. I shudder to think what is growing on from the borders of California right now, given that that, those cargos have fresh fruits. So certain environments and certain conditions will give rise to certain organisms and certain conditions.

So you have to understand that this is an international trade issue as well, as is security for us. So what is USDA done on either of those fronts?

Mr. BUTLER. Early in the year of 2000, prior to the 9/11 event of 2001, you recall seeing the horrendous outbreak of foot-and-mouth disease in other parts of the world. And during that time APHIS employees, as well as State veterinaries went to assist in other parts of the world as they were trying to overcome that livestock tragedy. From that we learned a great deal and I think States began to implement exercises and preparedness, and funds were distributed that heightened our concern for these global issues, using livestock as an example. So even prior to 9/11 I think there was a significantly increased effort with regard to these diseases.

In answer to your other questions, no doubt as we continue to increase our trading partners around the world we will be challenged by what those trading partners might bring in. The WTO does have standards. The international plant, pest community has a global board that identifies issues that globally are of concern. For instance, solid wood packing material is how some of these pests arrive, not only in our country, but are moved around the world. We have a similar body in the animal world, the International Epizootic that meets annually, raises issues of concern. So there is a global discussion going on about these pests, be they animal in nature, be they plant in nature.

Mr. GOODLATTE. Well, let me thank all the members of this panel for their fine contribution to the hearing today. I think we have a lot of work yet to do to figure out to coordinate the attack on invasive species that are causing serious harm to many aspects of our economy. And we will welcome and further responses to the questions that any of you may wish to submit in writing. And we will at this time dismiss the panel and welcome our second panel.

I will invite to the table Ms. Ann M. Bartuska, executive director, Invasive Species Initiative, The Nature Conservancy, Arlington, Va; Mr. Rob Hedberg, director of science policy, National and Regional Weed Science Society, Washington, DC; Dr. Richard Crowder, chief executive officer, American Seed Trade Association, Alexandria, VA; and Ms. Myra Hyde, Director of Environmental Issues, National Cattlemen's Beef Association, Washington, DC.

We would like to welcome all of you, I remind you again, your entire written statement will be made a part of the record and we would ask you to limit your comments to 5 minutes. And we will start with you, Dr. Bartuska.

STATEMENT OF

DR. SCOTT MILLER

**CHAIRMAN
DEPARTMENT OF SYSTEMATIC BIOLOGY
NATIONAL MUSEUM OF NATURAL HISTORY
SMITHSONIAN INSTITUTION**

BEFORE THE

**SUBCOMMITTEE ON DEPARTMENT OPERATIONS, OVERSIGHT,
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COMMITTEE ON AGRICULTURE
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Invasive species: Identification, Systematics and Information Needs

Invasive species, which are usually "alien" or non-indigenous species, are of great interest to agriculture, forestry, environment, and wildlife conservation agencies, as well as academia and the business community. Invasive species can impact the stability of both agricultural and natural habitats, they are one of the greatest threats to long-term conservation of biological diversity, they can impact on human health and cultural values, and they can have dramatic economic consequences.

Some examples of invasive species in recent news headlines: Asian longhorned beetle (NE USA); Emerald ash borer (Michigan); Snakehead fish (Maryland); Mitten crab (New York); Mosquitoes plus West Nile virus and Malaria; Fruit flies (California, Florida, Hawaii, Texas).

By their nature, invasive species challenge traditional disciplinary and geographic boundaries in the way we study and manage them. They can come from any place and be any kind of organism. Progress in recognizing and mitigating invasive species problems has been retarded by traditional thinking in terms of countries, sectors/disciplines and habitats. The National Invasive Species Council (NISC) and Global Invasive Species Programme (GISP) have been major steps forward.

Systematics (taxonomy) is important in providing (1) the basic tool for describing and explaining biological diversity; (2) a historical framework for ecology and biological control (e.g. predictive value of relationships or phylogeny); and (3) facilitating communication of knowledge. Getting the names of organisms wrong causes regulatory and management problems. For example, an invasive hydroid in Hawaii, thought to be rare endemic, almost became designated as an "endangered species."

Identification capabilities and systematics research are the basis for the prevention and control of invasive species. We need to know what is present within the USA in order to know what to keep out. We need to know what is present in other countries in order to determine which potentially invasive species we want to keep out. Accurate identifications are essential for appropriate decisions.

Examples will be given of modern tools that apply collections (specimen) data and predictive models of ecological niches to predicting potential spread of invasive species such as Chinese longhorned beetle and *Cactoblastis* moth.

Research and management needs for invasive species include:

- Information management and dissemination systems which should be accessible on Internet to the broadest possible audiences nationally and internationally.
- Identification aids on the "front line" such as keys and illustrations allowing quarantine officials to recognize potential pests.
- Broadening authoritative identification services such as those provided by agencies based at the National Museum of Natural History.
- Training and support for personnel.
- Targeted research in areas such as immature insects in cut flowers and horticulture, and plant pathogens (e.g., fungi).

The Smithsonian's National Museum of Natural History maintains worldwide reference collections and library resources, and is a source of global expertise and networking in systematics. The national biological collections are operated as a unique federal partnership with Agriculture, Commerce, Defense & Interior Departments to provide identification and research capacity.

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see also www.invasivespecies.gov

Invasive species: Identification, systematics and information needs

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Invasives in the news

- Asian longhorned beetle (NE USA)
- Emerald ash borer (Michigan)
- Snakehead fish (Maryland)
- Mitten crab (New York)
- Mosquitoes plus West Nile virus and Malaria
- Fruit flies (California, Florida, Hawaii, Texas)

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NEED CROSS-DISCIPLINARY APPROACH

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- By their nature, invasive species challenge traditional disciplinary and geographic boundaries in the way we study and manage them
- Can come from any place and any organism

Progress in recognizing and mitigating invasive species problems has been retarded by traditional thinking in terms of countries, sectors/disciplines and habitats...

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NISC is a major step forward...

Why systematics?

[= taxonomy]

- Basic tool for describing and explaining biological diversity
 - Historical framework for ecology & biocontrol (Predictive value of relationships)
 - Communication of knowledge
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Getting the names wrong causes problems

- Invasive hydroid in Hawaii, thought to be rare endemic, almost became an “endangered species”

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**Good or bad
depends on your point
of view**



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Jackson's Chameleon: invasive species on CITES?
Cactoblastis: biocontrol success or agriculture pest?
Apple snail: novel crop or pest?

**Identification capabilities and systematics
research are the basis for the prevention
and control of invasive species**



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- Need to know what is present in order to know what to keep out
 - Need to know what is present in other countries in order to determine which invasive species we want to keep out
 - Accurate identification is essential for appropriate decisions
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Current Solutions: Reactive

- Detect invading species *after invasion*
- Develop combat approach *only on a species by species basis*
- Approaches *lack general theoretical context*
 - Combat approaches are *reactive*

An example: Predictive modeling using collections data

- Distributed databases show native distribution and introduced distribution
- Model ecological niches of potential invaders
- Predict area of potential invasion
- Assess risk and critical areas for combating invasions
- www.speciesanalyst.net

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Potential Distribution of Asian Longhorn Beetle

Forest Types Potentially at Risk to Asian Long-horned Beetle*



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Research & Management Needs

- Information management & dissemination systems -- WWW accessible
- Identification aids on the “front line”
- Authoritative identification services
- Training and support for personnel
- Targeted research
 - Immature insects in cut flowers & horticulture
 - Plant pathogens (e.g., fungi)

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Smithsonian National Museum of Natural History role

- Worldwide reference collections and library
- Global expertise and networking
- Unique federal partnership with Agriculture, Commerce, Defense & Interior Departments to provide identification and research capacity

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