

## **Bioinvasion and Global Environmental Governance: The Transnational Policy Network on Invasive Alien Species**

### United States' Action on IAS

#### **Description<sup>1</sup>**

The United States of America (US) is a large country (either the third or fourth largest in the world by landmass) with about 305 million people. It was formed over several decades. Britain's American colonies broke with the mother country in 1776 and were recognized as the new nation of the United States of America following the Treaty of Paris in 1783. During the 19th and 20th centuries, 37 new states were added to the original 13 as the nation expanded across the North American continent and acquired a number of overseas possessions. The US is a federal constitutional republic.

The US is comprised of fifty states and a federal district. It is bordered to the North by Canada (this is a large and vastly unprotected border), and to the South Mexico. It spans from the Pacific Ocean in the west to the Atlantic Ocean in the east. The US is currently the world's sole superpower (economic, political and cultural) with the largest national economy—an estimated 2008 gross domestic product (GDP) of \$14.3 trillion. The US is a permanent member of United Nations Security Council as well as a member of G8 and NATO.

#### **Overview of Biodiversity**

- [Earth Trends Country Profile on Biodiversity and Protected Areas](#)
- [CBD Country Profile](#) (not complete)

#### **Legislation relating to IAS<sup>2</sup>**

- [Great Lakes--St. Lawrence River Basin Water Resources Compact](#),
- [Consolidated Natural Resources Act of 2008](#),
- [Food, Conservation, and Energy Act of 2008](#),
- [Water Resources Development Act 2007](#) (Asian carp),
- [Great Lakes Fish and Wildlife Restoration Act 2006](#) (Sea lamprey),
- [Salt Cedar and Russian Olive Control Demonstration Act 2006](#) (Salt Cedar and Russian Olive),
- [Public Lands Corps Healthy Forests Restoration Act 2005](#) (forest insect or disease pests),
- [Safe, Accountable, Flexible, Efficient Transport Equity Act: A Legacy for Users 2005](#) (terrestrial noxious weeds and aquatic weeds),
- [National Plan for Control and Management of Sudden oak Death 2004](#) (*Phytophthora ramorum*),
- [Noxious Weeds Control and Eradication Act 2004](#) (noxious weeds),
- [Brown Tree snake Control and Eradication Act 2004](#) (brown tree snake),
- [Nutria Eradication and Control Act 2003](#) (Nutria),
- [Plant Protection Act 2000](#) (plants and plant material and plant pests),

- [Water Resources Development Act 1999](#) (sea lamprey),
- [Lacey Act 1900 and 1998 amendment](#) (species injurious to human beings or resources),
- [National Invasive species Act 1996](#) (aquatic nuisance species and brown tree snake),
- [Agreement on the Application of Sanitary and Phytosanitary Measures 1995](#) (pests, diseases, disease-carrying organisms, or disease-causing organisms),
- [North American Agreement on Environmental Cooperation 1994](#) (exotic species),
- [Federal Plant Pest Act 1957 1994 amendment](#) (plant pests),
- [Alien Species Prevention and Enforcement Act 1992](#) (plant and animals whose shipment is prohibited under Lacey Act),
- [Hawaii Tropical Forest Recovery Act 1992](#) (non-native species),
- [Wild Bird Conservation Act 1992](#) (birds, non-native parasites and diseases transported by foreign birds),
- [Non-indigenous Aquatic Nuisance Prevention and Control Act 1990](#) (aquatic nuisance species),
- [Convention on the prohibition of the development, production and stockpiling of bacteriological \(biological\) and toxin weapons and on their destruction \(Biological Weapons Convention\) \(1975\)](#) (microbial or other biological agents),
- [Convention on International Trade in Endangered Species \(CITES\) \(1975\)](#) (species of flora and fauna which are threatened or endangered in exporting countries (Appendices I, II and III)),
- [Federal Noxious Weed Act 1974](#) (noxious weeds),
- [Endangered Species Act 1973](#) (non-native species),
- [Coastal Zone Management Act \(1972\)](#), [National Environmental Policy Act \(1970\)](#) (non-native species),
- [International Plant Protection Convention \(1952\)](#) (plant pests),
- [Federal Insecticide, Fungicide, and Rodenticide Act \(1947\)](#) (biological control agents),
- [Organic Act \(1944\)](#) (plant pests),
- [Federal Seed Act \(1940; ammended 1998\)](#) (seeds),
- [Animal Damage Control Act \(1931\)](#) (unintentional introductions),
- [Plant Quarantine Act \(1912\)](#) (unintentional and intentional introductions)

#### **Federal Government Agencies/Departments/Ministries dealing with IAS**

- [The National Institute for Global Environmental Change](#)
- [U.S. Environmental Protection Agency \(EPA\)](#)
  - [EPA Environmental Monitoring and Assessment Program \(EMAP\)](#)
- [U.S. Long-Term Ecological Research Network \(LTER\)](#)
- [U.S. Geological Survey \(USGS\)](#)
- [U.S. Fish and Wildlife Service](#)
- [US Department of the Interior \(DOI\)](#)
- [U.S. National Park Service \(NPS\)](#)
- [Oak Ridge National Laboratories \(ORNL\) - Environmental Sciences Division](#)
- [Earth Resources Observation Systems \(EROS\) Data Center](#)
- [U.S. Department of Agriculture \(USDA\)](#)

- USDA [National Invasive Species Information Center](#) (originally managed by a joint collaboration between NAL, the U.S. Geological Survey, National Biological Information Infrastructure, and the National Invasive Species Council.)
- USDA [Natural Resources Conservation Service](#)
- USDA [Economic Research Service](#)
- USDA [Animal and Plant Health Inspection Services](#)
- USDA [Forest Service](#)
- USDA [Cooperative State Research, Education and Extensive Service](#)
- NOAA (National Oceanic and Atmospheric Administration) Great Lakes Environmental Research Laboratory: [Aquatic Invasive Species Program](#)
- [NOAA National Oceanographic Data Center \(NODC\)](#)
- [National Invasive Species Council](#): an inter-Departmental council that helps to coordinate and ensure complementary, cost-efficient and effective Federal activities regarding invasive species. The Council was established February 3, 1999 by [Executive Order 13112](#). Council members include three co-chairs: the secretaries of the Agriculture, Commerce, Interior, and the secretaries of State, Defense, Homeland Security, Treasury, Transportation, Health and Human Services, as well as the Administrators of the Environmental Protection Agency, the U.S. Agency for International Development, the U.S Trade Representative, and the National Aeronautics and Space Administration.
- [US Department of Transportation](#)
- [US Coast Guard](#)
- [US Army Corps of Engineers](#)

**Major Invasive Alien Species** ([National Invasive Species Information Center](#), United States Department of Agriculture)

Aquatic Plants

[Brazilian Waterweed \(\*Egeria densa\*\)](#)  
[Caulerpa, Mediterranean Clone \(\*Caulerpa taxifolia\*\)](#)  
[Common Reed \(\*Phragmites australis\*\)](#)  
[Eurasian Watermilfoil \(\*Myriophyllum spicatum\*\)](#)  
[Giant Reed \(\*Arundo donax\*\)](#)  
[Giant Salvinia \(\*Salvinia molesta\*\)](#)  
[Hydrilla \(\*Hydrilla verticillata\*\)](#)  
[Melaleuca \(\*Melaleuca quinquenervia\*\)](#)  
[Purple Loosestrife \(\*Lythrum salicaria\*\)](#)  
[Water Chestnut \(\*Trapa natans\*\)](#)  
[Water Hyacinth \(\*Eichhornia crassipes\*\)](#)  
[Water Spinach \(\*Ipomoea aquatica\*\)](#)

Aquatic Animals

[Alewife \(\*Alosa pseudoharengus\*\)](#)  
[Asian Carps](#)  
[Asian Swamp Eel \(\*Monopterus albus\*\)](#)

[Bullfrog \(\*Rana catesbeiana\*\)](#)  
[Chinese Mitten Crab \(\*Eriocheir sinensis\*\)](#)  
[Eurasian Ruffe \(\*Gymnocephalus cernuus\*\)](#)  
[European Green Crab \(\*Carcinus maenas\*\)](#)  
[Flathead Catfish \(\*Pylodictus olivaris\*\)](#)  
[Lionfish \(\*Pterois volitans\*\)](#)  
[Northern Snakehead \(\*Channa argus\*\)](#)  
[New Zealand Mud Snail \(\*Potamopyrgus antipodarum\*\)](#)  
[Nutria \(\*Myocastor coypus\*\)](#)  
[Quagga Mussel \(\*Dreissena bugensis\*\)](#)  
[Round Goby \(\*Neogobius melanostomus\*\)](#)  
[Rusty Crayfish \(\*Orconectes rusticus\*\)](#)  
[Sea Lamprey \(\*Petromyzon marinus\*\)](#)  
[Sea Squirt \(\*Didemnum lahillei\*\)](#)  
[Spiny Water Flea \(\*Bythotrephes longimanus\*\)](#)  
[Veined Rapa Whelk \(\*Rapana venosa\*\)](#)  
[Zebra Mussel \(\*Dreissena polymorpha\*\)](#)

### Animal Pathogens

[Avian Influenza \(\*Orthomyxoviridae\*\)](#)  
[Exotic Newcastle Disease \(\*Paramyxovirus\*\)](#)  
[Fowlpox \(\*Avipoxvirus\*\)](#)  
[Viral Hemorrhagic Septicemia \(\*Novirhabdovirus\*\)](#)  
[West Nile Virus \(\*Flavivirus\*\)](#)  
[Whirling Disease \(\*Myxobolus cerebralis\*\)](#)

### Plant Pathogens

[Citrus Canker \(\*Xanthomonas axonopodis\*\)](#)  
[Citrus Greening \(\*Liberibacter asiaticus\*\)](#)  
[Plum Pox \(\*Potyvirus: Potyviridae\*\)](#)  
[Southern Bacterial Wilt \(\*Ralstonia solanacearum\*\)](#)  
[Soybean Rust \(\*Phakopsora pachyrhizi\*, \*Phakopsora meibomiae\*\)](#)  
[Sudden Oak Death \(\*Phytophthora ramorum\*\)](#)

### Plants

[Autumn Olive \(\*Elaeagnus umbellata\*\)](#)  
[Beach Vitex \(\*Vitex rotundifolia\*\)](#)  
[Canada Thistle \(\*Cirsium arvense\*\)](#)  
[Chinese Tallow \(\*Triadica sebifera\*\)](#)  
[Cogongrass \(\*Imperata cylindrica\*\)](#)  
[Common Teasel \(\*Dipsacus fullonum\*\)](#)  
[Dalmatian Toadflax \(\*Linaria dalmatica\*\)](#)  
[Diffuse Knapweed \(\*Centaurea diffusa\*\)](#)  
[Downy Brome \(\*Bromus tectorum\*\)](#)  
[Garlic Mustard \(\*Alliaria petiolata\*\)](#)  
[Giant Hogweed \(\*Heracleum\*](#)

[mantegazzianum\)](#)

[Hairy Whitetop \(\*Lepidium appelianum\*\)](#)  
[Houndstongue \(\*Cynoglossum officinale\*\)](#)  
[Japanese Honeysuckle \(\*Lonicera japonica\*\)](#)  
[Japanese Knotweed \(\*Fallopia japonica\*\)](#)  
[Johnsongrass \(\*Sorghum halepense\*\)](#)  
[Kudzu \(\*Pueraria montana\* var. \*lobata\*\)](#)  
[Leafy Spurge \(\*Euphorbia esula\*\)](#)  
[Medusahead \(\*Taeniatherum caput-medusae\*\)](#)  
[Mile-A-Minute Weed \(\*Persicaria perfoliata\*\)](#)  
[Multiflora Rose \(\*Rosa multiflora\*\)](#)  
[Musk Thistle \(\*Carduus nutans\*\)](#)  
[Purple Star Thistle \(\*Centaurea calcitrapa\*\)](#)  
[Quackgrass \(\*Elymus repens\*\)](#)  
[Russian Knapweed \(\*Rhaponticum repens\*\)](#)  
[Russian Olive \(\*Elaeagnus angustifolia\*\)](#)  
[Saltcedar \(\*Tamarix\* spp.\)](#)  
[St. Johnswort \(\*Hypericum perforatum\*\)](#)  
[Scotch Broom \(\*Cytisus scoparius\*\)](#)  
[Scotch Thistle \(\*Onopordum acanthium\*\)](#)  
[Spotted Knapweed \(\*Centaurea stoebe\*\)](#)  
[Tree-of-Heaven \(\*Ailanthus altissima\*\)](#)  
[Tropical Soda Apple \(\*Solanum viarum\*\)](#)  
[Whitetop \(\*Lepidium draba\*\)](#)  
[Yellow Star Thistle \(\*Centaurea solstitialis\*\)](#)  
[Yellow Toadflax \(\*Linaria vulgaris\*\)](#)

### Major Exported Species ([Ten Invasive Species that the United States Exported](#))<sup>2</sup>

Western corn rootworm	Devil's beggartick
Leidy's comb jelly	Pinwood nematode
North American bullfrog	<i>Bonamia osteae</i>
Eastern grey squirrel	Red swamp crayfish
Largemouth bass	Rosy wolfsnail

### Table 1 Actions to prevent, detect and manage IAS categorized into three themes: biodiversity, human health, and economic

Note: Actions (such as projects, publications and programs) are classified according to the most obvious theme but may also fit into the dimensions of another.

Theme	Action
Biodiversity	<ul style="list-style-type: none"> <li>The <a href="#">National Invasive Species Information Center</a> (NISIC) was</li> </ul>

	<p>established in 2005 at the National Agricultural Library to meet the information needs of users including the National Invasive Species Council (Council). NISIC Web site serves as a reference gateway to information, organizations, and services about invasive species.</p> <ul style="list-style-type: none"> <li>• University of Notre Dame: <a href="#">Center for Aquatic Conservation</a>: Scientists at Notre Dame partner with organizations such as The Nature Conservancy to affect both management and policy, and to enhance their own research in order to more efficiently and directly benefit society. Center-sponsored educational opportunities, such as courses, workshops, seminars, and research fellowships allow scientists to participate in informing management and policy. They also encourage students to relate research to pressing societal issues.</li> <li>• USDA <a href="#">Plant Pest Program Information</a> (implemented by the <a href="#">Animal and Plant Health Inspection Services</a>): Plant Protection and Quarantine (PPQ) safeguards agriculture and natural resources from the risks associated with the entry, establishment, or spread of animal and plant pests and noxious weeds to ensure an abundant, high-quality, and varied food supply.</li> <li>• USDA <a href="#">National Wildlife Disease Program</a> (implemented by the <a href="#">Animal and Plant Health Inspection Services</a>): NWDP participates in wildlife disease monitoring and surveillance in all regions of the United States. The program's Wildlife Disease Biologists (WDBs) act as WS' first responders through NWDP's Surveillance and Emergency Response System (SERS). Additionally, NWDP collaborates with non-governmental organizations and officials from other countries to promote and assist in the development of wildlife disease monitoring programs worldwide.</li> <li>• USDA <a href="#">National Wildlife Research Center</a> (implemented by the <a href="#">Animal and Plant Health Inspection Services</a>): Research on IAS has four components: <a href="#">Managing Invasive Species in Hawaiian Agriculture</a>, <a href="#">Invasive Mammalian Species</a>, <a href="#">Brown Treesnake Management</a>, and <a href="#">Avian Populations</a></li> <li>• USDA Public <a href="#">Pest Information Platform for Extension and Education</a> Website: tracks and maps soya bean rust infestations.</li> <li>• <a href="#">Eastern Forest Environmental Threat Assessment Center (EFETAC)</a> and <a href="#">Forest Threat Summary Viewer</a> (under the USDA <a href="#">Forest Service</a>): The mission is to generate, integrate, and apply knowledge to predict, detect, and assess environmental threats to public and private forests of the east, and to deliver this knowledge to managers in ways that are timely, useful, and user friendly.</li> <li>• U.S. Department of Agriculture (USDA) <a href="#">Grant and Partnership Programs that can Address Invasive Species Research, Technical Assistance, Prevention and Control 2008</a> (excluding four which are listed elsewhere in this table): Cooperative Forest Health Management Program (USDA Forest Service), National Research</li> </ul>
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	<p>Initiative: Biology of Weedy and Invasive Species (USDA Cooperative State Research, Education and Extensive Service or CSREES), <a href="#">Organismal and Population Biology of Arthropods and Nematodes</a> (USDA CSREES), <a href="#">Regional Integrated Pest Management Competitive Grants Program</a> (USDA CSREES), Wetlands Reserve Program (USDA Natural Resources Conservation Service-NRCS), Conservation Reserve Program (USDA Farm Service Agency), Wildlife Habitat Incentives Program (USDA NRCS), Environmental Quality Incentive Program (USDA NRCS), Conservation Reserve Enhancement Program (USDA FSA and NRCS), Conservation Innovation Grants (USDA NRCS), Grassland Reserve Program (USDA NRCS, FSA, and Forest Service), Plant Materials Program (USDA NRCS), Conservation on Private Lands Program (USDA NRCS), Cooperative Conservation Partnership Initiative (USDA NRCS), Agriculture Management Assistance Program (USDA NRCS), Conservation Security Program (USDA NRCS), Pest Detection (USDA Animal and Plant Health Inspection Service-APHIS), Animal Health Monitoring and Surveillance (USDA APHIS), and Emergency Management Systems (USDA APHIS)</p> <ul style="list-style-type: none"> <li>• <a href="#">Aquatic Nuisance Species Task Force</a>: education and outreach program includes three national campaigns (<a href="#">Stop Aquatic Hitchhikers</a>, <a href="#">Habitattitude</a>, <a href="#">100<sup>th</sup> Meridian Initiative</a>), fact sheets and posters. Conducted a <a href="#">Generic Non-indigenous Aquatic Organisms Risk Analysis Review Process in 1996</a>. The objective of the review process is to provide a standardized process for evaluating the risk of introducing non-indigenous organisms into a new environment and, if needed, determine the correct management steps needed to mitigate that risk.</li> <li>• <a href="#">Volunteer and Invasives Program</a> (National Wildlife Refuge Association, The Nature Conservancy, and USGS): Engaging volunteers in the fight against invasive species is an integral part of the National Wildlife Refuge System's (NWRs) management approach. It helps expand citizen participation in refuge operations while supporting the early detection of newly invading non-native species on refuge lands. Over the past few years, a new program has made this possible with support from a special Congressional appropriation to the U.S. Fish &amp; Wildlife Service.</li> <li>• <a href="#">An Ounce of Prevention: How to Stop Invasive Insects and Diseases from Devastating U.S. Forests (Feb 2007; 600 KB)</a> Nature Conservancy. Global Forest Partnership, Forest Health Program.</li> <li>• <a href="#">Defending Favorite Places: How Hunters and Anglers Can Stop the Spread of Invasive Species</a> (USDA. Forest Service) The documentary video, <i>Defending Favorite Places</i>, was produced on DVD as part of the National Invasive Species Threat Campaign.</li> </ul>
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	<p>Linking invasive species management principles with the hunting and angling conservation ethic is critical as invasive species threaten the future of hunting and fishing. The video links below require <a href="#">Windows Media Player</a> (.wmv):</p> <ul style="list-style-type: none"> <li>○ <a href="#">Full Length Program (26:46 min; 97 MB)</a></li> <li>○ <a href="#">Shorter Version (15:20 min; 56 MB)</a></li> <li>○ <a href="#">Trailer (5:20; 18.8 MB)</a></li> <li>○ <a href="#">Bonus Program (14:45; 53 MB)</a></li> </ul> <ul style="list-style-type: none"> <li>● <a href="#">Finger Lake PRISM: Partnership for Regional Invasive Species Management</a>: The Finger Lakes PRISM seeks to reduce the spread and impact of invasive species through coordinated prevention, detection, and control measures throughout Broome, Cayuga, Chemung, Chenango, Cortland, Livingston, Madison, Monroe, Onondaga, Ontario, Schuyler, Seneca, Tompkins, Tioga, Steuben, Wayne, and Yates counties.</li> <li>● <a href="#">The National Institute of Invasive Species Science</a> (run by the US Geological Survey Fort Collins Science Center, US Department of the Interior and NASA's Goddard Space Flight Center): aims to coordinate data and research from many sources to predict and reduce the effects of harmful non-native plants, animals, and diseases in natural areas and throughout the United States with a strategic approach to information management, research, modeling, technical assistance, and outreach.</li> <li>● <a href="#">Hawaiian Ecosystems at Risk project (HEAR)</a> - The mission of the Hawaiian Ecosystems at Risk (HEAR) project is to provide technology, methods, and information to decision-makers, resource managers, and the general public to help support effective science-based management of harmful non-native species in Hawaii and the Pacific.</li> <li>● <a href="#">Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW)</a> - FICMNEW represents a partnership between 16 federal agencies with direct invasive plant management and regulatory responsibilities spanning across the United States and territories. The committee's mission is to coordinate information regarding the identification and extent of invasive plants in the U.S. and to coordinate federal agency management of these species.</li> <li>● <a href="#">Invasive Species Forecasting System (ISFS)</a> - The NASA Office of Earth Science and the U.S. Geological Survey are working together to develop a National Invasive Species Forecasting System for the early detection, remediation, management, and control of invasive species on Department of Interior and adjacent lands.</li> <li>● <a href="#">Invasive Species Information Node</a> - The Invasive Species Information Node (ISIN) is an information portal for invasive plants, animals, and pathogens in the U.S. and a thematic node of the National Biological Information Infrastructure (NBII). It coordinates</li> </ul>
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	<p>invasive species information from other NBII nodes, several U.S. Geological Survey Science Centers, and other government and non-government partners.</p> <ul style="list-style-type: none"> <li>• Pacific Northwest Aquatic Monitoring Partnership’s <a href="#">Aquatic Invasive Species Working Group</a>: Goals and objectives, include to improve communication (increase awareness about AIS to field crews and agencies), to improve prevention practices (all field work should be following an Aquatic Invasive Species Hazard Analysis and Critical Control Point and analog for terrestrial invasive prevention) and to improve coordination (find potential partners in order to use existing monitoring programs to improve early detection capabilities)</li> <li>• <a href="#">Front Range Ecoregional Management Partnership (FREPM) Invasive Species Committee</a> (Department of the Air Force, Department of the Army, Department of Defense, US Fish and Wildlife Service, Colorado Natural Heritage Program, Colorado State University, and Texas A&amp;M University): <a href="#">Invasive Plant Species Strategic Plan</a> on a strategy for control of invasive plants found at nine military installations located along the Front Range of Colorado and Wyoming.</li> <li>• The <a href="#">National Aquatic Nuisance Species Clearinghouse</a>, <a href="#">Sea Grant Nonindigenous Species Site</a> (SGNIS) and <a href="#">Aquatic Invasions Research Directory</a> (AIRD) formed a collaborative partnership to provide an extensive landscape of information on aquatic invasive species, enhancing the dissemination of current aquatic invasive species research, ballast water technologies, aquatic invasive species management and contact information.</li> <li>• <a href="#">Invasive Plant Council of New York State</a>: purpose is to provide an information clearinghouse for invasive plant identification, research and management. We serve needs of the general public; local, state, and federal government and their agencies; the academic and scientific communities; the business community; and not-for-profit organizations concerning invasive plant issues in New York State. The organization has developed an Early Detection list for each of the eight PRISM regions in the State.</li> <li>• <a href="#">Oregon Invasive Species Council</a>: The purpose of OISC shall be to conduct a coordinated and comprehensive effort to keep invasive species out of Oregon and to eliminate, reduce, or mitigate the impacts of invasive species already established in Oregon.</li> <li>• <a href="#">Washington State Invasive Species Council</a>: The Council’s mission is to sustain Washington’s human, plant, and animal communities and our thriving economy, by preventing the introduction and spread of harmful invasive species. To do this, the Council is developing policy level direction, planning, and coordination that will:       <ul style="list-style-type: none"> <li>- Empower those engaged in the prevention, detection, and</li> </ul> </li> </ul>
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	<p>eradication of invasive species;</p> <ul style="list-style-type: none"> <li>- Include a strategic plan designed to build upon local, state, and regional efforts; and</li> <li>- Serve as a forum for invasive species education and communication.</li> </ul>
Human health	<ul style="list-style-type: none"> <li>• Armineh Zohrabian, Martin I. Meltzer, Raoult Ratard, Kaafee Billah, Noelle A. Molinari, Kakoli Roy, R. Douglas Scott II, and Lyle R. Petersen. (2002) <a href="#">West Nile Virus Economic Impact, Louisiana</a>. Centers for Disease Control and Prevention, Atlanta, Georgia, USA; and Louisiana Department of Health and Hospitals, New Orleans, Louisiana, USA.</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• <a href="#">Invasive Species Prevention Participating Business Program</a>: There are various businesses around Lake George, New York, that are members of the Commission's Invasive Species Prevention Program. These businesses participate in a volunteer network with the goal of preventing the introduction and transfer of aquatic invasive species into Lake George. This volunteer program offers services ranging from distribution of educational material and referral to facilities providing boat inspections and/or boat washes.</li> <li>• <a href="#">Program of Research on the Economic Side of Invasive Species Management (PREISM)</a> by the USDA <a href="#">Economic Research Service</a>: PREISM focuses on economic issues related to <a href="#">invasive species of agricultural significance or other pests that fall under USDA programs</a>. 45 project have been funded from 2003 to 2008. Program themes include international dimensions of invasive species prevention and management; development and application of methods to analyze important invasive species issues, policies, and programs; and analysis of economic, institutional, and behavioral factors affecting decisions to prevent or manage invasive species. A <a href="#">summary document</a> details PREISM objectives and activities and reports accomplishments for fiscal years 2003-06. Included are descriptions of the extramural research program and all funded projects, and a list of project outputs.</li> <li>• <a href="#">Phytosanitary Regulation of the Entry of Fresh Fruits and Vegetables into the United States</a>: This data product identifies which countries, under APHIS phytosanitary rules, are eligible to export to the United States the fresh fruits and vegetables that are most important in the American diet. Current data represent country eligibility as of June 2008. Previous (2007) data represent eligibility as of February 2007. Data on the absolute and relative importance of these countries in international production and trade, individually and in aggregate, are also included. This data product supports the objectives of the Program for Research on the Economics of Invasive Species (PREISM) under which ERS funds and conducts research to improve the economic basis of decisionmaking</li> </ul>

	<p>concerning invasive species issues, policies, and programs.</p> <ul style="list-style-type: none"> <li>• <a href="#">Economics and Invasive Plant Management in Florida</a> by the Florida Department of Environmental Protection has three projects: <ul style="list-style-type: none"> <li>○ The economic value of Lake Tarpon, Florida and the impact of aquatic weeds. A.I.Burruss Institute of Public Service, Kennesaw State University and the Department of Economics, Florida State University. 1998.</li> <li>○ When the multiplier is considered, it is estimated that spending of sales related to Lake Tarpon amounted to about \$50.4 million in the EIA in 1997. This generated nearly \$9 million in wages and 711 jobs.</li> <li>○ The economic value of Lake Jackson. A.L. Burruss Institute of Public Service, Kennesaw State College, and the Department of Economics, Florida State University. 1993.</li> </ul> </li> <li>• <i>Northeastern Agricultural and Research Economics Association</i>. Workshop Sponsored by U.S. Environmental Protection Agency and USDA, Economic Research Service. <a href="#">2005 NAREA Workshop on Economics of Invasive Species - Executive Summary (PDF   14 KB)</a> Jun 14-15, 2005 in Annapolis, Maryland.</li> <li>• <a href="#">Florida Invasive Species Partnership</a> (US Fish and Wildlife Service Partner's Program, USDA NRCS, The Nature Conservancy, Florida Exotic Pest Plant Council, US Army Corps of Engineers, Florida Fish and Wildlife Conservation Commission, Florida Department of Agriculture and Consumer Service, Florida Department of Transportation, Southwest Florida Water Management District, Palm Beach County, and University of Florida—website developed by the University of Georgia-Center for Invasive Species and Ecosystem Health) <p><b>Goals:</b></p> <ul style="list-style-type: none"> <li>• Increase effectiveness and decrease costs by working together.</li> <li>• Provide tools to develop a unified approach and bridge the gap between landowners.</li> <li>• Encourage development and implementation of new and innovative approaches.</li> </ul> <p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• Develop <a href="#">Incentive Program Matrix</a> of existing incentive programs that could target the problem on public and private lands.</li> <li>• Establish Matrix on an interactive website</li> <li>• Promote partnership efforts, such as Cooperative Weed Management Areas (CWMA), to encourage collaborative efforts on a statewide, regional and local level.</li> <li>• Provide central "clearinghouse" for CWMA's and innovative approaches.</li> </ul> </li> <li>• <a href="#">Hawaii Invasive Species Partnership</a></li> </ul>
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	<ul style="list-style-type: none"> <li>○ <a href="#">Hawaii Invasive Species Council</a>: provides policy level direction, coordination, and planning among state departments, federal agencies, and international and local initiatives for the control and eradication of harmful invasive species infestations throughout the State [of Hawaii] and for preventing the introduction of other invasive species that may be potentially harmful. The HISC is co-chaired by the <a href="#">Department of Land and Natural Resources</a> and the <a href="#">Department of Agriculture</a>, and they work in conjunction with its members: University of Hawaii, Hawaii Department of Business, Economic Development and Tourism, Hawaii Department of Health, and Hawaii Department of Transportation. In addition, the leaders of the following Departments and organizations have been invited to participate: County Mayors, Hawaii Department of Defense, Hawaii Department of Consumer Affairs, Department of Hawaiian Home Lands, Federal agency representatives, and Non-profit agency representatives.</li> <li>○ <a href="#">Coordinating Group on Alien Pest Species</a>: Formed in 1995, the CGAPS partnership is comprised primarily of management-level staff from every major agency and organization involved in invasive species work, including federal, state, county and private entities. Members participate in quarterly meetings and ad hoc steering committee meetings in an effort to influence policy and funding decisions, improve communications, increase collaborations, and to promote public awareness.</li> <li>○ <a href="#">Invasive Species Committees</a>: are island-based partnerships of government agencies, non-government organizations, and private businesses working to protect each island from the most threatening invasive pests. Each ISC partnership also has a paid staff and field crew to implement rapid response and control plans. The ISCs formed on each island to address the need for rapid response and control work on new invasive pests that have the potential to severely impact the economy, ecosystem, watersheds, human health, and quality of life. A driving objective of the ISCs is to control the most threatening pests while populations are still relatively small and it is economically feasible to control or eliminate them. The Invasive Species Committees of Hawaii include: <ul style="list-style-type: none"> <li>● <a href="#">Big Island Invasive Species Committee (BIISC)</a></li> <li>● <a href="#">Kauai Invasive Species Committee (KISC)</a></li> <li>● <a href="#">Maui Invasive Species Committee (MISC)</a></li> <li>● <a href="#">Molokai Invasive Species Committee (MoISC)</a></li> <li>● <a href="#">Oahu Invasive Species Committee (OISC)</a></li> </ul> </li> </ul>
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	<ul style="list-style-type: none"> <li>• <a href="#">National Invasive Species Council (NISC)</a> - The National Invasive Species Council (Council) is an inter-Departmental council that helps to coordinate and ensure complementary, cost-efficient and effective Federal activities regarding invasive species. This website lists information regarding the council's Executive Order, Management Plan, Invasive Species Advisory Committee, Working Groups, Council Members, FY 2004 Interagency Performance Budget (available for download) and Staff Profiles.</li> <li>• <a href="#">Puget Sound Partnership</a>: a community effort, engaging elected and public officials, tribal and business leaders, scientists, environmentalists and, most importantly - the public. We are all working collaboratively to develop the Action Agenda for Puget Sound (<a href="#">draft</a>) by our December 1, 2008 deadline, including the eradication and control of <a href="#">aquatic nuisance species</a>.</li> </ul>
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**Table 2 Actions on IAS in cooperation with other countries**

<b>Agreement/ Organization</b>	<b>Countries/ Member</b>	<b>Action</b>
Boundary Waters Treaty (1909)	Canada	Created the International Joint Commission, which oversees water quality to this day. <sup>3</sup>
<a href="#">International Joint Commission</a>	Canada	<p><a href="#">Great Lakes Water Quality Agreement</a></p> <ul style="list-style-type: none"> <li>• Binational Toxics Strategy of 1997 seeks to virtually eliminate the release of certain toxic substances into the Great Lakes.<sup>2</sup></li> <li>• Establishes Remedial Action Plans for Canada's <a href="#">Areas of Concern in the Great Lakes</a></li> <li>• Great Lakes Sustainability Fund 2000: aims to advance Remedial Action Plans</li> </ul>
<a href="#">The Great Lakes Water Commission</a>	Eight Great Lakes states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin) and the provinces of Ontario and Québec (associate members)	<p><b>The Great Lakes Panel on Aquatic Nuisance Species</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Great Lakes Regional Collaboration Strategy</a> (2005) Areas of priorities in include: “preventing the introductions of IAS by ships through ballast water and other means; stopping invasions of species through canals and waterways; restricting trade in live organisms; passage of comprehensive federal AIS legislation; establishing a program for rapid response and management; and education and outreach on AIS introduction and prevention.”</li> </ul>
<a href="#">North American Agreement on Environmental</a>	Canada and Mexico	<p><b>Commission for Environmental Cooperation</b></p> <ul style="list-style-type: none"> <li>• Citizens Submission Process</li> </ul> <p><a href="#">CEC Strategic Plan on Trade and Environment</a></p>

<p><a href="#">Cooperation (NAAEC)</a></p>		<ul style="list-style-type: none"> <li>• Projects will reduce the environmental and economic harm caused by invasive alien species (IAS) through greater coordination in the prevention, detection, analysis, and mitigation: <ul style="list-style-type: none"> <li>○ Share methodologies and develop guidelines for assessing and communicating risks associated with aquatic IAS pathways;</li> <li>○ Develop strategies for public engagement in identification and mitigation measures;</li> <li>○ Encourage greater collaboration between and among civil society groups and governments in North America to prevent and control IAS; and</li> <li>○ Develop methods to better analyze the environmental and economic costs of IAS including determining how these costs are borne by specific geographic regions, ecosystems, industry sectors and governments.</li> </ul> </li> <li>• Produced the report <a href="#">Closing the Pathways of Aquatic Invasive Species across North America: Overview and Resource Guide</a>.</li> <li>• Trinational Alien Invasive Species Project mandated the CEC to formulate the Trinational Aquatic Invasive Species Risk Assessment Guidelines and test them. Thus the CEC produced a report entitled the <a href="#">Trinational Aquatic Invasive Species Risk Assessment Guidelines for Aquatic Invasive Speices: Test Cases for the Snakeheads (<i>Channidae</i>) and Armored Catfish (<i>Loricariidae</i>) in North American Inland Waters</a>. These Guidelines will serve as a tool to North American resource managers who are evaluating whether or not to introduce a non-native species into a new ecosystem. Guidelines provide a framework where scientific, technical, and other relevant information can be organized into a format that is understandable and useful to managers and decision makers.</li> </ul>
<p><a href="#">Great Lakes St. Lawrence Seaway System</a></p>	<p>The Saint Lawrence Seaway Development Corp. in the U.S., a federal agency within the U.S.</p>	<p><a href="#">Ballast Water Management on the Great Lakes Seaway System</a> Regulatory bodies test the salinity in ballast tanks in order to confirm that the salinity meets the minimum required salinity of 30 ppt (parts per thousand). In addition, non-pumpable or NOBOB</p>

	Department of Transportation, and The St. Lawrence Seaway Management Corporation in Canada, a not-for-profit corporation	tanks are tested to determine salinity or condition of the tank ensuring proper saltwater flushing has been completed. Ships will be issued a letter of retention from the appropriate agency(s) if a ballast tank does not comply with the minimum salinity of 30 ppt and/or the condition of the tank indicates improper saltwater flushing. Ships can alternately choose to return to sea and conduct an appropriate exchange, treat or pump ashore as approved by Transport Canada and the U.S. Coast Guard.
<a href="#">Council of Great Lake Governors</a>	Governors of the eight Great Lakes States and the Premiers of Ontario and Québec	<a href="#">The Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement</a> (2005) Acknowledges that IAS is an important issue for the Council in protecting fresh water but only mentions the permissibility of removing water if it is to prevent IAS
<a href="#">Border Environmental Cooperation Commission (BECC)</a>	Mexico	Works to preserve, protect and enhance human health and the environment of the U.S. - Mexico border region, by strengthening cooperation among interested parties and supporting sustainable projects through a transparent binational process in close coordination with the North American Development Bank, federal, state and local agencies, the private sector, and civil society. <a href="#">Charter of the Border Environment Cooperation Commission</a>
<a href="#">Convention on Great Lakes Fisheries Between the United States and Canada (1955)</a>	Canada	<p style="text-align: center;"><b>ARTICLE I</b></p> <p>This Convention shall apply to Lake Ontario (including the St. Lawrence River from Lake Ontario to the forty-fifth parallel of latitude), Lake Erie, Lake Huron (including Lake St. Clair), Lake Michigan, Lake Superior and their connecting waters, hereinafter referred to as "the Convention Area." This Convention shall also apply to the tributaries of each of the above waters to the extent necessary to investigate any stock of fish of common concern, the taking or habitat of which is confined predominantly to the Convention Area, and to eradicate or minimize the populations of the sea lamprey (<i>Petromyzon marinus</i>) in the Convention Area.</p>



<a href="#">U.S.-Chile Joint Commission for Environmental Cooperation, Environmental Cooperation Agreement, 2005-2006 Work Program</a>	Chile	<p>Activity 3.2. Preventing the transmission of invasive species. Explore joint conferences and research opportunities to:</p> <ul style="list-style-type: none"> <li>• Develop practical decision making tools for invasive species management;</li> <li>• Evaluate trade impacts of invasive species;</li> <li>• Exchange experiences and approaches to border controls to prevent the entry of invasive species.</li> </ul> <p><b>Possible Participants</b>  <b>US:</b> USDA, EPA, DOI, DOS, Invasive Species Council, and Department of Homeland Security / Customs and Border Protection (DHS/CBP).  <b>Chile:</b> DIMA, National Customs Service, SAG, MINSAL, Direction General of Maritime Territory and Merchant Marine (DIRECTEMAR), SUBPESCA, and CONAMA.</p>
<a href="#">United States Node of the Inter-American Biodiversity Information Network (U.S. IABIN)</a>	Countries, organizations, research institutions, and banks in the Americas	<p>The <a href="#">Biological Informatics Office (BIO)</a> of the USGS Biological Resources Discipline is the U.S. IABIN Focal Point and is responsible for coordinating U.S. participation in IABIN. The U.S. currently holds the IABIN Council Chair position. As part of its work with BIO, the <a href="#">National Biological Information Infrastructure</a> provides leadership on the development of several core IABIN tools such as the IABIN Catalog and search engine.</p> <p><b>Key Partners:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">National Biological Information Infrastructure (NBII - USGS)</a> U.S. IABIN Focal Point IABIN Council Chair Coordinating Institution for the <a href="#">IABIN Invasives Species Thematic Network (I3N)</a> Leads development of several core tools</li> <li>• <a href="#">IABIN Focal Points</a> 34 countries of the Western Hemisphere have designated official Focal Points</li> <li>• <a href="#">Organization of American States (OAS)</a> IABIN Diplomatic Host Executing Agency for the GEF "Building IABIN" Project</li> <li>• <a href="#">The World Bank</a> Implementing Agency of the GEF "Building IABIN" Project</li> <li>• <a href="#">City of Knowledge</a> Host of the IABIN Secretariat</li> <li>• <a href="#">Clearing-House Mechanism (CHM)</a> (Convention on Biological Diversity)</li> </ul>

		<p><a href="#">Memorandum of Cooperation between IABIN and the CHM</a> to facilitate information sharing on biodiversity conservation and sustainable management. IABIN is represented on the CHM Informal Advisory Committee.</p> <ul style="list-style-type: none"> <li>• <a href="#">Global Biodiversity Information Facility (GBIF) Memorandum of Understanding between IABIN and GBIF</a> to promote biodiversity information exchange. IABIN is an associate member of GBIF.</li> <li>• <a href="#">Central American Commission on Environment and Development (CCAD) Memorandum of Cooperation between IABIN and CCAD</a> to promote the generation, exchange, and management of biodiversity information in Central America. (<a href="#">Spanish</a>)</li> <li>• <a href="#">Pan American Institute of Geography and History (PAIGH) Memorandum of Cooperation between IABIN and PAIGH</a> to promote integration of geospatial and biodiversity data, as well as tool development for environmental policy making.</li> <li>• <a href="#">Ocean Biogeographic Information System (OBIS) Memorandum of Cooperation between IABIN and OBIS</a> on exchange and management of marine biodiversity information.</li> </ul>
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## Case studies

### [The Value of Plant Disease Early-Warning Systems: A Case Study of USDA's Soybean Rust Coordinated Framework](#)

By Michael J. Roberts, David Schimmelpfennig, Elizabeth Ashley, Michael Livingston, Mark Ash, and Utpal Vasavada

Economic Research Report No. (ERR-18) 46 pp, April 2006

Early-warning systems for plant diseases are valuable when the systems provide timely forecasts that farmers can use to inform their pest management decisions. To evaluate the value of the systems, this study examines, as a case study, USDA's coordinated framework for soybean rust surveillance, reporting, prediction, and management, which was developed before the 2005 growing season. The framework's linchpin is a website that provides real-time, county-level information on the spread of the disease. The study assesses the value of the information tool to farmers and factors that influence that value. The information's value depends most heavily on

farmers' perceptions of the forecast's accuracy. The study finds that the framework's information is valuable to farmers even in a year with a low rust infection like that of 2005. We estimate that the information provided by the framework increased U.S. soybean producers' profits by a total of \$11-\$299 million in 2005, or between 16 cents and \$4.12 per acre, depending on the quality of information and other factors. The reported cost of the framework was between \$2.6 million and almost \$5 million in 2005.

### [Linking Risk and Economic Assessments in the Analysis of Plant Pest Regulations: The Case of U.S. Imports of Mexican Avocados](#)

By Everett Peterson and David Orden. ERS project representative: Donna Roberts

Contractor and Cooperator Report No. (CCR-25) 61 pp, October 2006

This study compares the effects of importing fresh Mexican Hass avocados into the United States under three scenarios for mitigating pest risks. The analysis finds that Scenario 1, adherence to the U.S. phytosanitary rule of November 2004—which removed all seasonal and geographic restrictions on Mexican avocados, while maintaining existing compliance procedures in Mexico—leads to low pest risks for U.S. producers and an estimated annual U.S. welfare gain of \$72 million. In Scenario 2, if compliance measures specific to fruit fly control are eliminated along with seasonal and geographic restrictions, pest risks for U.S. producers remain low and there is an additional gain in net U.S. welfare of \$1.7 million. Results for Scenario 3, which eliminates all control measures in Mexico, depends on the level of pest-risk estimated. With average risk, there is a gain in net U.S. welfare of about \$8.5 million compared with eliminating only seasonal and geographic restrictions, but U.S. producers incur significant pest control costs. With maximum pest-risk estimates, the net gain in U.S. welfare is \$16.2 million less than if only geographic and seasonal restrictions are eliminated, with larger pest control costs for U.S. producers and lower consumer welfare gains due to pest-related losses of U.S. avocados.

### [Economic and Policy Implications of Wind-Borne Entry of Asian Soybean Rust into the United States](#)

By Mike Livingston, Rob Johansson, Stan Daberkow, Michael Roberts, Mark Ash, and Vince Breneman

Outlook Report No. (OCS04D02), April 2004

American soybean producers and the research, regulatory, and extension institutions supporting them are preparing for the potential wind-borne entry of Asian soybean rust into the United States. This report examines how the economic impacts of soybean rust establishment will depend on the timing, location, spread, and severity of rust infestation and on how soybean and other crop producers, livestock producers, and consumers of agricultural commodities respond to this new pathogen.

## [A Framework for Analyzing Technical Trade Barriers in Agricultural Markets](#)

Donna Roberts, Timothy E. Josling, and David Orden

Technical Bulletin No. (TB1876) 52 pp, March 1999

Technical trade barriers are increasingly important in the international trade of agricultural products. Designing technical trade measures that can satisfy the growing demand for food safety, product differentiation, environmental amenities, and product information at the lowest cost to the consumer and to the international trading system requires an understanding of the complex economics of regulatory import barriers. This report proposes a definition and classification scheme to frame discussion and evaluation of such measures. Open-economy models that complement the classification scheme are developed graphically to highlight the basic elements that affect the economic impacts of changes in technical trade barriers.

### **References**

1. Country descriptions are compiled from the Central Intelligence Agency's World FactBook, available at <https://www.cia.gov/library/publications/the-world-factbook/>, and Wikipedia: The Free Encyclopaedia, available at [http://en.wikipedia.org/wiki/Main\\_Page](http://en.wikipedia.org/wiki/Main_Page).
2. Great Lakes United Union St-Lawrence Grands Lacs. (15 January 2004) "Ten Invasive Species that the United States Exports." Retrieved 18 May 2009, from [http://www.glu.org/sites/default/files/Exported\\_Problems\\_Factsheet.pdf](http://www.glu.org/sites/default/files/Exported_Problems_Factsheet.pdf)
3. Foreign Affairs and International Trade Canada. (18 August 2008) *Canada-United States: Our Shared Environment*. Retrieved 28 September 2008, from [http://geo.international.gc.ca/can-am/main/shared\\_env/default-en.asp](http://geo.international.gc.ca/can-am/main/shared_env/default-en.asp).