

HB

12

Good Afternoon Chairman Johnson and members of the House Finance committee

For the record, my name is Sue Ely and I am here on behalf of the Alaska Conservation Alliance, a coalition of 40 Alaskan conservation organizations with a combined membership of over 38,000 Alaskans. I would like to thank you for the opportunity to speak in support of HB12, establishing the Alaska Council on Invasive Species in the Department of Fish and Game.

Alaska is home to an amazing abundance of plant and animal life. Whether valued as charismatic Alaskan icons, or as the source of our continued economic and subsistence prosperity, Alaska's flora and fauna are vital to our economic well being Alaska way of life. However, these resources could be threatened by the spread of invasive species.

Already Alaska has suffered the effects of invasive Atlantic Salmon, pike and Reed Canary grass, to name a few. Plants, animals, fish and crustaceans, introduced into an environment devoid of their natural predators and limitations can irreversibly destroy an ecosystem and that destruction can translate into direct monetary, cultural and lifestyle impacts. Invasive species have cost lower 48 economies billions of

dollars in revenue. In order for Alaska to avoid a similar fate, it is prudent to address this issue now.

I believe the 14-member Council will provide the broad stakeholder cooperation and oversight needed to prevent new invasive species from taking root in Alaska and to mitigate the damage of invasives already introduced. At risk are Alaska's biological treasures; its harvested resources and subsistence plants and animals; the beauty and diversity that make Alaska a world-class tourist destination. It is our understanding and our hope that the least amount of the least toxic management tools would be used to control marine invasive species and that pesticides be used only as a last resort.

The Alaska Conservation Alliance would like to thank you for this opportunity to voice our support for HB 12 and encourage you to pass this bill out of the House Finance Committee.

Thank you Chairman Johnson and House Finance Committee members very much for all of your hard work and for giving me the chance to speak today.

FISCAL NOTE

STATE OF ALASKA
2009 LEGISLATIVE SESSION

Fiscal Note Number: _____
 Bill Version: HB12
 () Publish Date: _____

Identifier (file name): HB012-DFG-BDS-02-17-09
 Title An Act establishing the Alaska Council on Invasive Species
 Sponsor Representative Johnson
 Requester House Resources
 Dept. Affected: ADFG
 RDU Administration & Support
 Component Fish and Game Boards and Advisory Committees
 Component Number 2825

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	Appropriation Required	Information					
		FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
OPERATING EXPENDITURES							
Personal Services	164.8		164.8	164.8	164.8	164.8	164.8
Travel	12.4		12.4	12.4	12.4	12.4	12.4
Contractual	12.2		12.2	12.2	12.2	12.2	12.2
Supplies	6.5		6.5	6.5	6.5	6.5	6.5
Equipment							
Land & Structures							
Grants & Claims							
Miscellaneous							
TOTAL OPERATING	195.9	0.0	195.9	195.9	195.9	195.9	195.9

CAPITAL EXPENDITURES							
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CHANGE IN REVENUES ()							
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FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts							
1003 GF Match							
1004 GF	195.9		195.9	195.9	195.9	195.9	195.9
1005 GF/Program Receipts							
1037 GF/Mental Health							
Other Interagency Receipts							
TOTAL	195.9	0.0	195.9	195.9	195.9	195.9	195.9

Estimate of any current year (FY2009) cost: _____

POSITIONS

Full-time	2.0		2	2	2	2	2
Part-time							
Temporary							

ANALYSIS: (Attach a separate page if necessary)

This legislation establishes a statewide, all taxa Invasive Species Council in Alaska. Personal services are required to support two new positions, an Executive Director (Range 21, \$96.9) and an Administrative Assistant III (Range 15, \$67.8) to oversee and facilitate the actions and deliverables dictated by the bill, and to support a council of fourteen.

Travel, lodging, and per diem for an estimated 10 of 14 council members will be required for quarterly meetings (\$12.4). Meeting rooms, audio/visual equipment, printing of the strategic plan, educational materials, and website support is estimated at \$12.2, and supplies & computer equipment for staff and council meetings is \$6.5.

Prepared by: Charles O. Swanton
 Division: Sport Fisheries
 Approved by: Tom Lawson, Division Director
Administrative Services

Phone 465-6184
 Date/Time 1/23/09 12:00 AM
 Date 2/17/2009

FISCAL NOTE

STATE OF ALASKA
2009 LEGISLATIVE SESSION

Fiscal Note Number: _____
Bill Version: HB 12
() Publish Date: _____

Identifier (file name): HB012-DEC-SWM-1-29-09 Dept. Affected: Environmental Conservation
Title: Alaska Council on Invasive Species RDU: Environmental Health
Sponsor: Representative Johnson Component: Solid Waste Management
Requester: House Resources Committee Component Number: 2344

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	Appropriation Required	Information						
		FY 2010	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
OPERATING EXPENDITURES								
Personal Services								
Travel								
Contractual								
Supplies								
Equipment								
Land & Structures								
Grants & Claims								
Miscellaneous								
TOTAL OPERATING		0.0	0.0	0.0	0.0	0.0	0.0	0.0

CAPITAL EXPENDITURES								
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CHANGE IN REVENUES ()								
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FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts								
1003 GF Match								
1004 GF								
1005 GF/Program Receipts								
1037 GF/Mental Health								
Other Interagency Receipts								
TOTAL		0.0	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2009) cost: _____

POSITIONS

Full-time								
Part-time								
Temporary								

ANALYSIS: (Attach a separate page if necessary)

This bill will have no fiscal impact on the Department of Environmental Conservation.

Prepared by: Kristin Ryan, Director
Division: Environmental Health
Approved by: Dan Easton
Deputy Commissioner

Phone 907-269-7645
Date/Time 1-29-09 16:00 pm
Date 2/13/2009

FISCAL NOTE

STATE OF ALASKA
2009 LEGISLATIVE SESSION

Fiscal Note Number: _____
 Bill Version: HB012
 () Publish Date: _____

Identifier (file name): HB012-DNR-AG-02-17-09 Dept. Affected: Natural Resources
 Title Alaska Council on Invasive Species RDU Resource Development
 Component Agricultural Development
 Sponsor Representative Johnson
 Requester House Resources Committee Component Number 455

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	Appropriation Required	Information					
		FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
OPERATING EXPENDITURES							
Personal Services							
Travel							
Contractual							
Supplies							
Equipment							
Land & Structures							
Grants & Claims							
Miscellaneous							
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CAPITAL EXPENDITURES							
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CHANGE IN REVENUES ()							
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FUND SOURCE (Thousands of Dollars)

	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other Interagency Receipts						
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2009) cost: _____

POSITIONS

	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Full-time						
Part-time						
Temporary						

ANALYSIS: (Attach a separate page if necessary)

This bill will have no fiscal impact on the Department of Natural Resources.

Prepared by: Franci Havemeister, Director Phone 907-761-3867
 Division Agriculture Date/Time February 17, 2009
 Approved by: Tom Irwin, Commissioner Date February 17, 2009
Natural Resources

FISCAL NOTE

STATE OF ALASKA
2009 LEGISLATIVE SESSION

Fiscal Note Number: _____
 Bill Version: HB012
 () Publish Date: _____

Identifier (File Name): HB012-UA-UAF-2-17-09 Dept. Affected: University of Alaska
 Title: Noxious Weeds and Invasive Plants RDU: University of Alaska Fairbanks
 Component: Cooperative Extension Service
 Sponsor: Representatives Johnson and Buch, Munoz
 Requester: Resources Component No.: 745

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	Appropriation Required	Information						
		FY 2010	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
OPERATING EXPENDITURES								
Personal Services	0.0							
Travel								
Contractual								
Supplies								
Equipment								
Land & Structures								
Grants & Claims								
Miscellaneous								
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CAPITAL EXPENDITURES								
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CHANGE IN REVENUES ()								
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FUND SOURCE (Thousands of Dollars)

	FY 2010	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
1002 Federal Receipts							
1003 GF Match							
1004 GF							
1005 GF/Program Receipts							
1037 GF/Mental Health							
Other Interagency Receipts							
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2009) cost: _____

POSITIONS

Full-time							
Part-time							
Temporary							

ANALYSIS: (Attach a separate page if necessary)

Participation on the Council by a University of Alaska employee would not create a fiscal impact to the University.

Prepared by: Betty Dupee
 Division: University of Alaska
 Approved by: Michelle Rizk
 Agency: University of Alaska

Phone 907-450-8180
 Date/Time 2/17/09 1:00 PM
 Date 2/17/09 1:00 PM

FISCAL NOTE

STATE OF ALASKA
2009 LEGISLATIVE SESSION

Fiscal Note Number: _____
Bill Version: HB012
() Publish Date: _____

Identifier (file name): HB012-DHSS-EPI-02-13-09 Dept. Affected: Health & Social Services
Title: Alaska Council on Invasive Species RDU: Public Health
Sponsor: Johnson Component: Epidemiology
Requester: House Resources Component Number: 296

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	Appropriation Required	Information					
	FY 2010	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Personal Services							
Travel							
Contractual							
Supplies							
Equipment							
Land & Structures							
Grants & Claims							
Miscellaneous							
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CAPITAL EXPENDITURES							
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CHANGE IN REVENUES (
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FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts							
1003 GF Match							
1004 GF							
1005 GF/Program Receipts							
1037 GF/Mental Health							
Other Interagency Receipts							
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2009) cost: _____

POSITIONS

Full-time							
Part-time							
Temporary							

ANALYSIS: (Attach a separate page if necessary)

HB 12 would create in the Alaska Department of Fish and Game a Council on Invasive Species as a venue for communicating, planning and coordinating efforts that address the threats posed to Alaska by invasive, non-native species (whether plants, animals, insects, etc.). The Commissioner of the Department of Health and Social Services (DHSS) or a designee would have a seat on the council. While HB12 would allow DHSS to discuss and respond to invasive species with a direct impact on human health, such as a mosquito new to Alaska, the bill is focused primarily on invasive impacts to fish and game. It is expected that DHSS would not play a primary role but would be available to provide relevant input as needed. There is no anticipated fiscal impact on DHSS.

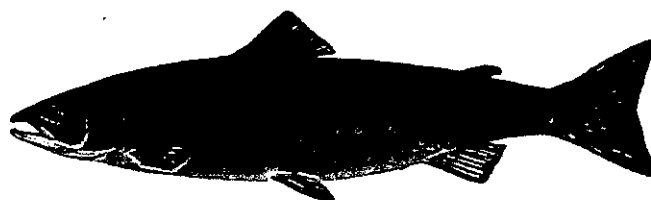
Prepared by: Beverly Wooley, Director Phone 269-8126
Division: Division of Public Health Date/Time 1/28/09 12:00 AM

Approved by: Alison Elgee, Assistant Commissioner Date 2/13/2009
Finance Management Services

**NON-NATIVE AND INVASIVE ANIMALS OF
ALASKA:
A COMPREHENSIVE LIST AND SELECT
SPECIES STATUS REPORTS**

FINAL REPORT

Jodi McClory
Tracey Gotthardt



**NON-NATIVE AND INVASIVE ANIMALS OF ALASKA:
A COMPREHENSIVE LIST AND SELECT SPECIES
STATUS REPORTS**

FINAL REPORT

Jodi McClory and Tracey Gotthardt

Alaska Natural Heritage Program
Environment and Natural Resources Institute
University of Alaska Anchorage
707 A Street, Anchorage AK 99501

January 2008

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EXECUTIVE SUMMARY

In recent years, a number of non-native animal species have been observed in Alaska, some of which have proven to be invasive. Since animal introductions to the state are still limited in distribution, and because protecting land not yet infested by non-natives is an efficient technique for the management of invasive species, we have the opportunity to preserve Alaska's immense natural resources with careful management of invasive animal threats. However, before management efforts towards invasive species can be successful, information must be gathered to identify which non-native animal species are present in the state, where they occur, and which species pose the greatest risk to native ecosystems. In an effort to provide managers with the most up-to-date information regarding invasive animal species in Alaska, we compiled a comprehensive list of non-native animals that have been documented in the state, and also developed a list of potential future invaders based on their occurrence in neighboring states and/or provinces. We collected published and unpublished information on a number of non-native animal species that are known to pose a high risk to native ecosystems, and summarized information on their biology, modes of dispersal, documented impacts, control options, and current and historic distribution.

A total of 116 non-native animal species (including fishes, amphibians, reptiles, birds, mammals, invertebrates, parasites and pathogens) were documented as present (either historically or currently) in the state, of which 20 were designated as highly invasive species. Status reports describing biology and invasive potential were developed for 14 of the highly invasive species and are included as an appendix to this report, along with maps of their known current distribution in the state. An additional 41 species were identified as potential invaders based on their rapid spread in western North America and on their ability to disperse over large distances. Ten of the 41 potential invaders were identified as being highly invasive, and status reports were developed for 3 of those species.

The development of the first comprehensive list of non-native animals in Alaska summarizes necessary and preliminary information about the current status of these animals in the state. Information contained within the individual species status reports and associated distribution maps may be used to interpret a species' ability to spread into particular regions, and could be used in future mapping efforts to calculate rates of dispersal as well as enable prediction of future range expansions. As global climate change continues to warm the landscape, Alaska may become more susceptible to harmful invaders and the information compiled within this report could be useful in predicting and preventing animal invasions.

INTRODUCTION

Invasive species are defined in federal law as species that are both non-native (alien) to a particular ecosystem and whose introduction causes or is likely to cause economic or environmental harm, or harm to human health (Executive Order 13112 1999). In recent years, a number of non-native animal species have been observed in Alaska, some of which have proven to be invasive. Invasive species threaten native ecosystem integrity and Alaska's valuable resources in fisheries, tourism, forestry, and agriculture by the alteration and loss of natural species biodiversity and ecosystem functions. Alaska's low population and relative geographic isolation have kept introductions of new invasive species comparatively low, but increased commercial traffic, development, and changes wrought by climate change all potentially increase the risk of new introductions to the state. Since many animal introductions to the state are still limited in distribution, and because protecting land not yet infested by non-natives is an efficient technique for the management of invasive species, we have the opportunity to preserve Alaska's valuable natural resources with careful management of invasive animal threats.

Before successful management efforts towards invasive species can be implemented, information must be gathered to identify which non-native animal species are present in the state, where they occur, and which species pose the greatest risk to native ecosystems. In an effort to provide managers with the most up-to-date information regarding invasive animal species in Alaska, we compiled a comprehensive list of non-native animals that have been documented in the state, and also developed a list of potential future invaders based on their occurrence in neighboring states and/or provinces. We collected published and unpublished information on a number of non-native animal species that pose a high risk to native ecosystems, and summarized information on their biology, modes of dispersal, documented impacts, control options, and current and historic distribution.

Specific project objectives were to:

- (1) Conduct a comprehensive literature review and consult with area biologists to compile a draft list of non-native animal species previously documented in Alaska. Compile a list of potential invaders to include species that have been documented in neighboring states and provinces.
- (2) Through literature review and expert consultation, identify which species are accidentals and unlikely invaders in Alaska and remove these species from the list, or identify them as such.
- (3) Research and synthesize information on the biology, modes of dispersal, documented impacts, and control options of listed species to identify those capable of causing the greatest impacts.

METHODOLOGY

Objective 1: To develop a comprehensive list of non-native animal species in the state, we reviewed published and unpublished information available in peer-reviewed and gray literature, museum specimen collection databases, wildlife and invasive species program websites, news reports, and personal communications with Alaska biologists and invasive

species experts for fishes, amphibians, reptiles, birds, mammals, invertebrates, parasites and pathogens. Data were compiled into two lists: 1) a preliminary list of non-native animals documented in the state (either currently or historically) and 2) a list of invasive species that have been detected in adjacent states and provinces which have the potential to spread and establish in Alaska. For animals present in Alaska, we included information about the species' status (e.g., cryptogenic, reported but not yet confirmed in the state, documented but eradicated, native but translocated). Draft lists were reviewed by local biologists and invasive species experts, and updated throughout the process of literature review and information synthesis.

Objective 2: We refined the list of non-native animal species present in Alaska by identifying those species already recognized as invasive in existing literature, reports or by experts in the state. Based on evidence in the literature, we identified a number of non-native species known to pose a high risk to native biodiversity. These "high risk" species were selected for in-depth research into their biology, ecology and possible impacts to native systems. It would require a systematic ranking scheme in order to objectively identify the highest risk species. Unfortunately, a ranking exercise was beyond the scope of this project. Instead, we selected "high-risk" species based on their widespread recognition as invasive species in the literature.

Objective 3: For select "high-risk" animal species, we summarized available information relating to the taxonomy, reproduction, feeding, habitat needs, dispersal potential, current/historic distribution, documented impacts, and control options. Maps of species' Alaskan range and/or distribution were developed using ArcGIS software.

RESULTS

The final list of non-native animal species in Alaska included 116 species documented (either historically or currently) in the state (including amphibians [3], birds [16], fishes [14], invertebrates [42], mammals [35], parasites [1], pathogens [4], and reptiles [1]; see Appendix I). An additional 41 species were identified as potential invaders based on their proximity in adjacent states and provinces and on their ability to disperse over large distances (amphibians [1], birds [1], invertebrates [37], and pathogens [2]; see Appendix II). Of those found in the state, 21 were highlighted as "high-risk" for invasiveness. Of those not yet found in the state, 10 were highlighted as "high-risk" for invasiveness. Status reports were developed for 17 species (2 amphibians, 10 invertebrates, 2 fishes and 3 mammals) and are included as Appendix III in this report.

DISCUSSION AND FUTURE DIRECTION

The majority of species listed as non-native in Alaska are not considered invasive by the formal definition. An exploration of the factors contributing to a species' invasiveness, and a systematic effort to rank species according to objective criteria would be constructive and has yet to be conducted for animals in the state. The need to evaluate and rank non-native species is a prerequisite before expensive management is attempted, so that the most threatening species are addressed first. A ranking system can help set

priorities for research and control efforts for invading bird, mammal, fish, invertebrate, and pathogenic species. Since many of the species on the Alaska non-native animal list have been documented during the last 20 years (this may be due to increased number of invasions or increased reporting and research on invasive species), there is a consensus in the invasive species community that a prioritization scheme is an important first step. Biological and ecological data summarized during this project will provide a valuable reference for future ranking efforts. These data also provide basic geographic information that could form the groundwork for development of a GIS database of non-native animal species distribution.

The development of the first comprehensive list of non-native animals in Alaska, presented here, summarizes necessary and preliminary information about the current status of these animals in the state. By making this information available to researchers and the general public, we hope it will be used to identify data gaps in our understanding and help direct targeted research. We also hope that it will serve to increase public awareness of the negative impacts of invasive species, which in turn, could help prevent their future spread. Questions that need to be addressed in the future include: Which species or groups of animals have the most invasive potential, and which have already caused the most damage to native ecosystems in the state? How can we target entire groups or dispersal pathways for prevention of non-native animal introductions? Where would financial resources prove most effective in the fight against invasions, and are there invasive populations that are already beyond our control? Information contained within the individual species status reports and associated distribution maps may be used to interpret an invasive species' ability to spread into particular regions, and could be used in future mapping efforts to calculate rates of dispersal as well as enable prediction of future range expansions (Riccardi et al. 2000). As global climate change continues to warm the landscape, Alaska may become more susceptible to harmful invaders (Union of Concerned Scientists 2005) and the information contained within this report could be useful in predicting and preventing animal invasions.

ACKNOWLEDGEMENTS

This project was generously funded by the Alaska Department of Fish and Game's Invasive Species Program. We would especially like to thank Tammy Davis, the Invasive Species Program Coordinator, for her guidance and enthusiasm throughout the duration of the project.

Many thanks to those who reviewed and contributed to the lists of non-native animal species of Alaska: Blythe Brown, Kodiak Soil and Water Conservation District; Paul Hennon, USDA Forest Service; Jeff Heys, National Park Service; James Kruse, USDA Forest Service; Denny Lassuy, US Fish and Wildlife Service; Whitney Rapp, National Park Service; Barbara Schrader, USDA Forest Service; and Rick Sinnott, Alaska Dept. of Fish and Game.

LITERATURE CITED

Executive Order 13112. 1999. Federal Register Vol. 64, No. 25. Monday, February 8, 1999.

Riccardi, A., W.W.M. Steiner, R.N. Mack, and D. Simberloff. 2000. Toward a global information system for invasive species. *BioScience* 50: 239-244.

Union of Concerned Scientists. 2005. Invasive species: Alaska. Available online at: http://www.ucsusa.org/invasive_species/state-invasion-portfolios.html.

APPENDIX I

List of non-native animal species documented in Alaska

Appendix 1, page 1. List of non-native animal species documented in Alaska. List includes amphibians, birds, invertebrates, mammals, pathogens and reptiles. List also include information on species status (when available), whether or not a status report was developed for that species, references, and an invasiveness rank as reported in the literature.

Taxon	Scientific Name	Common Name	Status	Status Report	Reference	Invasiveness Rank
Amphibians	<i>Pseudacris regilla</i>	Pacific chorus frog		X	Schrader and Hennon 2005, USGS 2007, MacDonald 2003, Hodge 2004	Low*
Amphibians	<i>Rana aurora</i>	Red-legged frog		X	Schrader and Hennon 2005	High*
Amphibians	<i>Taricha granulosa</i>	Roughskin newt	native but moved		USGS 2007	
Birds	<i>Strix varia</i>	Barred Owl			Rapp pers. comm.	
Birds	<i>Colinus virginianus</i>	Bobwhite Quail, Northern Bobwhite			Sinnott pers. comm.	
Birds	<i>Molothrus ater</i>	Brown-headed Cowbird			Armstrong 1995, USFWS 2007b	
Birds	<i>Alectoris chukar</i>	Chukar			Burris and McKnight 1973	
Birds	<i>Dendragapus obscurus</i>	Dusky Grouse, Blue Grouse	native but moved		Burris and McKnight 1973	
Birds	<i>Streptopelia decaocto</i>	Eurasian Collared Dove			Rapp pers. comm.	
Birds	<i>Carpodacus mexicanus</i>	House Finch			Armstrong 1995, USFWS 2007b	
Birds	<i>Passer domesticus</i>	House Sparrow			Armstrong 1995, USFWS 2007b	
Birds	<i>Lophura leucomelanos</i> , <i>others</i>	Other pheasants (Mongolian, Nepal, Brown-eared, Kalij, Reeves, Cheer)			Burris and McKnight 1973	
Birds	<i>Phasianus colchicus</i>	Ring-necked Pheasant			Burris and McKnight 1973	
Birds	<i>Columba livia</i>	Rock dove, rock pigeon			Schrader and Hennon 2005, GISD 2007, UCS 2005	Low*
Birds	<i>Bonasa umbellus</i>	Ruffed Grouse	native but moved		Sinnott pers. comm.	
Birds	<i>Falci pennis canadensis</i>	Spruce Grouse	native but moved		Burris and McKnight 1973	
Birds	<i>Sturnus vulgaris</i>	Starling			Schrader and Hennon 2005	Low*, High^

Appendix I, page 2. List of non-native animal species documented in Alaska.

Taxon	Scientific Name	Common Name	Status	Status Report	Reference	Invasiveness Rank
Birds	<i>Branta canadensis fulva</i>	Vancouver Canada goose	native but moved		Sinnott pers. comm.	
Birds	<i>Meleagris gallopavo</i>	Wild Turkey			Sinnott pers. comm.	
Fishes	<i>Dallia pectoralis</i>	Alaska blackfish	native but moved		USGS 2007, UCS 2005	
Fishes	<i>Alosa sapidissima</i>	American shad			USGS 2007	
Fishes	<i>Thymallus arcticus</i>	Arctic grayling	native but moved		USGS 2007, UCS 2005	
Fishes	<i>Salmo salar</i>	Atlantic salmon		X	Fay 2002, UCS 2005, USGS 2007	High*
Fishes	<i>Salvelinus fontinalis</i>	Brook trout			Fay 2002, USGS 2007, UCS 2005	Low*
Fishes	<i>Oncorhynchus kisutch</i>	Coho salmon			USGS 2007	
Fishes	<i>Carassius auratus</i>	Goldfish			Fay 2002	Low*
Fishes	<i>Esox lucius</i>	Northern pike		X	Fay 2002, UCS 2005, USGS 2007	High*
Fishes		Ornamental aquarium fish			Fay 2002	
Fishes	<i>Astronotus ocellatus</i>	Oscars			Fay 2002	
Fishes	<i>Oncorhynchus mykiss</i>	Rainbow trout			Schrader and Hennon 2005, USGS 2007	Low*, High^
Fishes	<i>Gasterosteus aculeatus</i>	Threespine stickleback			USGS 2007	
Fishes	<i>Gambusia affinis</i>	Western mosquitofish	persistence questionable		USGS 2007	High^
Fishes	<i>Perca flavescens</i>	Yellow perch	eradicated		Fay 2002, USGS 2007, UCS 2005	High*
Invertebrates	<i>Eriocampa ovata</i>	Alder woolly sawfly			Schrader and Hennon 2005, USFS 2007	Low*
Invertebrates	<i>Profenusa thomsoni</i>	Amber-marked birch leafminer		X	Schrader and Hennon 2005, UCS 2005	High*
Invertebrates	<i>Distaplia alaskensis</i>	Asciidiacean	cryptogenic species		Hines and Ruiz 2001	

Appendix I, page 3. List of non-native animal species documented in Alaska.

Taxon	Scientific Name	Common Name	Status	Status Report	Reference	Invasiveness Rank
Invertebrates	<i>Fenusa pusilla</i>	Birch leafminer		X	Schrader and Hennon 2005	Moderate*
Invertebrates	<i>Epinotia solandriana</i>	Birch leafroller			Schrader and Hennon 2005	Moderate*
Invertebrates	<i>Heterarthrus nemoratus</i>	Birch-edge leafminer			Schrader and Hennon 2005	Low*
Invertebrates	<i>Cliona thosina</i>	Boring sponge in oyster shell	reported but not yet confirmed		Hines and Ruiz 2001	
Invertebrates	<i>Schizoporella unicornis</i>	Bryozoan			Hines and Ruiz 2001	
Invertebrates	<i>Heteromastus filiformis</i>	Capitellid worm			USGS 2007	
Invertebrates	<i>Crassostrea gigas</i>	Cultured oyster			Hines and Ruiz 2001 GISD 2007	
Invertebrates	<i>Nematus ribesii</i>	Currantworm			Schrader and Hennon 2005, UCS 2005	Low*
Invertebrates	<i>Adelges piceae</i>	Eastern spruce gall aphid			Schrader and Hennon 2005	Low*
Invertebrates	<i>Arion ater</i>	European black slug			Schrader and Hennon 2005, UCS 2005	Low*
Invertebrates	<i>Lymantria dispar</i>	European gypsy moth, Asian gypsy moth		X	Schrader and Hennon 2005, UCS 2005, USFS 2007	High*, High^
Invertebrates	<i>Rhyacionia buoliana</i>	European pine shoot moth			Schrader and Hennon 2005, Kruse pers. comm.	Low*
Invertebrates	<i>Noctua pronuba</i>	European Yellow Underwing Moth			USFS 2007	
Invertebrates	<i>Arion sp.</i>	Garden slug			Schrader and Hennon 2005	Low*
Invertebrates	<i>Tubularia crocea</i>	Hydroid	reported but not yet confirmed		USGS 2007	
Invertebrates	<i>Bougainvilla sp. 2</i>	Hydroid	cryptogenic species		Hines and Ruiz 2001	
Invertebrates	<i>Bougainvilla sp. 1</i>	Hydroid	cryptogenic species		Hines and Ruiz 2001	
Invertebrates	<i>Cuspidella grandis</i>	Hydroid	cryptogenic species		Hines and Ruiz 2001	
Invertebrates	<i>Garvia franciscana</i>	Hydroid			Hines and Ruiz 2001	
Invertebrates	<i>Opercularella lacerata</i>	Hydroid			Hines and Ruiz 2001	

Appendix I, page 4. List of non-native animal species documented in Alaska.

Taxon	Scientific Name	Common Name	Status	Status Report	Reference	Invasiveness Rank
Invertebrates	<i>Proboscidaetila flavicirrata</i>	Hydroid			Hines and Ruiz 2001	
Invertebrates	<i>Venerupis philippinarum</i>	Japanese littleneck clam, Manila clam	reported but not yet confirmed		Hines and Ruiz 2001	
Invertebrates	<i>Pristiphora erichsonii</i>	Larch sawfly		X	Schrader and Hennon 2005, UCS 2005	High*
Invertebrates	<i>Limax maximus</i>	Leopard slug			Schrader and Hennon 2005	Low*
Invertebrates		Oysters			Fay 2002	
Invertebrates	<i>Polydora websteri</i>	Polychaete blister worm	reported but not yet confirmed		Hines and Ruiz 2001	
Invertebrates	<i>Procambarus clarkii</i>	Red swamp crayfish			USGS 2007	
Invertebrates	<i>Manayunkia speciosa</i>	Sabellid worm			USGS 2007	
Invertebrates	<i>Asterias amurensis</i>	Sea star	cryptogenic species		Hines and Ruiz 2001	
Invertebrates	<i>Pacifastacus leniusculus</i>	Signal crayfish		X	Fay 2002, GISD 2007, USGS 2007	High*
Invertebrates	<i>Schizoporella unicornis</i>	Single horn bryozoan			USGS 2007	
Invertebrates	<i>Pissodes strobi</i>	Sitka spruce weevil, white pine weevil			USFS 2007, Schrader and Hennon 2005, UCS 2005	Moderate*
Invertebrates	<i>Mya arenaria</i>	Soft-shelled clam			Hines and Ruiz 2001, USGS 2007, Powers et al. 2006	
Invertebrates	<i>Elatobium abietinum</i>	Spruce aphid			Schrader and Hennon 2005	Moderate*
Invertebrates	<i>Otiorhynchus ovatus</i>	Strawberry root weevil			Schrader and Hennon 2005, UCS 2005	Low*
Invertebrates	<i>Archips cerasivorana</i>	Uglynest caterpillar			USFS 2007, Schrader and Hennon 2005, UCS 2005	Low*
Invertebrates		Various ballast water species			Fay 2002	
Invertebrates	<i>Malacosoma californicum</i>	Western tent caterpillar		X	Schrader and Hennon 2005, UCS 2005, Kruse pers. comm.	High*
Invertebrates	<i>Pikonema alaskensis</i>	Yellow-headed Spruce Sawfly			USFS 2007	

Appendix I, page 5. List of non-native animal species documented in Alaska.

Taxon	Scientific Name	Common Name	Status	Status Report	Reference	Invasiveness Rank
Mammals	<i>Martes americana</i>	American marten	native but moved		Schrader and Hennon 2005	
Mammals	<i>Alopex lagopus</i>	Arctic fox			USFWS 2007, Ebbert and Byrd (2002).	
Mammals	<i>Spermophilus paryii ablusus</i>	Arctic ground squirrel			USFWS 2007, Ebbert and Byrd (2002).	
Mammals	<i>Spermophilus paryii nebulicola</i>	Arctic ground squirrel			USFWS 2007, Ebbert and Byrd (2002).	
Mammals	<i>Rangifer tarandus groenlandicus</i>	Barren-ground caribou	native but moved		Burris and McKnight 1973	
Mammals	<i>Castor canadensis</i>	Beaver			Brown pers. comm.	
Mammals	<i>Bos bison</i>	Bison			Burris and McKnight 1973	
Mammals	<i>Rattus rattus</i>	Black rat, Roof rat		X	USFWS 2007	High^
Mammals	<i>Canis latrans</i>	Coyote			NatureServe 2007, Sinnott pers. comm.	
Mammals	<i>Ovis dalli</i>	Dall's sheep	native but moved		Burris and McKnight 1973	
Mammals	<i>Peromyscus maniculatus</i>	Deer mouse			USFWS 2007, Ebbert and Byrd 2007	
Mammals	<i>Felis catus</i>	Domestic cat			Sinnott pers. comm.	High^
Mammals	<i>Canis familiaris</i>	Domestic dog			Rapp pers. comm.	High^
Mammals	<i>Mustela putorius furo</i>	Domestic ferret			Sinnott pers. comm.	
Mammals	<i>Cervus canadensis</i>	Elk		X	Schrader and Hennon 2005	Moderate*, High^
Mammals OK	<i>Orvctotagus cuniculus</i>	European rabbit			Burris and McKnight 1973, Schrader and Hennon 2005, USFWS 2007	High^
Mammals	<i>Canis lupus</i>	Gray wolf	native but moved		Burris and McKnight 1973	
Mammals	<i>Mus musculus</i>	House mouse			Schrader and Hennon 2005, UCS 2005, USFWS 2007	Low*, High^
Mammals	<i>Marmota caligata</i>	Marmot	native but moved		Sinnott pers. comm.	

Appendix I, page 6. List of non-native animal species documented in Alaska.

Taxon	Scientific Name	Common Name	Status	Status Report	Reference	Invasiveness Rank
Mammals	<i>Neovison vison</i>	Mink (from domestic stock)	native but moved		Burriss and McKnight 1973	
Mammals	<i>Alces americanus</i>	Moose	native but moved		Burriss and McKnight 1973	
Mammals	<i>Oreamnos americanus</i>	Mountain goat			Brown pers. comm.	
Mammals	<i>Puma concolor</i>	Mountain lion	reported but not yet confirmed		Sinnott pers. comm.	
Mammals	<i>Ovibos moschatus</i>	Muskox			Burriss and McKnight 1973	
Mammals	<i>Ondatra zibethicus</i>	Muskrat			Brown pers. comm.	
Mammals	<i>Rattus norvegicus</i>	Norway rat, Brown rat		X	Schrader and Hennon 2005, UCS 2005, USFWS 2007	High*
Mammals	<i>Procyon lotor</i>	Raccoon			Schrader and Hennon 2005	
Mammals	<i>Vulpes vulpes</i>	Red Fox			USFWS 2007	High^
Mammals	<i>Tamiasciurus hudsonicus</i>	Red squirrel	native but moved		Schrader and Hennon 2005	
Mammals	<i>Rangifer tarandus asiaticus</i>	Reindeer			USFWS 2007	
Mammals	<i>Bos taurus</i>	Scottish cattle				
Mammals	<i>Enhydra lutris</i>	Sea otter	native but moved		Burriss and McKnight 1973	
Mammals	<i>Odocoileus hemionus</i>	Sitka black-tailed deer	native but moved		Schrader and Hennon 2005	
Mammals	<i>Lepus americanus</i>	Snowshoe hare	native but moved		Burriss and McKnight 1973, Davis 1979, Schrader and Hennon 2005	
Mammals	<i>Sus scrofa</i>	Wild boar, feral swine, feral hogs				High^
Parasites	<i>Trichodectes canis</i>	Biting dog louse			Golden et al. 1999, Griese 1999, ADFG 2005, UCS 2005	
Pathogens	<i>Erwinia amylovora</i>	Bacterial fire blight			Schrader and Hennon 2005	
Pathogens	<i>Apiosporina morbosa</i>	Black knot			Schrader and Hennon 2005	

Appendix I, page 7. List of non-native animal species documented in Alaska.

Taxon	Scientific Name	Common Name	Status	Status Report	Reference	Invasiveness Rank
Pathogens	<i>Myxobolus cerebralis</i>	Whirling disease parasite		X	WDI 2007, Arsan et al. 2007	
Pathogens	<i>Cronartium ribicola</i>	White pine blister rust			Schrader and Hennon 2005	
Reptiles	<i>Macrochelys temminckii</i>	Alligator snapping turtle			Associated Press 2002	

* = Schrader
and Hennon
2005
^ = GISD
2007

APPENDIX II

List of non-native animal species with the potential for invasion in Alaska

Appendix II, page 1. List of non-native animal species that have been not documented in Alaska, but have the potential to enter the state. List includes amphibians, birds, invertebrates and pathogens. List also include information on species status (when available), whether or not a status report was developed for that species, references, and an invasiveness rank as reported in the literature.

Taxon	Scientific Name	Common Name	Status Report	Reference	Invasiveness Rank
Amphibians	<i>Rana catesbeiana</i>	American bullfrog		Secord et al 2005	High ^
Birds	<i>Carpodacus mexicanus</i>	House Finch			
Invertebrates	<i>Anoplophora glabripennis</i>	Asian longhorned beetle		Schrader and Hennon 2005, UCS 2005	Moderate*
Invertebrates	<i>Urosalpinx cinerea</i>	Atlantic oyster drill		Secord et al 2005	
Invertebrates	<i>Crepidula fornicata</i>	Atlantic slipper snail		Secord et al 2005	
Invertebrates	<i>Cliona sp.</i>	Boring sponge		USGS 2007	
Invertebrates	<i>Tetropium fuscum</i>	Brown spruce longhorn beetle		Schrader and Hennon 2005	High*
Invertebrates	<i>Bugula neritina</i>	Bryozoan		GISD 2007	
Invertebrates	<i>Eriocheir sinensis</i>	Chinese mitten crab	X	Fay 2002	High*, High^
Invertebrates	<i>Botryllus schlosseri</i>	Colonial sea squirt		Secord et al 2005	
Invertebrates	<i>Didemnum lahillei</i>	Colonial sea squirt		Secord et al 2005	
Invertebrates	<i>Ilyanassa obsoleta</i>	Eastern mudsnail		Secord et al 2005	
Invertebrates	<i>Teredo navalis</i>	European (naval) shipworm		Secord et al 2005	
Invertebrates	<i>Hemichroa crocera</i>	European alder sawfly		Schrader and Hennon 2005	Low*
Invertebrates	<i>Ips typographus</i>	European spruce beetle		Schrader and Hennon 2005	High*
Invertebrates	<i>Malacosoma disstria</i>	Forest tent caterpillar	X	Schrader and Hennon 2005	High*
Invertebrates	<i>Carcinus maenas</i>	Green crab, European green crab		Fay 2002, UCS 2005, Aquatic Nuisance Species Project 2007	High^
Invertebrates	<i>Adelges tsugae</i>	Hemlock woolly adelgid		Schrader and Hennon 2005	Moderate*
Invertebrates	<i>Diadumene lineata</i>	Japanese anemone		Secord et al 2005	
Invertebrates	<i>Musculista senhousia</i>	Japanese mussel		Secord et al 2005	
Invertebrates	<i>Ocenebrellus inornatus</i>	Japanese oyster drill		Secord et al 2005	
Invertebrates	<i>Coleophora laricella</i>	Larch casebearer		Schrader and Hennon 2005	Moderate*
Invertebrates	<i>Ips cembrae</i>	Larch engraver		Schrader and Hennon 2005	Moderate*
Invertebrates	<i>Venerupis philippinarum</i>	Manila clam		Secord et al 2005	
Invertebrates	<i>Mytilus galloprovincialis</i>	Mediterranean mussel		Secord et al 2005	

Appendix II, page 2. List of non-native species that have been not been positively identified in Alaska, but have been documented in adjacent states and provinces, and have the potential to invade.

Taxon	Scientific Name	Common Name	Status Report	Reference	Reported Invasiveness Rank
Invertebrates	<i>Batrillaria atramentaria</i>	Mudsnail		Secord et al 2005	
Invertebrates	<i>Potamopyrgus antipodarum</i>	New Zealand Mudsnail	X	Fay 2002, UCS 2005	High*
Invertebrates	<i>Lymantria monacha</i>	Nun moth		Schrader and Hennon 2005	High*
Invertebrates	<i>Alitta succinea</i>	Pile worm		GISD 2007	
Invertebrates	<i>Dendrolimus pini</i>	Pine moth		Schrader and Hennon 2005	High*
Invertebrates	<i>Nuttallia obscurata</i>	Purple varnish clam		Secord et al 2005	
Invertebrates	<i>Clathria prolifera</i>	Red beard sponge		Secord et al 2005	
Invertebrates	<i>Lymantria mathura</i>	Rosy gypsy moth		USFS 2007	
Invertebrates	<i>Botrylloides violaceus</i>	Sheath tunicate		USGS 2007	
Invertebrates	<i>Ciona savignyi</i>	Solitary sea squirt		Secord et al 2005	
Invertebrates	<i>Styela clava</i>	Solitary sea squirt		Secord et al 2005	
Invertebrates	<i>Bythotrephes cederstroemi</i>	Spiny water flea		Fay 2002, GLIN 2007	
Invertebrates	<i>Adelges abietis</i>	Woolly spruce aphid		Schrader and Hennon 2005	Moderate*
Invertebrates	<i>Dreissena polymorpha</i>	Zebra mussel		Fay 2002, UCS 2005	High^
Pathogens	<i>Chrysomyxa abietis</i>	Foliar spruce rust		Schrader and Hennon 2005	
Pathogens	<i>Bursaphelenchus xylophilus</i>	Pine wilt nematode		Schrader and Hennon 2005	Low*

* = Schrader and Hennon 2005
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- Testify 3 Gilson Green Crab testimony 2 9 09.pdf
- Testify 4 AK Cons Alliance.pdf
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HOUSE BILL NO. 12

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWENTY-SIXTH LEGISLATURE - FIRST SESSION

BY REPRESENTATIVE JOHNSON

Introduced: 1/9/09

Referred: Prefiled

A BILL

FOR AN ACT ENTITLED

1 **"An Act establishing the Alaska Council on Invasive Species in the Department of Fish**
2 **and Game."**

3 **BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:**

4 * **Section 1.** The uncodified law of the State of Alaska is amended by adding a new section
5 to read:

6 **LEGISLATIVE FINDINGS.** The legislature finds that

7 (1) the land, water, plants, animals, and other natural resources in the state
8 have the potential to be severely affected by the introduction of an increasing number of
9 invasive species;

10 (2) invasive species harm native species, alter ecosystem processes, transport
11 and cause disease, and otherwise threaten human health and the state's economy;

12 (3) governmental, public, and private entities need a cooperative means of
13 communicating, planning, coordinating, and collaborating in the development of a statewide
14 plan of action in addressing the threat posed by invasive species.

1 * **Sec. 2.** AS 03.22 is amended by adding new sections to read:

2 **Article 2. Alaska Council on Invasive Species.**

3 **Sec. 03.22.100. Alaska Council on Invasive Species.** The Alaska Council on
4 Invasive Species is established in the Department of Fish and Game. The purpose of
5 the council is to plan and coordinate efforts that address the threats posed to the state
6 and its residents by invasive species. The council shall work to foster cooperation,
7 communication, and coordinated approaches that support federal, state, local, and
8 regional initiatives relating to the control of harmful invasive species.

9 **Sec. 03.22.110. Council membership.** (a) The council consists of 14 members
10 as follows:

- 11 (1) the commissioner of fish and game or the commissioner's designee;
- 12 (2) the commissioner of natural resources or the commissioner's
13 designee;
- 14 (3) the commissioner of environmental conservation or the
15 commissioner's designee;
- 16 (4) the commissioner of transportation and public facilities or the
17 commissioner's designee;
- 18 (5) the commissioner of health and social services or the
19 commissioner's designee;
- 20 (6) a member of a soil and water conservation district established
21 under AS 41.10.130 nominated by the soil and water conservation districts;
- 22 (7) a member of a conservation organization;
- 23 (8) a person engaged in commercial production agriculture;
- 24 (9) a person engaged in the commercial landscaping or horticultural
25 nursery business;
- 26 (10) a representative of a commercial fishermen's organization;
- 27 (11) a representative of a commercial shipping organization;
- 28 (12) an employee of the University of Alaska involved in agricultural
29 research, extension, or outreach;
- 30 (13) a representative of a Native corporation established under 43
31 U.S.C. 1601 et seq. (Alaska Native Claims Settlement Act); and

1 (14) a public member.

2 (b) Members of the council serving under (a)(1) - (5) of this section serve ex
3 officio.

4 (c) Members of the council serving under (a)(6) - (14) of this section shall be
5 appointed by the commissioner.

6 (d) The term of a member serving under (a)(6) - (14) of this section is three
7 years. A member may be reappointed.

8 **Sec. 03.22.120. Compensation.** Members of the council who are not state
9 employees serve without compensation.

10 **Sec. 03.22.130. Council staff.** The commissioner may employ clerical staff to
11 assist the council.

12 **Sec. 03.22.140. Council meetings.** (a) The council shall meet at the call of the
13 presiding officer at least once annually and at other times as necessary to conduct its
14 business. In the absence of a call of the presiding officer, a majority of the
15 membership of the council may call a meeting.

16 (b) A majority of the membership of the council constitutes a quorum for the
17 transaction of business and is necessary for any action taken by the council.

18 **Sec. 03.22.150. Officers of the council.** The council shall elect a presiding
19 officer from among its members. The council may elect other officers. A member may
20 be reelected to serve additional terms as presiding officer or other officer.

21 **Sec. 03.22.160. Annual report.** The council shall submit an annual report of
22 its activities to the governor and the presiding officer of each house of the legislature
23 by December 15 each year. The report must include an evaluation of the council's
24 activities in the preceding calendar year relating to the implementation of the strategic
25 plan under AS 03.22.180 and identify the council's priorities for the next calendar
26 year.

27 **Sec. 03.22.170. Duties of the council.** (a) The council shall

28 (1) in consultation with federal, state, local, public, and private entities,
29 provide a coordinated approach that facilitates the development of a statewide policy
30 that addresses the risks of existing invasive species in the state and the prevention of
31 the introduction of additional invasive species;

1 (2) serve as a forum facilitating the communication, cooperation, and
2 coordination of federal, state, local, public, and private entities for the identification
3 and control of invasive species;

4 (3) request the assistance and participation of federal departments and
5 agencies;

6 (4) review the existing funding provided to state agencies for the
7 control of invasive species;

8 (5) develop and review a comprehensive strategic plan under
9 AS 03.22.180 to control invasive species in the state based on resources and priorities
10 identified by the council in consultation with federal, state, local, public, and private
11 entities;

12 (6) monitor and evaluate the implementation and effectiveness of the
13 strategic plan developed by the council; and

14 (7) provide an annual report under AS 03.22.160 to the governor and
15 the presiding officer of each house of the legislature.

16 (b) The council may

17 (1) publish the results of the council's efforts and disseminate
18 information related to the control of invasive species;

19 (2) develop or adapt relevant educational materials and programs;

20 (3) act in an advisory capacity in the development of policy concerning
21 invasive species to agencies of the United States that manage federal land in the state,
22 state land and water users, municipalities, agencies of the state, and public and private
23 organizations;

24 (4) accept, on behalf of the state, contributions of services, materials,
25 or money to assist in meeting the cost of carrying out AS 03.22.100 - 03.22.249; and

26 (5) solicit proposals, review applications, and advise the commissioner
27 as to grants, loans, and expenditures for activities related to the control of invasive
28 species.

29 **Sec. 03.22.180. Triennial strategic plan.** (a) The council shall create a
30 comprehensive strategic plan for the control of invasive species that

31 (1) addresses federal, state, local, public, and private efforts in the state

1 relating to the control of invasive species, including recommendations pertaining to

2 (A) revision of state statutes and regulations;

3 (B) action by state departments and agencies;

4 (2) addresses coordination of federal, state, local, public, and private
5 efforts in the state relating to the control of invasive species;

6 (3) prioritizes efforts to control invasive species in the state;

7 (4) includes standards for measuring the success of state departments
8 and agencies in controlling invasive species;

9 (5) provides for the early identification of and rapid response to the
10 introduction to the state of new invasive species;

11 (6) provides for the inventorying and monitoring of invasive species in
12 the state; and

13 (7) identifies individual projects related to the control of invasive
14 species that can be implemented during the period covered by the triennial strategic
15 plan.

16 (b) In prioritizing efforts to control invasive species under (a)(3) of this
17 section, the council shall annually select at least one project from the triennial strategic
18 plan for action by entities coordinating with the council.

19 (c) The strategic plan shall be submitted to the governor and the presiding
20 officer of each house of the legislature by September 15 triennially.

21 **Sec. 03.22.190. Advisory and technical groups of the council.** (a) The
22 council may establish advisory and technical groups to aid and advise the council in
23 the performance of its duties.

24 (b) The council shall invite and accept nominations for membership on the
25 advisory groups and shall consider the nominations in making appointments to the
26 groups.

27 (c) The council shall provide for public notice and an opportunity to comment
28 before accepting a nomination for membership on an advisory or technical group
29 under (b) of this section.

30 **Sec. 03.22.200. Federal laws.** All state control and education efforts under
31 AS 03.22.100 - 03.22.249 shall be done in cooperation with federal laws and

1 initiatives relating to invasive species.

2 **Sec. 03.22.210. Agency cooperation.** Each state agency, as defined in
3 AS 39.52.960, shall cooperate with the council in the fulfillment of the council's duties
4 under AS 03.22.170 and use its best efforts to comply with the plan developed under
5 AS 03.22.180(a).

6 **Sec. 03.22.220. Joint operations.** The council may exercise the duties
7 imposed by AS 03.22.170 jointly with a person, political subdivision of the state,
8 Native village or regional corporation, or an agency of the United States or Canada.

9 **Sec. 03.22.249. Definitions.** In AS 03.22.100 - 03.22.249,

10 (1) "commissioner" means the commissioner of fish and game;

11 (2) "control" means, as appropriate, eradicating, suppressing, reducing,
12 or managing invasive species populations, preventing the spread of invasive species
13 from areas where they are present, and taking steps such as restoration of native
14 species and habitats to reduce the effects of invasive species and to prevent further
15 invasions;

16 (3) "council" means the Alaska Council on Invasive Species;

17 (4) "introduction" means the intentional or unintentional escape,
18 release, dissemination, or placement of a species into an ecosystem as a result of
19 human activity;

20 (5) "invasive species" means a group of organisms, all of which have a
21 high degree of physical and genetic similarity, generally intrabreed only among
22 themselves, and show persistent differences from members of allied groups of
23 organisms, whose introduction causes or is likely to cause economic harm,
24 environmental harm, or harm to human health.

25 * **Sec. 3.** AS 03.22.100, 03.22.110, 03.22.120, 03.22.130, 03.22.140, 03.22.150, 03.22.160,
26 03.22.170, 03.22.180, 03.22.190, 03.22.200, 03.22.210, 03.22.220, and 03.22.249 are
27 repealed December 31, 2020.

28 * **Sec. 4.** The uncodified law of the State of Alaska is amended by adding a new section to
29 read:

30 **TRANSITIONAL PROVISIONS: ALASKA COUNCIL ON INVASIVE SPECIES;**
31 **FIRST MEETING.** Notwithstanding AS 03.22.140, added by sec. 2 of this Act, the first

1 meeting of the Alaska Council on Invasive Species shall be convened by the commissioner of
2 fish and game, who shall also serve as the presiding officer of the council until it selects a
3 presiding officer under AS 03.22.150, added by sec. 2 of this Act. At the first meeting, the
4 members of the council shall address council voting methods, meeting schedules, procedures
5 for removing a member, and the need for and use of possible advisory and technical groups.

6 * **Sec. 5.** The uncodified law of the State of Alaska is amended by adding a new section to
7 read:

8 TRANSITION: INITIAL TERMS OF MEMBERS APPOINTED TO THE ALASKA
9 COUNCIL ON INVASIVE SPECIES. Notwithstanding AS 03.22.110(d), enacted by sec. 2 of
10 this Act, the terms of the initially appointed members of the Alaska Council on Invasive
11 Species, established in the Department of Fish and Game by AS 03.22.100, enacted by sec. 2
12 of this Act, shall be set by the commissioner of fish and game to achieve staggered terms in
13 the manner provided by AS 39.05.055(7).

14 * **Sec. 6.** The uncodified law of the State of Alaska is amended by adding a new section to
15 read:

16 TRANSITIONAL PROVISIONS: STRATEGIC PLAN AND REPORTS OF THE
17 ALASKA COUNCIL ON INVASIVE SPECIES; RELEASE OF PLAN AND FIRST
18 REPORTS. (a) Notwithstanding AS 03.22.170(a)(5) and 03.22.180, added by sec. 2 of this
19 Act, the initial strategic plan shall be completed by September 15, 2011.

20 (b) Before the release of the initial strategic plan, the report required under
21 AS 03.22.160, added by sec. 2 of this Act, must include the council's recommendations
22 pertaining to statutes and regulations that relate to the existence and form of the council.

LEGAL SERVICES

DIVISION OF LEGAL AND RESEARCH SERVICES
LEGISLATIVE AFFAIRS AGENCY
STATE OF ALASKA

(907) 465-3867 or 465-2450
FAX (907) 465-2029
Mail Stop 3101

State Capitol
Juneau, Alaska 99801-1182
Deliveries to: 129 6th St., Rm. 329

MEMORANDUM

January 15, 2009

SUBJECT: Sectional Summary of House Bill No. 12
(Work Order No. 26-LS0068/R)

TO: Representative Craig Johnson
Attn: Jeanne Ostnes

FROM: Alpheus Bullard *LAB*
Legislative Counsel

You have requested a sectional summary of the above-described bill.

As a preliminary matter, note that a sectional summary of a bill should not be considered an authoritative interpretation of the bill and the bill itself is the best statement of its contents. If you would like an interpretation of the bill as it may apply to a particular set of circumstances, please advise.

Section 1. Provides legislative findings relating to invasive species and the need for a cooperative means of developing a statewide plan that will address the threat posed by invasive species.

Section 2. Adds a new article to AS 03.22 (Alaska Council on Invasive Species).

Sec. 03.22.100. Establishes the Alaska Council on Invasive Species in the Department of Fish and Game.

Sec. 03.22.110. Addresses council membership and membership terms.

Sec. 03.22.120. Provides that the members of the council who are not state employees serve without compensation.

Sec. 03.22.130. Allows the Commissioner of Fish and Game to employ clerical staff to assist the council.

Sec. 03.22.140. Addresses council meetings.

Sec. 03.22.150. Provides that the council shall select a presiding officer and may, if it chooses, elect other officers.

Sec. 03.22.160. Requires the council to submit an annual report to the governor and the presiding officer of each house of the legislature by December 15 of each year. The report must detail the council's activities in the preceding calendar year and the council's priorities for the next calendar year.

Sec. 3.22.170. Establishes the duties of the council.

Sec. 03.22.180. Provides that the council will create a triennial plan for the control of invasive species. Requires the council to annually choose one project for action by entities coordinating with the council. The plan must be submitted to the governor and the presiding officer of each house of the legislature by September 15 triennially.

Sec. 03.22.190. Allows the council to establish advisory and technical groups. Requires the council to invite and accept nominations for memberships on the advisory and technical groups.

Sec. 03.22.200. Provides that invasive species control and education efforts initiated by the council will be undertaken in cooperation with federal laws and initiatives.

Sec. 03.22.210. Requires that all state agencies cooperate with the council.

Sec. 03.22.220. Provides that the council may exercise its duties with a person, other entity, or other governmental agency.

Sec. 03.22.249. Provides the Article's definitions.

Section 3. Repeals the provisions of the Act on December 31, 2020.

Section 4. Provides that the first meeting of the council will be convened by the Commissioner of Fish and Game and provides what shall be addressed at that meeting.

Section 5. Provides that the terms of the first appointed members of the council shall be set to achieve staggered terms.

Section 6. Requires that the annual reports from the council submitted before December 15, 2011 include the council's recommendations addressing statutes and regulations relating to the council, and requires the initial triennial strategic plan to be completed by September 15, 2011.

TLAB:plm
09-014.plm

ALASKA STATE LEGISLATURE

Interim:
716 West 4th Avenue, Suite 640
Anchorage, Alaska 99501
Phone (907) 269-0200
Fax (907) 269-0204
Rep.Craig.Johnson@legis.state.ak.us



Session:
State Capitol, Room 126
Juneau, Alaska
99801-1182
Phone (907) 465-4993
Fax (907) 465-3872

REPRESENTATIVE CRAIG JOHNSON
HOUSE DISTRICT 28

SPONSOR STATEMENT

HB 12 ESTABLISHING THE ALASKA COUNCIL ON INVASIVE SPECIES

HB 12 establishes the Alaska Council on Invasive Species. A 14 member board would be established in the Department of Fish and Game with four other departments included as ex-officio members; Department of Natural Resources, Department of Transportation & Public Facilities, Department of Environmental Conservation, and the Department of Health & Social Services. The Commissioner of Fish and Game would appoint the other 9 members.

Invasive species are a relentless problem. These harmful, non-native plants, animals and microorganisms impact our economy and environment. The overall economic impact of invasive species in the U.S. was estimated in the range of tens of billions of dollars per year in 2000. The potential economic harm that invasive species could cause in Alaska is difficult to estimate. However, if just a few invasive plant species that are of known concern were to become wide-spread, they alone could cost the State's economy tens of millions of dollars annually.

Alaska is in a unique position to avoid the enormous costs associated with the widespread introduction and establishment of invasive species. Early intervention in Alaska can prevent the deterioration of the state's resources.

Formation of a unified Council for invasive species management is an important step in coordinating existing resources within Alaska and for improving our capacity for effective collaboration well into the future. The Alaska Council on Invasive Species will conduct a coordinated and comprehensive effort to keep invasive species out of Alaska and to eliminate, reduce, or mitigate the impacts of invasive species already established in Alaska.

Prevention and timely management is important for controlling the detrimental impacts of invasive species. Early detection programs and rapid response plans can help to cost-effectively mobilize resources from participating agencies.

Coordination between the organizations and agencies in Alaska is vital to identify shared priorities and avoid duplication of efforts, to promote compatibility of the collected research data, and to enhance the education and outreach activities associated with invasive species.

The State of Alaska and its partners can more strongly support regulation and enforcement efforts to protect our vital natural and economic resources. The recent actions of the Department of Natural Resources and Department of Fish and Game toward regulating such invasive species as rats, freshwater fish (non-native pike), and detrimental plant species (purple loosestrife and orange hawkweed) are positive steps toward invasive species prevention.

Effective prevention is both economically and ecologically efficient, and often more practical, than eradicating species after introduction has already occurred. Improved monitoring, inspection, and enforcement along all pathways for invasion into Alaska are needed.

Assessment of Invasive Species in Alaska and its National Forests

August 30, 2005

Compiled by Barbara Schrader and Paul Hennon

Contributing Authors:

USFS Alaska Regional Office: Michael Goldstein, Wildlife Ecologist; Don Martin, Fisheries Ecologist; Barbara Schrader, Vegetation Ecologist

USFS Alaska Region, State and Private Forestry/Forest Health Protection: Paul Hennon, Pathologist; Ed Holsten, Entomologist (retired); Jim Kruse, Entomologist

Executive Summary

This document assesses the current status of invasive species in Alaska's ecosystems, with emphasis on the State's two national forests. Lists of invasive species were developed in several taxonomic groups including plants, terrestrial and aquatic organisms, tree pathogens and insects. Sixty-three plant species have been ranked according to their invasive characteristics. Spotted knapweed, Japanese knotweed, reed canarygrass, white sweetclover, ornamental jewelweed, Canada thistle, bird vetch, orange hawkweed, and garlic mustard were among the highest-ranked species. A number of non-native terrestrial fauna species have been introduced or transplanted in Alaska. At this time only rats are considered to be causing substantial ecological harm. The impacts of non-native slugs in estuaries are unknown, and concern exists about the expansion of introduced elk populations in southeast Alaska. Northern pike represents the most immediate concern among aquatic species, but several other species (Atlantic salmon, Chinese mitten crab, and New Zealand mudsnail) could invade Alaska in the future. No tree pathogen is currently damaging Alaska's native tree species but several fungal species from Europe and Asia could cause considerable damage if introduced. Four introduced insects are currently established and causing defoliation and tree mortality to spruce, birch, and larch. The results of this assessment will be used to develop a strategy to manage invasive species by applying the principles of prevention, early detection, control, and rehabilitation in cooperation with different agencies and partners throughout Alaska.

Introduction

Invasive species threaten the integrity and sustainability of the world's ecosystems at a time of fluctuating global climate regimes, increasing disturbance—both natural and human caused—and expanding human populations (Simberloff et al. 2005, Pimentel et al. 2000). Until recently, Alaskan ecosystems have remained relatively isolated from invasive species. The state's geographic location, harsh climatic conditions, vast wilderness areas, and sparse human population with limited road access and few transportation corridors have contributed to this protective isolation (Fay 2002, Union of Concerned Scientists 2003). Increased global and national concern regarding the impact of invasive species on ecosystems and biodiversity has propelled natural resource agencies, managers, and scientists to investigate the threats posed to Alaskan ecosystems.

Species are considered invasive if they are not native to an ecosystem, and are likely to cause harm to human health, the economy, or the environment (Executive Order 13112 1999). Interagency working groups such as the statewide Alaska Committee for Noxious and Invasive Plant Management (CNIPM) are beginning to accumulate information on invasive species present or with potential to appear in Alaska. Compared to the contiguous United States and Canada, Alaska currently has fewer aggressive invasive species because of its largely remote landscape and harsh climate (National Agricultural Library 2005, Canadian Wildlife Federation 2003, Fay 2002). However, invasive species are expected to increase and expand in range as transportation networks expand, traffic and travelers increase throughout the Alaskan landscape, and other changes in disturbance patterns and climate occur.

Invasive species alter Alaskan ecosystems by displacing or preying on native species, contaminating gene pools by interbreeding with native species, and through widespread killing of native species, as seen with invasive insects in native forests. Invasive animals have been intentionally introduced for sport hunting or commercial endeavors such as furbearer farms. Invasive plants may originate from escaped ornamental plants, seeding after road construction projects, or as hitchhikers on equipment or gear. Some invasive plant species occur primarily in areas that have been heavily disturbed, such as road corridors. Others, such as nitrogen-fixing plants spread readily where there is any opportunity for them to germinate (such as in riparian areas). Invasive forest insects and pathogens are typically introduced via ornamental plants or forest products.

Scope and Approach

The purpose of this Invasive Species Assessment is to inform USDA Forest Service resource managers, land owners, and other interested people of the known and anticipated threats to Forest Service land from invasive species as identified in Executive Order 13112 (1999). In this assessment, we review all non-native freshwater and terrestrial organisms known to occur on lands managed by the Forest Service in Alaska. Invasive plants, forest pathogens, and forest insects that occur in other parts of the state are included because State and Private Forestry provide technical and financial assistance to address these threats on all forested lands. We also consider species that do not now occur in Alaska, but if introduced have the potential to cause damage. Lag effects may exist between the initial recording of a non-native species and its establishment and dispersal into surrounding ecosystems (Sakai et al. 2001, Alpert et al. 2000, Williamson 1996). These lag times are important to consider given the rapidly fluctuating climatic and disturbance regimes in Alaska.

We have compiled summary assessments for each taxonomic group, a conclusion section outlining priority species in each group, and a comprehensive table of common and scientific species names. We also identify whether each organism occurs in Alaska yet, and provide a relative ranking of invasiveness.

Invasive Plants

Alaska's vast and varied landscapes support plant communities in diverse environments ranging from coastal rainforests and wetlands, to boreal forests and tundra environments,

and newly emerged land surfaces at the edges of retreating glaciers and lands rebounding from glacial melt. Invasive plants may have long-term effects on Alaska native plant communities by displacing and outcompeting native plants. Extreme temperature, moisture, and light gradients at northern latitudes regulate plant composition and diversity of native ecosystems. These factors also limit the establishment and spread of invasive plant species. It is unknown how shifting climatic patterns may affect plant community vulnerability to invasion, especially if combined with disturbance, either natural or human caused. Compared to the lower 48 states, Alaska has a low level of invasive plant colonization. However, as inventories for non-native species have increased, more invasive plants have been located. Spotted knapweed (*Centaurea biebersteinii* DC), one of the worst invaders in the interior West, has been found at five different locations in the state (Alaska Exotic Plant Information Clearinghouse 2005), and may be arriving in the state on vehicles and machinery.

More than 130 non-native plant species have been identified in Alaska (Alaska Exotic Plant Information Clearinghouse (AKEPIC) 2004). Many of these species are naturalized, and others will remain contained to suburban yards or locally disturbed sites. Currently, 63 more common non-native plants have been ranked for invasiveness in Alaska on a 0-100 scale (Alaska Weed Ranking Program (http://akweeds.uaa.alaska.edu/akweeds_ranking_page.htm)), with resulting values falling between 34 and 89 (as of April 2005). Of these 63 species, 29 have an invasive ranking of 60 or greater, indicating a significant threat for invasion (Table 1). This list is still being compiled and is expected to contain nearly 100 species upon completion¹. A number of species ranked in this project have not yet been found in Alaska but are likely to arrive soon. The ranked species range from known destructive species such as Japanese knotweed (*Polygonum cuspidatum* Sieb & Zucc.) and reed canarygrass (*Phalaris arundinacea* L.) to the common and benign pineapple weed (*Matricaria discoidea* DC).

Alaska currently has two statewide programs in place to track and rank invasive plant species in Alaska: the Alaska Exotic Plant Information Clearinghouse (2005) database and the Weed Ranking Program. The Weed Ranking Program was initiated and funded by the USDA Forest Service, Forest Health Protection Program to better assess what species will be most problematic within Alaskan ecosystems. Both of these programs are coordinated by the Alaska Natural Heritage Program and are collaborative efforts with the USDA Forest Service, Forest Health Protection Program, National Park Service, USDA Agricultural Research Service, University of Alaska Anchorage, University of Alaska Fairbanks Cooperative Extension Service, and US Geological Survey.

In ranking the invasiveness of a particular species within the framework of the Weed Ranking Project, the invasive characteristics of plants are evaluated according to their potential and actual occurrence in Alaska within three broad climatic zones: South Coastal, Interior-Boreal, and Arctic-Alpine. The ecological impact of a species on ecosystem processes is also factored into the invasiveness score. This is measured by the

¹ Shephard, Michael. 2005. Personal Communication. Ecologist, USDA Forest Service, State and Private Forestry, Suite 202, 2201 'C' Street, Anchorage, AK 99503

ability of a species to alter plant community composition and structure, its reproduction and dispersal capabilities (both natural and disturbance-enhanced), impacts higher on the food chain, and occurrence in wetland or riparian habitats. Other considerations in the invasiveness ranking include assessing global distribution, known impacts in natural areas, and feasibility of control and management.

Highly invasive plants compete effectively for resources and generally have aggressive reproductive mechanisms. On a positive note, many of these species also have rather limited dispersal capabilities, thereby increasing the chance of successful control in small populations. All of these highly invasive plants are easily spread by human activities. These species may produce many seeds or possess aggressive sprouting characteristics. In some species, any part of the plant is capable of reproducing, not just the seeds, roots and stems. Many highly invasive plants in Alaska frequently form dense thickets of vegetation and have seeds that can remain viable in soil for more than 3 years. Many of our invasive plants establish with or without ground disturbance, constituting an increased threat to native plant communities once they are introduced. Additional characteristics of highly ranked invasive plants in Alaska include recent or historical presence on three or more continents (frequently with successful invasion occurring in arctic/subarctic environments), classification as a noxious weed in most of the lower 48 states or Canada, and once established, generally requiring major long-term investment to control.

Statewide, the highest ranking invasive plant species include spotted knapweed (*Centaurea biebersteinii* DC), Japanese knotweed (*Polygonum cuspidatum* Sieb & Zucc.), reed canarygrass (*Phalaris arundinacea* L.), white sweetclover (*Melilotus alba* Medikus), ornamental jewelweed (*Impatiens glandulifera* Royle), cheatgrass (*Bromus tectorum* L.), Himalayan blackberry (*Rubus discolor* Wiehe & Nees), Canada thistle (*Cirsium arvensis* L. Scop.), bird vetch (*Vicia cracca* L.), orange hawkweed (*Hieracium aurantiacum* L.), garlic mustard (*Alliaria petiolata* (Bieb.) Cavara & Grande), false brome (*Brachypodium sylvaticum* (Huds.) Beauv), and Scotch broom (*Cytisus scoparius* (L.) Link). High ranking species not yet occurring in Alaska include: Eurasian milfoil (*Myriophyllum spicatum* L.), Atlantic cordgrass (*Spartina alternifolia* Loisel.), and giant hogweed (*Heracleum mantegazzianum* Sommier & Levier) (Table 1). Because of the large number of invasive plants, readers are referred to the comprehensive Weed Ranking Project website (http://akweeds.uaa.alaska.edu/akweeds_ranking_page.htm) for detailed information about each species.

Eradication of invasive plants is an important activity in any Invasive Species Program, and must be linked with native plant restoration and effectiveness monitoring programs. Decisions to undertake treatment are based on several factors including a landscape analysis of sensitive habitats, site vulnerability, modes of spreading, and traits of individual species including reproductive mechanisms and dispersal capabilities. Certain species with a lower invasive ranking overall may be a higher priority for treatment and control over a more highly ranked species, based on a specific threat. For example, treatments to prevent Canada thistle from entering a wetland or garlic mustard from overtaking a subsistence berry patch would likely be higher priorities than eradicating

knotweed restricted to the roadside, even though knotweed is considered a more aggressive invasive species. Likewise a species that is ranked relatively low may be important to eradicate if it is a small, incipient population that only occurs at a few sites across the state. Individual site evaluations will be needed to determine appropriateness and priority of treatments.

Increasing awareness of invasive plants within urban/rural gardening communities is an important prevention activity. Common mullein (*Verbascum thapsus*) scored 53 in the Weed Ranking Project and is unfortunately being tried as an ornamental planting by gardeners in south-central Alaska. By adding this species to its "Do Not Plant" list, the Cooperative Extension Service is attempting to eradicate small populations of this plant before it naturalizes².

Although invasive plant populations in Alaska are currently small, in time these populations can be expected to expand and may compromise natural ecosystems and habitats (Williamson 1996). By acting now with comprehensive inventories and eradication, monitoring, and prevention strategies, the threat from invasive plants may be manageable. It is important to recognize, however, that no other state or Canadian province has been successful in limiting the spread of invasive plants to date. Results of current invasive plant surveys conducted in Alaska suggest highest invasive plant occurrences in areas of local disturbance, including industrial, commercial, and residential sites, highways and roads, campgrounds, trailheads, and other recreational areas (DeVelice 2003, Duffy 2003, Lapina and Carlson. 2005). The Alaska Committee for Noxious Invasive Plant Management (CNIPM) formed recently as a statewide network to deal with invasive plant issues, and is an important resource for individuals and organizations interested in managing invasive plants (Alaska Committee for Noxious and Invasive Plants Management 2004). Local collaborative efforts to target species of concern must be developed to make decisions on eradication, as the nature of threat will be different across the range of environmental and site conditions. Target species in the interior of Alaska may be different than in coastal areas because of climate variation, number of roads, and wetland and wilderness habitats that may facilitate or limit spread of invasive plants.

Preventing the spread of invasive plants requires the cooperation of community members and organizations to provide a unifying focus for various land management activities. Cities and boroughs, environmental groups, and others must work collaboratively with land management agencies to prevent invasive plants from spreading within local communities and across the Alaskan landscape.

Invasive (and Non-native) Terrestrial Animals

Although non-native terrestrial animal species are found in Alaska, few are considered invasive or threatening to ecosystem health and integrity. In this assessment we identify terrestrial animals that have been introduced to coastal habitats in Alaska, even if they are not considered to be invasive at this time. Rats and other rodents, raccoons, hares,

² Shephard, Michael. 2005. Personal Communication. Ecologist, USDA Forest Service, State and Private Forestry, Suite 202, 2201 'C' Street, Anchorage, AK 99503

pigeons, starlings and slugs have been introduced to southeast and south-central Alaska and occur on National Forest lands. Some species were transplanted in various Alaskan locations to establish additional hunting or trapping opportunities. Elk were introduced to Afognak Island and southeast Alaska, and marten and red squirrels were transplanted into new habitats in southeast Alaska. Other introduced species include foxes, rabbits, muskox and bison; however, none of these species occupy habitats on National Forest lands.

Concentrations of Norway rats (*Rattus norvegicus* Berkenhout) occur throughout Alaska, in areas of human settlement or on coastal islands with abundant food resources. Rats likely became established along Alaska coastal islands following shipwrecks of early European explorers. Seaports continue as points of entry today (Jarrell et al. 2001). Ground-nesting birds can be negatively affected when rats colonize islands, as observed in the Aleutian and Queen Charlotte Islands (Murie 1959). This has resulted in a rat-trapping program in the Alaska Maritime Refuge System and in the Aleutian and Pribilof Islands. It is unknown what impacts rats may be having on nesting shorebirds of forested islands and other habitats in coastal Alaska. Small rodents, in particular the house mouse (*Mus musculus* Linnaeus), are likely to occur in close proximity to human habitation. House mice are commensally adapted with people, and although they are present throughout the state, exact local distributions are unknown (National Wildlife Federation 2003). There is no evidence of serious harm caused by mice.

Raccoons (*Procyon lotor* Linnaeus) were first introduced in the mid-1930s on Long Island near Kodiak and on Baranof and Prince of Wales Islands (Jarrell et al. 2001). Later introductions occurred in southeast Alaska, but with limited survival of individuals. The current population distribution of raccoons in Alaska is very small and not considered a threat to coastal Alaskan ecosystems.

Snowshoe hares (*Lepus americanus* Erxleben) were transplanted to Juneau and Douglas Island in 1924, as well as to Kodiak Island and several Aleutian Islands (Davis 1979). Generally, introductions of hares and rabbits to the wet, forested islands of southeast Alaska have been unsuccessful, with hares persisting elsewhere in low numbers. Any detrimental impact is considered to be low.

Rock doves or pigeons (*Columba livia*) and starlings (*Sturnus vulgaris*) are both well established in the cities and boroughs of Alaska north to Fairbanks (Kessel 1979, Gibson and Andres 2002). These birds are often considered pests by humans, but may not pose threats to wildlife species in Alaska. Although starlings are known as competitors to other cavity-nesting birds, the extent of their impact in Alaska is unknown.

Garden slugs (*Arion* sp.) have been found in clusters in small towns and boroughs in Alaska, most notably Anchorage, Cordova, and Yakutat. The European black slug (*Arion ater*) and leopard slug (*Limax maximus*), the most common species in Alaska, were most likely imported on horticultural materials. People in Anchorage and Cordova have raised concerns about slugs invading home gardens. It is assumed that slugs are able to overwinter in Cordova and Yakutat, and there is some concern that slugs may

move from towns into adjacent wetland habitats. It is unknown if non-native slugs are invasive or pose a threat to native vegetation or communities (Wittwer 2005),

Elk (*Cervus elaphus* Linnaeus) are not native to Alaska but were historically introduced to develop sport-hunting opportunities in south-central and southeast Alaska. Although elk are not traditionally considered an invasive species, questions exist about the effects of their population expansion. As early as 1929 elk were successfully transplanted to Afognak Islands (Van Daele and Crye 2004), but early attempts at transplants were unsuccessful in southeast Alaska. In 1987 elk were successfully established on Etolin Island in southeast Alaska (Lowell 2004). The established population on Afognak still persists, as does the population on Etolin and Zarembo Islands in southeast Alaska. Sightings have been reported for five other islands in southeast Alaska including Wrangell, Mitkof, Kupreanof, Prince of Wales and Farm islands (USDA Forest Service 2005). There are concerns that increasing elk densities will result in increased competition with native Sitka black-tailed deer (*Odocoileus hemionus* Rafinesque), an important subsistence and sport-hunting species. There is wide overlap in the habitat and diets of these two species and increases in elk population densities may lead to declines in deer densities where the two species occur together (Lowell 2004).

Range extensions of native species have been encouraged by transplants of individual animals from one area into unoccupied suitable habitats. These transplants are generally viewed as beneficial to improve hunting and trapping opportunities, but the transplanted animals may also be considered non-native to that particular system. Sitka black-tailed deer have been introduced to Prince William Sound, Yakutat, and Kodiak/Afognak Islands (Alaska Department of Fish and Game 2003). American marten (*Martes Americana* Turton) and red squirrels (*Tamiasciurus hudsonicus* Erxleben) were released in southeast Alaska to support expanding furbearer populations. Red squirrels were released on Baranof, Chichagof, and Admiralty Islands in the 1930s to supplement the diet of marten, and are not considered invasive (USDA Forest Service undated). American marten were released on Prince of Wales and Baranof Islands in 1934 and to Chichagof Island in 1949. Marten are well-established on these islands and now exist on adjacent islands. There has been recent recognition of two species of pine marten (*Martes americana* and *Martes caurina*), the latter being native to southeast Alaska (MacDonald and Cook 2000). It is unknown whether populations of *M. americana* have different life history strategies than *M. caurina*, although populations of both species may be found in places such as Admiralty Island. It has been suggested that divergence in life history traits may be reflected in different responses to forest management in southeast Alaska.^{3 4}

The European rabbit (*Oryctolagus cuniculus* Linnaeus) occurs on several islands in Alaska (Burriss and McKnight 1973). Harvestable populations of European rabbits have

³ Cook, J. 2005. Personal Communication. Professor, Department of Biological Sciences, Idaho State University, Pocatello, Idaho.

⁴ Smith, W. 2005. Personal Communication. Research Wildlife Ecologist, USDA Forest Service, Forestry Sciences Lab, Juneau, Alaska 99801

evolved from unknown numbers introduced in the Aleutian Archipelago on Umnak Island in 1930 and on Rabbit Island in 1940. The time of the release on Hog Island (near Amuknak Island) is unknown. One male and three female rabbits placed on Middleton Island in the Gulf of Alaska in 1954 (O'Farrell 1965) produced a population of between 3,600 and 7,000 by 1961. These rabbits are primarily vegetarians; although there may be negative effects to native vegetation, there may be benefit to avian predators such as eagles.

The threats from invasive animals in Alaska at this point in time are very low, with a few exceptions. Rats are detrimental in coastal ecosystems because they prey on bird nests and impact breeding bird colonies; yet, little is known of rat distribution across coastal forests of Alaska. Other species of interest include non-native slugs and any effects they may be having on native vegetation in estuaries and marshes. It is unknown if these slugs escape the borders of towns such as Yakutat and Cordova, and move into sensitive environments. While elk are not considered an invasive species generally, population numbers of this introduced species are increasing in southeast Alaska. Negative effects are expected for local deer populations, and management plans will need to consider these factors. Because the Alaska Department of Fish and Game has primary responsibility for wildlife in Alaska, any considerations of invasive wildlife management must be coordinated through the Department.

Invasive Aquatic Organisms

Aquatic ecosystems in Alaska are some of the most pristine environments in the world. These high-quality habitats support important subsistence fish harvests, world class sport and commercial fishing opportunities, and a variety of outstanding recreational activities. Maintaining these high-quality environments in Alaska is a priority for all land management agencies. Aquatic habitats may be the most vulnerable to invasion by non-native species because of inherent transport capabilities of flowing water.

A number of non-native fish have been introduced into Alaskan waters over time. Fish species diversity is quite low in Alaska compared to other high-latitude regions of the world, due to physical barriers and geologic history. This has led to illegal introduction of fish from other high-latitude environments in order to establish new fishing opportunities. Because of the wide seasonal ranges in temperature, many of these introduced northern species are extremely hardy and adaptable. These introductions, along with inadvertent transplants of non-sport organisms, pose a serious threat to aquatic ecosystems in Alaska.

Eleven aquatic species are included in this assessment. Six species have already established breeding populations in National Forest lands and other areas in Alaska and include northern pike (*Esox lucius* Linnaeus), yellow perch (*Perca flavescens*), red-legged frog (*Rana aurora*), Pacific chorus frog (*Pseudacris regilla*), rainbow trout (*Oncorhynchus mykiss* Walbaum), and brook trout (*Salvelinus fontinalis*). The other five species are not established in Alaska yet, but cause widespread problems in the lower 48 states and could become problematic in Alaska. These species of concern are the Atlantic salmon (*Salmo salar*), Chinese mitten crab (*Eriocheir sinensis*), New Zealand

mudsnail (*Potamopyrgus antipodarum* Gray), goldfish (*Carassius auratus*), and the signal crayfish (*Pacifacstacus leniusculus*).

The northern pike was identified as the species of greatest immediate concern in the Alaska Aquatic Nuisance Species Management Plan (Fay 2002). The pike is native (endemic) to interior Alaska but not to Cook Inlet drainages, to Prince William Sound drainages, or, with the exception of one isolated population, to southeast Alaska (Fay 2002). Introduced populations of pike have become established throughout the Susitna River drainage, parts of the Kenai system, and a series of small ponds in Yakutat. These introduced populations have proven to be able to spread quickly and virtually eliminate other species in some habitats (Fay 2002). Pike may have a significant effect on salmon production in these systems. Once the introduced population spreads into a complex habitat of interconnected bodies of water, it is likely impossible to control or eliminate. The introduced population in Yakutat may still be contained within the small pond system. If this is so, it could be eliminated before it spreads throughout the Yakutat forelands.

The other five species that have known established populations are the yellow perch, red-legged frog, Pacific chorus frog, rainbow trout, and brook trout. The yellow perch was likely established in a small lake on the Kenai Peninsula by a person wishing to establish a new sport fishery (Fay 2002). This population is thought to have been removed with the use of pesticides.

Introduced non-native frogs have the potential to displace native amphibians from local ecosystems. The red-legged frog, native to the Pacific Northwest, has established populations on Chichagof Island throughout the Pavlov Bay drainage (MacDonald 2003). It is thought they were released there by a schoolteacher at the Freshwater Bay logging camp in 1982 or 1983. Frogs seen elsewhere on the island, near Freshwater Bay and possibly Hoonah, may be this species (MacDonald 2003). Recent surveys suggest range expansion of this species, and the red-legged frog is now found in several drainages along the west coast of Chichagof Island. Its impact to local ecosystems is unknown. At a minimum, the red-legged frog may displace endemic boreal toads (*Bufo boreas*) and/or wood frogs (*Rana sylvatica*). The red-legged frog's ability to persist and spread across drainages may represent a significant threat to local amphibian populations.

The introduced Pacific chorus frog has an established breeding population in a single pond complex on Revilla Island near Ward Lake. This population is thought to have been established in the 1960s (MacDonald 2003). Because boreal toads and rough-skinned newts (*Taricha granulose* Skilton) have successfully reproduced within the same pond complex in recent years, we may conclude that the population of chorus frogs is having little impact on native amphibians. However, this situation may change over time.

Rainbow trout and brook trout were stocked throughout southeast and south-central Alaska through the early 1900s (Fay 2002). The transplanted rainbow trout were from endemic stocks as well as from populations in the lower 48 states. The brook trout were brought up from the lower 48 and introduced to provide new sport fishing opportunities. Accurate records of these original introductions generally do not exist, and most did not

result in self-sustaining populations. The few successful introductions, however, have resulted in a number of healthy rainbow and brook trout populations scattered throughout the Tongass and Chugach National Forests. There is little concern about negative impacts, however, because endemic rainbow populations occur throughout both forests and negative impacts have not been recorded in species that share habitat with the introduced rainbow trout. Introduced brook trout are another story. Generally, where brook trout have become established, endemic Dolly Varden (*Salvelinus malma* Walbaum) are not found. The brook trout may have eliminated the endemic Dolly Varden populations, or it is possible Dolly Varden did not initially exist in these systems. Introduced brook trout populations have been a major contributing factor to the significant declines in bull trout (*Salvelinus confluentus* Suckley) populations in the Pacific Northwest (Rieman et al. 1977).

Since the 1970s, Atlantic salmon that escaped from salmon farming operations in British Columbia have had access to Alaska's coastal waters and fresh water streams. They appear in the commercial saltwater catch and occasionally in fresh water (Alaska Department of Fish and Game 2002). Reproduction has not been observed in Alaska; however, reproduction has taken place in British Columbia streams (Alaska Department of Fish and Game 2002, Volpe et al. 2000). There are concerns that established populations of Atlantic salmon could have significant negative impacts on the local salmon and trout populations and related industries. Control or elimination of established Atlantic salmon populations may be possible depending on the size and complexity of the watersheds involved. Alaska Department of Fish and Game has extensive information regarding Atlantic salmon at the following website: http://www.adfg.state.ak.us/special/as/as_home.php.

Chinese mitten crab, the New Zealand mudsnail, and goldfish are exotics that have become established in the Pacific Northwest and could become established in Alaska in the near future (Fay 2002). The Chinese mitten crab is likely transported by sea-going ships through the uptake and discharge of ballast water. This catadromous species (migrating from freshwater to the sea to breed) has significantly altered the ecosystems in places where it has become established (Sea Grant Washington 2000). Mitten crabs are highly mobile, and efficient predators that in large numbers can cause impacts to local fish populations and to commercial fishing operations (Fay 2002). Alaska Department of Fish and Game has extensive information regarding the Chinese mitten crab at the following website: <http://www.wsg.washington.edu/outreach/mas/nis/mittencrab.html>.

The New Zealand mudsnail is an exotic organism recently introduced to the western United States, and is currently documented in all western states except New Mexico (Montana State University 2005, U.S. Fish and Wildlife Service 2004). This organism can quickly colonize freshwater environments and dominate the invertebrate community. The mudsnail can alter aquatic ecosystems by consuming large portions of the food resources, outcompeting and physically crowding native species. Mudsnails are spread via fishing gear such as boots and waders, as well as by boat trailers and other equipment.

Goldfish have become a nuisance species throughout the world (Fossa 2004).

The one known established breeding population of goldfish in Alaska occurred on the Clear Airforce Base and was eradicated with the use of pesticides. This population established in a power plant water cooling system and became very dense before successful eradication (Fay 2002). Five large goldfish were removed from a small pond near the Mendenhall Glacier near Juneau, Alaska in 2002. Analysis of the scales showed that the fish were in the wild for 3 years prior to their capture and that they grew very well in the wild⁵. Goldfish could become a problem in small streams and ponds that are important for rearing salmon but do not have many larger predatory fish. This might be the case in some of the smaller urban streams. The mitten crab, mudsnail and goldfish are examples of species that could have impacts on the endemic salmon and trout populations and the industries that rely on them. Once established, control or elimination of these species is unlikely.

The signal crayfish is endemic to the western United States but has become an invasive species throughout the world (Fay 2002). Single individuals have been found on Kodiak Island and near Kenai. Breeding populations have not been found in Alaska, however. Where they have become invasive in many parts of Europe, they have had significant impacts on the local ecosystems (Scottish Fisheries Research Service 2005) by preying on local crayfish, carrying disease, preying on fish eggs and fry, and altering aquatic trophic structures.

An additional aquatic species, the invasive plant Eurasian milfoil, is a threat to aquatic systems. Although not documented yet in Alaska, it is a serious problem throughout the lower 48 states (National Invasive Species Council 2005). This species can become established by the introduction of small pieces of stem material, and is spread through the aquarium industry as well as by boats, trailers, and other water sports equipment. Once established, Eurasian milfoil can dominate its new environment with thick mats that shade out endemic plant species. It can reduce species diversity and increase eutrophication in some pond habitats. Eurasian milfoil is hard to control and likely impossible to eradicate once it is established. Refer to the Invasive Plant section of this document and the associated references for more information about Eurasian milfoil.

Aquatic ecosystems in Alaska are vulnerable to introduced organisms that could seriously impact system function and cause declines in native fish populations. While all of the introduced aquatic organisms are of concern, existing populations of northern pike generate the highest current threat to aquatic systems. If Atlantic salmon becomes established in coastal Alaska the impacts on native salmon populations could be severe. Similarly, introductions of Chinese mitten crab, New Zealand mudsnail, and crayfish will be difficult to control if breeding populations become established. Consideration of invasive aquatic species management must be coordinated through the Alaska Department of Fish & Game.

⁵ Martin, D. 2005. Fisheries Ecologist. Personal observation. USDA Forest Service, Alaska Regional Office, Juneau, Alaska 99802

Invasive Pathogens

Invasive pathogens have had devastating ecological, economic, and social effects on forests in the United States (Anonymous 1991, Liebold et al. 1995, Ciesla 2002). White pine blister rust (*Cronartium ribicola*), Dutch elm disease (*Ceratocystis ulmi*), chestnut blight (*Cryphonectria parasitica*) and more recently, sudden oak death (*Phytophthora ramorum*) are all examples of large-scale tree mortality to native tree species. In each example, the native tree species lacked genetic resistance to the introduced pathogen because the two did not co-evolve. In the example of chestnut blight, the introduced pathogen killed every chestnut tree in its native range (Worrall 2005). Alaskan forests may be particularly vulnerable to introduced pathogens because of the relatively small number of native tree species and their narrow genetic base. Many pathogenic fungi primarily disseminate by spores on air currents and can quickly spread over large distances. The introduction of a single pathogen capable of killing one of Alaska's tree species could have enormous consequences for forest ecosystems throughout the state.

Fortunately, to date, Alaskan forests have not been affected by any such introduced tree pathogen (Holsten et al. 2001). Several tree pathogens are known to have been introduced, but their spread has been limited by the available host plants that each can infect. Fungal pathogens such as white pine blister rust (*Cronartium ribicola*) and black knot (*Apiosporina morbosa*), and the bacterial fire blight pathogen (*Erwinia amylovora*) have been introduced into ornamental plantings at several locations, but these organisms are not capable of causing widespread damage to our native tree species (Wittwer 2004).

Without any known significant introductions, the regional strategy for pathogens will focus on prevention and early detection. Unfortunately, the national database on invasive tree pathogens ("EXFOR", North American Forest Commission Exotic Forest Pest Information System <http://spfnic.fs.fed.us/exfor/>) has few entries on pathogens that could threaten Alaskan tree species. Thus, an assessment of such pathogens is underway by USDA State and Private Forestry forest health specialists, and will be completed in late 2005. This is challenging because minor tree pathogens in their endemic ranges can become epidemic and become agents of major tree mortality on new hosts and in new environments. This assessment evaluates pathogens native to Europe and Asia that attack tree species whose genera are represented in Alaska (e.g., spruce (*Picea*), hemlock (*Tsuga*), birch (*Betula*), etc.), and determines the type of disease they cause, their climatic limitations, and avenues of movement. The type of disease caused (i.e., root, stem canker, vascular wilt, foliar) can indicate the most likely means of introduction. This preliminary assessment has yielded the names of 13 pathogens that are not presently in Alaska, but if introduced, could threaten our native tree species. Species such as *Chrysomyxa abietis* (foliar rust of spruce), *Didymascella chamaecypari* (cedar shot hole), *Cistella japonica* (resinous stem canker), *Seiridium cardinale* (foliar and stem canker pathogen of cedars), *Phytophthora lateralis* (root disease of cedar), and *Taphrina betulina* (foliar disease of birch) are among the potentially damaging fungi. The pine wilt nematode (*Bursaphelenchus xylophilus*) could cause a vascular wilt to spruce and pine in Alaska, and if ever introduced with its insect vector (the sawyer beetles, *Monochamus* spp.), would disrupt export of spruce wood from Alaska. Our assessment also documents

that many species of tree pathogens already have a circumpolar distribution and are native throughout Europe, Asia, and North America, including Alaska.

Knowledge of probable pathways for potential introductions will be the cornerstone of prevention and early detection. Most tree pathogens are likely to be introduced on live plant material, with ornamental plants in urban areas and towns as the most probable source. Christmas trees and wood products represent other likely sources. Thus, prevention will be conducted through public outreach efforts such as leaflets, brochures, and education and training sessions. The preliminary evaluation of potential pathogens from around the world will provide the names of pathogens that will be the focus of early detection. Monitoring for these potential pathogens occurs in nurseries and landscaping plant outlets, and will also involve observations on native trees located in strategic locations as bio-assays for early detection. Control of any introduced pathogen that is considered threatening should be conducted before it becomes established. Historically, eradication or control of established pathogens has been extremely difficult. Evaluation of economic or ecological impact should be conducted to justify the cost and any negative environmental consequences of control efforts. Restoration usually involves programs aimed at breeding for disease resistance to re-establish the native tree species that was affected. Such programs are expensive, involve long-term commitment, but have proven to be effective.

Currently, no serious outbreaks of invasive tree pathogens are found in Alaska. Thus, prevention and early detection will be the focus of most management effort toward invasive tree pathogens. The foliar rust of spruce, *Chrysomyxa abietis*, probably represents the largest potential threat. Other noteworthy potential pathogens include the foliar, stem, and root fungi of cedars, the foliar pathogen of birch, and pine wilt nematode of spruce and pine.

Invasive Insects

Invasive insects are among the most serious threats to forest ecosystems of the United States, including Alaska (Mattson 1997). Insects that are native to Canada and the lower 48 states as well as species introduced from other continents threaten native Alaskan ecosystems. The movement of insects into Alaska from the lower 48 or Canada is the most serious, and most likely threat, regardless if these insects originate from the North American continent or not. Because Alaska is increasing its role in international trade, other likely pathways of introduction for exotics are ports-of-entry. Once established, introduced insect populations can explode, and potentially bring about widespread ecological change to Alaska's forested ecosystems (Mattson 1997).

To date, several invasive species have become established in the forests of Alaska (Wittwer 2005). Some examples are larch sawfly (*Pristiphora erichsonii*), alder woolly sawfly (*Eriocampa ovata*), spruce aphid (*Elatobium abietinum*), and amber-marked birch leafminer (*Profenusa thomsoni*). Spruce aphid was probably introduced into southeast Alaska about 80 years ago, but appears to be causing more damage to spruce as the climate warms. Present on the continent for over 100 years, the amber-marked birch leafminer was introduced into south-central, interior, and southeast Alaska in the late

1990s. Populations are now established, and severe defoliation on more than 100,000 acres has occurred in south-central Alaska. The western tent caterpillar (*Malacosoma californicum*), a native to the lower 48 and Canada, has also been introduced into the Anchorage Bowl three times on nursery stock used for landscaping. Fortunately, these introduced populations were quickly eradicated.

Prevention is the first priority and will be conducted through public outreach efforts such as leaflets, brochures, and education and training sessions. This outreach will target both the public and natural resource managers and will focus on the risks and dangers associated with introduced insect pests. One such example of early detection and rapid response is the gypsy and nun moth trapping that is being conducted throughout Alaska. USDA Animal and Plant Health Inspection Service (APHIS) and the Integrated Pest Management Technician Program initiated this pheromone-based detection and trapping system over a decade ago, and it will likely continue on an annual basis. Likewise, a National Exotic Woodborer/Bark Beetle Early Warning Detection Program has been initiated in Alaska and will be carried out annually in cooperation with Alaska State and Private Forestry, Forest Health Protection staff and specialists from the Alaska State Division of Forestry.

A biological control program for the amber-marked birch leafminer is underway. A host-specific parasitoid was released in south-central Alaska in 2004 and releases will continue in 2005 and 2006. This is a cooperative program of the USDA APHIS & FS, Alaska Division of Forestry, University of Alberta, Canadian Forestry Service, and the Municipality of Anchorage.

The introduced larch sawfly has defoliated thousands of acres of tamaracks and caused extensive mortality throughout Alaska's interior forests. This insect was introduced to south-central Alaska and is defoliating ornamental Siberian larch as far south as Homer. Evaluations are ongoing to determine the amount and extent of larch mortality, and to determine if genetic conservation practices are needed to restore these severely impacted forested ecosystems.

When the insects on the list of current and potential invasive insect species are carefully considered using not only immediate tree mortality, but the ability to potentially alter an entire natural system, three species rise to the top. A European scolytid bark beetle (*Ips typographus*) has the potential to destroy large swaths of spruce forest throughout Alaska and greatly impact commercial forestry; the amber-marked birch leaf miner causes widespread defoliation of all species of birch found in Alaska, but has an unknown long-term effect on forest ecosystems; and the larch sawfly (*Pristiphora erichsonii*) which effectively kills over 80% of any larch tree attaining four inch diameter breast height and thus alters stand composition and threatens a tree species that exists in Alaska at the edge of its range where it has difficulty regenerating.

Conclusions

This invasive species assessment has identified 176 non-native species present in Alaska (Table 1). To date, 42 of these species pose a significant threat for invasion. Sixty-three plants are ranked according to their invasive characteristics and need to be assessed individually within an ecosystem context for relative importance. The highest ranking invasive plant species include Eurasian water-milfoil (not yet found in Alaska), spotted knapweed, Atlantic cordgrass (not yet found in AK), Japanese knotweed, reed canarygrass, giant hogweed (not yet found in AK), white sweetclover, purple loosestrife (no escapement in AK yet), ornamental jewelweed, cheatgrass, Himalayan blackberry, Canada thistle, bird vetch, orange hawkweed, garlic mustard, false brome, and Scotch broom. Additional plant species will be added to the Weed Ranking Project over time, so readers are encouraged to stay current with these changes.

Although many non-native wildlife species have been introduced or transplanted in Alaska, with the exception of rats in coastal ecosystems, and possibly slugs in estuaries and elk in southeast Alaska, none are considered invasive at the present. Of the nine invasive aquatic organisms identified as threats for Alaska, established populations of northern pike pose the greatest immediate concern, while the Atlantic salmon, Chinese mitten crab, and New Zealand mudsnail are species likely to invade Alaska in coming years.

Invasive tree pathogens are not currently damaging Alaskan ecosystems, but there are numerous species that could cause widespread tree mortality if introduced. Four introduced insects are currently established in Alaska: the larch sawfly, alder woolly aphid, spruce aphid, and amber-marked birch leafminer. These insects are causing widespread tree defoliation and mortality. A number of exotic insects pose a potential threat and are related primarily to transport of infested plant and wood products.

Managing invasive species on National Forest lands in Alaska will be challenging. More information must be made available to managers and landowners. Improved interagency cooperation and development of cooperative invasive species management partnerships is needed to contain Alaskan invasive species populations at current levels. The Forest Service is addressing invasive plant management through the Alaska Region Invasive Plant Strategy (2005) and the Chugach and Tongass National Forest Invasive Plant Management Guides (2005). Within the Forest Service, various approaches are in place to address four action elements in the National Strategy and Implementation Plan for Invasive Species Management (USDA Forest Service 2004). These four elements include **prevention, early detection and rapid response, control, and restoration**. Based on this Invasive Species Assessment, a Forest Service Alaska Region Invasive Species Strategy will be prepared during 2005.

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Table 1. Complete list of invasive species considered threats for invasion to National Forest Land in Alaska including plants, terrestrial fauna, aquatic organisms, insects and pathogens.

Invasive Plants

	Common name	Scientific name	Present in Alaska?	Invasive ranking
1	Eurasian water-milfoil	<i>Myriophyllum spicatum</i> L.	No	89
2	Spotted knapweed	<i>Centaurea biebersteinii</i> DC	Yes	88
3	Atlantic cordgrass, saltmarsh cordgrass, smooth cordgrass	<i>Spartina alternifolia</i> Loisel.	No	86
4	Japanese knotweed	<i>Polygonum cuspidatum</i> Sieb & Zucc.	Yes	84
5	reed canarygrass, canarygrass	<i>Phalaris arundinacea</i> L.	Yes	83
6	Giant hogweed	<i>Heracleum mantegazzianum</i> Sommier & Levier	No	81
7	White sweetclover	<i>Melilotus alba</i> Medikus	Yes	80
8	Cheatgrass	<i>Bromus tectorum</i> L.	Yes	78
9	Ornamental jewelweed	<i>Impatiens glandulifera</i> Royle	Yes	78
10	Purple loosestrife, spike loosestrife	<i>Lythrum salicaria</i> L. & <i>L. virgatum</i> L.	No	78
11	Himalayan blackberry	<i>Rubus discolor</i> Wiehe & Nees	Yes	77
12	Canada thistle	<i>Cirsium arvensis</i> L. Scop.	Yes	76
13	Bird vetch, cow vetch, tufted vetch	<i>Vicia cracca</i> L.	Yes	75
14	Orange hawkweed, devil's paintbrush & meadow hawkweed	<i>Hieracium aurantiacum</i> L. and <i>Hieracium caespitosum</i>	Yes	71
16	Garlic mustard	<i>Alliaria petiolata</i> (Bieb.) Cavara & Grande	Yes	70
17	False-brome	<i>Brachypodium sylvaticum</i> . (Huds.) Beauv.	No	70
18	English broom, scotch broom	<i>Cytisus scoparius</i> (L.) Link	Yes	69
19	Bush honeysuckle	<i>Lonicera tatarica</i> L.	No	67
20	Siberian pea shrub	<i>Caragana arborescens</i> Lam.	Yes	65
21	Yellow sweetclover, king's crown	<i>Melilotus officinalis</i> (L.) Lam	Yes	65
22	Common dandelion	<i>Taraxacum officinale</i> G.H. Weber ex Wigg	Yes	64
23	Foxtail barley	<i>Hordeum jubatum</i> L.	Yes	63
24	Yellow toadflax, butter and eggs	<i>Linaria vulgaris</i> Miller	Yes	63
25	Ragwort, stinking willie	<i>Senecio jacobaea</i> L.	Yes	63
26	Smooth brome	<i>Bromus inermis</i> ssp. <i>inermis</i> Leyss.	No	62
27	Oxeye daisy, white daisy	<i>Leucanthemum vulgare</i> Lam.	Yes	61
28	Bull thistle, common thistle	<i>Cirsium vulgare</i> (Savi) Ten.	Yes	60
29	European bird cherry	<i>Prunus padus</i> L.	Yes	60
30	Quackgrass, couchgrass, dog grass	<i>Elymus repens</i> (L.) Gould	Yes	59
31	Perennial sowthistle, moist sowthistle	<i>Sonchus arvensis</i> L. ssp. <i>uliginosis</i> (Bieb.) Nyman	Yes	59
32	White clover, ladino clover	<i>Trifolium repens</i> L.	Yes	59
33	Common tansy, garden tansy	<i>Tanacetum vulgare</i> L.	Yes	58
34	Baby's breath	<i>Gypsophila paniculata</i> L.	No	57
35	Kentucky bluegrass	<i>Poa pratensis</i> L.	No	57
36	Sulphur cinquefoil	<i>Potentilla recta</i> L.	No	57
37	Alsike clover	<i>Trifolium hybridum</i> L.	Yes	57
38	Common timothy	<i>Phleum pratense</i> L.	Yes	56
39	Perennial sowthistle	<i>Sonchus arvensis</i> L.	Yes	56

Invasive Plants Cont.

	Common name	Scientific name	Present in Alaska?	Invasive ranking
40	Bigleaf lupine	<i>Lupinus polyphyllus</i> Lindl.	Yes	55
41	Creeping buttercup and tall buttercup	<i>Ranunculus repens</i> L. and <i>Ranunculus acris</i> L.	Yes	54
42	European mountain ash, rowan	<i>Sorbus aucuparia</i> L.	Yes	53
43	Common mullein	<i>Verbascum thapsus</i> L.	No	53
44	Ground ivy	<i>Glechoma hederacea</i> L.	No	52
45	Winter vetch	<i>Vicia villosa</i> Roth	No	52
46	Purple foxglove	<i>Digitalis purpurea</i> (L.)	Yes	51
47	Annual bluegrass	<i>Poa annua</i> L.	Yes	51
48	Common yarrow	<i>Achillea millefolium</i> var. <i>millefolium</i> L.	Yes	49
49	Sneezewort	<i>Achillea ptarmica</i> L.	Yes	47
50	Flixweed	<i>Descurainia sophia</i> (L.) Webb ex Prantl.	Yes	47
51	Yellow salsify, goat's bear	<i>Tragopogon dubius</i> Scop.	Yes	47
52	Scentless false mayweed,	<i>Tripleurospermum perforata</i> (Merat) M.	Yes	
53	Scentless chamomile	Lainz		47
54	Dame's rocket	<i>Hesperis matronalis</i> L.	No	45
55	Common plantain	<i>Plantago major</i> L.	Yes	44
56	Narrow-leaf hawk's beard	<i>Crepis tectorum</i> L.	Yes	43
57	Split-lip hemp-nettle	<i>Galeopsis bifida</i> Boenn. and <i>G. tetrahit</i> L.	Yes	43
58	Common brassbuttons	<i>Cotula coronopifolia</i> L.	No	42
59	Lambsquarters	<i>Chenopodium album</i> L.	Yes	35
60	Narrow-leaved hawkweed	<i>Hieracium umbellatum</i> L.	Yes	35
61	Disc mayweed, pineappleweed	<i>Matricaria discoidea</i> DC.	Yes	34
62	Bouncing bet, soapwort	<i>Saponaria officinalis</i> L.	Yes	34
63	Wall lettuce	<i>Mycelis muralis</i> (L.) Dumort.	No	32
64	Crested wheatgrass	<i>Agropyron cristatum</i> L. Gaertn.	Yes	No Rating
65	Creeping bentgrass, red top	<i>Agrostis gigantea</i> Roth	Yes	No Rating
66	Colonial bentgrass	<i>Agrostis tenuis</i> Sibth.	Yes	No Rating
67	Water foxtail	<i>Alopecurus geniculatus</i> L.	Yes	No Rating
68	Meadow foxtail	<i>Alopecurus pratensis</i> L.	Yes	No Rating
69	Redroot pigweed	<i>Amaranthus retroflexus</i> L.	Yes	No Rating
70	Western pearly everlasting	<i>Anaphalis margaritacea</i> (L.) Benth.	Yes	No Rating
71	Mayweed, stinking chamomile	<i>Anthemis cotula</i> L.	Yes	No Rating
72	Tower rockcress	<i>Arabis glabra</i> L. Bernh.	Yes	No Rating
73	Chickpea milkvetch, cicer milkvetch	<i>Astragalus cicer</i> L.	Yes	No Rating
74	Wildoats	<i>Avena fatua</i> L.	Yes	No Rating
75	Rape	<i>Brassica napus</i> L.	Yes	No Rating
76	Field mustard	<i>Brassica rapa</i> L.	Yes	No Rating
77	Purple-topped turnip	<i>Brassica rapa</i> L. var. <i>rapa</i>	Yes	No Rating
78	Soft brome	<i>Bromus hordeaceus</i> L.	Yes	No Rating
79	Hedge false bindweed	<i>Calystegia sepium</i> (L.) R. Br. ssp. <i>sepium</i>	Yes	No Rating
80	Shepherd's purse	<i>Capsella bursa-pastoris</i> (L.) Medik.	Yes	No Rating
81	Larger mouse-eared chickweed	<i>Cerastium fontanum</i> Baumg. ssp. <i>triviale</i> (Link) Jalas	Yes	No Rating
82	Sticky chickweed	<i>Cerastium glomeratum</i> Thuill.	Yes	No Rating

Invasive Plants Cont.

	Common name	Scientific name	Present in Alaska?	Invasive ranking
83	Pitseed goosefoot	<i>Chenopodium berlandieri</i> L.	Yes	No Rating
84	Chicory	<i>Cichorium intybus</i>	Yes	No Rating
85	Field bindweed	<i>Convolvulus arvensis</i>	Yes	No Rating
86	Orchard grass	<i>Dactylis glomerata</i> L.	Yes	No Rating
87	Delphinium	<i>Delphinium sonnei</i> Greene	Yes	No Rating
88	Slender hairgrass	<i>Deschampsia elongata</i> (Hook.) Munro	Yes	No Rating
89	Siberian wild rye	<i>Elymus sibiricus</i> L.	Yes	No Rating
90	Slender wheatgrass	<i>Elymus trachycaulus</i>	Yes	No Rating
91	Wormseed wallflower	<i>Erysimum cheiranthoides</i> L. subsp. <i>cheiranthoides</i>	Yes	No Rating
92	Common dogmustard	<i>Erucastrum gallicum</i> (Willd.) O.E. Schulz*	Yes	No Rating
93	Wormseed mustard	<i>Erysimum cheiranthoides</i> L. subsp. <i>cheiranthoides</i>	Yes	No Rating
94	Tall fescue	<i>Festuca arundinacea</i> (Schreb.) S.J. Darbyshire	Yes	No Rating
95	Brittlestem hempnettle	<i>Galeopsis tetrahit</i> L.	Yes	No Rating
96	Annual (common) sunflower	<i>Helianthus annuus</i> L.	Yes	No Rating
97	Mouseear hawkweed	<i>Hieracium pilosella</i> L.	Yes	No Rating
98	Leporinum barley	<i>Hordeum murinum</i> L. spp <i>leporinum</i> (Link)	Yes	No Rating
99	Common barley	<i>Hordeum vulgare</i> L.	Yes	No Rating
100	Common St. Johnswort	<i>Hypericum perforatum</i> L.	Yes	No Rating
101	Cat's-ears	<i>Hypochoeris radicata</i> L.	Yes	No Rating
102	European beggar's lice	<i>Lappula myosotis</i> Moench	Yes	No Rating
103	Prickly lettuce	<i>Lactuca serriola</i> L.	Yes	No Rating
104	European stickweed	<i>Lappula squarrosa</i>	Yes	No Rating
105	Fall dandelion	<i>Leontodon autumnalis</i> L.	Yes	No Rating
106	Common pepperweed	<i>Lepidium densiflorum</i> Schrad	Yes	No Rating
107	Pineneedle toadflax	<i>Linaria pinifolia</i>	Yes	No Rating
108	Italian rye grass	<i>Lolium multiflorum</i> Lam.	Yes	No Rating
109	Perennial rye grass	<i>Lolium perenne</i> L.	Yes	No Rating
110	Maltesecross	<i>Lychnis chalcedonica</i> L.	Yes	No Rating
111	Yellow alfalfa	<i>Medicago falcata</i> L.	Yes	No Rating
112	Black medic, hop clover	<i>Medicago lupulina</i> L.	Yes	No Rating
113	Burr medic	<i>Medicago minima</i>	Yes	No Rating
114	Blfalfa	<i>Medicago sativa</i> L.	Yes	No Rating
115	Night-flowering catchfly	<i>Melandrium noctiflorum</i> (L.) Fries	Yes	No Rating
116	Spearmint	<i>Mentha spicata</i>	Yes	No Rating
117	True forget-me-not	<i>Myosotis scorpioides</i> L.	Yes	No Rating
118	Ball mustard	<i>Neslia paniculata</i> (L.) Desv.	Yes	No Rating
119	Iceland poppy	<i>Papaver nudicaule</i> L.	Yes	No Rating
120	Canary grass	<i>Phalaris canariensis</i> L.	Yes	No Rating
121	Ribgrass, buckhorn, English plantain	<i>Plantago lanceolata</i> L.	Yes	No Rating
122	Canada bluegrass	<i>Poa compressa</i> L.	Yes	No Rating
123	Glaucous bluegrass	<i>Poa glauca</i> Vahl.	Yes	No Rating
124	Fowl bluegrass	<i>Poa palustris</i> L.	Yes	No Rating

Invasive Plants Cont.

	Common name	Scientific name	Present in Alaska?	Invasive ranking
125	Spreading bluegrass	<i>Poa subcoerulea</i> Sm.	Yes	No Rating
126	Rough bluegrass	<i>Poa trivialis</i> L.	Yes	No Rating
127	Knotweed	<i>Polygonum aviculare</i> L.	Yes	No Rating
128	Black bindweed, wild buckwheat	<i>Polygonum convolvulus</i> L.	Yes	No Rating
129	Willow weed	<i>Polygonum lapathifolium</i> L.	Yes	No Rating
130	Silverweed	<i>Potentilla anserina</i> L.	Yes	No Rating
131	Norwegian cinquefoil	<i>Potentilla norvegica</i> L.	Yes	No Rating
132	Sheep sorel	<i>Rumex acetosella</i> L. ssp. <i>acetosella</i>	Yes	No Rating
133	Curled dock	<i>Rumex crispus</i> L.	Yes	No Rating
134	Garden dock	<i>Rumex longifolius</i> DC.	Yes	No Rating
135	Bitter dock	<i>Rumex obtusifolius</i> L.	Yes	No Rating
136	Common groundsel	<i>Senecio vulgaris</i> L.	Yes	No Rating
137	Green bristlegrass	<i>Setaria viridis</i> L. Beauv.	Yes	No Rating
138	Red catchfly	<i>Silene dioica</i> (L.) Clairville	Yes	No Rating
139	Bladder campion	<i>Silene latifolia</i> Poir.	Yes	No Rating
140	White mustard	<i>Sinapis alba</i> L.	Yes	No Rating
141	Tumbling mustard	<i>Sisymbrium altissimum</i> L.	Yes	No Rating
142	Spurry	<i>Spergula arvensis</i> L.	Yes	No Rating
143	Purple sand spurry	<i>Spergularia rubra</i> (L.) J. & K. Presl	Yes	No Rating
144	Common chickweed	<i>Stellaria media</i> (L.) Vill.	Yes	No Rating
145	Common comfrey	<i>Symphytum officinale</i>	Yes	No Rating
146	Pennycress	<i>Thlaspi arvense</i> L.	Yes	No Rating
147	Red clover	<i>Trifolium pratense</i> L.	Yes	No Rating
148	Wheat	<i>Triticum aestivum</i> L.	Yes	No Rating
149	Thyme-leaf speedwell	<i>Veronica serpyllifolia</i> L. subsp. <i>serpyllifolia</i>	Yes	No Rating
150	Johnny jumpup	<i>Viola tricolor</i> L.	Yes	No Rating

Invasive Terrestrial Fauna

	Common name	Scientific name	Present in Alaska?	Invasive ranking
1	Norway rat	<i>Rattus norvegicus</i>	Yes	High
2	European black slug	<i>Arion ater</i>	Yes	Low
3	Garden slug	<i>Arion spp.</i>	Yes	Low
4	Leopard slug	<i>Limax maximus</i>	Yes	Low
5	Elk	<i>Cervus elaphus</i>	Yes	Moderate
6	House mouse	<i>Mus musculus</i>	Yes	Low
7	Starling	<i>Sturnus vulgaris</i>	Yes	Low
8	Rock dove	<i>Columba livia</i>	Yes	Low

Invasive Aquatic Species

	Common name	Scientific name	Present in Alaska?	Invasive ranking
1	Chinese mitten crab	<i>Eriocheir sinensis</i>	No	High
2	Northern pike	<i>Esox lucius</i>	Yes	High
3	Eurasian water-milfoil	<i>Myriophyllum spicatum</i>	No	High
4	Signal crayfish	<i>Pacifacastacus leniusculus</i>	Yes	High
5	Yellow perch	<i>Perca flavescens</i>	No	High
6	New Zealand mudsnail	<i>Potamopyrgus antipodarum</i>	No	High
7	Red-legged frog	<i>Rana aurora</i>	Yes	High
8	Atlantic salmon	<i>Salmo salar</i>	Yes	High
9	Pacific chorus frog	<i>Pseudacris regilla</i>	Yes	Low
10	Rainbow trout	<i>Oncorhynchus mykiss</i> Walbaum	Yes	Low
11	Brook trout	<i>Salvelinus fontinalis</i>	Yes	Low
12	Goldfish	<i>Carassius auratus</i>	Yes	Low

Invasive Pathogens

	Common name	Scientific name	Present in Alaska?	Invasive ranking
1	Spruce needle rust	<i>Chrysomyxa abietis</i> (Wallr.) Unger	No	High
2	Rhododendron-spruce needle rust	<i>Chrysomyxa ledi</i> var. <i>rhododendri</i> (de Bary.) Savile	No	Moderate
3	Resinous stem canker	<i>Cistella japonica</i> Suto et Kobayashi	No	Moderate
4	Cedar shot hole	<i>Didymascella chamaecyparidis</i> (J. F. Adams.) Maire	No	Moderate
5	Cedar leaf blight	<i>Lophodermium chamaecyparissi</i> Shir & Hara.	No	Moderate
6	Poplar rust	<i>Melampsora larici-tremulae</i> Kleb.	No	Moderate
7	Seiridium shoot blight	<i>Seiridium cardinale</i> (Wagener) Sutton & Gibson	No	Moderate
8	Phytophthora root disease	<i>Phytophthora lateralis</i> Tucker & Milbrath	No	Moderate
9	Needle and twig blight	<i>Acanthostigma parasiticum</i> (Hart.) Sacc.	No	Low
10	Black knot	<i>Apiosporina morbosa</i> (Schwein.:Fr.) Arx	Yes	Low
11	Pine wilt nematode	<i>Bursaphelenchus xylophilus</i>	No	Low
12	White pine blister rust	<i>Cronartium ribicola</i> J.C. Fischer: Rabh.	Yes	Low
13	Fire blight	<i>Erwinia amylovora</i> (Burrill) Winslow	Yes	Low
14	Sudden oak death	<i>Phytophthora ramorum</i> Werres deCock	No	Low
15	Birch leaf curl	Man in't Veld	No	Low
16	Birch witches broom	<i>Taphrina betulae</i> (Fckl.) Johans.	No	Low
17	Valsa canker	<i>Taphrina betulina</i> Rostr.	No	Low
		<i>Valsa harti</i>	No	Low

Invasive insects

	Common name	Scientific name	Present in Alaska?	Invasive ranking
1	Pine moth	<i>Dendrolimus pini</i> (L.)	No	High
2	European spruce beetle	<i>Ips typographus</i> L.	No	High
3	Asian gypsy moth	<i>Lymantria dispar</i> L.	No	High
4	Nun moth	<i>Lymantria monacha</i> (L.)	No	High
	Western and forest tent caterpillars	<i>Malacosoma californicum</i> (Packard) and <i>Malacosoma disstria</i> (Hübner)	No	High
5				
6	Larch sawfly	<i>Pristiphora erichsonii</i> (Hartig)	Yes	High
7	Amber-marked birch leafminer	<i>Profenusa thomsoni</i> (Konow)	Yes	High
8	Brown spruce longhorn beetle	<i>Tetropium fuscum</i> (F.)	No	High
9	Woolly spruce aphid	<i>Adelges abietis</i> (L.)	No	Moderate
10	Hemlock woolly adelgid	<i>Adelges tsugae</i> Annand	No	Moderate
	Asian longhorned beetle	<i>Anoplophora glabripennis</i> (Motschulsky)	No	Moderate
11				
12	Larch casebearer	<i>Coleophora laricella</i> (Hübner)	No	Moderate
13	Spruce aphid	<i>Elatobium abietinum</i> (Walker)	Yes	Moderate
14	Birch leafroller	<i>Epinotia solandriana</i> L.	Yes	Moderate
15	Birch leafminer	<i>Fenusa pusilla</i> (Lepeletier)	Yes	Moderate
16	Larch engraver	<i>Ips cembrae</i> (Heer)	No	Moderate
17	European gypsy moth	<i>Lymantria dispar</i> (L.)	No	Moderate
18	Sitka spruce weevil	<i>Pissodes strobe</i> (Peck)	Yes	Moderate
19	Eastern spruce gall aphid	<i>Adelges piceae</i> (Ratzburg)	Yes	Low
20	Uglynest caterpillar	<i>Archips cerasivorana</i> (Fitch)	Yes	Low
21	Alder woolly sawfly	<i>Eriocampa ovata</i> (L.)	Yes	Low
22	European alder sawfly	<i>Hemichroa crocera</i> (Fourcroy)	No	Low
23	Birch-edge leafminer	<i>Heterarthrus nemoratus</i> (Fallen)	Yes	Low
24	Currantworm	<i>Nematus ribesii</i> (Scopoli)	Yes	Low
25	Strawberry root weevil	<i>Otiorhynchus ovatus</i> (L.)	Yes	Low
26	European pine shoot moth	<i>Rhyacionia buoliana</i> (Schiffermüller)	No	Low

THE NATIONAL INVASIVE SPECIES COUNCIL (NISC)



**2008 – 2012
National Invasive Species
Management Plan**

August 2008

PREPARE

PREVENT

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National Invasive Species Council

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National Invasive Species Council
Department of the Interior
Office of the Secretary (OS/SIO/NISC)
1849 C Street, N.W.
Washington, DC 20240

www.invasivespecies.gov

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Executive Summary

Invasive Species introduced into the United States from around the globe are affecting plant and animal communities on our farms, ranches and coasts; and in our parks, waters, forests, and backyards. As global climate patterns shift, the distribution of species will change, and so will the susceptibility of particular habitats to the impacts of new species introductions. Human activity such as trade, travel and tourism have all increased substantially, increasing the speed and volume of species movement to unprecedented levels. Invasive species are often unintended hitchhikers on cargo and other trade conveyances. Still more species are deliberately introduced as pets, ornamental plants, crops, food, or for recreation, pest control or other purposes. Most nonnative species, including most of our sources of food and fiber, are not harmful; and many are highly beneficial. A small percentage of nonnative species cause great harm to the environment, the economy or human health. Nonnative species that cause harm are collectively known as invasive species.

It is difficult to estimate the total economic harm caused by invasive species, however invasive plants alone result in two to three billion dollars in crop loss each year (Bridges 1992). Aquatic invasive species clog irrigation canals and pipes that supply water to power plants and factories. Invasive plants, pathogens and parasites cut crop yields and sicken livestock. Humans can be affected directly. Invasive ants cause painful stings. Invasive plant pollen increases the severity of respiratory allergies and the sap of the invasive plant, Giant Hogweed, causes blisters on the skin that can lead to permanent scarring. West Nile Virus (WNV) is an invasive pathogen of humans and animals. As of July 2008, the Centers for Disease Control and Prevention report that 1,086 deaths in the United States were caused by WNV (CDC 2008).

Invasive species (such as kudzu, snakehead fish, zebra mussels, emerald ash borers, sea lamprey, tree of heaven, hydrilla, nutria, West Nile virus, and Sudden Oak Death pathogen) may prey upon, displace or otherwise harm native species. Some invasive species also alter ecosystem processes, transport disease, interfere with crop production, or cause illnesses in animals and humans; affecting both aquatic and terrestrial habitats. For these reasons, invasive species are of national and global concern.

Invasive species populations span geographic and jurisdictional boundaries; thus efforts to manage invasive species must be coordinated across boundaries. In 1999, Executive Order (EO) 13112 established the National Invasive Species Council (NISC), co-chaired by the Secretaries of the Interior, Agriculture, and Commerce. NISC members include the Secretaries of Transportation, State, Defense, Homeland Security, Treasury, and Health and Human Services; the Administrators of the Environmental Protection Agency and the National Aeronautics and Space Administration; as well as the Director of the U.S. Agency for International Development and the U.S. Trade Representative. NISC was charged with providing coordination, planning and overall leadership for federal invasive species programs and reaching out to state, tribal, local and private partners.

EO 13112 also required the Secretary of the Interior to establish the Invasive Species Advisory Committee (ISAC), a group of 30 nonfederal stakeholders from diverse constituencies (representing state, tribal, local and private concerns) around the Nation, to advise NISC on invasive species issues. In addition, EO 13112 called on NISC to prepare and issue the first national plan to deal with invasive species. Completed in 2001, the National Invasive Species Management Plan, Meeting the Invasive Species Challenge (2001 Plan), served as a comprehensive "blueprint" for federal action on invasive species, as well as NISC's primary coordination tool. This coordination tool provided the first comprehensive national plan for

invasive species action. It called for about 170 specific actions within nine categories of activity, about 100 of which have been established or completed. Actions identified in the 2001 Plan continue to be implemented.

The 2008–2012 National Invasive Species Management Plan (2008 Plan) is the first revision of the 2001 Plan, as mandated by EO 13112. This document will direct Federal efforts (including overall strategy and objectives) to prevent, control and minimize invasive species and their impacts within the next five fiscal years (2008 through 2012). If necessary, it may be updated more frequently to reflect changes in circumstances, agency plans and priorities. NISC member agencies, ISAC members, NISC staff, stakeholders and other experts have provided input in drafting this revision, which replaces the 2001 Plan.

The 2008 Plan is focused upon five “Strategic Goals”: Prevention; Early Detection and Rapid Response; Control and Management; Restoration; and Organizational Collaboration. To accomplish these strategic goals, critical support for efforts such as research, data and information management, education and outreach, and international cooperation elements are included in pertinent sections of the 2008 Plan.

Each of the five strategic goals specifies on-going objectives and the long-term vision for success in that area. Under each strategic goal, “Objectives” describe what is to be accomplished over the next five years, and “Implementation Tasks” describe what agencies expect to do in order to accomplish that objective. Within the “Implementation Tasks”, there are “Performance Elements” which allow for measurement of progress towards accomplishing identified tasks.

The 2008 Plan is not a comprehensive list of all federal invasive species actions. It is a targeted set of priority strategic action plans with objectives and implementation tasks that are intended to be completed in the next five years. The over-arching strategic goals and strategic action plan objectives remain consistent with the 2001 Plan. The accomplishment of specific implementation tasks and performance elements will be dependent upon agency budgets, and in some cases, legal or regulatory changes.

The 2008 Plan currently requires the work of 35 different “entities” (typically agencies or bureaus within NISC members’ departments and agencies) to achieve a total of 87 Performance Elements. Participating agencies are identified either as a “Lead” or a “Participant” to describe their role in accomplishing a specific Performance Element.

Prevention is the first-line of defense. The Strategic Goal for Prevention calls for preventing the introduction and establishment of invasive species to reduce their impact on the environment, the economy and health of the United States.

Even the best prevention efforts cannot stop all invasive species. **Early Detection**, rapid assessment and **Rapid Response** (EDRR) may act as a critical second defense. The EDRR Strategic Goal calls for developing and enhancing the capacity in the United States to identify, report and effectively respond to newly discovered and localized invasive species.

The spread of widely established invasive species can be slowed and their impacts reduced. The **Control and Management** Strategic Goal calls for containing and reducing the spread of invasive populations to minimize their harmful impacts.

Invasive species can severely undermine the ability of plants and animal communities to recover. The **Restoration** Strategic Goal calls for the restoration of high-value ecosystems to meet natural resource conservation goals by conducting restoration efforts on multiple scales.

Invasive species cross jurisdictional boundaries, making coordination and collaboration critical to success. The **Organizational Collaboration** Strategic Goal calls for maximizing organizational effectiveness and collaboration on invasive species issues among international, federal, state, local and tribal governments, private organizations and individuals.

The problem of invasive species may at times seem overwhelming. However, considerable success is being achieved in the prevention, detection, eradication and control of some invasive species along with increasing emphasis in the restoration of ecosystems that have previously been dramatically affected by invasive species. Additional research and information exchange; new detection and eradication techniques; and innovative control methodologies and collaborative models are increasing our capacity to address invasive species problems. The 2008–2012 National Invasive Species Management Plan takes a strategic approach and builds on existing programs to maximize federal efforts over the next five years to prevent and control invasive species in order to enhance our environment, economy and human health.

Introduction

Invasive Species introduced into the United States from around the globe are affecting plant and animal communities on our farms, ranches and coasts; and in our parks, waters, forests, and backyards. As global climate patterns shift, the distribution of species will change, and particular habitats may become more or less susceptible to the impacts of new species introductions. Human activity such as trade, travel and tourism have all increased substantially, increasing the speed and volume of species movement to unprecedented levels. Invasive species are often unintended hitchhikers on cargo and other trade conveyances. Still more species are deliberately introduced as pets, ornamental plants and food, or for recreation, pest control or other purposes. Most nonnative species, including many of our sources of food and fiber, are not harmful; and many are highly beneficial. A small percentage of nonnative species cause great harm to the environment, the economy, or human health. Nonnative species that cause harm are collectively known as invasive species.

Executive Order 13112 (EO 13112) defines an invasive species as:

“an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.”

The definition includes many types of invasive species such as animals, plants and microorganisms. It focuses upon invasive species which are harmful, rather than focusing on nonnative species, most of which are not harmful. Several different terms have been used to describe invasive species, such as: “alien”, “aquatic nuisance species”, “injurious wildlife”, and “noxious.” In 2006, the Invasive Species Advisory Committee (ISAC) issued a white paper to provide advice on what is intended by the term “invasive species”, and why so many different terms have been used in the past. The ISAC white paper is available on the Web at: <http://www.invasivespeciesinfo.gov/docs/council/isacdef.pdf>.

Invasive species (such as West Nile virus and Sudden Oak Death pathogen, kudzu, tree of heaven, hydrilla, zebra mussels, emerald ash borers, sea lamprey, snakehead fish, and nutria) may prey upon, displace or otherwise harm native species. Some invasive species also alter ecosystem processes, transport disease, interfere with crop production, or cause disease in animals or humans; affecting both aquatic and terrestrial habitats. For these reasons, invasive species are of national and global concern.

Invasive species populations span geographic and jurisdictional boundaries; thus efforts to manage invasive species must be coordinated across boundaries. In 1999, EO13112 charged all federal departments whose actions may affect the status of invasive species, to the extent practicable and permitted by law, to work together within their current authorities to prepare, prevent, and protect resources from harm caused by invasive species. EO 13112 also established the National Invasive Species Council (NISC), co-chaired by the Secretaries of the Interior, Agriculture, and Commerce. NISC was charged with providing coordination, planning and overall leadership for federal invasive species programs and outreach to state, tribal, local and private partners. NISC members include the Secretaries of Transportation, State, Defense, Homeland Security, Treasury, Health and Human Services; the Administrators of the Environmental Protection Agency and National Aeronautics and Space Administration; as well as the U.S. Trade Representative and an official of the U.S. Agency for International Development.

EO 13112 also required the Secretary of the Interior to establish the Invasive Species Advisory

Committee (ISAC), a group of 30 non-Federal stakeholders from diverse constituencies around the Nation (representing state, private, local and tribal concerns), to advise NISC on invasive species issues. In addition, it directed NISC to prepare and issue the first national plan to deal with invasive species. Completed in 2001, The National Invasive Species Management Plan, *Meeting the Invasive Species Challenge* (2001 Plan), serves as a comprehensive "blueprint" for federal action on invasive species, as well as NISC's primary coordination tool.

This document is the first revision of the 2001 Plan, as mandated by EO 13112. The *2008–2012 National Invasive Species Management Plan* (2008 Plan) will direct federal efforts (including overall strategy and objectives) to prevent, control and minimize invasive species and their impacts within the next five fiscal years (2008 through 2012). If necessary, it may be updated more frequently to reflect changes in circumstances, agency plans and priorities. NISC member agencies, ISAC members, NISC staff, stakeholders and other experts have provided input in drafting this revision, which is intended to replace the 2001 Plan.

The 2008 Plan currently requires the work of 35 different "entities" (typically agencies or bureaus within NISC members' departments and agencies) to achieve a total of 87 Performance Elements. Participating agencies are identified as either a "Lead" or a "Participant" to describe their role in accomplishing a specific Performance Element.

Federal, state, local and tribal governments, as well as organizations in the private sector, have taken significant steps to meet the challenges posed by invasive species. These steps set the stage for the 2008 Plan and provide direction and focus. An estimated 59 percent of the 2001 Plan's 170 specific actions have been completed or are in progress. Among the products NISC has generated are guidance documents on early detection and rapid response, prioritization of control actions, and an analysis of major pathways for introduction of invasive species. NISC members have developed an *Invasive Species Performance (Crosscut) Budget* for fiscal years 2004–2007. ISAC members completed a white paper interpreting the EO definition of invasive species in 2006, and they provided input on the 2008 Plan and future crosscut budget categories and specific initiatives.

Awareness of the problems caused by invasive species has dramatically increased in the last eight years as evidenced by increased activity at federal, state, and local levels. More than 24 states now have invasive species coordination councils. Local governments and citizens groups of all types are active in invasive species prevention and control. Despite the significant increase in activity and awareness, much remains to be done to prevent and mitigate the problems caused by invasive species.

2008 Plan Structure and Organization

Long-range strategic planning, consistent with other government agencies' strategic plans, is necessary to address complex invasive species issues. The 2008 Plan establishes five long-term "Strategic Goals" that focus federal efforts in the areas of invasive species work related to:

- 1) **Prevention (P),**
- 2) **Early Detection and Rapid Response (EDRR),**
- 3) **Control and Management (CM),**
- 4) **Restoration (R), and**
- 5) **Organizational Collaboration (OC).**

The strategic goals are ongoing and serve as guideposts for managing invasive species. Each strategic goal has an associated Strategic Action Plan with long-term "Objectives" and shorter-term "Implementation Tasks" and "Performance Elements". Accomplishment of the strategic action plan objectives within each Strategic Goal will likely take longer than five years. However, the 2008 Plan specifically describes implementation tasks for each objective that the agencies expect to accomplish during the life of the 2008 Plan. Where practicable, implementation tasks define specific performance elements that can be used to gauge progress toward accomplishing the implementation tasks and achieving the objectives. These performance elements specify agencies and bureaus/offices that are assigned responsibility to be the "Lead" or a "Participant" in accomplishing each implementation task.

Structural Hierarchy of the 2008 Plan

- ❖ STRATEGIC GOALS (P, EDRR, CM, R, and OC)
 - Strategic Action Plan for each Strategic Goal
 - OBJECTIVES (e.g., P.1, P.2, P.3, etc.)
 - Implementation Tasks (e.g., P.1.1, P.1.2, P.1.3, etc.)
 - ◆ Performance Elements (e.g., P.1.1.1, P.1.1.2, P.1.1.3, etc.)
 - Leads [Agency (Bureau/Office)]
 - Participants [Agency (Bureau/Office)]

Although they are not highlighted as strategic goals, the following continue to play a crucial role in achieving success: (1) research, (2) information sharing and data management, (3) international cooperation, (4) education and outreach.

The 2008 Plan is not a comprehensive list of all federal invasive species actions. It is a targeted set of priority strategic action plans with objectives and implementation tasks that are intended to be completed in the next five years. The over-arching strategic goals and strategic action plan objectives remain consistent with the 2001 Plan. The accomplishment of specific implementation tasks and performance elements will be dependent upon agency budgets, and in some cases, legal or regulatory changes.

There have been significant advances in policy, information exchange, program activity, public awareness and control and management tools for invasive species since the 2001 Plan. A more strategic approach to prevent and minimize harm caused by invasive species over the next five years involves taking advantage of what has been learned, and creating next steps that are well planned and coordinated.

Within each implementation task, there are indices of progress called "Performance Elements."

Each performance element identifies the federal agency that has a leadership (Lead) or a participant role. Because of the varied nature of the work, the responsibilities associated with a lead or participant role varies among performance elements. The specific responsibilities of leads and participants will be determined by those engaged in the work. At a minimum, participants will play a role in and provide information concerning that agency's actions on that performance element. Leads will play a major role by providing their agency's information, and will also be the primary source of information concerning joint accomplishments for that performance element. Information provided by leads and participants will be summarized in reports prepared by NISC staff.

Prevention

STRATEGIC GOAL 1: *Prevent introduction and establishment of invasive species to reduce their impact on the environment, economy and health of the United States.*

Introduction

Prevention is the first-line of defense. It can be the most cost-effective approach because once a species becomes widespread; controlling it may require significant and sustained expenditures. Therefore, public investment in prevention tools, resources and infrastructure is indispensable in protecting human health, agriculture and natural resources. Since the original Plan was written in 2001, progress has been made on risk analyses, screening processes, evaluation of pathways, and the scientific understanding of the ecological effects of invasive species. A joint Aquatic Nuisance Species Task Force (ANSTF)/NISC Prevention Committee is currently addressing prevention issues.

Long-term success in prevention will reduce the rate of introduction, the rate of establishment and the damage from additional invasive species in the United States. Measuring success requires accurate baseline data and monitoring systems to measure long-term trends. The Implementation Tasks identified in the 2008 Plan focus on accomplishing a limited number of important and achievable tasks related to prevention within the next five years. This will substantially contribute toward the accomplishment of the Strategic Goals and Objectives.

OBJECTIVE P.1: PREVENT ESTABLISHMENT OF INTENTIONALLY INTRODUCED INVASIVE SPECIES. *Develop fair and practical screening processes that evaluate different types of species moving intentionally in trade. Encourage agencies to modify and incorporate the processes into their own regulatory and non-regulatory programs.*

- **Implementation Task P.1.1:** Develop screening processes to evaluate invasiveness of plants which are intended for planting and are moving in trade.

Performance Element P.1.1.1: APHIS publishes proposed rule(s) on intentional introduction of potentially invasive plant species, including mechanisms to evaluate invasiveness potential and restrict introduction of species likely to be invasive.

Lead: USDA (APHIS)

Participants: USTR; USDA (CSREES, ARS, NRCS, FS)

- **Implementation Task P.1.2:** Develop screening processes to evaluate invasiveness of terrestrial and aquatic nonnative wildlife (e.g., fish, mollusks, crustaceans, mammals, birds, reptiles and amphibians) moving in trade.

Performance Element P.1.2.1: Develop a draft screening process.

Leads: DOI (FWS); DOC (NOAA)

Participants: DOI (USGS, NPS); USDA (APHIS, ARS); USTR; EPA

- **Implementation Task P.1.3:** Develop a process to identify high-priority invasive plants, animals, and plant or animal pathogens for agencies' actions.

Performance Element P.1.3.1: Prioritization process will be developed and distributed widely via the internet, at www.invasivespecies.gov and www.invasivespeciesinfo.gov for agency use.

Lead: USDA (APHIS)

Participants: USDA (ARS, CSREES, NRCS, ERS); DOI (FWS); USTR

OBJECTIVE P.2: PREVENT ESTABLISHMENT OF UNINTENTIONALLY INTRODUCED INVASIVE SPECIES INTRODUCED THROUGH HIGH RISK PATHWAYS.

- **Implementation Task P.2.1:** Reduce the movement of invasive plants pests and pathogens with propagative plant material.

Performance Element P.2.1.1: APHIS will publish proposed rule(s) to revise the Quarantine on Plants for Planting (known as "Q37").

Lead: USDA (APHIS)

Participant: USDA (ARS)

Performance Element P.2.1.2: Contribute to the development of a new International Plant Protection Convention (IPPC) standard for Plants for Planting that protects against pests.

Lead: USDA (APHIS)

Participants: USDA (ARS, FS)

- **Implementation Task P.2.2:** Sponsor research on new technologies for ballast water management and formally assess their efficacy. Sponsor research on other ship-based pathways, assessing their impacts to the environment.

Performance Element P.2.2.1: Complete a minimum of five full scale projects.

Lead: DOC (NOAA)

Participants: DHS (CG); DOI; DOT (OST, MARAD, SLSDC); EPA; DOD (COE)

Performance Element P.2.2.2: Initiate other ship-based pathways studies.

Leads: DOC (NOAA); DHS (CG)

Participants: EPA; DOT

Performance Element P.2.2.3: Support additional research

efforts to mitigate movement of invasive species by aquatic recreation.

Lead: (DOI) FWS

Participants: DOC; DOI (USGS); EPA

- **Implementation Task P.2.3:** Support efforts in new techniques or practices to reduce the spread of aquatic invasive species through recreational activities.

Performance Element P.2.3.1: Reduce the spread of zebra and quagga mussels in the Western United States.

Lead: DOI (FWS, NPS, USGS)

Participants: None

- **Implementation Task P.2.4:** Reduce movement of invasive species on or in Solid Wood Packing Materials (SWPM).

Performance Element P.2.4.1: Evaluate the importance of residual bark on SWPM, and take appropriate management or regulatory measures.

Lead: USDA (APHIS)

Participants: USDA (FS, ARS); DHS; USTR

OBJECTIVE P.3: IMPROVE THE INTERNATIONAL, FEDERAL, STATE, AND TRIBAL STANDARDS AND GUIDELINES TO PROTECT THE UNITED STATES FROM INVASIVE SPECIES.

- **Implementation Task P.3.1:** Strengthen and/or support the development of risk-based sanitary and phytosanitary international standards and guidelines under IPPC, Office International des Epizooties (OIE), North American Plant Protection Organization (NAPPO) and other international fora.

Performance Element P.3.1.1: In cooperation with others, APHIS will approve and implement sanitary and phytosanitary standards developed in the appropriate international fora.

Lead: USDA (APHIS)

Participants: DOS; USDA (ARS); NISC; USTR; EPA; DOI (FWS)

Performance Element P.3.1.2: Provide training and capacity building for developing nations to assist them in understanding, adopting, and implementing international standards and guidelines for sanitary and phytosanitary measures.

Lead: USDA (FAS)

Participants: USDA (APHIS); DOI (FWS, USGS); USAID; USTR

- **Implementation Task P.3.2:** Improve and expand domestic and international risk analysis processes. Include new risk methodologies and scientific advances in understanding invasive species. Expand the scope of conducting risk assessments to include all nonnative terrestrial and aquatic organisms moved as a result of human activity or action.

Performance Element P.3.2.1: Revise 1996 Aquatic Nuisance Species Task Force (ANSTF) risk analysis process; submit draft for review in 24 months, and finalize in 36 months.

Leads: DOC (NOAA); DOI (USGS); ANSTF

Participants: NISC, DOI (FWS); DOS; EPA; USDA (APHIS, ARS); DOD (COE); USTR

Performance Element P.3.2.2: Provide training and capacity building for developing nations to assist them in utilizing new risk assessment methodologies and incorporate scientific advances in the understanding of invasive species.

Lead: USDA (FAS)

Participants: USDA (APHIS, ARS); USAID; DOS

Performance Element P.3.2.3: Provide training in Hazard Analysis and Critical Control Points (HACCP) and other risk-based methods to minimize introduction of invasive species.

Lead: DOI (FWS)

Participants: USDA (APHIS); DOC (NOAA)

- **Implementation Task P.3.3:** Design a process to identify and rank pathways by invasive species risk. Encourage agencies to modify and incorporate the process into their own regulatory and nonregulatory programs.

Performance Element P.3.3.1: Prepare a final draft of the pathway analysis process in 24 months; complete, **distribute and encourage use** in 36 months.

Lead: USDA (APHIS)

Participants: DOC (NOAA); DOI (FWS, USGS); USDA (FS, ARS); EPA; USTR; NISC Staff

- **Implementation Task 3.4:** Integrate agency data sets to improve assessment of invasive species threats prior to arrival.

Performance Element P.3.4.1: Three (3) or more data sets are integrated and utilized.

Lead: USDA (APHIS)

Participants: USDA (ARS, FS, CSREES, NRCS); DHS

- **Implementation Task P.3.5:** Support efforts by non-federal stakeholders to develop/enhance codes of conduct and Best Management Practices (BMPs).

Performance Element P.3.5.1: Encourage non-federal stakeholders to publish codes of conduct and BMPs on the Web.

Lead: *NISC Staff*

Participants: *DOC (NOAA); DOI (FWS, BLM); USDA (APHIS, FS, NRCS, ARS); DOS*

- **Implementation Task P.3.6:** Share BMPs among NISC members to prevent or mitigate invasive species establishment or movement.

Performance Element P.3.6.1: Distribute any new BMPs that NISC Staff are made aware of to all relevant NISC members **and other interested parties.**

Lead: *NISC Staff*

Participants: *All NISC Members*

Early Detection and Rapid Response

STRATEGIC GOAL 2: *Develop and enhance the capacity to identify, report and effectively respond to newly discovered/localized invasive species.*

Introduction

Even the best prevention efforts cannot stop all invasive species. Early detection, rapid assessment and rapid response (EDRR) is a critical second defense against the establishment of invasive populations. EDRR increases the likelihood that localized invasive populations will be found, contained, and eradicated before they become widely established. EDRR can slow range expansion, and avoid the need for costly long-term control efforts. Effective EDRR depends upon the timely ability to answer critical questions such as:

- a) What is the species of concern, and has it been authoritatively identified?
- b) Where is it located and likely to spread?
- c) What harm may the species cause?
- d) What actions (if any) should be taken?
- e) Who has the needed authorities and resources?
- f) How will efforts be funded?

EDRR requires collaboration among federal, tribal, state, local governments, nongovernment organizations (NGOs) and the private sector. The ability to conduct EDRR has improved, and a great deal is being accomplished. NISC continues to assess the current federal capabilities and encourage agencies to enhance their EDRR activities. However, access to invasive species taxonomic and mapping information, funds, and technical resources limit efforts.

There are three components of EDRR—Early Detection (ED), Rapid Assessment (RA), and Rapid Response (RR).

In order to conduct EDRR, invasive species populations must first be found. Specimens have to be authoritatively identified, and the boundaries of the infestations determined. These essential **Early Detection (ED)** efforts require resources, planning, and coordination. Invasive species are often detected by chance, but they can also be detected by trained individuals and personnel through targeted invasive species surveys and by monitoring specific areas. Area monitoring, taxonomic resources and species surveys provide the information needed to construct accurate distribution maps. Maps and other ecological/biological information are critical to planning and response actions. However, invasive species monitoring, mapping, and taxonomic resources and capabilities are still lacking for much of the United States.

Rapid Assessment (RA) encompasses actions necessary to determine the appropriate response, including the current and potential range of the invasive species' infestation(s). The RA process identifies the invasive species interdiction options, timing and overall strategy for actions and provides reliable information to the public. Advanced planning that anticipates invasions and takes into account that transjurisdictional issues greatly expedites efforts.

Rapid Response (RR) is a systematic effort to eradicate or contain invasive species while infestations are still localized. RR may address totally new introductions into the United States or range expanding infestations of previously established species. Timeliness is key to RR. It is critical to quickly mobilize resources to intensely control an infestation before it becomes more widely established. Many RR efforts are led by State or local officials working with private landowners. Invasions can rapidly overwhelm local resources. The ability to share resources across jurisdictional boundaries, form strategic partnerships, and have "ready" access to plans, funds and technical resources are critical components of RR.

OBJECTIVE EDRR.1: ENHANCE CURRENT MONITORING EFFORTS FOR EARLY DETECTION.

- **Implementation Task EDRR.1.1:** Identify and evaluate monitoring efforts for high-priority invasive species and supporting technological infrastructure including an evaluation of their geographic and temporal coverage.

Performance Element EDRR.1.1.1: Evaluate monitoring efforts for high-priority invasive species and make recommendations to address critical gaps.

Leads: *USDA (APHIS); DOI (USGS)*

Participants: *USDA (ARS, CSREES, FS, NRCS); DOI (NPS, FWS, BLM); DOC (NOAA); EPA; DHS; DOD (COE)*

- **Implementation Task EDRR.1.2:** Prepare protocols to identify high priority locations for targeted monitoring efforts. Initiate three systematic monitoring pilot programs.

Performance Element EDRR.1.2.1: Develop protocols; select monitoring programs/locations and implement pilot projects.

Leads: *DOI (USGS); USDA (APHIS)*

Participants: *DOI (FWS); DOT; DHS; DOC (NOAA); EPA; USDA (FS, CSREES, ARS)*

- **Implementation Task EDRR.1.3:** Improve and support recruitment and training of volunteers for EDRR efforts at the local level, utilizing existing programs and infrastructure (such as Master Gardeners, Master Naturalists, Cooperative Extension, Sea Grant, National Wildlife Refuge "Friends" Groups, 4-H Groups, National Park support groups, and others).

Performance Element EDRR.1.3.1: Develop guidance for volunteer training on at least one monitoring program. Publish guidance on invasivespeciesinfo.gov.

Lead: *USDA (APHIS)*

Participants: *DOI (USGS, FWS, NPS, BLM); USDA (CSREES, FS, ARS, NRCS); DOD (COE); DOC (NOAA)*

Performance Element EDRR.1.3.2: Develop at least two citizen-based networks to detect and monitor for new invasive species.

Lead: *DOI (FWS)*

Participants: *DOC (NOAA); DOI (NPS, BLM); USDA (FS, NRCS, CSREES); EPA*

- **Implementation Task EDRR.1.4:** Enhance plant and animal pathogen detection methods.

Performance Element EDRR.1.4.1: Develop enhanced identification methods and supportive technologies for at least one group of pathogens.

Lead: *USDA (ARS)*

Participants: *DOI (USGS); DHS; HHS; DOD; EPA; USDA (APHIS, CSREES, FS)*

OBJECTIVE EDRR.2: MAKE TAXONOMIC INFORMATION MORE READILY AVAILABLE TO GOVERNMENTS AND THE PUBLIC.

- **Implementation Task EDRR.2.1:** Develop or enhance taxonomic expert lists to facilitate identification of terrestrial and aquatic organisms.

Performance Element EDRR.2.1.1: Identify taxonomic experts for terrestrial plants, invertebrates and vertebrates, plant and animal pathogens, and make their contact information available, as appropriate.

Leads: *USDA (ARS); SI*

Participants: *USDA (APHIS, CSREES, NRCS); DOI (USGS)*

Performance Element EDRR.2.1.2: Finalize and maintain an updated database of taxonomic experts who can identify invertebrate and vertebrate aquatic species.

Leads: *DOC (NOAA); DOI (USGS)*

Participants: *USDA (APHIS)*

OBJECTIVE EDRR.3: DEVELOP AND ENHANCE CAPACITY AND TOOLS TO SUPPORT EDRR EFFORTS.

- **Implementation Task EDRR.3.1:** Prepare protocols to evaluate and map invasive species risks.

Performance Element EDRR.3.1.1: Test protocols by mapping current and potential extents of three high-priority invasions.

Leads: *USDA (APHIS); DOI (FWS, USGS)*

Participants: *USDA (CSREES, ERS, FS, NRCS, ARS); DHS ; DOC (NOAA); EPA ; NASA; DOD (COE)*

- **Implementation Task EDRR.3.2:** Engage risk assessment experts to provide authoritative and timely assessments of current or potential invasions.

Performance Element EDRR.3.2.1: Prepare lists of risk experts for major groups of invasive species (such as plants, terrestrial species, plant pathogens, animal pathogens, or aquatic species.) Identify gaps in available expertise.

Leads: *DOI (USGS); USDA (APHIS)*

Participants: *USDA (ARS, CSREES, ERS, FS, NRCS); DOI (FWS, NPS); DOC (NOAA); DHS; HHS; SI; EPA; DOD (COE)*

- **Implementation Task EDRR.3.3:** Develop and evaluate the use of predictive models to forecast the spread of specific invasive species.

Performance Element EDRR.3.3.1: Develop and test models to forecast spread of two invasive species.

Leads: DOI (USGS); USDA (ARS)

Participants: EPA, USDA (APHIS, CSREES, ERS, FS); DOI (FWS, NPS, BLM); DOC (NOAA); HHS; SI; DOD (COE)

OBJECTIVE EDRR.4: ENHANCE EXISTING CAPABILITY TO CONDUCT PLANNING FOR EDRR.

- **Implementation Task EDRR.4.1:** Prepare model guidance or plans that encourage RR contingency planning at the appropriate level (such as, international, national, state, regional or local). Include planning for communications, response funding, cooperative mechanisms and other relevant issues.

Performance Element EDRR.4.1.1: Identify and evaluate existing RR plans and identify effective mechanisms to enhance cooperation among and between state and federal agencies, and make this information available to response agencies.

Leads: USDA (APHIS); DOC (NOAA)

Participants: USDA (CSREES, NRCS, ARS); HHS; EPA; DOD; NASA; DOD (COE); DOI (FWS)

Performance Element EDRR.4.1.2: Identify and describe existing international EDRR cooperation efforts among regional neighbors and trading partners.

Leads: DOS; USTR; NISC Staff

Participants: All NISC Members

OBJECTIVE EDRR.5: DEVELOP OPTIONS PAPER TO FUND RAPID RESPONSE EFFORTS.

- **Implementation Task EDRR.5.1:** Work with ISAC, states and others to develop mechanisms for cooperation and funding rapid response efforts, such as options for matching grants to states.

Performance Element EDRR.5.1.1: Explore and prepare options for cooperation and funding RR; and submit to NISC for discussion and selection of preferred alternative(s).

Lead: NISC Staff

Participants: DOI (FWS, BLM, NPS); DOD (COE)

- **Implementation Task EDRR.5.2:** Explore options for research funding for preparedness and other programs that are required for RR.

Performance Element EDRR 5.2.1: Prepare and submit to NISC options for funding research for EDRR.

Lead: *NISC Staff*

Participants: *USDA (CSREES, APHIS, ARS, FS)*

Control and Management

STRATEGIC GOAL 3: *Contain and reduce the spread and populations of established invasive species to minimize their harmful impacts.*

Introduction

Eradication of widespread invasive species may not be feasible. Widespread invasive species are subject to control and management efforts that slow the rate of range expansion and lessen the impacts of invasive populations.

Invasive species can span geographic and jurisdictional boundaries. Their control and management requires interjurisdictional communication and regionally coordinated action. Information on the distribution, abundance, rates of spread, and impacts of invasive species is critical to their control.

Impacts of terrestrial invaders differ from those of aquatic species, and impacts also differ from taxon to taxon. Understanding the ecological, economic, and social impacts of invasive species is important in prioritizing control and management operations.

A variety of control and management tools is needed to assess, remove and contain invasive species populations and guide management decisions. These tools are applied within coordinated and integrated invasive species management strategies that are adjusted, as needed. Lack of financial and human resources often limits the capacity to control and manage invasive species.

OBJECTIVE CM.1: EVALUATE CONTROL AND MANAGEMENT CAPABILITIES AND IDENTIFY STRATEGIC GAPS.

- **Implementation Task CM.1.1:** Identify and evaluate regional invasive species control and management efforts.

Performance Element CM.1.1.1: Identify and evaluate three regional control and management efforts including their geographic coverage (such as, regions, states or countries within North America.)

Lead: DOI (BLM)

Participants: DOI (FWS, BOR, NPS) DOD (COE); USDA (CSREES, NRCS, APHIS)

Performance Element CM.1.1.2: Benchmark, compare and report on at least three control programs within broader regional efforts.

Lead: USDA (APHIS)

Participants: USDA (FS, NRCS, ARS)

- **Implementation Task CM.1.2:** Identify and address strategic gaps in regional invasive species control and management efforts and tools.

Performance Element CM.1.2.1: Identify three priority species or locations (including international border locations, if appropriate) that need additional or enhanced control methods.

Lead: NISC Staff (to collate information)

Participants: DOI (FWS, BLM, NPS, USGS, BOR); USDA (NRCS, APHIS); DOS; DOC (NOAA); DOD (COE)

Performance Element CM.1.2.2: Evaluate, develop or enhance three or more biological, chemical, physical or other control methods.

Leads: USDA (ARS); DOI (USGS); DOD (COE)

Participants: USDA (FS, NRCS, APHIS) ; DOI (FWS)

Performance Element CM.1.2.3: Increase acres of land or water included in regional invasive species control and management programs.

Lead: NISC Staff (to collate information)

Participants: USDA (NRCS, APHIS); DOI (FWS, BLM, NPS); DOD; DOD (COE)

OBJECTIVE CM.2: REDUCE THE SPREAD AND HARM CAUSED BY INVASIVE SPECIES.

- **Implementation Task CM.2.1:** Reduce the spread of invasive species.

Performance Element CM.2.1.1: Increase the number of cleaning treatments conducted to address pathways of spread such as potentially contaminated equipment, hikers, anglers, recreation vehicles, watercraft or other conveyances. Monitor effectiveness.

Leads: USDA (FS); DOD (COE); DOI (BLM)

Participants: USDA (APHIS, NRCS); DOT ; DOI (NPS, FWS)

Performance Element CM.2.1.2: Increase the number of acres treated. Encourage state and private sector partners to take steps to reduce the spread of invasive species by utilizing protective measures such as, requiring the use of weed-free forage, mulch, seed, gravel and other materials; restricting the movement of contaminated firewood and having live bait restrictions or other methods that reduce the spread of invasive species.

Lead: DOI (BLM)

Participants: USDA (APHIS, NRCS); DOI (NPS, FWS); DOD (COE)

- **Implementation Task CM. 2.2:** Support on-the-ground control and management efforts.

Performance Element CM.2.2.1: Increase the percentage of high priority, at-risk acres treated according to science-based plans that monitoring has demonstrated to have been implemented successfully.

Lead: *NISC Staff (to collate information)*

Participants: *USDA (APHIS, FS, ARS); DOD (COE)*

Performance Element CM.2.2.2: Increase the ratio of projects technically supported vs. the total number of on-the-ground projects requesting technical support.

Lead: *NISC Staff (to collate information)*

Participants: *USDA (APHIS); DOI (BLM, FWS, NPS); DOD (COE)*

Performance Element CM. 2.2.3: Increase the number of on-the-ground projects technically supported.

Lead: *NISC Staff (to collate information)*

Participants: *USDA (APHIS, ARS, FS, NRCS); DOD; DOI (BLM, FWS, NPS); DOD (COE)*

Performance Element CM. 2.2.4: Increase the number of acres receiving "on-the-ground" control and management treatments.

Lead: *NISC Staff (to collate information)*

Participants: *USDA (APHIS, FS, NRCS, ARS); DOI (BLM, FWS, NPS); DOD (COE)*

OBJECTIVE CM.3: DEVELOP WORKFORCE COMPETENCIES TO PERFORM CONTROL AND MANAGEMENT ACTIVITIES.

- **Implementation Task CM. 3.1:** Increase invasive species training for land and water resource managers, and others as appropriate.

Performance Element CM. 3.1.1: Increase the number of training workshops, training materials developed, and total number of personnel and volunteers trained, including but not limited to, training in Integrated Pest Management.

Leads: *USDA (CSREES); DOI (FWS)*

Participants: *DOI (BLM, NPS); USDA (CSREES, NRCS, ERS, ARS); DOD; DOD (COE)*

OBJECTIVE CM.4: ENHANCE ECOSYSTEM RECOVERY PROCESSES THAT CONTRIBUTE TO CONTROL AND MANAGEMENT.

- **Implementation Task CM.4.1:** Enhance ecosystem recovery decision tools and conduct ecosystem assessments.

Performance Element CM.4.1.1: Increase the efficiency, accuracy, and precision of monitoring and mapping operations.

Lead: *DOI (USGS)*

Participants: *USDA (APHIS, NRCS, ARS, ERS, CSREES); NASA; DOD (COE)*

Performance Element CM.4.1.2: Enhance ecosystem recovery models and evaluate ecosystem assessment methods.

Lead: *DOD (COE)*

Participants: *DOI (USGS); USDA (FS, ARS, CSREES)*

Performance Element CM.4.1.3: Report the number of acres and species monitored and mapped.

Lead: *NISC Staff (to collate information)*

Participants: *DOI (USGS, FWS, BLM); USDA (FS, NRCS, ARS); NASA; DOD (COE)*

Restoration

STRATEGIC GOAL 4: *Restore native species and habitat conditions and rehabilitate high-value ecosystems and key ecological processes that have been impacted by invasive species to meet desired future conditions.*

Introduction

Restoration treatments are an integral part of control and management efforts to help guard against future re-infestations and further harm. Section 2(a) (2) of EO 13112 charges Federal agencies to “provide for restoration of native species and habitat conditions in ecosystems that have been invaded”. Additionally, Section 4 (d) of EO 13112 calls on NISC to develop guidance, in coordination with the Council on Environmental Quality (CEQ), “including the procurement, use and maintenance of native species as they affect invasive species.” New restoration guidance will be shared widely with federal, tribal, state, and private landowners and water managers.

Habitats and ecological processes can suffer cumulative impacts from the direct and indirect effects of invasive species and other environmental stressors. Complex ecological relationships that have evolved over evolutionary time scales can be at risk if invasive species interrupt nutrient cycling, pollination, predator/prey relationships or other ecological processes and services. Processes altered by human activity may promote invasion by inhibiting the reproduction and/or survival of native or desirable species.

The 2001 Plan recognized the importance of using native species to restore long-term ecosystem resiliency. For shorter term rehabilitation and site stabilization, both native and desired nonnative species appropriate to the site have been used successfully. Evaluation of available materials that can successfully compete with invasive species is needed, as is the development of new materials. These will serve as an ecological transition while native components and ecosystem processes develop. Assessment of the ecosystem’s desired future condition and restoration potential across a range of spatial scales allows managers to strategically control and eradicate invasive species and to restore habitats with appropriate species. These efforts can result in lower control costs, increased effectiveness, and improved chances for ecosystem restoration success.

OBJECTIVE R.1: INCLUDE INVASIVE SPECIES CONSIDERATIONS IN FORMAL GUIDANCE FOR RESTORATION PROJECTS.

- **Implementation Task R.1.1:** Address invasive species concerns in planning for restoration projects in federal land and water management field and guidance manuals.

Performance Element R.1.1.1: Amend existing or develop new land use planning protocols and Best Management Practices within federal agencies to include restoration activities to mitigate impacts of invasive species.

Leads: DOI (NPS, BLM); USDA (FS)

Participants: DOI (FWS); USDA (NRCS); DOD (COE and other agencies); DOC (NOAA)

Performance Element R.1.1.2: Identify sources of native and appropriate nonnative materials for restoration projects carried out by federal agencies.

Leads: DOI (NPS); USDA (NRCS)

Participants: USDA (FS, CSREES, ARS); DOD (COE and other agencies); DOI (FWS, BLM)

Performance Element R.1.1.3: Incorporate invasive species prevention plans, such as those that utilize HACCP, into federally-funded or authorized restoration projects.

Lead: NISC Staff (to collate information)

Participants: DOI (BIA, BLM, BOR, FWS, NPS); USDA (FS, NRCS); EPA; DOD; NOAA

OBJECTIVE R.2: RESTORE HIGH-VALUE AREAS IMPACTED BY INVASIVE SPECIES.

- **Implementation Task R.2.1:** Restore sites that have the highest ecological or economic value or contribute most to protecting human health.

Performance Element R.2.1.1: Conduct and report on four interagency restoration projects that demonstrate the success of information sharing, plant (and animal) materials sharing, techniques for cost-effective modeling, and documentation of results, including decision support tools.

Leads: NISC staff, DOI (FWS, BLM, NPS); USDA (NRCS); DOD (COE)

Participants: DOI (BOR, USGS); DOD; USDA (APHIS, FS, ARS); EPA

Performance Element R.2.1.2: Provide technical assistance on the species and methods to use in restoring native species, including the use of low impact, nonnative or "transitional" species where appropriate.

Leads: DOI (FWS); USDA (NRCS); DOD (COE)

Participants: DOI (NPS, BLM, BOR, USGS); USDA (FS, APHIS, ARS)

Performance Element R.2.1.3: Provide technical assistance on site selection, site modification, and prioritization for restoration projects.

Leads: DOI (FWS, USGS); DOD (COE)

Participants: DOI (NPS, BLM, BOR); USDA (APHIS, NRCS)

Performance Element R.2.1.4: Conduct at least four (4) information sharing projects with stakeholders about invasive species restoration projects.

Lead: USDA (NRCS)

Participants: USDA (APHIS, ARS); DOD; DOI (FWS, USGS); DOC (NOAA)

OBJECTIVE R.3: RESTORE HABITAT AT MULTIPLE SCALES AND DEMONSTRATE MODEL APPROACHES THAT ENGAGE LOCAL COMMUNITIES AND THE PUBLIC.

- **Implementation Task R.3.1:** Coordinate multi-taxa restoration projects at the regional, watershed or landscape level (Healthy Lands Initiative, for example), addressing water quality, fisheries (both fresh and marine), and terrestrial plants and animals (including their pests and pathogens) in restoration planning.

Performance Element R.3.1.1: Work across agencies to create demonstration projects in at least three geographic or regional focus areas over the next three years.

Leads: DOI (FWS, NPS, BLM); DOD (COE)

Participants: DOI (BOR, USGS); DOC (NOAA); EPA

Performance Element R.3.1.2: Document four successful restoration projects involving recovery from invasive species impacts, for example on private lands or in coastal environments, with nongovernmental cooperators.

Leads: NISC staff; DOI (FWS); DOD (COE)

Participants: EPA; DOD

Performance Element R.3.1.3: Document four successful fire rehabilitation and fuels treatment projects involving recovery from invasive species impacts on different kinds of public lands (such as range, forest, shrub, and steppe).

Leads: NISC staff; USDA (FS); DOI (BLM)

Participants: DOI (OWFC, FWS, NPS, BIA)

Organizational Collaboration

STRATEGIC GOAL 5: *Maximize organizational effectiveness and collaboration on invasive species issues among international, federal, state, local and tribal governments, private organizations and individuals.*

OBJECTIVE OC.1: IMPROVE KNOWLEDGE AND UNDERSTANDING OF LEGAL AND REGULATORY TOOLS AVAILABLE TO ADDRESS INVASIVE SPECIES.

- **Implementation Task OC.1.1:** Complete an analysis of current federal laws and regulations dealing with invasive species.

Performance Element OC.1.1.1: Complete a brief status report based on the existing legal and regulatory analyses.

Lead: *NISC Staff*

Participants: *DOI; USDA; DOC and other NISC members as appropriate*

- **Implementation Task OC.1.2:** Provide information and briefings as requested on invasive species issues.

Performance Element OC.1.2.1: NISC will respond to requests for information or briefings within 30 days.

Lead: *NISC Staff*

Participants: *NISC members as appropriate*

OBJECTIVE OC.2: EXPAND THE COORDINATION OF INVASIVE SPECIES PROGRAMS AND EXPENDITURES TO LEVERAGE RESOURCES.

- **Implementation Task OC.2.1:** Update the invasive species crosscut budget for Federal agency expenditures concerning invasive species, changing its name to the **Invasive Species Inter-Agency Performance Budget** (Performance Budget). Request input from ISAC, ANSTF, Federal Interagency Committee on the Management of Noxious and Exotic Weeds (FICMNEW), and the Federal Interagency Committee on Invasive Terrestrial Animals and Pathogens (ITAP) on initiatives to be included in future Performance Budgets.

Performance Element OC.2.1.1: Complete Performance Budgets for fiscal years 2010, 2011, 2012 and 2013 as directed, along with reports on prior year's performance.

Lead: *NISC Staff*

Participants: *All NISC members*

OBJECTIVE OC.3: IMPROVE FEDERAL RESEARCH CAPACITY AND COORDINATION TO ADDRESS A BROADER ARRAY OF INVASIVE SPECIES ISSUES.

- **Implementation Task OC.3.1:** Improve the coordination and effectiveness of federal research.

Performance Element OC.3.1.1: Establish an Invasive Species Working Group under the OSTP/Committee on Environment and Natural Resources/Subcommittee on Ecological Systems, to coordinate existing federal invasive species research activities and outline federal research priorities by February 2009.

Lead: DOI (USGS)

Participants: DOC (NOAA); EPA; DOD; NASA; DOS

Performance Element OC.3.1.2: Provide research results on invasive species or summaries, as appropriate, and take steps to make information provided by agencies more readily available.

Lead: USDA (ARS/NAL)

Participants: NISC Staff; USDA (ARS, FS, ERS, CSREES); DOI (USGS); EPA; DOC (NOAA); NASA; DOD

- **Implementation Task OC.3.2:** Improve economic modeling of invasive species impacts.

Performance Element OC 3.2.1: Improve modeling of invasive species prevention actions to determine their costs and benefits.

Lead: USDA (ERS)

Participants: EPA

Performance Element OC 3.2.2: Improve economic modeling of control and management actions to determine their costs and benefits.

Lead: USDA (ERS)

Participant: DOC (NOAA); EPA

Performance Element OC 3.2.3: Develop cost and benefit analysis models of alternative control methods.

Leads: USDA (FS, CSREES, NRCS, APHIS, ERS)

Participants: None

OBJECTIVE OC.4: ENHANCE POLICY AND IMPROVE REGULATORY PROCESSES ON INVASIVE SPECIES.

- **Implementation Task OC.4.1:** As required by EO 13112, prepare, in cooperation with the President's Council on Environmental Quality (CEQ), guidance to federal agencies to prevent and control invasive species that is fully compliant with the National Environmental Policy Act (NEPA).

Performance Element OC.4.1.1: Prepare draft NEPA guidance for CEQ consideration and finalize.

Leads: NISC Staff, CEQ

Participants: All NISC members

- **Implementation Task OC.4.2:** Collect, organize and make available federal agency guidance to prevent, control and manage invasive species.

Performance Element OC.4.2.1: Each NISC agency shall make available their existing policies on prevention, EDRR, and control of invasive species.

Lead: NISC Staff

Participants: All NISC members

- **Implementation Task OC.4.3:** Develop an improved regulatory process for the development, testing, assessment and approval of biological control agents.

Performance Element OC.4.3.1: Implement improved regulatory process.

Lead: USDA (APHIS)

Participants: USDA (ARS, CSREES, NRCS)

OBJECTIVE OC.5: STRENGTHEN COORDINATION AMONG FEDERAL AGENCIES TO FACILITATE THE DEVELOPMENT OF INTERNATIONAL PRIORITIES FOR INVASIVE SPECIES.

- **Implementation Task OC.5.1:** Promote and facilitate communication on international invasive species issues and activities.

Performance Element OC.5.1.1: NISC staff prepares the monthly report of upcoming international meetings on invasive species to be distributed to federal agencies and others.

Leads: NISC Staff; DOS

Participants: USTR, USAID, DHS, EPA; DOD (COE)

- **Implementation Task OC.5.2:** Represent NISC interests in the formulation of United States policy positions related to invasive species in the context of discussions under relevant international organizations and agreements, e.g. Convention on Biological Diversity (CBD), International Plant Protection Convention (IPPC), Organisation International de Epizooties (OIE), World Health Organization (WHO), Food and Agriculture Organization (FAO), International Maritime Organization (IMO) and other relevant global or regional fora.

Performance Element OC.5.2.1: In cooperation with federal agencies, NISC will contribute to the development of United States positions on invasive species during preparation for relevant international meetings.

Leads: DOS; NISC Staff

Participants: NISC members as appropriate

- **Implementation Task OC.5.3:** As appropriate, seek to incorporate invasive species issues into the environmental cooperation mechanisms developed in connection with free trade agreements (FTA).

Performance Element OC.5.3.1: Department of State-led interagency working groups on FTA environmental cooperation mechanisms will assist in developing cooperative activities related to invasive species.

Lead: *DOS*

Participants: *USTR, EPA, DOI, USDA (FAS, ERS, ARS, APHIS); DOC*

OBJECTIVE OC.6: ENHANCE OUTREACH ON INVASIVE SPECIES.

- **Implementation Task OC.6.1:** Determine approaches regarding invasive species pathways for strategic outreach to targeted user groups and businesses.

Performance Element OC.6.1.1: Develop outreach materials for target audiences cooperatively with relevant stakeholders and make available through the internet.

Leads: *DOC (NOAA); USDA (APHIS)*

Participants: *USDA (FS, NRCS, ARS, FAS); DOI (FWS)*

- **Implementation Task OC.6.2:** Work with existing educational organizations to enhance invasive species information delivery to primary and secondary educators.

Performance Element OC.6.2.1: Information about at least eight invasive species or federal invasive species programs provided to educational organizations/invasive species outreach programs and reported to the NISC staff.

Lead: *NISC staff*

Participants: *All NISC Members*

- **Implementation Task OC.6.3:** Develop basic messages for common public awareness concerning invasive species for NISC member agencies and staff to utilize.

Performance Element OC.6.3.1: Communicate clear and consistent general messages on invasive species to all NISC members and stakeholders, so that they may include these points when a new invasive species action, regulation or policy is announced. Communicate via the Internet.

Lead: *NISC Staff*

Participants: *All NISC members*

OBJECTIVE OC.7: IMPROVE AND STREAMLINE NISC MEMBERS' REPORTING ON INVASIVE SPECIES PROGRAMS AND ACTIVITIES.

- **Implementation Task OC.7.1:** The following reports are required.

Performance Element OC.7.1.1: Each NISC member submits one formal (draft and final) report per fiscal year, tracking the implementation of the NISC 2008 Plan. NISC Staff will complete a streamlined reporting template within three months. Annual summary report by NISC is available on its website by February 28 of each year along with the individual NISC member reports.

Lead: *NISC Staff*

Participants: *All NISC Members*

Performance Element OC.7.1.2: NISC members provide a consistently formatted written report in response to ISAC recommendations, action items and requests.

Lead: *NISC staff (in consultation with ISAC)*

Participants: *All NISC Members*

Performance Element OC.7.1.3: Report on agency participation in the NISC Invasive Species Performance (Crosscut) Budget.

Lead: *NISC Staff*

Participants: *All NISC Members*

OBJECTIVE OC.8: ENHANCE DATA STANDARDS AND QUALITY TO IMPROVE ACCESS AND ABILITY TO SEARCH ACROSS DATA BASES AND FEDERAL DATA SOURCES.

- **Implementation Task OC.8.1:** Develop and provide portal and reference information, as well as public access to federal research information, as appropriate and consistent with applicable law.

Performance Element OC.8.1.1: Summarize research results on invasive species and take steps to make it more readily available based on information provided by agencies.

Lead: *USDA (ARS/NAL)*

Participants: *NISC Staff; All NISC Members*

Performance Element OC.8.1.2: Enhance and maintain the NISC website to provide an overview of federal invasive species efforts and policies; access to, and information about NISC member agencies and their invasive species programs and information about NISC, its activities, the Invasive Species Management Plan, and ISAC.

Lead: *NISC Staff*

Participants: *All NISC Members*

Performance Element OC.8.1.3: The Invasive Species Compendium will be

developed by interested agencies.

Lead: USDA (ARS)

Participants: USDA (APHIS, CSREES, NRCS); DOC (NOAA)

Performance Element OC.8.1.4: Share information on federal invasive species grant opportunities and programs by linking from the NISC website to grant information on existing agency websites.

Lead: NISC Staff

Participants: All NISC Members

- **Implementation Task OC.8.2:** Work cooperatively to develop common data standards and enhance databases.

Performance Element OC.8.2.1: Improve and expand participation in the aquatic invasive species information system NISbase.

Leads: DOI (USGS); DOC (NOAA), SI

Participants: DOI (FWS, BLM); DOD (COE); USDA (APHIS)

Performance Element OC.8.2.2: Link and expand databases of invasive plant pathogens.

Lead: USDA (ARS)

Participants: USDA (FS, APHIS)

Performance Element OC.8.2.3: Develop and implement an invasive species pathways database.

Lead: USDA (APHIS)

Participants: USDA (ARS, FAS); Other NISC agencies

Performance Element OC.8.2.4: Enhance the PLANTS database in regard to invasive species and pollinators.

Lead: USDA (NRCS)

Participants: USDA (ARS, FS, APHIS)

Performance Element OC.8.2.5: Improve and expand the U.S. Government's participation in the Global Invasive Species Information Network (GISIN) and the Inter-American Biodiversity Information Network (IABIN).

Lead: DOI (USGS)

Participants: DOS; DHS; NASA

Appendix 1: List of Acronyms Used

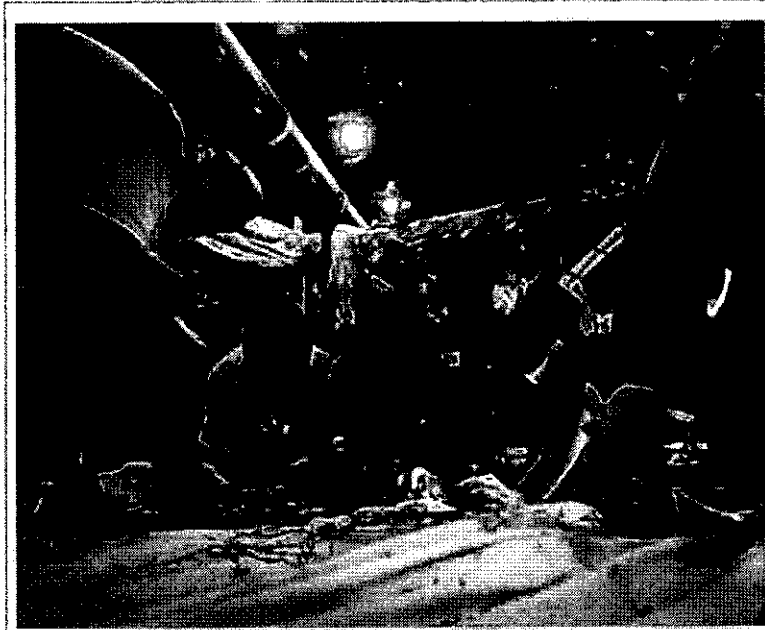
ANSTF	Aquatic Nuisance Species Task Force
APHIS	Animal and Plant Health Inspection Service
ARS	Agricultural Research Service
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practices
BOR	Bureau of Reclamation
CBD	Convention on Biological Diversity
CDC	Centers for Disease Control and Prevention
CEQ	Council on Environmental Quality
CG	Coast Guard
CM	Control and Management
COE	Army Corps of Engineers
CSREES	Cooperative State Research, Education, and Extension Service
DHS	U.S. Department of Homeland Security
DOC	U.S. Department of Commerce
DOD	U.S. Department of Defense
DOI	U.S. Department of the Interior
DOS	U.S. Department of State
DOT	U.S. Department of Transportation
ED	Early Detection
EDRR	Early Detection and Rapid Response
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ERS	Economic Research Service
FAO	Food and Agriculture Organization
FAS	Foreign Agricultural Service
FICMNEW	Federal Interagency Committee on the Management of Noxious and Exotic Weeds
FS	Forest Service
FTA	Free Trade Agreements
FWS	U.S. Fish and Wildlife Service
GISIN	Global Invasive Species Information Network
HACCP	Hazard Analysis and Critical Control Points
HHS	U.S. Department of Health and Human Services
IABIN	Inter-American Biodiversity Information Network
IMO	International Maritime Organization
IPPC	International Plant Protection Convention
ISAC	Invasive Species Advisory Council

ITAP	Federal Interagency Committee on Invasive Terrestrial Animals and Pathogens
MARAD	U.S. Department of Transportation Maritime Administration
NAL	National Agricultural Library
NAPPO	North American Plant Protection Organization
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NGO	Nongovernmental Organizations
NISC	National Invasive Species Council
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
OC	Organizational Collaboration
OIE	Office International des Epizooties
OWFC	Office of Wildland Fire Coordination
P	Prevention
R	Restoration
RA	Rapid Assessment
RR	Rapid Response
SI	Smithsonian Institution
SLSDC	Saint Lawrence Seaway Development Corporation
SWPM	Solid Wood Packing Materials
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USTR	Office of the U.S. Trade Representative
USTREAS	U.S. Department of the Treasury
WHO	World Health Organization
WNV	West Nile Virus

2007 Facts

- Invasive species threaten Alaska's ecosystems by displacing native plants, reducing wildlife forage and shelter, altering ecosystem dynamics, and in some cases permanently changing environmental conditions.
- Annual damage from invasive species worldwide estimated at \$1.4 trillion.
- Idaho is estimated to spend \$300 million per year on invasive species control.
- One weed – spotted knapweed – now costs Montana over \$14 million/year and covers over 5 million acres. In Alaska, this species has been found at over 10 sites from Ketchikan to Anchorage.
- The number of new invasive plants found in Alaska continues to rise each year.
- Many of the invasive plants in Alaska are not yet widespread and can be controlled quickly and cheaply by taking action NOW.

Alaska does not have this type of first response inspection. These trees were not accepted in Hawaii so were sent on to Alaska. Read on.



DENNIS ODA / DODA@STARBULLETIN.COM

Agricultural officials inspecting more than 3,100 Oregon-grown Christmas trees aboard a Boeing 747 aircraft yesterday found insects amid the trees. The inspectors included Dennis Nagatani, left, Elliot Nakashima, Edward O'Callaghan, Kanani Lai, scooping up an insect into a collection bottle, and Arseno Esteban. The planeload was returned to the mainland.

Wasp discoveries sting sales

Two schools were planning to sell the trees to raise funds

STORY SUMMARY »

They arrived late Thursday, but the journey wasn't quite over for a planeload of Christmas trees from Portland, Ore., which were intended for Oahu school and church fundraisers.

The 747 jet loaded with 3,150 Douglas, noble and grand firs was sent back to the mainland yesterday after the discovery of several types of wasp, two of which are not found in Hawaii.

The Department of Agriculture said it did not have the proper decontamination facilities for the first large-scale air delivery of Christmas trees to the state, so the plane was rerouted to Anchorage, Alaska.

Five churches and schools and one wholesaler were affected. One of the schools, which planned to sell the trees as a part of a fundraising project, said it stands to lose \$10,000.

McMinville, Ore.-based cargo shipper Evergreen International Aviation Inc., which handled the shipment, said it will lose \$1 million from the operation.

STAR-BULLETIN

FULL STORY »

By Jennifer Sudick
jsudick@starbulletin.com

A planeload of Christmas trees intended for sale by isle fundraisers and wholesalers was sent back to the mainland yesterday after the discovery of several types of wasp, two of which are not found in Hawaii.

The Boeing 747, which arrived in Honolulu Thursday night, contained 3,150 Douglas, noble and grand firs, marking the first large-scale air delivery of Christmas trees to the state. Five churches and schools and one wholesaler were affected.

The plane was diverted to Anchorage, Alaska, late yesterday afternoon, said David Rath, president of Evergreen Agricultural Enterprises, a division of McMinville, Ore.-based cargo shipper Evergreen International Aviation Inc., which handled the shipment.

"We've shipped to Japan, Puerto Rico, Mexico and China and haven't had anything like this happen before," Rath said. "We asked if we could pay a charge or incinerate them there or fumigate them, but they are not allowing any of that. They wouldn't allow us to offload them at all."

Evergreen stands to lose \$1 million from the diversion because the flight had to be rerouted, delaying a scheduled textile shipment out of Asia and incurring additional fuel costs. Rath said the company hopes to sell the trees at cost or give them away in Alaska.

Kailua Christian Academy and Waialua High and Intermediate School had arranged to purchase the largest portion of the trees, said Hollie Spivey, Evergreen's Christmas tree sales manager. Evergreen's aviation and ground logistics unit planned to sell 1,000 trees. Spivey declined to name the other affected buyers. Any money paid to Evergreen for the fundraisers will be refunded, Rath said.

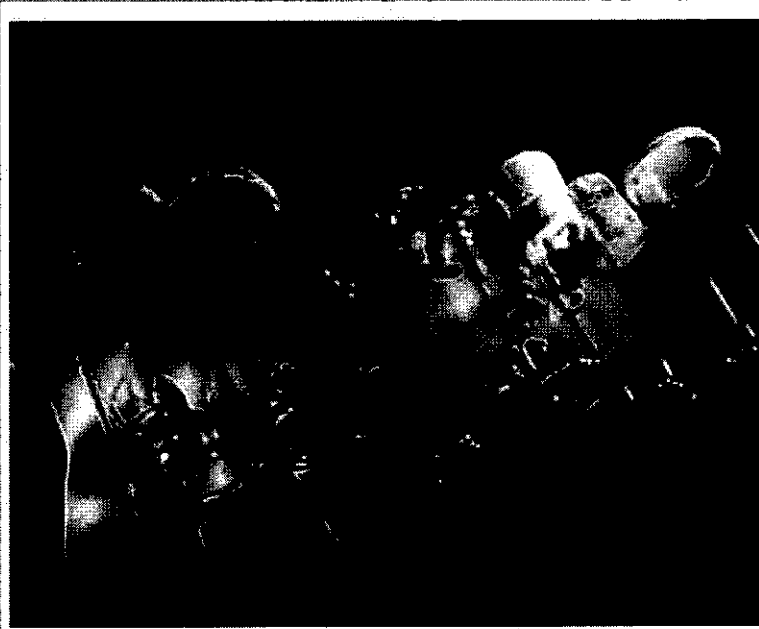
Ben Abraham, an administrator at Kailua Christian Academy, said he purchased 1,300 trees for what was meant to be the school's only fundraiser of the year.

"This was a major fundraiser for our school, and we stand to lose \$10,000," he said.

The school planned to make \$40 to \$60 a tree, he said, with a 6- to 7-foot Douglas fir selling for \$75. He had paid to advertise the fundraiser and for a refrigerated truck to pick the trees up from the airport.

"Most were pre-sold," he said. "We have to refund the funds."

The trees were cut Wednesday at Evergreen's 800-acre tree farm and shipped out of Portland International Airport in Oregon on Thursday.



DENNIS ODA / DODA@STARBULLETIN.COM

These were some of the insects found yesterday during an inspection of Christmas trees.

The Hawaii Department of Agriculture sent a team of 10 inspectors to the plane yesterday morning, where they found three yellow-jacket wasps, including two live queens, along with two other genera of wasps, one tentatively identified as a dolichovespula, which was found alive, and a vespa, which is a type of hornet. Both are not currently found in Hawaii, said Domingo Cravalho Jr., chief of the state Department of Agriculture's Inspection and Compliance Section, which inspects all imported trees.

"The unusual thing about the entire air shipment was that many of the insects that were found in the air shipment were not found in maritime inspections of Christmas trees," he said.

Evergreen secured a certificate from the Oregon Department of Agriculture clearing the trees, meaning that they were all shaken to remove insects, Cravalho said. "Evidently it wasn't shaken enough, or it was staged in an area where it could get re-infested," he said.

Flies, parasitic wasps and other pests also were found, as well as dirt and rocks that could carry microorganisms, Cravalho said. No trees were removed from the plane during the inspection, he said.

The department was unable to clean the plane because the state's cleaning and inspection facilities are made for surface containers, he said, not large aircraft.

"It's best that the shipment move out of Hawaii and go to another destination that accepts these types of pests," he said. "We're at a greater risk because of the fact that we have warmer weather and some of these species might take hold here."

The majority of the state's 150,000 imported Christmas trees this year are shipped by sea, with the last of four Matson Navigation Co. shipments expected to arrive today.

A Boeing 747-200 can hold up to 4,500 trees, said Spivey, but some buyers backed out after wasps were found on three surface containers last month. Spivey said Evergreen plans to fly Christmas trees to Hawaii next year in containers so they can be removed and dealt with separately.

"We had such a tremendous response," she said, adding that more than a dozen cars were lined up this morning at Evergreen's airport site waiting for a tree. "Phones were ringing off the hook -- that's encouraging."

Detoured trees bring out local kindness



More than 2,000 trees were diverted to Anchorage. (Jason Kohler/KTUU-TV)

by Jill Burke
Sunday, Dec. 2, 2007

ANCHORAGE, Alaska - While many are searching for the perfect Christmas tree, one Oregon-based company is looking for a way to dump thousands of them.

Evergreen International Aviation had a planeload of Oregon trees headed for Hawaii when the Department of Agriculture refused to let them in because an inspector spotted a bug.



Northern Air Cargo C.O.O. David Karp
(Jason Kohler/KTUU-TV)

The 747 wound up in Anchorage and needed to unload more than 2,000 trees.

Evergreen partnered with Northern Air Cargo and came up with an emergency strategy to unload to wayward trees -- team up with ChangePoint Church.

Northern Air Cargo C.O.O. David Karp said the companies will be donating profits to a downtown soup kitchen.

"It's just a good way to get the trees out and do some good," Karp said. "When stuff like this comes along you just make the best out of it. It wasn't the way I planned on spending my weekend but we are having a good time."

The trees range in size from 5 feet to 12 feet tall.

They are being sold for \$40 each through Monday at the Northern Air Cargo facility from 9 a.m. to 4 p.m.

Contact Jill Burke at jburke@ktuu.com

Invasive Species

ALASKA



Finding Solutions: Protecting Our Nation's Waters – The National Aquatic Invasive Species Act (NAISA)

Congress is now considering the National Aquatic Invasive Species Act (NAISA), which builds on past legislation. As of November 2003, several subcommittees and committees in both the House and the Senate are still considering the bill.

When ships arrive from foreign ports and empty their ballast water in Alaska's waters, they are potentially introducing thousands of alien organisms. Since its passage in 1990, a single law has been the nation's chief protection against such new aquatic invasions and especially those that arrive in ballast water. That law—the National Aquatic Nuisance Prevention and Control Act (NANPCA)—was revised and reauthorized in 1996 and Congress is considering a second revision now. As state officials give more attention to problems associated with aquatic and other invaders, they estimate that the costs of preventing economic and environmental harm will be substantial. The proposed revision would provide new tools for the work they are undertaking and strengthen the use of existing ones.

Congress passed NANPCA in 1990 in response to the invasion of the zebra mussel and other species that damaged the Great Lakes. The new law brought much-needed attention to the global movement of aquatic species. It also established the federal interagency Aquatic Nuisance Species Task Force, which became a key resource for regional and state efforts. NANPCA's strictest and most detailed provisions

required that ships headed for the Great Lakes exchange their ballast water at sea.

The law was reauthorized in 1996, renamed the National Invasive Species Act, or NISA, and expanded slightly. NISA encourages all ships arriving from outside the 200-mile US Exclusive Economic Zone to exchange their ballast water, but requires them to report whether they have. NISA also authorized important research and linked its results to decisions about whether further ballast water regulation would be needed.

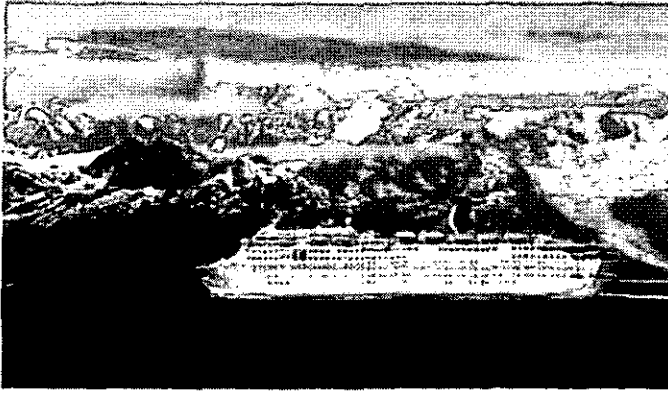
NISA has a number of features that help states like Alaska:

- The law established an Aquatic Nuisance Species Task Force that, in turn, set up regional groups to share information and develop cooperative plans. Alaska is a member of the Western Regional Panel, formed in 1997. Membership gives access to a wealth of information on species like the European green crab, connects experts to a system of committees on specific topics and species, and provides a forum for discussing the latest research and common policy concerns.
- The law promotes the use of comprehensive state management plans by providing federal funds (up to 75 percent) for implementing such Task Force-approved plans. States have successfully used these plans to identify their worst problems and to marshal the resources to address them. The Task Force approved Alaska's official state aquatic invasive species management plan on November 15, 2002.

Despite its successes, NISA has considerable room for improvement. Federal agencies have ignored important provisions; the law neglects important pathways of introduc-



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Tourism is one of Alaska's most lucrative businesses, and is heavily dependent on healthy ecosystems and abundant native wildlife.

tion other than ballast water; all the nation's waters deserve protection equal to the Great Lakes; and reliance on ballast water exchange to reduce organisms in ballast water doesn't work—even in the Great Lakes where exchange is mandatory.

NISA expired in September 2002, so Congress must reauthorize the law. This is an opportunity to address NISA's shortcomings. Alaska would be a major beneficiary of these improvements.

How can strengthened national aquatic invasive species legislation help Alaskans?

A broad group of stakeholders has been working with members of Congress for months to draft and revise a stronger version of NISA, titled the National Aquatic Invasive Species Act (NAISA). Generally, it extends protections to all US waters, including inland ones, and authorizes additional federal work in key areas: identifying and limiting the riskiest pathways of aquatic introductions; monitoring to detect invasive species new to the United States; and providing the means to respond quickly to such newcomers.

Much of the focus remains on ships' management of ballast water and on strengthening NISA's related provisions. For example, the many ships that travel Alaska's coast would be required to manage their ballast water in specific ways for the first time, including ships making trips within Alaska. The proposed bill also requires that ships eventually meet objective standards for reducing the number of organisms released along with ballast water discharges.

Like the 1996 law, the new bill would provide federal cost sharing up to 75 percent for states to implement aquatic invasive species management plans, but in the new bill, states could also receive federal matching funds to expand their management plans.

In addition, the bill authorizes the Task Force to increase its spending—from \$4 million to \$30 million—on state

grants. In Alaska, where officials estimate that implementing the state aquatic nuisance species management plan will cost up to \$713,500 per year, these changes should give the state greater access to federal funds.

Also, the bill lays out a timetable and a process for developing a program to evaluate, or "screen," first-time intentional introductions of species. The public often assumes that this is routinely done before species are allowed into the country. In fact, this would be the first instance that federal officials have attempted such an approach. Some of Alaska's worst invasive species were intentional imports. By more carefully weighing species' risks before they enter the country, the bill's new provisions would help prevent additional invaders. NAISA also instructs the National Science Foundation to establish a grants program to study systematics and taxonomy. This could be a boon for Alaska, where many organisms are as yet unstudied.

What's at Risk?

Alaska has vast waterways that can be protected with stronger legislation:

- Alaska has 6,640 miles of open ocean coastline and, counting islands, almost 34,000 miles of shoreline—more than one-third of the nation's coastal areas.
- Alaska has more than 3,000 rivers and three million lakes of more than 20 acres. The Yukon River is the United States' third longest.

Alaskan industries rely upon healthy ecosystems:

- **FISHING:** Almost 55 percent of US seafood production comes from Alaska's waters, nearly four times more than the next largest state. In 2001, commercial harvests of all fish and shellfish were worth \$871 million.
- **TOURISM:** Tourism provides almost 17,000 direct jobs for Alaskans, more than 1.5 times the number employed in Alaska's petroleum and mining industries combined.



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

NATIONAL HEADQUARTERS
Two Brattle Square
Cambridge, MA 02238-9105
Phone: 617-547-5552
Toll Free: 1-800-666-8276
Fax: 617-864-9405

WASHINGTON OFFICE
1707 H Street, NW, Suite 600
Washington, DC 20006-3962
Phone: 202-223-6133
Fax: 202-223-6162

Invasive Species

ALASKA

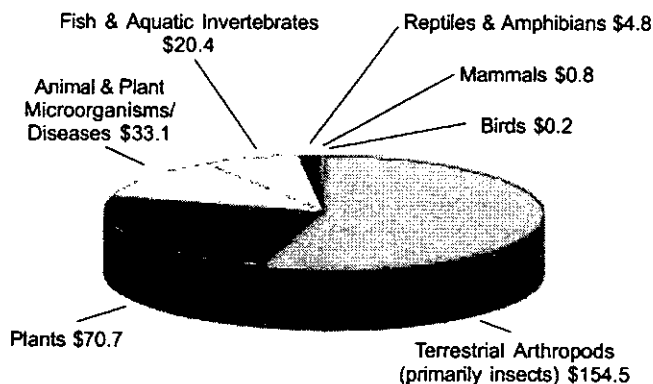


What Is an "Invasive Species"?

As legally defined, an invasive species is "An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health . . . 'Alien species' means, with respect to a particular ecosystem, any species . . . that is not native to that ecosystem."¹ Alien species are also known as exotic, non-native, introduced, or non-indigenous species, and the term noxious or nuisance is sometimes used instead of "invasive" when these organisms cause harm. Since invasive species are only apparent to those few people who know their foreign origins, and because their spread can be slow, over years or even decades, we have tended to underestimate their impacts. Invasive species cause a range of problems. They can:

- threaten the survival of native plants and animals
- interfere with ecosystem functions
- hybridize with native species, resulting in negative genetic impacts
- spread easily in today's era of global commerce
- be difficult and costly to control
- impede industries and threaten agriculture
- be a significant drain on the economy
- endanger human health

Federal Funding for Categories of Invasive Species
(Fiscal Year 1999, in Millions of Dollars)



Source: General Accounting Office

How Severe Is the Invasive Species Problem in the United States?

- Invasive species are a significant threat to nearly half of the native US species currently listed under the federal Endangered Species Act.²
- Costs of preventing, monitoring, and controlling invasive species in the United States—not to mention the costs of damage to crops, fisheries, forests, and other resources—are huge. The economic impact of invasive plants is thought to be at least \$13 billion per year.³ Costs or losses due to our most expensive invasive species can top \$100 million annually per species.⁴ In addition, invasive species can impose costs that are less readily quantified, such as damage to the small organisms that are the basis of all aquatic food webs.

What Is an "Introduction"?

When an animal, plant, fungus, bacterium, or virus ends up in a new ecosystem, it is said that the organism has been "introduced" to that new ecosystem. Humans are responsible for introducing the vast majority of non-native species. We deliberately transport some organisms; others end up in a new ecosystem unintentionally.

Examples of deliberate introductions are plants that we import for gardens, fish that we keep as pets or put in pens

Table of Contents *Invasive Species – Alaska*

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Various Ways that Unintentionally Introduced Species Arrive

- On imported nursery stock or soil**
(e.g., balsam wooly adelgid, chestnut blight, mealybug)
- On imported fruits and vegetables**
(e.g., Mediterranean fruit fly)
- In untreated, discharged ballast water of ships**
(e.g., zebra mussel, Chinese mitten crab)
- In or on vehicles like boats, airplanes, trucks, ships, etc.**
(e.g., Asian cockroach, poverty grass)
- In bilge water, live wells, bait buckets, and on fishing gear**
(e.g., European shore crab)
- In packing material and shipping containers**
(e.g., Asian long-horned beetle, wood-boring wasp)
- Mixed in with seed packets or shipments**
(e.g., serrated tussock, corn brome)
- From people traveling for tourism, recreation, or commerce**
(e.g., rust fungus)
- Through canals and other humanly produced paths**
(e.g., sea lamprey)
- On imported or migrating animals** (e.g., whirling disease)

for aquaculture, animals for hunting, fish we stock in lakes, and animals and insects introduced into new ecosystems to control other organisms.

Examples of unintentional introductions are insects that cling to or burrow into wooden packing material used to protect imported goods, or insects and their eggs "hitchhiking" on imported plants, in soil, or on fresh produce. We accidentally take in huge numbers of small and microscopic organisms in ships' ballast water, and we transport them to new ports of call.

When Introduction Becomes Harmful

The vast majority of species transported to a place other than their native ecosystem—whether intentionally or

Some Means of Deliberate Introductions

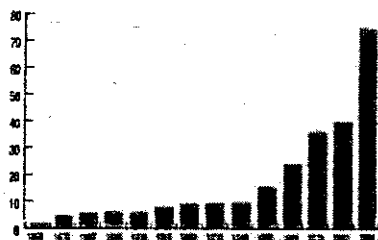
- Sport fishing** (e.g., largemouth bass, flathead catfish)
- Aquaculture** (e.g., Pacific oyster, Atlantic salmon, Pacific white shrimp)
- Home aquaria** (e.g., Asian swamp eel, hydrilla, zebra danio)
- Biological control** (e.g., grass carp, rosy wolfsnail)
- Research facilities** (e.g., giant tiger shrimp)
- Seeds/Gardens/Landscaping** (e.g., purple loosestrife, kudzu)
- Erosion control** (e.g., tamarisk [also known as saltcedar])
- Fur/silk production** (e.g., nutria, European gypsy moth)

accidentally—do not survive. Of those that do survive, scientists estimate that approximately 15% go on to become very harmful.⁵ Plants and animals may escape from confined areas, or carry a wide variety of parasites or diseases that themselves may escape, to devastating effects. People may dump no-longer-wanted fish or aquarium plants into a nearby pond or river, or discard yard waste or garden clippings in a nearby park. The species that become invasive do succeed, in part, because the new ecosystems in which they find themselves offer favorable environmental conditions and lack the natural predators, competitors, and diseases that would normally keep their populations in check.

With increased global commerce and human exploration, rates of introduction and numbers of invasive species continue to rise. For example, ships only began to use water as ballast in the mid-1800s;⁶ now transport in ships' ballast water and ballast sediments is the leading means of unintentionally moving a broad range of aquatic species throughout the world.⁷

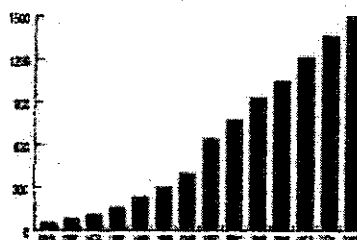
Cumulative Numbers of Non-Native Species

US Fish



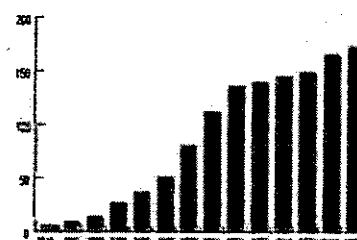
Source: J.L. Ruesink, W. Courtenay, Jr., P. Fuller, US Geological Survey and others.

North American Insects



Source: J.L. Ruesink, R.I. Sailer, and others.

US Plant Diseases



Source: C.L. Schoofies

The Emerging Threat of Invasive Species in Alaska

The wild beauty that draws many people to Alaska is under quiet siege. Dozens of harmful non-native organisms, including plants, animals, and microbes, have arrived in parts of Alaska from outside the state, or from other parts of the state, and are spreading throughout large areas. They cause a range of problems, from defoliating forests, to decimating seabird colonies, to killing fish. Yet, Alaska has the opportunity to avoid some of the worst problems that plague the lower 48 states and Hawai'i and to contain existing problem species before they become well established.

Non-native and Invasive Animals and Plants in Alaska

Native and non-native species in Alaska's vast landscape have not been well catalogued. However, experts have counted almost forty species thought to be invasive, and many more established non-native species that may become invasive.¹

The species of greatest concern include:

- One mammal species (Norway rat)
- Two bird species (pigeon in Anchorage² and starling as far north as Fairbanks³)
- One non-native fish species (Atlantic salmon) plus one Alaskan fish species (northern pike) moved beyond its native range
- At least eight insect species (larch sawfly in southcentral Alaska, strawberry root weevil, western tent caterpillar,



© Alaska Division of Tourism

Introducing foxes to Alaskan islands for the fur trade has had disastrous consequences for many native bird populations.

white pine weevil, wooly alder sawfly, imported currant worm, ugly nest caterpillar, and amber-marked birch leaf miner)⁴

- Another invertebrate species (European black slug, a crop pest in Anchorage)⁵
- At least 11 terrestrial plant species out of approximately 170 established non-native and non-cultivated plant species⁶ (Canada thistle, reed canary grass, garlic mustard, orange hawkweed,⁷ white sweetclover,⁸ perennial sowthistle, hawksbeard, tufted vetch, Japanese knotweed, hempnettle, and oxeye daisy)
- At least six aquatic plant species (such as common brassbuttons and several species of red and brown algae)⁹
- At least seven aquatic invertebrate species (such as a softshell clam, rope grass hydroid, and boring sponge)¹⁰

As in many places, there are differing views regarding which species are native, since some, like one subspecies of bison, went extinct long ago, but another was reintroduced. In addition, there are various perspectives on which non-natives have become established in Alaska (e.g., raccoons). Nor is there always agreement on which species are truly harmful (e.g., starlings), or valuable (e.g., game species introduced in the past for subsistence and sport), since these designations are somewhat subjective. These distinctions sometimes affect management and policy choices. In general, however, there is broad consensus among Alaska's experts on the seriousness of the risk posed by many of these species.

Some intentional introductions, such as many food crops and farm animals, are beneficial. However, there are disas-



Steve Lee, US Fish and Wildlife Service

Campers, such as these at the Arctic National Wildlife Refuge, can unknowingly bring invasive species into pristine wilderness areas.

trous exceptions. Foxes, brought to more than 450 Alaskan islands for fur trapping and farming—plus the animals introduced as food sources for the foxes—have devastated native bird populations and disrupted island ecosystems.¹¹ As recently as 1987 the Alaska Department of Fish and Game introduced elk for hunting on Etolin Island. Elk have spread, probably by swimming, to other islands and areas in the Southeast, affecting native plants and animals. Less clear is the pre-statehood introduction of brook trout from outside the territory, and grayling and rainbow trout from other parts of the state, to southeast Alaska for food and sport fishing. The populations are self-sustaining but usually not considered invasive, although brook trout may be preying on salmon fry or hybridizing with native Dolly Varden char.¹² Alaska blackfish have been moved to the Anchorage area and

may also be affecting salmon fry.¹³

Numerous pathogens and parasites have been introduced to Alaska but have not yet been well studied. Known problems include lice from domestic dogs that have infested wolves on the Kenai Peninsula¹⁴ and black knot, a fungus so far affecting only ornamental cherry trees in Anchorage.¹⁵

Where Are Invasive Species a Problem?

Four elements of Alaska's landscape are most vulnerable to invasive species: ports, islands, waterways, and disturbed or reclaimed areas.

- Commercial ports, especially those in the southcentral and southeast regions, are continually exposed to new species, especially from the Pacific corridor as far south as Mexico.

An Ounce of Prevention: A Sampling of Worrisome Potential Invaders

Invasive species are a global problem, and Alaska is susceptible to many harmful invaders, particularly as global climate change is projected to warm Alaska. (Alaska has already experienced a 4°F increase in average temperature during the past 50 years, while the global average has increased only 1°F.)¹⁶ The following species are particularly harmful and are already wreaking economic and ecological damage in the lower 48 states and Canada. Some of these species have been found in Alaska, but none is yet thought to be established.



Asian gypsy moth

Invader	Impacts	Where Found
Asian gypsy moth	Defoliates trees	Pacific Northwest
Asian longhorned beetle ¹⁷	Kills hardwood trees	Chicago, New York region; intercepted at West Coast ports
European green crab	Competes with native crabs such as Dungeness and other shellfish	West Coast to Vancouver Island
Zebra mussel ¹⁸	Competes with native mussels, alters nutrient balances, clogs pipes	Eastern North America waterways; population found in Kansas in 2003
New Zealand mudsnail	Concern about effects on native species (e.g., aquatic insects, native snails), fisheries (especially native trout), and aquatic ecosystems	Western US (including three national parks); population found in Lake Ontario in early 1990s
Yellow perch	Competes with native fish, restricts salmon reproduction	Widespread in northern US and Canada; eradicated from Kenai Peninsula lake
Russian knapweed	Invades riverbanks, may affect moose forage	Western US and Canada, including Yukon Territory
Purple loosestrife	Aggressively outcompetes native wetland plants	Widespread in lower 48 states including Pacific Northwest; grown in Anchorage gardens
Fire blight	Destroys apple crops, may affect related trees such as native mountain ash	Globally widespread; found in Alaska in 2000

Photo: US Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine Archives, www.invasive.org

- Islands are particularly vulnerable and some have been hard hit because they typically have unique species that have evolved without grazing pressure and other predation; some have been hit hard. Dutch Harbor and other islands in the Aleutian chain, the Alexander Archipelago, and the Kodiak Archipelago are of special concern.¹⁹
- Waterways, including Alaska's vast rivers, streams, lakes, and wetlands, provide relatively hospitable temperatures

for many aquatic invaders. Low-gradient floodplain communities with road crossings in southcentral and interior Alaska, as well as spits, barrier beaches, and coastal marshes, are especially vulnerable, as are floodplains and karst-rich sites in southeast Alaska.²⁰

- Disturbed and reclamation areas associated with mining, trails, recreation, agriculture, the Alaska pipeline, and roadways commonly contain invasive plants.²¹

How Do We Bring Invasive Species to Alaska?

Fortunately, Alaska's historically low population and geographic isolation have kept introductions of new invasive species relatively low. However, increased commercial traffic (both from the continental United States and abroad) and further development increase the risk of new introductions.

Shipping: The large amount and diversity of ship traffic in Alaska—oil tankers, commercial freighters, military vessels, fishing vessels, and chip, pulp, and timber barges—bring invasive species in ballast water, bilge water, or live wells.

Port Valdez, in Prince William Sound, receives the third largest volume of tanker ballast water of US ports.¹ About one-half of this ballast water is oily and is processed at a treatment facility. The rest is discharged into the port's waters, releasing many non-native species. One study of

organisms in ballast water of oil tankers arriving at Valdez found 13 species of non-native crustaceans, one fish species, as well as enormous numbers of potentially damaging smaller organisms.² Ships' hulls may also carry a variety of organisms, and rats, mice, other mammals, and insects arrive in cargo.

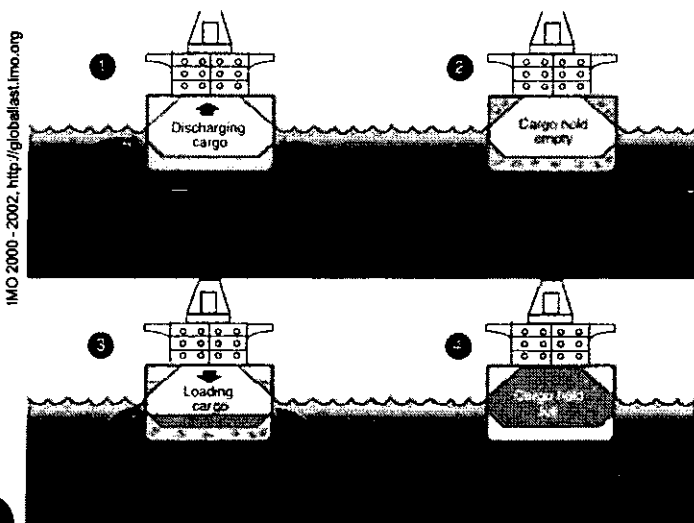
Aquaculture: Fish farming can result in severe damage to native ecosystems and fisheries when fish or hitchhiking organisms escape. Of current concern are escaped Atlantic salmon arriving in Alaskan waters from British Columbia and Washington State fish farms.

Agriculture and Horticulture: Only a very small percentage of Alaska's acreage is agricultural, but farms, nurseries, and state agencies import plants, seeds, and other products, which can either be invasive themselves or carry damaging hitchhikers. An example is Canada thistle, found in Fairbanks and southcentral Alaska, which is thought to have arrived as seed within root balls of tree-planting stock.³ Other invasive plants, such as perennial sowthistle, are thought to have arrived as contaminants in seed mixtures. Nurseries, in most cases, are not prohibited from selling invasive plants.



Canada thistle seeds are thought to have arrived in Alaska through the horticulture industry.

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IMO 2000 - 2002. <http://globallast.imo.org>

We unintentionally move thousands of aquatic species in ships' ballast water and ballast sediments.

Recreation and Tourism: There have been intentional efforts to import species such as European grouse as game birds.⁴ Pack animals, dogs, vehicles, and people can all transport seeds to backcountry areas unintentionally. In addition, hay brought in to feed horses or to use as sled dog bedding can be contaminated with weed seeds. Invasive plants have affected ostensibly pristine areas such as Denali National Park, the Tongass and Chugach National Forests, and numerous other sites in southern Alaska. Many weeds are found around roadsides, trailheads, campgrounds,

Jim Steinborn © 1986



Roads and vehicles can unintentionally bring invasive species into previously undisturbed areas.

parking lots, and other disturbed recreation-related areas.⁵ While cruise ships do not usually transfer ballast water in Alaska, ships coming directly from Far East Asia or Japan do.⁶ Like other ships, all can carry invaders on their hulls, in their holds, or on their decks.

Construction, Mining, and Restoration: These activities transport weed seeds, as well as other organisms, when equipment and machinery are moved without cleaning.⁷

Aquarium and Pet Trades: Aquarium fish and plants, as well as other pets, have occasionally turned up in the wild and could become a problem, especially if they carry diseases.

How Much Do Invasive Species Cost Alaskans?

In states where invasive species are a bigger problem than in Alaska, losses to industries and costs of control have skyrocketed. Alaska has a unique opportunity to avoid costly losses by focusing on preventing the introduction of additional invasive species while controlling those already established.

The costs of invasive species in Alaska take many forms, including labor and pesticides associated with eradication and control efforts, losses to fisheries and crops, and loss of native species and ecosystems.

Alaska's largest industries bring in more than \$1 billion per year. Invasive species are taking a bite out of each, and costs are likely to rise.

FACT: State, federal, and private groups spend millions to manage or remove established invaders.

- Since 1949, the US Fish and Wildlife Service (FWS) has spent roughly \$3 million to remove arctic and red foxes from some 40 islands where the federal government had originally introduced them to help early settlers economically.¹
- FWS spent at least \$400,000 in a two-year effort to remove abandoned reindeer that had seriously overgrazed Hagemester Island in the Alaska Maritime National



© Alaska Division of Tourism

Fisheries and the seafood industry would likely suffer if invasive species took hold.

Wildlife Refuge.² Other islands have also been cleared of reindeer, cattle, and similar animals.

- FWS is now beginning to tackle the extensive problem of Norway rats and other rodents on more than 20 islands, projected to be even more expensive than the other mammal removals.³
- To assess the extent of the aquatic nuisance problem, the Prince William Sound Citizens Advisory Council, California Sea Grant, FWS, and other agencies have spent an estimated \$500,000 on a study of ballast water introductions into the Sound, which includes the port of Valdez, and a small subset of other key Alaska ports.⁴
- Alaskan officials estimate that the state's overall aquatic nuisance species plan will cost \$373,000 in 2003, increasing to \$690,000 and \$760,000 during the next two fiscal years.
- The Alaska Department of Fish and Game has identified the need for an estimated \$200,000 emergency fund that would allow a quick response to newly identified invasions of aquatic nuisance species. Half of this money is included in the latter two estimates above. However, the fund's establishment requires new state legislation.⁵

FACT: Three of Alaska's major industries, commercial fishing, sport fishing, and tourism, risk economic losses from invasive species.

- If northern pike, Atlantic salmon, or other invasive fish continue to encroach on native salmon habitat, the \$216 million salmon fishery—already experiencing four years of low prices⁶—could further decline.
- Potential invasion of the European green crab could be costly to the \$117 million shellfish industry.⁷
- Tourism brings the state almost \$1 billion annually from 1.4 million visitors,⁸ who come expressly for Alaska's untrammeled natural beauty and wildlife. In a study of perceptions of bark beetle damage, visitors ranked views of natural scenery and wildlife as most important for their visit, and judged scenic value to



European green crab

Washington Department of Fish and Wildlife



Alaska's robust tourism industry relies upon the health of the state's natural treasures. Here, a tourist observes wildlife at Alaska Maritime National Wildlife Refuge.

decline significantly as tree damage increased.⁹ Invasive species able to defoliate forests or eliminate bird, fish, or marine mammal populations would likely reduce visitor interest and spending.

FACT: Forestry, agriculture, and other industries suffer from invasive species.

- Logging and related industries generated \$64 million in wages in 2000.¹⁰ From 1996 to 2001, almost five million out of the total 129 million forested acres in Alaska suffered insect damage from both native and non-native pests.¹¹
- Agriculture in 1997 accounted for \$53.4 million of the state's economy.¹² Losses from pest species are not currently quantified, but a significant proportion of agricultural weeds, insects, and diseases are non-native. Examples are sowthistle, hempnettle, and the potato late blight that was found in the Matanuska Valley in 1995 and 1998, requiring expenditures for quarantine¹³ and fungicides.
- Many other industries are negatively affected by invasive species. For example, trappers experience financial losses when wolf pelts are damaged by dog lice, not to mention the substantial costs incurred by state agencies in medicating sick animals and trying to stop the infestation from spreading.

The Worst of the Worst

Norway Rat (*Rattus norvegicus*)



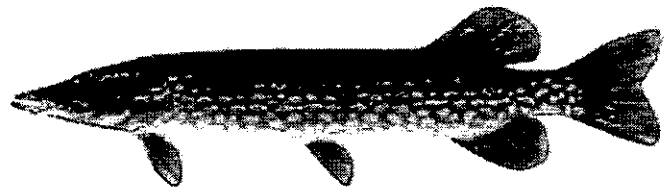
Rats are considered one of the most harmful invasive species in the world and one of the first to be transported almost everywhere that humans settle. Norway rats prey on wild birds and their eggs, kill poultry and livestock, and can transmit diseases to humans and animals. They also damage—sometimes to the point of extinction— invertebrates, reptiles, birds, and other wildlife, as well as plants. They eat stored grain and seeds and contaminate with droppings whatever they don't eat. Norway rats are especially devastating when introduced to oceanic islands. A Japanese shipwreck in 1780 introduced the first Norway rats to Alaska,¹ and by 1790 one of the

Aleutians was named Rat Island. Today, rats have invaded some 30 Alaskan islands and many additional areas, coastal and otherwise. Rat “spills” (rats swimming to land from shipwrecks or walking from docked ships to land on ropes or gang-planks) are considered to be more ecologically damaging than oil spills.² Active efforts are in place to try to prevent further rat introductions and to control current populations.

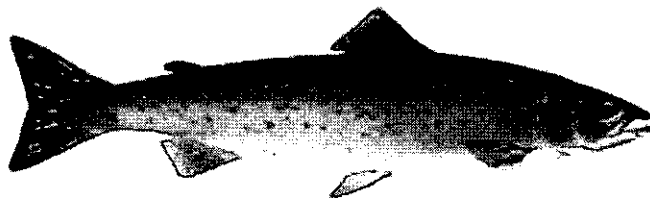
Northern Pike (*Esox lucius*)

Although northern pike are native to northern Alaska, they have become an invasive species in southcentral Alaska, specifically in the Anchorage Bowl, Matanuska-Susitna Valley, and Kenai Peninsula. Northern pike were intentionally introduced by unknown individuals, presumably for sport fishing. These predatory fish consume salmon fry and are invading vast systems of streams and lakes.

The Alaska Department of Fish and Game has found lakes (e.g., Trapper, Alexander, and Red Shirt) devoid of once-healthy trout and salmon populations and abundant with pike. Pike are also having an impact on native suckers and whitefish as well as ducklings and other waterfowl.³ Fish, wildlife, and game managers consider established pike populations difficult to remove and their potential impact on native salmon and other fish in the Southeast to be “immense.”⁴



Atlantic Salmon (*Salmo salar*)



Although finfish farms are banned in Alaska, hundreds of thousands of Atlantic salmon raised in fish farms in British Columbia and Washington State have escaped from their pens, some reaching waters near Ketchikan and Yakutat and as far north as the Bering Sea.⁵ Scientists used to believe that Atlantic salmon would not venture into fresh

water, but several pen-reared salmon have been found in fresh water streams. In 1998, an Atlantic salmon—sexually mature and thought to have been with a mate—was recovered north of Ketchikan at Ward Creek.⁶ If such salmon successfully spawn and become established, they could compete for limited food and spawning habitat with native fish such as steel-

head, cutthroat trout, Dolly Varden char, and coho salmon. Farmed fish also present a risk in that they could spread disease and parasites. For example, scientists speculate that escaped sea lice from open net Atlantic salmon farming pens in British Columbia's Broughton Archipelago infested juvenile wild pink salmon, causing that native species' population in the province to decline sharply.⁷

Amber-marked Birch Leaf Miner (*Profenusa thomsoni*)



Most likely introduced from Europe to the northeastern United States in the 1920s, this insect—a defoliator of birch—has spread throughout southern Canada and into Alaska. It was accidentally introduced in Anchorage during the mid-1990s, most likely on ornamental birches.⁸ These pests are especially damaging in Alaska, where they have no natural enemies. The larvae of the amber-marked birch leaf miner defoliated more than 30,000 acres throughout the Anchorage Bowl in 2002, have been found in the Matanuska-Susitna Valley, and were detected in 2002 in the birch-abundant area of Fairbanks.

Hardest hit have been urban paper birch. Chemical treatment is the

only currently available control method (for urban trees); using a certain parasitic wasp as a possible biological control agent is under investigation.⁹

Japanese Knotweed (*Polygonum cuspidatum*)

Native to eastern Asia, Japanese knotweed has spread to 37 US states with the help of gardeners who plant knotweed as an ornamental. In Alaska, Japanese knotweed was first reported in the 1940s in Sitka, although it probably arrived earlier.¹⁰ It is now found in communities in southeastern Alaska as well as in Anchorage. Roadside planting by the Department of Transportation as well as landscaping have contributed to its spread.¹¹ Japanese knotweed is difficult to remove, since fragments regenerate readily and send up new shoots from rhizomes. The weed aggressively crowds out native plants along roadsides, stream banks, and woodland edges, destroying habitat for native insects, fish, birds, and other animals. It may also become an agricultural weed,¹² and increase fire risks, as it has in other states.¹³ Experts recommend monitoring for new instances of Japanese knotweed and when found, thoroughly removing and carefully disposing of the plants, including all root fragments, so that the plants cannot become established.¹⁴

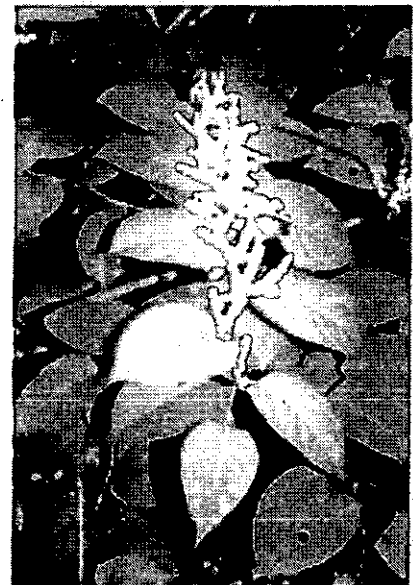


Image sources: Norway rat: Ian L. Jones; Northern pike: Timothy Knepp, US Fish and Wildlife Service; Atlantic salmon: Timothy Knepp, US Fish and Wildlife Service; Amber-marked birch leaf miner: Natural Resources Canada, Canadian Forest Service; Japanese knotweed: © John M. Randall, The Nature Conservancy.

What's at Stake? Impacts on Alaska's Natural Areas and Resources

In Alaska, healthy ecosystems contribute an estimated \$1.2 to \$1.6 billion per year in basic ecosystem services, like nutrient cycling, waste treatment, and regulation of floods.¹ As the largest state, Alaska has an immense and diverse landscape, including tundra, wetlands, waterways, forests, farmland, coastlines, islands, and urban areas. Nearly all these types of areas show signs of emerging or well-established invasions.

FACT: Invasive species are a growing problem in areas of traffic and disturbance.

- In many national parks, forests, and wildlife refuges, non-native weeds have gained purchase in areas of human activity.
- Alaskan ecosystems support populations of large predators, such as bears and wolves. Yet, even Denali National Park—a crown jewel of the national park system—is facing pressure from proposed additional roads and

traffic,² which would likely bring invasive species that spread disease or compete with these predators' food sources.

- In heavily traversed Prince William Sound, the proportion of aquatic non-native species is small, but increasing. The effects are only beginning to be studied. However, in other parts of the country, aquatic environments and water-based industries have been hard hit by invasives as commercial traffic grows.

FACT: Invasive species threaten Alaska's rare and unusual animals and plants, and impact the functioning of whole ecosystems.

- Roadsides in southcentral and interior Alaska are commonly filled with white sweetclover and tufted vetch, two hard-to-remove non-native weeds. These legumes alter the nitrogen balance in soils, negatively affecting organisms adapted to lower nitrogen levels, and also threaten to invade Alaska's forests, riparian areas, and non-forested wetlands.³
- On Kiska Island, a popular cruise ship destination, Norway rats are threatening the survival of one of the world's largest auklet colonies.⁴



The auklet-filled sky as these birds arrive at Sirius Point on Kiska Island to mate and raise their young. Auklet populations, though still in the millions, are threatened by Norway rats, accidentally introduced to Kiska and many other islands. The rats roam from bird to bird, killing them and eating very little of each.



Photographs: Ian L. Jones

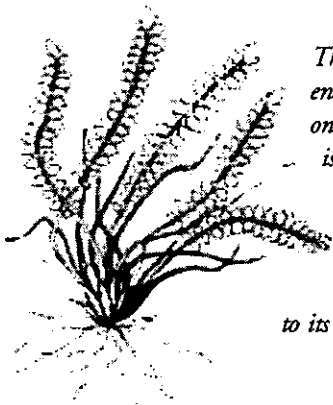
Jules Straus © California Academy of Sciences



Even Denali National Park is not immune to potential new invaders.

- Alaska's island ecosystems contain many unique forms of plants and birds, such as the Aleutian Canada goose. The populations of these geese and nesting seabirds have declined where arctic foxes were introduced. Even where foxes have been removed, some island species have not fully recovered.⁵
- Some habitat for salmon and other native fish is being degraded and diminished from introduced northern pike in southcentral Alaska. Salmon play a crucial part in sustaining watersheds, add nutrients to aquatic systems, and are an important food for bears, eagles, and other wildlife.

Ann-Lillian Schell, US Fish and Wildlife Service



The Aleutian shield fern—endemic to Alaska and found only on one or two Aleutian islands—is the only federally listed endangered plant in Alaska. Grazing by introduced caribou is considered a potential threat to its survival in the wild.

Alaska's salmon industry is already struggling. With the added pressure of invasive species, many fishing vessels, like this salmon gillnetter in Bristol Bay, may find it even more difficult to keep their businesses afloat.

Who's Tracking What's Rare?

The Alaska Department of Fish and Game lists five endangered species (identified by Alaska's Commissioner of Fish and Game as being in danger of extinction in Alaska) and 16 "species of special concern" (identified by Alaska's Commissioner of Fish and Game as declining in abundance or vulnerable to decline in Alaska).⁶ Likewise, the US Fish and Wildlife Service and the Department of Commerce's National Marine Fisheries Service maintain lists for rare animals under their respective jurisdictions. These include 27 species or distinct populations considered "endangered" or "threatened." The Alaska Natural Heritage Program, the US Forest Service, the Conservation of Arctic Flora and Fauna Working Group, and other agencies all track rare plants. Together, there are several dozen such plant species. Only one—the Aleutian shield fern—is a federally listed endangered species. Invasive species affect a number of these rare species.



Karen Ducey, National Marine Fisheries Service, National Oceanic and Atmospheric Administration; Denise Urzant, US Department of Commerce

Finding Solutions: Who Deals with Invasive Species in Alaska?

Alaska's Opportunity

Alaska is blessed with abundant natural beauty and resources, which can and should be protected for the benefit of all Alaskans. Because the state currently has a relatively small problem with invasive species, it is well positioned to prevent the worst invaders from becoming established, learning from successes and failures in the lower 48 states, Hawai'i, and around the world. Alaska's two recent statewide plans are examples of strong coordinated approaches. However, more work is needed to strengthen efforts if Alaska is to protect its natural resources and economic interests.

Alaska's Cooperative Approach

In many ways, Alaska is a national leader. It has combined the expertise of federal, state, tribal, international, and private groups to produce two strategic plans. Taken together, these plans express the need for well-coordinated action to prevent and manage not only aquatic but also terrestrial invasive species, along with more effective and comprehensive planning, legal authority, enforcement, and funding to back it up.

One cooperative effort resulted in the 2001 *Strategic Plan for Noxious and Invasive Plants Management in Alaska*.¹ This plan makes a series of recommendations to heighten awareness of invasive plant problems in the state and to halt these plants' introduction and spread. Committee members from the broad-based Alaska Committee for Noxious and Invasive Plants Management have marshaled resources and implemented a number of the recommendations.

Another effort, led by the Alaska Department of Fish and Game, resulted in the 2002 *Alaska Aquatic Nuisance Species Management Plan*.² The federal Aquatic Nuisance Species Task Force approved this plan, as stipulated by federal law, so implementation of the plan qualifies for federal cost sharing of up to 75%. The plan's focus is on identifying and responding to the highest priority threats.³ It concludes that, "It is in the best interest of Alaska and Alaskans that both purposeful and unintentional introductions of invasive species not be tolerated."⁴

Both of the state plans highlight the need for better public education to prevent new species' arrivals and to curb the spread of existing ones. Without public support and cooperation, resource managers will be combating not only accidental introductions, but intentional ones, such as the dandelions planted by a visitor in a national forest⁵ and northern pike.

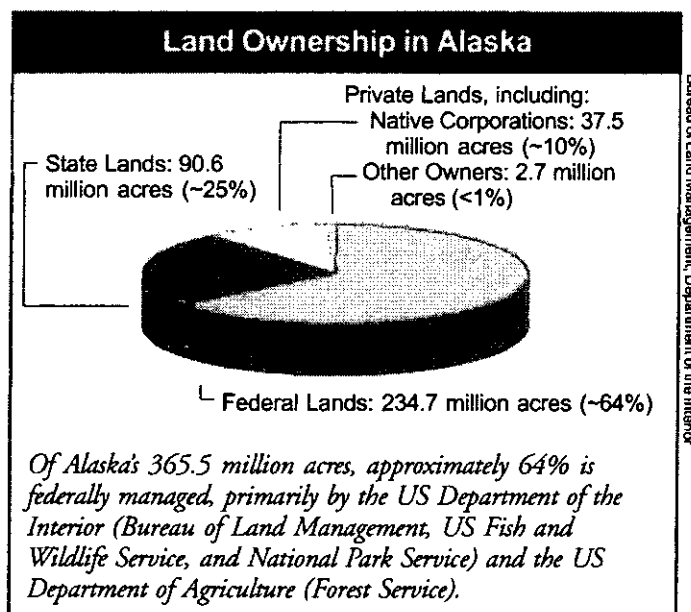
Some urgently needed education efforts are underway. The Alaska Department of Fish and Game Sport Fish Division, for example, produced television spots on aquatic invasive species and, with the US Fish and Wildlife Service, is producing identification cards with warnings about Atlantic salmon and European green crabs.⁶ The Forest Service, Bureau of Land Management, Smithsonian Environmental Research Center, University of Alaska Cooperative Extension Program, Sea Grant, The Nature Conservancy, Regional Citizens' Advisory Council of Prince William Sound, and the Alaska Natural Heritage Program are also working to educate the public about non-native species. Some of these entities have substantial educational materials available to the public.

Federal and State Efforts

Implementing the above plans falls to individual state and federal agencies. Some of their most significant work is described below.

Federal Efforts

Under the new Department of Homeland Security (DHS), the Coast Guard is responsible for monitoring ships' compli-

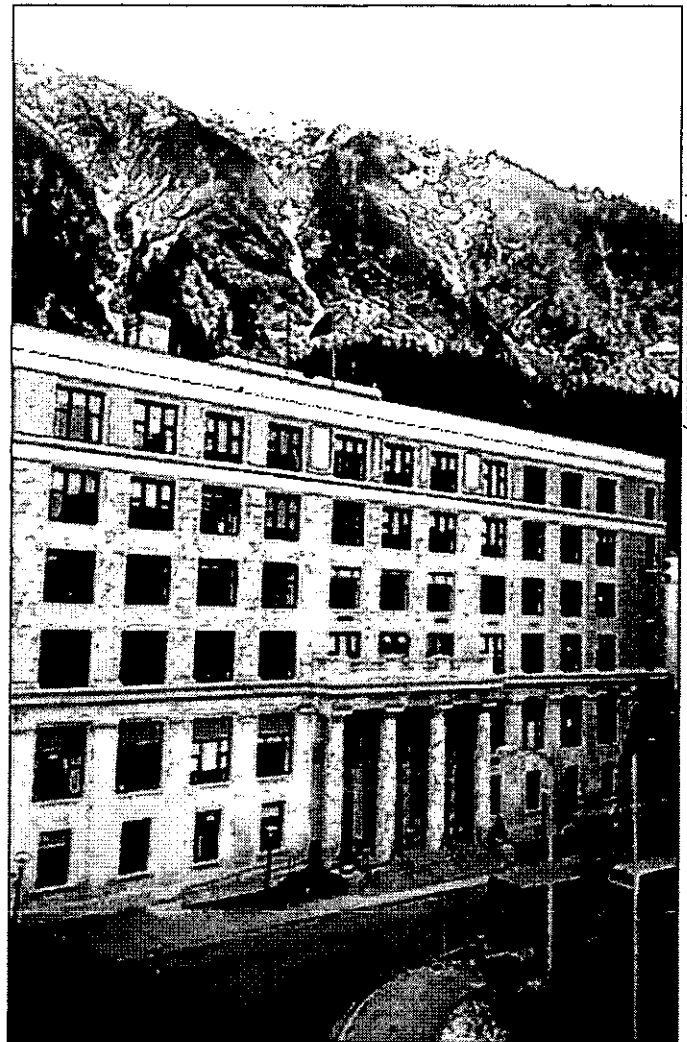


ance with voluntary ballast water exchange practices and related requirements. The DHS Bureau of Customs and Border Protection and US Department of Agriculture's Animal and Plant Health Inspection Service share responsibility for protecting agriculture at and near approximately a dozen ports of entry. DHS officers inspect incoming passengers and cargo while USDA retains other key functions, such as monitoring the effectiveness of inspections, conducting emergency responses to newly detected pests, and a much-expanded effort to detect such pests, which also involves the Alaska Department of Natural Resources.

The USDA Forest Service is responsible for surveying, monitoring, and managing non-native species in national forests. In 2002, the USFS Forest Health Protection Program and the US Geological Survey Alaska Science Center launched a project to create a statewide database for invasive plants. The database incorporates data from field collaborators from federal and state agencies, universities, private consulting firms, and other interested groups.⁷ Similarly, the USFS Tongass National Forest's Ecology Department recently completed an invasive plant management plan for this 17-million-acre forest to prioritize prevention/education, inventory, control, and monitoring over the next five years. That plan addresses specific stakeholders and suggests partnerships to work cooperatively. Some specific projects include efforts to eradicate or control weeds such as tansy ragwort and Japanese knotweed. In addition, the USFS has worked with other agencies, the Kake Tribal, Inc., and the Organized Village of Kake to control Japanese knotweed in the Petersburg area.⁸

The US Fish and Wildlife Service in Alaska has undertaken extensive efforts to eliminate harmful invasive species from islands in the Alaska Maritime National Wildlife Refuge, where recovery of bird populations has been dramatic. Efforts are underway elsewhere to prevent widespread rat populations from spreading. One area of particular concern is the Pribilof Islands.

Other federal agencies, including the Bureau of Land Management, the Department of Defense, and the National Park Service, are involved in surveying, monitoring, and managing non-native species in the large holdings for which they are responsible. For instance, the National Park Service hires seasonal technicians to do an extensive survey for exotic plants throughout Alaska's park system, to pull weed species, and to restore native species in Denali National Park at an estimated cost of \$50,000 annually.⁹



Cordaine Rod & Breakfast (http://www.juneauCordaine.com)

State Law and State-based Efforts

Sizable groups of officials and other experts are working to strengthen the state's legislation and policies. The two interagency invasive species plans described above provide a strong framework for this process, as well as specific, high-priority recommendations.

When Alaska became a state, it prohibited the introduction of out-of-state fish for rearing or stocking in state waters, creating one of the strongest such laws in the country. The strength of the state's approaches to other types of introductions varies, and some important policy areas are not addressed at all.¹⁰ For example, Alaska is the only west coast state that has not recently updated its legislation regarding non-native species in the ballast water of ships; instead, Alaska's ballast water law focuses solely on preventing discharges of petroleum.¹¹ State law does not authorize specific funds to implement statutes and regulations that address invasive species, nor does it have emergency powers to

address sudden outbreaks that can quickly cause widespread damage.¹²

Alaska Department of Fish and Game: Fish, Game, and Aquatic Plants

Responsibility for fish, wildlife, game, and aquatic plants falls to the Alaska Department of Fish and Game.¹³ The release of fish and other aquatic animals is prohibited by law and regulated by the Board of Fisheries. Similarly, game species are prohibited without a permit from the Department of Fish and Game, unless the animal is on a "clean list" of domesticated animals, such as farm animals.

After an extensive permitting and planning process, the Alaska Department of Fish and Game has extended the natural range of some native fish, like rainbow trout and arctic grayling, by stocking hatchery-grown fish in certain lakes to enhance fishing.¹⁴ Populations of non-native yellow perch and goldfish, which have the potential to become invasive, were chemically eradicated by the Alaska Department of Fish and Game and the US Air Force, respectively.¹⁵

Alaska Department of Natural Resources: Weeds, Seeds, Coasts, and Habitat

The Alaska Division of Agriculture has responsibility to prevent the arrival and spread of pests considered "injurious to the public interest, and for the protection of the agricultural industry."¹⁶ It prohibits seeds (but not plants) of 14 noxious weeds and restricts the allowable amount of 10 other

Alaska's Prohibited Noxious Weed Seeds

Austrian fieldcress	Horsenettle
Blue-flowering lettuce	Leafy spurge
Canada thistle	Perennial sowthistle
Field bindweed	Quackgrass
Galinsoga	Russian knapweed
Hempnettle	Whitetops (three species)

Alaska's Restricted Noxious Weed Seeds (only small amounts allowed):

Annual bluegrass	Tufted vetch
Blue burr	Wild buckwheat
Buckhorn plantain	Wild oats
Mustard (two species)	Yellow toadflax
Radish	

weed species in seed mixes. The regulated weeds all affect agricultural lands, although natural areas are far more extensive in the state. Alaska needs explicit regulatory action for these kinds of weeds, such as Japanese knotweed, white sweetclover, and garlic mustard, which have recently arrived in the state or are currently spreading.

The Department of Natural Resources also implements a coastal management program, which is the basis for controlling certain non-agricultural invasive plants. Also, recent legislation made the Office of Habitat Management and Permitting responsible for protecting both aquatic and terrestrial habitat via state habitat standards.

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Thank You!

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Deborah Koons and Christine Mlot - Writers
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UCS Staff

Andrea Shotkin - Biodiversity Outreach Specialist, Global Environment Program
Phyllis Windle - Senior Staff Scientist, Invasive Species, Global Environment Program
Teri Grimwood - Layout, Global Security Program
Heather Turtle - Assistant Editor, Communications

Sincere thanks to the following individuals who provided useful information and/or invaluable review of these materials:

Aaron M. Archibeque - Refuge Manager, Togiak National Wildlife Refuge, US Fish and Wildlife Service, Dillingham, AK

Sharon Atkinson - University of Alaska, Seward, AK

Keith Boggs - Program Manager, Alaska Natural Heritage Program, University of Alaska Anchorage, Anchorage, AK

Karen Bosworth - Botanist and Wetland Ecologist, Bosworth Botanical Consulting, Juneau, AK

Robert Bosworth - Program Director, Southeast Alaska Office, The Nature Conservancy, Juneau, AK

Terry Brock - Alaska Regional Soil Scientist (retired), USDA Forest Service, Juneau, AK

Vernon Byrd - Supervisory Wildlife Biologist, Alaska Maritime National Wildlife Refuge, US Fish and Wildlife Service, Homer, AK

John DeLapp - Cook Inlet Coastal Program, US Fish and Wildlife Service-Ecological Services, Anchorage, AK

Faith L. Duncan - Disturbance Ecologist, Office of Planning, USDA Forest Service, Ketchikan, AK

Peter Dunlevy - Wildlife Biologist, Alaska Maritime National Wildlife Refuge, US Fish and Wildlife Service, Homer, AK

Steve Ebbert - Invasive Species Biologist, Alaska Maritime National Wildlife Refuge, US Fish and Wildlife Service, Homer, AK

Nora Foster - Independent Biologist, Fairbanks, AK

Randall H. Hagenstein - Director of Conservation, Alaska Chapter, The Nature Conservancy, Anchorage, AK

Michele Hebert - Land Resources Agent, Cooperative Extension Service, University of Alaska Fairbanks, Fairbanks, AK

Patricia J. Heglund - Regional Refuge Biologist, US Fish and Wildlife Service-Refuges, Anchorage, AK

Ed Holsten - Research Entomologist, Forest Health Protection, USDA Forest Service, Anchorage, AK

Henry P. Huntington - Owner, Huntington Consulting, Eagle River, AK

Randi Jandt - Fire Ecologist, Alaska Fire Service, Bureau of Land Management, Fort Wainwright, AK

Christina Jewett - State Plant Health Director-Alaska, Animal and Plant Health Inspection Service, Plant Protection & Quarantine, US Department of Agriculture, Anchorage, AK

Charles Knight - Agricultural Inspector, Alaska Division of Agriculture, Alaska Department of Natural Resources, Fairbanks, AK

Jack Lortigan - Biologist, Sitka Tribe of Alaska, Sitka, AK

Rich Lowell - Wildlife Biologist, Division of Wildlife Conservation, Alaska Department of Fish and Game, Petersburg, AK

Marta Mueller - Program Assistant, Invasive Plants Program, and Integrated Pest Management (IPM) Technician, Cooperative Extension Service, University of Alaska Fairbanks, Fairbanks, AK

Cathy A. Needham - Environmental Technical Specialist, POWTEC, llc, Environmental Services, Juneau, AK

Robert S. Otto - Supervisory Fishery Biologist, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Kodiak, AK

Steve Peterson - Wildlife Biologist (retired), Division of Wildlife Conservation, Alaska Department of Fish and Game, Juneau, AK

Bob Piotrkowski - Invasive Species Program Coordinator, Commercial Fisheries Division, Alaska Department of Fish and Game, Juneau, AK

Bill Pyle - Supervisory Wildlife Biologist, Kodiak National Wildlife Refuge, US Fish and Wildlife Service, Kodiak, AK

Mary L. Rabe - Nongame Program Coordinator, Division of Wildlife Conservation, Alaska Department of Fish and Game, Juneau, AK

Matt Robus - Director, Division of Wildlife Conservation, Alaska Department of Fish and Game, Juneau, AK

Mike Roy - Habitat Restoration and Partnerships Coordinator, Alaska Regional Office, US Fish and Wildlife Service, Anchorage, AK

Janet Hall Schempf - Habitat Biologist, Sport Fish Division, Alaska Department of Fish and Game, Juneau, AK

Mark Schwan - Research Coordinator, Sport Fish Division, Alaska Department of Fish and Game, Juneau, AK

Michael Shephard - Vegetation Ecologist, Forest Health Protection, State & Private Forestry, USDA Forest Service, Anchorage, AK

Thomas C. Shirley - Invertebrate Biologist, Juneau Center, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Juneau, AK

Gary Sonnevil - Field Supervisor, Kenai Fish and Wildlife Field Office, US Fish and Wildlife Service, Kenai, AK

Page Spencer - Ecologist, National Park Service, Anchorage, AK

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Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

NATIONAL HEADQUARTERS
Two Brattle Square
Cambridge, MA 02238-9105
Phone: 617-547-5552
Toll Free: 1-800-666-8276
Fax: 617-864-9405

WASHINGTON OFFICE
1707 H Street NW, Suite 600
Washington, DC 20006-3962
Phone: 202-223-6133
Fax: 202-223-6162

WEST COAST OFFICE
2397 Shattuck Ave., Suite 203
Berkeley, CA 94704-1567
Phone: 510-843-1872
Fax: 510-843-3785

EMAIL
ucs@ucsusa.org
WEB
www.ucsusa.org

M I C H I G A N

Carl Levin
UNITED STATES SENATOR

FOR IMMEDIATE RELEASE
March 1, 2007

Contact: Senator Levin's Office
Phone: 202.224.6221

Levin Introduces Bipartisan Bills to Combat Invasive Species in Great Lakes

WASHINGTON—Sen. Carl Levin, D-Mich., today introduced two bipartisan bills aimed at protecting U.S. waters from the threats posed by aquatic invasive species. The National Aquatic Invasive Species Act and the Asian Carp Prevention and Control Act would help combat these harmful species that damage U.S. aquatic ecosystems and natural resources.

"Invasive species wreak havoc on our waterways and cost us billions each year," said Levin, who is a co-chair of the Senate Great Lakes Task Force. "Because it has proven immeasurably difficult to fight invasive species once they have entered our waters, these bills are focused on preventative measures that will tackle the problem at the source."

Details of the two bills follow:

The National Aquatic Invasive Species Act would reauthorize and strengthen the National Invasive Species Act of 1996 to protect U.S. waters by preventing new introductions of aquatic invasive species. The legislation, which Levin is sponsoring along with Sen. Susan Collins, R-Maine, would regulate ballast discharge from commercial vessels; prevent invasive species introductions from other pathways; support state management plans; screen live aquatic organisms entering the United States for the first time in trade; authorize rapid response funds; create education and outreach programs; conduct research on invasion pathways, and prevention and control technologies; authorize funds for state and regional grants; and strengthen specific prevention efforts in the Great Lakes. A summary of the bill can be found [here](#).

"What is so important about the National Aquatic Invasive Species Act is that it takes a comprehensive approach toward the problem of aquatic invasive species rather than just focusing on species after they are established and a nuisance," Levin said. "The bill deals with the prevention of new introductions of species, the screening of live aquatic organisms imported into the country, the rapid response to new invasions before they become established, and the research to implement the provisions of this bill."

The Asian Carp Prevention and Control Act, which Levin is sponsoring with Sen. George Voinovich, R-Ohio, and Sen. Russell Feingold, D-Wisc., would list three species of Asian carp – the bighead, black and silver carp – as injurious wildlife under the Lacey Act. By doing so, Congress would prevent the intentional introduction of these species into the

Great Lakes by prohibiting the interstate transportation or importation of live Asian carp without a permit. Congress passed the original Lacey Act in 1900 and the Lacey Act Amendments in 1981, which make it unlawful to import, export, transport, buy or sell fish, wildlife and plants taken or possessed in violation of federal, state or tribal law. This legislation would not interfere with existing state regulations of Asian carp, and permits to transport or purchase live Asian carp could be issued for scientific, medical or educational purposes.

In addition to Levin, Voinovich and Feingold, other cosponsors of the Asian Carp Prevention and Control Act include Sens. Debbie Stabenow, D-Mich., Norm Coleman, R-Minn., Sherrod Brown, D-Ohio, Barack Obama, D-Ill., and Richard Durbin, D-Ill.

Aquatic invasive species threaten biodiversity nationwide, especially in the Great Lakes. The leading pathway for these aquatic invaders is maritime commerce. In the late 1980s, zebra mussels were released in the Great Lakes after crossing the Atlantic Ocean in the ballast tanks of ships from the Mediterranean. Zebra mussels created such a problem for the Great Lakes that Congress passed legislation in 1990 and 1996 requiring ballast water management for ships entering the Great Lakes, which has reduced, but not eliminated, the threat of new aquatic invasions.

Invasive species are also an economic drain. Estimates of the annual economic damage caused nationwide by invasive species range as high as \$137 billion. Because the Great Lakes fisheries are valued at \$4 billion annually, preventing invasions into the Great Lakes from ballast water, hulls or the system of canals connecting the Great Lakes to the Mississippi River and Atlantic Ocean is critical. Once an exotic species establishes itself, it is almost impossible to eradicate and usually difficult to prevent from moving throughout the nation.

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M I C H I G A N

Carl Levin
UNITED STATES SENATOR

FOR IMMEDIATE RELEASE
March 1, 2007

Contact: Senator Levin's Office
Phone: 202.224.6221

Summary of the National Aquatic Invasive Species Act of 2007 (NAISA)

This act reauthorizes and amends the **Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA)**, as amended by the **National Invasive Species Act of 1996 (NISA)**.

Section 1: Short title; Table of Contents

Section 2: Findings

Section 3: Definitions

TITLE I – PREVENTION OF INTRODUCTION OF AQUATIC INVASIVE SPECIES IN WATERS OF THE UNITED STATES BY VESSELS

Section 101: Prevention of Introduction of Aquatic Invasive Species in Waters of the United States by Vessels

Building on the current mandatory National Ballast Water Management Program, the bill sets requirements applicable to all ships (coastal and transoceanic) operating in waters of the United States and a timeframe for compliance. In particular, it would require all vessels that ply U.S. waters, with limited exceptions, to undertake ballast management/treatment practices to minimize the risk of new introductions of aquatic invasive species in U.S. waters by any aspect of ship operations.

Requirements on Vessels Operating in Waters of the United States

Every ship operating in waters of the United States must have an Aquatic Invasive Species Management Plan, carry out Best Management Practices (including practices to reduce hull fouling), document ballast operations and management activities, and comply with applicable ballast water treatment requirements.

Ballast Water Requirements

Until the end of 2011, all existing ships entering a U.S. port must conduct ballast water

exchange and any other management practices included in regulations unless the safety of the vessel is at stake. Exceptions include vessels operating entirely within the exclusive economic zone and existing vessels that operate entirely within an enclosed aquatic ecosystem.

Beginning in 2012, all vessels entering a US port shall conduct ballast water treatment so that ballast water discharged contains less than 1 living organism that is larger than 50 micrometers in dimension per 10 cubic meters of water and less than 1 living organism that is smaller than 50 micrometers per 10 milliliters of water. The Coast Guard in concurrence with the Environmental Protection Agency (EPA) may set an alternative standard that is as protective. If the Coast Guard and EPA determine that technology to meet this standard does not exist, the Coast Guard and EPA shall require the use of treatment systems that meet or exceed the best performance available at that time, provided that the technology meets the standard adopted by the International Maritime Organization.

Approved ballast treatment technologies shall be environmentally sound. Permits to use technology are valid for the lesser of 10 years or the life of the treatment system and may be renewed if the treatment system remains in compliance with applicable standards. The Coast Guard will monitor treatment system operation and effectiveness. Permits are revocable if the performance is seriously deficient relative to expectations.

Certification Procedures

The Coast Guard and EPA shall develop protocols measuring ballast treatment performance, and approving ballast water and other treatment systems to certify effectiveness, occupational safety, environmental soundness, and its minimum lifespan. Approval of a system shall be qualified, as needed, based on voyage pattern, vessel class, and other properties that may limit system performance. Certification must include ship-based testing.

Experimental Treatment Approval

The Coast Guard shall issue and implement procedures for approving experimental ballast water treatment methods on a ship-by-ship basis, largely mirroring the Coast Guard's existing Shipboard Treatment Evaluation Program (STEP). Experimental treatment approvals are valid for the lesser of 10 years or the life of the treatment system and also may be renewed. Ship owners must agree to gather information regarding the operational and biological effectiveness of the treatment system.

Great Lakes Program

Current regulations would stay in place, but within 18 months of enactment, the U.S. Coast Guard must review and revise the Great Lakes ballast water management. Ships reporting no ballast on board or "NOBOBs" will be required to conduct saltwater flushing. Before 2011, ships may use treatment systems meeting the prevailing IMO standard in lieu of

ballast water exchange.

Section 102: Armed Services Whole Vessel Management Program

The Armed Services Whole Vessel Management Program is amended to minimize the risk of introductions of aquatic invasive species by towed vessels. This program shall not affect the current ballast program in place for Department of Defense vessels.

TITLE II – PREVENTION OF INTRODUCTION OF AQUATIC INVASIVE SPECIES IN WATERS OF THE UNITED STATES BY OTHER PATHWAYS

Section 201: Priority Pathway Management Program

The Aquatic Nuisance Species (ANS) Task Force will conduct pathway analysis in order to identify the highest risk pathways for introduction of aquatic invasive species into US waters and to implement management strategies to reduce these introductions.

Section 202: Screening Process for Planned Importations of Live Aquatic Organisms

The USGS, APHIS, and Smithsonian Environmental Research Center shall develop a catalog of aquatic species that have a documented history of being in trade. Beginning 3 years after enactment, anyone trying to import a live aquatic species not in trade, as documented by the catalog, must obtain a permit to import the species. The National Invasive Species Council will develop screening guidelines for federal agencies to use to determine if the U.S. should permit the importation of a live organism, and if so, whether the U.S. should condition the importation of the species. Federal agencies that currently have authority over the importation of an aquatic species will be in charge of screening that species though any agency may opt to give its screening authority to the Fish and Wildlife Service. The bill authorizes grant funding to help states perform their own screening processes in addition to the federal process.

TITLE III - EARLY DETECTION; RAPID RESPONSE; CONTROL AND OUTREACH

Section 301: Early Detection

The National Invasive Species Council will develop a set of sampling protocols, a geographic plan, and a budget to support a national system of ecological surveys for rapid detection of aquatic invasive species. This national system will establish clear lines of communication and help identify pathways causing distribution of newly-detected aquatic invasive species.

Section 302: Rapid Response

The bill establishes a Rapid Response Fund to provide grants to states and regions to implement approved rapid response contingency strategies. The ANS Task Force will develop model state and regional rapid response contingency strategies to aid states and regions in the development of contingency strategies. The National Invasive Species Council, within 12 months of enactment, would establish a Federal Rapid Response Team to: (1) implement eradication and control responses on federal land; (2) assist, if requested, in implementing rapid response measures on non-federal land; and, (3) provide training to state, tribal, and regional rapid responders.

Section 303: Dispersal Barriers

This bill expands the existing dispersal barrier program. The Army Corps of Engineers would complete construction and upgrades of the Chicago Ship and Sanitary Canal Dispersal Barriers, operate the barriers, and conduct a feasibility study on the full range of options to prevent spread of invasive species through the canal. The Fish and Wildlife Service would establish a monitoring program to track invasive species moving through interbasin and intrabasin waterways, assess the efficacy of dispersal barriers and other measures in preventing this spread, identify waterways suitable for dispersal barrier projects, and analyze the range of options available to prevent spread in the Lake Champlain Canal and the Upper Mississippi River.

Section 304: Environmental Soundness

The EPA will promulgate regulations to evaluate treatment methods to ensure no adverse effects on human health, public safety, or the environment result from their use.

Section 305: Information, Education and Outreach

The legislation expands on education initiatives under existing law by including new public and industry outreach programs. The Task Force, Sea Grant and the National Park Service would develop programs to address the spread of aquatic invasive species by recreational boats. The Task Force will maintain a website to inform the public on screening, monitoring and control efforts. In addition, the Task Force would carry out activities to inform and promote voluntary cooperation and regulatory compliance.

TITLE IV - AQUATIC INVASIVE SPECIES RESEARCH

Sections 401 - 404: Research

Research priorities form an integral component of this bill. Key research programs include:

- The development and implementation of ecological surveys at various sites and

invasion surveys to assess the rates and patterns of introductions of nonindigenous aquatic species in U.S aquatic ecosystems and to track the establishment of these species;

- The execution of standardized, field-based pathway surveys to monitor high-risk pathways by which nonindigenous aquatic species may be introduced into aquatic ecosystems (including ballast discharge) and to determine practices that contribute to the introduction of these species;
- The development and maintenance of a central, national pathways and ecological survey database of information collected under the Act, and the coordination of this database with other relevant previously established databases;
- The utilization of US Geological Survey field stations to perform collaborative experimental research to identify the relationship between the introduction and establishment of nonindigenous aquatic species, including organism concentration and any ambient conditions necessary for those species to survive and thrive;
- Establishment of a research, development, and demonstration program to develop a wide set of environmentally sound methods and treatment tools for detecting, preventing, controlling and eradicating aquatic invasive species, including interbasin dispersal barriers and ballast water treatment technologies;
- Research to support the implementation of pathway standards;
- Encouragement of Graduate studies in taxonomy and systematics.

TITLE V - COORDINATION

Section 501: Program Coordination

The ANS Task Force membership will add the Directors of USGS, Secretary of the Department of State, and the Smithsonian. The content of State Aquatic Invasive Species Management Plans would expand to include rapid response, aquatic plant control, screening and early detection strategies, and Federal funds are made available for the development of State Management Plans.

Section 502: International Coordination

The Secretary of State would initiate negotiations with Canada to task the International Joint Commission with a review of policies to protect the Great Lakes, and with Mexico for the US-Mexican border region.

TITLE VI - AUTHORIZATION OF APPROPRIATIONS

Section 601: Authorization of Appropriations

Except as otherwise provided in this section, there are authorized to be appropriated such sums as are necessary to carry out this Act for each of fiscal years 2006 through 2010.

Task Force and Aquatic Nuisance Species Program -- \$43 million

- \$8,000,000 (\$4,000,000 to FWS and \$3,000,000 to NOAA) - Task Force Activities and \$1,000,000 to NISC Sec 1202
- \$30,000,000 to FWS - Grants for State Management Plans Sec 1204(b)
- \$3,000,000 - Regional Panels of the ANS Task Force
- \$1,000,000 to FWS to carry out screening under 1105(g)
- \$1,000,000 to State Dept for coordination activities Sec 1403

Prevention of Introduction of Aquatic Invasive Species by Vessels -- \$11.25 million

- \$6,000,000 to USCG Sec 1101
- \$2,500,000 to EPA Sec 1101
- \$2,750,000 to Task Force (\$1,500,000 to FWS and \$1,250,000 to NOAA) Sec 1101

Prevention of Aquatic Invasive Species by Other Pathways -- \$9.5 million

- \$5,000,000 (\$2,000,000 to NOAA and \$3,000,000 to FWS) -Priority Pathway Management Program Sec 1210
- \$1,000,000 to NISC - Screening Guidelines Sec 1105 (d)
- \$3,500,000 to FWS - Screening Regulations Sec 1105 (e)

Early Detection and Monitoring -- \$12 million

\$1,000,000 to NOAA and \$1,000,000 to FWS (2008 - 2009) and \$5,000,000 to NOAA and \$5,000,000 to FWS (2010-2012) - Survey planning and implementation Sec 1106

Containment and Control -- \$2.15 million

\$2,150,000 for FWS - Monitoring Program Sec 1202 (j)(2)

Rapid Response -- \$27.5 million

- \$25,000,000 to Secretary of Interior - Rapid Response Fund Sec 1211
- \$1,000,000 - Model State and Regional Rapid Response Contingency Strategies Sec 1211
- \$1,500,000 to NISC (\$500,000 to NOAA and \$1,000,000 to FWS) - Federal Rapid Response Teams Sec 1211 (f)

Environmental Soundness -- \$0.6 million

\$600,000 to EPA - Criteria for Improvement of Treatment Methods for Aquatic Invasive Species Sec 1202 (k)

Information, Education and Outreach -- \$3.75 million

- \$500,000 to NPS - Info and Ed program Sec 1202 (h)(2)(D)
- \$750,000 to FWS - 100th Meridian Sec 1202 (h)(2)(C)
- \$2,000,000 (\$1,000,000 to FWS and \$1,000,000 to NOAA) Task Force Activities Sec 1202 (h)
- \$500,000 to NOAA - marina outreach program Sec 1202 (h)(2)(B)(ii)

Research

Ecological and Pathway Research and Analysis -- \$27.15 million

- \$17,000,000 to NOAA for sec 1107 and 1008 (\$13,000,000 for 1107 (g))
- \$4,000,000 to SERC for sec 1107 and 1108
- \$4,500,000 to USGS for sec 1107 and 1108 (\$500,000 for 1107 (j))
- \$1,650,000 to GLERL for sec 1202 (i)

Dissemination

\$500,000 to NISC Sec 1109

Technology Development, Demonstration and Verification -- \$11 million

- \$2,500,000 to EPA for Sec 1110 (a)
- \$1,000,000 to Army Corps for Sec 1110 (b)
- \$7,500,000 to NOAA for Sec 1104 and 1301 (e)

Vessel Pathway Standards Research -- \$10.5 million

- \$3,000,000 (\$1,500,000 to EPA and \$2,000,000 to USCG) for Sec 1111 (a)
- \$500,000 to USCG for Sec 1111 (b) (2008-1010)
- \$500,000 to USCG for Sec 1111 (c) (2008)

Systematics and Taxonomy

\$2,500,000 to NSF for Sec 1112

TOTALS:

FY 2008 - \$144.4 million

FY 2009 - \$143.9 million

FY 2010 - \$151.9 million

FY 2011 - \$151.4 million

FY 2012 -- \$151.4 million

TITLE VII—CONFORMING AMENDMENTS

**Memorandum of Understanding
For
The Establishment, Endorsement, and Support of the
Alaska Invasive Species Workgroup**

Among the

STATE OF ALASKA

and

NON-GOVERNMENT ORGANIZATIONS

and

PRIVATE ORGANIZATIONS

and

FEDERAL AGENCIES

**(SEE SIGNATORY PAGES FOR LISTS OF AGENCIES AND
ORGANIZATIONS)**

**Memorandum of Understanding
For
The Establishment, Endorsement, and Support of the
Alaska Invasive Species Workgroup**

This Memorandum of Understanding (MOU) is made and entered into by and among the signatory parties.

A. Purpose

The purpose of this memorandum is to establish an Alaska Invasive Species Workgroup to minimize invasive species impacts in Alaska by facilitating collaboration, cooperation and communication.

The signatory parties propose to work together within the scope of their respective authorities toward the goals outlined below.

B. Goals of the Alaska Invasive Species Workgroup

1. Clarify the jurisdictional authorities of signatory parties as they relate to invasive species management.
2. Share the scientific and technical expertise of the parties related to invasive species management.
3. Encourage and enable signatory party employees or members to work collaboratively to optimize their respective capabilities to minimize invasive species impacts.
4. Collaborate in the development of a needs assessment and drafting of a statewide strategic plan for the management of invasive species.
5. Consider the formation by the State of Alaska, in collaboration with the other signatory parties, a formal structure for continued collaboration, cooperation and communication to minimize invasive species impacts in Alaska.

C. It Is Mutually Agreed and Understood by Signatory Agencies:

1. Specific work projects or activities which involve the transfer of funds, services, or property between the parties to this MOU will require the execution of separate agreements or contracts, contingent upon the availability of funds as appropriated by the Alaska State Legislature, United States Congress, or other applicable governmental units or provided by other parties to this MOU. Each subsequent agreement or arrangement that involves the transfer of funds, services, or property among the parties to this MOU must comply with all applicable statutes and regulations, including those statutes and regulations dealing with competition applicable to procurement and financial assistance activities, and must be independently authorized by appropriate statutory authority.
2. This MOU in no way restricts signatory parties from participating in similar activities or arrangements with other public or private agencies, organizations, or individuals.
3. Nothing in this MOU shall obligate signatory parties to expend appropriations or to enter into any contracts or other obligations.
4. The workgroup coordinators and contacts for this agreement are listed under Exhibits.

5. Modifications within the scope of the MOU shall be made by mutual consent of the parties, by the issuance of a written modification, signed and dated by all parties, prior to any changes being performed.
6. This MOU is executed as of the date of last signature and is effective through December 31, 2011, at which time it will expire unless extended.

Appendices:

Exhibit A - Principal Contacts and Invasive Coordinators (see attached)

Exhibit B - State of Alaska Signatories

Exhibit C - Non-Government Organizations Signatories

Exhibit D - Private Organizations Signatories

Exhibit E - Federal Agencies Signatories

E.1 Department of Agriculture Signatories

E.2 Department of Commerce Signatories

E.3 Department of Defense Signatories

E.4 Department of Homeland Security Signatories

E.5 Department of Interior Signatories

Exhibit F – BLM-AK Authorities Letter

Exhibit A - AISWG Contacts (primarily attendees of the April 2006 meeting in Anchorage)

State of Alaska Contacts

State of Alaska Department of Environmental Conservation, Pesticide Program
Rosemarie Lombardi, VMD
Environmental Specialist
907-376-1866
Rosemarie_Lombardi@dec.state.ak.us

State of Alaska Department of Fish and Game
Douglas Vincent-Lang
Special Assistant
907-267-2339
douglas_vincent-lang@fishgame.state.ak.us

State of Alaska Department of Natural Resources
Rachael Petro
Special Assistant to the Commissioner
907-269-8434
rachael_petro@dnr.state.ak.us

State of Alaska Department of Natural Resources, Division of Agriculture
Larry DeVilbiss
Director
907-745-7200
larry_devilbiss@dnr.state.ak.us

State of Alaska Department of Transportation and Public Facilities, Operations and Maintenance
Larry Johnson
Integrated Vegetation Management Coordinator

907-458-6899
larry_johnson@dot.state.ak.us

University of Alaska Fairbanks School of Natural Resources and Agriculture Science
Matt Cronin
Governor's Office Representative
907-786-6378
croninm@aol.com

Non-Governmental Organization Contacts

Alaska Association of Conservation Districts
Gino Graziano
Invasive Plant Program Coordinator
907-354-1227
cwma@ak.net

Alaska Conservation Alliance (Alaska Conservation Voters)
Caitlin Higgins
Outreach Organizer
907-258-6175
Caitlin@akvoice.org

Alaska Conservation Alliance
Kate Troll
Executive Director
907-258-6171
kate@akvoice.org

Alaska Intertribal Council
Anne Jourdan
Environmental Coordinator
907-563-9334
ajourdan@ALASKAINTERTRIBAL.ORG

Cook Inlet Regional Citizens Advisory Council
Steven Howell
Director of Public Outreach
907-283-7222
howell@circac.org

Prince William Sound Regional Citizens' Advisory Council
Dan Gilson
Project Manager, Oil Spill Prevention & Response Operations
907-834-5040
gilson@pwsrca.org

Prince William Sound Regional Citizens' Advisory Council
Lisa Ka'aihue
Project Manager, Environmental Monitoring

907-273-6225
kaaihue@pwsrca.org

Prince William Soundkeeper
Sharry Miller
Executive Director
907-835-5503
sharry@pwsoundkeeper.org

The Nature Conservancy Alaska Field Office
Shelly Morgan
Executive Coordinator
907-276-3133 ex 115
smorgan@tnc.org

University of Alaska Fairbanks Cooperative Extension Service
Michele Hebert
Land Resources Program Chair
907-474-2423
ffmah@uaf.edu

University of Alaska Fairbanks Cooperative Extension Service
Deena Jallen
Invasive Species Program Assistant
907-474-2422
fndmj@uaf.edu

University of Alaska Fairbanks Cooperative Extension Service
Tony Nakazawa, PhD
Director
907-474-7246
fnatn@uaf.edu

Federal Contacts

US Department of Agriculture Agricultural Research Service, Subarctic Agricultural Research Unit
Jeffery Conn, PhD
Research Agronomist
907-474-7652
ffjocl@uaf.edu

US Department of Agriculture Agricultural Research Service, Subarctic Agricultural Research Unit
Steven Seefeldt
Research Agronomist
907-474-1898
sseefeldt@pw.ars.usda.gov

US Department of Agriculture Animal and Plant Health Inspection Service, Plant Protection and Quarantine

Ann Ferguson
State Plant Health Director
907-357-9542
ann.ferguson@aphis.usda.gov

US Department of Agriculture Forest Service, National Forest System

Barbara A. Schrader, PhD
Regional Ecologist and Invasive Species Coordinator
907-586-7863
bschrader@fs.fed.us

US Department of Agriculture Forest Service, State and Private Forestry

Michael Shephard
Vegetation Ecologist
907-743-9454
mshephard@fs.fed.us

US Department of Agriculture Natural Resources Conservation Service

Calvin Steele
Rangeland Management Specialist
907-761-7741
calvin.steele@ak.usda.gov

US Department of Agriculture Natural Resources Conservation Service

Gene Schock
Soil Conservationist
907-761-7715
eugene.schock@ak.usda.gov

US Department of Commerce National Marine Fisheries Service, Alaska Region/HCD

Linda Shaw
Wildlife Biologist
907-586-7510
Linda.Shaw@noaa.gov

US Department of Commerce Sea Grant, AK Sea Grant College Program

Brian Allee, PhD
Director
907-474-7949
allee@sfos.uaf.edu

US Department of Defense, Army

Josh Buzby
Ecologist
Joshua.buzby@us.army.mil

US Department of Defense, Army

Josh Carlson
Ecologist
Josh.carlson@us.army.mil

US Department of Defense, Army
Jeffrey Mason
Range and Training Land Assessment Program Coordinator
907-873-1615
Jeffrey.mason3@us.army.mil

US Department of Defense, Army Center for Environmental Management of Military Lands
Chris Garner
Natural Resources Specialist
907-384-2744
christopher.d.garner@us.army.mil

US Department of Defense, Coast Guard 17th District
Robert S. Fields, LT
Preventions Department
907-463-2812
Robert.S.Fields@uscg.mil

US Department of Homeland Security US Customs and Boarder Protection
John Sheahan
Agricultural Inspector Supervisor
907-271-6873
john.sheahan@dhs.gov

US Department of the Interior Bureau of Indian Affairs
Keith Kahklen
Natural Resources Coordinator
907-586-7618

US Department of the Interior Bureau of Land Management
Jeanne Standley
State Vegetation Specialist
907-271-3082
Jeanne_Standley@ak.blm.gov

US Department of the Interior Fish and Wildlife Service, Alaska Region
Denny Lassuy, PhD
Invasive Species Coordinator
907-786-3813
denny_lassuy@fws.gov

US Department of the Interior Geological Survey, Alaska Science Center
Joy Geiselman
Deputy Chief, Biological Science Office
907-786-3668
joy_geiselman@usgs.gov

US Department of the Interior Minerals Management Services, Alaska Region
Susan Banet
Supervisory Geologist

907-334-5323
Susan.Banet@mms.gov

US Department of the Interior National Park Service, Alaska Region-Natural Resources Team
Judy Alderson (contact Jeff Heys)
Regional Wilderness Specialist
907 644-3442
Judy_Alderson@nps.gov

US Department of the Interior National Park Service, Alaska Region
Jeff Heys
Exotic Plant Management Team Liaison
907-644-3451
jeff_heys@nps.gov

EXHIBIT B – State of Alaska Signatories:

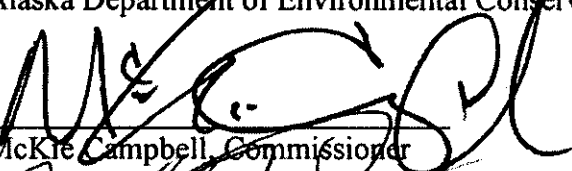
THE PARTIES HERETO have executed this instrument (State Parties):



Kurt Fredriksson, Commissioner
Alaska Department of Environmental Conservation

10-6-06

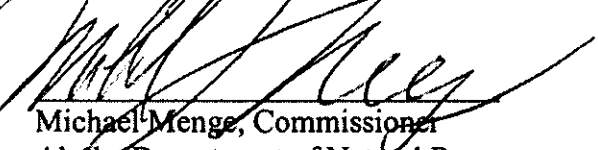
Date



McKie Campbell, Commissioner
Alaska Department of Fish and Game

10/3/06

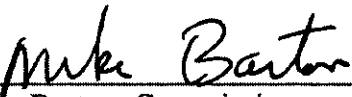
Date



Michael Menge, Commissioner
Alaska Department of Natural Resources

9/26/06

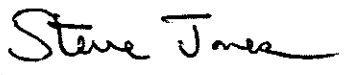
Date



Mike Barton, Commissioner
Alaska Department of Transportation and Public Facilities

10/21/06

Date



Steve Jones, Chancellor
University of Alaska Fairbanks, Cooperative Extension Service

9-19-06

Date

Exhibit C - Non-Government Organizations Signatories

THE PARTIES HERETO have executed this instrument (NGO Parties):

Al Poindexter 11-2-06
Al Poindexter, Executive Director Date
Alaska Association of Conservation Districts

Steven E. Sumida 10/17/06
Steven E. Sumida, Executive Director (Acting) Date
Alaska Inter-Tribal Council

Kate Troll, Executive Director Date
Alaska Conservation Alliance

Michael L. Munger, Executive Director Date
Cook Inlet Regional Citizens' Advisory Council

John S. Devens 10/2/06
John S. Devens, PhD., Executive Director Date
Prince William Sound Regional Citizens' Advisory Council

Sharry Miller September 25, 2006
Sharry Miller, Executive Director Date
Prince William Soundkeeper

T. David Banks 10-4-06
David Banks, State Director Date
The Nature Conservancy in Alaska

Exhibit D - Private Organizations Signatories

THE PARTIES HERETO have executed this instrument (Private):

Signature Date

Exhibit E – Federal Signatories

THE PARTIES HERETO have executed this instrument (Federal Parties):

Exhibit E.1 - U.S. Department of Agriculture

Ann Ferguson, State Plant Health Director
USDA Animal and Plant Health Inspection Service

Date

for Paul K. Brewster

Dennis E. Bschor, Regional Forester
USDA Forest Service-Alaska Region

October 13, 2006

Date

Robert N. Jones

Robert Jones, State Conservationist
USDA National Resource Conservation Service

10-17-06

Date

Exhibit E.2 - U.S. Department of Commerce

Doug Mechin

Doug Mechin, Acting Administrator
USDC National Oceanic and Atmospheric Administration, Alaska Region
By authority of Executive Order 13112 and the Fish and Wildlife Coordination Act

12/13/06

Date

Exhibit E.3 - U.S. Department of Defense

David L. Shutt, Colonel
USDD Army

Date

Exhibit E.4 - U.S. Department of Homeland Security

USDHS Customs and Border Protection

Date

Arthur E. Biales

US Coast Guard, REAR ADMIRAL

10/19/06

Date

Exhibit E.5 - U.S. Department of the Interior

Niles Cesar
Niles Cesar, Regional Director
USDI Bureau of Indian Affairs

9.29.06
Date

for Julie Atcheller
Julia Dougan, Acting State Director-Alaska
USDI Bureau of Land Management

11/17/06
Date

Thomas O. Melius
Thomas O. Melius, Regional Director
USDI Fish and Wildlife Service, Alaska Region

October 19, 2006
Date

Leslie Holland-Bartels
Leslie Holland-Bartels, Director
Alaska Science Center
USDI Geological Survey

9/28/06
Date

John Goll
John Goll, Regional Director
USDI Minerals Management Service

10/16/2006
Date

Marcia Blaszk
Marcia Blaszk, Regional Director
USDI National Park Service, Alaska Region

10.6.06
Date



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Alaska State Office
222 West Seventh Avenue, #13
Anchorage, Alaska 99513-7599
<http://www.ak.blm.gov>



1786 (AK-931)

NOV 17 2006

Michele Hebert, Land Resources Agent
University of Alaska - Cooperative Extension Service
1000 University Avenue
Post Office Box 758155
Fairbanks, Alaska 99775-8155

Dear Ms. Hebert:

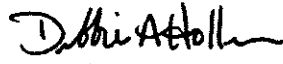
The Bureau of Land Management-Alaska (BLM-AK) is pleased to support the establishment of the Alaska Invasive Species Workgroup. The BLM is also pleased to formalize its relationship with the other cooperating agencies or signatories to the Memorandum of Understanding (MOU). Since the majority of the signatories have signed the MOU, BLM would like to supplement the MOU to conform to our guidelines.

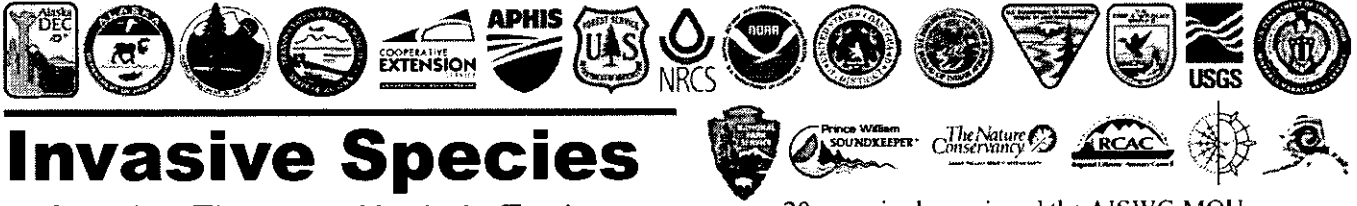
The MOU states, "*The signatory parties propose to work together within the scope of their respective authorities towards the goals outlined.*" However, the MOU guidelines for the BLM specify we identify the principle statutory authorities that authorize the cooperating agencies to enter into the MOU. The authorities are essential elements under which the BLM-AK formally enters into the Alaska Invasive Species Workgroup MOU. Please include the following authorities for the BLM-AK by attaching this letter as an appendix to the MOU.

1. Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.)
2. Federal Noxious Weed Act of 1974 as amended by Sec. 15 "Management of Undesirable Plants on Federal Lands," 1990.(7 U.S.C. 2814)
3. Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C.4701 et seq.)
4. Lacey Act as amended (18 U.S.C.42)
5. Executive Order 13112, Invasive Species, 2/3/99

Thank you for the opportunity to increase federal, state and local cooperation and coordination on invasive species. Please find attached the signed MOU.

Sincerely,


for Julia Dougan
Acting State Director



Invasive Species

A Growing Threat to Alaska's Ecology and Economy

20 agencies have signed the AISWG MOU

Issue

Invasive species are a relentless problem. These harmful, non-native plants, animals and microorganisms impact our economy and environment. The economic impact of invasive species in the U.S. is estimated to be over \$137 billion¹ per year.

In Alaska, invasive species threaten native fish, plants and wildlife and their subsistence users as well as our resource-dependent industries, including agriculture, tourism, forestry, hunting, and fishing. Alaska has so far experienced fewer invasions than many other states, but we are at a critical point. Human-mediated mechanisms for introduction are increasing, raising the risks of invasive species reaching Alaska's shores and lands.

Alaska's vast size and the varied management of Alaska's public and private lands and waters demands collaborative efforts to ensure effective prevention, early detection, monitoring and management if we are to reduce duplication of efforts and increase our overall effectiveness.

Almost half of all states in the US have a formalized group to address strategies for managing invasive species. Alaska does not yet have a unified forum under which invasive species are managed. However, in the Fall of 2006, twenty state, federal, tribal and non-governmental organizations did sign a Memorandum of Understanding (MOU) to create the Alaska Invasive Species Working Group (AISWG) as a means to improve our collective ability to slow the pace of invasion and its impacts in Alaska.

One of the key goals of this newly formed AISWG is to help the State of Alaska establish an Alaska Invasive Species Council with a formal structure for continued collaboration, cooperation and communication to minimize invasive species impacts in Alaska.

AISWG cooperators are already working actively on improving communication by maintaining a listserv, website, sharing information and holding monthly statewide conference calls. As a means of enabling efficient collaboration, cooperators are also identifying their respective jurisdictional authorities for invasive species management and looking for



Purple loosestrife along Chester Creek in Anchorage². This species was popular with some gardeners, but can severely impact natural wetland ecosystems. Each plant can produce as much as 2 million seeds and sterile plants can hybridize and reproduce with non-sterile plants. This species has recently been banned from sale in Alaska.

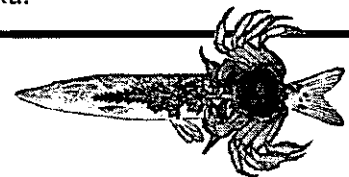
how these authorities can be used and improved in a complementary way.

The AISWG is also set to host a first ever all-taxa statewide invasive species conference in Fairbanks in the fall of 2007.

Facts

- Alaska is not immune from invasion, and in the face of climate change and expanding international trade is in fact likely to see even greater invasion pressure in the future.
- Some invaders (rats, green crabs, knotweeds, purple loosestrife, and others) are threatening or already dramatically altering Alaska's native ecosystems.
- Because invading species do not recognize private or political boundaries, a coordinated and collaborative effort is needed to prevent, detect, and control invasion.
- Alaska is the only West Coast state that DOES NOT have a formal all-taxa state invasive species council.
- State of Alaska agencies increasingly recognize the importance of managing invasive species. In recent years, the Alaska Department of Fish and Game has produced an Aquatic Nuisance Species Plan, an Invasive Pike Plan, and the Invasive Rat Plan is near completion. The Department of Natural Resources has proposed expanding the list of plants considered noxious within Alaska.

**Alaska Invasive Species Working Group
Issue Paper - May 2007**



“...Idaho’s programs have been likened to a “patchwork quilt”, where each “patch” represents an individual program or effort. So long as the patches connect, the quilt is useful, but if they do not, then there are gaps in the coverage through which undesirable species can enter.” -- Idaho’s Action Plan for Invasive Species

- Federal agencies, non-governmental organizations, universities, private industries, native groups, and individual citizen partners of the State are increasingly working together to help stop the spread of invasive species through a variety of institutional, group and volunteer efforts.
- The AISWG is committed to collaboration, cooperation and communication to minimize invasive species impacts and to helping the State of Alaska to improve the viability and capability of cooperative efforts by forming an all-taxa invasive species council.

Alaska — Priority List

1. Establish an Alaska Invasive Species Council or other formal structure for coordinating the management of invasive species.

Formation of a unified Council for invasive species management is an important step in coordinating existing resources within Alaska and for improving our capacity for effective collaboration well into the future.

2. Support funding of a prevention and early detection/rapid response system.

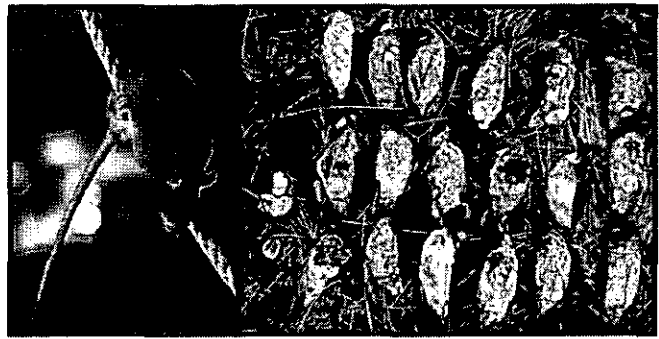
Prevention and timely management is important for controlling the detrimental impacts of invasive species. Early detection programs and rapid response plans can help to cost-effectively mobilize resources from participating agencies.

3. Enhance existing and initiate new research and public awareness campaigns.

Coordination between the organizations and agencies in Alaska is vital to identify shared priorities and avoid duplication of efforts, to promote compatibility of the collected research data, and to enhance the education and outreach activities associated with invasive species.

4. Negotiate standards to limit invasive species pests arriving in Alaska.

The State of Alaska and its partners can more strongly support regulation and enforcement efforts to protect our vital natural and economic resources. The recent actions of the Department of Natural Resources and Department of Fish and Game toward regulating such invasive species as rats, freshwater fish (non-native pike), and detrimental plant species (purple loosestrife and orange hawkweed) are



Rat on rope (left), and a rat cache on Kiska Island (right)³. Most rats on Alaska’s islands are there as a result of “rat spills” from wrecked ships. Rats really do flee a sinking ship! In one rat cache on Kiska Island, researchers found over 100 least auklets⁴. Rats pose a serious threat to our globally important seabird populations.

positive steps toward invasive species prevention. Effective prevention is both economically and ecologically efficient, and often more practical, than eradicating species after introduction has already occurred. Improved monitoring, inspection, and enforcement along all pathways for invasion into Alaska are needed.

Summary

Alaska is in a unique position to avoid the enormous costs associated with the widespread introduction and establishment of invasive species. Early intervention in Alaska can prevent the deterioration of the state’s ecological and economical resources.

More Information:

Michele Hebert

Agriculture and
Horticulture Agent
UAF- Cooperative
Extension Service
(907) 474-2423
e-mail: fimah@uaf.edu

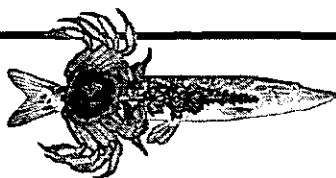
Deena Jallen

Invasive Species
Program Assistant
UAF-Cooperative
Extension Service
(907) 474-2422
e-mail: fndmj@uaf.edu

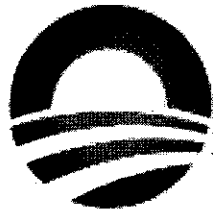
AISWG Website: www.alaskainvasives.org

References:

1. Pimentel, D., Lach, L., Zuniga, R., and D. Morrison. 2000. Environmental and Economic Costs of Nonindigenous Species in the United States. *BioScience* 50(1):53-65.
2. Photo taken by Michael Shephard, US Forest Service
3. www.stoprats.org
4. Alaska Science Forum, June 24, 2004, Rats and birds clash on volcanic island Article, #1704, by Ned Rozell. <http://www.gi.alaska.edu/ScienceForum/ASF17/1704.html>



**Alaska Invasive Species Working Group
Issue Paper - May 2007**



**OBAMA
BIDEN**

WWW.BARACKOBAMA.COM

BARACK OBAMA AND JOE BIDEN: COMMITTED TO GREAT LAKES RESTORATION

The Great Lakes are one of the world's greatest natural treasures. They are the largest fresh water body on our planet, providing the principal source of drinking water for 42 million people, support for a \$4.5 billion annual recreational and sport fishing industry, and recreational opportunities for millions of Americans who swim in the Lakes, play on the beaches and walk along the shoreline.

Today, the Great Lakes are under unprecedented stresses. Years of degradation from the build up of toxic sediments, mercury and other air pollutants, wetlands destruction, invasive species and pollution from antiquated sewage systems have left the Great Lakes at a tipping point. The impacts from global warming threaten to hasten and exacerbate this potentially catastrophic situation. Fortunately, we know many of the solutions to these serious threats. And, there is bipartisan political will and cooperative public and private goodwill to achieve them. It is time now for aggressive action to implement a comprehensive restoration plan for the Great Lakes, because the longer we wait, the worse the problems become and the higher the price of restoration. An investment in restoring the Great Lakes is an investment in our outdoor heritage and environment as well as the economy.

Barack Obama and his family have lived by the shore of Lake Michigan for 20 years. He knows, understands and cares about the Great Lakes and has the record to prove it. As a State Senator, he worked to help clean up Lake Michigan. As a United States Senator, he is a key leader on the bipartisan Great Lakes Compact -- legislation which ensures that as demand for water grows for our businesses and communities, the Great Lakes region will be ready to create jobs and support growth in a sustainable way. He was also a co-sponsor of the Great Lakes Collaboration Implementation Act and other legislation to help prevent the spread of invasive species, promote cleanup initiatives and projects, and prevent sediment pollution. In contrast, Senator John McCain has repeatedly failed to support critical legislation and even opposed measures to preserve the Great Lakes, including cleanup initiatives and projects to prevent sediment pollution. He also opposed funding to complete the Asian Carp Barrier Project to prevent invasive species from reaching the Great Lakes.

The Obama-Biden vision for the future of our Great Lakes will:

- **Provide New Federal Funding of \$5 Billion to Jumpstart Great Lakes Restoration**
- **Designate a Great Lakes Coordinator to Prioritize Coordination of Federal, State and Local Agencies**
- **Ratify and Fully Implement the Great Lakes Compact to Conserve Water and Protect Against Water Diversions**

Protecting and Restoring the Natural Heritage of the Great Lakes: Barack Obama has a plan to restore the Great Lakes ecosystem and to revive this engine of economic prosperity. The plan is built around a commitment to restore our outdoor heritage: pure and safe drinking water; fish that are safe to eat; and a healthy resource for all Americans to use and enjoy. Barack Obama will replace empty talk with serious action to protect and restore our Great Lakes. His five-point plan for restoring our Great Lakes includes:

1. \$5 BILLION GREAT LAKES TRUST FUND

Barack Obama will provide \$5 billion in new federal funds to jumpstart the restoration work and capture the economic, ecological and community quality of life values. The money to establish this trust fund will be generated from rolling back tax breaks and loopholes for big oil and gas companies.

Federal funding is desperately needed to invest in the sewage repairs, toxic cleanups, and wetlands restoration that will maintain and restore the greatness of the Lakes. The \$5 billion investment will support clean beaches and new parks, build boat ramps, and protect open spaces, wildlife habitats and wetlands. An Obama-Biden administration will make the federal government a full partner with states and municipalities in addressing wastewater treatment and storm water control needs. Funding will help eliminate sources of pathogenic pollution that puts public health at risk rather than just funding to study the problem. As a State Senator with lakefront district that included beaches that regularly closed, Barack Obama understands that healthy beaches contribute to local economies and must be clean for families to enjoy.

According to the Brookings Institution, an investment in Great Lakes restoration will create jobs and improve the local economy. A healthy Great Lakes ecosystem would boost the long-term regional economy by an estimated \$50 billion and create a short-term economic gain of at least \$30 billion. Brookings concludes that for each \$1 invested in Great Lakes restoration, \$2 or more will be generated in additional jobs, property value, and other economic enhancements.

2. AGGRESSIVE TOXICS PLAN FOR THE GREAT LAKES

The Obama-Biden Administration will end the "business as usual" approach to toxic releases into the Great Lakes. Their toxics plan for the Great Lakes will comprehensively measure current toxic loadings, identify significant sources of new toxics, and develop an integrated strategy for reducing toxic deposits in the Great Lakes that harm fish, wildlife and people.

To address harmful mercury pollution, Obama will not only implement and enforce the Clean Air Act, but he will also strengthen the federal mercury pollution reduction standards in order to protect children's health and our environment. Under his Great Lakes Restoration Plan, toxic legacy "hot spots" will be prioritized and cleaned up.

3. GREAT LAKES COORDINATOR

The current piecemeal approach to dealing with the Great Lakes ecosystem is neither efficient, nor effective. The Obama-Biden Administration will designate a Great Lakes Coordinator in the U.S. Environmental Protection Agency to prioritize coordination of Federal, State and Local Agencies' agendas, policies, expertise, funds and staff.

4. ZERO TOLERANCE POLICY FOR INVASIVE SPECIES

Invasive species threaten the ecological balance of the Great Lakes; over 160 exotic species have already invaded the Lakes. Invaders like zebra mussels deprive fish of food, cause blooms of toxic algae and overtake spawning areas and drinking water intakes. Recent research indicates that invasive species are costing taxpayers hundreds of millions of dollars in ecological damage.

The Obama-Biden Administration will address the serious problem of invasive species by taking more aggressive steps to prevent their introduction into the Great Lakes. He will join in efforts with the eight Great Lakes states to stop the discharge of invasive species from the ballast water of ships. They will aggressively

pursue policies and dedicate federal funds to control and prevent Asian Carp and other new harmful species from entering the Great Lakes. They will also enhance investment in research, development and necessary actions, such as electric barriers, to support efforts to prevent, control, and eradicate invasive species, as well as to educate citizens and stakeholders.

5. "NO WATER DIVERSIONS" COMPACT POLICY THAT WORKS FOR THE GREAT LAKES

Barack Obama is a lead cosponsor of the Great Lakes Compact legislation. The Compact is an agreement between the eight lake-bordering states to protect the Great Lakes from water diversions and exports. As President, he will work closely with the Governors and municipal leaders to encourage water conservation and avoid out-of-basin diversions in the future.

Paid for by Obama for America

Printed in House

From: Chris_Dionigi@ios.doi.gov [mailto:Chris_Dionigi@ios.doi.gov]
Sent: Monday, February 09, 2009 1:05 PM
To: Rep. Craig Johnson
Subject: Fw: Economic Impact of Invasive Species

Hello Representative Johnson and Ms. Ostnes,

Thank you for your interest in invasive species and NISC. My boss, Lori Williams asked me to respond to your request for information.

The number that you reference is widely used. It is based upon a compilation of cost estimates that could be found in the published literature at the time. The authors included a very broad scope of species, such as human pathogens. While it is a widely referenced citation from a peer-reviewed journal, there are other estimates that are more specific to your question.

There is no overall estimate of the economic impact of invasive plants for the U.S. The economic impact of most species is poorly documented. This is generally due to a lack of quantitative information on ecosystems impact and the challenge of assessing non-market cost, such as those to society and the environment, (e.g., changes in fire frequency, wildlife habitat, aesthetics, and biodiversity) (Duncan and Clark, 2005 – see below). For example, invasive plants in wetlands can impact recreational opportunities (fishing, swimming, boating, etc.), consumer communities, biogeochemical cycling, water levels (Shafroth and others 2005), and diversity (Schooler and others 2006). The Weed Science Society of America lists several invasive plants that cause allergic reactions. These categories of impact do not lend themselves to economic valuation.

The overall economic impact of invasive plants is difficult to estimate even well-defined systems such as row crops. A report published in 1992 estimated average annual monetary loss in the U.S. caused by weeds with current control strategies in 46 row crops to be \$4.6 billion (Bridges, D. C. 1992. *Crop Losses due to Weeds in Canada and the United States*. D. C. Bridges (ed). Weed Science Society of America, 309 West Clark Street, Champaign, IL. 403 pp). I am not aware of a more recent overall estimate for row crop weed losses. Nationwide, aquatic weed control is estimated to cost 1 to 10 billion dollars annually. Florida alone spends \$30 million each year to control aquatic weeds. A recent paper by Zika et. al (<http://www.ehponline.org/members/2008/11501/11501.pdf>) indicates that certain invasive plants such are **Canada Thistle** will become more difficult to control with herbicides at higher carbon dioxide levels.

The 2005 book edited by Duncan and Clark (Duncan, Celestine L., and Janet K. Clark, eds. *Invasive Plants of Range and Wildlands and Their Environmental, Economic, and Societal Impacts*. Weed Science Society of America, 2005) provides an overall acreage and spread estimates for 16 invasive plants. They report that these species alone infest over 126 million acres of Western range lands in 17 states. They are spreading at rates from 1.3% to 25% annually.

While there are few overall estimates of economic impacts due to invasive plants, there is some specific information. **Leafy Spurge**, a Noxious Weed in Alaska, is estimated to cause an **\$185 million** annual impact in Montana, North Dakota, South Dakota, and Wyoming (Duncan and Clark, 2005, page 101). They also report that **Russian knapweed**, another Alaska Noxious weed, is estimated together with spotted and diffuse knapweeds to cause **\$42 million** in direct and secondary costs in Montana alone each year. If even a fraction of the costs from just these two species would to occur in Alaska, the economic harm would be considerable. Alaska is fortunate; many of the invasive species that cause extensive harm in other states are largely preventable in Alaska.

However, technical experts I have talked with say that many invasive plants could survive and spread in Alaska if they reach your state. The magnitude of the resources at risk in Alaska and the challenges of controlling species on such scales are great. In Alaska, maybe even more so than other places, prevention and early detection and rapid response efforts are critical.

Your statement in your sponsor statement might be something like: **"Invasive species are a relentless problem. These harmful, non-native plants, animals and microorganisms impact our economy and environment. The overall economic impact of invasive species in the U.S. was estimated in the range of tens of billions of dollars per year in 2000. The potential economic harm that invasive species could cause in Alaska is difficult to estimate. However, if just a few invasive plant species that are of known concern were to become wide-spread, they alone could cost the State's economy tens of millions of dollars annually."**

Please let me know if I can be of service.

Thanks again, Chris

Chris Dionigi, Ph.D.
Assistant Director for Domestic Policy, Science, and Cooperation
National Invasive Species Council (NISC)
1201 Eye Street, N.W. Room 71, Floor 5
Washington, DC 20005
202-513-7243, direct 202-354-1876, fax, 202-371-1751
Chris_Dionigi@IOS.DOI.gov
www.Invasivespecies.gov

----- Forwarded by Chris Dionigi/NISC/OS/DOI on 02/09/2009 02:32 PM -----

From: Lori Williams/NISC/OS/DOI
To: <Chris_Dionigi@ios.doi.gov>
Date: 02/09/2009 09:42 AM
Subject: Fw: Economic Impact of Invasive Species

Please answer this inquiry with existing data such as it is
Thanks!

From: "Rep. Craig Johnson" [Representative_Craig_Johnson@legis.state.ak.us]
Sent: 02/08/2009 03:23 PM YST
To: Lori Williams
Subject: Economic Impact of Invasive Species
Hello,

We will be hearing for the first time a House Bill to form the Alaska Council on Invasive Species on February 18, 2009. I have attached the bill for your perusal. I have also attached a Sponsor Statement for the House Bill.

I was only able to find a cost figure from 2000 for an economic impact to the United States of \$137 billion dollars.
(Pimentel, D., Lach, L., Zuniga, R., and D. Morrison. 2000. Environmental and Economic Costs of Nonindigenous Species in the United States. BioScience 50(1):53-65.)

Would you have an updated figure I might be able to use? I would also like to identify some cost figures to other states for their attempts to eradicate or contain invasive species.

Any help you might be able to give would be greatly appreciated.

Thanks,
Jeanne Ostnes, Staff
Representative Craig Johnson
Co-Chair House Resources Committee
Phone: 907-465-4993
Fax: (907) 465-3872

[attachment "00 HB0012A.pdf" deleted by Chris Dionigi/NISC/OS/DOI] [attachment "00 Sponsor Statement Alaska Council on Invasive Species.pdf" deleted by Chris Dionigi/NISC/OS/DOI]

Costs of Invasive Species

Invasive aquatic species pose a significant problem for our state. Nationally, hundreds of millions of dollars are spent every year in efforts to control aquatic invasive species. Experts in the field agree that money spent on prevention is a wise investment. Once an invasive species takes hold, it is virtually impossible to eliminate it from a lake or stream. The cost of managing the problem, let alone the economic downside to infestations, is enormous. Here are some figures to put it into perspective:

- All the new England states as well as 41 other states and six Canadian provinces, are battling milfoil, water chestnut and other plants as well as invaders such as zebra mussels.
- Mechanical or chemical means of control can typically cost \$200-2000 per lake-acre each year, with no end in sight.
- New research in Vermont shows that invasive plants can cost shoreline owners over \$12,000 each in lost property values on infested lakes.
- Since the early 1980's Vermont has spent over \$6 million dollars in state, federal and local funds to prevent and control the spread of invasive aquatic species. That state now spends more than \$200,000 annually just on staff devoted to managing the problem on 46 of its 285 larger lakes.
- New Hampshire spends close to \$100,000 each year in state-local operating funds to cost share on 7-9 control projects. This does not come close to the public demand for projects on their 55 infested lakes.
- Massachusetts spends over \$290,000 annually on grants for local lake projects, most of which is spent on invasives control in their 298 infested lakes. The state also spends \$95,000 each year for control operations just on state properties.
- In 1998 alone, Connecticut spent more than \$150,000 in state funds to cost share local projects for invasives control.

Maine has been spared the worst of this problem, but already some local groups are struggling with invasive plants. The cost of these invasions could prove to be enormous. If we saw a fraction of Vermont's infestation rate just in our southern five counties, the property value loss alone would exceed \$11 million and control costs could reach \$2-4 million/year. This does not even begin to tally losses in local tourism dollars, fishing, and water sports opportunities, and the wholesale alteration of habitat. We should consider the very great losses we face if we do not mount an effective effort to combat the spread of these invasive species.

Action Washington

Year established 2007-Legislature

Sunset 2011

Number of members 17

State Agency Reps 5: DNR, DOT, DFW, Ecol., Ag.

Non-agency Reps 12: 6 Feds: CG, CBProtect, DA, EPA, FS, FWS

Where Council is housed WA Recreation and Conservation Ofc (Interagency)

Funding (source) \$200,000 bi-annual (GF)

Other Funding

Administrative Support Part-time Coordinator, Part-time Planner (RCO)
RCO provides admin support (attends mtgs), graphics, tech. writer

Travel Paid by Council

Deliverables

Strategic Plan X- written by coord & plan, (council work groups) hired GD, Tech writer, RCO Com Dir.

Annual Report X- written by coordinator & planner

Projects X-mandated to engage in at least one project annually

Other Responsibilities

Chairing

Responsibilities

Oregon

2001-Legislature

13

5: PSU, Forestry, F&W, OSU SG, Ag-Plant Div.

8: see list (no feds)

Department of Ag.

\$15,000 bi-annuum (GF)

Coordinator: 1/3 FTE GF, 1/3 FTE Fed., 1/3 FTE gant
(Nature Cons.)

FED \$ NEVER RECEIVED

2/3 coordinator who is contracted, non-state employee

Agency reps pay own travel, some other reps volunteer,
others accept pay

X - Action Plan: Written by present chair with asst from
agency staff

X - Written by chair and membership

no funding for projects

Education, website, phone

Rotates annually among state agency reps

National invasive species panel gets a look at Alaska

The introduction of foreign species into Alaska could threaten ecosystems and damage fishing, subsistence, hunting and tourism industries. For the first time ever, the Invasive Species Advisory Committee met in Anchorage for a week-long summit. The committee, based in Washington, holds meetings in locations across the United States, in order to get a first-hand look at the issues at hand.

The committee is composed of stakeholders from state organizations, industry, conservation groups, scientists, academia and other interests from across the U.S. It advises the National Invasive Species Council, an inter-departmental body that helps coordinate federal action on invasive species.

Lori Williams, the executive director of the national council, said that, given the absence of any huge problems with invasive species in Alaska to date, she was impressed by the level of effort on the part of volunteers and agency experts to confront the issue here.

"Even though it's a small number of people and the programs are relatively small, everyone was on the right track and knew what the issues were," Williams said. "They were very aware of their challenges."

The Prince William Sound Regional Citizens' Advisory Council has held a seat on the Invasive Species Advisory Committee since 2000.

Council Director of Administration Lisa Ka'aihue worked primarily with Jeff Heys of the National Park Service to bring the Invasive Species Advisory Committee meeting to Alaska, in an effort to collaborate on invasive species prevention and to share information about the latest legislation, technologies and progress in the fight against invasive species across the U.S.



The council's Lisa Ka'aihue and Jeff Heys of the National Park Service worked to bring the Invasive Species Advisory Committee meeting to Alaska.

coastal organisms in ballast water has been a major concern for invasions in recent years. Port Valdez ranks third in the United States for ballast water discharge, putting it at high risk for invasion.

Hull fouling is another focus of the council with regard to invasive species. Hull fouling involves organisms such as barnacles or mussels

attaching themselves to ship hulls and either coming in contact with structures in a new port or releasing larvae into the water.

A critical issue for the council is the fact that the National Invasive Species Act of 1996 exempts crude oil tankers in the Alaska North Slope trade from ballast water exchange requirements. Ballast water exchange is a technique to remove coastal organisms from ballast tanks by replacing the seawater taken on in port with open-ocean seawater.

The council is currently working on several projects to defend the Sound from invasive species, including monitoring for the European green crab, partnering with U.S. Fish and Wildlife Service to identify and record hull fouling on large ships, and working with the University of Washington to develop hull sampling methods, focusing on oil tankers in particular.

Several invasive-species bills are before Congress, some addressing ballast-water management. The council has submitted comments in favor of bills that remove a trade exemption that includes Alaska tankers sailing to domestic ports, currently exempt from ballast water regulations that require exchange and reporting.

At the state level, the council has been active in the Alaska Invasive Species Working Group to coordinate efforts and push forward issues of concern.

For more information on invasive species, visit www.adfg.state.ak.us and look for the invasive species link under News & Issues. Or, visit the citizens' council website, www.pwsrccac.org.

Species documented in Alaska:				Likely or previously	
Taxon	Scientific Name	Common Name	In AK?	ranked highly invasive	Reference
Amphibians	<i>Pseudacris regilla</i>	Pacific chorus frog	Yes		Schrader and Hennon 2005, USGS 2007, MacDonald 2003, Hodge 2004
Amphibians	<i>Rana aurora</i>	red-legged frog	Yes	Schrader and Hennon 2005	Schrader and Hennon 2005
Amphibians	<i>Taricha granulosa</i>	rough-skinned newt	Yes		USGS 2007
Birds	<i>Columba livia</i>	rock dove, rock pigeon	Yes		Schrader and Hennon 2005, GISD 2007, UCS 2005
Birds	<i>Sturnus vulgaris</i>	Starling	Yes		Schrader and Hennon 2005
Fish	<i>Alosa sapidissima</i>	American shad	Yes		USGS 2007
Fish	<i>Astronotus ocellatus</i>	Oscars	Yes		Fay 2002
Fish	<i>Carassius auratus</i>	Goldfish	Yes		Fay 2002
Fish	<i>Dallia pectoralis</i>	Alaska blackfish	Yes - native but moved		USGS 2007, UCS 2005
Fish	<i>Esox lucius</i>	Northern pike	Yes	Schrader and Hennon 2005, Fay 2002	Fay 2002, Schrader and Hennon 2005, UCS 2005, USGS 2007
Fish	<i>Gambusia affinis</i>	Western mosquitofish	Yes - but persistence is ?		USGS 2007
Fish	<i>Gasterosteus aculeatus</i>	threespine stickleback	Yes		USGS 2007
Fish	<i>Oncorhynchus kisutch</i>	Coho salmon	Yes		USGS 2007
Fish	<i>Oncorhynchus mykiss</i>	rainbow trout	Yes		Schrader and Hennon 2005, USGS 2007
Fish	<i>Perca flavescens</i>	yellow perch	Yes but eradicated	Schrader and Hennon 2005, Fay 2002	Fay 2002, USGS 2007, UCS 2005, Schrader and Hennon 2005
Fish	<i>Salmo salar</i>	Atlantic salmon	Yes	Schrader and Hennon 2005, Fay 2002	Fay 2002, UCS 2005, USGS 2007, Schrader and Hennon 2005
Fish	<i>Salvelinus fontinalis</i>	brook trout	Yes	Fay 2002	Fay 2002, USGS 2007, UCS 2005
Fish	<i>Thymallus arcticus</i>	Arctic grayling	Yes - native but moved		USGS 2007, UCS 2005
Fish		Ornamental aquarium fish	Yes		Fay 2002
Invertebrates	<i>Adelges piceae</i>	Eastern spruce gall aphid	Yes		Schrader and Hennon 2005
Invertebrates	<i>Archips cerasivorana</i>	Uglynest caterpillar	Yes		USFS 2007, Schrader and Hennon 2005, UCS 2005
Invertebrates	<i>Arion ater</i>	European black slug	Yes		Schrader and Hennon 2005, UCS 2005

Species documented in Alaska:				Likely or previously	
Taxon	Scientific Name	Common Name	In AK?	ranked highly invasive	Reference
Invertebrates	<i>Arion sp.</i>	Garden slug	Yes		Schrader and Hennon 2005
Invertebrates	<i>Asterias amurensis</i>	Sea star	Yes - Cryptogenic		Hines and Ruiz 2001
Invertebrates	<i>Bougainvillea sp. 2</i>	hydroid	Yes - Cryptogenic		Hines and Ruiz 2001
Invertebrates	<i>Bougainvillea sp. 1</i>	hydroid	Yes - Cryptogenic		Hines and Ruiz 2001
Invertebrates	<i>Cliona thosina</i>	oyster shell boring sponge	Reported but not yet confirmed		Hines and Ruiz 2001
Invertebrates	<i>Crassostrea gigas</i>	cultured oyster	Yes		Hines and Ruiz 2001 GISD 2007
Invertebrates	<i>Cuspidella grandis</i>	hydroid	Yes - Cryptogenic		Hines and Ruiz 2001
Invertebrates	<i>Distaplia alaskensis</i>	ascidiacean	Yes - Cryptogenic		Hines and Ruiz 2001
Invertebrates	<i>Elatobium abietinum</i>	Spruce aphid	Yes		Schrader and Hennon 2005
Invertebrates	<i>Epinotia solandriana</i>	Birch leafroller	Yes		Schrader and Hennon 2005
Invertebrates	<i>Eriocampa ovata</i>	Alder woolly sawfly	Yes		Schrader and Hennon 2005, USFS 2007
Invertebrates	<i>Fenusa pusilla</i>	Birch leafminer	Yes		Schrader and Hennon 2005
Invertebrates	<i>Garvia franciscana</i>	hydroid	Yes		Hines and Ruiz 2001
Invertebrates	<i>Heterarthrus nemoratus</i>	Birch-edge leafminer	Yes		Schrader and Hennon 2005
Invertebrates	<i>Heteromastus filiformis</i>	a capitellid worm	Yes		USGS 2007
Invertebrates	<i>Limax maximus</i>	Leopard slug	Yes		Schrader and Hennon 2005
Invertebrates	<i>Lymantria dispar</i>	European gypsy moth, Asian gypsy moth	Yes	Schrader and Hennon 2005	Schrader and Hennon 2005, UCS 2005, USFS 2007, Kruse pers. comm.
Invertebrates	<i>Malacosoma californicum</i>	Western tent caterpillar	Yes	Schrader and Hennon 2006	Schrader and Hennon 2005, UCS 2005, Kruse pers. comm.
Invertebrates	<i>Manayunkia speciosa</i>	a sabellid worm	Yes		USGS 2007
Invertebrates	<i>Mya arenaria</i>	soft-shelled clam	Yes		Hines and Ruiz 2001, USGS 2007, Powers et al. 2006
Invertebrates	<i>Nematus ribesii</i>	Currantworm	Yes		Schrader and Hennon 2005, UCS 2005
Invertebrates	<i>Noctua pronuba</i>	European Yellow Underwing Moth	Yes		USFS 2007

Species documented in Alaska:				Likely or previously	
Taxon	Scientific Name	Common Name	In AK?	ranked highly invasive	Reference
Invertebrates	<i>Opercularella lacerata</i>	hydroid	Yes		Hines and Ruiz 2001
Invertebrates	<i>Otiorhynchus ovatus</i>	Strawberry root weevil	Yes		Schrader and Hennon 2005, UCS 2005
Invertebrates	<i>Pacifastacus leniusculus</i>	signal crayfish	Yes	Schrader and Hennon 2005, Fay 2002	USGS 2007, Schrader and Hennon 2005, Fay 2002
Invertebrates	<i>Pikonema alaskensis</i>	Yellow-headed Spruce Sawfly	Yes		USFS 2007
Invertebrates	<i>Pissodes strobi</i>	Sitka spruce weevil, white pine weevil	Yes		USFS 2007, Schrader and Hennon 2005, UCS 2005
Invertebrates	<i>Polydora websteri</i>	polychaete blister worm	Reported but not yet confirmed		Hines and Ruiz 2001
Invertebrates	<i>Pristiphora erichsonii</i>	Larch sawfly	Yes	Schrader and Hennon 2005	Schrader and Hennon 2005, UCS 2005
Invertebrates	<i>Proboscidactyla flavicirrata</i>	hydroid	Yes		Hines and Ruiz 2001
Invertebrates	<i>Procambarus clarkii</i>	red swamp crayfish	Yes		USGS 2007
Invertebrates	<i>Profenusa thomsoni</i>	Amber-marked birch leafminer	Yes	Schrader and Hennon 2005	Schrader and Hennon 2005, UCS 2005
Invertebrates	<i>Rhyacionia buoliana</i>	European pine shoot moth	Yes		Schrader and Hennon 2005, Kruse pers. comm.
Invertebrates	<i>Schizoporella unicornis</i>	bryozoan	Yes		Hines and Ruiz 2001
Invertebrates	<i>Schizoporella unicornis</i>	single horn bryozoan	Yes		USGS 2007
Invertebrates	<i>Tubularia crocea</i>	a hydroid	Reported but not yet confirmed		USGS 2007
Invertebrates	<i>Venerupis philippinarum</i>	Japanese littleneck clam, Manila clam	Reported but not yet confirmed		Hines and Ruiz 2001, Secord et al. 2005
Invertebrates		various ballast water species	Yes		Fay 2002
Invertebrates		Oysters	Yes		Fay 2002
Mammals	<i>Alopex lagopus</i>	Arctic fox	Yes		USFWS 2007, Ebbert and Byrd (2002).
Mammals	<i>Castor canadensis</i>	Beaver	Yes		Brown pers. comm.
Mammals	<i>Cervus elaphus</i>	Elk	Yes		Schrader and Hennon 2005
Mammals	<i>Lepus americanus</i>	Snowshoe hare	Yes		Schrader and Hennon 2005, Davis 1979
Mammals	<i>Martes americana</i>	American marten	Yes - native but moved		Schrader and Hennon 2005

Species documented in Alaska:				Likely or previously	
Taxon	Scientific Name	Common Name	In AK?	ranked highly invasive	Reference
Mammals	<i>Mus musculus</i>	House mouse	Yes		Schrader and Hennon 2005, UCS 2005, USFWS 2007
Mammals	<i>Odocoileus hemionus</i>	Sitka black-tailed deer	Yes - native but moved		Schrader and Hennon 2005
Mammals	<i>Ondatra zibethicus</i>	Muskrat	Yes		Brown pers. comm.
Mammals	<i>Oreamnos americanus</i>	Mountain goat	Yes		Brown pers. comm.
Mammals	<i>Oryctolagus cuniculus</i>	European rabbit	Yes		Schrader and Hennon 2005, USFWS 2007
Mammals	<i>Peromyscus maniculatus</i>	Deer mouse	Yes		USFWS 2007, Ebbert and Byrd 2007
Mammals	<i>Procyon lotor</i>	Raccoon	Yes		Schrader and Hennon 2005
Mammals	<i>Rangifer tarandus asiaticus</i>	Reindeer	Yes		USFWS 2007
Mammals	<i>Rattus norvegicus</i>	Norway rat, Brown rat	Yes	Schrader and Hennon 2005	Schrader and Hennon 2005, UCS 2005, USFWS 2007
Mammals	<i>Rattus rattus</i>	Black rat, Roof rat	Yes		USFWS 2007
Mammals	<i>Spermophilus paryii ablusus</i>	Arctic ground squirrel	Yes		USFWS 2007, Ebbert and Byrd (2002).
Mammals	<i>Spermophilus paryii nebulicola</i>	Arctic ground squirrel	Yes		USFWS 2007, Ebbert and Byrd (2002).
Mammals	<i>Tamiasciurus hudsonicus</i>	Red squirrel	Yes - native but moved		Schrader and Hennon 2005
Mammals	<i>Vulpes vulpes</i>	Red Fox	Yes		USFWS 2007
Parasites	<i>Trichodectes canis</i>	Biting dog louse	Yes		Golden et al. 1999., Griese 1999, ADF&G 2005, UCS 2005
Pathogens	<i>Apiosporina morbosa</i>	black knot	Yes		Schrader and Hennon 2005
Pathogens	<i>Cronartium ribicola</i>	white pine blister rust	Yes		Schrader and Hennon 2005
Pathogens	<i>Erwinia amylovora</i>	a bacterial fire blight	Yes		Schrader and Hennon 2005
Pathogens	<i>Myxobolus cerebralis</i>	Whirling disease parasite	Yes	Fay 2002	WDI 2007, Arsan et al. 2007, Fay 2002

Species found in nearby states or provinces, or likely to be found in Alaska in the future:					
Taxon	Scientific Name	Common Name	In AK?	Likely or previously ranked highly invasive	Reference
Amphibians	<i>Rana catesbeiana</i>	American bullfrog	No		Secord et al. 2005
Invertebrates	<i>Adelges abietis</i>	Woolly spruce aphid	No		Schrader and Hennon 2005
Invertebrates	<i>Adelges tsugae</i>	Hemlock woolly adelgid	No		Schrader and Hennon 2005
Invertebrates	<i>Alitta succinea</i>	pile worm	No		GISD 2007
Invertebrates	<i>Anoplophora glabripennis</i>	Asian longhorned beetle	No		Schrader and Hennon 2005, UCS 2005
Invertebrates	<i>Batracharia atramentaria</i>	Mudsnail	No		Secord et al. 2005
Invertebrates	<i>Botrylloides violaceus</i>	an orange sheath tunicate	No		USGS 2007
Invertebrates	<i>Botryllus schlosseri</i>	Colonial sea squirt	No		Secord et al. 2005
Invertebrates	<i>Bugula neritina</i>	brown bryozoan	No		GISD 2007
Invertebrates	<i>Bythotrephes cederstroemi</i>	Spiny water flea	No		Fay 2002, GLIN 2007
Invertebrates	<i>Carcinus maenas</i>	Green crab, European green crab	No	Fay 2002	Fay 2002, UCS 2005
Invertebrates	<i>Ciona savignyi</i>	solitary sea squirt	No		Secord et al. 2005
Invertebrates	<i>Clathria prolifera</i>	Red beard sponge	No		Secord et al. 2005
Invertebrates	<i>Cliona sp.</i>	boring sponge	No		USGS 2007
Invertebrates	<i>Coleophora laricella</i>	Larch casebearer	No		Schrader and Hennon 2005
Invertebrates	<i>Crepidula fornicata</i>	Atlantic slipper snail	No		Secord et al. 2005
Invertebrates	<i>Dendrolimus pini</i>	Pine moth	No	Schrader and Hennon 2005	Schrader and Hennon 2005
Invertebrates	<i>Diadumene lineata</i>	Japanese anemone	No		Secord et al. 2005
Invertebrates	<i>Didemnum lahillei</i>	Colonial sea squirt	No		Secord et al. 2005
Invertebrates	<i>Dreissena polymorpha</i>	Zebra mussel	No	Fay 2002	Fay 2002, UCS 2005
Invertebrates	<i>Eriocheir sinensis</i>	Chinese mitten crab	No	Schrader and Hennon 2005, Fay 2002	Fay 2002, Schrader and Hennon 2005
Invertebrates	<i>Hemichroa crocera</i>	European alder sawfly	No		Schrader and Hennon 2005
Invertebrates	<i>Ilyanassa obsoleta</i>	Eastern mudsnail	No		Secord et al. 2005

Species found in nearby states or provinces, or likely to be found in Alaska in the future:					
Taxon	Scientific Name	Common Name	In AK?	Likely or previously ranked highly invasive	Reference
Invertebrates	<i>Ips cembrae</i>	Larch engraver	No		Schrader and Hennon 2005
Invertebrates	<i>Ips typographus</i>	European spruce beetle	No	Schrader and Hennon 2005	Schrader and Hennon 2005
Invertebrates	<i>Lymantria mathura</i>	Rosy gypsy moth	No		USFS 2007
Invertebrates	<i>Lymantria monacha</i>	Nun moth	No	Schrader and Hennon 2005	Schrader and Hennon 2005
Invertebrates	<i>Malacosoma disstria</i>	Forest tent caterpillar	No	Schrader and Hennon 2006	Schrader and Hennon 2005
Invertebrates	<i>Musculista senhousia</i>	Japanese mussel	No		Secord et al. 2005
Invertebrates	<i>Mytilus galloprovincialis</i>	Mediterranean mussel	No		Secord et al. 2005
Invertebrates	<i>Nuttallia obscurata</i>	Purple varnish clam	No		Secord et al. 2005
Invertebrates	<i>Ocenebrellus inornatus</i>	Japanese oyster drill	No		Secord et al. 2005
Invertebrates	<i>Pacifastacus leniusculus</i>	Signal crayfish	No		GISD 07, and Fay 2002
Invertebrates	<i>Potamopyrgus antipodarum</i>	New Zealand Mudsnaill	No	Schrader and Hennon 2005, Fay 2002	Fay 2002, UCS 2005, Schrader and Hennon 2005
Invertebrates	<i>Styela clava</i>	solitary sea squirt	No		Secord et al. 2005
Invertebrates	<i>Teredo navalis</i>	European (naval) shipworm	No		Secord et al. 2005
Invertebrates	<i>Tetroplum fuscum</i>	Brown spruce longhorn beetle	No	Schrader and Hennon 2005	Schrader and Hennon 2005
Invertebrates	<i>Urosalpinx cinerea</i>	Atlantic oyster drill	No		Secord et al. 2005
Pathogens	<i>Bursaphelenchus xylophilus</i>	Pine wilt nematode	No		Schrader and Hennon 2005
Pathogens	<i>Chrysomyxa abietis</i>	a foliar spruce rust	No	Schrader and Hennon 2005	Schrader and Hennon 2005



Alaska Conservation Alliance

Uniting for Alaska's Future

February 5, 2009

House Committee on Resources
State Senate
Alaska State Capitol
Juneau, Alaska 99801-1182

Dear Representative Johnson, Buch and Munoz,

On behalf of the 40 conservation groups and the 38,000 Alaskans represented by the Alaska Conservation Alliance, I am pleased to acknowledge our strong support for HB12 to establish the Alaska Council on Invasive Species in the Department of Fish and Game. Some state economies have lost billions of dollars in revenue due to damage caused by invasives. In order for Alaska to avoid a similar fate, it is prudent to address this issue now.

We believe the 14-member Council will provide the broad stakeholder cooperation and oversight needed to prevent new invasive species from taking root in Alaska and to mitigate the damage of invasives currently pushing our native species to the brink. At risk are Alaska's biological treasures, its flora and fauna; its harvested resources and subsistence plants and animals; the beauty and diversity that make Alaska a world-class tourist destination.

Already Alaska has suffered the effects of invasive Atlantic Salmon, pike and Reed Canary grass, to name a few. Plants, animals, fish and crustaceans, introduced into an environment devoid of their natural predators and limitations can irreversibly destroy an ecosystem and the economy and cultures it supports. These foreign species invade Alaska's ecosystem primarily due to human activities. It is therefore important that Alaskans take an active role to prevent this potential man-made disaster by serving on the Alaska Council on Invasive Species.

The Alaska Conservation Alliance would like to thank you for this opportunity to voice our support for HB 12 and encourage you to pass this bill out of the Senate Finance Committee.

Sincerely,

Kate Troll
Executive Director

CC: House Finance Committee Members

Sent: 1/12/2009 2:12:20 P.M. Alaskan Standard Time
Subject: Letter of Support

To Whom It May Concern:

The threat from invasive weeds and other species continues to close in on Alaska every day. Work is continuing with a growing sense of urgency, and it is only with the active support of our legislators that we will ultimately succeed in protecting Alaska. We are forwarding an email we received from Representative Craig Johnson's office regarding a letter of support Senator Begich is providing for upcoming legislation in Alaska. Troy and I are asking for the continued support of Senator Murkowski, Representative Don Young and Governor Palin on these matters.

In addition to the legislation on the state level, The 100th Meridian Bill (S.1949) introduced by Senator Harry Reid would be a huge boost to Alaska's momentum and we are asking once again for it to be given a priority on the Natural Resources agenda for our legislators in Washington.

Troy and I have just returned from an interagency conference sponsored by the Oregon Dept of Agriculture, where we were invited speakers. We will be leaving to speak at another conference in Nevada next week. We receive these invitations because these groups are energized by the story of how citizens and dedicated agency experts are making a difference from the ground up in our Great land. But without support from the top down, Alaska will ultimately lose the precious ground she is holding now. Other states are watching as Alaska fights to avoid the same mistakes they made and are cheering our efforts as the sort of thing they only wish they would have had the insight to undertake when they had the opportunity. It is critical that we benefit from those who have gone before us--they are fighting losing battles to the tune of tens of millions of dollars a year because they hesitated. Alaska's economy, ecology and environment are at stake and we can not afford to be tentative. Each day adds more expense and less chance to win the battle!

We look forward to the results that will be achieved on this matter from a united Alaska!!

Troy and Lori Zaumseil
Citizens Against Noxious
Weeds Invading the North
CANWIN
AKCANWIN@aol.com

Alaska Committee for Noxious and Invasive Plant
Management
c/o Elizabeth Bella, Vice Chair
2525 C Street, Suite 305
Anchorage, AK 99503



Governor Sarah Palin
Alaska State Capital Building
Third Floor
PO Box 110001
Juneau, AK 99811-0020

Dear Governor Palin:

The Board of Directors for the Alaska Committee for Noxious and Invasive Plants Management (CNIPM) would like to provide members of the legislature information about invasive species threats to natural resources and invasive species management efforts in Alaska and other states. CNIPM works for the statewide management of noxious and invasive plants in Alaska. CNIPM is an informal group comprised of individuals involved in invasive species work, representing agencies and organizations statewide. More information about CNIPM is found at our website at: <http://www.uaf.edu/ces/cnipm/>. The information provided may be of assistance in making decisions about House Bill 12 (HB12), "An Act establishing the Alaska Council on Invasive Species in the Department of Fish and Game".

Invasive species have proven worldwide to be a threat to natural resources because they compete with crops and native species, degrade fish and wildlife habitat, and can decrease property values. Worldwide, estimated annual costs of invasive species are \$1.4 trillion. Idaho spends \$300 million a year on invasive species control, and Montana spends \$14 million a year on just one weed, spotted knapweed. In Alaska, spotted knapweed has been found at just more than 10 sites. Many other invasive species have been found in Alaska in similarly small populations that will expand beyond control without prompt management. Managing invasive plants species when they are in small, incipient populations is recognized by experts as the most cost effective way to prevent damage to resources and the economy. Alaska has a unique opportunity in prevention; to avoid natural resource losses, direct and indirect economic impacts and extensive herbicide use that others are experiencing.

Despite Alaska's unique opportunity, invasive species management professionals and the public have discovered well established and expanding populations of highly invasive species ranging from rat and insects to plants such as orange hawkweed. These highly invasive species are a threat to agricultural production, forestry, fisheries, tourism, subsistence resources, waterfowl, large and small game, wildlife, and non-timber forest products such as wild berries. Alaska's natural resource based industries and subsistence areas are dependent on these resources. In other parts of the world introductions of invasive species have contributed to severe impacts to these resources. To prevent losses

to resources from invasive species with the least amount of cost action should be taken now.

Other states have established Invasive Species Councils to provide affected stakeholders a cooperative means of communicating, planning, coordinating, and collaborating efforts towards invasive species prevention and management. Inclusion of an appropriate range of stakeholders on a council provides a framework for governmental, public, and private entities to identify solutions in a timely fashion. Swift coordinated management will reduce management cost and prevent major losses to resources and expenditures of state funds.

Invasive species councils develop and regularly review statewide strategic plans for invasive species prevention and management. Plans provide coordination and direction to state agencies and local weed management efforts. Strategic plans establish a state policy towards invasive species. Strategic plans developed by a council demonstrate state commitment and cooperation with local efforts. State commitment and cooperation is often a pre-requisite to acquisition of funds through grant programs supporting invasive species management.

A council's coordinated approach will serve many essential functions in advancing invasive species management. Councils facilitate the development of a statewide policy to address the risks of existing invasive species in the state and the prevention of the introduction of additional invasive species. Councils foster communication between entities, helping to develop partnerships and identify and fill gaps in funding. Federal agency involvement is essential, and often Federal departments and agencies are provided ex-officio board seats on invasive species councils. In Alaska and other parts of the United States Federal Agencies have provided essential partnerships and support for invasive species management efforts.

Development of a strategic plan will implement control of invasive species, coordinate efforts, prioritize actions, streamline management efforts, identify information gaps, and implement early detection and rapid response plans. Council developed strategic plans facilitate implementation of essential elements that are widely recognized as critical to successful invasive species management.

Thank you for your time and actions to protect Alaska's natural resources and economies related to those resources from the threat of invasive species.

Sincerely,



Gino Graziano (CNIPM Board Chair)

Elizabeth Bella (CNIPM Board Vice-Chair)

Michele Hebert
1460 Goshawk Lane
Fairbanks, Alaska 99709

January 19, 2009

Honorable Sarah Palin
Governor of the State of Alaska
P.O. Box 11001
Juneau, AK 99811-0001

Dear Governor Palin:

I am writing a letter in support of the formation of an Alaska Council on Invasive Species. I am a professor of Agriculture with the Cooperative Extension Service at the University of Alaska, Fairbanks. I chair the Alaska Invasive Species Working Group, with a mission to minimize invasive species impacts in Alaska by facilitating collaboration, cooperation and communication among Federal, State, Tribal and private groups. The establishment of a council is one of the top priorities for improving Alaska's ability to manage invasive species and protecting Alaska's industries potentially affected by problems invasive species pose.

Invasive species are a global problem, and Alaska is susceptible to many invaders, particularly as global climate change is projected to warm Alaska. Invasive species will, if not properly managed, affect all our major industries, including fisheries, tourism and transportation. The management of invasive species in other states cost millions of dollars. We have a unique opportunity in Alaska through the development of a council to be proactive and work collaboratively to reduce the introduction of new species and management efforts of species that have already entered the state.

A bill, HB 12 is being introduced by Representative Craig Johnson to the 26th Alaska Legislature. I urge you to support any legislation for the formation of an Invasive Species Council. Please support Bills that include the establishment of an Invasive Species Council and development of a strategic plan to address the threats of all invasive species in Alaska. If you have any questions, please contact Michele Hebert at 907-388-6085 or ffmah@uaf.edu.

Sincerely,

Michele Hebert
Agriculture and Horticulture Agent UAF

Cc: Representative Craig Johnson
State Capital, Room 126
Juneau, AK 99801-1182

Representative Craig Johnson
716 W. 4th Avenue Suite 640
Anchorage, AK 99501-2133

Larry Hartig, Commissioner
Department of Environmental Conservation
410 Willoughby Ave., Ste 303
P.O. Box 111800
Juneau, AK 99811-1800

Denby S. Lloyd, Commissioner
Department of Fish & Game
P.O. Box 115526
1255 W. 8th Street
Juneau, AK 99811-5526

Tom Irwin, Commissioner
Department of Natural Resources
550 W. 7th. Ave., Suite 1400
Anchorage, AK 99501

William H. (Bill) Hogan, Commissioner
Department of Health and Social Services
350 Main Street, Room 404
PO Box 110601
Juneau, Alaska 99811-0601

Leo von Scheben, Commissioner
Department of Transportation & Public Facilities
Office of the Commissioner
3132 Channel Drive
PO Box 112500
Juneau, AK 99811-2500

Representative David Guttenberg
AK State Capitol Room # 418
Juneau, AK 99801

Representative Mike Kelly
AK State Capitol, Room 434
Juneau, AK 99801-1182

Representative Gene Therriault
1292 Sadler Way, Room 308
Fairbanks, Alaska 99701



**UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration**

National Marine Fisheries Service

P.O. Box 21668

Juneau, Alaska 99802-1668

January 13, 2009

Governor Sarah Palin
Alaska State Capital Building
Third Floor
P. O. Box 110001
Juneau, Alaska 99811-0020

Dear Governor Palin:

The purpose of this letter is to express the support of the National Marine Fisheries Service (NMFS) for the formation of an Alaska Council on Invasive Species. A bill that would realize this goal is being introduced by Representative Craig Johnson to the 26th Alaska Legislature. NMFS hopes that Alaska will recognize both the threat invasive species pose to economic, environmental and human health, and the unique opportunity for Alaska to get "ahead of the curve" to prevent and control invasions early, when it is most economically feasible to do so. Invasive species experts from the lower 48 states and other countries repeatedly emphasize this advantage in the State of Alaska, but only for now. With climate change and increasing opportunities for many vectors to bring undesirable non-native species to Alaska, this enviable position will not last forever. Forming an Alaska Council to bring action to the problem will save money in the long run and preserve the integrity of Alaska's economy, environment and public health.

NMFS has been working closely with the Alaska Invasive Species Council and many other partners on the invasive species issue in Alaska. We have been impressed with the high degree of interest, enthusiasm, expertise and effort that has allowed much progress. More progress is needed, however, with the formation of an Alaska Council that is sufficiently funded to carry out its mandates. NMFS will seek to help bring success to minimizing the impacts of invasive species in Alaska as much as possible by participating as a Federal partner with an Alaska Council on Invasive Species.

Thank you for the opportunity to comment. If you have any questions regarding our support for the formation of an Alaska Council on Invasive Species, please, please contact Linda Shaw at 907-586-7643 or linda.shaw@noaa.gov.

Sincerely,

Robert D. Mecum
Acting Administrator, Alaska Region



cc: Representative Craig Johnson
Representative Craig Johnson
State Capital, Room 126
Juneau, AK 99801-1182

Representative Craig Johnson
716 W. 4th Avenue
Suite 640
Anchorage, AK 99501-2133

G:\INVASIVES\AK Council Letter of Support lrs 01-09.doc



Regional Citizens' Advisory Council / "Citizens promoting environmentally safe operation of the Alyeska terminal and associated tankers."

In Anchorage: 3709 Spenard Road / Suite 100 / Anchorage, Alaska 99503 / (907) 277-7222 / FAX (907) 277-4523
In Valdez: P.O. Box 3089 / 130 South Meals / Suite 202 / Valdez, Alaska 99686 / (907) 834-5000 / FAX (907) 835-5926

MEMBERS January 19, 2009

Alaska State
Chamber of
Commerce

Honorable Sarah Palin
Governor of the State of Alaska
P.O. Box 110001
Juneau, AK 99811-0001

Alaska Wilderness
Recreation & Tourism
Association

Dear Governor Palin:

Chugach Alaska
Corporation

Recently Representative Johnson introduced HB 12, "An Act establishing the Alaska Council on Invasive Species in the Department of Fish and Game." We feel this legislation is critical in helping to help protect our precious Alaska environments and economies from the threat of invasion by harmful non-indigenous organisms. Our support for this bill follows a letter we sent to you in November urging you to support the concept of an Alaska Invasive Species Council.

City of Cordova

City of Homer

City of Kodiak

City of Seldovia

City of Seward

City of Valdez

City of Whittier

Community of
Chenega Bay

I am writing on behalf of the Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) which is an independent non-profit corporation whose mission is to promote environmentally safe operation of the Valdez Marine Terminal and associated tankers. Our work is guided by the Oil Pollution Act of 1990, and our contract with Alyeska Pipeline Service Company. PWSRCAC's 18 member organizations are communities in the region affected by the 1989 Exxon Valdez oil spill, as well as commercial fishing, aquaculture, Native, recreation, tourism and environmental groups.

Community of
Tatitlek

We care about HB12 because of our experience and knowledge of invasive species issues. Invasion by non-indigenous aquatic species into Alaska waters, particularly Prince William Sound, is a serious and growing concern as huge volumes of oil-tanker ballast water containing such species continue to be discharged into the Sound. In partnership with governmental agencies and industry, we have supported invasive species research several years. PWSRCAC has also held a seat on the national Invasive Species Advisory Committee for over a decade now.

Cordova District
Fishermen United

Kenai Peninsula
Borough

Kodiak Island
Borough

Kodiak Village Mayors
Association

Thus it is that we see a state-wide council as critical to combating harmful invasive species. The purpose of the council would be to provide a coordinated, multi-stakeholder approach for addressing the potential risks of harmful invasive organisms and agents throughout the state and to work toward preventing the future introduction of other new invasive organisms and agents to the state.

Oil Spill Region
Environmental
Coalition

Prince William Sound
Aquaculture
Corporation

One only has to look at the rest of the United States to see the huge amounts of effort and money that has already been spent on harmful invasions. The prime example of this is in the Great Lakes region. The invasive zebra mussel

has virtually taken over the Great Lakes. Damage to water pipes, boat hulls, and other hard surfaces by zebra mussels in the Great Lakes is estimated at \$5 billion. We believe that the money spent on proactive coordination and planning through a state council will be minimal compared to dealing with the economic and environmental fallout from harmful invasions. We urge you to support HB12.

Sincerely,

A handwritten signature in cursive script that reads "John S. Devens". The signature is written in black ink and is positioned above the typed name.

John S. Devens, Ph.D.
Executive Director

United States Senate

WASHINGTON, DC 20510

February 3, 2009

Representative Craig Johnson
Alaska State Legislature
State Capitol, Room 126
Juneau, AK 99801- 1182

Dear Representative Johnson:

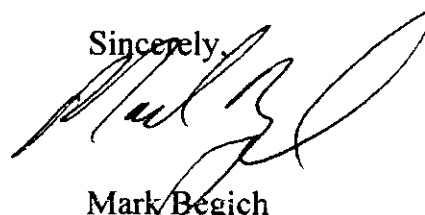
Because invasive plant species threaten native fish, plants and wildlife in Alaska, I fully support HB 12 and the formation of the Alaska Council on Invasive Species.

The collaboration and strategic planning set forth in the HB 12 are important steps in addressing invasive species in Alaska. We must do all we can to prevent the introduction of invasive species and have the ability respond rapidly as a community when needed.

Thank you for your work on this matter and please let me know if my office can lend any further assistance.

*Thanks for
your work!*

Sincerely,



Mark Begich
Senator

Climate Change's Impact On Invasive Plants In Western US May Create Restoration Opportunities

ScienceDaily (Jan. 30, 2009) — <http://www.sciencedaily.com/releases/2009/01/090127112055.htm>

A new study by researchers at Princeton University's Woodrow Wilson School of Public and International Affairs has found that global climate change may lead to the retreat of some invasive plant species in the western United States, which could create unprecedented ecological restoration opportunities across millions of acres throughout America. At the same time, global warming may enable other invasive plants to spread more widely.

The researchers assessed the relationship between climate change and the distribution of five prominent invasive plants in the western United States – known colloquially as the "kudzus of the West" – cheatgrass; spotted knapweed; yellow starthistle; tamarisk; and leafy spurge. Such plants are defined as invasive because they were brought into this country from other lands and now dominate and alter ecosystems in ways that threaten native wildlife, agriculture, and ranching. All have greatly expanded their ranges in recent decades in the western U.S., causing millions of dollars in damage to farmlands and rangelands. Invasive plants are increasingly expensive to control, and it is widely believed that global warming will make the problem worse.

But Bradley and her co-authors find that global warming may also reduce the competitiveness of some invasive plants if conditions become climatically unsuitable to the weeds, "creating opportunities for restoration in areas currently dominated by intractable invasive species," according to the study.

The five species were selected in part because they represent the most problematic plants in the western U.S. The study authors created "bioclimatic envelope models," wherein the authors identified where the invasive plant species occurred, and identified critical climate variables such as precipitation patterns and temperature patterns that are associated with the presence of the invasive plants under investigation. The authors then determined what combined set of climate variables best described the distribution of these weeds, and mapped all of the places in the U.S. where these climate conditions occur.

Developing such models is important because scientists can use them to assess how changing climate conditions might affect the distributions of invasive plants. Maps of how invasion risk is likely to change with global warming are also important for land managers designing long-term protocols for fighting invasive plants.

The researchers employed 10 atmosphere-ocean general circulation models (AOGCMs) that predict what climatic conditions in the West are likely to be in 2100 if emissions are not limited, and matched those predicted conditions to the climate conditions associated with each of the invasive plant species. The projected invasive species distributions for each of the models were added together to create a map of invasion risk under future climate conditions.

"Just as native species are expected to shift in range and relative competitiveness with climate change," the authors wrote, "the same should be expected of invasive species."

Specifically, the researchers concluded that climate change is likely to expand invasion risk from yellow starthistle in California and Nevada – and lands currently occupied by invasive populations of the weed in California, Oregon and Washington are unlikely to become unsuitable for the species; hence, they have low potential for restoration. Tamarisk distribution, they found, is unlikely to be affected by climate change.

Cheatgrass, however, is likely to be affected by climate change, potentially moving northwards into parts of Idaho, Montana and Wyoming, but retreating in southern Nevada and Utah. And, according to Bradley and her co-authors, the impacts of climate change will likely shift spotted knapweed, currently distributed throughout the foothills of the Rocky Mountains and the Colorado Plateau, to higher elevations, leading to both expanded risk and restoration opportunities in part of Montana, Wyoming, Utah, and Colorado.

Leafy spurge, abundant in northern states west of the Mississippi River and some rangeland west of the Rockies, will likely retreat from some places in the face of climate change, creating restoration possibilities in Colorado, Nebraska, Iowa, and Minnesota – but potentially expanding into parts of Canada not included in the researchers' study. In addition, the researchers found that leafy spurge is likely to retreat from Nebraska and parts of Oregon and Iowa, creating strong potential for restoration in these areas.

To better address the impacts of invasive species, the authors note, further modeling and experimental work is needed to determine which species will be able to occupy these sites if the invasive species are reduced or eliminated by climate change. Local native plants (the ones that were there prior to the arrival of the invasive species) may be unable to reoccupy these areas as a result of global warming. If local native plants cannot reoccupy the areas, then native plants from elsewhere in the West will need to be considered for restoration to prevent new invasive species from quickly invading these sites.

"The restoration opportunities associated with the retreat of currently intractable invasive species are vast in the western United States," the authors wrote. "The uncertainties associated with these changes, as well as the unknown makeup of viable future vegetation... highlight a pressing need for integrated modeling, monitoring, and experimental work to better address the ecological consequences of climate change."

"The question for policy makers and land managers is, 'What do we want these lands to be?'" said Wilcove. "These lands will change, and we must decide now – before the window of opportunity closes - whether we do nothing or whether we intervene."

"Governments need to reduce emissions quickly to avoid a variety of dangerous climate changes, Oppenheimer warned. "At the same time, it will be necessary to adapt to the inevitability of some warming. Proper management of ecosystems to minimize the damages is a key part of any effective adaptation strategy."

Journal reference:

Bethany Bradley, Michael Oppenheimer, David Wilcove. Climate change and plant invasions: restoration opportunities ahead? *Global Change Biology*, 2009; DOI: 10.1111/j.1365-2486.2008.01824.x

Adapted from materials provided by Wiley-Blackwell, via EurekAlert!, a service of AAAS.

Thank you for this opportunity to testify. Last year, the first vital steps were taken to protect Alaska's economy, ecology and environment from the devastation of noxious weeds. Troy and I had no experience with the political process, but were very gratified by the unanimous response to HB330. When Representative Johnson proposed that legislation, we vowed to dedicate our time and effort to making people understand the importance of developing this statewide response and why it was the fiscally responsible thing for their senators and representatives to do. We have spoken to many local, state and national audiences about Alaska's fight with invasives and met experts fighting the same problems in other states that threaten Alaska. Without exception, we hear the same message--that Alaska is America's last chance to do it right and not suffer the tens of millions of dollars in expense and losses due to invasive species, but that is only possible if we act quickly and aggressively while the advantage is still ours to take. HB12 is the next important step in the process. This legislation needs your vote today and as it moves forward, but in addition, Alaska and her citizens need your continued support as the agencies and people on the ground work to prevent and control invasive species from impacting our Great Land. Thank you

Lori Zaumseil

Good afternoon. My name is Dan Gilson and I am with the Prince William Sound Regional Citizens Advisory Council. The Council is a non-profit whose mission is promoting the environmentally safe operation of the Alyeska terminal and associated tankers. The Council's 18 member organizations are communities in the Exxon Valdez oil spill impact region, as well as business, recreation, tourism, commercial fishing, Native and aquaculture groups.

Because of our concerns regarding invasive species arriving in the ballast water attached to the hulls of tankers, we are here today to support HB 12, the bill to create an invasive species council.

This legislation is vital in helping to help protect Alaska environments and economies from the threat of invasion by harmful non-indigenous organisms. We must act now in order to avoid a potential catastrophe.

The purpose of the council would be to provide a coordinated, multi-stakeholder approach for addressing the potential risks of harmful invasive organisms and agents throughout the state and to work toward preventing the future introduction of other new invasive organisms and agents to the state.

The minor amount of money spent annually on a council could save us billions of dollars in lost economies, environments and industries in addition to costs associated with controlling invasions. Just look at the situation with the zebra mussels in the Great Lakes. The government estimates that economic losses and control efforts cost the United States about \$5 billion each year.

A more immediate threat to Alaska Coastlines is the European Green Crab. Green crabs eat clams, oysters, mussels, marine worms and small crustaceans that are important foods for native species. This invasive crab has marched its way up the west coast of the United States and has invaded Vancouver Island most recently. It is not a matter of "if" we get green crabs, but "where and when." To give you an idea of the economic devastation posed by the green crab, which is also invasive to the East Coast of the United States, the estimated total losses due to the green crab on the East Coast during 1975-2005 range from \$719 to \$806 million. Although economic impacts to the West Coast are negligible under current conditions, the West Coast impacts could increase to almost a million dollars per year if the green crab were to spread up to Alaska. And we do expect this spread to makes it way to Alaska. We know the crabs can survive and establish themselves in our waters.

There are numerous threats to Alaska in terms of invasive species and just as many horror stories of these species taking over environments in other states. Another real threat to Alaska is Purple Loosetrife which has been found in the Westchester Lagoon area in Anchorage. This plant can produce up to 2.7 million seeds per plant yearly and spreads across approximately 1 million

additional acres of wetlands each year, with an economic impact of millions of dollars. A coordinated local effort in Anchorage has been on top of that infestation, but one can easily see how a broader coordinated effort is needed to proactively deal with these issues.

At this moment in time, Alaska is relatively free from invasive species. Contrary to a popular myth, Alaska is not isolated as it receives significant amounts of air, water, and land traffic. Also, climate change is making conditions in Alaska more favorable for harmful invasive species.

Unless Alaska takes a proactive stance, Alaska will suffer the same fate as other states dealing with the management of harmful invasive species. Formation of a council to develop a strategic plan, coordinate efforts, and share information is essential to be able to take advantage of funding opportunities only available to such coordinated entities. The minor amount of money spent on a council annual will pay dividends in the significant amount of money not spent on managing weeds, pests and other critters.

I urge you to support this bill.



Alaska Conservation Alliance

Uniting for Alaska's Future

February 5, 2009

House Committee on Resources
State Senate
Alaska State Capitol
Juneau, Alaska 99801-1182

Dear Representative Johnson, Buch and Munoz,

On behalf of the 40 conservation groups and the 38,000 Alaskans represented by the Alaska Conservation Alliance, I am pleased to acknowledge our strong support for HB12 to establish the Alaska Council on Invasive Species in the Department of Fish and Game. Some state economies have lost billions of dollars in revenue due to damage caused by invasives. In order for Alaska to avoid a similar fate, it is prudent to address this issue now.

We believe the 14-member Council will provide the broad stakeholder cooperation and oversight needed to prevent new invasive species from taking root in Alaska and to mitigate the damage of invasives currently pushing our native species to the brink. At risk are Alaska's biological treasures, its flora and fauna; its harvested resources and subsistence plants and animals; the beauty and diversity that make Alaska a world-class tourist destination.

Already Alaska has suffered the effects of invasive Atlantic Salmon, pike and Reed Canary grass, to name a few. Plants, animals, fish and crustaceans, introduced into an environment devoid of their natural predators and limitations can irreversibly destroy an ecosystem and the economy and cultures it supports. These foreign species invade Alaska's ecosystem primarily due to human activities. It is therefore important that Alaskans take an active role to prevent this potential man-made disaster by serving on the Alaska Council on Invasive Species.

The Alaska Conservation Alliance would like to thank you for this opportunity to voice our support for HB 12 and encourage you to pass this bill out of the Senate Finance Committee.

Sincerely,

Kate Troll
Executive Director

CC: House Finance Committee Members

TESTIFY LIST FOR HB 12

OFF NET

**Michele Hebert (pronounced A-bear) Land Resources Agent,
Cooperative Extension Service and Chair of the Alaska Invasive
Species Working Group**

University of Alaska
PO Box 75-8155
1000 University Ave.
Fairbanks Alaska 99775-8155
Phone 907-474-2423
Fax 907-474-6885
e-mail ffmah@uaf.edu

<http://www.uaf.edu/ces/aiswg/index.html>

**Lori Zaumseil, (pronounce Zaum Zel) Executive Director for
AKCANWIN and Anchorage's CWMA**

AKCANWIN =

Alaska Citizen Against Noxious Weeds Invading the North

Anchorage's CWMA =

Anchorage Cooperative Weed Management Area

9015 Dewberry Street
Anchorage, AK 99502
(907) 245-2373
AKCANWIN@aol.com

VALDEZ LIO

**Dan Gilson, Project Manager, Oil Spill Prevention & Response
Operations for the Prince William Sound Regional Citizens'
Advisory Council (PWSRCAC) which, is an independent non-
profit corporation. PWSRCAC has holds a seat on the Invasive
Species Advisory Council, that advises the National Invasive**

Species Council. This past summer Council Staff, Lisa Ka'aihue (KA aa Hu aa) worked with Jeff Heys of the National Park Service to bring that National Council to Alaska.

Valdez Office
PO Box 3089
130 S. Meals, Suite 202
Valdez, AK 99686
907.834.5000
877.478.7221 (toll free)
907.835.5926 (fax)

<http://www.pwsrca.org/>

IN ROOM or ANCHORAGE LIO

Kate Troll, executive director of the Alaska Conservation Alliance, or Sue Ely, Legislative & Communications Manager

Anchorage Office
Kate Troll, Exec. Dir.
PO Box 100660
Anchorage, Alaska 99510
Phone: (907) 258-6171
Fax: (907) 258-6177

Juneau Office
Sue Ely, Legislative & Communications Manager
419 6th Street, Suite 321
Juneau, AK 99801
Phone: (907) 463-3366
Fax: (907) 463-2554
Sue@akvoice.org

<http://www.akvoice.org/>

Tom Lawson, Division Director, Alaska Department of Fish and Game – Questions on Fiscal Note

PO Box 115526
Juneau, AK 99811-5526
(907) 465-5999
tom.lawson@alaska.gov

ADF&G
PO Box 25526
Juneau, AK 99802-5526

<http://www.adfg.state.ak.us/special/invasive/invasive.php>
