Alaska Aquatic Nuisance Species Management Plan

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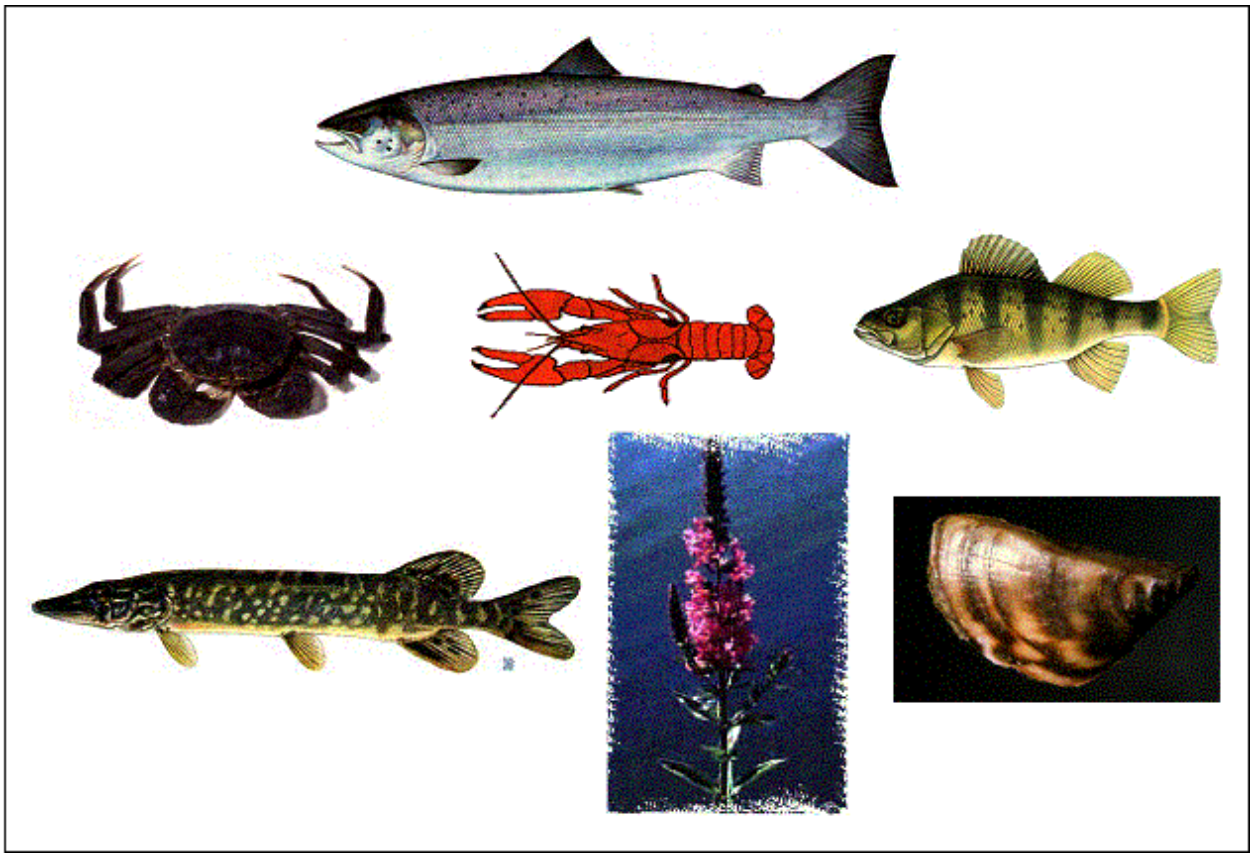

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Executive Summary

Invasive species are 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. This plan focuses on non-indigenous aquatic nuisance species (ANS) that have been or could be introduced into Alaska waters. "Aquatic" includes marine, coastal, estuarine, lake, and river environments. The emphasis of this management plan is on preventing introductions and identifying and responding to the highest invasive threats. Relatively few invasive aquatic species have been introduced and become established in Alaska compared to other states. This is in part due to Alaska's stringent plant and animal transportation laws, geographic isolation, northern climate, small human population, and relatively few concentrated disturbed habitat areas. Alaska's fortunate status provides an excellent opportunity for Alaskans to take a proactive approach to preventing invasions.

The ANS plan takes advantage of Alaska's relatively pristine status, and focuses on prevention of invasions by the major invasive threats. The main goals of the plan are to coordinate with the public and with federal, state, local, and tribal governments for the prevention and monitoring of invasive species and the development of an effective public information program. This ANS management plan is an initial step toward development of a comprehensive multi-agency aquatic and terrestrial invasive species program in Alaska.

To accomplish this goal, the Alaska Department of Fish and Game (ADF&G) first developed the following invasive species policy and initial broad action strategies:

Invasive species pose a major threat to Alaska's native flora and fauna. Invasive species can harm native species of fish, wildlife, and plants, resulting in ecosystem disruptions that could cause severe economic harm to the people of Alaska. It is in the best interest of Alaska and Alaskans that both purposeful and unintentional introduction of invasive species be prohibited. Accordingly, ADF&G will take the following actions to prevent the introduction and spread of invasive species:

- *Develop an inter-division Alaska Invasive Species Prevention and Response Program within ADF&G.*
- *Pursue new funding sources for long-term support of the Invasive Species Response Program.*
- *Provide leadership and coordination between state, federal and international agencies and tribes and non-governmental organizations (NGOs).*
- *Develop policies, procedures, and laws to prevent the introduction and spread of invasive species into Alaska.*
- *Prevent the spread of invasive species already introduced into Alaska, through the identification and closing of transport pathways.*
- *Develop protocols for early detection, rapid response to, control and management of new invasive species.*
- *Design and conduct research for invasive prevention, control and management.*
- *Develop educational plans and public awareness announcements on problems associated with invasive species.*

The goals of this ANS management plan are:

Goal 1: Coordinate all Aquatic Nuisance Species Management Programs within Alaska and collaborate with regional, national, and international Programs.

Goal 2: Prevent the introduction of new ANS into Alaska waters.

Goal 3: Detect, monitor, contain, reduce, or eradicate populations of ANS as quickly as possible with a minimum of environmental impact.

Goal 4: Educate the public and appropriate resource user groups to the importance of preventing ANS introductions and how the harmful impacts of ANS can be reduced.

Goal 5: Identify, develop, conduct, and disseminate research on ANS that are identified as species of concern in Alaska.

Goal 6: Take appropriate steps to ensure that federal and state rules and regulations sufficiently promote the prevention and control of ANS.

The initial actions to accomplish these goals include:

- Establishing an ANS coordinating council comprised of tribes, NGOs, the public, and state, federal and local government and managed by an ANS coordinator.
- Review the respective responsibilities of tribes, NGOs, state, federal, and regional entities and develop coordination process.
- Develop a reporting system to receive information on suspected ANS.
- Develop a public education and communication plan.
- Provide educational briefings to state legislatures and legislative staff and to locally elected officials.
- Develop, maintain and publish a list of experts with a broad knowledge of aquatic taxonomic groups.
- Maintain a database of ongoing West Coast and national ANS research efforts.
- Develop a process to inform researchers and public and private land and resource managers of recent and emerging ANS information and research.
- Continue to develop and maintain a coordinated list of ANS and nonnative species known to occur in Alaska and coordinate with the USGS, National Invasive Species database.
- Conduct a review of Alaska and federal ANS laws and regulations.
- Coordinate ballast water management and treatment standards development.
- Develop individual, multiple species and pathways-based action plans.
- Develop an annual process to: identify potential new threats to state waters; identify the threats associated with the spread of existing ANS; assess the relative environmental risks associated with these threats; and report findings.

- Identify a protocol for development of an invasive species list identifying species that cannot be introduced into Alaska or into select geographic areas in Alaska.
- Develop a database out of which GIS maps can be built to show the locations of ANS sightings.
- Develop and implement a monitoring program utilizing citizen volunteers and coordinated with tribal and state, federal and local government agency activities.

The economic well-being and quality of life of all Alaskans is strongly dependent on Alaska's natural environment including healthy and abundant flora and fauna. This ANS plan is an important initial step in working proactively to protect these important assets.

I. INTRODUCTION

Alaska is a seemingly quiet oasis within a growing worldwide invasion. The invasion involves the movement of living organisms from where they are normally found to another place where they can live, prosper and cause environmental, human health and economic harm. This invasion costs the nations of the world many billions of dollars annually, greatly impacting natural ecosystems, industry, and human society. On February 3, 1999, Presidential Executive Order 13112 on Invasive Species called for increased coordination between federal agencies and cooperation with state entities to combat the invasion. Invasive species are defined in the Executive Order as "a species that is both non native (alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health."

The invasion by alien species is the result of increased worldwide trade and travel by humans. People can circle the globe in less than a day and move huge shiploads of freight across oceans in a week. Next-day air delivery is available to most places on earth. Many organisms can move as undetected hitchhikers, making it easy for organisms to travel across the globe. Most introductions of invasive species are unintentional or accidental (such as organisms released in ship ballast water) while some are the result of negligence or ignorance (such as release of unwanted aquarium fish to the wild or excess live seafood). Still other introductions are intended to benefit humans (deer to Prince William Sound and Kodiak Island) but occasionally cause harm (carp and nutria in North America and reed canary grass in Juneau's Duck Creek and Twin Lakes).

As the agency with primary responsibility for the management of fish and wildlife and their habitats in Alaska, the Alaska Department of Fish and Game (ADF&G) is developing this aquatic nuisance species (ANS) plan to minimize their impacts in Alaska. It is a first step in initiating the establishment of a coordinated state aquatic and terrestrial invasive species program. This ANS program is a small investment that can pay large dividends to Alaskans in the future. For example, it is estimated that the costs for seven years from 1985 through 1992 of controlling zebra mussel populations introduced to the Great Lakes and mid-west through ballast water would pay the annual costs of the New York invasive species program for 14,000 years.[1] Since the time of that report, the costs of attempts to control the spread of zebra mussels has increased to $1 billion annually, "paying for" a few more thousand years of New York's ANS program. Development of this plan also makes Alaska eligible for federal dollars to help control invasive species.

This plan focuses on non-indigenous ANS that have been or could be introduced into Alaska waters. "Aquatic" includes marine, coastal, estuarine, lake, and river environments. The emphasis is on preventing introductions and identifying and responding to the highest invasive threats. As mentioned previously, few invasive aquatic species have been introduced and become established in Alaska compared to other states. This is in part due to Alaska's stringent plant and animal transportation laws, geographic isolation, northern climate, small human population, and relatively few concentrated disturbed habitat areas. Alaska's fortunate status provides an

[1] New York Department of Environmental Conservation, Division of Fish and Wildlife. *Nonindigenous Aquatic Species Comprehensive Management Plan.* November 1993, p. 3.

excellent opportunity for Alaskans to take a proactive, and considerably less costly, role to prevent invasions.

This management plan focuses on prevention and identifying the most prominent threats. What constitutes a "high" threat is based on a subjective assessment of risk of economic and ecological damages. However, a recommendation of the plan is to develop a rigorous, scientifically based process for assessing risk, setting priorities, and responding to invasions. Given the great variability of climates across Alaska, focusing on the highest level threats generally results in an approach that is also geographically based; climate zones naturally limit the establishment of some of the most damaging invasive species. In addition, the movements of trade and people tend to be highly concentrated in the portions of Alaska that also are the most hospitable climates for invasive species. Given limited resources to implement an invasive species program, this focus will allow ADF&G to manage the most effective program possible given available resources.

While invasive species impacts to date are low, Alaska has much to lose should some of the prominent threats at its borders become established. A significant portion of Alaska's economy, including sport and commercial fishing, is dependent upon the pristine and natural quality of its aquatic ecosystems. Despite the low level of impacts to date, Alaska is certainly vulnerable to invasive species introduction. Potential introduction pathways include fish farms, the intentional movement of game or bait fish from one aquatic system to another, the movement of large ships and ballast water from the United States West Coast and Asia, fishing vessels docking at Alaska's busy commercial fishing ports, construction equipment, trade of live seafood, aquaculture, and contaminated sport angler gear brought to Alaska's world-renowned fishing sites.

This plan includes an overview of invasive species issues in Alaska, including relevant laws, regulations, and projects of the Alaska Department of Fish and Game, with recommendations for implementation of strategic monitoring and abatement programs as needed.

II. AQUATIC NUISANCE SPECIES PROBLEMS AND CONCERNS IN ALASKA

History of Invasion

Ecological studies to date indicate Alaska's extreme northern area north of the Brooks Range poses less risk than more southern areas for the establishment of ANS because of its location, isolation, and severe climate. Most aquatic invasive species come from warmer climates, and few of these species are capable of surviving in Alaska's more extreme latitudes. However, the area south of the Brooks Range has a warmer climate, more developed land, more disturbed habitats, and better road access. These factors increase the likelihood of invasive species introductions. Many species of fish, birds, mammals, plants, and aquatic invertebrates from temperate climate zones around the world could be introduced to and thrive in Alaska.

Ports with high volume marine traffic, especially commercial traffic, such as Cook Inlet, Dutch Harbor, Prince William Sound, and Southeast Alaska are at risk of ANS introductions. Invasive species from the West Coast of the U.S. and Canada may easily extend their range northward.

Coastal Alaska receives a large amount of ship traffic, which increases the possibility of invasive species introductions. Ballast water releases from barges and ships are known to be an important route by which introductions occur. The potential for new invasive species introductions on the Aleutian Island chain is significant as well, because of the large amount of ship traffic that arrives from around the world. In addition, the Aleutian Islands receive coastal trade from ports infested with potential invasive species and the ballast from this traffic is largely unregulated if it does not pass through Vancouver, B.C., or Washington ports.

Risk assessment, monitoring and detection of ANS are especially difficult in Alaska because of the vast size, small human population, and limited and costly transportation system. This is compounded by limited baseline information on freshwater and saltwater invertebrates. In the absence of an ANS monitoring program, information on species introductions is necessarily limited and anecdotal.

Fish

Several non-indigenous fish species have been illegally introduced in some areas of Alaska.

Northern pike (*Esox lucius* (Linnaeus)), native to Alaska, are indigenous to the area north and west of the Alaska Range. In the 1950s, pike were illegally transported from north of the Alaska Range and stocked in Bulchitna Lake in the Susitna River Drainage. In the last 40 years, pike have moved throughout the drainage, adversely impacting valuable salmonid stocks in numerous sub-drainages. Pike are now appearing in other Southcentral Alaska drainages. Also, they have been illegally introduced on the Kenai Peninsula. (See Appendix H for more information on northern pike and other invasive species.)

Atlantic salmon (*Salmo salar*) continue to escape from fish farms in British Columbia and Washington and have been found in streams near Cordova, Ketchikan, and Yakutat and as far north as the Bering Sea. Atlantic salmon are a serious invasive threat in Alaska. Natural reproduction of escaped Atlantic salmon is documented from streams in British Columbia, suggesting successful spawning could now be occurring in similar habitat in Washington and Alaska. It is thought Atlantic salmon would most likely compete with native steelhead (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarkii*), Dolly Varden (*Salvelinus malma*), and coho salmon (*Oncorhynchus kisutch*), and may also adversely impact other species of Pacific salmon.

Recently, **yellow perch** (*Perca flavescens*) were discovered in a small, unnamed lake on the Kenai Peninsula. This fish population was a product of an illegal introduction. Yellow perch compete with all resident fish species and could restrict salmon fry production. Because perch pose a significant economic threat to Alaska sport fisheries, ADF&G used rotenone to eradicate this population.

Currently, ADF&G stocks salmon and other native fish outside their historical ranges to increase sport-fishing opportunities. Likewise, private non-profit hatcheries release salmon fry to provide economic benefits to the commercial fishing industry. It is ADF&G's policy to stock non-indigenous fish only in areas lacking significant wild fish populations, so transplants generally do not compete with native fish species. In many instances, only sterile fish are stocked so the

introduced fish can be tightly controlled and managed. Alaska law stringently regulates all fish stocking. All fish stocking receives thorough review to ensure State of Alaska pathology, genetic, and management policies and regulations are followed (5AAC 41.005). No recent stockings are known to have harmed native species or caused environmental damage. The only sport fish species imported into Alaska is the brook trout (*Salvelinus fontinalis*), which was brought in prior to statehood. Fish species moved to new locations within Alaska, by federal and state agencies, include rainbow trout, grayling, char, and the five species of Pacific salmon.

Plants

Japanese knotweed (*Polygonum cuspidatum*) is spreading in Sitka, Juneau and other Southeast Alaska communities, choking out native plants. A Forest Service ecologist who participated in a knotweed surveillance study indicates knotweed could easily advance up the surrounding mountains into avalanche chutes. Having established a foothold, it could spread along the stream banks, shoreline or estuaries. The loss of springtime cover and woody streamside vegetation would result in destabilized stream banks and the reduction of woody debris and other detritus from native plants that would normally fall into the streams. This would potentially affect insect and fish populations and disrupt aquatic ecosystems.

Knotweed was probably brought to the area in the 19th century, as an ornamental plant from Great Britain where it is a major invasive problem. One British community employs a person solely for the purpose of eradicating Japanese knotweed. Washington and Oregon have taken action against knotweed, classifying the plant as "noxious," imposing fines for raising it privately, and undertaking control programs along major rivers to protect fish and wildlife habitat. Even with the use of herbicides, eradicating large patches of knotweed can take up to eight years of repeated intervention.

Reed canary grass (*Phalaris arundinacea*) is invading freshwater wetlands, and in some places choking channels of small streams. **Foxtail barley** (*Hordeum jubatum*), used for revegetation work during the construction of the Trans Alaska oil pipeline, has invaded salt marsh habitats in the Mendenhall Wetlands State Game Refuge near Juneau, and reduced hay quality from farms in Interior Alaska.

Highest Potential Threats[2]

The annual temperature ranges of water bodies such as oceans, lakes, and rivers in Alaska vary seasonally much less than the temperature ranges occurring on land. Given relatively warm marine currents, Alaska's marine environment is relatively temperate despite its northern latitude, and is similar to its southern West Coast neighbors. Unfortunately, the aquatic locations of ANS invasions make them harder to detect than terrestrial invasions. This allows much more time for an invasive species to become established and makes it harder to eradicate when they are located.

Fish

Northern pike and **Atlantic salmon** are currently the two invasive fish species of greatest concern to Alaska. Northern pike, considered by Division of Sport Fisheries biologists the

[2] See Appendix H for more information on northern pike and other invasive species.

highest priority threat in Southcentral Alaska, are rapidly spreading throughout the region. Pike have caused widespread measurable damage to resident species (primarily rainbow trout and grayling) and potential impact to coho salmon stocks in the Susitna River drainage. Pike are also an upcoming threat to the Kenai Peninsula and West Cook Inlet, including the Kenai River and Swanson River.[3] Wherever pike are introduced, they eliminate or greatly reduce the native species present. They have the potential to cause severe environmental and economic impacts to many highly productive salmon streams.

Atlantic salmon also pose a threat to Alaska, although the extent of impact is more speculative than that caused by pike. Biologists speculate small populations of Atlantic salmon will develop in particular locations. Atlantic salmon can displace native fish populations, through competition for limited food and spawning habitat. Even more likely to be affected will be steelhead and cutthroat trout, because they have life histories and habitat preferences that are similar to those of Atlantic salmon.

Ornamental aquarium fish now only occasionally appear in the wild, but this could change given an unmonitored aquarium industry and the public demand for new and exotic species. **Oscars** (*Astronotus ocellatus*) have been found in Jewel Lake, near Anchorage, and a sport angler harvested a **Pacu** in Campbell Creek. The Oscars were found dead along the shoreline prior to ice formation on the lake. Most aquarium fish cannot live in cold water and die in the fall when the lakes get cold. However, these species can cause damage during the time they are free in the wild as they compete with and, in some cases feed on native species. In addition, some aquarium fish are natives of temperate climates that can survive in Alaska. In special circumstances ornamental fish can thrive in the wild. For example, Clear Air Force Station discharges water used to cool its power plant and radar equipment into a system of ponds and a gravel pit that are connected by canals. In the late 1980s, goldfish were dumped into this system. The population exploded and the cooling system became plugged with many hundreds of goldfish. The Air Force had to resort to poison to eliminate the goldfish problem.

Other fish species could become invasive to Alaska as exemplified by the recently eradicated **yellow perch** population on the Kenai Peninsula. If this species had spread throughout the numerous lakes and rivers on the Kenai Peninsula, the effects on salmonid populations could have been severe. This perch population was most likely introduced intentionally by the planting of perch eggs or fry brought from the lower 48 states. While illegal to introduce, numerous other fish species indigenous to the lower 48 states and Canada could become invasive problems in Alaska. In the past, the logistics of moving eggs or fry into the state was difficult, lessening the possibility of an unwanted introduction. However, movement of live animals is simpler today. Many of these species can be purchased over the Internet and shipped to the purchaser within 24 hours.[4]

[3] Robert A. Clark, fishery biologist, Division of Sport Fish, Alaska Department of Fish and Game, personal communication, June 24, 2002.
[4] Larry Peltz, fishery biologist, Division of Sport Fish, Alaska Department of Fish and Game, personal communication, March 2002.

Invertebrates

One potential invasive species of concern is the **green crab** (*Carcinus maenas*), a native of northern Europe. It became established in California about ten years ago and has expanded its range northward to Vancouver Island. It is thought to be capable of surviving environmental conditions at least as far north as the Aleutian Islands. A very aggressive small crab living close to shore, it has severely reduced shore-dwelling crab populations at one long-term study site in Bodega Bay, California. Because king, Tanner and Dungeness crab all use shorelines as nursery areas, a green crab invasion has the potential to significantly impact recruitment needed to maintain Alaska's valuable crab and halibut fisheries. Both the green crab and Chinese mitten crab, discussed below, are efficient predators that compete with indigenous fish, shellfish, and birds for food. It is possible these two species could permanently alter the invaded marine ecosystem.[5] However, it is uncertain whether estuary salinity and water temperature conditions in Alaska are conducive to green crab reproduction. Research will be necessary to adequately assess the invasion risk for green crabs.

The **New Zealand mudsnail** (*Potamopyrgus antipodarum*) is a small aquatic snail. As its name states, this species is native to freshwater lakes and streams of New Zealand. Like many organisms today, it is being carried to many locations around the world, such as Europe, Asia, and North America. In the U.S., this snail was first detected in the mid-1980s in the Snake River region of Idaho. Since then, it has spread to waters of Montana, Wyoming, California, and most recently Arizona. Mudsnail densities of over one-half million per meter square in western streams are causing great concern. Because the West is known for abundant trout and productive fishing, there is concern that mudsnails will impact the food chain for native trout and the physical characteristics of the streams themselves.[6] This species poses a serious threat to Alaska's sport fisheries.

The **Chinese mitten crab** (*Eriocheir sinensis*) is indigenous to China but has now become established in the San Francisco Bay/Delta and its tributaries, and may have recently spread to the Columbia River, where a single mitten crab was caught near the mouth of the river. A breeding population has not yet been found to exist in the Columbia River and the species has not been confirmed elsewhere in Oregon.[7] With a catadromous life history similar to the American eel, it can move up rivers hundreds of miles where it may displace native fauna, and it is known to feed on salmonid eggs, which could affect salmon recruitment.

Zebra mussels (*Dreissena polymorpha*) are invaders from Europe that out-compete resident mussels, clog water intake lines, sequester nutrients needed to fuel primary production, and are unpalatable to indigenous fish. Zebra mussels were introduced into the Great Lakes via ballast water. Zebra mussels were first detected in 1988 in Lake St. Clair, located between Lake Huron and Lake Erie. Within just a few years, they spread into all five of the Great Lakes. Since then, zebra mussels have spread into many large navigable rivers in the eastern United States as well as small lakes within the states surrounding the Great Lakes. Hitchhiking on the bottoms of

[5] John Devens, executive director, Prince William Sound Regional Citizens Advisory Council, August 1, 2002.
[6] U.S. Department of Interior, USGS, Florida Caribbean Science Center, Nonindigenous Species Information Bulletin: New Zealand mudsnail (*Potamopyrgus antipodarum*), May 17, 2002, No. 2001-003.
[7] Dan Hilburn, Chair, Oregon Invasive Species Council and Administrator, Plant Division, Oregon Department of Agriculture, personal communication, July 5, 2002.

commercial barges is most likely how they were spread up and down the large rivers. Because of their ability to adhere to objects, adult zebra mussels can easily be transported on the hull of a boat.[8] Zebra mussels are currently not found in the Pacific Northwest, but the upcoming Lewis and Clark Bicentennial Commemoration and associated increase in boater traffic along that route is expected to significantly increase the likelihood they will become established there.[9] They are transported by boats, barges, and in floatplane floats and ballast water.

Signal crayfish (*Pacifastacus leniusculus*) are not indigenous to Alaska. However, they occur in streams in western Canada where the climate is similar to that of Alaska A successful invasive group commonly sold in pet stores, they eat all that is available to be eaten, competing with other stream fauna. Usually, crayfish become the dominant portion of a stream's biomass because, besides omnivory, they can survive extended periods of drought and famine Recently, a crayfish was caught in the Buskin River on Kodiak Island. The department has not determined if the specimen was alone or part of a developing population.

While certified **oyster** spat is allowed to be imported into Alaska for aquatic farming purposes, the illegal transport of oysters into Alaska can be a source of a number of invasive species. There are reports that beachfront owners buy bags of oysters from Pacific Northwest farms, transporting them to Alaska sites to be hung off docks, ready to eat as needed. While oysters are not thought to be able to reproduce in the cold waters of Alaska, these uncertified oysters could harbor many kinds of invasive invertebrate larvae, bacteria, and viruses that could prove damaging to aquatic communities.

The **spiny water flea,** tiny cladoceran or aquatic crustacean, is an invader from Europe now found in the Great Lakes region and California. It displaces existing zooplankton communities but is unpalatable to fish. The end result of its invasion is much lower production of fish for harvest. One method of transport is through sport fishing gear that has not been disinfected.

Bacteria, Viruses and Parasites

Little is know about the threat of the movement of bacteria, viruses and parasites within or to Alaska. Devastation from the Pacific herring virus in PWS is well known and documented. The origin of the virus has not been established, but even the movement of ballast water from one place to another within Alaska coastal waters could result in injury to other fisheries.[10] Atlantic Ocean herring disease could also be introduced into Alaska through the import of frozen herring that are used as bait by Alaskan commercial fishers.

Whirling disease (*Myxobolus cerebralis*) is a parasitic infection that attacks juvenile trout and salmon, but does not infect warm water species. The parasite infiltrates the head and spinal cartilage of fingerling trout where it multiples rapidly, causing the fish to swim erratically and, in severe cases, to die. When an infected fish dies, millions of tiny indestructible spores (each about the size of a red blood cell) are released to the water where they can survive in a "dormant" form

[8] U.S.G.S., Florida Caribbean Science Center website, http://www.fcsc.usgs.gov/Nonindigenous_Species/Zebra_mussel_distribution/zebra_mussel_distribution.html
[9] Dr. Dennis Lassuy, Regional Aquatic Nuisance Species Coordinator, U.S. Fish and Wildlife Service, personal communication, August 16, 2002.
[10] John Devens, executive director, Prince William Sound Regional Citizens Advisory Council, August 1, 2002.

for up to 30 years. All species of trout and salmon may be susceptible to whirling disease. The minute organism, native to the Eurasian continent, was introduced into North American waters in the late 1950s. It is present in 22 states, including all western states except Alaska and Arizona. Rainbow trout and cutthroat trout appear to be more susceptible to the disease than other trout species. Brown trout become infected with the parasite, but they appear to be immune to the infection and have not been as greatly impacted as rainbow trout. Whirling disease is transmitted by infected fish and fish parts. It may also be transmitted by birds and it is possible fishermen could carry the disease on fishing equipment. However, live infected fish are the main vector for the spread of the disease.[11] Most Alaska freshwater stream environments may be too nutrient-limited to support Whirling disease because the tubifex worm needed for one stage of development need a nutrient rich environment. Additional research is needed to assess risks.[12]

Plants

The ANS that most likely pose the most significant threat of introduction and spread in Alaska include:

Hydrilla verticillata, hydrilla, water thyme;
Landoltia (Spirodela) punctata, dotted duckweed;
Lythrum salicaria, purple loosestrife;
Myriophyllum spicatum, Eurasian water-milfoil (present);
Phalaris arundinacea, Reed Canary grass (present);
Polygonum cuspidatum, Japanese knotweed (present);
Spartina alterniflora, salt marsh cordgrass;
Spartina densiflora, dense-flowered cordgrass; and
Utricularia inflate, swollen bladderwort.

These species are highly invasive, have caused severe impacts in the Lower-48 states, have spread into the Pacific Northwest, and are capable of living in Alaska's climate. More detailed information on each of these species can be found at the websites listed in Appendix H. The risk assessment proposed in this plan will evaluate the respective threat of each of these species as well as other potential aquatic nuisance plants.

Pathways of Non-Native Aquatic Introductions

Major pathways through which non-native species are introduced into coastal lands and waters include[13]:

Aquaculture: Historically, culture of finfish and shellfish was a primary path for both intentional and unintentional introductions. Imports of oyster spat early in the century brought several unwanted species introductions, such as the oyster drill to the West Coast. In addition, cultured non-native species can escape from captivity, such as Atlantic salmon that escape from net pens. These pose a major threat to Alaska's salmonid fisheries.

[11] Whirling Disease Foundation website, http://www.whirling-disease.org/, June 2002.
[12] Ted Meyers, PhD., principle state fishery pathologist, personal communication, Alaska Department of Fish and Game, June 24, 2002 and Robert Piorkowski, PhD., personal communication, fishery biologist, Alaska Department of Fish and Game, June 24, 2002.
[13] Adapted from Washington Sea Grant Program. *Bio-invasions: Breaching Natural Barriers*. October 2000.

Aquarium trade: Wholesale importers, culture facilities and retail pet stores culture, transport, and sell non-native fresh and saltwater plants, fish and invertebrates. The intentional and unintentional release or escape of species into the wild from industry facilities and the hobbyist aquarium owner has led to introductions. The common goldfish, for example, has become a nuisance species in eastern Washington.

Biological control: Selected non-native species, usually predators, have been intentionally introduced to control the growth and spread of other introduced species. History shows that achieving the desired effect is difficult. Grass carp introduced to control unwanted aquatic plants in many lower-48 inland lakes resulted in native plant species being decimated.

Boats, ships and aircraft: Ballast discharge, hull fouling and plants and animals caught in propellers and on float rudders are ways boats, ships, and aircraft can introduce organisms.[14] Ballast water can contain aquatic plants, animals, and pathogens. Marine vessels take on and discharge millions of tons of ballast water daily in ports and harbors around the world. The discharge of ballast water is considered a major pathway for aquatic introductions because of the huge volume of water carried as ballast. A large number of fishing vessels are home ported in Washington State or ports farther south, or spend the off season there, and may take on water to increase stability while transiting to Alaska. These vessels come from ports already infested with invasive species. Because fishing vessels remain relatively close to shore as they transit to Alaska, they have the potential to accidentally take on water containing larvae of nearshore ANS and discharge it in Alaska waters.[15] Tankers arriving to Port Valdez release the third largest volume of ballast water of any U.S. port. While only a relatively small number ANS introductions have been discovered in the Port of Valdez, ballast water is probably one the most serious potential vectors of concern for Alaska (discussed in more detail in the section below).

Recreational boaters transport nuisance species in bait buckets, stuck on trailers or in boat wells, often without realizing it. Fouling of vessel hulls, including the hulls of sea or float planes, by encrusted or entangled organisms also provides a mechanism for transfer of species. Aquatic plants, in particular, are easily transported when plant fragments get tangled on boat propellers, trailers, and fishing gear of recreational boats and aircraft floats. The spread of invasive plants through entanglement on aircraft floats presents not only an ecological risk to the receiving aquatic ecosystem, but could also seriously and rapidly jeopardize the utility of the invaded lake for safe aircraft take off and landing—thus also presenting an economic and human safety concern.

Channels, canals, locks: The building of channels, canals and locks creates artificial connections between waterways, allowing the free movement of species across physical barriers. It also facilitates the transport of species by vessels.

[14] The International Maritime Organization is proposing a ban on the use of tri-butyl-tin, TBT, an effective but highly toxic anti-fouling agent. This may increase the potential for bottom fouling on vessels from outside the United States and contribute to ANS introduction. It is very difficult to manage or control ANS introductions from fouling.

[15] Molly McCammon, executive director, *Exxon Valdez* Oil Spill Trustee Council, July 30, 2002.

Live bait: Live worms, minnows and other aquatic organisms for the recreational fishing industry, both the bait species and its packing material, can result in introductions through intentional and unintentional release. Fortunately, Alaska does not permit the use of minnows as fishing bait.

Nursery industry: Nurseries, garden centers, and mail-order catalogs sell non-native plants for aquatic gardens and ponds. Commercial seed mixes for gardens or restoration planting can be contaminated with non-native plant seeds. Individuals discard non-native plants in public waterways. Non-native plants are sometimes accidentally attached to other horticultural species and discarded unintentionally or intentionally.

Scientific research institutions, schools, and public aquariums: Private and public research laboratories, schools, and aquariums use non-native species for testing, teaching, and research. Individuals who do not follow strict protocols for animal management may accidentally release specimens. Accidental release may also occur when those protocols do not exist. Intentional release and escape from confinement are also possible. A number of devastating ANS introductions have occurred as a result of research activities, such as the introduction by researchers at the University of Hawaii of *Gracilaria salicornia*, an invasive algae threatening Hawaiian coral reefs, into Kaneohe Bay.[16]

Recreational fisheries enhancement: It used to be a common practice for U.S. federal and state agencies to import game fish to enhance recreational fishing. While most of these introductions were intentional, there were accidental releases and the unplanned spread of some species as a by-product of this activity. Private citizens also have transported and released their favorite fish or shellfish species into a body of water, hoping a viable population survives.

Restaurants, seafood retail and processing: As we have witnessed with the recent alarming spread of snakehead fish on the East Coast (as live seafood or pets) and in past experiences with the exportation of East Coast lobsters, shipments of live seafood provide an opportunity for species introductions when individuals improperly dispose of unused product, packing materials (such as seaweed and salt water) and shipping containers. Associated live organisms either in or on the product may pose an additional threat.

Ballast Water Delivery Patterns and Biological Characteristics

Biological invasions of coastal bays and estuaries are common throughout the world and are having significant ecological and economic impacts. Transport of coastal planktonic organisms in ballast water of commercial ships appears to be the major source of new invasions worldwide in recent years. High-latitude, cold-water regions are also subject to biological invasions by many species with potential ecological and economic consequences similar to those reported for more temperate latitudes. Ballast water from oil tankers calling on Port Valdez in Prince William Sound (PWS) poses the most significant ballast water threat in Alaska. As a result of the volume of activity, the Prince William Sound Regional Citizens' Advisory Council (PWS RCAC) conducted extensive research on the potential invasive threat posed by oil tankers. This section reports the major findings from the PWS comprehensive study.[17] Most of the ballast water

[16] Ibid. For more information see: http://www.botany.hawaii.edu/GradStud/smith/websites/Alien-Bishop.htm
[17] Unless cited otherwise, information in this section on ballast water in Prince William Sound is from:

research done to date has been conducted in PWS as a result of the PWS RCAC, a non-profit corporation whose mission is to promote environmentally safe operation of the Valdez Marine Terminal and associated tankers. Their work is statutorily limited to PWS. While oil tankers calling in PWS undoubtedly pose an ANS threat, other under-studied areas of Alaska also warrant research coordinated with PWS research.

As mentioned previously, Port Valdez harbor receives the third highest amount of ballast water of any U.S. port. For the past decade, tanker arrivals to Port Valdez averaged 713 ships per year. In 1998, these tankers carried an estimated average of 65,775m^3 of total ballast water, including both segregated (non-oily) and non-segregated (or oily) ballast water. Segregated ballast water comprised an average of 54.7% of the total ballast water arriving to PWS in tankers. Overall, an estimated 17,000,000 m^3 of segregated ballast water (an average of 32,715 m^3 per arrival) was discharged into PWS by oil tankers in 1998. That is enough water to cover a 100m by 50m soccer field approximately 3.5 kilometers or 2 miles deep.

The Alaska Department of Environmental Conservation (DEC), Wastewater Discharge Program, permits and inspects the facilities that accept and treat the non-segregated oily ballast water from oil tankers (i.e. Alyeska Valdez Marine Terminal Ballast Water Treatment Facility (BWTF)). The BWTF uses a three-phase treatment process (settling/separation, dissolved air floatation, and biological treatment). Studies have shown that the amount of hydrocarbons in the oily ballast water would preclude any aquatic or benthic species from surviving the trip. There is no evidence of any microbial invasive species interfering with the treatment processes at the facility.[18]

U.S. Navy vessels with non-segregated fuel/ballast tanks are also a concern. The Navy uses several ports with military facilities to refuel, but does not do deep-ocean ballast water exchange before coming into port. This issue was not satisfactorily resolved when the Navy was using Kodiak in 2001 as a base for military exercises. While the exercises take place every year, it was not an issue in 2002 since Valdez was the port and the Alyeska BWTF took their bilge water.[19]

The DEC's Spill Prevention and Response Program does annual inspections of the 25 oil tankers servicing the Valdez Terminal. There are currently 6 tankers that have segregated ballast. Two of those have clean ballast (the Polar Endeavor and the Polar Resolution) and four others that still offload some dirty ballast. There are pilot studies in progress to test ozone treatment for non-indigenous species in the segregated ballast.[20]

Until 1996, exporting of crude oil to foreign countries from Valdez was not allowed, so the 14,000 tankers loaded during those 20 years delivered more than 11 billion barrels of oil to U. S. ports only. No ballast water treatment or management plan, including ballast exchange, was required. On May 28, 1996, Public Law 104-58 went into effect, effectively lifting the ban on the export of Alaska's North Slope crude. There are several conditions in the law, one of which

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Hines, Anson H. and Gregory M. Ruiz. *Biological Invasions of Cold-Water Coastal Ecosystems: Ballast-Mediated Introductions in Port Valdez, Prince William Sound, Alaska*. March 2000.

[18] Tom Chapple, Director, Division of Air and Water Quality, Alaska Department of Environmental Conservation, August 22, 2002.

[19] Ibid.

[20] Ibid.

requires exporting tankers to "adopt a mandatory program of deep water ballast exchange in at least 2,000 meters water depth. Exceptions can be made at the discretion of the captain only in order to ensure the safety of the vessel and crew. Specified records shall be maintained and made available for audit by government officials." (15 CFR 754.2)

Thus, since the summer of 1996, exporting tankers have exchanged their ballast water at sea before returning to Valdez. However, the vast majority of tankers (c. 95%) still sail to domestic ports (which are themselves invaded with exotic species) and have never been required to exchange their ballast. Nor are they required to participate in the U.S. Coast Guard's new voluntary ballast management program because they were specifically exempted from the language in the National Invasive Species Act of 1996 (NISA-1996) upon which that program is based. [21]

Most ballast water delivered to PWS by crude oil tankers originates from U.S. domestic ports. Tankers arriving directly from western U.S. ports accounted for 95.8% of the total tanker traffic, and 96% of the total segregated ballast water delivered by tankers, to PWS in 1998. Arrivals from Puget Sound, San Francisco, and Long Beach comprised approximately 82.7% of all tanker traffic, as well as 86% of all segregated ballast water delivered by tankers, to PWS in 1998. Most (95.6%) of arriving tankers do not undergo ballast water exchange, a process that could significantly reduce the risk of ANS introductions. Most (69.6%) of the tankers arriving to Port Valdez from overseas came directly from Korea in 1998. Tankers arriving from domestic ports transfer ballast water directly from that port to PWS, whereas foreign arrivals have replaced coastal ballast water with open-ocean exchange prior to their arrival, reducing non-indigenous coastal organisms by over 90%.

The voyage duration of tankers arriving to Port Valdez is relatively short compared to traffic arriving at other commercial ports, where invasions are common. This shorter residence time favors survival of transported organisms and results in dense inoculation of competent organisms into PWS. Ballast water spends an average of 6.6 days in the ballast tanks of oil tankers before arrival to Port Valdez, ranging between 4.8 to 10.2 days. In addition, tankers repeatedly deliver ballast water from the same, limited source ports, providing repeated inoculations of the same species. The volume, short-trip durations, and repeated source deliveries are all factors that raise the risk of ANS becoming established in PWS.

Large commercial passenger ships, commonly known as cruise ships, do not transfer ballast water in Alaska under normal operating conditions. Cruise ships are fueled in Seattle or Vancouver. As the fuel is consumed during the voyage, the ship takes on ballast water to compensate for the loss of fuel weight. The ballast water is released in Vancouver or Seattle before refueling[22]. There is a mandatory ballast exchange program in the Port of Vancouver. Washington's newly established ballast water program, administered by the Department of Ecology and Environment, requires ballast exchange a minimum of 60 miles off the coast.

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[21] *Pacific Ballast Water Group WORKING DRAFT Report and Recommendations* Obtained online from http://web.pdx.edu/~sytsmam/pbwg/pbwg%20report1.html under Ballast Water Exchange Programs

[22] John Hansen, Northwest Cruise Association, telephone call with Carolyn Morehouse, Passenger Vessel Compliance Engineer, Alaska Department of Environmental Conservation, June 11, 2002.

Canada also has a ballast exchange program administered by Transport Canada Marine[23] that requires all vessels entering Canadian water from the south to exchange ballast 50 miles from shore before entering Canada. One large cruise ship and two small vessels come directly from across the Pacific to Alaska without stopping in Seattle or Vancouver. There is no requirement in Alaska to exchange ballast water. The only pathway thought to be vulnerable for invasive species from commercial passenger vessels are vessels coming directly from Far East Asia and/or Japan to Alaska that do not participate in the ballast exchange programs in British Columbia or Washington State. No regulation of ballast water from these vessels is included in the currently proposed cruises ship regulations in 18 AAC 69.[24]

Alaska Marine Highway System ferries and small ships stay in the general Alaska environment except for ferries to and from Bellingham. These vessels are not required to exchange ballast water entering Canada or Washington, but they are not believed to pose as much of a threat as vessels traveling from Mexico, California, or Asia. [25] However, given the spread of green crab to Washington and Oregon, this assessment is only accurate in terms of relative risk. The Alaska Marine Highway System ferries do not take on ballast water from the open ocean. All ferries take on potable water as ballast. The vessels are either run full or empty and they discharge ballast water to onshore treatment facilities. The only exception is when they are traveling to dry dock when they sometimes discharge fresh potable water in the harbor if there are no reception facilities. This practice poses no invasive species problem.[26]

The U.S. Coast Guard has a voluntary ballast water exchange program.[27] The U.S. Government started this program on May 17, 1999 in response to NISA-1996. These are voluntary guidelines that suggest precautionary practices should be taken by every vessel to minimize the uptake and release of harmful aquatic organisms, pathogens, or sediments. Additionally, the program recommends that vessels carrying ballast water into the waters of the U.S. after having operated beyond the Exclusive Economic Zone (EEZ) employ one of the following ballast water management practices:

1. conduct an exchange of ballast water beyond the EEZ, in an area no less than 200 miles from any shore and where the water depth exceeds 2000 meters,
2. retain the ballast water on board,
3. use an alternative method of ballast water management,
4. discharge ballast water to an approved reception facility, or
5. conduct an exchange of ballast water in an approved Alternative Exchange Zone.[28]

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[23] Mike Gashall, Marine Transport Canada BC Regional Acting Director, telephone call with Carolyn Morehouse, Passenger Vessel Compliance Engineer, Alaska Department of Environmental Conservation, June 11, 2002.
[24] Tom Chapple, Director, Division of Air and Water Quality, Alaska Department of Environmental Conservation, August 22, 2002.
[25] Mike Gashall, Marine Transport Canada BC Regional Acting Director, telephone call with Carolyn Morehouse, Passenger Vessel Compliance Engineer, Alaska Department of Environmental Conservation, June 11, 2002.
[26] Carolyn Morehouse, personal communication, Passenger Vessel Compliance Engineer, Alaska Department of Environmental Conservation, June 11, 2002.
[27] *Pacific Ballast Water Group WORKING DRAFT Report and Recommendations* Obtained online from http://web.pdx.edu/~sytsmam/pbwg/pbwg%20report1.html under Ballast Water Exchange Programs
[28] Ibid.

The USCG requires all vessels calling at West Coast U.S. ports to submit a completed Ballast Water Report Form located in Appendix to 33 CFR 151, Subpart D, or the International Maritime Organization ballast Water Reporting Form to the Smithsonian Environmental Research Council (SERC). The reports must be kept on board the vessel and available for inspection for two years. In addition the USCG conducts random ballast water inspections by the Coast Guard Marine Safety Office (MSO) during normal business hours. To monitor compliance with both the mandatory and voluntary aspects of the Coast Guard ballast water management program, ballast water boarding officers will examine documents, take samples of ballast water and sediments, interview crew, and make other inquiries to access compliance.

The USCG is required to conduct a National Ballast Water Management Survey and report to Congress no later than 30 months after voluntary guidelines are implemented as to whether these guidelines are effective in controlling the introduction and spread of invasive species. If found to not be effective, the ballast water exchange is to become mandatory, similar to ballast water exchange rules in the Great Lakes. Preliminary study results indicate that voluntary standards are not effective.[29] Whether a voluntary program can be effective is questionable.[30]

Alaska ports receiving a large volume of commercial vessel traffic are vulnerable to ANS introductions. This is especially true if the vessels come from the West Pacific without stopping in Seattle or Vancouver, which have mandatory ballast exchange programs.[31] British Petroleum and the Alaska Tanker Company have been testing the use of ozone to treat ballast water. They have taken the lead on this work in Alaska and the ozone treatment system they are testing seems to be promising.[32]

Public Awareness and Education

In Alaska there is a lack of information and awareness regarding the mechanisms and ecological effects of invasive species introduction. In addition, there are few biologists or members of the public trained in field identification of high priority threatening ANS. The range expansion of northern pike in lakes throughout Southcentral Alaska is an example of people stocking fish in lakes close to home for personal use. Most likely, they do not realize that stocking these fish is illegal or that pike can damage indigenous species. Many Alaskans have moved to Alaska from the Midwest and Northern United States where pike, perch, and walleye are highly prized by sport anglers. A cornerstone of Alaska's ANS program must be public communication and education to prevent invasions, and gain assistance with detection and monitoring.

[29] Pacific Ballast Water Group, WORKING DRAFT Report and Recommendations on Voluntary Ballast Water Exchange, no date. http://web.pdx.edu/~sytsmam/pbwg/pbwg%20report1.html
[30] Nadol, Viki, "Aquatic Invasive Species in the Coastal West: An Analysis of State Regulation within a Federal Framework", *Environmental Law*, Volume 29, Issue 2, Summer 1999.
[31] Carolyn Morehouse, Passenger Vessel Compliance Engineer, Alaska Department of Environmental Conservation, personal communication, June 11, 2002.
[32] John Devens, executive director, Prince William Sound Regional Citizens Advisory Council, August 1, 2002.

III. AQUATIC NUISANCE SPECIES AUTHORITIES

The intentional introduction of invasive species of fish, and wildlife into Alaska is greatly reduced by Alaska's stringent fish and animal transport laws. At the time of Statehood, Alaska adopted a positive, resource protective approach toward the introduction of non-indigenous fish and wildlife species. Alaska now has the toughest laws in the United States governing the movement of fish and wildlife.

However, Alaska's laws related to ANS are neither well coordinated nor comprehensive. Plant laws are directed at the protection of agriculture and do not address ecosystem or habitat impacts of introduced plants. Ballast laws focus on petroleum discharge from non-segregated ballast with no references to non-indigenous aquatic species.

This section highlights some of the most notable deficiencies in Alaska laws. Pertinent state laws are provided in Appendix D.

The public, including private landowners, Tribal governments, and Native corporations, is largely unaware of ANS issues. One of the goals of this ANS plan is to coordinate the efforts of the various state and federal agencies, non-government organizations (NGOs) and the public in Alaska to tackle the problem of aquatic nuisance species. Eventually the goal will be to achieve coordination of all invasive species management in Alaska. Many other states on the West Coast are moving toward these goals. In addition to lack of coordination and awareness, Alaska is hampered by lack of funding to implement an invasive species program.

Alaska is the only West Coast state that has not recently passed new ballast water legislation addressing non-indigenous species. Currently, ballast water laws in Alaska focus only on petroleum discharge from non-segregated ballast tanks. Given the volume of vessel traffic and ballast water entering Alaska from ports seriously contaminated with aquatic nuisance species, Alaska should consider development of a ballast water law consistent with the other West Coast states that addresses non-indigenous species issues, particularly in the context of coastal trade. Boats coming from other U.S. ports such as San Francisco or Long Beach, California and Asia that do not pass through and comply with the Vancouver, B.C. or Washington State mandatory ballast exchange laws are some of the most likely carriers of harmful invasive species. The USCG voluntary ballast exchange program is likely to be evaluated as insufficiently effective. This provides an opportunity for Alaska to work with other Western states and the USCG to craft comprehensive standards.

Alaska regulates invasive fish species by prohibiting the importation of out-of-state fish, but the prohibition is limited to importation for purposes of rearing fish or stocking fish in state waters. Presumably, out-of-state fish can be imported for other reasons, but the statute is silent on this issue. In addition, Alaska law specifies that ornamental fish may be imported into Alaska but cannot be released into state waters.

However, the law does not provide guidance on prevention of aquaria escapes, a common method of unintentional ANS introduction. Also, Alaska statues are silent on when and how to

dispose of ornamental aquarium plants. This issue should be addressed in order to prevent the spread of potentially invasive aquatic plants.

Although Alaska has fairly strict laws governing the movement of fish and other wildlife into and out of the state, regulating the transport of fish and wildlife within the state has posed a difficult problem. This is partly because Alaska is so large and the ecosystems so diverse. Problems have arisen when unknown person(s) released northern pike, found north and west of the Alaska Range, into lakes and streams around Anchorage for stocking purposes. Pike are not normally found in Southcentral Alaska and are a threat to the indigenous trout and salmon. Attempts to regulate the movement of live fish throughout Alaska have been largely unsuccessful because it has been too difficult to distinguish the movement of live fish that humans are planning to release for harmful stocking purposes from the movement of live fish for personal consumption or commercial purposes. As live seafood transport becomes a greater issue of concern in Alaska, finding ways to address this issue will be a key component to any future regulation of aquatic invasive species.

Although Alaska laws do not restrict the movement of fish within the state for commercial purposes, there are stricter laws regarding the movement of farmed shellfish. A permit is required to move shellfish from one mariculture farm to another even if the farms are only several miles apart. The laws, regulations, and permits governing the movement of fish caught commercially or for personal use within Alaska and those for mariculture vary considerably in their oversight and consistency. This is an issue that warrants additional research and consideration.

With regard to plants, Alaska lacks a strong weed monitoring program and a noxious weed plan similar to those currently being developed in many other states. The focus of Alaska's plant laws is agriculture, but attention should be expanded to include environmental and ecosystem considerations as well. In addition, more careful attention is warranted for plants such as seaweed that are used for packing purposes when shipping fish and other animals from one place to another. As these materials may harbor invasive species, proper disposal of this material is critical and may need to be addressed through regulation.

A clear and comprehensive ANS management plan is a good step towards strengthening Alaska's invasive species laws. Alaska will be able to minimize the impact of aquatic nuisance species by taking steps to implement this plan and address the gaps in the existing laws.

For more information, see **Appendix D**, Alaska State Laws and Regulations; **Appendix E**, Summary of Research on West Coast Invasive Species Laws: Canadian Laws, Program Enabling Legislation, Ballast Water, and Plants; and **Appendix F**. Section 1204 of NISA-1996and Executive Order 13112.

IV. FOCUS OF THE MANAGEMENT PLAN

The ANS plan takes advantage of Alaska's relatively intact ecosystems and, through proactive action, prevent invasions by the prominent invasive threats. The main goal of the plan is to coordinate with the public and with federal, state, local, and tribal governments for the prevention and monitoring of invasive species and the development of an effective public information program

To accomplish this goal, ADF&G adopted the following invasive species policy and initial broad action strategies:

Invasive species pose a major threat to Alaska's native flora and fauna. Invasive species can harm native species of fish, wildlife, and plants resulting in ecosystem disruptions that could cause severe economic impacts to the people of Alaska. It is in the best interest of Alaska and Alaskans that both purposeful and unintentional introduction of invasive species not be tolerated. Accordingly, the ADF&G will take the following actions to prevent the introduction and spread of invasive species:

- *Develop an interdivision Alaska Invasive Species Prevention and Response Program within ADF&G.*
- *Pursue new funding sources for long-term support of the Invasive Species Response Program.*
- *Provide leadership and coordination between state, federal and international agencies and tribes and nongovernmental organizations (NGOs).*
- *Develop policies, procedures, and laws to prevent the introduction and spread of invasive species into Alaska.*
- *Prevent the spread of invasive species already introduced into Alaska, through the identification and closing of transport pathways.*
- *Develop protocols for early detection, rapid response to, control and management of new invasive species.*
- *Design and conduct research for invasive prevention, control and management.*
- *Develop educational plans and public awareness announcements on problems associated with invasive species.*

V. MANAGEMENT ACTIONS

Goal 1: Coordinate All Aquatic Nuisance Species Management Programs within Alaska and Collaborate with Regional, National, and International Programs

1A. Problem: ANS management responsibilities are divided among various agencies in Alaska. There is little coordination of efforts and no leadership in policy and program development.

1A1. Strategic Action: Coordinate ANS management programs and actions within Alaska and ensure coordination with regional, national, and international programs.

1A1a. Task: Create and fund an ANS coordinator position within the Alaska Department of Fish and Game. Initially apply for federal funding after submitting the ANS plan for approval. Develop a long-term funding strategy.

1A1b. Task: Establish an intradepartmental, multiple-division ADF&G Aquatic Nuisance Species Coordinating Committee to foster cooperation and coordination on ANS tasks. The ANS coordinator position will coordinate and lead the committee.

1A1c. Task: Establish a State of Alaska Aquatic Nuisance Species Coordinating Committee to foster cooperation and coordination on ANS tasks in Alaska. The ANS coordinator position will serve as chair to the committee. The committee will include broad representation including state and federal agencies, tribal groups, the *Exxon Valdez* Oil Spill (EVOS) Trustee Council, local government, non-government organizations, the University of Alaska and public.

1A1d. Task: Establish subcommittees to address major issues such as Atlantic salmon; commercial shipping; recreational boating, aquaculture, commercial and sport fishing; nursery and aquarium; education; research; risk assessment; imports and transfers; and monitoring, response and regulatory reform. These subcommittees will work with representatives of organizations that are identified as potential pathways for ANS introductions and other affected groups to identify voluntary or regulatory measures to prevent new ANS introductions.

1A1e. Task: Review the respective responsibilities of tribes and nongovernmental organizations, state, federal, and regional entities and develop a system to coordinate their ANS programs. Acknowledge this system through committee participation and a memorandum of understanding among the coordination committee members.

1A1f. Task: Ensure participation in the Pacific Ballast Water Group and coordinate participation among ADF&G, DEC, and the PWS RCAC and interested tribes and NGOs. The DEC will serve as the primary participant in meetings and agency lead.

1A1g. Task: Coordinate ballast water management and treatment standards development with the U.S. Coast Guard and the International Maritime Organization. Work with DEC and PWS RCAC to review other West Coast state ballast treatment standards, especially Washington, Oregon, and California, to develop a coast wide standard.

Goal 2: Prevent the introduction of new ANS into Alaska waters.

Education is a primary component of prevention and is addressed as Goal 4.

2A. Problem: New introductions of ANS into Alaska waters can cause ecological and economic damage. Prevention is the most cost-effective and ecologically sensitive method of eliminating problems. Alaska currently has no program for preventing ANS introductions.

2A1. Strategic Action: Coordinate with other states, interested tribes, NGOs and nations to prevent the spread of ANS into Alaska, either from or through areas outside of Alaska.

2A1a. Task: Develop individual species, multiple species or pathways-based, as appropriate, action plans for currently recognized highest invasive threats of Atlantic salmon, northern pike, New Zealand mudsnail, green crab, Chinese mitten crab, purple loosestrife, and Japanese knotweed.

2A1b. Task: Conduct a scientific ecological and economic risk assessment to determine the priority ranking for action on additional ANS threats and to verify or make changes to initial subjective assessments of ANS risks. Work with state, federal and private entities to work cooperatively on and fund this initial comprehensive risk assessment, including a funding proposal to the EVOS Trustee Council.

2A1c. Task: Based on the outcome of the risk assessment, reevaluate priorities and refine or develop additional individual, multiple species, or pathways-based action plans.

2A1d. Task: ADF&G will coordinate participation in regional and national conferences to increase awareness of ANS issues by other state, federal and agencies, tribes, NGOs and the public.

2A1e. Task: ADF&G will participate in the Western Regional Panel on Aquatic Nuisance Species in cooperation with the state representative to the panel.

2A1f. Task: ADF&G will participate in the Pacific States Marine Fisheries Commission effort to coordinate and implement regional ANS activities.

2A1g. Task: ADF&G will explore new opportunities to increase Native awareness and involvement in ANS issues and provide support to identify ANS management issues on Native lands.

2A1h. Task: ADF&G will consult with the Washington Department of Fish and Wildlife and British Columbia to discuss cooperative measures designed to address concerns regarding intentional introductions of nonnative aquatic species in our shared waters. In addition, ADF&G will work with the Trans-boundary Watershed Project to address the spread of ANS via trans-boundary rivers.

2A2. Strategic Action: Foster state, federal, tribal, and private coordination on ANS prevention issues to achieve maximum effectiveness and efficiency.

2A2a. Task: The Commercial Shipping subcommittee will work with maritime cargo vessel representatives, the Pacific Ballast Water Group, and other interested groups to explore commercial shipping practices, such as ballast water exchange and ANS-infested anchor chains to identify opportunities for preventing ANS introductions.

2A2b. Task: The Recreational Boating and Sport Fishing subcommittee will work with representatives of the recreational boating industry, sport fish guides and associations, seaplane associations, and other affected groups to prevent further introductions of ANS into Alaska waters through these pathways.

2A2c. Task: The Commercial Fishing and Mariculture subcommittee will work with representatives of the commercial fishing and mariculture industries, commercial fishing associations, and buyers and sellers of live seafood in the restaurant and grocery trade to prevent introductions of ANS into Alaska waters through these pathways.

2A2d. Task: The Education/Research/Risk Assessment subcommittee will work with representatives of the aquarium trade and pet suppliers, biological supply catalogues, aquatic garden suppliers, aquatic mail order catalogues, plant importers and nurseries, and other affected groups to prevent further introductions of ANS into Alaska waters through these pathways.

2A2e. Task: The Monitoring/Response/Control subcommittee will work with state and federal agencies, tribes, and other affected parties to prioritize monitoring efforts and develop response protocols.

2A2f. Task: The Regulatory Reform subcommittee will review existing state laws and regulations to identify gaps and help develop statutes and rules that serve to protect State waters from invasive species introductions.

2A3. Strategic Action: Prohibit, control, or permit the importation of nonnative aquatic species based on their invasive potential. Develop a pathways-based approach, rather than a species-based approach, that utilizes incentives, regulations, and technologies to reduce the likelihood that invasive species will enter Alaska.

2A3a. Task: Identify a protocol for ADF&G development of an invasive species list identifying species that cannot be introduced into Alaska or into select geographic areas in Alaska. The list will include: fish, other aquatic organisms, and aquatic plants. The commissioner can add invasive species to this list as necessary. A new addition to the list will require a statement justification by the commissioner that a particular species is considered invasive. Note: Current law provides that except for oysters and scallops, fish and other marine invertebrates cannot be legally imported into the state. The process should distinguish among: 1) species that pose a significant threat to the biological health and diversity of state waters; 2) species that pose a minimal threat to the biological health and diversity of state waters; 3) species for which there is little or no information to ascertain their status as an ANS; and 4) species that have potential commercial or recreational value and may be safely managed under aquaculture regulations. ADF&G will work with the Alaska Department of Natural Resources (DNR), Divisions of Agriculture and Forestry, and the Division of Governmental Coordination to develop a process to coordinate or combine lists to improve the efficiency and effectiveness of the invasive species listing process especially as it pertains to public and business user friendliness. Ultimately the listing process will include terrestrial plants and animals and be part of the invasive species council purview. Alaska may consider using the approach adopted by Hawaii that a lack of information about a species is considered reason to exclude a species, not an excuse to allow entry. This listing process should also consider quarantine and import procedures.

2A3b. Task: ADF&G in cooperation with the ANS Coordinating Committee will develop and implement, through the Aquatic Nuisance Species Management Plan, an annual process to: identify potential new threats to state waters; identify the threats associated with the spread of

existing ANS; assess the relative environmental risks associated with these threats; and report these findings to the appropriate agencies. After initial years, this review process can become biennial.

2A3c. Task: The ANS Coordinating Committee will develop and implement, through the Aquatic Nuisance Species Management Plan, a method for evaluating, permitting and using biological control agents, which are frequently non-native species, and have on occasion, themselves become invaders. The committee should develop and implement uniform guidelines across agencies for the import and use of biological control agents.

2A4. Strategic Action: Increase enforcement and awareness of existing laws controlling the transport, propagation, sale, collection, possession, importation, purchase, cultivation, distribution, and introduction of ANS.

2A4a. Task: ADF&G will initiate a training program for state troopers and commissioned fish and wildlife enforcement officers on ANS identification and laws and regulations.

2A4b. Task: ADF&G will work with the University of Alaska, Sea Grant Marine Advisory Program, and other state agencies to distribute information on ANS laws to businesses that import aquatic organisms, including information on existing penalties for the intentional introduction of any non-native species in Alaska waters.

Goal 3: Detect, monitor, contain, reduce, or eradicate populations of aquatic nuisance species as quickly as possible with a minimum of environmental impact.

3A. Problem: A number of potentially very damaging ANS are spreading closer to Alaska waters. Alaska has no program to monitor these species and a limited effort for monitoring for species already present in Alaska. Economic and environmental damage will be greater without an effective monitoring program to quickly detect new ANS introductions or the spread of those already present. Early and rapid detection of new introductions and the spread of established ANS are needed so that emergency response plans can be immediately implemented to allow for eradication. Accurate baseline information is needed on ANS presence, locations, and an estimate of population number and/or densities. This information needs to be made available to appropriate agencies and the public.

3A1. Strategic Action: Using both government employees and volunteers from the public, monitor waters that are vulnerable to new ANS introductions and track the distribution of existing ANS populations.

3A1a. Task: Based on the results of the risk assessment, develop an overall monitoring program with specific monitoring components, including a citizen volunteer monitoring program, to address the most critical potential introductions or expansions of ANS. The monitoring program should include pro-active collection of baseline data, in addition to opportunistic identification through field activities.

3A1b. Task: Develop a program for training ADF&G staff, as well as state and federal biologists and land managers in the field, so the identification and reporting of ANS can be an integral part of their field activities.[33]

3A1c. Task: Develop a GIS database to show the locations of ANS sightings and established populations in Alaska. Obtain GIS maps developed in Washington to provide additional information on threats and rates of spread of species on the West Coast. Work with the U.S. Geological Service, Biological Resources Division laboratory in Gainesville, Florida to determine if Alaska can coordinate with the Division's extensive GIS capabilities and ANS database to share efficiencies and reduce costs.

3A1d. Task: Develop a reporting system to receive information on suspected ANS and the capacity to follow up sightings, including expertise to identify aquatic species and a system for information to be added to a central database.

3B. Problem: Alaska has no emergency response plans in place to quickly address new introductions of ANS. Small populations of newly introduced ANS are most vulnerable to eradication. Without previously developed plans, new ANS populations can become established while agencies are developing and agreeing upon appropriate eradication measures.

3B1. Strategic Action: Develop emergency response plans for specific ANS known to be an imminent threat to Alaska waters. Actions outlined in these emergency response plans, when implemented, will prevent the establishment and spread of these species, or minimize their impacts. The emergency response plans will address permitting, funding, equipment and resources, staffing, and stakeholder input.

3B1a. Task: Given that Atlantic salmon are known to be invading Alaska waters and pose an imminent threat to Alaska ecosystems and salmonid populations, develop an Atlantic salmon action plan to address prevention, monitoring, and eradication.

3B1b. Task: Given the imminent threat to salmonid habitat and populations, develop an interim action plan to address prevention, monitoring, and eradication of Alaska's highest perceived threats, including green crab, New Zealand mudsnail, and northern pike. Actively work to eradicate existing northern pike populations and prevent further spread.

3B1c. Task: ADF&G will research the establishment and administration of an ANS Response Fund. Having readily available funds to be used to finance a quick initial response to the introduction of an ANS will allow for immediate response to new sightings of invasive species. This will reduce the likelihood of their establishment in Alaska. Based on similar funds established in other Western states, a $200,000 fund may be adequate for initial response activities. ADF&G will seek funding from state, public, and private organizations and will develop and introduce legislation to establish the fund. Jurisdictional issues will be explored as part of the development research process. Until other funding sources are established, Alaska

[33] Among others this could include EPA's National Estuary Program, the US Fish and Wildlife Service's National Wildlife Refuges system, the National Park Service, State and local parks, and Tongass and Chugach National Forest staff in a program of identifying and reporting any new introductions.

will petition the ANS Task Force for funding to allow us to deal with emergency-type ANS invasions.

Goal 4: Educate the public and appropriate resource user groups to the importance of preventing ANS introductions and how the harmful impacts of ANS can be reduced.

4A. Problem: Accidental introductions occur through the actions of the public, such as naively releasing non-native aquarium plants and animals into natural waters. The current state of public awareness of ANS issues and laws is inadequate to address the problem.

4A1. Strategic Action: Compile, develop, and coordinate the dissemination of educational materials on ANS that will increase general public awareness of the ANS problem.

4A1a. Task: Develop a public education and communication plan for ANS. To minimize the cost and maximize the efficiency of an education program, consider all potential ongoing ADF&G and other state and federal agency activities into which ANS education and communication can be incorporated. Also work closely with the national Aquatic Nuisance Species Task Force, Communications, Education and Outreach committee to incorporate and leverage these programs; continue state participation on this committee. Collaborate with the Alaska Department of Education and University of Alaska for educational outreach. Determine how educational components will be coordinated and funded internally. Components of the plan to consider include the following.

4A1b. Task: Develop an ANS website that includes images and directions on how to identify and report ANS sightings.

4A1c. Task: Develop and include on the website of ANS GIS maps showing the locations of ANS sightings and established populations in Alaska.

4A1d. Task: Develop fliers and small license holder sized identification cards for Atlantic salmon to be distributed with all sport fish licenses and licensing vendors and sport fish supply and equipment retail outlets.

4A1e. Task: Publish an aquatic plant identification manual for Alaska to enable residents as well as resource managers to identify nonnative aquatic plants as well as common native species.

4A1f. Task: Develop ANS information to be distributed to community watershed groups and provide training for volunteers to participate in monitoring programs.

4A1g. Task: Develop partnerships with media outlets and established publications to reach a broad spectrum of the public with ANS messages.

4A1h. Task: Identify key state publications into which ANS text and graphics can be included. Develop an electronic press kit available over the web. Develop a library of images and graphics for ready use.

4A1i. Task: Develop information that can be easily incorporated into classroom curriculum and material for kindergarten through twelfth-grade teachers.

4A1j. Task: Develop ANS educational materials outlining the potential impacts of releasing non-indigenous species and identifying good practices for pet stores to be shared with retail and wholesale suppliers of aquarium fish, plants, and supplies.

4A1k. Task: Develop ANS educational materials outlining the potential impacts of releasing non-indigenous species and identifying good practices for pet stores to be distributed with customer purchases of aquarium fish, plants and supplies.

4A1l. Task: Develop a "good housekeeping" program for pet stores to be awarded to those with good outreach programs and responsible policies against ANS introductions.

4A2. Strategic Action: Develop and distribute educational information targeted at specific groups who are especially affected by ANS introductions and/or may be able to first observe introductions.

4A2a. Task: Provide training and identification materials to aquaculture companies and their staff, and encourage them to report sightings of suspected ANS.

4A2b. Task: Provide information to fishing groups and fishers to monitor and report sightings of ANS, including information so fishers can recognize and remove ANS weeds that can choke waterways and impact fishing opportunities.

4A2c. Task: Develop a New Zealand mudsnail education program for sport fishing guides, potential visitors, and residents who travel to infested areas regarding practices to prevent the introduction of mudsnails into Alaska's pristine fishing areas.

4B. Problem: Decision makers need to be aware of the threat of ANS to the marine resources of Alaska so they can develop policies, direct agencies to develop ANS programs, and appropriate funds to carry out education, research, prevention, control and management activities. Natural resource managers must be knowledgeable about ANS in order to develop and implement effective ANS programs.

4B1. Strategic Action: ADF&G and the ANS Council will provide educational briefings on the threats and solutions to ANS invasions for decision makers.

4B1a. Task: ADF&G will provide educational briefing to state legislators and legislative staff, and to local elected officials and their staff on the threat of ANS and potential solutions. A multi-media presentation will be developed for use by ANS Coordinating Committee members so the presentation can be easily made around the state. Material for these briefings will be derived as much as possible from local sources, as well as from other parts of the country and internationally.

4B1b. Task: Provide similar training as that described above for elected officials and staff to state and federal agency decision makers to build support for and incorporation of ANS programs into agency activities.

Goal 5: Identify, develop, conduct, and disseminate research on ANS that are identified as species of concern in Alaska.

5A. Problem: Little is known about ANS introductions, spread, and impacts to human health, ecosystems, and the economy in Alaska. More information is needed in order to develop effective prevention, management and control programs, to create accurate education programs, and to weigh the relative risks of ANS invasions so limited resources can be used most effectively to minimize risks.

5A1. Strategic Action: Assess the risk of ANS introductions to human health, ecosystems, and the economy.

5A1a. Task: Define ANS risks that affect ecosystems, human health, and the economy, and develop criteria for evaluating and classifying these risks. Study the population dynamics, ecology, and impacts of current and potential invaders to gain an understanding of the chances of invasion and potential damage from specific species. Based on these risk criteria, conduct a full risk assessment of ANS.

5A1b. Task: Characterize potential ANS by identifying and describing traits associated with successful high-impact invaders, particularly those present in West Coast estuaries, coastal regions, lakes and streams, and in similar habitats elsewhere.

5A1c. Task: Characterize resources and habitats with highly sensitive-to-invasion ecological communities in Alaska, such as disturbed habitats that may be at greater risk for invasion.

5A1d. Task: Develop a list of experts with a broad knowledge of aquatic taxonomic groups, and assess their availability to respond to requests for identification of ANS.

5A1e. Task: Maintain a database of ongoing West Coast and national ANS research efforts and coordinate Alaska with these efforts to avoid duplication and utilize limited resources most effectively.

5A1f. Task: Continue to develop and maintain a coordinated list of ANS and nonnative species known to occur in Alaska.

5A1g. Task: Develop a process to inform researchers and public, private and Native resource managers of recent and emerging information and research on ANS. Foster research relationships with such groups as the University of Alaska, EVOS Trustee Council and Federal research institutions such as the USGS/BRD Science Centers and Cooperative Units, the U.S. Department of Interior Cooperative Ecosystem Study Units, the National Oceanic and Atmospheric Association (NOAA) Sea Grant Marine Advisory Program, Estuarine Research Reserve, and Marine Protected Areas Programs. This effort will improve gathering of baseline and monitoring data and coordination of research efforts.

5B. Problem: The pathways by which ANS invasions may occur is not well understood. Geographically referenced data on the extent and spread of ANS invasions, and their pathways of introduction, are needed to understand where the existing ANS in Alaska or near Alaska borders might spread, to further understand what allows certain non-native species to become established as ANS, and to develop strategies for closing ANS entry pathways as well as tools for management and control for ANS. As part of this analysis, consider the spread of ANS from Russia, as well as Canada and the lower 48.

5B1. Strategic Action: Develop baseline assessments.

5B1a. Task: Compile maps of major human activities that affect aquatic resources with invasions of ANS. Overlaps will help elucidate the interaction among human activities, the pathways by which nonnative species arrive, and the establishment of ANS. Include as part of this mapping process, linkages through watersheds and drainages that might facilitate the spread of ANS as has been seem with northern pike in Southcentral Alaska.

5B1b. Task: Compare and contrast ANS management and control strategies throughout the world for species of Alaska interest, and develop Best Management Practices for established populations or potential invasions of ANS in Alaska.

Goal 6: Take appropriate steps to ensure that federal and state rules and regulations sufficiently promote the prevention and control of ANS.

6A. Problem: The recognition and understanding of the damage caused by ANS is relatively new and rapidly evolving. As knowledge of and the ability to deal with ANS improves, regulatory authority must also adapt. Alaska laws are insufficient to provide for the development of an effective and coordinated state program to guard against ANS invasions without the authority and financial support afforded by well-designed and integrated legislation.[34]

6A1. Strategic Action: Review the laws governing ANS in Alaska for gaps and overlaps, compare them to other states' ANS laws, and recommend changes to improve our ability to protect Alaska waters from the introduction and spread of ANS. ADF&G will need to develop broad based, diverse citizen support to accomplish this goal.

6A1a. Task: Commission a law student to conduct a review of Alaska's ANS law.

6A1b. Task: Review Alaska statutes that pertain to invasive species, specifically to ascertain the authority and effectiveness of the statutes for the prevention, monitoring, control, and eradication of invasive species in terrestrial and aquatic environments.

6A1c. Task: Review and report on the respective authorities of State agencies and gaps and overlaps in authorities among State agencies.

[34] Much of the work on this goal was completed. The results are presented in: Section III. Aquatic Nuisance Species Authorities, which contains an analysis of gaps in current laws; Appendix D, which contains copies of Alaska laws and regulations; and Appendix E, which provides an overview of the most pertinent invasive species laws in Western states and Canada.

6A1d. Task: Identify potential for improved coordination as well as necessary new legislation to strengthen Alaska's statutes aimed at the prevention and treatment of invasive species.

6A1e. Task: Review and report on the compatibility of Alaska statutes with federal laws, especially the National Invasive Species Act.

6A1f. Task: Review and report on the potential development of West Coast standards based on a review of statutes in the Western states.

6A1g. Task: Monitor the reauthorization of the National Invasive Species Act to ensure that Alaska's interests are addressed, and work with the Alaska Governor's Office and Congressional delegation as needed to protect Alaska's interests.

VI. IMPLEMENTATION

Information on implementation of this plan is contained in the Implementation Table, located after Section VII. This table provides information on the implementation of specific tasks included in the management plan. It includes funding sources and identifies the implementing agency or position, coordinating agencies, when the task will be conducted, and anticipated costs. Following federal approval of this plan, it is expected that 75% of the cost of implementation will be provided by the national aquatic nuisance species program funded through the U.S. Fish and Wildlife Service. Some federal ANS funds may be available in FFY03. If not, federal funds are anticipated in FFY04 as a result of the plan submission, review, and grant cycle.

During FFY03 regardless of whether federal funds are made available through the USFWS, Sustainable Salmon Fund ($200K + $20K for green crab + $45K for Atlantic salmon research and monitoring), Division of Sport Fish ($75.0) for continued northern pike monitoring and eradication, Conservation and Reinvestment Act (CARA) funds for preventing the introduction of New Zealand mudsnails by fouled fishing gear ($30.0), and ADF&G general funds will be used to initiate a streamlined program.[35] This includes the hiring of a program coordinator.

FY03 Milestones and Major Tasks[36]

1. Hire ANS coordinator.
2. Establish intradepartmental ADF&G ANS coordinating committee.
3. Establish a multi-agency ANS coordinating council.
4. Establish council subcommittees to address major issues such as Atlantic salmon, shipping, education, and risk assessment.
5. Review the respective responsibilities of tribes, NGOs, state, federal, and regional entities and develop coordination process.
6. Oversee contracts to:
   - Assist the Pacific States Marine Fisheries Commission ANS program
   - Conduct risk assessment.
   - Define ANS risks that affect ecosystems, human health, and the economy and develop criteria for evaluating and classifying these risks.
7. Develop a reporting system to receive information on suspected ANS.
8. Develop a public education and communication plan.
9. Provide educational briefings to state legislatures and legislative staff and to locally elected officials.
10. Develop, maintain and publish a list of experts with a broad knowledge of aquatic taxonomic groups.
11. Maintain a database of ongoing West Coast and national ANS research efforts.
12. Develop a process to inform researchers and public and private land and resource managers of recent and emerging ANS information and research.

[35] Dollar values are in thousands. Sustainable Salmon, green crab and Atlantic salmon funds are available from congressionally appropriated funds to limit the spread of invasive species.

[36] For state FY 03-05, tasks and milestones are cumulative in that processes and program elements developed in FY03 continue to be implemented in FY04 as the program grows and becomes more comprehensive.

13. Continue to develop and maintain a coordinated list of ANS and nonnative species known to occur in Alaska and coordinate with the USGS, National Invasive Species database.
14. Conduct a review of Alaska and federal ANS laws and regulations.[37]

FY04 Milestones and Major Tasks

1. Hire an assistant ANS position.
2. Increase division capacity for addressing ANS issues.
3. Coordinate ballast water management and treatment standards development.
4. Develop individual, multiple species and pathways-based action plans.
5. Develop an annual process to: identify potential new threats to state waters; identify the threats associated with the spread of existing ANS; assess the relative environmental risks associated with these threats; and report findings.
6. Alaska ANS Coordinating subcommittees work with specific industry sectors to reduce ANS threats.
7. Identify a protocol for development of an invasive species list identifying species that cannot be introduced into Alaska or into select geographic areas in Alaska.
8. Initiate a training program for state troopers and commissioned fish and game enforcement officers on ANS identification and laws and regulations.
9. Develop ANS information to be distributed to community watershed groups.
10. Develop a database out of which GIS maps can be built to show the locations of ANS sightings.
11. Implement public education and communication program.
12. Develop and implement a monitoring program.
13. Develop and implement training to integrate ANS identification and reporting into field activities.

FY05 Milestones and Major Tasks

Oversee research to:

1. Publish an aquatic plant identification manual for Alaska.
2. Characterize potential ANS by identifying and describing traits associated with successful high-impact invaders.
3. Characterize resources and habitats with highly "invade able" ecological communities in Alaska.
4. Compile maps of major human activities that affect aquatic resources with invasions of ANS.
5. Compare and contrast ANS management and control strategies to develop Best Management Practices for established populations or potential invasions of ANS in Alaska.

[37] Much of this work was completed during summer 2002.

VII. MONITORING, EVALUATION AND FEEDBACK

Systematic monitoring of program outputs and results will be part of the implementation of the ANS Management Plan. This process will be a formal evaluation regarding the efficiency and effectiveness of the program. Initially, the ANS plan will be updated annually. As part of the update, the program coordinator will review the status of all tasks included in the implementation table and report on the status of each task. The Plan is an active working document that will be used to evaluate the performance and success of the program. Effectiveness of each task toward meeting plan goals will be evaluated and reported. Obstacles to completing tasks or factors that limit effectiveness will also be evaluated and reported. Changes to the Plan will be made as a result of this evaluation. The program coordinator will be responsible for overseeing the review process

Implementation Table

Tasks/Actions		Fund Source	Implem. Entity	Coop. Organization	Preliminary Cost Estimate		Preliminary Cost Estimate		Preliminary Cost Estimate	
#	Descriptive Title				$ 1,000s FY03	FTE	$ 1,000s FY04	FTE	$ 1,000s FY05	FTE
Goal 1: Coordinate All Aquatic Nuisance Species Management Programs within Alaska and Collaborate with Regional, National and International Programs.										
1A1a	Create & fund an ANS coordinator position within ADF&G.	USFWS	ADF&G		87.0	1.0	157.0	2.0	152.0	2.0
1A1b	Establish an intra-dept. ADF&G ANS Coordinating Committee chaired by the ANS coordinator.	USFWS/ADF&G	ADF&G ANS Coordinator	ADF&G	60.0	0.75	120.0	1.5	120.0	1.5
1A1c	Establish a multi-agency Aquatic Nuisance Species Coordinating Committee.	USFWS	ADF&G	U of A, Sea Grant, DNR, DEC, USFS, USFWS, EVOS Trustee Council			10.0		10.0	
1A1d	Establish subcommittees to address major issues such as Atlantic salmon, shipping, education and risk assessment.	USFWS	AK ANS Com.	ADF&G ANS Coordinator	b					
1A1e	Review the respective responsibilities of tribes, NGOs, state, federal and regional entities & develop coordination process.	USFWS	AK ANS Com.	ADF&G ANS Coordinator	b					
1A1f	Participate in the Pacific Ballast Water Group and coordinate participation.	DEC	DEC	AK ANS Com.	5.0		5.0		5.0	
1A1g	Coordinate ballast water management and treatment standards development.	USFWS	DEC	AK ANS Com.	5.0	0.1	5.0	0.1	5.0	0.1
Goal 2: Prevent the introduction of new ANS into Alaska waters.										
2A1a	Develop individual species, multiple species, or pathways-based action plans	USFWS	ADF&G	ADF&G ANS Coordinator			b,c		b,c	
	Develop an interim plan for Atlantic salmon (highest priority current invasive) (see Task 3B1a)	ADF&G	ADF&G	ADF&G ANS Coordinator						
	Develop an interim plan for northern pike (highest priority current invasive) (see Task 3B1b)	ADF&G	ADF&G	ADF&G ANS Coordinator						
	Develop an interim prevention and monitoring plan for green crab	ADF&G	ADF&G	ADF&G ANS Coordinator	20.0					
2A1b	Conduct a scientific risk assessment to determine the priority ranking for action on ANS threats.	EVOS	AK ANS Com.	ADF&G ANS Coordinator	25.0					

Tasks/Actions		Fund Source	Implem. Entity	Coop. Organization	Preliminary Cost Estimate		Preliminary Cost Estimate		Preliminary Cost Estimate	
#	Descriptive Title				$ 1,000s FY03	FTE	$ 1,000s FY04	FTE	$ 1,000s FY05	FTE
2A1c	Based on the outcome of the risk assessment, reevaluate priorities and refine or develop additional individual or multiple species action plans.	EVOS	AK ANS Com.	ADF&G ANS Coordinator	a,b					
2A1d	Coordinate participation in state, regional, national & international conferences.	ADF&G	ADF&G ANS Coordinator	AK ANS Com.	5.0	b				
2A1e	Participate in the Western Regional Panel on Aquatic Nuisance Species.	ADF&G	ADF&G ANS Coordinator	AK ANS Com.	6.0	b				
2A1f	Participate in the Pacific States Marine Fisheries Commission effort to coordinate and implement regional Aquatic Nuisance Species activities.	ADF&G	ADF&G ANS Coordinator	AK ANS Com.	3.0	b				
2A1h	Consult with the Washington Dept. of F&W and the British Columbia Transplant Committee re. Atlantic salmon.	ADF&G	ADF&G ANS Coordinator	AK ANS Com.			b	b		
2A2a	The Commercial Shipping sub-committee work with maritime cargo vessel representatives, the Pacific Ballast Water Group, & other interested groups re. commercial shipping practices.	USFWS	AK ANS Com.	ADF&G ANS Coordinator			b	b		
2A2b	The Recreational Boating and Sport Fishing sub-committee work with representatives of the recreational boating industry.	USFWS	AK ANS Com.	ADF&G ANS Coordinator			b	b		
2A2c	The education/Research/Risk Assessment sub-committee work with representatives of aquarium trade.	USFWS	AK ANS Com.	ADF&G ANS Coordinator			b	b		
2A2d	The Monitoring/Response/Control sub-committee will work with tribes, NGOs, state and federal agencies to prioritize monitoring efforts and develop response protocols.	USFWS	AK ANS Com.	ADF&G ANS Coordinator			b	b		
2A2e	The Regulatory Reform sub-committee will review existing state laws and regulations	USFWS	AK ANS Com.	ADF&G ANS Coordinator			b	b		
2A3a	Identify a protocol for development of an invasive species list identifying species that cannot be introduced into Alaska or into select geographic areas in Alaska	USFWS	AK ANS Com.	ADF&G ANS Coordinator			b	b		

Tasks/Actions		Fund Source	Implem. Entity	Coop. Organization	Preliminary Cost Estimate		Preliminary Cost Estimate		Preliminary Cost Estimate	
#	Descriptive Title				$ 1,000s FY03	FTE	$ 1,000s FY04	FTE	$ 1,000s FY05	FTE
2A3b	Develop an annual process to: identify potential new threats to state waters; identify the threats associated with the spread of existing ANS; assess the relative environmental risks associated with these threats; and report findings.	USFWS	AK ANS Com.	ADF&G ANS Coordinator			b	b		
2A4a	Initiate a training program for state troopers and commissioned fish and game enforcement officers on ANS identification and laws and regulations.	USFWS	AK ANS Com.	ADF&G ANS Coordinator			5.0		5.0	
2A4b	Distribute information on ANS law to businesses that import aquatic organisms.	USFWS	ADF&G ANS Coordinator	DCED	1.0		1.0		1.0	
Goal 3: Detect, monitor, contain, reduce or eradicate populations of aquatic nuisance species as quickly as possible with a minimum of environmental impact.										
3A1a	Based on the results of the risk assessment, develop and implement an overall monitoring program.	USFWS	AK ANS Com.	ADF&G			50.0		50.0	
3A1b	Develop and implement training to integrate ANS identification and reporting into field activities.	ADF&G	ADF&G ANS Coordinator	ADF&G			25.0		25.0	
3A1c	Develop a database out of which GIS maps can be built to show the locations of ANS sightings	USFWS	ADF&G ANS Coordinator	ADF&G			20.0		10.0	
3A1d	Develop a reporting system to receive information on suspected ANS	USFWS	ADF&G ANS Coordinator	ADF&G	5.0					
3B1a	Develop an Atlantic salmon interim action plan to address prevention, monitoring and eradication.		ADF&G	ADF&G ANS Coordinator	25.0		25.0		25.0	
3B1b	Implement a northern pike action plan to address prevention, monitoring and eradication.		ADF&G	ADF&G ANS Coordinator	75.0	1.0	75.0	1.0	75.0	1.0
3B1c	Establish and administer an ANS response fund.	USFWS/ State of Alaska	ADF&G	ADF&G ANS Coordinator			100.0		100.0	
Goal 4: Educate the public and appropriate resource user groups to the importance of preventing ANS introductions, and how the harmful impacts of ANS can be reduced.										
4A1a	Develop a public education and communication plan for ANS.	USFWS	ADF&G ANS Coordinator	ADF&G	10.0	0.1	10.0	0.1	10.0	0.1
4A1b	Develop an ANS website that includes images and directions on how to identify and report ANS sightings.	USFWS	ADF&G ANS Coordinator	ADF&G			15.0		15.0	

Tasks/Actions		Fund Source	Implem. Entity	Coop. Organization	Preliminary Cost Estimate		Preliminary Cost Estimate		Preliminary Cost Estimate	
#	Descriptive Title				$ 1,000s FY03	FTE	$ 1,000s FY04	FTE	$ 1,000s FY05	FTE
4A1c	Include ANS GIS maps on the ANS website.	USFWS	ADF&G ANS Coordinator	ADF&G			5.0		5.0	
4A1d	Develop fliers and small license holder size identification cards for Atlantic salmon.	USFWS	ADF&G ANS Coordinator	ADF&G	2.0					
4A1e	Publish an aquatic plant identification manual for Alaska.	USFWS	U of A, Sea Grant, DNR, DEC, USFS, USFWS	ADF&G ANS Coordinator					15.0	
4A1f	Develop ANS information to be distributed to community watershed groups.	USFWS	ADF&G ANS Coordinator	DEC			10.0		10.0	
4A1g	Develop partnerships with media outlets.	ADF&G	ADF&G ANS Coordinator	ADF&G	b					
4A1h	Identify key state publications into which ANS test and graphics can be included.	ADF&G	ADF&G ANS Coordinator		b					
4A1i	Develop information that can be easily incorporated into classroom curriculum	USFWS	ADF&G ANS Coordinator	DOE					15.0	
4A1j	Develop ANS educational materials for pet stores to be shared with retail & wholesale suppliers.	USFWS	ADF&G ANS Coordinator	DCED			5.0		5.0	
4A1k	Develop ANS educational materials for pet stores to be distributed with customer purchases.	USFWS	ADF&G ANS Coordinator	DCED, U of A			1.0		1.0	
4A1l	Develop a "good housekeeping" program for pet stores w/ good outreach programs and responsible polices.	USFWS	ADF&G ANS Coordinator	ADF&G			1.0		1.0	
4A2a	Provide ANS training & identification material to aquaculture companies.	USFWS	ADF&G ANS Coordinator	ADF&G			5.0		5.0	
4A2b	Provide information to fishing groups and fishers to monitor and report sighting of ANS	USFWS	ADF&G ANS Coordinator	ADF&G, U of A			10.0		10.0	
4A2c	Develop a New Zealand mud snail education program	CARA	ADF&G		30.0		15.0		15.0	
4B1a	Provide educational briefing to state legislatures and legislative staff & to local elected officials.	ADF&G	ADF&G ANS Coordinator	ADF&G, U of A	1.0					

Tasks/Actions		Fund Source	Implem. Entity	Coop. Organization		Preliminary Cost Estimate		Preliminary Cost Estimate		Preliminary Cost Estimate	
#	Descriptive Title					$ 1,000s FY03	FTE	$ 1,000s FY04	FTE	$ 1,000s FY05	FTE
4B1b	Provide similar training to state agency leaders to build support for & incorporation of ANS programs.	ADF&G	ADF&G ANS Coordinator	ADF&G, U of A		1.0					
Goal 5: Identify, develop, conduct and disseminate research on ANS that are identified as species of concern in Alaska.											
5A1a	Define ANS risks that affect ecosystems, human health and the economy and develop criteria for evaluating and classifying these risks.	USFWS	AK ANS Com.	ADF&G				10.0			
5A1b	Characterize potential ANS by identifying and describing traits associated with successful high-impact invaders.	USFWS	ADF&G	U of A, Sea Grant, DNR, DEC, USFS, USFWS						15.0	
5A1c	Characterize resources & habitats with highly "invade-able" ecological communities in Alaska.	USFWS	ADF&G	U of A, Sea Grant, DNR, DEC, USFS, USFWS						15.0	
5A1d	Develop, maintain and publish a list of experts with a broad knowledge of aquatic taxonomic groups.		ADF&G ANS Coordinator	ADF&G, U of A		2.0					
5A1e	Maintain a database of ongoing West Coast & national ANS research efforts.		ADF&G ANS Coordinator	ADF&G		5.0		5.0		5.0	
5A1f	Continue to develop and maintain a coordinated list of ANS and nonnative species known to occur in Alaska.		ADF&G ANS Coordinator	U of A, Sea Grant, DNR, DEC, USFS, USFWS		b,c					
5A1g	Develop a process to inform researchers and resource managers of recent and emerging ANS information and research.		ADF&G ANS Coordinator	U of A, Sea Grant, DNR, DEC, USFS, USFWS		b					
5B1a	Compile maps of major human activities that affect aquatic resources with invasions of ANS.	USFWS	AK ANS Com.							15.0	
5B1b	Compare and contrast ANS management and control strategies to develop Best Management Practices for established populations or potential invasions of ANS in Alaska.	USFWS	ADF&G ANS Coordinator							20.0	

Tasks/Actions		Fund Source	Implem. Entity	Coop. Organization	Preliminary Cost Estimate		Preliminary Cost Estimate		Preliminary Cost Estimate	
#	Descriptive Title				$ 1,000s FY03	FTE	$ 1,000s FY04	FTE	$ 1,000s FY05	FTE
Goal 6: Take appropriate steps to insure that federal and state rules and regulations sufficiently promote the prevention and control of ANS.										
6A1a	Commission a law student to conduct a review of Alaska's ANS laws and regulations.	ADF&G		ADF&G						
6A1b	Review Alaska state statutes that pertain to invasive species.	ADF&G		Law intern		0.2				
6A1c	Review & report on the respective authorities of State agencies.	ADF&G		Law intern		0.2				
6A1d	Identify potential for improved coordination and new legislation to strengthen Alaska's statutes aimed at the prevention and treatment of invasive species.	ADF&G		Law intern		0.2				
6A1e	Review & report on the compatibility of Alaska statutes with federal laws.	ADF&G		Law intern		0.2				
6A1f	Review and report on the potential development of West Coast standards based on a review of statutes in the Western states.	ADF&G		Law intern		0.2				
6A1g	Monitor the reauthorization of the National Invasive Species Act to ensure that Alaska's interests are addressed.	ADF&G		ADF&G ANS Coordinator						
Totals					373.0		690.0		760.0	
	Sources of Funds for FFY03: (tentative)									
	Sustainable Salmon Fund	200.0								
	Green Crab research and monitoring funds	20.0								
	Atlantic Salmon research and monitoring fund	45.0								
	Sport Fish northern pike	75.0								
	CARA New Zealand mud snail	30.0								
		370.0								

[a] USFWS dollars are not available until FY04. USFWS/federal dollars in FY03 are sustainable salmon funds.
[b] Coordinators duties.
[c] Division staff duties.

IX. APPENDICES

Appendix A. Literature Cited

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Appendix B: Glossary

ACCIDENTAL INTRODUCTION – An introduction of non-native aquatic species that occurs as the result of activities other than the purposeful or intentional introduction of the species involved, such as the transport of nonnative species in ballast water or in water used to transport fish, mollusks, or crustaceans for aquaculture or other purposes.

ALIEN SPECIES – With respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

AQUATIC NUISANCE SPECIES – A nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters. Aquatic nuisance species include nonindigenous species that may occur in inland, estuarine and marine waters and that presently or potentially threaten ecological processes and natural resources. In addition to adversely affecting activities dependent on waters of the United States, aquatic nuisance species adversely affect individuals, including health effects.

AQUATIC SPECIES – All animals and plants as well as pathogens or parasites of aquatic animals and plants totally dependent on aquatic ecosystems for at least a portion of their life cycle. Bacteria, viruses, parasites and other pathogens of humans are excluded.

BAIT – Species used as bait for recreational fishing including fish, worms, and other invertebrates.

BALLAST WATER – Any water and associated sediments used to manipulate the trim and stability of a vessel.

BIOCONTROL – The use of living organisms, such as predators, parasites, and pathogens, to control pest insects, weeds, or diseases.

CONTROL – Activities to eliminate or reduce the effects of aquatic nuisance species, including efforts to eradicate infestations, reduce populations of aquatic nuisance species, develop means to adapt human activities and facilities to accommodate infestations, and prevent the spread of aquatic nuisance species from infested areas. Control may involve activities to protect native species likely to be adversely affected by aquatic nuisance species. Preventing the spread of aquatic nuisance species is addressed in the Prevention Element of the proposed Program; all other control activities are included in the Control Element.

ECOLOGICAL INTEGRITY – The extent to which an ecosystem has been altered by human behavior; an ecosystem with minimal impact from human activity has a high level of integrity; an ecosystem that has been substantially altered by human activity has a low level of integrity

ECOSYSTEM – The biological organisms in an ecological community and the non-living factors of the environment.

ENTRY POTENTIAL – The relative ability of an organism to penetrate the borders of a given area within a time interval.

ENVIRONMENTALLY SOUND – Methods, efforts, actions or programs to prevent introductions or control infestations of aquatic nuisance species that minimize adverse impacts to the structure and function of an ecosystem and adverse effects on non-target organisms and ecosystems and emphasize integrated pest management techniques and nonchemical measures.

ERADICATE – The act or process of eliminating an aquatic nuisance species.

ESTABLISHED – An introduced organism with a permanent population(s), i.e., one unlikely to be eliminated by man or natural causes (Shafland and Lewis 1984).

EXCLUSIVE ECONOMIC ZONE – The Exclusive Economic Zone of the United States established by Proclamation Number 5030 of March 10, 1983, and the equivalent zone of Canada.

EXOTIC – (same as nonnative) An organism introduced from a foreign country (i.e., one whose entire native range is outside the country where found) (Shafland and Lewis 1984). A subcategory of introduced.

FEDERAL CONSISTENCY – The requirement under the Coastal Zone Management Act that stipulates that federal actions that are reasonably likely to affect land or water use or natural resources of the coastal zone be consistent with the enforceable policies of a coastal state's federally approved coastal management program (CMP). A coastal state reviews the federal action to determine if the proposed action will be consistent with the CMP.

INDIGENOUS – Occurring naturally in a particular area or ecosystem; historically occurring in geographic range previous to the arrival of the first European settlers; a species that is a member of the native natural community (Fuller et al. 1999). Excludes species descended from domesticated ancestors.

INTENTIONAL INTRODUCTION – The knowing import or introduction of nonindigenous species into, or transport through, an area or ecosystem where it was not previously established. Even when there is no intent to introduce an aquatic organism into an ecosystem, escapement, accidental release, improper disposal (e.g., "aquarium dumps") or similar releases are the virtual inevitable consequences of an intentional introduction, not an unintentional introduction. Synonyms: Purposeful, Deliberate.

INTEGRATED PEST MANAGEMENT – The control of pests utilizing a practical, economical, and scientifically based combination of chemical, biological, mechanical or physical, and cultural control methods. Coordinated application of non-chemical control methods is emphasized in order to reduce or eliminate the need for pesticides. Integrated pest management is a balanced approach that considers hazard to the environment, efficacy, costs, and vulnerability of the pest. It requires: (1) identification of acceptable thresholds of damage; (2) environmental monitoring; and (3) a carefully designed control program to limit damage from the pest to a predetermined acceptable level.

INTRODUCTION – The intentional or unintentional escape, release, dissemination, or placement of a species into Alaska ecosystem as a result of human activity.

INVASIVE SPECIES – A nonindigenous species that has the ability to establish self-sustaining, expanding, free-living populations, and may cause economic and/or environmental harm.

LOCALIZED – A confined, reproducing population of an introduced organism that can be eliminated using standard methods (Shafland and Lewis 1984).

LOCALLY ESTABLISHED – An introduced organism with one or more naturally reproducing populations but with a very restricted distribution and no evidence of natural range expansion (in general, limited to a relatively confined area, such as a small lake) (Fuller et al. 1999).

NATIVE SPECIES – A species within its natural range or natural zone of dispersal, i.e., within the range it could or would occupy without direct or indirect introduction and/or care by humans. It excludes species descended from domesticated ancestors.

NONINDIGENOUS SPECIES (synonyms: exotic or non-native species) – Means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, which is not native to Alaska.

ORGANISM – Any active, infective, or dormant stage of life form of an entity characterized as living, including vertebrate and invertebrate animals, plants, bacteria, fungi, mycoplasmas, viroids, viruses, or any entity characterized as living, related to the foregoing.

PATHWAYS – Natural and human connections that allow movement of species or their reproductive propagules from place to place.

PIONEER INFESTATION – A small ANS colony that has spread to a new area from an established colony.

PREVENTION – Measures to minimize the risk of unintentional introductions of nonindigenous aquatic species that are, or could become, aquatic nuisance species into waters of the United States.

PRIORITY SPECIES – An ANS that is considered to be a significant threat to Alaska waters and is recommended for immediate or continued management action to minimize or eliminate their impact.

PUBLIC FACILITIES – Federal, state, regional, and local government-owned or controlled buildings, structures and other man-made facilities, including water intakes, boat docks, electrical power plants, locks and dams, levees, water control structures, and publicly owned fish culture facilities. Electric generating stations, water supply systems, and similar facilities operated by public utilities or other non-governmental entities are also considered public facilities.

RISK – Is the likelihood and magnitude of an adverse event.

RISK ANALYSIS – The process that includes both risk assessment and risk management.

RISK ASSESSMENT – A science-based process to evaluate the economic and/or environmental risk(s) of non-indigenous species.

SPECIES – A group of organisms, all of which have a high degree of physical and genetic similarity, can generally interbreed only among themselves, and show persistent differences from members of allied species. Species may include subspecies, populations, stocks, or other taxonomic classifications less than full species.

STAKEHOLDERS – Any and all interested parties.

TRANSFERS – Introductions within the native range of a species (allendorf 1991).

TRANSPLANTED – An organism moved outside its native range but within a country where it occurs naturally6 (i.e., one whose native range includes at least a portion of the country where found) (Shafland and Lewis 1984. A subcategory of introduced.

UNINTENTIONAL INTRODUCTION – An introduction of nonindigenous species that occurs as a result of activities other than the purposeful or intentional introduction of the species involved, such as the transport of nonindigenous species in ballast or in water used to transport fish, mollusks or crustaceans for aquaculture or other purpose. Involved is the release, often unknowingly, of nonindigenous organisms without any specific purpose. The virtually inevitable escapement, accidental release, improper disposal (e.g., "aquarium dumping") or similar releases of intentionally introduced nonindigenous species do not constitute unintentional introductions. Synonyms: Accidental, Incidental, Inadvertent.

VECTOR – A biological pathway for a disease or parasite, i.e., an organism that transmits pathogens to various hosts. Not a synonym for Pathways as that term is used in the proposed Aquatic Nuisance Species Program.

WATERS OF THE UNITED STATES – The navigable waters and the territorial sea of the United States. Since aquatic nuisance species can move or be transported by currents into navigable waters, all internal waters of the United States, including its territories and possessions, are included. The Territorial Sea of the United States is that established by Presidential Proclamation Number 5928 of December 27, 1988. Synonyms: United States Waters.

WATERSHED – An entire drainage basin including all living and nonliving components.

Appendix C. Acronyms

ADF&G – Alaska Department of Fish and Game
ANS – Aquatic Nuisance Species
DEC – Alaska Department of Environmental Conservation
DNR – Alaska Department of Natural Resources
EVOS – *Exxon Valdez* Oil Spill
NISA – National Invasive Species Act
NOAA – National Oceanic and Atmospheric Association
PBWG – Pacific Ballast Water Group
PWS – Prince William Sound
PWS RCAC – Prince William Sound Regional Citizens Advisory Council
USCG – United States Coast Guard
USGS – United States Geological Survey

Appendix D. Alaska Statutes and Regulations Pertinent to Invasive Species

DEPARTMENT OF FISH AND GAME

Title 16. Fish and Game
Chapter 5. Fish and Game Code

AS 16.05.010. Commissioner of fish and game.
The commissioner is the principal executive officer of the Department of Fish and Game. The commissioner shall be a qualified executive with knowledge of the requirements for the protection, management, conservation, and restoration of the fish and game resources of the state.

AS 16.05.020. Functions of commissioner.
The commissioner shall

(1) supervise and control the department, and may appoint and employ division heads, enforcement agents, and the technical, clerical, and other assistants necessary for the general administration of the department;

(2) manage, protect, maintain, improve, and extend the fish, game and aquatic plant resources of the state in the interest of the economy and general well-being of the state;

(3) have necessary power to accomplish the foregoing including, but not limited to, the power to delegate authority to subordinate officers and employees of the department.

AS 16.05.251. Regulations of the Board of Fisheries.
(a) The Board of Fisheries may adopt regulations it considers advisable in accordance with AS 44.62 (Administrative Procedure Act) for

(1) setting apart fish reserve areas, refuges, and sanctuaries in the waters of the state over which it has jurisdiction, subject to the approval of the legislature;

(2) establishing open and closed seasons and areas for the taking of fish; if consistent with resource conservation and development goals, the board may adopt regulations establishing restricted seasons and areas necessary for persons 60 years of age and older to participate in sport, personal use, or subsistence fishing;

(3) setting quotas, bag limits, harvest levels, and sex and size limitations on the taking of fish;

(4) establishing the means and methods employed in the pursuit, capture, and transport of fish;

(5) establishing marking and identification requirements for means used in pursuit, capture, and transport of fish;

(6) classifying as commercial fish, sport fish, guided sport fish, personal use fish, subsistence fish, or predators or other categories essential for regulatory purposes;

(7) watershed and habitat improvement, and management, conservation, protection, use, disposal, propagation, and stocking of fish;

(8) investigating and determining the extent and effect of disease, predation, and competition among fish in the state, exercising control measures considered necessary to the resources of the state;

(9) **prohibiting and regulating the live capture, possession, transport, or release of native or exotic fish or their eggs;**

(10) establishing seasons, areas, quotas, and methods of harvest for aquatic plants;

(11) establishing the times and dates during which the issuance of fishing licenses, permits, and registrations and the transfer of permits and registrations between registration areas is allowed; however, this paragraph does not apply to permits issued or transferred under AS 16.43;

(12) regulating commercial, sport, guided sport, subsistence, and personal use fishing as needed for the conservation, development, and utilization of fisheries;

(13) requiring, in a fishery, observers on board fishing vessels, as defined in AS 16.05.475 (d), that are registered under the laws of the state, as defined in AS16.05.475 (c), after making a written determination that an on-board observer program

(A) is the only practical data-gathering or enforcement mechanism for that fishery;

(B) will not unduly disrupt the fishery;

(C) can be conducted at a reasonable cost; and

(D) can be coordinated with observer programs of other agencies, including the National Marine Fisheries Service, North Pacific Fishery Management Council, and the International Pacific Halibut Commission;

(14) establishing nonexclusive, exclusive, and super exclusive registration and use areas for regulating commercial fishing;

(15) regulating resident or nonresident sport fishermen as needed for the conservation, development, and utilization of fishery resources;

(16) requiring unlicensed fishing vessels present in or transiting the waters of the state to report to the department the quantity, species, and origin of fish on board; in this paragraph, "unlicensed fishing vessel" means a fishing vessel that is not licensed under AS 16.05.490 - 16.05.530.

(b) [Repealed, Sec. 12 ch 52 SLA 1986].

(c) If the Board of Fisheries denies a petition or proposal to amend, adopt, or repeal a regulation, the board, upon receiving a written request from the sponsor of the petition or proposal, shall in addition to the requirements of AS 44.62.230 provide a written explanation for the denial to the sponsor not later than 30 days after the board has officially met and denied the sponsor's petition or proposal, or 30 days after receiving the request for an explanation, whichever is later.

(d) Regulations adopted under (a) of this section must, consistent with sustained yield and the provisions of AS 16.05.258 , provide a fair and reasonable opportunity for the taking of fishery resources by personal use, sport, and commercial fishermen.

(e) The Board of Fisheries may allocate fishery resources among personal use, sport, guided sport, and commercial fisheries. The board shall adopt criteria for the allocation of fishery resources and shall use the criteria as appropriate to particular allocation decisions. The criteria may include factors such as

(1) the history of each personal use, sport, guided sport, and commercial fishery;

(2) the number of residents and nonresidents who have participated in each fishery in the past and the number of residents and nonresidents who can reasonably be expected to participate in the future;

(3) the importance of each fishery for providing residents the opportunity to obtain fish for personal and family consumption;

(4) the availability of alternative fisheries resources;

(5) the importance of each fishery to the economy of the state;

(6) the importance of each fishery to the economy of the region and local area in which the fishery is located;

(7) the importance of each fishery in providing recreational opportunities for residents and nonresidents.

(f) Except as expressly provided in AS 16.40.120 (e) and 16.40.130, the Board of Fisheries may not adopt regulations or take action regarding the issuance, denial, or conditioning of a permit under AS 16.40.100 or 16.40.120, the construction or operation of a farm or hatchery required to have a permit under AS 16.40.100, or a harvest with a permit issued under AS 16.40.120 .

(g) The Board of Fisheries shall consider a request of the commissioner for approval of a petition to the Alaska Commercial Fisheries Entry Commission to establish a moratorium on new entrants into a commercial fishery under AS 16.43.225 at the board's next regular or special meeting that follows the receipt by the board of the request for approval of the petition and that allows time for the notice required under this subsection. The board may consider the request of the commissioner for approval of the petition only after 15 days' public notice of the board's intention to consider approval of the petition. The board shall consider whether the

commissioner, in support of the request for approval of the petition, has adequately shown that the fishery meets requirements for a moratorium on new entrants under AS 16.05.050. The board by a majority vote of its members at the meeting when the petition must be considered shall approve or disapprove the petition.

(h) The Board of Fisheries shall adopt by regulation a policy for the management of mixed stock fisheries. The policy shall provide for the management of mixed stock fisheries in a manner that is consistent with sustained yield of wild fish stocks.

AS 16.05.255. Regulations of the Board of Game; Management Requirements.

(a) The Board of Game may adopt regulations it considers advisable in accordance with AS 44.62 (Administrative Procedure Act) for

(1) setting apart game reserve areas, refuges, and sanctuaries in the water or on the land of the state over which it has jurisdiction, subject to the approval of the legislature;

(2) establishing open and closed seasons and areas for the taking of game;

(3) establishing the means and methods employed in the pursuit, capture, taking, and transport of game, including regulations, consistent with resource conservation and development goals, establishing means and methods that may be employed by persons with physical disabilities;

(4) setting quotas, bag limits, harvest levels, and sex, age, and size limitations on the taking of game;

(5) classifying game as game birds, songbirds, big game animals, fur bearing animals, predators, or other categories;

(6) methods, means, and harvest levels necessary to control predation and competition among game in the state;

(7) watershed and habitat improvement, and management, conservation, protection, use, disposal, propagation, and stocking of game;

(8) prohibiting the live capture, possession, transport, or release of native or exotic game or their eggs;

(9) establishing the times and dates during which the issuance of game licenses, permits, and registrations and the transfer of permits and registrations between registration areas and game management units or subunits is allowed;

(10) regulating sport hunting and subsistence hunting as needed for the conservation, development, and utilization of game;

(11) taking game to ensure public safety.

(b) [Repealed, Sec. 12 ch 52 SLA 1986].

(c) If the Board of Game denies a petition or proposal to amend, adopt, or repeal a regulation, the board, upon receiving a written request from the sponsor of the petition or proposal, shall in addition to the requirements of AS 44.62.230 provide a written explanation for the denial to the sponsor not later than 30 days after the board has officially met and denied the sponsor's petition or proposal, or 30 days after receiving the request for an explanation, whichever is later.

(d) Regulations adopted under (a) of this section must provide that, consistent with the provisions of AS 16.05.258, the taking of moose, deer, elk, and caribou by residents for personal or family consumption has preference over taking by nonresidents.

(e) The Board of Game shall adopt regulations to provide for intensive management programs to restore the abundance or productivity of identified big game prey populations as necessary to achieve human consumptive use goals of the board in an area where the board has determined that

(1) consumptive use of the big game prey population is a preferred use;

(2) depletion of the big game prey population or reduction of the productivity of the big game prey population has occurred and may result in a significant reduction in the allowable human harvest of the population; and

(3) enhancement of abundance or productivity of the big game prey population is feasibly achievable utilizing recognized and prudent active management techniques.

(f) The Board of Game may not significantly reduce the taking of an identified big game prey population by adopting regulations relating to restrictions on harvest or access to the population, or to management of the population by customary adjustments in seasons, bag limits, open and closed areas, methods and means, or by other customary means authorized under (a) of this section, unless the board has adopted regulations, or has scheduled for adoption at the next regularly scheduled meeting of the board regulations, that provide for intensive management to increase the take of the population for human harvest consistent with (e) of this section.

This subsection does not apply if the board

(1) determines that intensive management would be

(A) ineffective, based on scientific information;

(B) inappropriate due to land ownership patterns; or

(C) against the best interest of subsistence uses; or

(2) declares that a biological emergency exists and takes immediate action to protect or maintain the big game prey population in conjunction with the scheduling for adoption of those regulations that are necessary to implement (e) of this section.

(g) The Board of Game shall establish population and harvest goals and seasons for intensive management of identified big game prey populations to achieve a high level of human harvest.

(h) [Repealed, 2000 Ballot Measure No. 6].

(i) For the purpose of encouraging adults to take children hunting, the board shall establish annual hunting seasons in appropriate areas of the state for big game, other than bison and musk ox, that are open before schools start in the fall and before regular hunting seasons begin. Only a resident child accompanied by a resident adult or a child accompanied by the child's resident parent, resident stepparent, or resident legal guardian may take big game in an area where a season established under this subsection is in effect. The adult, parent, stepparent, or legal guardian who accompanies the child may only assist the child in taking big game. A big game animal taken under this subsection must be counted against the bag limits of both the child and the adult, parent, stepparent, or legal guardian who accompanies the child. In this subsection,

(1) "adult" means an individual who is 21 years of age or older;

(2) "child" means an individual who is not more than 17 years of age and not younger than eight years of age.

(j) In this section,

(1) "harvestable surplus" means the number of animals that is estimated to equal the number of offspring born in a game population during a year less the number of animals required for recruitment for population maintenance and enhancement, when necessary, and the number of animals in the population that died from all causes, other than predation or human harvest, during that year;

(2) "high level of human harvest" means the allocation of a sufficient portion of the harvestable surplus of a game population to achieve a high probability of success for human harvest of the game population based on biological capabilities of the population and considering hunter demand;

(3) "identified big game prey population" means a population of ungulates that is identified by the Board of Game and that is important for providing high levels of harvest for human consumptive use;

(4) "intensive management" means management of an identified big game prey population consistent with sustained yield through active management measures to enhance, extend, and develop the population to maintain high levels or provide for higher levels of human harvest, including control of predation and prescribed or planned use of fire and other habitat improvement techniques.

(5) "sustained yield" means the achievement and maintenance in perpetuity of the ability to support a high level of human harvest of game, subject to preferences among beneficial uses, on an annual or periodic basis.

AS 16.05.920. Prohibited Conduct Generally.

(a) **Unless permitted by AS 16.05 - AS 16.40 or by regulation adopted under AS 16.05 - AS 16.40, a person may not take, possess, transport, sell, offer to sell, purchase, or offer to purchase fish, game, or marine aquatic plants, or any part of fish, game, or aquatic plants, or a nest or egg of fish or game.**

(b) A person may not knowingly disturb, injure, or destroy a notice, signboard, seal, tag, aircraft, boat, vessel, automobile, paraphernalia, equipment, building, or other improvement or property of the department used in the administration or enforcement of this title except AS 16.51 and AS 16.52, or a poster or notice to the public concerning the provisions of this title except AS 16.51 and AS 16.52, or a regulation adopted under this title except AS 16.51 and AS 16.52, or a marker indicating the boundary of an area closed to hunting, trapping, fishing, or other special use under this title except AS 16.51 and AS 16.52. A person may not knowingly destroy, remove, tamper with, or imitate a seal or tag issued or used by the department or attached under its authority to a skin, portion, or specimen of fish or game, or other article for the purpose of identification or authentication in accordance with this title except AS 16.51 and AS 16.52 or a regulation adopted under this title except AS 16.51 and AS 16.52.

AS 16.05.921. Venomous Reptiles and Insects or Their Eggs; Prohibited Conduct; Permits.

(a) A person may not import, possess, transport, or release in the state live venomous reptiles, live venomous reptile eggs, live venomous insects, or live venomous insect eggs, except in accordance with the terms of a permit issued under (b) of this section. This prohibition does not apply to bees as defined in AS 03.47.040. A person who violates this subsection is guilty of a misdemeanor and may be cited as set out in AS 16.05.165.

(b) A permit required under (a) of this section may be granted only if, in the determination of the commissioner, the applicant demonstrates a valid educational purpose for seeking the permit. A valid educational purpose includes display in educational institutions and in zoos.

AS 16.05.940 Definitions.

In AS 16.05-AS 16.40, unless the context otherwise requires, "fish" means any species of aquatic finfish, invertebrate, or amphibian, in any stage of its life cycle, found in or introduced into the state, and includes any part of such aquatic finfish, invertebrate, or amphibian.

Chapter 20. Conservation and Protection of Alaskan Wildlife.

AS 16.20 Conservation and Protection of Alaskan Wildlife.

Under this statute, the ADF&G manages state legislatively designated refuges, sanctuaries, and critical habitat areas with authority over terrestrial and aquatic plant species. Many of the Special Area Permits issued by the Habitat and Restoration Division for activities in these special areas explicitly prohibit introduction of exotic plant species.

Chapter 40. Commercial Use of Fish and Game.

AS 16.40.100. Aquatic Farm and Hatchery Permits.
(a) A person may not, without a permit from the commissioner, construct or operate

(1) an aquatic farm; or

(2) a hatchery for the purpose of supplying aquatic plants or shellfish to an aquatic farm.

(b) A permit issued under this section authorizes the permittee, subject to the conditions of AS 16.40.100 - 16.40.199 and AS 17.20, to acquire, purchase, offer to purchase, transfer, possess, sell, and offer to sell stock and aquatic farm products that are used or reared at the hatchery or aquatic farm. A person who holds a permit under this section may sell or offer to sell shellfish stock to the department or to an aquatic farm or related hatchery outside of the state.

(c) The commissioner may attach conditions to a permit issued under this section that are necessary to protect natural fish and wildlife resources.

(d) Notwithstanding other provisions of law, the commissioner may not issue a permit under this section for the farming of, or hatchery operations involving, Atlantic salmon.

Alaska Administrative Code.

Title 5. Fish and Game
Chapter 1. Subsistence Fin Fishing

05 AAC 01.010. Methods, Means, and General Provisions.
The use of live nonindigenous fish as bait is prohibited.

Chapter 27. Herring Fishery

05 AAC 27.334. Harvest Specifications and Operations for the Herring Spawn-On-Kelp Pound Fishery in Prince William Sound Area.
A permit issued by the commissioner is not required for the harvest of spawn on kelp in pounds. The following provisions apply to the herring spawn-on-kelp pound fishery:

(1) after fishing commences in a pound, no more than four persons may use that pound at any time, except that if the department determines that the maximum number of kelp blades that a person may maintain in a pound, established under (5) of this section, will not be enough substrate for adequate spawn deposition to produce a commercially valuable spawn-on-kelp product, based on kelp blade density and the volume of the pound, the department may allow more than four persons to use a pound at any time; if the department allows more than four persons to use a pound under this paragraph, the department will provide public notice of the number of persons allowed;

(2) if more than one person uses a pound, from the time fishing commences in the pound until all herring spawn on kelp has been removed from the pound, the pound may not contain more than the amount of herring or kelp that all persons using the pound may, in the aggregate, legally maintain in it; each person using the pound has a duty to ensure that the pound does not, at any time, contain more than the legal amount of herring or kelp;

(3) for a closed pound, fishing commences when herring are introduced into the pound; once herring are introduced into a closed pound, all herring must remain in the pound until the department has authorized the release of the herring;

(4) For an open pound, fishing commences when kelp is placed into the water within the pound; before operating an open pound, a person must notify the department of that person's intent to operate an open pound for the fishing season; once a person has notified the department of that person's intent to operate an open pound under this paragraph, that person may not use a closed pound during the remainder of that season;

(5) before each fishing season the department, consistent with 5 AAC 27.365(d) (2), shall establish the maximum amount of herring that a person may take and maintain in a pound, and the maximum number of blades of kelp that a person may maintain in a pound after fishing commences; the department shall provide public notice of that amount and number; a person who notifies the department before April 1 of that person's intent to operate an open pound shall receive an increase in the maximum amount of kelp blades established in this paragraph that is calculated on the basis of the wild spawn-on-kelp conversion factor described in 5 AAC 27.365(d) (1);

(6) a person may use a closed herring pound only north and east of a line from Porcupine Point to Point Freemantle, unless otherwise provided by emergency order; a person may use an open herring pound throughout the Prince William Sound Area in areas established by emergency order;

(7) notwithstanding 5 AAC 37.100 and 5 AAC 37.200, a person may take kelp for the herring spawn-on-kelp pound fishery anywhere in the Prince William Sound Area unless otherwise provided by emergency order;

(8) for the herring spawn-on-kelp pound fishery, a person may take kelp by hand and may take the entire plant including the stipe (stem) and holdfast;

(9) before a person places kelp in a pound, the person must plainly and legibly mark the person's name and five-digit CFEC permit number in characters that are at least two inches high and one-half inch wide in a color that contrasts with the pound background and that are mounted on the exterior of the pound and are plainly visible and not obscured in any way;

(10) after fishing commences and until the season closes, the CFEC permit number or numbers marked on a pound may not change;

(11) before the commencement of fishing, a person shall plainly and legibly mark all of that person's lines of kelp blades with the person's name and shall indicate on each line of kelp blades the number of blades attached to that line;

(12) at the time fishing commences, during the capture and transfer of herring into the pound, and during the harvest of herring spawn on kelp produced in the pound, a person using a closed pound must be present at the pound, at a support shelter near the pound, or on a fishing vessel while the vessel is being used to harvest herring or transfer herring to the pound;

(13) a person using an open pound must be present at the pound, or near the pound at a structure or on a vessel used in support of the operation, when kelp is placed in the water and during the harvest of herring spawn on kelp produced in the pound;

(14) a person using a closed pound shall notify the department before dropping the webbing; after the webbing has been dropped, the pound may only be used as an open pound during the remainder of that season;

(15) a person may not place herring in a pound after the fifth day following the day on which the person first placed herring in the pound;

(16) a person may not hold herring in a pound after the seventh day following the day on which the person first placed herring into the pound;

(17) herring that die during capture, transfer, or holding will be counted toward the legal amount of herring that may be taken by the person who captured, transferred, or held the herring;

(18) a person using a pound shall weigh the spawn on kelp when the person removes spawn on kelp from the pound;

(19) if more than one person uses a pound, a person removing spawn on kelp from the pound shall

(A) from the time spawn on kelp is removed until it is processed, segregate that spawn on kelp from spawn on kelp that is possessed by other persons using the pound;

(B) weigh the quantity of spawn on kelp that is possessed by that person and provide the weight to a buyer for recording on a fish ticket;

(20) a person may not transfer herring between pounds;

(21) after release of herring from a pound, a person using the pound shall keep the pound, including webbing, at the fishing location not less than four weeks, shall keep egg-covered webbing on the pound frame in the original configuration with adequate water circulation on all sides to optimize egg hatching, and, not later than six weeks after harvesting the spawn on kelp, shall completely remove the pound from the water.

Authority:
AS 16.05.060
AS 16.05.251

05 AAC 27.965. Management Plan for Herring Pound Spawn-On-Kelp Fishery in the Norton Sound District.

(a) The purpose of this management plan is to establish criteria for the herring pound spawn-on-kelp fishery in the Norton Sound District.

(b) The commissioner, or the commissioner's designee, shall issue a permit for participation in the herring pound spawn-on-kelp fishery if

(1) an applicant holds a valid Norton Sound herring gillnet or beach seine CFEC interim-use permit or limited entry permit; and
2) an applicant applies for the herring pound spawn-on-kelp permit before April 16 of each calendar year.

(c) A permit holder that participates in the herring pound spawn-on-kelp fishery may not also participate in the wild herring spawn-on-kelp fishery or the gillnet or beach seine sac roe herring fishery in the Norton Sound District during the same year.

(d) The herring allocation for the herring pound spawn-on-kelp fishery may not be more than 320 tons of herring. The department shall deduct this allocation from the total annual herring harvest projection before determining the seine harvest allocation under 5 AAC 27.960.

(e) The herring spawn-on-kelp guideline harvest level may not be more than 90 tons. The herring spawn-on-kelp guideline harvest level includes the combined weight of herring eggs and kelp.

(f) The department shall manage the herring pound spawn-on-kelp fishery to achieve the spawn-on-kelp guideline harvest level by restricting the number of blades of kelp that may be suspended from a herring pound as follows:

(1) no more than a total of 75,000 blades of kelp are allowed in the herring pound spawn-on-kelp fishery; and

(2) the maximum number of blades of kelp any permit holder may attach to a herring pound is 3,000; if more than 25 permits are issued for the herring pound spawn-on-kelp fishery, the department shall determine the number of blades of kelp a permit holder may attach to a herring pound by dividing 75,000 by the number of permits issued.

(g) Before a permit holder attaches kelp to a herring pound, the permit holder must plainly and legibly mark the permit holder's name and five-digit CFEC permit number in a conspicuous place on the herring pound. After fishing commences until the season is closed, the CFEC permit number marked on a herring pound may be changed. For purposes of this subsection, fishing commences when a permit holder first attaches kelp to the herring pound in the water.

(h) Only one permit holder may operate a herring pound at a time.

(i) The permit holder must be physically present at any time when kelp is being attached to the herring pound and when herring spawn on kelp is harvested from the herring pound. The permit holder shall weigh the spawn on kelp when it is removed from the herring pound and provide that information to a local representative of the department who is designated as a catch monitor for the fishery.

(j) Before the herring pound spawn-on-kelp permits are issued, the commissioner may specify on the permits any other criteria that the commissioner determines is necessary for the conservation and management of herring and kelp and the herring pound spawn-on-kelp fishery.

(k) After a person removes the spawn-on-kelp from the herring pound, the person shall maintain the pound structure at it present fishing location for not less than four weeks in its original configuration with adequate water circulation on all sides to optimize egg hatching. Not later than six weeks after a person removes the spawn on kelp from a structure, the person shall remove the structure and leads from the water.

(l) Repealed 5/19/99.

(m) For the purposes of this section, a "herring pound" is a structure or a means of suspending kelp in the water to provide spawning substrate for herring to be harvested as spawn on kelp. The structure may not have an enclosure, but may have two leads. A lead may not be more than 300 feet in length measured from shore to a point on the structure. The lead shall consist of a seine weight net with meshes of not more than two inches stretched measure, a cork line, a lead line, and anchors at either end.

Authority:
AS 16.05.251

Chapter 37. Aquatic Plants

05 AAC 37.100. Permits.
A processor, buyer, harvester of aquatic plants, aquatic plant farmer operating under a permit authorized by AS 16.40.100, or a person intending to collect and supply wild stock to such an aquatic farm must obtain a harvest permit issued by the commissioner, or the commissioner's authorized representative, before operating. The permit must include the following provisions:

(1) the area of operation shall be restricted to one or more fishing districts;

(2) species to be harvested;

(3) method of harvest shall be restricted to mechanical cutting or handpicking;

(4) plants shall be removed from the water at the time of harvesting;

(5) aquatic plants where used as a substrate for herring spawn may be harvested only as otherwise provided in this title.

Authority:
AS 16.05.251

05 AAC 37.900. Restrictions
The transplanting of aquatic plants is prohibited, except as follows:

(1) as provided for in 5 AAC 27 for the issuance of permits by the commissioner for the purpose of producing herring spawn-on-kelp in pounds; or

(2) as provided for in 5 AAC 41.001 - 5 AAC 41.400 for the issuance of permits by the commissioner for the purpose of aquatic farming; or

(3) for the issuance of permits by the commissioner for the purposes of scientific research or educational purposes.

Authority:
AS 16.05.251

05 AAC 92.029. Permit For Possessing Live Game.

(a) Except as otherwise provided in this chapter, or in AS 16, no person may possess, import, release, export, or assist in importing, releasing, or exporting, live game, unless the person holds a possession permit issued by the department.

(b) The following species, not including a hybrid of a game animal and a species listed in this subsection, may be possessed, imported, exported, bought, sold, or traded without a permit from the department but may not be released into the wild:

Common Name	Scientific Name
Chimpanzee	*Pan* spp.
Dog	*Canis familiaris*
Cat	*Felis catus*
Sheep	*Ovis aries*
Goat	*Capra hircus*
Cattle	*Bos taurus*
Oxen	*Bos* spp.
Horse	*Equus caballus*
Guinea pig	*Cavia porcellus*
Reindeer (except feral reindeer)	*Rangifer tarandus* var.
Llama	*Lama peruana*
Alpaca	*Lama pacos*
One-humped camel	*Camelus dromedarius*
Ass	*Equus asinus* var.
Mule	*Equus asinus x caballus*
Swine	*Sus scrofa* var.
European ferret	*Mustela putorius furo*

European rabbit	*Oryctolagus cuniculus* var.
White rat	*Rattus norvegicus* var. albinus
Mice: white, waltzing, singing,	*Mus musculus* var. shaker, piebald
Fat-tailed gerbil	*Pachyuromys duprasi*
Gerbil	*Gerbillus* spp.
Hamster (golden)	*Mesocricetus auratus*
Chinchilla	*Chinchilla laniger*
Cavy	*Cavia apera*
Hedgehog, African Pygmy	*Erinaceus albiventris*
Chicken	*Gallus gallus* var.
Pigeon	*Columbia livea* var.
Any Turkey species	*Subfamily Meleagridinae*
Any Pheasant, Junglefowl or Coturnix species	*Subfamily Phasianinae*
Any Guinea fowl species	Subfamily Numidinae
Canary	Serinus canaria var.
Parrot, parakeet, cockatiel, macaw, and other members of the Family Psittacidae not prohibited by federal or international law	Family Psittacidae
Toucan	Family Ramphastidae
Any New World Quail species (incl. Bobwhite)	Subfamily Odontophorinae
Mynah	*Acridotheres* spp.
Any Peafowl species	*Pavo* spp.
Any duck, goose, swan, or other migratory waterfowl which the U.S. Fish and Wildlife Service determines does not require a federal permit For private ownership Chukar partridge	*Alectoris chukar*
Button "quail"	Family Turnicidae in the order Gruiformes
Any nonvenomous reptile (crocodile, alligator, snake, turtle, or lizard)	Class Reptilia
Members of the bird families Fringillidae, Turdidae, Zosteripidae, Pycnonotidae, Timaliidae, and Ploceidae of non-Holarctic origin.	
Members of the bird families Columbidae and Trogonidae of non-nearctic origin.	

(c) The department may not issue a permit for the capture, possession, import, or export of any game animal, including a hybrid of a game animal and a species listed in (b) of this section, for use as a pet.

(d) Under this section, and in accordance with the definition of "game" in AS 16.05.940 (which includes feral domestic animals), a

(1) European ferret (*Mustela putorius furo*), swine (*Sus scrofa* var.), or nonindigenous gallinaceous bird is feral if the animal is not under direct control of owner, including being confined in a cage or other physical structure, or being restrained on a leash; the commissioner may capture, destroy, or dispose of any feral ferret, feral swine, or feral nonindigenous gallinaceous bird in an appropriate manner;

(2) musk oxen, bison, or reindeer that is lawfully owned, or an elk held under a valid game mammal farming license, that is not confined or is not under positive control is feral unless the animal is a free-ranging animal under a state or federal grazing lease; however,

(A) a person who can demonstrate ownership of the animal may pursue and capture the animal within 48 hours after the animal escapes from confinement, without needing to obtain a permit from the department;

(B) a person who can demonstrate ownership of the animal may pursue and capture the animal more than 48 hours after the animal escapes from confinement only if the person obtains a permit from the department;

(C) any free-ranging musk oxen, bison, reindeer, or elk for which ownership cannot be demonstrated is presumed to be game;

(D) for purposes of this paragraph, ownership of an animal can be demonstrated only by means of a clearly visible permanent brand, ear tag, or owner's mark on the body of the animal.

(e) Any of the above species of bird, mammal, or reptile that is endangered may not be held in private ownership without a permit from the United States Fish and Wildlife Service.

(f) Notwithstanding (b) of this section, the following species may be temporarily released for the purpose of hunting dog or falcon training, field trials, and tests:

(1) Pigeon (*Columbia livia* var.);

(2) Pheasant, Jungle Fowl, or Coturnix (Subfamily Phasianinae);

(3) any Guineafowl species (Subfamily Numidinae);

(4) any New World Quail species (including Colinus) (Subfamily Odontophorinae);

(5) any duck, goose, swan, or other migratory waterfowl which the U.S. Fish and Wildlife Service has determined does not require a federal permit for private ownership;

(6) Chukar Partridge (*Alectoris chukar*).

(g) A person using live game listed in (f) of this section for the purpose of hunting dog or falcon training, field trials, or tests

(1) may release the game only on the day of use and shall make reasonable efforts to capture, kill, or recover the temporarily released live game;

(2) may take the live game in connection with hunting dog or falcon training, field trial, and test activities; and

(3) must legally acquire, hold, and dispose of the live game in accordance with all other applicable state statutes and regulations.

(h) Upon application, the board will add a species to the list in (b) of this section if there is clear and convincing evidence that the species

(1) is not capable of surviving in the wild in Alaska;

(2) is not capable of causing a genetic alteration of a species that is indigenous to Alaska;

(3) is not capable of causing a significant reduction in the population of a species that is indigenous to Alaska;

(4) is not capable of transmitting a disease to a species that is indigenous to Alaska; and

(5) does not otherwise present a threat to the health or population of a species that is indigenous to Alaska.

(i) **The board will remove a species from the list in (b) of this section, if there is a preponderance of evidence that the species**

(1) is capable of surviving in the wild in Alaska;

(2) is capable of causing a genetic alteration of a species that is indigenous to Alaska;

(3) is capable of causing a significant reduction in the population of a species that is indigenous to Alaska;

(4) is capable of transmitting a disease to a species that is indigenous to Alaska; or

(5) otherwise presents a threat to the health or population of a species that is indigenous to Alaska.

Authority:
AS 16.05.255
AS 16.05.270
AS 16.05.920

Chapter 41. Transportation, Possession, and Release of Live Fish; Aquatic Farming

05 AAC 41.005. Permit Required.

(a) **No person may transport, possess, export from the state, or release into the waters of the state, any live fish unless the person holds a fish transport permit** issued by the commissioner or his authorized designee, and the person is in compliance with all conditions of the permit and the provisions of this chapter. A fish transport permit will be issued for a fixed term subject to the provisions of (c) of this section.

(b) A fish transport permit authorizes only that operation specified in the permit. Any change of species, brood stock, or location requires a new permit. Any other change requires an amendment to the permit.

(c) The commissioner shall suspend the permit, or particular provisions of the permit including amendments, if he finds

(1) on the basis of new information or changed circumstances, that the permitted activity will adversely affect the continued health and perpetuation of native, wild, or hatchery stocks of fish; or

(2) the permittee has failed to comply with permit terms or the provisions of this chapter.

(d) Notwithstanding the expiration, termination or suspension of a fish transport permit, each permittee is responsible for the obligations arising under the terms and conditions of the permit, and under the provisions of this chapter.

05 AAC 41.070. Prohibitions on Importation and Release of Live Fish.

(a) **Except as provided in (b) - (d) of this section, no person may import any live fish into the state for purposes of stocking or rearing in the waters of the state.**

(b) Live oysters native to and originating from the Pacific Coast of North America may be imported for aquaculture purposes, under a permit required by this chapter, and may be released into the waters of the state only if the

(1) brood stock is derived from oysters commercially cultured on the Pacific Coast of North America through three or more generations; and

(2) disease history or an inspection indicates no incidence of disease that is not indigenous to Alaska.

(c) Ornamental fish not raised for human consumption or sport fishing purposes may be imported into the state, but may not be reared in or released into the waters of the state. Fish wastes and wastewater from ornamental fish may not be released directly into the waters of the state.

(d) Weathervane scallops originating from wild stocks or cultured stocks in the Southeastern Alaska and Yakutat Areas may be imported for aquaculture purposes and may be released only into the waters of the Southeastern Alaska and Yakutat Areas under a permit required by this chapter only if the

(1) brood stock was taken under the provisions of a permit issued by the department;

(2) brood stock was certified by the department's fish pathology section before transport out of the state;

(3) brood stock was held continuously in a department-approved isolation facility;

(4) weathervane scallops proposed for import have been held continuously in a department-approved isolation facility before import into the state;

(5) disease history, or an inspection, of the weathervane scallops proposed for import indicates no incidence of a disease of transport significance.

Authority:
AS 16.05.251 (a)

ALASKA COASTAL MANAGEMENT PROGRAM HABITAT STANDARDS

Under the Alaska Coastal Management Program Habitat Standards, the Alaska Department of Fish and Game, Division of Habitat Restoration reviews development projects within the coastal zone. Such review is used as a tool to request measures to prevent invasions, and could be made more effective through refinement of standards and best management practices.

DEPARTMENT OF NATURAL RESOURCES

Title 3. Agriculture and Animals

AS 03.05.010. Powers and Duties of Commissioner of Natural Resources.
(a) The commissioner of natural resources shall

(1) direct, administer, and supervise promotional and experimental work, extension services, and agricultural projects for the purpose of promoting and developing the agricultural industry within the state including such fields as horticulture, dairying, cattle raising, fur farming, grain production, vegetable production, and development of other agricultural products;

(2) procure and preserve all information pertaining to the development of the agricultural industry and disseminate that information to the public;

(3) assist prospective settlers and others desiring to engage in the agricultural industry in the state with information concerning areas suitable for agriculture and other activities and programs essential to the development of the agricultural industry in the state;

(4) review the marketing, financing, and development of agricultural products inside the state including transportation, with special emphasis upon local production, and negotiate for the marketing of agricultural products of the state with federal and state agencies operating in the state;

(5) regulate and control the entry into the state and the transportation, sale, or use inside the state of plants, seeds, vegetables, shell eggs, fruits and berries, nursery stock, animal feeds, remedies and mineral supplements, fertilizers, and agricultural chemicals in order to prevent the spread of pests, diseases, or toxic substances injurious to the public interest,

and to protect the agricultural industry against fraud, deception, and misrepresentation; in this connection the commissioner may require registration, inspection, and testing, and establish procedures and fees; and

(6) regulate the farming of elk in a manner similar to the manner in which the commissioner regulates domestic animals and livestock, to the extent that is appropriate.

(b) To carry out the requirements of this title, the commissioner of natural resources may issue orders, regulations, quarantines, and embargoes relating to

(1) examination and inspection of premises containing products, articles, and commodities carrying pests;

(2) establishment of quarantines for eradication of pests;

(3) establishment of standards and labeling requirements pertaining to the sale of agricultural and vegetable seeds;

(4) tests and analyses which may be made and hearings which may be held to determine whether the commissioner will issue a stop order or quarantine;

(5) cooperation with federal and other state agencies.

AS 44.37.030. Duties of Department with Respect to Agriculture.
The Department of Natural Resources shall

(1) get and distribute information on subjects connected with agriculture;

(2) control and regulate the entry and transportation of seeds, plants, and other horticultural products;

(3) control and eradicate the spread of pests injurious to plants, trees, vegetables, livestock, poultry;

(4) aid in developing used and unused agricultural resources; and

(5) experiment and determine practical methods of growing, processing, soil analysis, eradication of obnoxious weeds, control of insects, and cheaper and more satisfactory methods of land clearing.

ALASKA ADMINISTRATIVE CODE

Title 11. Natural Resources
Chapter 34. Plant Health and Quarantine

11 AAC 34.020
(a) The following are prohibited noxious weeds:

Bindweed, field	(*Convolvulus arvensis*);
Fieldcress, Austrian	(*Rorippa austriaca*);
Galensoga	(*Galensoga parviflora*);
Hempnettle	(*Galeopsis tetrahit*);
Horsenettle	(*Solanum carolinense*);
Knapweed, Russian	(*Centaurea repens*);
Lettuce, blue-flowering	(*Lactuca puichella*);
Quackgrass	(*Agropyron repens*);
Sowthistle, perennial	(*Sonchus arvensis*);
Spurge, leafy	(*Euphorbia esula*);
Thistle, Canada	(*Cirsium arvense*); and
Whitetops and its varieties	(*Cardaria drabe, C. pubescens, Lepidium latifolium*).

(b) The following are restricted noxious weeds, with their maximum allowable tolerances:

Annual bluegrass	(*Poa annua*),	90 seeds per pound;
Blue burr	(*Lappula echinatat*),	18 seeds per pound;
Mustard	(*Brassica kaber, juncea*),	36 seeds per pound;
Oats wild	(*Avena fatua*),	seven seeds per pound;
Plantain, buckhorn	(*Plantago* sp.),	90 seeds per pound;
Radish	(*Raphanus raphanistrum*),	27 seeds per pound;
Toadflax, yellow	(*Linaria vulgaris*),	one seed per pound;
Vetch, tufted	(*Vicia cracca*),	two seeds per pound; and
Wild Buckwheat	(*Polygonum convovulus*),	two seeds per pound.

11 AAC 34.075. Prohibited Acts
(a) No person may sell, offer for sale, expose for sale, or transport for use in planting in the state any agricultural or vegetable seed that

(1) unless exempt under 11 AAC 34.010(h) , has not been labeled as required by 11 AAC 34.010;

(2) bears a false or misleading label;

(3) contains any prohibited noxious weed seed, except as allowed in (g) of this section;

(4) contains any restricted noxious weed seed in excess of the permissible tolerance per pound established under 11 AAC 34.020(b) , except as allowed in (g) of this section; or

(5) has not been tested within the 18 months preceding the sale, offering, or exposure for sale, or transportation, not including the calendar month in which the test was completed, except for hermetically sealed containers under 11 AAC 34.010(g) (3), and except that

(A) the director will, in his discretion, allow a shorter period for kinds of seed which he finds, under ordinary conditions of handling, will not maintain a germination within the established limits of tolerance during the prescribed time period, or a longer period for kinds of seed which are packaged in a container and under conditions the director determines will, during the longer period, maintain the viability of the seed under ordinary conditions of handling;

(B) a person in possession of seed shall keep on file, available for department inspection, the original or duplicate copy of the latest test made of the seed which must show, in addition to the information required by this chapter, the date and name of the person making the test.

(b) No person may substitute uncertified seed for certified seed.

(c) No person may use tags or seals indicating certification other than as prescribed by the authorized certification agency unless the tuber, horticultural, vegetable, tree, shrub, flower, or cereal grain seed has been produced, tested, examined, and labeled in accordance with this chapter or the official certification agency of another state, territory, or country. No person may

(1) sell, offer for sale, expose for sale, advertise, or transport any tuber, plant, or seed, falsely representing it to be certified; or

(2) use in connection with a tuber, plant, or seed any tags or seals similar to those used in official certification as established by this chapter.

(d) No person may hinder or obstruct in any way, any authorized person in the performance of his duties under this chapter.

(e) No person may sell, offer, or expose for sale, plant, transport or process any seed that is under a stop sale order issued under 11 AAC 34.045(a) (3) or that is in violation of this chapter, without express approval of the director.

(f) No person may plant in this state any agricultural, vegetable, tree, shrub, or flower seed containing any prohibited noxious weeds listed in 11 AAC 34.020(a) or any restricted noxious weeds in excess of the maximum allowable tolerances listed in 11 AAC 34.020(b) , except as provided in 11 AAC 34.030, without express written approval of the director, or as provided in (g) of this section.

(g) No person may use, sell, offer, expose for sale, give away, or transport for feeding, seeding, or mulching purposes any seed or grain screenings containing any prohibited noxious weed seed listed in 11 AAC 34.020(a) or any restricted noxious weeds in excess of the maximum allowable tolerances listed in 11 AAC 34.020(b), except as provided in 11 AAC 34.030, and except that the director may allow sale or transport of screenings for

(1) complete destruction;

(2) removal outside of the boundaries of the state;

(3) recleaning to the point of being in compliance with 11 AAC 34.020(a) and (b); or

(4) processing to make the weed seed nonviable.

(h) No person may sell, offer, or expose for sale for seeding purposes, seed containing more than one and one-half percent by weight of all weed seed.

(i) No person may sell, offer, expose for sale or transportation, or transport a container or package of seed within this state unless the container or package of seed is labeled with a net contents statement, expressed by either weight, volume, or numerical count, except for seed being transported from an owner's field to a warehouse for storage, cleaning, or processing.

(j) No person may sell, offer for sale, or represent potatoes as seed potatoes unless the potatoes have been certified by the official seed certifying agency of the state or country of origin.

Authority:
AS 03.05.010
AS 03.05.030
AS 44.37.030

11 AAC 34.130. Quarantine Regulations; Inspections.

(a) The director may establish, maintain and enforce such quarantine regulations as he deems necessary to protect the agricultural industry of this state from pests, by establishing quarantine at the boundaries of this state or elsewhere within the state. He may make and enforce such rules and regulations as are necessary to prevent any plant or thing which is or is liable to be infested or infected by or which might act as a carrier of any pest, from passing over any quarantine line established and proclaimed pursuant to this chapter. The person conducting the inspection shall not permit any such plant or thing to pass over the quarantine line during quarantine, except upon a certificate of inspection and release signed by him.

(b) No person shall conceal from plant quarantine officers any plant or fail to present the same or any quarantined article for inspection at the request of such officer.

Authority:
AS 03.05.010
AS 03.05.030
AS 44.37.030

11 AAC 34.140. New Pests.

Upon information received by the director of the existence of any pest not generally distributed within this state he shall thoroughly investigate the existence and probability of the spread thereof. He may also establish, maintain and enforce quarantine and such other regulations as are in his opinion necessary to circumscribe and exterminate or prevent the spread of such pest. The director

may disinfect, or take such other action with reference to, any plants or things infested or infected with, or which in his opinion may have been exposed to infection or infestation by, any such pest, as in his discretion shall seem necessary.

11 AAC 34.145. Permits for Pest Shipment.
No pest, live insect or disease may be imported into or shipped or transported within the state except for the purpose of identification, unless such shipment or transportation is authorized under written permit and the regulations of the director or the United States Department of Agriculture. Any unauthorized shipment shall be returned to the point or origin, shipped out of the state, or destroyed within 48 hours at the expense of the owner or bailee.

11 AAC 34.400. Definitions.
The terms used in this chapter are construed to conform insofar as possible with the terms used in the Federal Seed Act (7 U.S.C. 1551 et seq.) and the regulations issued under that Act. Unless the context indicates otherwise, in this chapter

"noxious weed" means any species of plants, either annual, biennial, or perennial, reproduced by seed, root, underground stem, or bulblet, which when established is or may become destructive and difficult to control by ordinary means of cultivation or other farm practices; or seed of such weeds that is considered commercially inseparable from agricultural or vegetable seed;
"pest" means a form of animal life, plant life, or infectious, transmissible, or contagious disease of plants, that is or is liable to be dangerous or detrimental to the agricultural industry of the state;

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Chapter 5. Powers and Duties of Commissioners of Natural Resources and Environmental Conservation

AS 03.05.011. Powers and Duties of Commissioner of Environmental Conservation.
(a) To carry out the requirements of this title, the commissioner of environmental conservation may issue orders, regulations, permits, quarantines, and embargoes relating to

(1) examination and inspection of premises containing products, articles, and commodities carrying pests;

(2) establishment of quarantines for eradication of pests and diseases in livestock;

(3) tests and analyses that may be made and hearings that may be held to determine whether the commissioner will issue a stop order or quarantine;

(4) cooperation with federal and other state agencies;

(5) regulation of fur farming; for purposes of this paragraph, "fur farming" means the raising of and caring for animals for the purpose of marketing their fur, or animals themselves for breeding stock.

(b) The commissioner of environmental conservation shall regulate the farming of elk in a manner similar to the manner in which the commissioner regulates domestic animals and livestock, to the extent that is appropriate.

Title 46. Water, Air, Energy, and Environmental Conservation
Chapter 3. Environmental Conservation

AS 46.03.750. Ballast Water Discharge.
(a) Except as provided in (b) of this section, a person may not cause or permit the discharge of ballast water from a cargo tank of a tank vessel into the waters of the state. A tank vessel may not take on petroleum or a petroleum product or by-product as cargo unless it arrives in ports in the state without having discharged ballast from cargo tanks into the waters of the state and the master of the vessel certifies that fact on forms provided by the department.

(b) The master of a tank vessel may discharge ballast water from a cargo tank of a tank vessel if it is necessary for the safety of the tank vessel and no alternative action is feasible to ensure the safety of the tank vessel.

Water Quality Standards
The authority for the water quality standards comes from

AS 46.03.070 Pollution standards:
"After public hearing, the department may adopt standards and make them public and determine what qualities and properties of water indicate a polluted condition actually or potentially deleterious, harmful, detrimental, or injurious to the public health, safety, or welfare, to terrestrial and aquatic life or their growth and propagation, or to the use of waters for domestic, commercial, industrial, agricultural, recreational, or other reasonable purposes."

The Water Quality Standards regulations in 18 AAC 70 contain the following references to aquatic nuisance species.

18 AAC 70.020(b) temperature criteria for freshwater aquaculture use:
" …the weekly average temperature may not exceed site-specific requirements needed to preserve normal species diversity or to prevent appearance of nuisance organisms."

18 AAC 70.250(b) "The department will reduce in size or deny a mixing zone if the department finds that available evidence reasonably demonstrates that the pollutants discharged could (1) result in undesirable or nuisance aquatic life"

The following revision to the Water Quality Standards has also been included in the 2002 proposed revisions currently out to public notice.

18 AAC 70.020(b) Toxic and Other Deleterious Substances for Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife.
"There may be no concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, adverse effects on aquatic life or produce undesirable or nuisance aquatic life."

Wastewater Discharge Program
The authority for permitting ballast water treatment comes from

AS 46.03.100 Waste disposal permit; and
AS 46.03.750 Ballast water discharge.
"(a) Except as provided in (b) of this section, a person may not cause or permit the discharge of ballast water from a cargo tank of a tank vessel into the waters of the state. A tank vessel may not take on petroleum or a petroleum product or by-product as cargo unless it arrives in ports in the state without having discharged ballast from cargo tanks into the waters of the state and the master of the vessel certifies that fact on forms provided by the department.

(b) The master of a tank vessel may discharge ballast water from a cargo tank of a tank vessel if it is necessary for the safety of the tank vessel and no alternative action is feasible to ensure the safety of the tank vessel."

Commercial Passenger Vessel Environmental Compliance
The authority to regulate sewage, gray water and other wastewater discharged from commercial passenger vessels (cruise ships) comes from AS 46.03.463:

Sec. 46.03.463. Prohibited discharges; limitations on discharges.
(a) Except as provided in (h) of this section, a person may not discharge untreated sewage from a commercial passenger vessel into the marine waters of the state.

Pesticide Services Program
Some of the Pesticide Regulations and program requirements may affect the implementation of the "treatment and control" aspects of the ANS Plan discussed in Goal 2 of Section V - Management Actions. The use of pesticides as a management tool must comply with state statutes and regulations including:

AS 46.03.320. Regulation of pesticides and broadcast chemicals.
" (a) The department may

(1) regulate the transportation, testing, inspection, packaging, labeling, handling, and advertising of pesticides and broadcast chemicals offered for sale, or placed in commerce for use in the state;

(2) regulate and supervise the distribution, application, or use of pesticides and broadcast chemicals in any state project or program, or by a public agency under the jurisdiction of the state;

(3) regulate or prohibit the use of pesticides and broadcast chemicals.

(b) The department may provide by regulation for the licensing of private applicators of restricted-use pesticides and for persons engaged in the custom, commercial, or contract spraying or application of pesticides and broadcast chemicals. A person engaged in the custom, commercial, or contract spraying or application of pesticides and broadcast chemicals may, by regulation, be required to secure a surety bond or liability insurance."

18 AAC 90.200 Any of the pesticides used must be registered with the Environmental Protection Agency and the State of Alaska.

18 AAC 90. 300. DEC highly recommends that any applicators of pesticides become certified pesticide applicators. Many fish toxicants such as *Rotenone* are Restricted-Use Pesticides; and Federal and State law requires an individual to be certified to sell, purchase or use or supervise the use of Restricted-Use Pesticides.

18 AAC 90.300(5). Alaska laws also require certification for individuals "who engage in the custom, commercial, or contract use of a pesticide." If for instance, the Department of Fish and Game hired a commercial pest control company, then the individual they hired would have to be certified for both restricted-use and general-use pesticides.

18 AAC 90.620.That company must also provide DEC with proof of liability insurance.

18 AAC 90.500-505. Permits are required from DEC for certain public pesticide applications and more importantly to "direct, conduct, participate in or allow the use of a pesticide to waters of the state or by aircraft."

18 AAC 90.520. Permitees need to allow for significant time and preparation prior to an actual treatment. Applications to water also require public notice and potentially a public hearing. Note that many of the pesticide permits issued by DEC also require Alaska Coastal Management Program review.

18 AAC 90.510. The DEC Commissioner may exempt the use of a pesticide from some of the permit requirements if an emergency exists, including, significant human health risk, significant risk to endangered, threatened species, beneficial organisms or the environment; or significant economic loss.

18 AAC 90.530. Permits are generally issued for one to two years and may be renewed only once for one additional year. A permit takes effect no sooner than 40 days after DEC issues a permit.

18 AAC 90.535. Accurate records must be maintained of all uses of restricted-use pesticides for at least two years after each use. 18 AAC 400. A "summary or treatment results" should be submitted to DEC 90 days after a *permit* is issued.

18 AAC 90.615. Pesticide storage and disposal requirements must be met, which includes proper signage.

Appendix E. Summary of Research on West Coast Invasive Species Laws: Canadian Laws, Program Enabling Legislation, Ballast Water, and Plants

CANADA'S INVASIVE SPECIES LAWS

Overall, Canada has comprehensive laws relating to invasive plants. However, Canada's ballast water laws and aquatic nuisance species laws are weak.

The research process discovered a significant number of high-ranking Canadian officials stating that Canada is not adequately addressing the invasive species threat.

Ballast Water

The Canadian government adopted voluntary guidelines for the control of ballast water on September 1, 2000. The purpose of the guidelines is to protect Canadian waters (Canadian EEZ) from nonindigenous aquatic organisms.

Under the Canadian guidelines, ships should 1) have ballast management plans, 2) submit ballast water reports if destined to a Canadian port, 3) not discharge ballast water taken on in areas outside Canadian waters, and 4) not dispose of ballast sediments except in mid-ocean outside Canadian waters. The guidelines also provide ballast water management options. The Canadian guidelines have regional implementation specifications including a West Coast section.

Vessels arriving from ports in British Columbia, Alaska or the West Coast of the United States (north of Cape Mendocino) wishing to discharge ballast water are exempted from these provisions if the ballast water to be discharged originated from these waters.

The *major problem with the Canadian ballast water guidelines is that they are voluntary*, similar to the U.S. national law, and compliance is not at high levels. Therefore, certain parts of Canada have chosen to enforce stricter mandatory ballast water laws in their areas, as U.S. West Coast states have done. The Port of Vancouver has had mandatory ballast water exchange requirements for certain ships, backed up by compliance sampling and testing, in place since 1996.

Aquatic Nuisance Species

Canada has not taken a proactive role in preventing aquatic nuisance species. On Canada's Department of Oceans and Fisheries web site, it is acknowledged that aquatic invasive species pose a threat but the Department admits that they usually do not do anything about them until the problem has already occurred. The site focuses mainly on the case history of the zebra mussel and gives little other information.

"So far our approach to dealing with invading species has been largely reactive. Once we have a problem we try to deal with it. The better approach is the proactive one such as that taken with ballast water, trying to prevent the problem before it happens." [38]

Invasive Plants

Canada has fairly comprehensive noxious weed and plant monitoring.

[38] http://www.ncr.dfo.ca/regions/CENTRAL/science/great-grand/ballast-lest/ans-ea_e.htm

ACTION PLANS/ ENABLING LEGISLATION

One problem with invasive species management is that the authorities to control invasive species are usually spread among many different agencies. One task an invasive species management program should accomplish is filling in the gaps among the various agencies and coordinating their efforts.

There are several ways this task can be accomplished. In Washington and Oregon the authorities are spread out, but committees (formed by legislation) are in charge of coordinating the various efforts. In Washington, however, only aquatic nuisance species are covered by the committee and the committee is comprised primarily of agency representatives. In Oregon, the committee covers all invasive species and is comprised primarily of economic interest groups.

A different approach was taken in Minnesota. In that state, the entire system of laws was revamped so that all of the laws regarding invasive species were condensed into a single chapter. The Minnesota Department of Natural Resources has the overarching authority for all of the state's invasive species actions and regulations.

Alaska could follow any of these approaches. Pam Meacham (Washington Department of Fish and Wildlife), who coordinated Washington's aquatic nuisance species management plan, said that many states have followed Washington State's plan and that she was pleased with its success. However, she said ideally Washington would have a plan more like Minnesota's because it is more effective in building a cooperative effort among the agencies.

WASHINGTON

State Level Institutional Framework

The Department of Fish and Wildlife manages non-native animal species. They can authorize the release of non-native aquatic animals and may also designate certain non-native animal species as deleterious, making it illegal to import or possess them. The agency also prepared a statewide Aquatic Nuisance Species Management Plan to respond to imminent threats of aquatic nuisance species to Washington waters under NISA. Fish and Wildlife administers a ballast water management program and will implement treatment standards for ballast water discharged to state waters after 2002. Fish and Wildlife also coordinates the statewide Aquatic Nuisance Species Coordinating Committee. The committee's mission is to minimize the unauthorized or accidental introduction of non-native aquatic species and to control the spread of aquatic and wetland nuisance species already established in the state. Federally recognized tribes, federal agencies, local conservation organizations, environmental groups and affected businesses or industry are encouraged to participate on the coordinating committee.

The Noxious Weed Control Board and departments of Agriculture, Ecology, and Natural Resources manage non-native aquatic and wetland plant species. The Noxious Weed Control Board lists non-native noxious plants that adversely affect agricultural and natural areas and oversees the work of county noxious weed control boards to control the introduction and spread of these species. The Department of Agriculture maintains a plant quarantine list of species that may not be transported, bought or sold in the state. The department also coordinates and administers a program to eradicate

and control the spread of *Spartina spp*. and purple loosestrife that invade estuaries and wetlands. The Department of Natural Resources manages, controls, and eradicates aquatic nuisance plant and animal species on state-owned lands. The Department of Ecology administers financial and technical assistance programs to eliminate noxious non-native aquatic plants in Washington's lakes and rivers. The Department of Ecology has no regulatory authority; however, it is responsible for water quality management and issues permits and licenses related to pesticide application. Local noxious weed control boards work with landowners to prevent and control noxious weeds and plants on their properties.

All state agencies with pest management responsibilities must use an integrated pest management approach defined in Chapter 17.15 RCW to prevent, control, contain and eliminate aquatic nuisance species. Integrated pest management means a coordinated decision-making process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet agency programmatic pest management objectives.

The shipping industry also plays an important role in preventing non-native species introductions. Through the Pacific Coast Ballast Water Group, the industry seeks to find West Coast solutions to non-native species introductions from ballast water discharges, including the use of ballast water treatment technologies.

Washington has an ANS Committee formed by legislation. The Committee is primarily responsible for organizing the efforts of all of the different agencies.

Aquatic Nuisance Species Management Plan

The purpose of the Washington State Aquatic Nuisance Species Management Plan is to coordinate all ANS management actions currently in progress within Washington, and to identify additional ANS management actions, especially those relating to ANS animals.

The Washington State Plan, published in December 1998, was developed by the Washington State Aquatic Nuisance Species Planning Committee.

The Washington ANS Management Plan is focused on the identification of feasible, cost effective management practices to be implemented in partnership with tribes, private, and public interests for the environmentally sound prevention and control of ANS.

The current revision has been developed with the assistance of the Aquatic Nuisance Species Committee formed by the 2000 Washington Legislature for the purpose of fostering state, federal, tribal and private cooperation to prevent the introduction and spread of ANS.

Washington's focus on aquatics might be because of its geography and Puget Sound. In addition, the emphasis by states on ANS might also be driven by the fact that federal dollars are available for ANS.

Washington's plan is considered a model for other states to follow. The Washington ANS program was contracted by the Western Governor's Association to assist other states to develop ANS plans.

OREGON

As in Washington, the authorities to manage ANS and other invasive species are spread out among many agencies in Oregon. A more detailed discussion of enabling legislation and structure is available and provides a list of the agencies that have authority in Oregon and the primary programs for which they are responsible.

Invasive Species Council

Oregon, like Washington, also has an invasive species committee formed by legislation (House Bill 2181). According to Mark Sytsma, chairmen-elect of the Council, Oregon's Council differs from Washington's in several significant ways. In Oregon, there are two agencies (Department of Agriculture and the Department of Fish and Wildlife) that must be members of the Council, according to legislation, and two universities that must be members. Otherwise, the Council is made up primarily of members of interest and industry groups, such nurseries, that have an economic interest in invasive species, not a governmental interest. However, in Washington, the members are primarily government agency representatives. According to Sytsma, agency involvement and cooperation has not been very forthcoming in Oregon. Sytsma recommended a top-down approach when deciding how to form an invasive species council, with the governor mandating participation of certain agencies through legislation or executive order.

Oregon Aquatic Nuisance Species Management Plan (June 2001)

In addition to the Invasive Species Council, Oregon also has an aquatic nuisance species management plan. The plan's main goal is to coordinate ANS management efforts within the state and to " minimize the harmful ecological, economic and social impact of ANS through prevention and management of introduction, population growth, and dispersal of ANS into, within, and from Oregon."

The first objective of the Oregon Plan is to "coordinate and implement a comprehensive management plan" because "many state agencies have authority over and regulatory roles in managing natural resources. While many agencies have some authority to regulate ANS, no centralized authority or management structure exists to coordinate ANS activities in Oregon. The lack of coordination, oversight and funding has allowed many nuisance species to become established in Oregon, and permits new introductions."

Relationship between the Plan and the Council

An annual report on the plan will be produced by the Invasive Species Council, which will include recommendations for updating and modifying management activities and priorities. Sytsma said the new revised ANS plan will be a product of the Council. The Plan also says that its goals will be achieved by producing "agency collaboration through an invasive species council."

According to Mark Sytsma, the Invasive Species Council was formed after the Aquatic Nuisance Species Management Plan and the Noxious Weed Plans were written. The two plans were written at about the same time, and they tried to make the two plans mesh well together. Each plan references the other. Oregon borrowed heavily from Washington's ANS plan. The Council itself is very new and its success cannot be measured yet.

Overall, coordination of the various agencies and the implementation of the two plans are still issues. The ANS plan attempts to coordinate the agencies responsible for ANS management but it's difficult because the ANS plan has no actual authority. The Invasive Species Council cannot do much coordination because it's mostly for public interest groups and not government agencies. Up until now, Portland State University has provided most of the coordination between the agencies. There are hopes for the programs and agencies to become more interrelated. Symposia have been organized to bring the various groups together to improve management efforts.

MINNESOTA

Minnesota's Department of Natural Resources, Division of Ecological Services, has the primary responsibility for coordinating the state's invasive species program. One reason that Minnesota may have been able to bring its program under more centralized management is because the Department of Natural Resources encompasses Fisheries, Wildlife, Water, and Forestry. [39]

However, although the Department of Natural Resources has primary authority over the Exotic Species Program, the Department of Agriculture also has considerable involvement with invasive species.

The purpose of the DNR's Exotic Species Program is to curb the spread and minimize the current and future harmful effects of exotic species that can naturalize in the state and either cause displacement of, or otherwise threaten, native species in their natural communities; or threaten natural resources or their use in the state.

The DNR web site says that the program has three goals:
1. Prevent introductions of new harmful exotic species into Minnesota.
2. Prevent the spread of harmful exotic species within Minnesota.
3. Reduce the impacts caused by harmful exotic species to Minnesota's ecology, society, and economy.

Responsibilities of the Department of Natural Resources

The DNR is assigned responsibility for preparing a long-term plan for the statewide management of harmful exotic species of aquatic plants and wild animals, for coordinating efforts within the state, and establishing priorities for prevention, management, research and similar activities. Management plans for individual species are also prepared by the DNR.

The DNR is assigned responsibility for designating infested waters. Water bodies are designated infested if they contain certain harmful exotic species that could spread to other waters if lake water use and related activities are not regulated and where the risk of spread to an uninfested waterbody through such activities is high.

[39] http://www.dnr.state.mn.us/ecological_services/exotics/index.html

The DNR is also required to adopt rules, which place exotic species into various regulatory classifications: prohibited exotic species, regulated exotic species, unregulated exotic species, and unlisted exotic species.

The Department is obligated to spend 20,000 hours each year inspecting boats at public water accesses primarily on infested waters. The Watercraft Inspection Program hires a crew of nearly 30 seasonal watercraft inspectors each year to work at these public water accesses educating boaters about harmful aquatic exotic species.

Funding for the DNR's exotic species activities is derived primarily from the surcharge on watercraft licenses. The surcharge for a three-year license period is $5, or $1.67 per year, and generates approximately $1,100,000 annually. Additional appropriations, primarily for specific research efforts, have come from the Environment and Natural Resources Trust Fund and Minnesota Future Resources Fund.

BALLAST WATER: NATIONAL AND WEST COAST STANDARDS

NATIONAL STANDARDS

The U.S. Coast Guard has a voluntary ballast water exchange program.[40] On May 17, 1999, the U.S. government started this program in response to the National Invasive Species Act (NISA) of 1996. These are voluntary guidelines and the recommended practices suggest precautionary measures should be taken by every vessel to minimize the uptake and release of harmful aquatic organisms, pathogens, or sediments.

Under NISA, the USCG is required to conduct a National Ballast Water Management Survey and report to Congress no later than 30 months (December 2001) after voluntary guidelines are implemented as to whether these guidelines are effective in controlling the introduction and spread of invasive species. If found not to be effective, the ballast water exchange is to become mandatory, similar to ballast water exchange rules in the Great Lakes. Preliminary study results indicate that voluntary standards are not effective.[41] Whether a voluntary program can be effective is questionable.[42]

As a result of the perceived ineffectiveness of voluntary guidelines, the states of California, Oregon, and Washington and the Port of Vancouver, B.C. passed mandatory ballast water rules. The state laws are summarized below.

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[40] *Pacific Ballast Water Group WORKING DRAFT Report and Recommendations* Obtained online from http://web.pdx.edu/~sytsmam/pbwg/pbwg%20report1.html under Ballast Water Exchange Programs

[41] Pacific Ballast Water Group, WORKING DRAFT Report and Recommendations on Voluntary Ballast Water Exchange, no date. http://web.pdx.edu/~sytsmam/pbwg/pbwg%20report1.html

[42] Nadol, Viki, "Aquatic Invasive Species in the Coastal West: An Analysis of State Regulation within a Federal Framework", *Environmental Law*, Volume 29, Issue 2, Summer 1999.

WASHINGTON

History

In 2000, the Washington legislature passed a ballast water management law. The first rule implementing the law went into effect in September 2000.

Key Points

- The rule made the U.S. coast guard reporting program mandatory in Washington.
- Discharge into Washington waters is authorized if the vessel has conducted an open sea exchange of ballast water.
- The primary difference between the Washington law and the federal law is that Washington law requires vessels involved in coastal trade to report and conduct a ballast water exchange at least 50 miles offshore
- Vessels are required to a file a ballast water management report 24 hours prior to discharging ballast in state waters.
- After July 1, 2002, discharge of ballast water into waters of the state is authorized only if there has been an open sea exchange or if the vessel has treated its ballast water to meet standards set by the department.
- Washington only requires ships to report if they discharge; however, in other states, like Oregon and California, all ships must report whether they discharge or not.
- Washington's ballast law is administered by the Washington Department of Fish and Wildlife.

OREGON

History

The Oregon Ballast Water Management Bill (Senate Bill 895) passed in the Oregon 2001 legislature.

Key Points

- Prohibits discharge of ballast water into the waters of the state, except under specified conditions.
- A vessel may discharge ballast waters in the waters of the state:
  - If the vessel has conducted an open ocean exchange.
  - If the vessel has conducted a coastal exchange--for vessels traveling to Oregon from a North American coastal port south of 40N or north of 50N, an exchange of ballast water at sea is required prior to reaching 40N or 50N, respectively.
  - Without performing an exchange, if the exchange would be unsafe or infeasible due to vessel design limitations or equipment failure.
- The bill requires ballast water management reports at least 24 hours prior to entry into Oregon.
- Establishes a task force to study and recommend to the 2003 Oregon Legislature methods and improvements to ballast water management.
- The bill declares Oregon's support for international and federal programs and declares the state's intent that its rules be coordinated with related rules and regulations adopted by Washington and California and the Province of British Columbia.
- The Oregon Department of Environmental Quality administers the ballast water discharge restrictions.

CALIFORNIA

History

Ballast Water Management for Control of Non-Indigenous Species Assembly Bill 703 was signed into law in October 1999 and was the first West Coast ballast legislation passed. The law became effective on January 1, 2000 and sunsets in January 2004.

Key Points

- The act established mandatory statewide, multi-agency ballast water management and control.
- Under AB703, Ballast Water Management, Ballast Water Report Forms, and Ballast Water plans are all mandatory.
- Establishes mandatory mid-ocean exchange for all qualifying vessels:
  - qualifying vessels means all vessels, U.S. and foreign, carrying ballast water into the waters of the state after operating outside the EEZ--- "EEZ" means exclusive economic zone, which extends from the baseline of the territorial sea of the United States seaward 200 miles.
  - mid-ocean exchanges need not be performed in circumstances where executing this practice would threaten the safety of the vessel, its crew or its passengers.
- Establishes mandatory completion and submission of ballast water report form by vessel master, owner, operator, agent, or person in charge of vessel
- Mandatory Compliance with “good housekeeping” practices including among others:
  - avoiding uptake or discharge in or near marine sanctuaries, reserves, parks or coral reefs
  - minimizing or avoiding uptake in areas of known infestations or pathogens, near dredging operations, neat sewage outfalls, etc.
- Establishes maintaining a ballast water management plan prepared specifically for each vessel.
- Calls for training of vessel master, PIC and crew regarding the application of ballast water and sediment management and treatment procedures.
- Imposes mandatory fee submission to California’s Board of Equalization to pay for the program.
- Random Sampling of Vessels for Compliance.
- Civil Penalties for failure to comply with any portion of the law.

CANADA

As discussed above, the Canadian government adopted voluntary guidelines for the Control of Ballast Waters from Ships in Waters under Canadian Jurisdiction on September 1, 2000.

WEST COAST PLANT AND WEED MANAGEMENT

WASHINGTON

Washington State Weed Laws

Overview: In recognition of the threats caused by invasive exotic plants, a state law was instituted to control the introduction and spread of noxious weeds. The original purpose behind Washington's primary noxious weed law, Chapter 17.10 RCW, was to limit economic loss due to the presence and spread of noxious weeds on or near agricultural land. In 1987 RCW 17.10 was revised, with an expanded focus to control the negative impacts of noxious weeds in all natural areas.[43]

Washington's approach to weed/invasive plant management has improved by moving beyond the more singular purpose of controlling weeds on agricultural lands. However, invasive plant management still suffers from being spread among agencies with disparate missions and authorities. For example the Washington State Noxious Weed Control Board declares what is a noxious weed and maintains the annually updated noxious weed list. The WSDA Plant Services Division has regulatory control over quarantined species that are *offered for sale* and works with nurseries but the quarantined species list is not updated annually and has no relationship with the noxious species list. The Department of Fish and Wildlife has authority over non-native plants introduced into the wild from the perspective of protecting habitat. The Washington Department of Ecology has jurisdiction over invasive species to the extent to which they impact water quality. This lack of coordination seems to be common in many states. The Washington invasive species coordinating board is limited to aquatic nuisance species, which probably does little to assist in remedying this problem.

Noxious Weed List and Weed Boards

The Washington State Noxious Weed Control Board and the Washington State Department of Agriculture (WSDA) work with the county weed boards to carry out the state weed laws. These weed control laws assign a primary responsibility for noxious weed control to the landowner, be it private, state or county lands. There are civil penalties for failure to control noxious weeds by landowners. It is the responsibility of the county, or district, weed boards to ensure weed control meets minimum standards.

Each year, the State Noxious Weed Control Board coordinates and influences noxious weed control activities throughout Washington. The board adopts by rule the state noxious weed list. None of the weeds on the list are native to the state.

The list determines which plants will be considered a noxious weed and where in Washington control will be required. This approach allows control activities of landowners, public and private, to be prioritized toward the protection and enhancement of Washington's agricultural and natural resources in the most cost-effective manner.

The plan emphasizes prevention, eradication, and containment.

[43] www.wa.gov/agr/weedboard/weed_laws/overview.html

OREGON

In contrast, Oregon's invasive species program and coordinating committee includes both aquatic and terrestrial species, which may improve coordination of invasive plant management.

Oregon Revised Statutes, 1999 Edition
Chapter 452- Vector and Weed Control
Chapter 561- State Department of Agriculture
561.510-561.600 Quarantine Powers
561.650-561.680 State Weed Board
Chapter 570-Plants: Inspection, Quarantine, Pest and Weed Control

- In addition to these existing laws, the Oregon Department of Agriculture, Plant Division recently developed a Noxious Weed Strategy Plan.
- The plan's mission is "to protect Oregon's natural resources from the invasion and proliferation of exotic noxious weeds."
- The plan's mission talks about "natural resources" as opposed to "agriculture."
- There are several other parts of the plan that reflect an interest in protecting the state's ecology as well as agricultural industry. The plan seems to have been formulated with ecological contexts in mind.
- Overall, the plan "provides a framework and overall strategy for cooperators in noxious weed management. It assesses the magnitude of the problem, highlights the importance of current weed control activities, and offers recommendations. Implementation of this strategic plan will build and expand strong coordinated programs for the future to protect Oregon's agricultural economy and natural resources."
- However, a lack of adequate funding has impeded goals of the plan.

CALIFORNIA

California is somewhat unique because it already has a serious weed problem in the form of the yellow star thistle. To address the star thistle problem, California has also developed a noxious weed plan. California's agricultural emphasis makes its laws less applicable to Alaska. However, similar to Washington and Oregon, California is taking a more ecosystem-based approach to plant management as reflected in their noxious weed plan.

Strategic Plan for the Coordinated Management of Noxious Weeds in California[44]

California's strategic plan was written primarily to address the yellow star thistle problem and the other invasions of non-native weeds within the state. The goals of California's plan for the coordinated management of its noxious weeds include: (1) Increasing the profitability and value of cropland and rangeland; (2) Decreasing the costs of roadside, park, and waterway maintenance; (3) Reducing fire hazard and fire control costs in the state; and (4) *Protecting and enhancing the biodiversity of California ecosystems."*

[44] http://wric.ucdavis.edu/yst/plan/rmac.pdf

COLORADO

Colorado released in December 2001 a clear and comprehensive weed management plan entitled: *Colorado's Plan to Stop the Spread of Noxious Weeds: A Framework for Statewide Coordinated and Cost-Effective Action to Protect Agriculture and the Environment.*[45]

Colorado decided to develop its plan because compared to other Western states, Colorado is relatively weed free, and wants to maintain that status. Colorado also incorporated an environmental focus into its plan and stated that it was imperative to weed management efforts to continue to protect natural areas of high environmental value.

Changes in Colorado's weed laws occurred around the time the management plan was being written. The Rules and Regulations Pertaining to the Administration and Enforcement of the Colorado Weed Management Act became effective in April 2001. In December 2000, the Proposed Amendments to the Rules and Regulations pertaining to the Administration and Enforcement of the Colorado Weed Management Act went into effect. In 1999 there was an Executive Order by the Governor for developing and implementing noxious weed management programs. However, not all states that implement noxious weed plans also have a change in laws. In Oregon, the laws were not changed when their plan was published.

[45] http://www.ag.state.co.us/dpi/publications/strategicPlan.pdf

Appendix F. Section 1204 of the National Invasive Species Act of 1996 and Executive Order 13112

SEC. 1204. STATE AQUATIC NUISANCE SPECIES MANAGEMENT PLANS

(a) STATE OR INTERSTATE INVASIVE SPECIES MANAGEMENT PLANS--

(1) IN GENERAL – After providing notice and opportunity for public comment, the governor of each State may prepare and submit, or the Governors of the States and the governments of Indian Tribes involved in an interstate organization, may jointly prepare and submit—

(A) a comprehensive management plan to the Task Force for approval which identifies those areas or activities within the State or within the interstate region involved, other than those related to public facilities, for which technical, enforcement, or financial assistance (or any combination thereof) is needed to eliminate or reduce the environmental, public health, and safety risk associated with aquatic nuisance species, particularly the zebra mussel; and

(B) a public facility management plan to the Assistant Secretary for approval which is limited solely to identifying those public facilities within the State or within the interstate region involved for which technical and financial assistance is needed to reduce infestations of zebra mussels.

(2) CONTENT – Each plan shall, to the extent possible, identify the management practices and measures that will be undertaken to reduce infestations of aquatic nuisance species. Each plan shall --

(A) identify and describe State and local programs for environmentally sound prevention and control of the target aquatic nuisance species;

(B) identify Federal activities that may be needed for environmentally sound prevention and control of aquatic nuisance species and a description of the manner in which those activities should be coordinated with State and local government activities;

(C) identify any authority that the State (or any State or Indian Tribe involved in the interstate organization) does not have at the time of the development of the plan that may be necessary for the State (or any State or Indian Tribe involved in the interstate organization) to protect public health, property, and the environment from harm by aquatic nuisance species; and

(D) a schedule of implementing the plan, including a schedule of annual objectives and enabling legislation.

(3) CONSULTATION—

(A) In developing and implementing a management plan, the State or interstate organization should, to the maximum extent practicable, involve local governments and regional entities, Indian Tribes, and public and private organizations that have expertise in the control of aquatic nuisance species.

(B) Upon the request of a State or the appropriate official of an interstate organization, the Task Force or the Assistant Secretary, as appropriate under paragraph (1), may provide technical assistance in developing and implementing a management plan.

(4) PLAN APPROVAL – Within 90 days after the submission of a management plan, the Task Force or the Assistant Secretary in consultation with the Task Force, as appropriate under paragraph (1), shall review the proposed plan and approve it if it meets the requirements of this subsection or return the plan to the Governor or the interstate organization with recommended modifications.

(b) GRANT PROGRAM –

(1) STATE GRANTS -- The Director may, at the recommendation of the Task Force, make grants to States with management plans approved under subsection (a) for the implementation of those plans.

(2) APPLICATION – An application for a grant under this subsection shall include an identification and description of the best management practices and measures which the State proposes to utilize in implementing an approved management plan with any Federal assistance to be provided under the grant.

(3) FEDERAL SHARE –

(A) The Federal share of the cost of each comprehensive management plan implemented with Federal assistance under this section in any fiscal year shall not exceed 75 percent of the cost incurred by the State in implementing such management program and the non-Federal share of such costs shall be provided from non-Federal sources.

(B) The Federal share of the cost of each public facility management plan implemented with Federal assistance under this section in any fiscal year shall not exceed 50 percent of the cost incurred by the State in implementing such management program and the non-Federal share of such costs shall be provided from non-Federal sources.

(4) ADMINISTRATIVE COSTS – For the purposes of this section, administrative costs for activities and programs carried out with a grant in any fiscal year shall not exceed 5 percent of the amount of the grant in that year.

(5) IN-KIND CONTRIBUTIONS – In addition to cash outlays and payments, in-kind contributions of property or personnel services by non-Federal interests for activities under this section may be used for the non-Federal share of the cost of those activities.

(c) ENFORCEMENT ASSISTANCE –Upon request of a State or Indian Tribe, the Director or Under Secretary, to the extent allowable by law and in a manner consistent with section 141 of title 14, United States Code, may provide assistance to a State or Indian Tribe in enforcing an approved State or interstate invasive species management plan.

Executive Order 13112 of February 3, 1999

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 et seq.), Lacey Act, as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa et seq.), Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.), Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and other pertinent statutes, to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause, it is ordered as follows:

Section 1. Definitions.

(a) "Alien species" means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

(b) "Control" means, as appropriate, eradicating, suppressing, reducing, or managing invasive species populations, preventing spread of invasive species from areas where they are present, and taking steps such as restoration of native species and habitats to reduce the effects of invasive species and to prevent further invasions.

(c) "Ecosystem" means the complex of a community of organisms and its environment.

(d) "Federal agency" means an executive department or agency, but does not include independent establishments as defined by 5 U.S.C. 104.

(e) "Introduction" means the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

(f) "Invasive species" means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

(g) "Native species" means, with respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

(h) "Species" means a group of organisms all of which have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms.

(i) "Stakeholders" means, but is not limited to, State, tribal, and local government agencies, academic institutions, the scientific community, nongovernmental entities including

environmental, agricultural, and conservation organizations, trade groups, commercial interests, and private landowners.

(j) "United States" means the 50 States, the District of Columbia, Puerto Rico, Guam, and all possessions, territories, and the territorial sea of the United States.

Section 2. Federal Agency Duties.
Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law, identify such actions;

1) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and

2) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

(b) Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

Section 3. Invasive Species Council.
(a) An Invasive Species Council (Council) is hereby established whose members shall include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the Environmental Protection Agency. The Council shall be co-chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Council may invite additional Federal agency representatives to be members, including representatives from subcabinet bureaus or offices with significant responsibilities concerning invasive species, and may prescribe special procedures for their participation. The Secretary of the Interior shall, with concurrence of the co-chairs, appoint an Executive Director of the Council and shall provide the staff and administrative support for the Council.

(b) The Secretary of the Interior shall establish an advisory committee under the Federal Advisory Committee Act, 5 U.S.C. App., to provide information and advice for consideration by the

Council, and shall, after consultation with other members of the Council, appoint members of the advisory committee representing stakeholders. Among other things, the advisory committee shall recommend plans and actions at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order. The advisory committee shall act in cooperation with stakeholders and existing organizations addressing invasive species. The Department of the Interior shall provide the administrative and financial support for the advisory committee.

Section 4. Duties of the Invasive Species Council.
The Invasive Species Council shall provide national leadership regarding invasive species, and shall:

(a) oversee the implementation of this order and see that the Federal agency activities concerning invasive species are coordinated, complementary, cost-efficient, and effective, relying to the extent feasible and appropriate on existing organizations addressing invasive species, such as the Aquatic Nuisance Species Task Force, the Federal Interagency Committee for the Management of Noxious and Exotic Weeds, and the Committee on Environment and Natural Resources;

(b) encourage planning and action at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order, in cooperation with stakeholders and existing organizations addressing invasive species;

(c) develop recommendations for international cooperation in addressing invasive species;

(d) develop, in consultation with the Council on Environmental Quality, guidance to Federal agencies pursuant to the National Environmental Policy Act on prevention and control of invasive species, including the procurement, use, and maintenance of native species as they affect invasive species;

(e) facilitate development of a coordinated network among Federal agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health;

(f) facilitate establishment of a coordinated, up-to-date information-sharing system that utilizes, to the greatest extent practicable, the Internet; this system shall facilitate access to and exchange of information concerning invasive species, including, but not limited to, information on distribution and abundance of invasive species; life histories of such species and invasive characteristics; economic, environmental, and human health impacts; management techniques, and laws and programs for management, research, and public education; and

(g) prepare and issue a national Invasive Species Management Plan as set forth in section 5 of this order.

Section 5. Invasive Species Management Plan.
(a) Within 18 months after issuance of this order, the Council shall prepare and issue the first edition of a National Invasive Species Management Plan (Management Plan), which shall detail

and recommend performance-oriented goals and objectives and specific measures of success for Federal agency efforts concerning invasive species. The Management Plan shall recommend specific objectives and measures for carrying out each of the Federal agency duties established in section 2(a) of this order and shall set forth steps to be taken by the Council to carry out the duties assigned to it under section 4 of this order. The Management Plan shall be developed through a public process and in consultation with Federal agencies and stakeholders.

(b) The first edition of the Management Plan shall include a review of existing and prospective approaches and authorities for preventing the introduction and spread of invasive species, pathways that may be involved in the introduction of invasive species. If recommended measures are not authorized by current law, the Council shall develop and recommend to the President through its Co-Chairs legislative proposals for necessary changes in authority.

(c) The Council shall update the Management Plan biennially and shall concurrently evaluate and report on success in achieving the goals and objectives set forth in the Management Plan. The Management Plan shall identify the personnel, other resources, and additional levels of coordination needed to achieve the Management Plan's identified goals and objectives, and the Council shall provide each edition of the Management Plan and each report on it to the Office of Management and Budget. Within 18 months after measures have been recommended by the Council in any edition of the Management Plan, each Federal agency whose action is required to implement such measures shall either take the action recommended or shall provide the Council with an explanation of why the action is not feasible. The Council shall assess the effectiveness of this order no less than once each 5 years after the order is issued and shall report to the Office of Management and Budget on whether the order should be revised.

Section 6. Judicial Review and Administration.

(a) This order is intended only to improve the internal management of the executive branch and is not intended to create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or any other person.

(b) Executive Order 11987 of May 24, 1977, is hereby revoked.

(c) The requirements of this order do not affect the obligations of Federal agencies under 16 U.S.C. 4713 with respect to ballast water programs.

(d) The requirements of section 2(a)(3) of this order shall not apply to any action of the Department of State or Department of Defense if the Secretary of State or the Secretary of Defense finds that exemption from such requirements is necessary for foreign policy or national security reasons.

WILLIAM J. CLINTON
THE WHITE HOUSE,
February 3, 1999

Appendix G. Public Comments Received and Responses[46]

1)
Subject: Re: Invasive species plan
Date: Wed, 10 Jul 2002 15:16:10 -0800
From: Ginny Fay <ginny_fay@fishgame.state.ak.us>
To: "Frackman, Gary" <GFRACKMA@acsalaska.com>
References: 1
Gary, thank you very much for your interest. There are no specifics in the plan regarding using volunteers for monitoring because a monitoring plan has not been developed yet. That is one of the most important initial tasks of the management plan. Washington has developed a successful citizen-monitoring program that we will probably investigate more fully in developing Alaska's. If you have suggestions regarding a monitoring program, we would be delighted to receive and incorporate them. We will start a list of interested people and I will be sure to put your name on it. Thanks again!

"Frackman, Gary" wrote:
Good day.....Can you provide me with more information on this plan, in particular how Alaskans would assist. Will you be looking for volunteers? I have looked at the draft plan and it mentions using Alaskan's but does not give specifics. Maybe this kind of information has not yet been decided on? Anyway, I am interested in learning more if you can assist here I would appreciate it. Thank you for your time…..

2)
Subject: Re: invasive species
Date: Wed, 10 Jul 2002 16:16:46 -0800
From: Ginny Fay <ginny_fay@fishgame.state.ak.us>
To: KeexKwaan@starband.net
CC: Janet E Schempf <janet_schempf@fishgame.state.ak.us>,
Catherine A Pohl <catherine_pohl@fishgame.state.ak.us>
References: 1
Edna, thank you for your comments and observations. Japanese knotweed is definitely an increasing problem that we acknowledge in the management plan. The ADF&G Habitat biologists and US Forest Service ecologists and botanists are also concerned about its spread. Once we are able to implement the plan, it will be an important species for which to develop a cooperative control program. I will make sure you are kept informed.

Edna Jackson wrote:
Hello, I was looking at the ADFG web page of invasive species. Although we haven't noticed anything out of the ordinary regarding the fish, crustaceans & mollusks that you have listed, we have a growing problem with Japanese knotweed. Can you pass on any information to get this plant either eradicated or under control. Thanks.
Edna Davis Jackson
Environmental Coordinator
Organized Village of Kake

[46] State and federal agency comments are available upon request.

P.O. Box 316
Kake, Alaska 99830
Telephone 907-785-6471
KeexKwaan@starband.net

3)
Date: Tue, 16 Jul 2002 13:27:48 -0500
From: "Lynn R. Schlueter" lschluet@state.nd.us
To: Ginny_Fay@fishgame.state.ak.us
Ginny:
Just finished reviewing Alaska's draft ANS Management Plan.
General comments are
it was well written
broke out the areas of concern
identified the various agencies and entities which need to work together
listed the appropriate entitles and existing regulations that can be used to control ANS will have a risk assessment of potential ANS to focus efforts on likely problem candidates provide a central point with information on species (this should include in-depth life histories and descriptions)
inform the public and state officials how ANS will impact their livelihood and recreation (important - as with out the bite-in-the-wallet, most people are not concerned about ANS impacts)
the goals were listed, the objectives were not as clearly defined, but the management plans calls for review and modification as need develops or as needed (pp 28).
What was very interesting was section VII. MONITORING, EVALUATION AND FEEDBACK, this document is one of the few that has included this important point. Entities need to know what efforts are successful, which ones are not working and what is changing in the public sector. While many agencies use public involvement techniques, few are using up-to-date marketing campaigns and then determining if those were met the objectives (that being +or - (Q and Q)/T [change in quantity or quality over time]).

Thank you for the opportunity to read and comment on the report.

Lynn R Schlueter
Fisheries Division
Special Project Biologist
North Dakota Game and Fish Department
7928 45th Street NE
Devils Lake, North Dakota 58301-8501
e-mail at lschluet@state.nd.us
work phone --- 701/662-3617
FAX number --- 701/662-3618
cell phone --- 701/739-6869

4)
Subject: draft plan comments
Date: Thu, 18 Jul 2002 15:55:28 -0700
From: "Stephen Phillips" <stephen_phillips@psmfc.org>
To: ginny_fay@fishgame.state.ak.us
CC: Randy Fisher <randy_fisher@psmfc.org>,
rob bosworth <robert_bosworth@fishgame.state.ak.us>

July 18, 2002

Ms. Ginny Fay
ADFG
1255 W. 8th Street
Juneau, Alaska 99802-5526

Dear Ms. Fay:

Thank you for providing us with a copy of the "Draft Aquatic Nuisance Species Management Plan" for the State of Alaska.

The document provides a good overview of the Aquatic Nuisance Species (ANS) problem facing Alaska. Also, the draft plan more than adequately covers the goals and tasks necessary for managing the aquatic nuisance species threat in Alaska. We are pleased to see that the draft plan contains numerous educational action items. Regarding ANS education, please be aware that we have educational resources available here for your use (e.g. Mitten Crab Watch cards, Zap the Zebra brochures, etc.).

As you probably know, the PSMFC was successful in securing federal funds from Congress (FY2002) for ANS work in Alaska (administered by Bob Piorkowski) and the West Coast. We also hope to amend language to the National Invasive Species Act (currently in reauthorization) that would provide a stable source of funding for the member states of the Pacific States Marine Fisheries Commission. We will continue to seek resources for our member state's ANS programs in the future.

We look forward to working with the Alaska Department of Fish and Game in developing the Alaska ANS plan and program. Please call on us anytime you feel that we may be of assistance.

Sincerely,

Stephen H. Phillips
Coordinator, Aquatic Nuisance Species Program
Pacific States Marine Fisheries Commission
45 SE 82nd Drive
Suite 100
Gladstone, Oregon 97027-2522
503-650-5400
stephen_phillips@psmfc.org

5)
Julie Crawford, Projects Coordinator July 18th, 2002
Fairbanks Soil & Water Conservation District
590 University Ave Suite B
Fairbanks, AK 99709

Dear Ginny Fay,

I received in my inbox just yesterday a copy of your draft Aquatic Nuisance Species Management Plan. I am happy to give comments on this plan as I have a strong interest in this subject, but given the short turn around deadline and my busy schedule I did not review the document thoroughly. Having said that, I would like to compliment you on a massive piece of work - a very thorough plan. All of my concerns were addressed and I saw few grammatical / spelling / typing errors. I have but two suggestions:
as I am sure you are aware there is already in place a statewide "Committee for Noxious and Invasive Plant Management" which could be mentioned directly when inter-agency coordination is discussed. This would emphasize the already existing commitment state and federal agencies have shown to the invasive species problem. If you have already done this and I just missed it, I apologize.
I feel that there are other plant species that could be added to you list. When describing the impacts of *Polygonum cuspidatum*, you discuss loss of vegetation, destabilized stream banks, and the reduction of woody debris etc. There are many invasive exotics in the state that fit this description. For example, here in Fairbanks, *Linaria vulgare* is an ever-increasing species that can invade lakeshores and stream banks such as the Sloughs that pass through town.
2a) As an aside, you mention Reed canary grass and Foxtail barley, but do not give scientific names or any additional information in the appendix on these species. Presumably they are not considered a high potential threat and therefore not in the appendix or in the Highest Potential Threats section.

I am sorry for the abbreviated review. I wish you luck (and funding) with implementation of this important plan!

Sincerely,
Julie Crawford

6)
Subject: Re: Ballast water regulations
Date: Mon, 22 Jul 2002 15:59:37 –0800
From: Ginny Fay ginny_fay@fishgame.state.ak.us
To: "Wilson, Stephen" Stephen.Wilson@crowley.com
CC: Carrie Gombos Carrie_Gombos@law.state.ak.us
References: 1
Alaska has limited laws/regulations regarding ballast water management. The only statute is directed toward managing oily residual in unsegregated ballast tanks in petroleum carrying vessels. As such, discharge is governed by national standards. The Alaska state statute text is provided below. If you have any additional questions, please do not hesitate to contact us.

Ballast Water Discharge Alaska Statutes, Title 46: Water, Air, Energy and Environmental Conservation, Section 750 Chapter 03. Environmental Conservation
Article 7: Prohibited Acts and Penalties
Sec. 46.03.750. Ballast water discharge.
Except as provided in (b) of this section, a person may not cause or permit the discharge of ballast water from a cargo tank of a tank vessel into the waters of the state. A tank vessel may not take on petroleum or a petroleum product or by-product as cargo unless it arrives in ports in the state without having discharged ballast from cargo tanks into the waters of the state and the master of the vessel certifies that fact on forms provided by the department.
(b) The master of a tank vessel may discharge ballast water from a cargo tank of a tank vessel if it is necessary for the safety of the tank vessel and no alternative action is feasible to ensure the safety of the tank vessel. Sec. 46.03.755. Discharge reporting.
(a) A person in charge of a facility, operation, or vessel, as soon as the person has knowledge of any discharge from the facility, operation, or vessel in violation of
AS 46.03.740 or 46.03.750, shall immediately notify the department of the discharge.

"Wilson, Stephen" wrote:

Would you please let me know where I can find the existing regulations for the discharge of ballast water in Alaskan waters. Thank you
Stephen Wilson Director,
Health, Safety & Environmental Affairs
Crowley Maritime Corporation
(206)332-8033

7)
Subject: Re: Aquatic Invasive Species Plan
Date: Wed, 24 Jul 2002 12:54:25 -0800
From: Ginny Fay <ginny_fay@fishgame.state.ak.us>
To: ossianla <ossianla@plu.edu>
References: 1
Thank you for your thoughtful and positive comments on the report. We will definitely keep you informed regarding a citizen monitoring program and implementation of the plan as it progresses. Thanks! Ginny

ossianla wrote:

Dear Ms. Fay,

I am writing to comment on the draft invasive species plan for Alaska after reviewing the draft on the Alaska Department of Fish and Game website.

I am very pleased that our state is preparing to proactively confront the challenge of invasive species. I have witnessed the prevalence of invasive species, particularly plants, in western Washington as a student at Pacific Lutheran University. Coming home to Alaska after graduation, where the waters and land are still relatively pristine habitats for native species, I believe in the urgency of enacting a plan to protect both the economic interests at stake in aquatic invasive

species as well as the threat to biodiversity that invaders pose. There are a few points in the draft I wished to comment on.

A policy of mandatory ballast exchange offshore is prudent and wise for Alaska. Our waters are a resource that we should take reasonable measures to protect. The factors common to the vast majority of incoming vessels (short trip duration and repeated exposure to the same ports) heighten the risk to this marine ecosystem.

Although we can learn a great deal from the lessons learned the hard way by our southern neighbors in Washington and British Columbia, Alaskan ecosystems require further basic research. There may exist risks or existing invasive species populations that we are not yet aware of that more science would illuminate. A strong foundation for public policy ought to be built on oceanographic research to the fullest extent possible. When the science is not available, a precautionary principle should be applied.

Another important facet to tackling the challenge of invasive species is public outreach. Alaskans, myself included, have a lot to learn about invasive species and how seemingly small actions on our part may make a tremendous difference in our environment. The size of Alaska also dictates that volunteer effort to monitor and report invasive species is desirable. I hope to assist in invasive species projects in my home state. Thank you for spearheading a plan to gather resources to prevent and respond to invasive species in Alaska.

Sincerely,
Lia Ossiander
P.O. Box 670772
Chugiak, AK 99567
ossianla@plu.edu

8)
Subject: Re: Aquatic Nuisance Species Plan
Date: Wed, 24 Jul 2002 14:23:23 -0800
From: Ginny Fay <ginny_fay@fishgame.state.ak.us>
To: Richard@icebergseafood.com
References: 1

Rich,
Thank you very much for taking the time to review and comment on the draft plan. The plan is a first step in the development of an aquatic nuisance species (ANS) and broader invasive species program for Alaska. It lays out the first steps for development. Each of the steps will include significant opportunity for public and special interest groups participation especially through the proposed invasive species council/committee and its subcommittees. The portion of the report referring to "restaurants, seafood retail and processing," was briefly and generally referring to recognized vectors for ANS introductions. As you noted, ballast water may be a significantly more critical pathway for invasive species introduction. As a result, considerably more of the plan is dedicated to reviewing the research that has been done on ballast water in Alaska. We will keep you informed of the process and hope that you will continue to be involved to improve the program.

Rich Sewell wrote:

Dear Ginny,

Invasive species are potentially a big problem for Alaska when viewed in the global context and should be addressed systematically. While this is a step in the right direction, the plan development seems to lack credible public participation so far.

In this regard the plan comment period was very short and I only heard about it through one article in the newspaper. A plan of this importance and breadth needs much more public input and participation than it has received so far.

My particular concern is with the single sentence reference to "Restaurants, seafood retail and processing." These areas encompass a huge portion of the Alaskan businesses and economy. To include so many businesses in a sweeping single sentence is troubling. I would hope that businesses that would be effected by this plan would be notified directly and formally asked to comment on the plan.

Furthermore, the live seafood section of the problem is such an infantismal [sic] drop in the bucket compared with say ballast water, one wonders why it was even included.

However, I would urge the ADF&G to broaden the public participation in the development of this important plan and actively seek out all the affected parties the plan refers to in order to develop ideas and cooperation to implement the solutions that are developed in the planning process.

Sincerely,

Rich Sewell
CEO

9)
Subject: Re: ANS Plan
Date: Tue, 23 Jul 2002 09:07:12 -0800
From: Ginny Fay <ginny_fay@fishgame.state.ak.us>
To: Adelheid Herrmann <herrmann@gci.net>
References: 1

Adelheid, I was out of town until mid-day yesterday, which is why I did not get back to you. Thank you for reviewing the report. If you have additional comments, please feel free to submit them this week. We will definitely keep you informed. I will call you later today.

Adelheid Herrmann wrote:

Hi Ginny, I got to look at the Alaska ANS plan more closely and it looks like my concern for tribes is covered. I'm working for the Native American Fish and Wildlife Society now in Anchorage and am a member of the Western Regional Panel so would like to be kept informed of the States efforts as you move forward. Thank you. Adelheid Ph: 222-6005

10)
Subject: Re: Noxious weeds
Date: Thu, 25 Jul 2002 11:21:35 -0800
From: Ginny Fay <ginny_fay@fishgame.state.ak.us>
To: carlson1@gci.net
CC: Janet E Schempf <janet_schempf@fishgame.state.ak.us>,
Catherine A Pohl <catherine_pohl@fishgame.state.ak.us>
References: 1
Ms Carlson, thank you for taking the time to review the Plan and your concern about the noxious weed on your property. I am cc'ing two biologists in the Habitat and Restoration Division who can assist you with follow up.
Thanks again, ginny

Carlson Family wrote:

> Dear Ms. Fay:
>
I came across this document on the Fish & Game web site last week when trying to identify a plant in our yard. I am concerned that we may have several potentially noxious weeds on our property which is directly adjacent to the Anchorage Coastal Wildlife Refuge, so I ask your advice:

Is there a person I can get to make a site visit to let me know if there are things that I should clear out?

While I just skimmed the document and am not a biology professional, I appreciate the appropriate agencies taking a proactive stance and protecting the diversity of our wild Alaska.

Thank you for your time and consideration.

Barbara Carlson

11)
Subject: Draft Aquatic Nuisance Species Management Plan
Date: Mon, 22 Jul 2002 17:52:10 -0700
From: "Hitchcock, Susan J POA02" <Susan.J.Hitchcock@poa02.usace.army.mil>
To: "'ginny_fay@fishgame.state.ak.us'" <ginny_fay@fishgame.state.ak.us>

I reviewed your management plan. It looks like a comprehensive plan and although I am not very familiar with aquatic species. Such plans are necessary to protect indigenous species. Thanks for the oportunity to comment. Katheryn Judy Hall or Julia Ross University of Alaska (789-9328 hm, 465-6505 wk) are my plant experts. Best of luck. Susan

12)
July 22, 2002

Ginny Fay
Alaska Department of Fish and Game
1255 West 8th Street
P.O. Box 25526
Juneau, AK 99802-5526

Dear Dr. Fay:

Defenders of Wildlife welcomes the opportunity to comment on the Alaska Department of Fish & Game Aquatic Nuisance Species Management Plan (ANSMP). As a leading conservation organization with over 430,000 members nationwide, we view invasive species as one of the greatest threats to our nation's biological diversity. We are pleased that the State has developed a plan in accordance with the recommendations of the Aquatic Nuisance Species Task Force intends to coordinate its various aquatic nuisance species management programs, prevent introduction of new invaders, establish a monitoring plan and rapid response capabilities, and undertake research, public education to keep aquatic invaders out of Alaska. We offer these comments in order to further improve the plan and its implementation.

The Management Plan identifies much that is already being done by Alaska's agencies to identify, exclude, and control invasive aquatic species. However, a number of issues and tools that we believe to be important are not addressed explicitly in either the summaries of current agency responsibilities or in the recommendations for improving coordination and management. The issues and tools described here are drawn from ANS Task Force guidelines and the standards for invasives management developed by the Environmental Law Institute and should be included in the plan (or, if these actions are already being accomplished by state, federal or other authorities, they should be described more explicitly in the management plan).

Coordination:
Task 1A1c. Defenders applauds Alaska's stated intent to hire a full-time ANS coordinator and to include state and federal agencies, tribal groups and non-governmental organizations on the Coordinating Committee. We recommend inclusion of representatives of local and county governments, university researchers and private sector representatives as well.

Task 1A1d. Defenders recommends inclusion of subcommittees to address aquaculture, nursery and aquarium issues as well as Atlantic salmon, shipping, recreational boating, fishing and the others listed here.

Prevention of entry of new ANS into Alaska:

Action 2A3. The Strategic Action, "Prohibit, control or permit the importation of nonnative aquatic species based on their invasive potential," implies that officials will be able to intercept, identify and make a determination about all potential invaders. Species-based approaches of this sort have failed time and again because larvae or spores pass inspectors unnoticed, the invasive potential of a species is not recognized by investigators until it is too late, or for other reasons. We recommend, alternatively, that the ANSMP move beyond managing individual species, and develop a pathways-based approach that utilizes incentives, regulations and technologies to reduce the likelihood that invasive species will enter the state. A pathways-based approach would combine technologies such as ballast treatment (e.g. UV, filtration or ozone) for oceanic and coastal ships, dispersal barriers on locks and canals, and education and regulations to prevent deliberate release or accidental fouling by boaters, fishermen, oil drilling platforms, dry docks, aquaculture facilities and aquarium enthusiasts. The pathway-oriented subcommittees described in Task 1A1d, and the research objectives defined under Action 5B1 will be helpful in the development of a pathways-based approach.

Task 2A3a. The state should, for all taxa, follow the lead of "current law [that] provides that except for oysters and scallops, fish and other marine invertebrates cannot be legally imported into the state." Thus, in using the four-category system described in the Task, only species in that are likely to have minimal adverse impact should be allowed in the state. This includes any potentially harmful aquaculture species, which should not be brought on the pretense they can be managed to minimize escape. With respect to introductions of all taxa, we recommend a precautionary approach: lack of information about a species should be considered reason for exclusion of a species, not an excuse to allow entry.

Other recommendations for strategic actions and tasks that are not explicitly detailed, but should be included under the Prevention goal:

- *Quarantine facilities and import procedures*. The Plan does not describe in any detail quarantine requirements and procedures for imported live organisms or products that could harbor pests. Nor does the Plan appear to contain labeling requirements for imports, mandated registration of shippers, or requirements that shippers post bonds to cover the cost of inspection and quarantine, or be insured for any damage that might stem from imported pest species. If these import and quarantine issues are being handled exclusively through the federal government, the Plan should at least state this.

- *Biological control agents*. The Plan should include a section on the evaluation, permitting and use of biological control agents, which are frequently non-native species, and have, on occasion, themselves become invaders. The state should develop and implement uniform guidelines across agencies for the import and use of biological control agents.

Detection and Eradication:

Defenders applauds the Management Plan's goals to track and monitor invasive species spread and develop reporting systems (Tasks 3A11-d), and implement action plans for the most incipient threat species (Task 3B1a-b), and to establish ANS Emergency Fund (Task 3B1c). Defenders

suggests, however, that the Fund should be even larger than $100,000. Emergency response efforts to eradicate small populations of the invasive seaweed *Caulerpa taxifolia* have cost $2.46 million over the past two years. While this amount pales in comparison to the costs of not eradicating the seaweed, it serves as an example of how expensive emergency eradication actions can be, Defenders of Wildlife also recommends that the Management Plan should include a restoration component. We believe that habitat restoration and good management practices are key to improving habitat and preventing re-infestation. Restoration activities can take place across a range of agencies, requiring coordination. Restoration activities can also be a way to provide outreach to communities and get involvement and buy-in from a wide range of stakeholders.

Miscellaneous comments:

We are pleased to see that the ANSMP states that the plan is "a first step in initiating the establishment of a coordinated state aquatic and terrestrial invasive species program." Defenders encourages the state to move forward with a management plan for terrestrial invasive species that addresses coordination, prevention, rapid response, control, education and research. This plan should build on the contents of the ANSMP so that agencies can work seamlessly on all invasive species issues, and should identify and close the pathways that expose the state of Alaska to forest threats, agricultural pests, noxious weeds, and other exotic invasive species. As Alaska officials improve and implement the ANSMP and develop a corresponding plan to deal with terrestrial invasives, officials and managers may find the following resources to be useful:

- The Environmental Law Institute, which has recently completed a comprehensive analysis of state laws pertaining to invasive species, including recommendations for comprehensive programs, which will allow states to identify gaps and needs in their programs. The report is now in press, and will be available soon at http://www.eli.org .

- The State Environmental Resource Council, a project of Defenders of Wildlife and the Natural Resources Defense Council, can assist with the drafting and passage of pro-environmental laws, and can be a resource for the development of invasive species law. Http://www.serconline.org

Thank you for your attention to our comments.

Sincerely,
Aimee Delach
Species Conservation Associate

13)
Subject: Re: [Fwd: Ragweed is spreading throughout AK]
Date: Thu, 25 Jul 2002 11:31:54 –0800
From: Ginny Fay ginny_fay@fishgame.state.ak.us
To: Frances Merrill <frances_merrill@health.state.ak.us>,
Janet E Schempf <janet_schempf@fishgame.state.ak.us>,
Catherine A Pohl <catherine_pohl@fishgame.state.ak.us>,
William F Ballard <bill_ballard@dot.state.ak.us>,
Marta Mueller <ftmrm@uaf.edu
References: 1

France, thank you for taking the time to review the ANS plan and provide comments. As I mentioned on the phone, I am forwarding your comments regarding to ragweed to Habitat and Restoration biologists, DOT environmental coordinator and the UAF invasive plant committee coordinator. Please let me know if you would like additional information.

Frances Merrill wrote:
Subject: Ragweed is spreading throughout AK
Date: Tue, 23 Jul 2002 09:45:18 –0800
From: Frances Merrill <frances_merrill@health.state.ak.us
Organization: Epidemiology
To: ginny_faye@fishgame.ak.us

Frances R. Merrill
1200 W. Dimond Blvd.
Anchorage, AK 99515
(907) 344-1327
akfrancie&gci.net

Dear Ginny,

I want to thank you for championing support in such necessary causes as to save our environment from non-native encroachments such as mine.

My concern I called to report to you and have to others in state departments is the last several years is the introduction of ragweed from grass seed being planted in road side meridians of newly constructed highways, roads and storage lots all around in Mat Su and Anchorage. I don't know myself of other areas but am suspect.

This plant I have seen spread miles in one year as each huge tall 4'-6' plant carries thousands of seeds. It's fragrance is stronger than clover, I see it completed overrun all other vegitation including our beautiful fireweed's and grass. It is planted in the new Cuddy Family park at the Lousace library and found up and down south C street from south on King. I saw it start spreading first at the big construction lot back in the Waste Water Management area west on King around the 100th block. Now I see it everywhere, a single plant here or there and it empty lots used as snow dumps.

I can't forecast stopping this plant from evading all of Alaska. No animals can eat it and our lands will be covered entirely if eradication is not started immediately.

Please keep me advised of what is being done about this matter, who is being notified and results. I pray to our Creator this will of immediate concern.
Thank you,

Frances R. Merrill

Appendix H. Strategic Response Plans

Nonindigenous Northern Pike Populations
Division of Sport Fish

Introduction

Northern pike are native to much of North America. Northern pike were historically found east of the continental divide. In Alaska, pike are native north of the Alaska Range. Northern pike are not native in the large drainages of the Copper, Susitna, and Kenai rivers as well as the numerous smaller drainages in Prince William Sound, Cook Inlet and the Gulf of Alaska Coast.

Northern pike first appeared in the Susitna River Drainage in the 1950s. It is believed that a well-intentioned angler stocked these fish in a lake via floatplane. Approximately 50 years later, northern pike can be found throughout the Susitna River drainage. Northern pike are most numerous in those parts of the Susitna River Drainage that correspond to its preferred habitat niche. This includes shallow lakes and sloughs and slow clear tributary streams. Northern pike are less numerous or absent from those parts of the Susitna River Drainage that are turbid, fast moving or having extremely cold water.

The actual impact of northern pike on the Susitna River Drainage is impossible to measure. However, northern pike have had a significant impact in some parts of the drainage. Several lakes (Trappers, Alexander, and Red Shirt) that once contained healthy trout and salmon populations are now devoid of these species. Pike densities remain high in these systems and it is unlikely trout and salmon will ever become reestablished. Other fishes in these systems such as suckers and whitefish have been similarly impacted. In addition to lakes, numerous sloughs and small streams have had their native fish populations replaced by northern pike. The cumulative impact of northern pike on the Susitna River Drainage is probably quite large, particularly for those species (rainbow trout, coho salmon, suckers, whitefish, etc.) that have significant overlap of preferred habitat niches.

The range expansion of northern pike is continuing. Northern pike are being found in many lakes in the Matanuska-Susitna Valley, Anchorage urban area, and the Kenai Peninsula. This range expansion is thought to be the result of northern pike anglers stocking these fish in lakes where the anglers would like to see a pike fishery develop. The potential exists for northern pike to become established in most if not all Cook Inlet drainages.

Problem and Impacts

Much of the aquatic habitat found in Southcentral Alaska is similar to northern pike habitat found in much of its' native range. However, most Southcentral aquatic systems are much less productive than those found in the northern pike native range. The typical course of events when pike are introduced into a Southcentral Alaska lake is as follows: the few introduced pike have lots of food and they grow fast; the pike produce lots of offspring; the offspring grow fast and they reproduce; the lake soon contains thousands of small pike; the pike eat everything in the lake including each other; after a period of 5 to 10 years the lake contains nothing but 10 to 20 inch pike that anglers don't pursue because they are too small. The biomass of fish capable of being sustained in a Southcentral Alaska lake is small. Once that biomass is eaten by pike, native fish production in the lake is essentially lost unless the pike can be removed.

Replacing native fish biomass with northern pike biomass is a loss for Alaskans. Rainbow trout are a highly sought after species in Alaska. This species is so prized that highly restrictive regulations for this species exist throughout Alaska. Eliminating rainbow trout and replacing it with northern pike is unacceptable in the minds of most Alaskan sport anglers. A similar argument can be made for salmon. Once established in a lake, northern pike are capable of consuming most if not all juvenile salmon originating in that system. The net result is that no adult salmon return. Besides being a loss to sport and commercial fishers, there is a large loss of productivity to the system. The carcasses of spawned out salmon provide a large nutrient input into most aquatic systems. Loss of this input means the systems can support fewer and fewer fish over time.

Northern pike are showing up in many stocked lakes. These pike compete with the anglers intended to benefit from the stocking. If pike densities become high, the anglers are actually out-competed and stocking is no longer of any benefit. These lakes are no longer stocked. Some of these lakes are in urban areas and heavily utilized. Loss of this fishing opportunity can be devastating to urban anglers.

The potential for northern pike to continue spreading is large and the potential impact is immense. Northern pike are still being found in new locations, particularly stocked lakes. This means that people are still moving them around. The potential for damage is immense in 2 critical river systems. The Kenai River system is heavily utilized by sport and commercial fishers as well as personal use and subsistence fishers. Northern pike are present in some subdrainages of the Kenai. Permitting these populations of pike to spread could jeopardize some or all of the Kenai River fisheries. The Copper River Delta contains a tremendous amount of potential northern pike habitat. Introduction of northern pike into the Copper River Delta is not beyond belief. Once established, northern pike could again have a large impact on commercial, sport, personal use and subsistence fishers.

The unchecked spread of northern pike into waterbodies where they previously weren't found is unacceptable. Once established, northern pike are difficult to eliminate or control. However, there are actions that can be taken to eliminate or control the growth of northern pike populations in a variety of circumstances. A strategic response plan has been developed using the following criteria to make decisions; lake type and size, potential northern pike spawning area, and the likely northern pike prognosis if left unchecked.

Goal Statement

The ADF&G will control and prevent the spread of nonindigenous or non-native populations of northern pike in order to ensure sustained yield of indigenous stocks, preserve diverse and dependable fishing opportunity, and maintain wild populations of desired fish species.

Objectives

1. Document and characterize the presence of northern pike outside their native range.
2. Prevent the spread of northern pike into new areas.
3. Eliminate or reduce northern pike predation on indigenous fish populations.
4. Eliminate or reduce northern pike predation on high use/ value stocked fisheries.
5. Control northern pike in areas where they have impacted fisheries and cannot be eliminated.
6. Restore, where feasible, fish populations that have been eradicated or severely impacted by pike predation.

Strategic Response Plan

The ADF&G will monitor the spread of northern pike populations into new areas through several venues. Routine sampling of fish populations occurs throughout the State and documentation of northern pike will occur through the routine sampling. Reports of northern pike presence in a waterbody are also received from the general public. These reports are and will continue to be verified through further sampling. Status of the northern pike population will be ascertained from this sampling. The attached matrix will be used to classify the waterbody, perform a northern pike risk assessment, and determine the appropriate level of strategic response. Selecting the response will include economic, political, social and biological considerations. Regardless of what response is selected, a public process will be used to educate and inform the public of the appropriate action for a particular situation. All control measures are regulated processes that may involve involvement from the Board of Fisheries, Department of Environmental Conservation, Department of Natural Resources, or other State and Federal agencies. The strategic response plan will address the involvement of other agencies and the control measures that need to be addressed.

Appendix I. Species Information on High Priority Threats and USGS Database List of Alaska ANS[47]

Fish
Atlantic salmon (*Salmo salar)*: http://nas.er.usgs.gov/fishes/accounts/salmonid/sa_salar.html
Brook trout (*Salvelinus fontinalis)*: http://nas.er.usgs.gov/fishes/accounts/salmonid/sa_fonti.html
Northern pike (*Esox lucius)*: http://nas.er.usgs.gov/fishes/accounts/esocidae/es_luciu.html
Oscar (*Astronotus ocellatus)*: http://nas.er.usgs.gov/fishes/accounts/cichlida/as_ocell.html
Yellow perch (*Perca flavescens)*: http://nas.er.usgs.gov/fishes/accounts/percidae/pe_flave.html

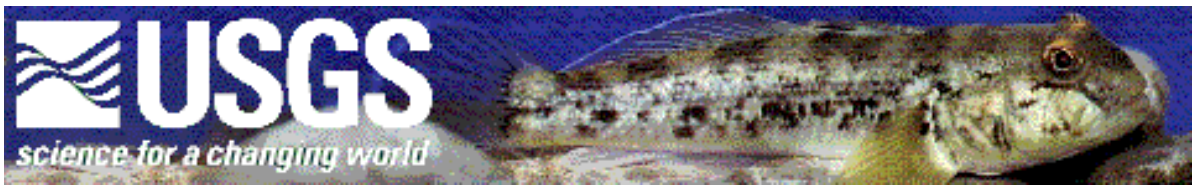
Crustaceans
Chinese mitten crab (*Eriocheir sinensis*): http://www.gsmfc.org/nis/nis/Eriocheir_sinensis.html
Green crab (*Carcinus maenas*): http://www.wa.gov/wdfw/fish/ans/greencrab.htm
Signal crayfish (*Pacifastacus leniusculus*) distribution map:
http://nas.er.usgs.gov/crustaceans/maps/pa_leniusculus.gif

Mollusks
New Zealand mudsnail (*Potamopyrgus antipodarum*):
http://www.fcsc.usgs.gov/Nonindigenous_Species/New_Zealand_Mudsnail/new_zealand_mudsnail.html
Zebra mussel (*Dreissena polymorpha)*: http://nas.er.usgs.gov/zebra.mussel/docs/sp_account.html

Plants
Hydrilla verticillata, hydrilla, water thyme: http://nas.er.usgs.gov/plants/docs/hy_verti.html
Landoltia (Spirodela) punctata, dotted duckweed: http://nas.er.usgs.gov/plants/docs/la_punct.html
Lythrum salicaria, purple loosestrife: (General)
http://www.ecy.wa.gov/programs/wq/plants/weeds/purple_loosestrife.html
(Technical) http://www.ecy.wa.gov/programs/wq/plants/weeds/aqua009.html
Myriophyllum spicatum, Eurasian water-milfoil: http://nas.er.usgs.gov/plants/docs/my_spica.html
Phalaris arundinacea, reed canarygrass:
http://www.ecy.wa.gov/programs/wq/plants/weeds/aqua011.html
Polygonum cuspidatum, Japanese knotweed:
http://www.ecy.wa.gov/programs/wq/plants/weeds/aqua015.html
Spartina alterniflora, saltmarsh cordgrass: http://nas.er.usgs.gov/plants/docs/sp_alter.html
Utricularia inflate, swollen bladderwort: http://nas.er.usgs.gov/plants/docs/utric_in.html

Other
Whirling disease, *Myxobolus cerebralis:* http://www.whirling-disease.org/

[47] This information is from the Nonindigenous Aquatic Species (NAS) information database for the United States Geological Survey. Located at the Florida Caribbean Science Center, this site was established as a central repository for accurate and spatially referenced biogeographic accounts of nonindigenous aquatic species. The USGS definition of nonindigenous used to construct this database is an aquatic species located in a location in which it is not a native or indigenous species. As a result, species moved from areas where they are naturally occurring to areas where they are not, are listed in this database.



Query Results for All Taxonomic Groups

Group	Scientific Name	Common Name	Exotic
Amphibians-Frogs	*Pseudacris regilla*	Pacific chorus frog	
Annelids-Polychaetes	*Manayunkia speciosa*	a sabellid worm	
Coelenterates-Hydrozoans	*Ectopleura crocea*	tubularian hydroid	
Crustaceans-Crayfish	*Pacifastacus leniusculus*	signal crayfish	
Fishes	*Alosa sapidissima*	American shad	
Fishes	*Dallia pectoralis*	Alaska blackfish	
Fishes	*Esox lucius*	northern pike	
Fishes	*Gambusia affinis*	mosquitofish	
Fishes	*Gasterosteus aculeatus*	threespine stickleback	
Fishes	*Oncorhynchus kisutch*	coho salmon	
Fishes	*Oncorhynchus mykiss*	rainbow trout	
Fishes	*Perca flavescens*	yellow perch	
Fishes	*Salmo salar*	Atlantic salmon	
Fishes	*Salmo salar salar*	Atlantic salmon	
Fishes	*Salvelinus fontinalis*	brook trout	
Fishes	*Thymallus arcticus*	Arctic grayling	**Exotic**
Mollusks-Bivalves	*Mya arenaria*	softshell clam	
Plants-Dicots	*Cotula coronopifolia*	brassbuttons	**Exotic**

Source: This information is from the Nonindigenous Aquatic Species (NAS) information database for the United States Geological Survey. Located at the Florida Caribbean Science Center, this web accessible site was established as a central repository for accurate and spatially referenced biogeographic accounts of nonindigenous aquatic species. The USGS definition of nonindigenous used to construct this database is an aquatic species located in a location in which it is not a native or indigenous species. As a result, species moved from areas where they are naturally occurring to areas where they are not, are listed in this database.