State of Maine

Action Plan For Managing Invasive Aquatic Species

A report to the

Land and Water Resources Council

From the

Interagency Task Force On Invasive Aquatic Plants and Nuisance Species

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This plan was drafted for the Interagency Task Force On Invasive Aquatic Plants and Nuisance Species by:

H. Dominie Consulting of Readfield, Maine
and
Task Force's Technical Subcommittee
Roy Bouchard and John McPhedran, Department of Environmental Protection and federal AIS Task Force: Northeast Panel Member; Don Cameron, Maine Natural Areas Program and New England Invasive Plant Group Member, DOC; Dr. Russell Danner, Department of Inland Fisheries and Wildlife; Ann Gibbs, Department of Agriculture, Food, and Rural Resources; Mark McCoullough, Department of Inland Fisheries and Wildlife; Kate O'Brien, Rachel Carson National Wildlife Refuge; Pete Thayer, Department of Marine Resources and federal AIS Task Force: Northeast Panel Member; and Scott Williams, Volunteer Lake Monitoring Program.

Interagency Task Force On
Invasive Aquatic Plants and Nuisance Species
Roy Bouchard, Chair, Maine Dept. of Environmental Protection
Nancy Beardsley, Maine Drinking Water Program
Shippen Bright, Maine Lakes Conservancy and National Invasive Species Council Advisory Committee Member
Jim Chandler, Recreational Watercraft Owners Assoc.
Gary Cobb, Maine Sporting Camp Association
Michael Crooker, Town of Bradley
Russell Danner, MS, DVM, Maine Dept. Inland Fisheries & Wildlife
Mary Jane Dillingham, Auburn Water District
Debbie Gardner, Maine Marine Trade Association
Ann Gibbs, Dept. of Agriculture, Food, & Rural Resources
Becky Linney, Public member w/ expertise in gardening and education
Ellen Peters, Rangeley Region Sportsmans Association
Dale Pierson, Pierson Nurseries
George Powell, Dept. of Conservation
Matt Scott, Public member w/ expertise in lake ecology
Clyde Walton, Congress of Lake Associations
Scott Williams, Volunteer Lake Monitoring Program

Task Force Staff
John McPhedran, DEP Invasive Aquatic Species Program Coordinator

Other Contributors
Task Force Alternates: Sally Dyer (E. Peters)
Maine Department of Agriculture, Food and Rural Resources: Tom Eddy, Gary Fish
Maine Department of Environmental Protection: Karen Hahnel, Dave Halliwell, Christine Smith, David Van Wie
Maine Department of Inland Fisheries and Wildlife: David Basley, Peter Bourque, Dave Boucher, Ken Elowe, Don Kleiner, Dennis McNeish, Tim Peabody, Mike Sawyer, Steve Timpano, Mike Sawyer
Maine Department of Marine Resources: John Sowles, Joseph Fessendon, Linda Mercer, Penn Estabrook
Maine Land Use Regulation Commission: Fred Todd
US Fish and Wildlife Service: Sandra Keppner (Aquatic Nuisance Species Coordinator), Cynthia Boettner (Silvio O. Conte National Fish and Wildlife Refuge)
Other: Ann Bove, Vermont Department of Environmental Conservation, Dr. James Carlton, Williams College, Williamstown, MA; Linda Gregory, Acadia National Park; Marcia Spencer-Famous, Maine Wetland Professionals Association, LURC; Dana Wallace, retired, DMR; Katherine Webster, University of Maine at Orono

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Summary

This plan will guide the State of Maine in managing invasive aquatic species over the next 4 years. Mandated by the Legislature, it was developed by the Interagency Task Force On Invasive Aquatic Plants and Nuisance Species for the Land and Water Resources Council.

An invasive aquatic organism is one that has been moved from its native aquatic habitat to a new location, even nearby, and causes significant harm to that new environment. Such organisms spread naturally, but human activities are spreading them much more rapidly through such means as:

- Transportation between waters on water-contact vehicles, gear and equipment;
- Fragmentation and spread within already infested waters;
- Release or inadvertent escape into the wild;
- Discharge of untreated live wastes from marine processing facilities; and
- Release of ballast water and navigation of infested hulls in marine waters.

Invasive milfoil and other aquatic plants are not the only threat to freshwaters – harmful animals such as non-native fish and the zebra mussel are just as likely to be introduced, and marine and wetland invasive organisms threaten other aquatic habitats. Maine's climate, water chemistry, and geographic isolation make it the last state in line generally to host invasive aquatic infestations so we still have time to take preventive measures for many freshwater and wetland species. But the dynamics of the Gulf of Maine make our state highly vulnerable to marine infestations no matter what we do – in which case we can only anticipate and lessen their impacts.

While many introduced species bring great benefits such as food and landscaping products, invasive species promise serious biological and socio-economic impacts. They can:

- Displace native species filling same ecologic niche;
- Reduce biodiversity;
- Disrupt food webs;
- Degrade habitats;
- Suppress property values and drain public coffers;
- Impair commercial fishing and aquaculture;
- Degrade recreational experiences;
- Impair public water supplies;
- Threaten native fish populations and spoil sport fisheries;
- Degrade coastal infrastructure; clog or foul pipes and drainage ditches; and
- Threaten public health.

Many other states are looking to Maine for ideas because we have moved fast to curb the introduction and spread of milfoil and other invasive freshwater plants. We have instituted an inspection and education program supported through a boat sticker program; and authorized the Departments of Environmental Protection and Inland Fisheries and Wildlife to regulate surface use in plant-infested waters. But we also have much to learn from other states and provinces that have been dealing with other types of organisms. This plan guides and coordinates the policies and programs of state agencies and action partners involved in managing invasive aquatic species. It also sets priorities for obtaining funds to support planned activities.

A key part of Maine's approach is an Advisory List of Invasive Aquatic Species found in Appendix D of this plan. Organisms on the list are those most likely to be a concern in Maine. The list provides an assessment of the relative threat that each organism poses and the crucial pathways of spread to address. It groups the organisms by habitat (freshwater, wetland, and marine) and management category (prevention and eradication; selective control and/or impact management; and no action at this time).

Four key goals underpin Maine's Action Plan:

1. Educate the public and people involved in business, trade, research and government so well about invasive aquatic species that they do not facilitate the introduction or spread of species through activities over which they have control;
2. Prevent new introductions of invasive aquatic species into the state to the extent possible;
3. Limit the spread of established populations to other waters of the state; and
4. Reduce the harmful effects resulting from infestations of invasive aquatic species by managing those that cannot be eradicated.

Five objectives organize the work to be done:

1. Provide effective leadership, coordination and program monitoring,
2. Raise awareness and educate the public well,
3. Strengthen programs to avoid introduction and transport,
4. Be prepared to respond rapidly and control spreading, and
5. Effectively inventory, research, and manage information.

Leading strategies stand out:

1. Freshwater Plants and Organisms That Travel With Them:
   - First line of defense: The fledgling watercraft inspection program for milfoil and other macrophytes will be strengthened so that it is as effective as a voluntary program can be. It will be expanded to include tidal rivers and also inform the public about zebra mussels and other organisms that are transported with these plants;
   - Second line of defense: A monitoring and rapid response system will be established to eradicate new infestations. Maine will move to a mandatory inspection program or other stringent controls should infestations occur beyond acceptable thresholds.
2. Illegal Fish Introductions
   - First line of defense: Stocking of any fish into any water of the state requires a permit from DIFW. DIFW will continue to regulate transfers in this manner. A high priority will be placed on developing a regular, ongoing public information and education effort to increase public awareness of the impacts of illegal fish introductions and the need for public support and assistance with the enforcement of laws designed to discourage unauthorized fish introductions. A very high priority will be placed on the enforcement of laws designed to prevent the illegal introduction of fish species.
   - Second line of defense: DIFW will establish and maintain a contingency program including staff, training, equipment, and financial resources necessary to provide a speedy and credible response to illegal introductions. DIFW will remove the fish if feasible to do so. Chemical reclamation is the most common and effective means of achieving this goal. DIFW will afford no specific regulatory protection to any fish species introduced illegally. Where a practical benefit can be reasonably expected, DIFW will adopt regulations designed to maximize the take of illegally introduced species to the benefit of indigenous species, requiring catch disposal where health advisories rule out consumption.

     DIFW's ability to achieve these goals may be hampered by limited staff and financial resources.

3. Marine Species:
   Since Maine has no defense against species that are introduced into marine waters on the East Coast, the State will seek to understand the ecology and impacts of species that have the greatest potential to disrupt Maine's commercial fisheries and marine infrastructure.

4. All Species:
   Maine will identify invasive aquatic organisms coming into the state, list and prohibit the most harmful as appropriate, and inform retailers, wholesalers, and the public about how to avoid introduction and spread, in collaboration with the Northeast Panel and other states and provinces.

The plan includes the following tasks; high priority tasks are indicated with a "♦":

1. Leadership, Coordination, & Program Monitoring
   - 1A1 Including marine representation on task force♦
   - 1A2 Expanding coverage to marine waters supported by boat sticker♦
   - 1B Ensuring ongoing interagency coordination
   - 1C Instituting a plan update process
   - 1D1 Coordinating at the regional level♦
   - 1D2 Coordinating at the national level
   - 1Ea Reviewing sticker program♦
   - 1Eb Training sticker vendors

2. Education and Outreach
   - 2A Establishing a lead coordinator
   - 2B1 Conducting a general information & education campaign
   - 2B2 Creating uniform educational materials
   - 2B3 Monitoring progress through public perceptions
   - 2C1 Targeting watercraft transport pathway education♦
   - 2C2 Targeting release into the wild pathway education♦

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Introduction

What are Invasive Aquatic Species?

People are not the only globetrotters. For centuries, plants, animals, and microbes have moved around the world as a result of human activities, usually as planned introductions of useful products such as food, building materials, forage for livestock, garden plants, and research supplies, but also as stowaways in such places as bilge water and cargo holds or on the underside of boats. In this modern global economy, the flow has become so intense that biota from all parts of the world are mixing in ways and with outcomes that we have only begun to anticipate and understand.

> An Invasive Aquatic Organism is one that has been moved from its native aquatic habitat to a new location, even nearby, AND causes significant harm to that new environment.

Organisms that have been moved from their native habitat to a new location are commonly referred to as "nonindigenous," "non-native," or "exotic to their new environment" (see Appendix A: Glossary). A new environment can be the next country, state, or just over the hill or in a different part of a watershed. Some nonindigenous species seriously degrade their new environment, impair social and economic values, and sometimes cause public health problems. These are collectively known as "invasive species." Invasive species that live in freshwater, inland wetlands (including floodplains), coastal wetlands, or marine waters, are called "invasive aquatic species."

The term "nuisance species" is sometimes used as a synonym for invasive species.[1] This plan favors the use of "invasive" because it avoids confusion with other nonindigenous species that pose comparatively minor disruption to our natural environment, economy, or way of life; or those that may in fact be beneficial. However, when referencing legislation in this document, the specific terminology used in each act or regulation has been maintained.

Invasive aquatic species are the focus of this plan because they pose a clear and present threat to Maine's lakes, rivers, marshes, and coastal waters – among the state's most valued resources and mainstays of our unique lifestyle and economy. We must act to prevent the introduction of invasive aquatic species into the state and limit the spread of existing ones to other Maine waters.

At a later date, Maine may decide to address terrestrial invasive species in the same manner.

What makes invasive species so successful?

Invasive aquatic species are adept at spreading because of their biological vigor and aggressiveness. They and their terrestrial counterparts proliferate because they generally:

- Have reproductive adaptations that allow them to disperse successfully,
- Tolerate and adapt to a wide range of environmental conditions,
- Lack predators and other controls that limit their establishment in new environments, and
- Develop self-sustaining populations.

Ready-made for success, they can disrupt a local ecosystem, economy, or way of life, and travel on to their next easy conquest in no time at all.

How do people spread them?

People keep invasive aquatic species on the move in a multitude of ways. The means and routes by which aquatic invasive species are introduced into a new setting are often referred to as "invasion pathways." In Maine waters, the major pathways created by human activities involve:

- Transporting plants, animals, mud or water between water bodies on and within watercraft, planes, trailers, and other water-contact gear and equipment,
- Fragmenting and spreading established invasive plants and other organisms attached to them by mechanical actions such as trying to remove the plants or operating watercraft within infested areas,
- Releasing or inadvertently allowing the escape of invasive aquatic organisms into the wild from bait buckets, aquariums, water gardens, research and education projects, illegal stocking, containment areas for commercial mariculture projects, and dredge spoils,

- Discharging untreated biological wastes from aquaculture, seafood, or other processing facilities that introduce pathogens and other organisms into marine waters, and
- Releasing invasive species-infested ballast water or navigating the fouled hulls of commercial ships, industrial structures, or recreational boats through marine waters.

Do they spread naturally?

Once introduced by people, invasive aquatic plants, animals, and protists (organisms that are neither plant nor animal) continue to spread naturally and rapidly. They can flow downstream, swim upstream or downstream, float or swim through interconnected waters and currents, and hitch a ride on other organisms such as fish or waterfowl. And with global climate change, they may spread even further as freshwater and ocean temperatures moderate.

How vulnerable is Maine?

In some respects Maine is lucky. Our waters tend to be colder, less nutrient-rich, and in the case of marine waters, higher in salinity – all factors that discourage biological diversity in general. Access to many freshwaters is limited. We are so far north and so isolated geographically and, to some extent, economically that we tend to be the last state or province in the Northeast to host invasive aquatic infestations. For instance, most other states have widespread populations of "invasive weeds" such as Eurasian milfoil and water chestnut in their lakes. But only variable milfoil is established in Maine so far. We still have time to take preventive measures, at least with invasive freshwater plants and animals.

But other factors make Maine highly vulnerable to infestation. The most critical has to do with our marine waters. Because of Gulf Stream currents, Scotian Shelf upwellings, backwash, eddies, and other dynamics of the Gulf of Maine, we will eventually get any species that arrives on the East Coast. This means not only from the south, but also from the Great Lakes via the Saint Lawrence Seaway in Canada. The bottom line is that we have little power to prevent the introduction of new marine species that arrive here from natural pathways.

> Gulf of Maine ocean dynamics ensure that Maine will get everything that lands on the East coast and survives local conditions.

Furthermore, the popularity of recreational boating in Maine makes both marine and freshwaters vulnerable. Visiting freshwater boaters come largely from New England and the Maritimes. Recreational mariners come from as far away as the Caribbean and Europe. And their numbers are great.

> Maine has much to lose - ecologically, culturally, and economically - if we do not prevent, detect, and control new invaders effectively.

What's at stake?

Let there be no misunderstanding - multitudes of introduced species have been a boon for Maine. We enjoy great benefits from such cultured non-native organisms as honeybees, corn, and turf grass.

But we are learning to be more selective in what we introduce, having coped with the unanticipated consequences of some particularly unpleasant past introductions. When Dutch elm disease devastated the state's elegant elms in the last century, heartbroken Mainers had to plant other tree species to grace roadsides and lawns. When European green crabs literally ate the bottom out of the state's soft shell clam industry in the 1980's, clam diggers had to buy new gear and go after other fisheries or find other vocations.

While in the past these invasions seemed isolated events, we now know that they were only a forewarning of what promises to be the long term deterioration and change of our natural environment unless Maine takes decisive steps to prevent new invasions. And the threat is not just to Maine. We must be vigilant not to pass on our infestations and aggressive native species elsewhere. Already, the Maine baitworm industry, the largest supplier in the world, unwittingly has sent green crabs to California, hidden in seaweed used in packing bait worms for transport.[2]

Examples highlighting the most serious potential impacts follow:

Biological Consequences:

1. **Invasive species displace native species filling the same ecological niches.** The rusty crayfish is such a culprit. Introduced into Maine as

bait, this species can out-compete native crayfish for prey, breeding sites, and other needed resources. [3] White perch is an example of a species that can easily destroy Maine's native salmonid communities. Many invasive species are similarly capable, becoming the dominant or only species filling a particular niche.

2. **Invasive species can reduce biodiversity.** They can reduce the overall number of organisms in a habitat. For instance, water chestnut and many other invasive freshwater plants can become so prolific that they choke the water column and block out sunlight. As a result, other plants and animals living in the same habitat can no longer survive and may be eliminated locally. Such a community is no longer as species-rich. One national study reports that invasive species have contributed to the placement of 35 to 46 percent of the plants and animals on the Federal Endangered Species List.[4] It is also important to note that introducing non-indigenous species, inclusive of invasive species, also distorts assessments of biological integrity by making communities appear to have higher numbers of different kinds of species than would occur naturally.[5]

3. **Invasive species disrupt food webs.** The spiny waterflea, *Bythotrephes*, eats smaller plant-eating crustacea such as the common zooplankton, Daphnia, an important food item for small juvenile fish. The rapid reproductive rate of the spiny waterflea enables the species to monopolize the food supply at times, to the detriment of native fisheries. Small plant-eating fish are further affected because they cannot eat the spines of this waterflea.[6] Many other invasive species have similar advantages.

4. **Invasive species can degrade habitats.** Many organisms can degrade and fundamentally change the habitat of local plant and animal communities. For example, the common carp destroys vegetation and increases water turbidity by dislodging plants and rooting around in the bottom muck. The habitat is then unsuitable for species requiring vegetative cover and clear water.[8] Invasive crayfish are also capable of destroying large areas of aquatic vegetation. They may also spread pathogens and parasites, or alter the genetic make-up of closely related species.[3]

Socio-Economic Consequences:

1. **Invasive species suppress property values and drain public coffers**. New research in Vermont shows that invasive plants can cost shoreline owners over $12,000 each in lost property values on infested lakes.[9] The cost to eradicate or control such infestations is considerable. Cooperating partners in Vermont now spend $300,000 or more a year on just 5 control projects for water chestnut alone. Some other New England states spend even more.

> Property value loss alone would exceed $11 million and control costs could reach $2-4 million/year, if Maine saw only a fraction of Vermont's plant infestation rate in just our southern five counties.[9]

2. **Invasive organisms can impair commercial fishing and aquaculture.** Invasive species can bring substantial job and economic losses to commercial finfish and shellfish industries. Some biologists wonder what marine invasive species eat and how they may affect other species. Invasive species can introduce pathogens which native or farmed stock cannot tolerate. They compete more successfully for the same prey. The green crab provides a sobering example. In just a decade, this invader reduced the number of clam diggers in Maine from nearly 5,000 in the 1940s to less than 1500.[10] More recently, the infectious salmon anemia virus, a pathogen that had been found in Maine some time ago, was reintroduced into the state by way of salmon-rearing pens Downeast. This viral strain forced the aquaculture company to destroy all of the fish in Cobscook Bay marine pens. A widespread outbreak could devastate Maine's industry that produces 18% of US and 2% of the world's consumption of farmed Atlantic Salmon.[11]

3. **Invasive species can degrade recreational experiences.** Aquatic invasive plants and some species of crayfish can make shallow waters of lakes and rivers unsuitable for swimming, boating, and other water activities. Plants accomplish this by growing so thick that their tangled masses cannot be penetrated. Anglers can no longer fish and people can no longer swim in plant-clogged areas. Crayfish can also ruin recreation values by proliferating so much that they become a nuisance underfoot. For example, cabin owners on heavily crayfish-infested waters in Wisconsin and Minnesota lakes have stopped swimming because large numbers of rusty crayfish occupy their

Battling Water Chestnut in Vermont
Lesson learned: KEEP FUNDING STABLE

Vermont has learned the hard way that erratic support for control programs costs much more in the long run.

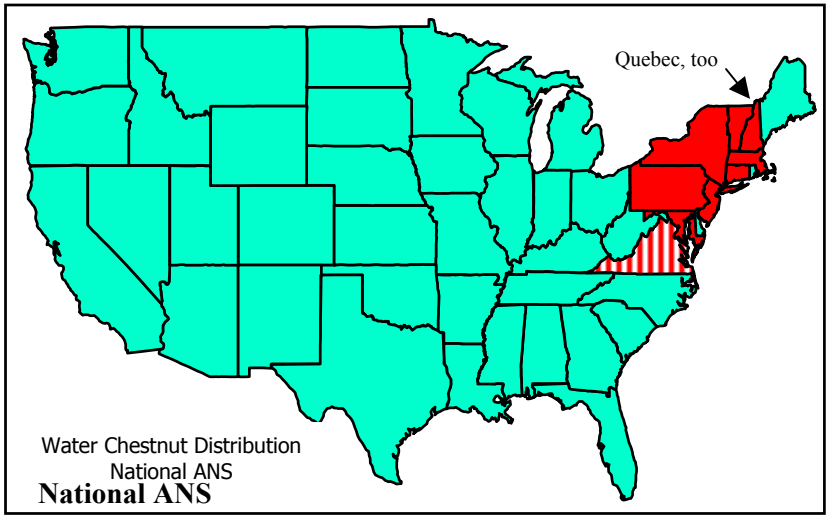
Vermont state and local governments have been battling water chestnut, *Trapa natans*, in Lake Champlain since the 1940's; and more recently in four other nearby lakes as well. Introduced into Massachusetts by a Harvard botantist, water chestnut has now spread throughout the Northeast including Quebec (see map). It reproduces through hard seeds that are spread naturally by waterfowl. Controlling this plant is particularly problematic because the seeds can remain dormant for up to 10 years. **One acre of water chestnut can spread to an area covering 10 acres in just one year.**

The state and partnering communities had the infestation in the 120-mile long lake well under control by 1969 using chemical application and hand pulling techniques, but then "walked away" for lack of funding. If they had stuck with it, they could have kept the invader at bay through surveillance and hand pulling of plants in small numbers.

But backing off allowed the infestation to spread throughout the southern half of the lake, in gigantic mats (see photo). Since 1982 when funding once again became available, the Department of Environmental Conservation has spent over $4.3 million in state and federal funds on a combination of mechanical control and hand pulling, starting from the north each season and working south until the money runs out.

The department and its partners were on the verge of successful control, though not eradication, when funding was withdrawn for a second time in 1989. This lapse allowed the infestation to reoccur substantially, requiring an even greater effort when funding was rejuvenated. Now with the lake once again at a crucial point of "remission," department staff hopes that this time the commitment will remain stable.

Water chestnut on Lake Champlain in Vermont (Photo: Vermont Department of Environmental Conservation)



favorite swimming areas throughout the day; they fear stepping on them and getting pinched by their large claws.[12]

4. **Invasive species can impair public water supplies**. Macrophytes, large visible-to-the-eye aquatic plants ("water weeds"), are an example of organisms that can threaten public water supplies. Prolific growth and subsequent decomposition of naturally dying plant

matter from Eurasian milfoil, water chestnut, and other invasive macrophytes accelerates the increase of organic matter in a lake ecosystem.

Elevated levels of organic matter in drinking water pose special problems for water utilities. First, water that is higher in organic matter is more turbid (less clear). Turbidity interferes with treatment processes. During disinfection, for instance, turbid water can provide a virtual screen where some organisms can "hide" and survive. Organic matter can also clog the filtration systems used by some utilities thus compromising the efficiency and effectiveness of those systems.

A second problem occurs for water treatment systems that use chlorine as a disinfectant. When water is high in organic matter, chlorine systems produce "disinfection by-products," some of which are carcinogenic and are strictly regulated. Keeping levels of such by-products below safe limits increases treatment costs.[13]

5. **Some invasive species threaten native fish populations and spoil sport fisheries.** Many invasive fish, crustaceans, and plants can significantly change the quality of sport fisheries in infested waters. Maine already has experienced impacts from illegally stocked fish. Smallmouth bass, for example, could eventually destroy the prized salmon and trout fishery of the Rapid River; and jeopardize the recovery of the Atlantic Salmon, a federally-designated Endangered Species, in Pleasant River Lake. Likewise, muskellunge threaten the trout fishery of the upper St. John. Introduction of these top-level predators greatly affects the entire aquatic community – from fish to invertebrates.

6. **Invasive species degrade coastal infrastructure**. Many species destroy the structural integrity of piers and other wood pilings causing considerable economic loss. The naval shipworm was introduced into the San Francisco Bay via wooden ships in the early part of the 20th century. It excavated the majority of wood pilings, causing warehouses and loaded freight cars to collapse into the Bay.[14] Some species of tunicates, also known as sea squirts, similarly encrust and destroy marine vessels, structures, and gear.

7. **Invasive species can clog or foul pipes and drainage ditches.** The zebra mussel is one example of an invasive aquatic species that wreaks havoc by colonizing water supply pipes of hydroelectric plants, public water supply plants, and other industrial facilities. In Michigan, zebra mussel densities have been recorded as high as 700,000 per square meter at one power plant and have reduced intake pipe diameters by two-thirds at two water treatment facilities.[15]

8. **Some aquatic invasive species threaten public health**. Nutria, for example, is an invasive wetland mammal that was introduced into this country from South America in the 1940s for the fur industry. Having migrated as far north as New York, nutria not only destroy emergent marsh vegetation, they also can carry a parasitic nematode that causes a severe rash.[16]

What are we already doing about invasive aquatic species?

Action to combat the spread of invasive aquatic species is already occurring within Maine, among states and provinces in the Northeast, and at the federal level. A list describing existing authorities and programs may be found in Appendix B.

Maine's initial efforts were species- and location-specific

Until recently, prevention, detection, and control efforts in Maine primarily focused on specific species or land management areas, as the examples below highlight:

- **Green Crab** - The Department of Marine Resources (DMR), in conjunction with local clam committees, has long battled the green crab with experimental control methods. Introduced to the state about the time of the Civil War, the green crab's prolific reproductive rate was ready-made for the department's unwitting efforts to seed new clamflats. As the seeding program produced greater yields, crab populations skyrocketed. The Department of Marine Resources experimented with fencing and other controls, but the only significant damper on crab populations occurred when a spate of cold winters depressed them in the late 1960s. Since then, the only success achieved in depleting a local green crab population occurred in the 1970s and 1980s when a Scarborough clam digger found a market in New Jersey for his "crab harvest." More recently, the department has alerted the public to report sightings of the Asian shore crab, a more recent arrival that may prove as destructive as the green if unchecked. (See sidebar on page 17.)

- **Illegally Introduced Game Fish** - Maine law prohibits the transport of fish between waters and importation of baitfish. In the last 15 years, illegal introductions and natural spread of non-native fish species such as smallmouth bass and yellow perch have increased dramatically. This occurred in part because fishing boats now have "live wells." People sometimes use live wells to establish their favorite fishery by illegally transporting fish they've caught in one location and releasing them in other lakes and rivers. Occasionally, the DIFW learns about an introduction early enough to eradicate an invasive fish species before it becomes established (see sidebar). In many other instances, including Umbagog Lake, such action is not possible.

  Smallmouth bass were introduced into Umbagog Lake in 1985 and have spread throughout its tributaries, including the Rapid River where they may eventually out-compete and eliminate the renowned brook trout fishery. Because this invader has become so well established and cannot be eradicated in the Umbagog Lake system, Inland Fisheries and Wildlife regulations now encourage people to take as many as possible from the lake, as well as in

DIFW Biologists prepare to apply rotenone to eradicate illegally introduced smallmouth bass from Durepo Lake near Limestone. (Photo: David Baisley)

Protecting Brook Trout
Lesson Learned: ACT FAST

A female brook trout can produce between 750 and 1,000 eggs during spawning. A female perch will produce **100 to 200 times as many**. This is why DIFW biologists know they have to act fast to successfully eradicate an invasive fish such as yellow perch or bass and safeguard remaining native brook trout populations. If lucky enough to detect an illegal introduction before spawning, the department has a chance of success. And if the introduction occurs in a part of a watershed that can be isolated, it has an even better chance.

Last year, DIFW used an organic pesticide called rotenone to kill off more than 1,000 largemouth bass that someone had put into Durepo Lake near Limestone. Luckily, the fish were introduced as fry and hadn't yet reproduced. While the pesticide application also wiped out all the native brook trout, other fish, and aquatic insects, the good news is that the aquatic community is expected to recover rapidly. And DIFW is facilitating the process by stocking a wild strain of brook trout. Trout from natural reproduction should repopulate the watershed in less than a decade.

More than thirty years ago, DIFW went to even greater lengths when yellow perch were illegally introduced into Island Pond in T15R9. Acting fast, biologists trapped the native brook trout in the fall, carried them over the height of land into Upper Pond, killed the yellow perch with rotenone, and then moved the "brookies" back in the spring. In addition, they used dynamite to make an impassible barrier to isolate this headwater pond from the lower drainage where the invasive species may have become established. Yellow perch have not repopulated Island Pond and the brook trout fishery remains high quality.

Both instances demonstrate the kind of response that is needed when invasive fish species are detected. Unfortunately, the department has been unable to respond to the multitude of introductions that have allowed bass, and other invasive fish, to spread so widely in Maine that only limited populations of native coldwater brook trout now remain.

other waters with established populations, in the hope of at least keeping their numbers down.

- **Purple loosestrife** – Purple loosestrife is a beautiful wetland garden plant introduced from Europe. It produces seeds by the millions, which escape from gardens on the wind or water, only to displace plant species and destroy the habitat of many native birds, fish, and amphibians in wetlands of the Northeast and southern Canada. On federal lands, botanists at Acadia National Park are using herbicides to keep this invasive wetland plant in check at selected release sites, while biologists at the Rachel Carson National Wildlife Refuge are using a biological control, a leaf-eating beetle with a palate for loosestrife. This method of control is called "integrated pest management." Maine Department of Food and Rural Resources (DAFRR) staff, in coordination with other entities, is helping the United States Department of Agriculture (USDA) undertake test trials and provide a nursery situation to produce beetles. Some beetle release projects result from federal EPA permit conditions requiring that wetlands be created or restored with a certain complement of native species diversity. (See sidebar on page 11.)

- **Aquaculture and fish pathogens and disease** - In response to concerns about fish diseases being transported into Maine by aquaculture, DIFW and DMR adopted joint salmonid fish health inspection rules and established a Maine Fish Health Technical Committee in 1999. This committee advises the commissioners about fish pathogens and diseases associated with aquaculture and fisheries. Biologists, pathologists, and veterinarians from state and federal agencies and educational institutions participate in this group and now hold regular consultations.

  In addition, both DIFW and DMR have regulations and procedures governing the biosecurity of aquaculture and hatchery operations to minimize the chance that invasive aquatic species are inadvertently moved from one place to another. In addition, DIFW tests all groups of hatchery-reared fishes for pathogens such as whirling disease caused by the aquatic invasive species *Myxobolus cerebralis*. DIFW hatcheries have elaborate intake screen and UV disinfection systems to prevent organisms from infecting fish and becoming established at the hatcheries.

- **Aquatic plants** – Some efforts have focused on broadening Maine's understanding of the what's here now. In 1999, the Maine Natural Areas Program (MNAP) conducted an aquatic vegetation survey of selected Maine Lakes, in conjunction with the Department of Environmental Protection and Volunteer Lake Monitoring Program (VLMP).[17] In this study, researchers collected aquatic plant community composition data from 30 relatively undisturbed lakes distributed throughout the state and searched for and documented invasive aquatic species in 50 water bodies. In 2001, MNAP developed an Invasive Plant Survey Atlas that, with contributions from volunteers, documents the geographic distribution of invasive terrestrial and aquatic plants throughout Maine that have been listed as invasive by other New England states. The goal of the atlas is to provide evidence of which plants are currently exhibiting invasive growth patterns. MNAP and its partners, DEP, VLMP, and the Nature Conservancy, continue to plan and conduct studies to increase our knowledge of aquatic plant systems in Maine.

  Other plant-related efforts have focused on eradicating existing infestations of variable milfoil as in the case of Cushman Pond where the Kezar Lake Watershed Association, residents of Cushman Pond, Volunteer Lake Monitoring Program, and town of Lovell have established an ongoing program to minimize the spread of variable milfoil. (See sidebar on page 8.)

- **Freshwater animals** - Maine also has an initiative underway to compile existing data on the composition and distribution of freshwater animal and plant species and communities through the Maine Aquatic Biodiversity Project. This database includes both invasive and non-invasive species, including unauthorized fish and crayfish introductions.

Milfoil and fish introductions have prompted a more comprehensive approach

Interest in controlling invasive species in Maine has accelerated for three major reasons.

1. Maine's first aggressive submerged aquatic plant invader, variable milfoil, has spread to more than 10 lakes;
2. Illegally introduced invasive fish and bait fish have disrupted native fish communities in many waters; and

3. We are witnessing rapid infestations of even more destructive species in neighboring states.

To anticipate rather than react to future invasions, the legislature enacted two laws in succession that broaden Maine's approach beyond simply targeting a particular species or habitat type. While the main focus of these recent laws is invasive plants in inland waters, they laid the groundwork for a more comprehensive approach to organisms in any type of aquatic habitat:

- **An Act to Prevent the Spread of Invasive Aquatic Plants (Chapter 722)** – The 119th Legislature focused on inland waters in a bill enacted in 2000 that prohibited the transportation of 11 invasive aquatic plants (see Appendix C). The law also charged the Department of Environmental Protection (DEP) with preparing educational materials and signs; and authorized staff to investigate and document the occurrence of invasive plants, and control their spread, if feasible. The law also directed DEP and DIFW to come back in 2001 with recommendations for the control of plants and animals threatening inland waters.

- **An Act to Prevent Infestation of Invasive Aquatic Plants and to Control Other Invasive Species (Chapter 434)** – Acting a year later, the 120th Legislature instituted more sweeping authorities, programs, and planning requirements relating to invasive plants and other nuisance species (see Appendix C). The law put in place some key components for an effective invasive aquatic species program for inland waters, including:
  - **A boat sticker program to** raise funds and public awareness for the prevention, detection, and control of invasive species;
  - **An inspection and education program**; and
  - **Emergency authority** to regulate surface use in plant-infested waters.

In addition, the law directed the governor to appoint an interagency task force on invasive aquatic plants and nuisance species to oversee implementation efforts and to offer recommendations to the Land and Water Resources Council for comprehensive planning and management of "all invasive aquatic plants and nuisance species in the state."

Getting People Involved On Cushman Pond
Lesson Learned: PUBLIC AWARENESS IS KEY

Cushman Pond is looking like a success story for the Kezar Lake Watershed Association and the many citizens who have banded together to contain and reduce a variable milfoil infestation there, and keep it from spreading to other parts of the watershed.

Homeowners Gerry and Meg Nelson discovered the infestation by chance in several locations along one shoreline of the pond six years ago while canoeing. The Kezar Lake Watershed Association (KLWA), Volunteer Lake Monitoring Program (VLMP), DEP, and DIFW obtained a positive identification of the invasive plant. The VLMP, along with Cushman Pond residents, designed and installed polyethylene barriers to contain it. Then, a licensed individual from DIFW, along with DEP and VLMP staff, applied an aquatic herbicide in the enclosures where the barriers had been installed.

All watched closely to see if the variable milfoil would die off. The following spring, the group found that the infestation within the small area of the barrier had disappeared but scattered plants had spread to several other areas in the pond. They decided that continued use of the herbicide would not be feasible or effective, and some had questions concerning its safety. The group decided to remove the new plants by hand. Since then, about 10 to 20 volunteers team up four to five times a year to look for new stems, using scuba gear in deep areas, snorkels in the shallows, and canoes and kayaks throughout the pond. Using a rope grid system, they usually find a few variable milfoil plants and root masses for two members of the team, who are carefully trained, to remove by hand.

Looking for plants has become a Cushman Pond community event so noteworthy that it attracts TV coverage and many visitors wanting to learn about the Cushman Pond experience. The Cushman Pond group has made it a point to involve all the camp/homeowners on the pond in the annual hunt and cook-out.

The Kezar Lake Watershed Association wrote a grant application under the name of the Association and the Town of Lovell received a $20,000 grant dedicated to the milfoil project on Cushman Pond. The taxpayers of the town of Lovell have provided an additional $50,000 to establish a prevention program for the watershed to ensure that the infestation does not spread.

It is no exaggeration to say that early detection, diligence, and the "the more the merrier" approach have truly paid off. Since chemicals can no longer be used, Gerry and Meg are quick to share their advice with others – increase public knowledge so that infestations will be spotted while hand removal is still an option for bringing these dangerous invasive plants under control.

Variable milfoil hunt on Cushman Pond in Lovell, Maine. (Photo: Gerry Nelson)

Appendix B describes what state agencies, interagency groups, organizations and other partners are doing to implement the provisions of this important new law and carry out other state and federal initiatives to prevent, detect, and control the introduction and spread of invasive aquatic plants. A January 2002 report from DEP and DIFW to the Legislature titled, *Invasive Aquatic Species Program Report* provides a detailed account of these activities.[19] See also DEP and DIFW websites: http://www.state.me.us/dep/blwq/topic/invasive.htm and http://www.state.me.us/dep/blwq/topic/invasive.htm.

This plan is the direct result of Task Force work to create a "comprehensive state invasive aquatic species and nuisance species management plan that meets the requirements of the National Invasive Species Act of 1996," as charged by the Maine Legislature.

The Federal government plays a key role, too

Section 1204 of the Aquatic Nuisance Prevention and Control Act of 1990 (amended as the National Invasive Species Act of 1996) specifically calls for states to develop comprehensive Nonindigenous Aquatic Nuisance Species Management Plans. While Maine would have prepared this plan on its own initiative, the federal role is welcome because it carries with it the possibility of funding for implementation and increases opportunities for regional coordination. The Act authorizes a 75:25 federal to state match of funds required to achieve objectives and actions outlined in plans approved by the federal Aquatic Nuisance Species Task Force (ANS Task Force, also established by the 1990 Act). In developing this plan, the task force has closely followed the *Guidance for State and Interstate Aquatic Nuisance Species Management Plans* developed by the federal task force.

Looking at both terrestrial and aquatic organisms, the National Invasive Species Council developed a *Management Plan for Meeting The Invasive Species Challenge* as directed by Executive Order 13112.[20] This plan provides national leadership and oversight on invasive species and ensures that federal agency activities are coordinated, effective, work in partnership with states. In addition to managing invasive species on federal lands, many federal land managers and researchers provide technical support and information about the biology, distribution, pathways, and impacts of invasive species to state governments. See Appendix B for a general list of federal authorities and programs.

Regional coordination is also underway

While the authorities and programs outlined in this plan are generally limited to the political boundaries of this state, Maine is also coordinating with Northeastern states and bordering Canadian provinces, through the recently-formed Northeast Regional Panel of the Federal Aquatic Nuisance Species Task Force. The mission of the panel is to provide networking opportunities for participants and to streamline activities such as research, monitoring, and public awareness efforts.

One group of botanists from organizations and agencies involved with terrestrial and freshwater invasive plant issues is specifically coordinating their efforts to document and track the occurrence and spread of invasive plants in New England. The University of Connecticut, in conjunction with the New England Invasive Plant Group, is compiling an invasive plant atlas for the region and creating an early warning system to alert states and public land managers of potential threats. Maine's Natural Areas Program is

participating in this effort and has produced an *Invasive Plant Survey Atlas.*[21]

Public comments made a difference

The public, through representatives of various interests who sit on the Task Force, has been indirectly involved in the development of this plan and has been kept apprised of Task Force meetings through press releases and public notices. Considerable public debate and discourse occurred during legislative deliberations on the two bills passed in 2000 and 2001. Many of the action items in this plan are a direct result of, and build on, the strength of the programs and policies established at that time.

The Task Force held four meetings around the state, and designated 30 days for written comments, to provide opportunities for public comment on the draft of this plan. It then made many changes in response. These are summarized in Appendix F.

The most significant changes respond to calls for more aggressive state action on this issue, particularly in regard to the sticker funding mechanism (Task 1E); inspections (3B1b); enforcement (Tasks 3C3A and 4A2c); and all things fish, e.g. policy (Task 3C3a), rapid response (4B2), and monitoring (5A3).

Maine's Approach

Prevention is the key

Consistent with Maine's traditional approach to addressing environmental problems, the goals of this plan are based on a hierarchy designed first to prevent problems, and then, if any should occur, to limit their extent and reduce their effects. Prevention carries a price tag, but it is the only possible way to avoid incurring much higher costs associated with the environmental, economic, and social disruptions that follow infestations of aquatic invasive organisms. Specifically, Maine's goals are to:

1. Prevent new introductions of invasive plant and animal aquatic species into the state to the extent possible;
2. Limit the spread of established populations to other waters of the state;
3. Reduce the harmful effects resulting from infestations of invasive aquatic species by managing those that cannot be eradicated; and
4. Educate the public and people involved in business, trade, research and government so well about invasive aquatic species that they do not facilitate the introduction or spread of species through activities over which they have control.

Assessing the biggest threats

Maine's approach to identifying priorities among the myriad of problems and concerns relating to invasive aquatic organisms is based upon an environmental assessment. Using the best information available, which in some cases is quite limited, the analysis considers the potential risks that may result if Maine takes no action at all to prevent, detect, or reduce infestations. The first part of the assessment focuses on organisms. The second part considers invasion pathways.

The **Advisory List of Invasive Aquatic Species**, located in Appendix D, is the result of this analysis. Please note that while the label "species" is used in the table for purposes of simplicity, the list also includes organisms that are not considered species, e.g. viral pathogens.

Loosestrife-eating beetle
Photo: Cornell University

Choosing Battles With Purple Loosestrife
Lesson Learned: CONTROL TAKES CONTINUAL EFFORT

Controlling purple loosestrife is central to preserving the ecological diversity and integrity of wetlands with unique values; it is also sometimes a condition applied to federal wetland mitigation permits. Land managers have learned that control of such a widely established species is a long-term proposition that must be undertaken selectively.

Acadia National Park has implemented an Integrated Pest Management Strategy for loosestrife since 1989. The strategy has several prongs without which the park's wetlands would have been overrun years ago. The park avoids water drawdown and site disturbance during the growing season to avoid exposing mudflats where seeds can germinate. It surveys all wetlands at least every three years to pinpoint new infestations. Every year, seasonal workers spray stems at "active" wetland sites with the herbicide glysophate, and count them at selected sampling sites. And the park botanist is beginning to work with landowners on sites outside the park boundary.

The loosestrife-eating beetle, Galerucella calmeriensis, is another approach to longterm control. This beetle has passed 10 years of rigorous study to ensure its introduction will not have unintended consequences. Rachel Carson National Wildlife Refuge (RCNWR), as well as DAFRR and other entities, have released beetles in several locations (see table below), and monitor their populations annually. The beetles are surviving, and significantly damaging loosestrife populations at sites that have been established for 4 or 5 years.

Year	Location	Responsible Entity	Quantity	Source
1997	Bangor	USDA/DAFRR	5000	USDA
	Salsbury Cove	DAFRR/USDA	1500	"
	Kittery	Kittery Land Trust	5000	Other
1998	Winslow	MDOT/DAFRR	5000	USDA
1999	Phippsburg	TNC/DAFRR	5000	"
	Lewiston	MDOT/DAFRR	5000	"
	Woolwich	Permit applicant	5000	Other
2000	Hamden	MDOT	3500	"
	Lewiston	MDOT	5000	"
2002	Norridgewock	Permit applicant	3000	"
	Salsbury Cove	DAFRR/USDA	5000	USDA
	Scarborough	Permit applicant	3000	"
1996 to present	Wells, Scarbor. Saco, Ogunq, York	RCNWR	10,000	"

While this plan emphasizes more "truly" aquatic invasive species found in fresh and marine waters, it also considers wetland species that straddle aquatic and terrestrial habitats. Upland species that inhabit the fringe of wetlands and shorelands but are not truly wetland species are not included but noted in footnotes on the table for future reference in the event that the state undertakes a similar planning process for terrestrial invasive species.

Species assessment

The Advisory List of Invasive Aquatic Species located in Appendix D provides a planning tool for setting priorities and direction to ensure coordinated interagency action. In and of itself, the list is not a regulation or law. It is up to the Legislature or agencies with jurisdiction over a particular species to adopt statutory or rule changes that prohibit or require a permit for the importation of these organisms.

The list is designed to provide a better understanding of the relative threat that each organism poses and identify the common pathways of spread that appear most crucial to address. The table groups the organisms by type of water (freshwater, wetland, and marine) and biological taxa (crustacea or fish), and according to broad management categories for later refinement into specific management strategies.

Controlling pathways is key to success. And the distinction between targeting particular species or the most crucial invasion pathways is critical to note: the species on the table represent only present conditions and knowledge - we don't knzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzow exactly what may arrive in the future so we must anticipate their pathways.

The Technical Subcommittee and other agency staff developed the entries in the columns based upon information gleaned from the literature or personal knowledge. For a few species, not enough information is presently available to complete all of the assessment.

This list of species is only a beginning. It is not exhaustive and will be updated annually as we learn more about additional species that pose a threat.

A description of the definitions used for each of the columns follows.

ASSESSMENT CRITERIA

Topic:	Column Heading/Explanation:
Occurrence:	**Likelihood species will be introduced** into the state **Likelihood species will spread** elsewhere in state
Vigor:	**Biological Vigor** – a combined evaluation of the ability of a species to proliferate and spread successfully
Potential Impacts:	**Biological Consequences** – a combined evaluation of the adverse impacts on other species, biodiversity, food webs, and habitat characteristics
	Social and Economic Consequences – a combined evaluation of the impacts on infrastructure, recreation values, property values, public health, and commercial enterprise
Management:	**Difficulty** – relative technical feasibility and acceptability (environmental and political) of available eradication and control mechanisms
	Cost – relative level of resource investment (e.g. money, time) needed to eradicate or control species

High means a serious impact or degree of influence
Low describes a mild impact
Moderate lies somewhere in between.

Occurrence
Species already occurring in Maine are noted with an "X" on the table. The closest state or area where a species is established is indicated for those that are likely to be introduced.

Biological Vigor
The factors that allow invasive aquatic species to proliferate and spread easily include high reproductive rate, high adaptability, and lack of predators or other controls in their new environment.

Maine Pathways
Pathways documented or believed to be most important in Maine are described on pages 1 and 2 and pages 14 through 17.

Potential Consequences
While Maine has not yet developed "fact sheets" for each species, we do have the benefit of much information prepared by other entities, along with research on species ecology. These sources have provided the information shown under this category. For a general description of these impacts, see pages 2-4. See Appendix E for a sample fact sheet.

Assessment Summary
The assessment columns summarize the information in the previous columns for each species, and introduce new information on species management considerations. Essentially, they are the criteria used to place species on the list.

Biologists on the Technical Subcommittee, along with other invited state and federal reviewers, used their professional judgment to assess the potential negative factors associated with each of the species. They applied a high, moderate, or low rating to each criterion as described in the box on this page.

Management Categories
Following the assessment, the subcommittee then assigned each species to one of the management categories in the box below:

Prevention and Eradication
Prevent introduction of new organisms and limit the spread of those with limited and controllable populations

1. **What is the likelihood of an organism being introduced into Maine?** Since prevention is much easier, far less costly, and more likely to work than controlling an aggressive invasive after it is established, it is important to know whether an invasive species or strain or pathogen is already here. If an organism is not present but is likely to appear in an environment from sources that can be anticipated and controlled, Maine will endeavor to minimize opportunities favorable to its introduction.

2. **What is the likelihood of on organism spreading within Maine?** For the same reason, Maine will seek to detect and eradicate new infestations early that have not yet widely spread.

   A variety of management tools will be used to prevent introduction and spread. Some organisms will be outright prohibited as are the invasive macrophytes already named in statute and others prohibited through agency rules. For many in this category, vigilant action will be taken to detect and eradicate infestations. Other species can be more effectively managed through education or changes in federal oversight, depending upon the species or strain.

Selective Control and/or Impact Management
Selectively control and/or anticipate the impacts of organisms that are, or will be, widely established.

1. **Do environmental or socio-economic values warrant controlling an invasive aquatic organism that is already established?** It would be exceedingly difficult and, in some cases, undesirable to eradicate the entire populations of species already well established within the state. And, in the case of marine organisms introduced by Gulf of Maine ocean dynamics or fish introduced to large inland waterbodies, prevention or eradication would be impossible. Accordingly, Maine will manage and or monitor and study these species on a case-by-case basis.

   On public lands, certain species may be controlled selectively to maintain natural and indigenous diversity. DIFW will continue to stock desirable fish species where appropriate, enforce laws against illegal introduction to avoid spreading invasive fish into vulnerable environments, and eradicate undesirable species

when practical. An ongoing assessment of the state's aquatic biodiversity will help identify sensitive areas and protect areas with high natural biodiversity and integrity.

In addition, DEP and DIFW commissioners will carefully consider environmental trade-offs that affect the spread of invasive aquatic species when considering permit applications. For instance, removing additional Kennebec River dams without providing expensive tributary barriers may allow carp to spread to and out-compete important fisheries. In the case of any potential dam removals or similar actions, the state will consider whether the potential spread of invasive aquatic species and increased management costs outweigh the advantages of the action. It may also incorporate the costs of addressing invasive species in these projects.

> We need to know how invasive species affect our natural ecosystems and better understand the potential impacts of control programs.

For species on the list over whose introduction and spread the state has little control, Maine will conduct or compile research about ecology and potential impacts and seek ways to minimize their harmful effects.

No Action At This Time

Learn more before acting.

1. **Do we know enough to determine whether an organism will be a problem?** The biology and potential effects of some invasive species or pathogen strains are still under investigation. If we suspect the outcome of such research will reveal that a species will be invasive in Maine, it will be included in this category.

2. **Which species are now far away and spreading slowly?** Some species are quite distant now and appear to be spreading slowly. Maine will keep an eye on these to make sure that conditions do not change.

3. **Which species could become established if climatic conditions change?** Maine's cold climate and ocean temperatures now limit warmwater species. But warming temperatures and fluctuating weather patterns may in time be more favorable to their introduction. At the same time, changing conditions may become less favorable for coldwater species, thus contributing to an overall shift toward warmwater assemblages. Taking the long view, Maine will monitor climatic conditions to provide early warning of potential infestations.

Dispute Resolution

1. **Is there disagreement or uncertainty among agencies or from the public on whether certain organisms are a threat to Maine**? This category ensures that species that have been left off the list for lack of agreement can be easily ascertained and the dispute resolved. No organisms have been placed in this category at this time.

Transport pathways assessment

The Advisory List identifies the various human activities that provide pathways (sometimes called "vectors") for the introduction or spread of aquatic invasive species. The marine section is the only place this table shows natural mechanisms as a pathway but readers should bear in mind that organisms in other habitats can spread naturally, too.

> Water currents, wind, waterfowl, and other natural mechanisms can also spread an invasive aquatic species throughout a water body and its interconnected systems.

> In 2001, over 3% of the boats & trailers inspected at 7 cross-border stations carried plant fragments. If these plants had been invasive, they could have resulted in at least 1200 new infestations. This does not count gear and live wells that wardens found carrying almost as many fragments.

We have much to learn about invasive aquatic species pathways. But based on what we do know, Maine will place high priority on addressing those described below. This assessment will be updated as new information becomes available.

Equipment transport

Plants, animals, mud or water can be transported between water bodies by

watercraft, planes, trailers, bait buckets, and other water-contact equipment. The popularity of water activities on Maine waters, both recreational and commercial, makes equipment transport the most likely pathway based upon shear numbers of users.

Invasive organisms can become attached to, entangled on, or immersed within the following:

- **Watercraft of all kinds, float planes, trailers, and ATVs**;
- **Fishing and waterfowl hunting gear** such as dipnets, tackle, traps, hip waders, float tubes, anchors, and decoys and lines;
- **Water contact sport gear** for such activities as scuba diving, water skiing, kayaking, wind surfing; and
- **Construction equipment** used within the water on dams, causeways, water and power lines, and other projects.

Fragmentation and spread

People can easily fragment and spread established invasive plants and other organisms attached to them.

- **Vehicular surface use within infested areas** already has spread variable milfoil and will continue to be a priority for attention to prevent infestations of other species and other lakes from occurring. The variable milfoil infestation on Messalonskee Stream confirms this reality.
- **Mechanical control** can be a problem, too. Well-intentioned shorefront owners can spread an infestation by trying to pull out and remove invasive plants without proper training and equipment. Mechanical controls, even when conducted according to protocol, can be problematic under the best of circumstances because of the difficulty of capturing all loose fragments.

Release into the wild

Releasing organisms accidentally or purposefully into the wild from live wells, bait buckets, aquariums, water gardens, research and education projects, and illegal stocking is a significant pathway for invasive species.

- **Discarded live bait** has proven to be a primary pathway in Maine's freshwaters. Rusty crayfish and rudd are two examples of invasive species used for bait that were discarded thoughtlessly or fell off the hook. Discarding cleaned fish skins and entrails also has the potential to spread invasive organisms.
- **Invasive organisms purchased for water and wetland gardens** provide pathways, too. With the current popularity of gardening, people are introducing many more non-native species into their water gardens and wetland edges. Some of these have the potential to be invasive and spread by natural means. Purple loosestrife became established in this country as a garden plant imported from Europe. Aquatic plants can also be mislabeled and confused with native or innocuous non-native species and inadvertently released. For instance, a professional botanist may have spotted water chestnut at a recent Maine garden show.
- **Invasive organisms purchased for aquariums and as pets** are a threat if they can successfully over-winter. An invasive species of snail was presumably introduced into the Belgrade Lakes by someone discarding the contents of a used aquarium into a lake or stream in the chain. And Colby and Bates students dumped goldfish and other aquaria contents into college ponds. In addition and as with landscape materials, organisms can be mislabeled and confused with native or innocuous species. Recently, a state biologist inadvertently purchased an invasive freshwater plant that is prohibited for sale when it was inadvertently mixed in with a species that had been legally stocked for sale.[22]
- **Invasive species used in education and research** pose a similar threat. Marine and freshwater organisms can be ordered from supply companies around the world through catalogues or internet web sites. Once organisms are delivered, they can be handled improperly and released. Both lab and field routines present the opportunity for accidental or purposeful release through wastewater discharge of unwanted organisms and poorly contained study apparatus. Mudpuppies, subjects of research by a Colby College biology professor, escaped into the Belgrade Lakes around 1940. The professor imported and purchased the mudpuppies from a Pennsylvania biological supply house.[23]

- **Fish illegally introduced** into Maine waters include such species as northern pike, muskellunge, walleye, yellow perch, and black crappie. Other managed non-native species that have been illegally introduced into non-target waters include smallmouth and largemouth bass. White perch, rainbow smelt, chain pickerel, and yellow perch are among the species native to some Maine waters that have been illegally introduced into other waters where they did not belong and had the opportunity to become invasive. Live wells in boats have made illegal transport and stocking very easy.

- **Dredge Spoils** are sometimes dumped in the ocean and could contain invasive organisms. The extent of this potential problem is not known. While DEP and DMR have some authority over dredging, the extent of their authority and focus on preventing the spread of invasive aquatic species is unclear.

Marine Products Import and Export

Processing and sale of live fin and shellfish are important components of Maine's economy. Unfortunately, they can also result in the unintentional release of invasive organisms, such as pathogens, crabs, and epiphytes. Specific pathways include:

- **Seafood waste** from imported shucked shells and other unwanted materials can be a problem if discarded into marine waters. Such dumping is prohibited and controlled by Chapter 24, Title 12 Section 6251.

- **Seafood packing materials** composed of algal or plant materials can also be a problem if discarded into Maine waters or shipped out of state. Stowaway organisms hidden in such materials are hard to detect even when one pays close attention.

- **Bivalve wet storage** where shellfish are held in flow-through systems connected to surrounding surface waters can introduce stowaway invasive organisms, too. This most commonly occurs in association with lobster off-loading docks and depuration plants, the numbers of which have declined in recent years. This activity is regulated by Chapter 24, Title 12, Section 6071.

Aquaculture practices

Aquaculture of fin and shellfish is an important sector of Maine's economy. While intensive culture reduces the adverse effects of over-harvesting wild stocks, it may also result in the release and spread of invasive organisms, especially pathogens and shell-borers. Some of the most likely pathways in Maine from this source are described below:

- **Shellfish seed** are commonly grown in hatcheries in Maine but occasionally imported for use in shellfish culture operations. Subject to permit, through Chapter 24, Title 12, Section 6070. Shellfish culture is conducted primarily in the Damariscotta River area.

- **Shellfish cultch**, i.e. discarded shells, is used to create clean, hard surfaces on which juveniles settle and attach in grow-out areas. If such materials have not been properly disinfected and selected, they can transport invasive aquatic species.

- **Finfish holding systems** such as raceways, flow-through tanks, and net pens expose surrounding aquatic systems to pathogens associated with cultural fish populations. Infectious salmon anemia virus, for example, can spread when marine net pens are in close proximity to one another. Salmon fry/young are raised in freshwater in Maine, then moved to holding pens, primarily Downeast. Canadian waters support salmon culture as well.

- **Cultivation areas for new commercial species** also may facilitate introduction. Without containment and sufficient information about species ecology, new mariculture initiatives could allow free interchange of potentially invasive aquatice species with natural systems, thus allowing their release into the wild. For example, nori, an invasive marine red algae, was cultivated under permit during the 1990s in Eastern Maine where the water was determined to be too cold for its reproduction.

Marine vessels

Commercial shipping and fishing vessels, cruise ships, dry docks, oil platforms, and recreational boating are some of the most important sources of unintentional aquatic invasive species introductions into coastal and estuarine waters of the United States and worldwide.[24] The steady rise of global commerce, increased shipping and cruising activities, and shorter transport times all facilitate invasive aquatic species dispersal.

Commercial vessels fill and release ballast tanks with seawater from harbors (and sometimes freshwaters) as a means of stabilizing loads. Research indicates that live organisms ranging from plankton to adult fish are regularly transported and released via this pathway.[25] Except for foreign fishing vessels that do the opposite, ships coming to Maine generally unload cargo and take on rather than release ballast water here. For those that do release ballast water, the introduction of invasive species is a concern.

- **Hull fouling may rival ballast** water discharge as the leading historical cause of harmful invasive aquatic species introductions.[26] Organisms with sedentary life history stages such as shipworms attach to the hulls of vessels or become entangled in submerged ship components. These organisms survive for extended periods on vessels of any size and be introduced through dislodging, disentanglement, or by spawning in the ports to which they are transported. Cruise ships, recreational East Coast boaters, commercial vessels, and industrial structures are primary sources of marine invasive organisms in Maine.

Diggers compete with the green crab for softshell clams. (Photo credit: Garrett Coffin, DMR archives)

Poisoning Green Crabs
Lesson Learned: AVOID UNINTENDED CONSEQUENCES

DEP biologists puzzled over the source of DDT and other pesticides found in mudflats during the 1990s. Then they learned that, in an attempt to eradicate the green crab, the state and individuals had applied those same pesticides to the flats about 50 years earlier.

Those persistent pesticides seemed like a good idea at the time, but thanks to Rachel Carson, we now know that they had devastating effects on wildlife. Fortunately, much has since been done to improve the way chemicals are used to tackle environmental problems. But the lesson learned from our attempt to control the green crab is still important – the environment is an interconnected system in which one action may have unintended consequences for other parts of the system, including our reaction to a new species. We must be careful that our "cure" does not cause new or even more serious problems.

As Maine searches for approaches to eradicating and controlling invasive aquatic species, we must think and act thoughtfully and responsibly. This may even mean acting "too slowly" in the face of public pressure to take dramatic yet potentially risky steps. This was certainly the case recently when some individuals wanted the state to require an application of pesticides to a dry dock towed from China and to scrub the hull. Poisoning might have unnecessarily harmed native species and scrubbing would have released fragments to deeper, warmer and saltier places in the estuary where stowaway invasive species could survive – leaving it in freezing freshwater turned out to be the most effective approach although perhaps less dramatic.

And when dealing with species whose establishment is not prevented, we have to accept that evolution will take its course as the environment seeks equilibrium in accommodating invaders. While the shellfish industry is not what it once was, the green crab and soft shell clam seem to have reached a stable relationship - only time will tell what the mudflat ecosystem will be like over the long term.

Action Plan

This plan guides and coordinates the policies and programs of state agencies and action partners involved in managing invasive aquatic species. It also sets priorities for obtaining funds to support planned activities. "Action partners" is a term that describes the institutions and organizations committed to assisting the state in the endeavors specified in this plan.

Four key goals underpin Maine's Action Plan:

1. Educate the public and people involved in business, trade, research and government so well about invasive aquatic species that they do not facilitate the introduction or spread of species through activities over which they have control;
2. Prevent new introductions of invasive aquatic plant and animal species into the state to the extent possible;
3. Limit the spread of established populations to other waters of the state; and
4. Reduce the harmful effects resulting from infestations of invasive aquatic species by managing those that cannot be eradicated.

Five objectives organize the work to be done:

1. Provide effective leadership, coordination and program monitoring,
2. Raise awareness and educate the public well,
3. Strengthen programs to avoid introduction and transport,
4. Be prepared to respond rapidly and control spreading, and
5. Effectively inventory, research, and manage information.

Leading strategies stand out:

1. Freshwater Plants and Organisms That Travel With Them:
   - First line of defense: The fledgling watercraft inspection program for milfoil and other macrophytes will be strengthened so that it is as effective as a voluntary program can be. It will be expanded to include tidal rivers and also inform the public about zebra mussels and other organisms that are transported with these plants;
   - Second line of defense: A monitoring and rapid response system will be established to eradicate new infestations. Maine will move to a mandatory inspection program or other stringent controls should infestations occur beyond acceptable thresholds.

2. Non-native freshwater fish:
   - First line of defense: Stocking of any fish into any water of the state requires a permit from DIFW. DIFW will continue to regulate transfers in this manner. A high priority will be placed on developing a regular, ongoing public information and education effort to increase public awareness of the impacts of illegal fish introductions and the need for public support and assistance with the enforcement of laws designed to discourage unauthorized fish introductions. A very high priority will be placed on the enforcement of laws designed to prevent the illegal introduction of fish species.
   - Second line of defense: DIFW will establish and maintain a contingency program including staff, training, equipment, and financial resources necessary to provide a speedy and credible response to illegal introductions. DIFW will remove the fish if feasible to do so. DIFW will afford no specific regulatory protection to any fish species introduced illegally. Where a practical benefit can be reasonably expected, DIFW will adopt regulations designed to maximize the take of the illegally introduced species to the benefit of indigenous species.

     DIFW's ability to achieve these goals may be hampered by limited staff and financial resources.

3. Marine Species:
   Since Maine has no defense against species that are introduced into marine waters on the East Coast, the State will seek to understand the ecology and impacts of species that have the greatest potential to disrupt Maine's commercial fisheries and marine infrastructure.

4. All Species:
   Maine will identify invasive aquatic organisms coming into the state, list and prohibit the most harmful as appropriate, and inform retailers, wholesalers, and the public about how to avoid introduction and spread, in collaboration with the Northeast Panel and other states and provinces.

GUIDE TO SYMBOLS:

♦ **High priority**

♣ **Funding needed before task can be undertaken**
Note: Existing sources may cover none or only a portion of these tasks, including some high priority ones.

Objective 1: Leadership, Coordination, & Program Monitoring

Overview: In moving toward a comprehensive approach to managing invasive species as directed by LD 1812 (Title 38, Chapter 722), Maine has laid the framework for providing strong leadership and coordination on this issue. The Interagency Task Force on Invasive Aquatic Plants and Nuisance Species, supported by "dedicated" staff within DEP and DIFW, will provide ongoing advice to Maine's Land and Water Resources Council, the group of state agency commissioners mandated to advise the Governor, the Legislature, and state agencies on natural resources policy. Details need to be refined, however, in regard to some of the most important aspects of the Task Force's work. These include the need to:

A. Close the management gap to include tidal and marine waters,
B. Ensure ongoing and timely communications and agreements among agencies and action partners,
C. Establish a process for periodic update of this action plan,
D. Ensure a strong voice on the Northeast AIS Panel and other regional working groups and in Washington, DC; and
E. Review the sticker funding mechanism for the program to ensure that it is fair, effective, and adequate to meet high priority needs.

Strategy 1A: Close the management gap to include tidal and marine waters

Issue: Under current law, Maine's tidal rivers are not included in the freshwater plant inspection and education program. This is because they are under the jurisdiction of DMR rather than DIFW. Invasive aquatic plants and other organisms could be introduced in these rivers through recreational watercraft and gear. State and nationally significant resources such as Merry Meeting Bay on the Kennebec River could be affected.

In addition, invasive aquatic species also pose a threat in marine waters, especially to commercial fisheries and marine infrastructure.

Because the threat to lakes was the primary impetus for establishment of the Task Force, marine interests were not included in the legislation. Nevertheless, the Department of Marine Resources (DMR) has participated in the development of this plan. While there is an important role for DMR to play in managing invasive aquatic species, the department lacks the authority and resources to effectively participate.

Task 1A1: **Marine Representation ♦**
The Land and Water Resources Council will ask the Governor to submit legislation in 2003 seeking the inclusion of marine representation on the Task Force. In addition to the DMR Commissioner, the following types of interests should be considered: U.S. Coast Guard and Navy, port authorities, coastal boaters and marinas, commercial fishing, shipping, and boat building.

Task 1A2: **Tidal Rivers and Marine Waters ♦**
The Task Force, during the first annual review of the program in 2003, and in conjunction with DMR, DEP, and DIFW, will clarify details about how tidal rivers will be integrated into the inspection and education program, and how the sticker program can be expanded to cover DMR's invasive aquatic species management efforts. Depending upon the outcome of this review, the Land and Water Resources Council may ask the Governor to seek changes to LD 1812 (Title 38, Chapter 722) that will ensure that tidal rivers are managed to prevent the spread of invasive aquatic species, and extend the sticker program to include boats used on coastal waters. These changes will allow DMR to participate with IF&W and DEP on coastal waters; fulfill other invasive aquatic species management responsibilities under this plan; and raise public awareness about the vulnerability of tidal waters to freshwater plant and animal infestations.

Strategy 1B: Ensure timely and ongoing communications

Issue: The Invasive Aquatic Species Program Coordinator at DEP is responsible for ensuring ongoing coordination and communication among agencies and action partners. No understanding currently exists as to how

this will be accomplished. **But the Task Force and agencies do agree on the premise that Maine should proceed using its existing jurisdictional and regulatory structure**.

Task 1B: **Technical Subcommittee & Interagency Coordination** ♦
Participating agencies and action partners will report progress on implementing the plan to the Task Force on an annual basis. The Invasive Aquatic Species Program Coordinator will work with the Technical Subcommittee and other agencies and partners to review functional roles, gaps in authority, and develop an integrated annual work plan and budget for consideration by the Task Force and the Land and Water Resources Council. Three DEP positions will continue to provide staff support to the Task Force and fulfill DEP's role in the inspection and education program. The Technical Subcommittee will continue to include representation from DEP, DIFW, DAFRR, DOC, and DMR.

Strategy 1C: Establish action plan update process

Issue: Legislation establishing the Task Force did not specify a process for updating the action plan; and how the public was to be involved in its formulation.

Task 1C: **Plan Update Process**
The Task Force will review, update, and submit the action plan for Land and Water Resources Council approval on a revolving, four-year basis. This means the Task Force will plan ahead for two biennial budget periods, a total of four years, during each biennial review. Public representation on the Task Force, public notice of meetings, and legislative consideration of relevant budgets and programs will ensure public involvement in the process.

Strategy 1D: Ensure a strong regional and national voice

Issue: Some activities, especially those related to commerce, are best accomplished regionally or nationally. DEP and DMR represent Maine on the Northeast Regional Panel. DOC Natural Heritage Program and Department of Agriculture and Rural Resources (DAFRR) staff participates in the New England Invasive Plant Group. A member of the task force sits on the National Invasive Species Advisory Committee to the National Invasive Species Council that covers both aquatic and terrestrial species. DMR and the State Planning Office (SPO) participate in the Gulf of Maine Council. The Council named invasive aquatic species a high priority in its recent plan. Maine is thus well represented and needs to use these opportunities well.

Task 1D1: **Regional Coordination** ♦
Maine will continue to provide active representation in these organizations and advocate for regional initiatives or cost-sharing agreements on projects that are best undertaken at this level.

Task 1D2: **National Coordination**
Maine's Task Force, through the Invasive Aquatic Species Program Coordinator, will provide periodic communications on Maine's progress and emerging issues/needs to the congressional delegation and the National AIS Task Force. The Maine Task Force representative will do likewise on the advisory committee to the National Invasive Species Council.

Strategy 1E: Review funding mechanism

Issue: Many concerns were raised during public comment on this plan about the fairness, effectiveness, and adequacy of the sticker program. A need also exists to determine how it can best support DMR's participation in the program, especially, among other implementation tasks, the details of how DMR can be integrated into the prevention, detection, and response issues related to tidal rivers.

Task 1Ea: **Sticker Program** ♦
DEP and DIFW, and in conjunction with DMR in regards to expansion to estuarine and marine waters, will evaluate the revenue stream generated by the sticker program, and make recommendations to the Task Force during the 2003 program review better to ensure that it is fair, effective, and adequate to meet high priority program needs.

Task 1Eb: **Administrative Training**
DEP and DIFW will provide information and training for local officials and other sticker "vendors" through such means as the Maine Municipal Association's annual meeting and publications.

Objective 2: Education and Outreach

Strategy 2A: Speak with one voice

Issue: Current education initiatives relating to invasive aquatic plant species lack a unified coordinator, budget, and approach to audience messages. This means that efforts may sometimes be duplicated, work at

cross-purposes, or not happen at all. Because Maine's efforts will encompass more than just plants, it will be even more important that the agencies work together to ensure consistent treatment of overarching messages, logos, and the like.

Task 2A: **Education Coordination**
Agencies will assume responsibility for spearheading education efforts related to the species under their authority, with DEP taking the lead on plants, DIFW on inland fisheries and wildlife, and DMR on marine species. They will establish an education subcommittee of personnel involved in the effort from DIFW, DOC, DAFRR, DMR, and other agencies and non-profit organizations as appropriate, and report annually to the Task Force on their efforts and, in particular, on issues relating to overarching matters such as general messages and unified logos.

Strategy 2B: Raise public consciousness in general about invasive aquatic species

Issue: Freshwater plants get all the press. Maine citizens now perceive that "milfoil" is the invasive aquatic species problem. Most are yet unaware that the issue is broader, threatening other plants and freshwater animals and affecting the marine environment as well. Many state and federal agencies around the country, including Maine's Natural Areas Program in conjunction with the university extension program, have developed fact sheets that can serve as models and sources of information.

Task 2B1: **General Campaign**
The Education Coordinator and Subcommittee will conduct a general campaign to acquaint the public with the following messages, through such tools as press releases, public service announcements and presentations, Task Force website (on the DEP web site), links with community and non-profit organization websites, and posters and brochures in town offices, marinas, retail stores, and other heavily trafficked places:

- Pride in our state will be the thematic motivator and prevention will be the key theme, at least for most freshwater/ and wetland invasive aquatic species. Anticipation and understanding of harmful impacts are more realistic goals for marine species.
- Many freshwater plants, not just milfoil, are a big threat.
- Freshwater animals and marine species pose a threat, too.
- The scale and nature of impacts could be substantial. Doing nothing could be costly.
- Individuals can make a difference.
- Program results, i.e. where has the money been spent and did it make a difference?

Task 2B2: **Uniform Education Materials**
The education subcommittee will develop a uniform format, logo, and approach to the development of fact sheets, wallet ID cards, and other such educational materials; and coordinate their development (see sample fact sheet in Appendix E). Individual agencies will develop and distribute the materials.

Task 2B3: **Public Perceptions♣**
DEP and the education subcommittee will continue to purchase "questions" on an existing, annual statewide survey to determine public knowledge and perceptions about this issue. The survey will be repeated periodically to measure program progress in raising public awareness and initiative.

Strategy 2C: Target and inform audiences that can make a big difference in preventing or spreading key species

Issue: Maine does not have significant resources to throw at this issue. Accordingly, it is critical that every effort be focused to provide maximum results for minimal expenditures. DEP and DIFW have already developed and are implementing an extensive Invasive Aquatic Plant Education Program (see DEP website). Public polling on the milfoil issue shows public consciousness has raised considerably in the last year. Both agencies are also endeavoring to get the word out about the boat sticker program. DIFW also has an education program for illegal fish, but no similar initiative exists for zebra mussels, or organisms released into the wild.

Task 2C1: **Watercraft Transport♦♣**
DEP and DIFW, and DMR to the extent that funding is available, will designate a coordinator and continue to develop and implement a unified education plan and budget for this pathway. See also Tasks: 3B1b/c, 4A1, 4A2d, 4C1a/c, 4C2c, and 5C1b.

Task 2C2: **Release into the Wild♦♣**
DAFRR and DIFW, to the extent that funding is available, will develop and implement education plans for this pathway. See also Tasks: 3C1b/c, 3C2, 3C3a, 4A1, and 5C1b.

Objective 3:
Introduction and Transport

Overview: Maine has begun measures focused on preventing the introduction and spread of freshwater invasive aquatic plants. These efforts will be refined and broadened as a result of this plan. At the same time, Maine will undertake some preliminary steps better to understand and coordinate programs and policies related to invasive wetland and marine species and pathways.

A. Species Lists and Pathway Priorities

Strategy 3A1: Clarify authority for regulating invasive aquatic species

Four Maine laws regulate the introduction and transport of organisms. IF&W seems to have the clearest authority to list and regulate fish and wildlife species through rule making, though invasive aquatic species are not specifically mentioned. DMR's authority over marine organisms is similarly unspecific. In addition, no agency has direct authority to list and regulate additional freshwater plants without a statutory change, unless DAFRR's authority over plant "pests" can be exercised in this manner.

To be specific, Title 38, Sections 410-N and 419-C, Chapter 722, prohibits the transport of all 11 of the freshwater invasive aquatic plants listed on the Action Plan Advisory List of Invasive Aquatic Species. Legislative action is required for any changes to this plant list, a process that can be complex and untimely. DAFRR's authority to regulate "plant pests" under Title 7, Section 2211 and 2213, Chapter 405A, does not distinguish between pests and invasive aquatic species.

Many sections within Title 12 give the Commissioner of DIFW discretion to require permits for the importation, transport, and release species into the wild, but no provision explicitly states how invasive aquatic species are to be listed and managed. The Department maintains a list of "Unrestricted Fish and Wildlife Species" that do not require such a permit. None of the invasive aquatic species on The Action Plan Advisory List of Invasive Aquatic Species are currently on this unrestricted list. No list is currently promulgated to explicitly prohibit certain species.

DMR has authority under Title 12, Sections 6071 and 652, Chapter 24, to prohibit people from "landing on, bringing into, or depositing" non-indigenous marine organisms into marine waters including tidal estuaries such as the Penobscot and Kennebec Rivers. No provision explicitly names invasive aquatic species and states how invasive aquatic species are to be managed. DMR does prohibit shellfish pathogens by rule explicitly. The state's authority over ocean dumping is also not entirely clear relative to invasive aquatic species.

Task 3A1: **Authority Clarification ♦**
The Task Force, assisted by its technical subcommittee, will evaluate and make recommendations to the Land and Water Resources Council and Governor to clarify and make explicit agency authority regarding the listing and regulation, including prohibition, of invasive aquatic species; and seek agency rule-making authority rather than legislative action to list and regulate freshwater and wetland plants.

Strategy 3A2: Maintain an official species list(s) using a defined process and standards

Issue: The Advisory List contained in this plan is intended for planning purposes. Greater specificity will be developed over time about how each species or taxa are to be managed, (e.g., explicitly listed and prohibited by an agency or simply included in public awareness campaigns). Clear guidelines are needed to maintain the list over time to answer such questions as:

- What is the process for adding and deleting species from the list over time, and how can citizens nominate candidates?
- What criteria are to be used for making listing decisions?
- What status does the list have, if any, in regulatory proceedings such as FERC relicensing?
- What are the trade-offs between a legislatively generated list and one maintained by Commissioner discretion and rule-making?
- Is authority for listing for regulatory (or any other management purpose) best left with the individual agencies with jurisdiction and management responsibility or consolidated within a centralized, interagency process?
- To what extent should criteria and protocols be unified and coordinated, if agencies list species independently?

Task 3A2a: **Official Listing Process ♦**
Decentralized screening/centralized listing

The Task Force, assisted by its Technical Subcommittee, will develop a unified screening and risk assessment protocol for identifying which species should be listed officially as invasive. It will specify the protocols and standards for the risk assessment and nomination process; and indicate when species are to be listed by rulemaking or agency adoption. The public will be given the opportunity to nominate candidates for potential listing through the Task Force.

Agencies, coordinated by the Technical Subcommittee, will screen and evaluate candidates for listing on an annual basis following Task Force protocols: DIFW (freshwater fish and wildlife), DMR (marine organisms), and DAFRR, MNAP of DOC, and DEP (freshwater and wetland plants). Agencies will report recommendations to the Task Force which will then develop and recommend a comprehensive list of species to be added or deleted from the Advisory List to the Land and Water Resources Council. The Council will determine the "official" list. Citizens and organizations can propose candidates to the Task Force for referral to state agencies for evaluation.

Task 3A2b: **Priority Pathways**
The technical subcommittee will develop a protocol and conduct an annual review of priority pathways. It will recommend related tasks to the Task Force as part of the development of the annual coordinated interagency work plan.

B. Watercraft and Equipment Transport

Strategy 3B1: Strengthen the watercraft inspection program for freshwaters focusing on high priority locations, times, and vehicles

Issue: Maine instituted a "pilot" boat/trailer/gear inspection program in 2001 focused on freshwater plants. Voluntary inspections during the first two seasons were made at selected times and locations including entry points and boating access facilities; and, in 2002, boaters from Vermont, New York, upper Midwest, and Quebec were also given information about control of zebra mussels and other invertebrates. The pilot program must now be refined and expanded. And the law regarding whether inspections can be mandatory needs to be clarified, especially in regard to the removal of watercraft and equipment from infested waters.

Voluntary inspections are fraught with risk. According to the public, something more failsafe is needed -- Maine is only going to get one shot at doing "it" right, so we must be aggressive in finding ways to reduce the risk as much as possible and slow down what may be inevitable. We don't know yet which methods reduce risks best. The Task Force believes that field testing as many "good ideas" as possible will help us evaluate and learn from the results.

Task 3B1a: **Most Vulnerable Waters List ♦**
DEP, DIFW, and DMR will develop a list of most vulnerable waters before the 2003 inspection season. In addition to the criteria specified in the law, priority will also be given to such considerations as proximity to infested waters and exceptional tidal rivers, bays, and lakes (such as those with pristine conditions as defined by native aquatic assemblages, lack of previous stocking, and/or extent of watershed disturbance).

Task 3B1b: **Boat Launching Facility Inspections ♦♣**
Before the 2003 field season, DEP and DIFW will evaluate the methods, results, and cost-effectiveness of the last two seasons; obtain legal clarification on related issues specified in Task 3B1d; compare and contrast the relative contribution of education and inspection programs to compliance; and recommend creative ways to the Task Force to increase compliance and reduce risks.

Task 3B1c: **Roadside Inspections ♦**
An outside contractor, temporary staff, or agency personnel may continue roadside inspections in subsequent seasons if the review under Task 3B1b determines such inspections to be cost effective.

Task 3B1d: **Legal Clarification ♦**
DEP and DIFW will request an opinion from the Attorney Generals Office to clarify the following issues:

- Under what circumstances, if any, can the state require mandatory stops of a subset of traffic, i.e. only vehicles transporting watercraft and equipment?
- Under what circumstances, if any, can the state require mandatory inspections at entry points or boat launches?
- Does the state have the authority to close private, federally funded, or municipal boat launches?
- Under what circumstances, if any, can municipalities close private boat access facilities or require inspections?

- Does DOC have the authority for deployment and enforcement of buoys for the purposes of limiting surface use in infested areas?
- Can authority for deployment and enforcement of buoys for the purpose of limiting surface uses be delegated to DEP and/or DIFW?

Strategy 3B2: Consider stronger options on plant-infested waters if voluntary inspections do not succeed

Issue: If voluntary inspections do not prevent the spread of invasive plants from infested lakes then it may be necessary to determine if limiting access to infested waters would be a viable option. The Task Force and other policy makers will have to weigh whether limiting access is worth preventing the spread to other water bodies.

A related issue centers on state boating facility construction and permitting programs. DIFW and DOC both have an obligation to ensure public access to state waters and constructing boat launching facilities are part of this obligation. In addition, DEP (organized portion of state) and the Land Use Regulation Commission (unorganized territory) have jurisdiction over the development of new boating access sites. Neither permitting agency has explicit authority to consider the potential impacts on the spread of invasive aquatic species, but agency staff or board/commission can use their discretion in deciding upon permitting outcomes. Limited LURC staff resources make enforcement of new standards impossible at this time.

Task 3B2a: **Infestation Control Plans♦♣**
DEP and DIFW will develop guidelines for local development and state review of management plans and encourage municipalities and lake associations to undertake them for priority infested waters (see Early Detection, Rapid Response and Management, Strategy 4C1a/b).

Task 3B2b: **Establish Critical Threshold♦**
DEP and DIFW will monitor infestations and, depending upon the water body, legal authority, and costs and benefits will institute one or more of the following strategies on a case-by-case basis:

- Make physical changes in the design of facilities, e.g. location of channel;
- Require inspection programs during high-traffic events such as open angling tournaments and regattas, or prohibit them altogether;
- Limit boat removal to specific locations/times;
- Require mandatory inspection of all boat removals, and/or
- Manage public and private access facilities, taking into account the state's obligation to balance the provision of public access with private opportunities and other resource and recreational values.

By 2004, the Task Force will establish critical thresholds for the maximum extent of plant infestations that will be tolerated statewide, e.g. percent or number of Great Ponds and streams infested, without triggering stronger statewide action.

Task 3B2c: **Boating Access Sites on Plant-Infested Waters ♦**
DEP and LURC will develop and apply unified changes in their rules that:

- Require permits or establish permit by rule notification standards related to invasive aquatic organisms for the development of all public and private facilities on infested waters,
- Issue permits only for those infested water bodies where a state- approved infestation control plan is in place (see Task 4C1b),
- Establish criteria for determining when impacts are unacceptable, and
- Establish construction standards with which any approved projects must comply.

DEP and LURC will also clarify which agency is responsible for enforcing conditions applied to any permitted projects.

C. Introduction Into the Wild

Strategy 3C1: Understand and manage what is coming into Maine through pet shops, garden centers, schools, scientific research and studies, and other sources

Issue: Maine is fortunate in having a relatively small number of businesses that sell plants and animals to the public. This limited number, together with established procedures for inspection and permitting, means that identifying and working with retailers and their out-of-state suppliers will be straightforward. Maine does not know exactly what might be coming in, either purposefully or as stowaways along with orders of other non-invasive organisms.

We do know, however, that many animal and aquatic plant wholesalers are located all across the nation, and customers and retailers both shop in New Hampshire, so discussions with these other state programs will be important. The Animal Welfare Program has had success enforcing unlicensed species regulations in pet shops by requiring that all organisms be labeled with their Latin names. This puts the burden of proof on the retailer/wholesaler to stock only permitted species. While Maine has been relatively lucky so far in avoiding a significant problem from release into the wild, vigilance is needed, especially in regard to macrophytes.

Task 3C1a: **Wild Release Baseline Inventory♦**
DAFRR Horticulture and Animal Welfare Programs and DIFW will compile a list of in-state retailers and out-of-state suppliers; and invasive aquatic species that are routinely ordered, permitted, or introduced as stowaways. The agencies will work with the Northeast Panel to avoid overlap and build upon the New England Transport Vector Study (see Strategy 3E2). In compiling the list, the agencies will consult a panel of experts to establish comprehensive lists of what is being sold by Latin name, cross-referenced with common names. DAFRR will randomly sample supplied products and continue to require that all species be labeled with Latin names.

Task 3C1b: **Inspection Training♦♣**
DAFRR and DIFW, with DEP or other help on plants, will provide immediate and periodic training for inspectors in the identification of invasive aquatic species; and educate retailers about which species are prohibited or ill advised for sale. Inspectors will educate retailers about the threats from invasive aquatic species, and how they can best help educate their customers as well.

Task 3C1c: **Advisory List Updates & Information**
DAFRR and DIFW staff will provide before each ordering/field season updated legal lists of prohibited invasive aquatic species to Maine retailers, suppliers, and education and research institutions. They will work with the Northeast Panel to promote regional efforts to educate tradespersons through trade and professional journals, shows, and conferences; direct mailings; and other venues. They will also provide educational materials for distribution to the public, e.g., native plants for waters gardens and invasive species to avoid.

Strategy 3C2: Strengthen bait-handling standards and educate bait handlers about this issue

Issue: Freshwater invasive aquatic species can be transported with bait (spiny water flea) and sometimes as bait (e.g. crayfish). In addition, plant fragments and other invasive organisms may be attached to bait traps and nets. While the sale and possession of out of state baitfish is no longer legal, some anglers may still be bringing baitfish in or spreading already established in-state sources, they may also be using invertebrates. Fortunately, some of the invasive species of bait, such as crayfish, are no longer commonly used. It is nevertheless important to prevent new introductions and limit spread of existing populations. DIFW has such authority and may need to refine and strengthen it.

Task 3C2: **Bait Inventory and Information**
DIFW will develop a list of bait retailers and suppliers; and invasive bait species that are currently being supplied and sold, or brought in by anglers. It will work with the Northeast Panel, to the extent possible, to determine whether region-wide standards are needed for bait handling, and how best to educate retailers and wholesalers about this issue. The department will identify, evaluate, and propose the most harmful species for listing on the Task Force's Advisory List (see Introduction and Transport, Task 3A2a). The department will periodically distribute the list of species and information about this issue to dealers, suppliers, sporting journals, and the public.

Strategy 3C3: Strengthen the state's capacity to monitor and respond to invasive fish species, continue to educate the public about illegal stocking, and rigorously enforce the law

Issue: Some illegally stocked fish, including bait species, have turned out to be very aggressive. Most notably bass, white perch, northern pike, and black crappie have upset the balance in many waters, displacing native and stocked salmonids. Statutes explicitly prohibit illegal stocking, but the incidence has grown and raised public awareness, and to some extent, concern about the potential conflict between state stocking programs and the need to reign in illegal introductions. DIFW does not have the capacity to monitor new introductions and can only conduct one fish reclamation project a year. Wardens are overextended and find identifying and proving the source of illegal introductions difficult so only one such case has ever been prosecuted. The maximum fine for illegal stocking is $10,000, but the judgment in that case was much less, perhaps because the judge may not have understood the gravity of the problem.

The department has a program called Operation Game Thief that can assist in identifying people involved in this activity. The department distributes cards offering $2,000 rewards for information leading to a conviction of illegal fish and wildlife.

Task 3C3a: **Further evaluate capacity to prevent, detect, and control invasive fish. ♦**
DIFW will evaluate the incidence and potential risk of invasive fish introductions, identify any related conflicts and needed changes regarding existing policies, rules, and programs better to protect native fish communities; identify staffing and resource needs, including opportunities for assistance from non-governmental organizations; evaluate additional fish species candidates for placement or changes in category on the advisory list; and report back to the Task Force by September 2003. The Task Force and DIFW will provide opportunities for public involvement in deliberating the above.

Task 3C3b: **Invasive Fish Information**
DIFW will include information about the harmful effects and ways to avoid the introduction and spread of invasive freshwater fish, bait, and other relevant species in its annual rulebook. The department will also consider other ways to educate the public.

Task 3C3c: **Illegal Stocking Fines**
DIFW will evaluate the adequacy of existing fines, knowledge of judges about the potential impacts of invasive species, and possible use of consent agreements or other tools and report its findings and recommendations to the Task Force by 2004. The department will continue to promote the reporting of offenders through Operation Game Thief.

Strategy 3C4: Evaluate the impacts related to invasive aquatic species when permitting in-river projects

Issue: Some established invasive species may spread and cause significant harm if barriers, such as dams, are removed without adequate precautions.

Task 3C4: **Barrier Removal♦**
DIFW and DMR will identify waters where this potential problem exists and make the information available to river and watershed managers and the public. DEP, DIFW, LURC, and DMR will develop policy guidance, and rule-changes if needed, that take into consideration the need to weigh the impacts from potential spread of invasive aquatic species against benefits gained from the removal of dams and similar actions.

Strategy 3C5: Evaluate authority relating to marine dredging and processing waste disposal to ensure that adequate safeguards are in place

Issue: The extent of this potential threat and adequacy of existing authority to deal with it are not known. DMR was concerned a few years ago about the potential disposal of sea urchin wastes from product imported from Canada that contained in infectious paramoeba, but this is not an issue at this time. DEP has jurisdiction over ocean dumping within the 3-mile limit, DMR has some authority related to waste disposal under Title 12, Section 6521, and the Federal Refuse Act may delegate some authority to states.

Task 3C5: **Marine Dredging♣**
DMR will evaluate authority for dredging and report back to the Task Force, consulting with DEP and the Northeast Panel in the process.

Strategy 3C6: Require good biosecurity protocols in field sampling.

Issue: Many government agencies, non-profits, and private concerns conduct field sampling in Maine waters.

Task 3C6: **Sampling Permits**
All agencies that issue sampling permits will update their regulations and/or applications to require applicants to use good biosecurity procedures to prevent the inadvertent spread of invasive aquatic species and infective pathogens.

D. Marine Vessels

Strategy 3D: Work with the US Coast Guard (USCG) and Northeast Panel to make sure that ballast water is effectively controlled

Issue: With the exception of foreign fishing vessels, most commercial vessels do not unload ballast water in Maine waters because they arrive with cargos. While this source may not, therefore, be as likely as in other states, it is still an issue for those vessels that do unload. The Coast Guard promulgated voluntary standards for ballast water in 1999, and recently reported to Congress that there is insufficient compliance. The regulations

are voluntary, but will most probably become mandatory within the next year during reauthorization of the National Aquatic Nuisance Prevention and Control Act of 1990 (as amended by the National Invasive Species Act).

The USCG's salinity standard is of special interest to Maine because our near shore waters are saltier than elsewhere on the East Coast. The salinity standards specify how close to shore ballast water can be unloaded: the higher the salinity, the closer the release can occur. Thus purged organisms have a better chance of reaching lower salinity estuaries where they can survive.

Task 3D1: **Salinity Standard♦**
DMR will request the USCG to review its salinity standard to ensure that it is effective in Maine's waters.

Task 3D2: **Shipping Activity♦♣**
DMR will work with the USCG, port authorities, and Northeast Panel to document the type and amount of shipping and ballast water activity.

E. Marine Products Import and Export

Strategy 3E1: Identify alternatives to natural packing materials

Issue: "Wormweed" is currently used to pack bait worms for shipping. It is most difficult to remove all potential stowaways such as the green crab from this seaweed. Alternatives will be needed to keep the baitworm economy viable.

Task 3E1: **Bait Worm Packing ♣**
DMR will work with the bait exporting industry, and in collaboration with other states and the Northeast Panel as appropriate, to identify alternative packing materials.

Strategy 3E2: Understand how marine organisms are being introduced and spread in New England.

Issue: A team of researchers is currently assessing the risk of introduction through a variety of potential pathways including seafood companies, aquaculture facilities, bait shops, pet stores, public aquaria, marine research facilities, and wetland restoration efforts. The New England Transport Vector Study began in Massachusetts but is being expanded New England-wide. The study team is developing a database of companies and organizations involved in transport and trade of both native and nonindigenous organisms. It is distributing a survey to industry representatives to determine the type, quantity and frequency of species imports and exports, along with handling techniques.

Task 3E2: **Marine Pathways ♣**
DMR will work with the Northeast Panel to evaluate and apply the results of the New England Transport Vector Study.

Objective 4: Early Detection, Rapid Response and Management

Overview. The need exists to make sure that all responses to possible infestations are grounded in the positive identification of reported organisms and undertaken with the public interest in mind. For this reason, the State will adopt mechanisms for positively identifying potential invaders and overseeing the development of infestation control plans. While it may delegate authority to local entities to carry out planned activities, it will monitor the effectiveness of such implementation efforts to ensure quality control and that public interests are safeguarded.

A. Early Detection (see also 5A. Inventory)

Strategy 4A1: Establish simple reporting procedures.

Issue: The public now notifies agencies when they sight invasive aquatic species sightings in an ad hoc manner. DEP has an official number for citizens to call about freshwater plants, and encourages them to do so through public information materials. DMR uses its web site to advise citizens to report Asian crab sightings. DIFW has no official reporting procedure, but refers citizens to department biologists for the identification of questionable organisms. No coordinated approach exists for encouraging reporting from, and exchange of information with, state and federal land managers and other field personnel.

Task 4A1: **Decentralized Reporting**
Each agency will publicize information about its reporting procedures and how to identify Advisory List species. Each will track and confirm new introductions and sightings, using a standard protocol developed by the Task Force's technical

subcommittee; and immediately notify local officials and non-governmental organizations of new infestations. Web sites will be linked with referral "buttons" to ensure that people get to the right contacts in Augusta responsible for rapid response and data management, as well as state and federal lands managers in areas where organisms are sighted. The Invasive Aquatic Species Program Coordinator will coordinate this task, along with the Northeast Panel's regional data base initiative.

Strategy 4A2: Ensure that field staff and rapid response team personnel can easily identify species.

Issue: Training for field personnel is important for three reasons. First, state park managers, field biologists, wardens, and similar staff are most likely to encounter infestations. They need to know what they are looking for. Second, new species are being introduced all the time because of global mobility. Staff needs periodic updates and training to keep abreast of the latest species likely to be introduced. In addition, some field staff may be involved in rapid response or control initiatives.

It is equally important for lead contacts on the rapid response team to be able to ascertain whether reported species are in fact invasive since some, such as Eurasian and variable milfoil, bear close resemblance to native species. Staff will be able to make some of these calls but may occasionally need "expert" help. Maine can expect help in regard to plants because Dr. Leslie Mehrhoff of the G.S. Torrey Herbarium in Connecticut is under contract with the U.S. Department of Agriculture to develop a contingency plan to detect, identify, and respond to new plant introductions in New England.

Task 4A2a: **In-House Expert List** ♦
The Technical Subcommittee will develop a master list of in-house agency and partnering organization personnel who have expertise in the identification of various taxa and species. This list will also include federal land managers as well.

Task 4A2b: **Experts On Call** ♦
The Technical Subcommittee will develop a list of outside contractors who can help with hard-to-identify species, and develop contract arrangements as necessary. The subcommittee will coordinate plant experts with Dr. Mehrhoff.

Task 4A2c: **Annual Staff Training** ♦ ♣
The Technical Subcommittee will coordinate interagency plant identification training for field staff prior to each field season. This will include lead agencies as well as others such as the Maine Department of Transportation. The Board of Pesticides Control will continue to train and certify persons to apply pesticides for control of aquatic invasive species. Training for staff involved in field sampling will include biosecurity measures to prevent inadvertent spread on invasive aquatic species and infective pathogens. In addition, DEP and DIFW education staff will provide training information and opportunities for Maine's enforcement community to stay abreast of laws and regulations pertaining to invasive aquatic species.

Task 4A2d: **Plant Patroller Training**
The Volunteer Lake Monitoring Program will continue to train volunteers to identify freshwater plants and conduct invasive aquatic plant screenings surveys on lakes and ponds.

B. Rapid Response

Strategy 4B1: Develop and maintain a flexible rapid response system

Issue: Prevention is Maine's greatest priority. Currently, DEP is developing an interim rapid response plan for the upcoming season for freshwater plant infestations, but a more comprehensive and detailed approach is necessary. DIFW is committed to developing a similar capability for response to illegal fish introductions, though implementation will depend upon the availability of funding and resources.

Task 4B1: **Plant Response Plan** ♦ ♣
DEP will coordinate the development of a rapid response team to develop and carry out a rapid response plan for plants.

Rapid response teams will include both planners and responders and plans will address unique situations such as public water supplies. DMR and DIFW will continue to maintain a separate initiative for dealing with pathogens and other species over which they have jurisdiction.

Rapid response plans will:

- Specify the conditions/criteria under which a rapid response team is to be deployed and the participants, procedures, and chain of command for various situations;
- Establish a hierarchy of preferred/approved control and containment techniques and a program for testing the system and training participants;
- Contain the licenses and permits necessary for specified control techniques (DEP: mechanical and biological; BPC: chemical), contract authority necessary for purchased services; and agreements necessary for mutual aid with other states and federal agencies (e.g., in coordination with Dr. Mehrhoff and other initiatives within New England);
- Identify the funding mechanisms that support each aspect, procedures for keeping the plan current, and any statutory or regulatory changes needed for implementation;
- Include criteria for measuring response effectiveness; standard Operating Procedures for the methods used for control; and procedure notifications (i.e. drinking water supplies).

Task 4B2: **Fish and Wildlife Response Plan♦ ♣**
DIFW will establish and maintain a contingency program, including staff, training, equipment and financial resources necessary to provide a speedy and credible response to illegal introductions of invasive fish and other aquatic fauna. As part of this effort, DIFW will discuss with lake associations and other non-governmental organizations the feasibility of their helping to monitor and detect fish introductions. This response plan will encompass the same components are listed for plant response above.

C. Management

Strategy 4C1: Develop plans and contingencies to contain and reduce existing freshwater plant infestations

Issue: At least ten lakes and streams are now infested with variable milfoil. This is a relatively small number, assuming that infestations are not considerably more widespread than documented. Controlling these outbreaks so they do not spread to other waters is a high priority. DEP staff is providing technical assistance to some communities and lake and fish and game associations to help control the infestations, but scare resources limit the amount of effort that can be supported.

Task 4C1a: **Model Infestation Control Plan♦♣**
DEP and DIFW will seek funding to support and work with a local community(s) and lake and game associations to develop a management plan for the water body that is best suited as a "demonstration" project to model the kind of components such a plan should contain, e.g., strategies for containment, eradication and restoration (if eradication is successful), surface use, boating access, and measuring results.

Task 4C1b: **Invasive Aquatic Plant Grants♣**
DEP will seek funds to establish and administer a grant program to fund the development of infestation control plans, as well as local prevention plans. DEP, in conjunction with DIFW and other agencies as appropriate, will develop guidelines for local development and state approval of such plans, including plan scope, eligibility for funding, and qualifications needed to conduct the work, among other provisions.

Task 4C1c: **Plant-Infestation Buoys♦**
DOC, DEP, and DIFW will develop a standard buoy type, protocol for deploying and maintaining buoys directing traffic outside of infested areas, and public information campaign.

Task 4C1d: **Surface Use Restrictions On Infested Waters♦**
DEP and DIFW will develop a procedure for determining when to apply limited-duration surface use restrictions on infested waters. This procedure will take into account the state's need to balance the provision of public access with other resource and recreational values. As part of this effort, they will work with the DOC Boating Facility Program, municipalities and lake associations to determine when and how non-state entities could be responsible for plan enforcement and buoy deployment.

Strategy 4C2: Ensure appropriate, effective, and practical control techniques

Issue: Control techniques for plants and animals are different.

Current policy promotes hand removal as the primary control technique for plants. DEP has a protocol for and allows hand removal under Permit by Rule provisions of the Natural Resources Protection Act. An identical protocol will be needed for LURC jurisdiction, though rules pertaining to it could be administered by either LURC or DEP. If hand removal proves ineffective by itself, DEP has the authority to consider other options, such as mechanical controls, which may require licenses from other agencies.

Though DEP has authority to issue a NPDES permit for discharge of an herbicide to a person licensed by the Board of Pesticides Control (see sidebar to the right), current DEP policy precludes the use of herbicides because of their potential environmental harm and the fact that some plant species are becoming resistant to chemicals after years of use in other states. Note: Chapter 434 Section 1864 requires outright prohibition on using chemical control agents on public water supplies without prior written consent from public water suppliers, as well as review and comment by adjoining municipalities and property owners. Public review should also be required for any future proposed herbicide use even in non-public water supply lakes. An NPDES permit is the National Pollutant Discharge Elimination System that DEP administers with EPA. The NPDES permit is needed to directly discharge pollutants into waters of the state.

DIFW has licensed applicators on staff to use pesticides such as rotenone to control invasive fish, but deploys them only in limited circumstances such as small, isolated ponds. Aside from physical barriers, an approach that is not usually practical, the Department has no other options for controlling invasive fish once they are introduced. Funding to allow monitoring and response to introductions is limited. DMR has required the destruction of cultured stocks to control pathogens in pen-reared facilities.

Task 4C2a: **Plant Control s♦**
DEP will develop protocols and, in conjunction with LURC, advanced permitting for additional control techniques for plants, coordinating with other agencies and federal land managers as necessary. Priority will be given to the use of integrated pest management techniques to the extent practical.

Task 4C2b: **Controls For Animals and Pathogens**
Each agency will investigate and secure expedited or generic permit and license approvals from the Board of Pesticides Control and DEP for preferred techniques for controlling the species within their authority. Priority will be given to the use of integrated pest management techniques to the extent practical. Environmentally appropriate pesticide applications will be considered only as a last resort, when applied by licensed state personnel, and for state waters that are isolated and small scale.

Task 4C2c: **Restricted Chemicals**
The Task Force will support the initiative that DEP and the Board of Pesticides Control are currently undertaking to restrict the sale, purchase, and use of aquatic pesticide applications to persons licensed by the BPC; and educating the public about them. The agencies will take steps to eliminate website sales, using such tools as website "crawlers" to send messages to vendors regarding illegal species. The Board of Pesticides Control will also continue to provide continuing education for licensed applicators to make them aware of the impacts of inappropriate use of pesticide applications.

Minimizing Pesticide Use
Lesson Learned: EDUCATE HOMEOWNERS SO THEY WILL DO THE RIGHT THING

At the request of the DEP and citizens, the Board of Pesticides Control (BPC) is considering rule changes to restrict the sale of aquatic pesticides. If the BPC classifies aquatic pesticides for restricted use only, these products would be available only from trained and licensed dealers for use by trained and licensed applicators. At-home applicators would no longer have legal access to them through retail dealers or from the Internet.

Interest in making these changes developed following DEP enforcement cases involving waterfront property owners who purchased and used aquatic herbicides without training or a license. Current law requires an NPDES permit (National Pollutant Discharge Elimination System) from DEP and a commercial pesticide applicator license from the BPC before applying aquatic pesticides to State waters.

The waterfront homeowners didn't know this law nor did the pesticide dealer provide this information when they purchased and applied a "weed killer" in a pond owned by the homeowners association in the subdivision where they lived. The individuals each ended up paying a $1,000 fine to the DEP in a consent agreement.

Such incidents point out the need for more effective outreach to waterfront property owners regarding the legal and proper use of aquatic pesticides. Homeowners need this information to do their part to protect the environment and stay within the law.

Homeowners: do not apply pesticides to your lakes and ponds – you are breaking the law if you do.

Objective 5: Inventory, Research, and Information Management

A. Inventory (see also 4A. Early Detection)

Strategy 5A: Develop baseline information

Issue: DMR's information about the movement of new invasive species into the state is largely anecdotal and spotty. Biologists and the public have identified a few new invaders such as the Asian and blue crabs. The invasive species management plans developed by other East Coast states are helpful, but similar information has not yet been gathered from Canadian provinces – and Maine gets species drift from both directions.

Considering freshwater species, ten Maine lakes contain variable milfoil, but we do not know if this is the extent of infestation. DIFW has good information about the extent of fish introductions in its files and Maine Biodiversity Database. Little is known about the occurrence of other invasive freshwater animals or wetland plants, with the exception of the more widely established species such as purple loosestrife. And Maine does not yet have an adequate understanding of the composition and biodiversity of native plant and animal communities. DIFW's Maine Biodiversity Database and MNAP's atlas of terrestrial and aquatic invasive plants are laying a good foundation, however. Lack of ongoing funding may limit ability to maintain an effective database.

Task 5A1: **Marine Baseline Inventory (i.e., Rapid Assessment)♦♣**
DMR will seek a grant and coordinate with the Northeast Panel to sample the type, occurrence, and numbers of invasive marine species in various habitats and locations along the coast. In addition to reporting the results, the report will contain a list of invasive marine species known to exist in Maine and track their distribution with GIS mapping.

Task 5A2: **Freshwater Plant Baseline Inventory (Rapid Assessment)♦♣**
DEP, in conjunction with the Maine Natural Areas Program and Northeast Panel, will seek funding to sample the type, occurrence, and numbers of invasive macrophytes in Maine lakes and tidal rivers. The agencies will develop a baseline inventory for native aquatic plant communities, and continue to develop Maine's Atlas of Invasive Plant Species including GIS map(s) depicting occurrences.

Task 5A3: **Freshwater Fish & Fauna Inventory Project ♣♦**
DIFW will seek funding to expand the lake and pond inventory of fish and other animal species by conducting both new surveys of unsurveyed waters and resurveys of waters that have not been visited in many years. These data will become part of the Maine Aquatic Biodiversity database and will be used as a tool for identifying waters of highest natural biodiversity, establish a baseline of ecological conditions prior to invasive species infestation and track distribution of freshwater invasive aquatic animal species in the state with GIS mapping.

Also see 3C1a: Wild Release Baseline Inventory.

Task 5A4: **Crayfish and Snail Baseline Inventory (Rapid Assessment)♣**
DIFW, in conjunction with Northeast Panel, will seek funding to sample the type, occurrence, and numbers of invasive crayfish and snails in Maine and track their distribution with GIS mapping.

Task 5A5: **East Coast Marine Species Information**
The Invasive Species Coordinator at DEP will gather species lists and management plans from states and Canadian provinces and distribute them to DMR and others involved in marine invasive species management in Maine.

Task 5A6: **Other Species♣**
The Invasive Aquatic Species Program Coordinator will coordinate with the Northeast Panel and establish a list of interested academics and researchers and periodically inform and encourage them to conduct survey projects or sponsor graduate research documenting and mapping the occurrence of invasive aquatic species on the list.

B. Research

Strategy 5B1: Anticipate impacts and research & develop tools

Issue: Maine has much to learn from ongoing research in other states and provinces. We may not discover from these sources, however, how species will affect Maine's ecology. Of particular interest are impacts on marine fisheries and genetic markers that can improve the identification of species

that are easily confused with native species, e.g., Eurasian milfoil. Some species such as the Asian crab have the potential to devastate segments of the marine economy. While the spread of species that can survive Maine conditions is inevitable, Maine needs to how best to protect existing fisheries when and if species become established.

Task 5B1a: **Asian Crab Research♦♣**
DMR will seek a grant to contract or conduct research to investigate the potential threat of the Asian crab to Maine's shellfish industries and local ecology.

Task 5B1b: **Northeast Panel Marine Research Conference**
DMR will attend the Panel's conference to identify research priorities this fall.

Task 5B1c: **Other Research Needs**
The Task Force will support universities, non-governmental agencies and others seeking research grants for genetic markers, biological controls, and other important topics. Agencies will pursue individual grant and networking opportunities better to understand the ecology of invasive species relative to Maine. The Invasive Species Program Coordinator will distribute and share research information from other places as appropriate. Agencies will report annually to the Task Force on research activities and identified needs as part of their annual work plan report.

C. Information Management

Strategy 5C1:

Issue: Maine's resource management agencies are decentralized. This makes database development more complex, but facilitates targeted attention to all groups of organisms. Limited financial resources across the board means that Maine must be realistic about the development and maintenance of databases and websites, particularly their content. The Biodiversity Database provides the opportunity to centralize data in one location providing that standardized protocols guide interagency contributions.

Task 5C1a: **Agency Databases**
The Technical Subcommittee will develop a standardized protocol, building on opportunities for centralization to the extent possible, and agencies will develop and maintain individual databases, including lists of waters that are free from or infested with invasive aquatic species.

Task 5C1b: **Agency Websites**
The Task Force will develop a protocol for website coordination. Agencies will develop and maintain web sites, with an emphasis on education, and with links to the Task Force site and other state and federal agencies including the Northeast Panel's web site and database.

Task 5C1c: **Annotated Bibliography**
The Task Force will encourage one of its partners to develop and disseminate an annotated bibliography of Maine-generated research on invasive aquatic species.

Implementation Plan

Table 1: Tasks by Action Partner – see pages 34 and 35.

Table 2: Implementation Program – see pages 36 and 37 (hard copy); see separate EXCEL spreadsheet (ImplementationProgram.xls) for electronic version.

Table 1: Tasks by Action Partner

	Tasks To Be Scheduled	Ongoing Tasks	2002-2003	2003-2004	2004-2005	2005-2006
LWRC, Governor		1B	1A1/2 3A1			
Task Force (TF)	5C1c	1B, 1C, 1D1/2 3A3	1A/2, 1C?, 1Ea 3A1/2/3,3A2,3B1b			
IAS Program Coordinator (IASPC)		1B, 1C, 1D1/2 2A1, 2B1-3 4A1, 4A2c 5B1c	 3A1/2 4B1 (plants)	 4A1, 4B1 5A5/6		
Task Force Technical Subcommittee (TFTS)		1B 3A3 4A1	 3A1/2 4B1 (animals)	 4A2a/b, 4B1(animals), 4C2a-c	 4C2a/b/c 5C1a	
DEP	 5A6	1B, 1D1 2A1, 2B1-3, 2C1 3B1b/c, 3B2a, 3B2b 4A1, 4A2c, 4C2a 5B1c, 5C1a/b	1A2, 1Ea/b 3B1a/b/d, 3B2c 4B1(plants) 4C2a/b/c 5A2	 3B1a/d, 3B2b, 3C6 4B1 (inverts) 4C1a/b, 4C2a/b/c	 4C2a/b/c	
DIFW		1B 2A1, 2B1-3, 2C1/2 3B1b/c/d, 3B2a 3C1b/c, 3C3b 4A1, 4A2c, 4B2 5B1c, 5C1a/b	1A2, 1Ea/b 3B1b/d, 3B2e 3C1a/b/c, 3C3a 4C1d	 3B1a, 3B2b 3C1a/b/c, 3C2 3C3c, 3C6 4C2a-c 5A4	 3C1a/b/c 4C2a/b/c	
DAFRR (BPC = Board of Pesticide Control)		1B 2A1, 2B1/2/3, 2C2 3C1b/c 4A1, 4A2c, 4B1(BPC) 5B1c, 5C1a/b	 2C2 3C1a/b/c	 3C1a/b/c 4A2c(BPC), 4C2a/b/c	 3C1a/b/c 4A2c(BPC)	 4A2c(BPC)
DOC BFP = Boating Facilities; MNAP = Natural Areas Program; LURC – Land Use Regulation Commission		1B (DOC) 2A1, 2B1/2/3 4A1(MNAP), 4A2c(DOC) 5A2,5B1c,5C1a/b (MNAP)	 3B2c(LURC) 4C2a	 4C2a		

Table 1: Tasks by Action Partner						
	Tasks To Be Scheduled	Ongoing Tasks	2002-2003	2003-2004	2004-2005	2005-2006
DMR	3C5, 3D2, 3E1/2 5A1/5, 5B1a	1A1/2 2A1, 2B1/2/3 3B1b 4A1, 4A2c, 4B1 5B1c	1A1/2, 1Ea 4C2a 5B1b	3B1a 4C2a		
Attorney General (AG)			3B1d			
Coast Guard (USCG)	3D1, 3D2	1A1				
Northeast Panel	3C5, 3D2, 3E1/2 5A1/5/6	1D1 3C1c 4A1	3C1a 5B2a, 5A2	3C2 5A4		
Federal Agencies (FA)		4A1, 4A2c	4B1	4A2a/b, 4B1		
National Invasive Species Council (NISC)		1D2				
Gulf of Maine Council (GMC)		1D1				
Volunteer Lake Monitoring Program (VLMP)		4A2c 4A2d 3C1b	3B1a 5A2	3C6 4A2a/b 5A6		
Municipalities (M)		3B2a 4C2a		4C1a		
Lake Associations (LA)		3B2a 4C2a		4C1a		
Maine Lakes Conservancy	5C1c?					

See Implementation Program Table –separate document.

Appendix A:
Glossary of Terms & Acronyms

Terms

Aquatic – relating to fresh or saltwater ecosystems

Ballast water – any water that is placed in the hold of a ship for the purposes of maintaining stability

Control – limiting the distribution and abundance of organisms through biological, chemical, or mechanical means

Cryptogenic species – an organism of unknown origin; may be introduced or native

Eradicate – to completely eliminate a population from a geographic area

Exotic – see "nonindigenous"

Indigenous – existing within a historical ecological range, usually within a balanced system of coevolved organisms, i.e. the range an organism would or could occupy without direct or indirect introduction and/or care by humans

Infestation – an invasive population that is living in and overrunning an ecosystem to an unwanted degree or harmful manner

Introduction – the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity

Invasive – nonindigenous or cryptogenic organisms that may threaten the diversity or abundance of native species or the ecological stability and/or uses of infested areas

Macrophyte – a plant that is macroscopic; generally used to refer to plants in a body of water

Native – see "indigenous"

Nonindigenous – an organism transported intentionally or accidentally from another region (also called: non-native or exotic)

Nuisance species – animal or plant species that have been introduced into new ecosystems throughout the United States and the world and are having harmful impacts on the natural resources in these ecosystems and the human use of these resources (as defined by the federal Aquatic Nuisance Species Task Force)

Pathogen – any agent that causes disease in plants or animals; typically referring to microbes such as bacteria, viruses, or protozoan parasites

Pathways – natural and human connections that allow movement of organisms or their reproductive materials, such as seeds, spores, or eggs, from place to place

Population – all individuals of a single species within a defined habitat or geographic area such as a pond or watershed

Risk assessment – a science-based process to evaluate the economic and/or environmental risk(s) of invasive species

Vector – see pathways

Watershed – the geographic area that drains to a single water body or hydrographic unit such as a lake, stream, or estuary

Acronyms and Abbreviations

Maine

AG – Attorney General's Office
BPC – Board of Pesticides Control (within DOC)
BFP – Boating Facilities Program (within DOC)
DAFRR – Department of Agriculture, Food, & Rural Resources
DEP – Department of Environmental Protection
DMR – Department of Marine Resources
DIFW – Department of Inland Fisheries & Wildlife
DOC – Department of Conservation
IASPC – Invasive Aquatic Species Program Coordinator
IASTF – Invasive Aquatic Species Task Force

LA – lake associations
LURC – Land Use Regulation Commission (within DOC)
LWRC – Land and Water Resources Council
M - municipalities
MNAP – Maine Natural Areas Program (within DOC)
NRPA – Natural Resources Protection Act
SPO – State Planning Office
VLMP – Volunteer Lakes Monitoring Program

Federal

ANS – Aquatic Nuisance Species
APHIS – USDA Animal and Plant Health Inspection Service
EPA – United States Environmental Protection Agency
FA – federal agencies
FERC – Federal Energy Regulatory Commission
FIFRA – Federal Insecticide, Fungicide, and Rodenticide Act
NISA – National Invasive Species Act
NISC – National Invasive Species Council
NOAA – National Oceanic and Atmospheric Agency
NPDES – National Pollutant Discharge Elimination System permit
PPA – Plant Protection Act
USCG – United States Coast Guard
USDA – United States Department of Agriculture
USGS - United States Geological Survey
USFWS – United States Fish and Wildlife Service

Appendix B: Authorities & Programs

State

Coordination & Program Evaluation

Maine has a reasonable institutional structure for ensuring interagency coordination on this issue. The Interagency Task Force on Invasive Aquatic Plants and Nuisance Species provides focus and direction, and the Land and Water Resources Council facilitates interagency coordination. Legislation gave DEP and DIFW a mandate to establish a joint invasive aquatic species program. The only real institutional gap is the omission of DMR (and other marine interests) from the task force and established programs.

Interagency Task Force on Invasive Aquatic Plants and Nuisance Species

The governor-appointed Task Force oversees implementation efforts and offers recommendations to the Land and Water Resources Council (LWRC) for comprehensive planning and management of all invasive aquatic plants and nuisance species in Maine. Recommendations the Task Force may make are detailed in 38 MRSA, 20-B (see Appendix C). The Task Force is also charged with coordinating with federal, state, and local agencies throughout the northeast to prevent the spread of invasive aquatic plants and nuisance species.

Land and Water Resources Council

The Council is established in legislation (5 MRSA Chapter 314 section 3331) to advise the Governor, the Legislature and state agencies in the formulation of policies for management of the State's land and water resources. Council members include the commissioners of Agriculture, Food and Rural Resources, Conservation, Environmental Protection, Human Services, Inland Fisheries and Wildlife, Marine Resources, Economic and Community Development, and the Director of the State Planning Office.

Invasive Aquatic Species Program

Legislation (38 MRSA c.20-A and 20-B) authorized an invasive Aquatic Species Program to be housed in DEP and DIFW, with funding to be split between the agencies (60% to DEP). Funding is to be provided by purchases of a supplemental Lake and River Protection sticker required for boats operating on fresh waters (Sec. A-3, 12 MRSA).

DIFW was authorized to hire eight FTE positions. These included 6 new game wardens, 1.5 FTE in information and education and one half FTE in fisheries biology. To date DIFW has used available staff, paid for out of the initial funding provided by the legislature, to expand warden services and public outreach functions (primarily through the existing Public Safety Program). Hiring new staff will be delayed until revenues from the sticker program are sufficient to enable stable support for the positions. The new positions will not be dedicated solely to invasive species work. Rather DIFW intends to use the new position hours spread out over the expanded warden service and public education to include activities related to inform public and for enforcement of the current laws.

DEP was authorized to hire three new staff. One of these, the program coordinator, is a biologist who was hired in December of 2001. He is concentrating on program development, including the Maine Invasive Species Task Force and ANS plan development, interstate cooperation though the federal Northeast Regional ANS Panel. Other priorities include boat inspection coordination through outside contracting and some information and education activities.

DEP hired an environmental specialist in the spring of 2002; and plans to hire one more. These positions will share duties related to information and education, monitoring and evaluation (including liaison with the Volunteer Monitoring Program) managing infested waters, and developing rapid response capabilities. For 2002, DEP will also use contracts with outside entities to manage aspects of monitoring (VLMP Plant Patrollers Program), information (boat ramp signs, direct mailing campaign), and coordinating boat inspections at ramps using a mix of paid staff and volunteers. Staff of the Lakes Assessment Section and DEP education staff will carry on other program aspects until new hires are in place.

Education and Outreach

Education and outreach is always a difficult program area for state governments to deliver because it tends to come up short when competing for scarce resources with other mandates. Maine agencies have much authority in this area, but generally limited resources to deliver. Fortunately, a portion of the boat sticker program is directed toward this issue, but more attention needs to be paid to coordinating DIFW and DEP aspects of the program.

An Act to Prevent the Spread of Invasive Aquatic Plants (LD 2581)

In addition to the prohibition of 11 aquatic plants noted above, this bill charged DEP with preparing educational materials and signs. Educational materials are provided to municipalities, lake associations, water quality monitors, law enforcement agents, businesses that sell aquatic plants in Maine, and other interested individuals. Signs inform the public about the prohibition of aquatic plant transportation and were to be provided for installation at all state boat launch facilities on fresh waters. DEP was also charged with working with the Department of Transportation and the Maine Turnpike Authority to provide signs on all major roads at the State's borders advising incoming boat owners that Maine requires all boats and trailers to be free of aquatic plant material.

An Act to Prevent Infestation of Invasive Aquatic Plants and to Control Other Invasive Species (LD 1812)

The DEP and DIFW are charged with implementing a boat, trailer, and outboard motor inspection program at or near the state border and at boat launching sites for the presence of invasive aquatic plants. Also required by this bill is the provision of educational materials to the public regarding invasive aquatic plants, via inspection programs and other outlets.

Inland Fisheries and Wildlife

DIFW conducts many initiatives that can be used to educate the public about invasive aquatic species, such as its annual fishing rulebook, Operation Game Thief, and ongoing public information program. DIFW and DEP are coordinating to deliver education as directed by the invasive aquatic species legislation (see below).

Department of Environmental Protection

DEP has developed a public outreach program for invasive aquatic plants. The agency also maintains a web Page devoted to invasive plants and related information at www.mainedep.com and http://www.state.me.us/dep/blwq/topic/invasive.htm. The page contains links to other state, regional and national sites, along with updates on the state's program. Other information is maintained on the University of Maine's PEARL website which has links to DEP and other sites and includes education anal material supported by DEP's Lake Assessment Program (www.pearl.spatial.maine.edu).

Department of Conservation, Maine Natural Areas Program (MNAP)

MNAP, in conjunction with others, has developed educational materials for invasive plants. Materials include factsheets, gardening brochures, a free standing display, and the Invasive Plant Survey Atlas. MNAP has also conducted workshops and presentations for interested groups. These events are designed to create greater awareness of the problem of invasive plants.

Board of Pesticides Control, DOC

The BPC trains and certifies individuals on the proper identification and management of pest problems, including invasive species. In conjunction with the University of Maine Cooperative Extension, Pest Management Office, BPC is often the place where people go to find out how to control invasive species. The BPC also provides continuing education programs for the people already licensed to control invasive species.

Interagency Task Force on Invasive Aquatic Plants and Nuisance Species (LD 1812)

The task force is mandated to include recommendations on the development and distribution of training material and public information materials for the public, lake monitors, and boat inspectors.

Maine Volunteer Lake Monitoring Program (VLMP)

The VLMP is a primary provider of information to the public concerning all aspects of invasive aquatic species. The VLMP works in concert with the Maine DEP, volunteer lake monitors, and lake associations throughout Maine. The following information and services are ongoing:

- "Invasive Plant Patrol" workshops help participants develop aquatic plant identification skills, provide general

information about preventing the introduction and spread of IAS, and train volunteers to conduct invasive plant screening surveys for lakes and ponds. Information gathered through screening surveys is added to a database that is being developed to help state agencies compile information on invasive aquatic plant infestations in Maine.

- Plant Identification: VLMP staff has developed a service to identify questionable plant specimens.
- General information concerning IAS is available through the VLMP website mainevolunteerlakemonitors.org Slide presentations and other outreach information is available to public groups, schools, and organizations on request.

Transport and Introduction

DIFW and DMR commissioners have broad authority to prevent introduction and spread of unwanted freshwater animals and marine organisms, but it is not explicitly targeted toward invasive aquatic organisms. DEP and DAFRR have jurisdiction over plants but no outright authority to prohibit the introduction of invasive aquatic species with legislative action.

Inland Fisheries and Wildlife

Pertinent DIFW statutes are too numerous to explain each one. Rather than approaching regulation through inclusive listing, the department generally applies its authority by requiring permits for activities it seeks to tightly control or prohibit, such as the following:

- Importation and use of bait and baitfish,
- Importation and transportation of live fish and wildlife, and
- Release of wild birds and animals into the wild.

The department does issue a list of species that can be traded by commercial pet shops without a permit; and it prohibits the sale of baitfish from out-of-state and the illegal stocking of fish. DIFW also has regulations and procedures governing the biosecurity of hatchery operations that also have elaborate intake screen and UV disinfection systems.

Department of Environmental Protection (DEP)

An Act to Prevent the Spread of Invasive Aquatic Plants (Chapter 722). This law, passed by the Maine Legislature in 2000, prohibits the possession, importation, cultivation, distribution, or transportation of the following 11 invasive aquatic plants: variable water milfoil, (*Myriophyllum heterophyllum*), curly leaf pond weed (*Potamogeton crispus*), Brazilian elodea (*Egeria densa*), fanwort (*Cabomba caroliniana*), European frog-bit (*Hydrocharis morus-ranae*), hydrilla (*Hydrilla verticillata*), Eurasian water milfoil (*Myriophyllum spicatum*), European naiad (*Najas minor*), parrot feather (*Myriophyllum aquaticum*), water chestnut (*Trapa natans*), and yellow floating-heart (*Nymphoides peltata*). Fines for violations under 38 MRSA §419-C may be up to $500.00 for the first violation and up to $2,500.00 for subsequent violations.

An Act to Prevent Infestation of Invasive Aquatic Plants and to Control Other Invasive Species (Chapter 434). This law established the Lake and River Protection Sticker, sales of which fund DEP's and DIFW's invasive species programs. A fine of between $100.00 and $250.00 can be levied for failure to display a sticker on a motorboat or personal watercraft on inland waters in Maine. Launching a watercraft carrying an invasive aquatic plant into an inland water may be subject to a fine of between $500.00 and $5,000.00. Operation of a boat in a quarantined area may receive a fine of between $500.00 and $5,000.00.

Department of Agriculture, Food, and Rural Resources (DAFARR)

DAFARR has two programs that deal indirectly with the Transport and Introduction of aquatic invasive species: Animal Welfare and Horticulture.

The Animal Welfare Program, within the Office of Agricultural, Natural and Rural Resources, licenses pet shops. It operates under the authority of 7 MRSA Chapter 723. While the definition of pet shops includes only exotic birds, mammals, fish, and reptiles (see section 3907, 7 MRSA Chapter 717), inspectors look for banned aquatic plants and will look for additional ones if they have back-up identification. If pet shops sell rooted plants pet shop inspectors require them to get a nursery license as described below.

The Horticulture Program within the Division of Plant Industry has the authority to license businesses involved in selling plants. Staff conducts annual routine inspections of all nurseries and water

garden suppliers. Under the definition for plant pest contained in 7 MRSA Chapter 405A sections 2211-2217, staff can also make spot inspections of garden centers suspected of being infested with plant pests used in water gardening or landscaping for wetland areas. Inspectors can act to educate and help enforce the invasive plant laws. Staff in the unit also work cooperatively with USDA to help enforce plant quarantines, federal noxious weed list and certify plants exported internationally.

Maine Department of Marine Resources

DMR has regulations giving the Commissioner the authority to regulate the importation of marine organisms into the state (Chapter 24, Title 12, Section 6070). Dumping of waste material is controlled by Chapter 24, Title 12, Section 6251. The department regulates bivalve wet storage under Chapter 24, Title 12, Section 6071; and, as with DIFW, has regulations governing biosecurity at aquaculture facilities.

Maine Volunteer Lake Monitoring Program (VLMP)

The Maine Volunteer Lake Monitoring Program (VLMP) conducts an ongoing education and outreach program intended to prevent the introduction and spread of invasive aquatic species through public transportation vectors. A major part of this program includes providing information to the public concerning specific actions that can be taken to reduce the risk of introducing IAS to Maine lakes and ponds, including local voluntary vehicle and boat inspections. Information is provided to all, but the primary target audience includes more than 500 active volunteer lake monitors on Maine lakes, as well as lake associations throughout the state.

Early Detection, Rapid Response, and Management

Inland Fisheries and Wildlife

DIFW responds on an ad hoc basis to introductions of invasive aquatic fish, and has a licensed pesticide applicator on staff for the occasional instance when it is appropriate to use pesticides to control an invasive fish introduction. The department is also responsible for managing fisheries in all state waters, and commenting on permits relating to FERC relicensing and state environmental review of projects that may affect the spread of invasive fish and wildlife. The agency also has a program for providing public boating access to state waters.

Department of Environmental Protection (DEP)

Maine Water Classification Program (38 MRSA Sec. Sections 464 and 465) and Section 413 Discharge of Pollutants provide narrative criteria for habitat and biological integrity for the State waters. Section 413 provides conditions under which the department or someone working for DEP could procure a discharge license for the use of pesticides.

DEP takes the lead in controlling invasive plant infestations. Activities manipulating aquatic plants have generally to meet NPDES standards and those of the Natural Resources Protection Act (NRPA), and the department has some authority to pursue experimental techniques. An NPDES permit is the National Pollutant Discharge Elimination System that DEP administers with EPA. The NPDES permit is needed to directly discharge pollutants into waters of the state.

In addition, Section 465 places significant restrictions on the discharge of pollutants to lakes, including chemical discharges, such as those used to control plants. Such discharges are prohibited in lakes, unless they are "… aquatic pesticide treatments or chemical treatments for the purpose of restoring water quality…" Current department policy precludes the use of herbicides for any purpose because of their potential environmental harm and the fact that some plant species are becoming resistant to chemicals after years of use in other states.

DEP policy instead promotes hand removal as the primary control technique for plants. DEP has a protocol for and allows hand removal under Permit by Rule provisions of the Natural Resources Protection Act. If hand removal proves ineffective by itself, DEP has the authority to consider other options, such as mechanical controls, which may require licenses from other agencies. Note: LD 1812 Section 1864 requires written consent for control techniques from public water suppliers.

The Natural Resources Protection Act (NRPA 38 MRSA Sec. 480-N-U) contains standards for a variety of activities relating to physical modification of protected resources such as wetlands, streams and lakes. Physical methods of plant control (harvesting, bottom barriers, plant removal, certain water level manipulations,

etc) are governed by NRPA standards, and permits are required for these activities as well as for boating access sites on state waters.

An Act to Prevent the Spread of Invasive Aquatic Plants (Chapter 722, 38 MRSA Section 410-N) describes certain conditions under which the DEP may undertake activities for control invasive plant populations. The department may undertake physical or biological control management efforts designed to eradicate an infestation of one of the listed plants without first obtaining a permit if timely response would be hindered by the usual NRPA permitting process. In situations where enough advance notice is available, the Department would follow normal NRPA permitting procedures. This exemption does not extend to regular maintenance or management interventions.

Maine Drinking Water Program (DWP), Department of Human Services

The DWP is the primary agency responsible for administering the Safe Drinking Water Act in Maine. The DWP regulates nearly 2200 Public Water Systems for compliance with the National Primary Drinking Water Regulations that includes inorganic and organic chemicals, as well as microorganisms and disinfection byproducts. Maine has approximately 81 lakes, ponds, rivers and streams that serve as drinking water sources for at least 40% of Maine's population.

An Act to Prevent Infestation of Invasive Aquatic Plants and to Control Other Invasive Species (LD 1812)

The Commissioners of DEP and DIFW may issue an emergency order to restrict or prohibit the use of any watercraft on all or a portion of a water body infested with an invasive aquatic plant.

Interagency Task Force on Invasive Aquatic Plants and Nuisance Species (LD 1812)

The action plan required of the Task Force may include a response program to deal with new introductions of invasive aquatic plants and nuisance species in Maine inland waters.

Board of Pesticides Control, Dept. of Agriculture, Food and Rural Resources (BPC)

The Board of Pesticides Control administers all state and federal regulations related to the distribution and use of pesticides, including those used in aquatic environments. The BPC must register all pesticides before they can be legally distributed or used in the State. (see 7 MRSA § 607) Applicators must also be licensed by the BPC before treating aquatic areas with pesticides (see 22 MRSA § 1471-C(5)) and before they can apply for a discharge permit from the DEP. (see 22 MRSA § 1471-E)

Department of Conservation

The department's boating facilities program, together with DIFW, is responsible for providing public boating access sites. The Land Use Regulation Commission, within DOC, is responsible for issuing permits for private and public access sites within the unorganized portion of the state.

Maine Volunteer Monitoring Program (VLMP)

VLMP staff assists the Maine DEP in developing and overseeing rapid response initiatives for infested lakes and ponds. VLMP is currently working with a number of local groups to manage eradication and control programs on infested lakes.

Inventory, Research, and Information Management

No major gaps in authority exist in regard to inventorying, researching, and managing information related to invasive aquatic species, but resources to conduct these activities are not abundant.

Inland Fisheries and Wildlife

DIFW has an excellent database documenting the occurrence of fish species in Maine, including invasive species. The Department has also begun a Maine Biodiversity Project documenting the occurrence and composition of faunal communities in the state.

Department of Environmental Protection (DEP)

An Act to Prevent the Spread of Invasive Aquatic Plants (LD 2581) charges DEP with investigating and documenting the occurrence of invasive aquatic plants in state waters. Some of this mandate involves support for the VLMP Plant Patrollers program, plant specimen ID for the volunteer monitors, and field reconnaissance of reports of plant infestations in southern Maine.

Maine Department of Conservation Natural Areas Program

MNAP is the lead state agency in documenting and providing information to government agencies, organizations, and the public about the occurrence, distribution, and fragility of rare plants and

exemplary natural communities. MNAP conducts research on the biotic and abiotic characteristics of natural communities including those found in lacustrine and estuarine environments. MNAP ecologists are compiling an atlas of terrestrial and aquatic invasive plants in Maine in conjunction with the New England Invasive Plant Group. MNAP has no regulatory authority but advises permitting agencies on specific projects.

Interagency Task Force on Invasive Aquatic Plants and Nuisance Species (LD 1812)

The action plan required of the Task Force may include identification of inland waters that are infested and an assessment of inland waters most at risk of infestation by invasive aquatic plants and nuisance species. The action plan may also include a program to monitor inland waters for new introductions of invasive aquatic plants and nuisance species.

Maine Volunteer Monitoring Program (VLMP)

VLMP is working with the DEP and other agencies to monitor lakes and ponds throughout Maine for any possible introductions of IAS. Plant patrol workshops are designed to train the public to assist state authorities in gathering inventory data.

Federal

Overall Coordination

At the federal level, no single agency has authority over the management of aquatic invasive species. Rather, multiple agencies have developed invasive species programs. Section 1201 of the Nonindigenous Aquatic Nuisance prevention and Control Act of 1990 (NANPCA, PL 101-646) established the federal interagency Aquatic Nuisance Species Task Force (ANS Task Force). The Task Force is charged with coordinating federal aquatic nuisance species efforts with the efforts of the private sector and other North American interests. The ANS Task Force is responsible for initiating research programs, planning initiatives, and policy direction for the prevention, detection and monitoring, and control of nuisance species, and operates through regional panels as well as specific working groups that address particularly problematic invaders.

More recently, Executive Order 131122 recommended an increase in the federal budget for the management of all invasive species and established the National Invasive Species Council, a federal interagency organization charged with the biennial development of a National Invasive Species Management Plan.

The sections below underscore some of the highlights of federal authorities and programs related to invasive aquatic species. Much of this information is taken from the National Invasive Species Council's Management Plan: Meeting the Invasive Species Challenge, January 18, 2001 and the Massachusetts Draft Aquatic Invasive Species Management Plan.

Education and Outreach

A number of federal agencies have specific projects and programs that provide information to the public or assistance to state, local, and private landowners for control efforts. The Commerce Department conducts outreach efforts on aquatic invasive species. Many agencies such as USGS, USDA, and USFWS maintain extensive, spatially referenced data bases and web sites for nonindigenous aquatic species.

Transport and Introduction

US Coast Guard

Ballast and Recreation Guidelines. The Coast Guard, within the Department of Transportation issued voluntary guidelines for managing ballast water in non-Great Lakes or Hudson River waters in July of 1999, but as of December 21, 2001, also requires that ballast water discharges for nearly all vessels entering US waters be reported. In addition, the Coast Guard issued voluntary guidelines for recreational activities in 2000 (USCG-2000-7206).

US Department of Agriculture (USDA)

The protection of agriculture has been, and continues to be, the primary focus of Federal efforts to prevent invasions of non-native species in general.

The New Plant Protection Act (PPA), which consolidated the authorities in the Plant Quarantine Act, Federal Plant Pest Act, Federal Noxious Weed Act, and other plant-related statutes, authorizes the USDA Animal and Plant Health Inspection Service (APHIS) to prohibit the import and interstate transport of species

included on the Noxious Weed List developed by the USDA. In addition and in cooperation with state agricultural department, APHIS annually designates priority agricultural pest species for annual intensive monitoring efforts. Each year, the state survey committee reviews the Noxious Weed List and chooses one or more for annual surveillance efforts.

The movement of seed is regulated under the Federal Seed Act, which prohibits the importation of any agricultural or vegetable seed containing high-risk weed seeds and ensures the purity and proper labeling of seed imports.

US Fish and Wildlife Service (USFWS)

The USFWS has traditionally led in dealing with invasive species at the federal level, and is co-chair of the ANS Task Force. The Service provides technical assistance to states in developing invasive species control plans.

The Lacey Act of 1900 (and amendments) establishes a permitting process within the USFWS of the Department of Interior for the importation and transport of vertebrates, mollusks, and crustacea that are "injurious to human beings, to the interests of agriculture, horticulture, forestry, or to wildlife or to wildlife resources of the United States." The Secretary of Interior maintains the Injurious Species List that as of January 2001 included 12 genera of mammals, 4 species of birds, 1 reptile, 1 mollusk, and 1 crustacean.

Early Detection, Rapid Response and Management

A number of federal departments have programs to detect, assess, and respond to invasions by non-native species. Only USDA has emergency authority to deal with an incipient invasion, with emergency powers under the Plant Protection Act (PPA). Interior has established four exotic plant management teams to identify, eradicate, or control small, localized infestations of lands managed by the National Park Service.

All federal land and water management agencies within Interior, NOAA, and Defense have authority to control and manage invasive species as well as restore affected areas on their lands and waters. In addition, EPA has authority under two statutes that can be used to control and manage invasive species, including the Clean Water Act and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). For example, EPA uses FIFRA regulates a pesticide for the control of lamprey populations in the Great Lakes.

Inventory, Research, and Information Management

Almost all departments with major responsibilities in the areas of prevention or control of invasive species also have research and monitoring programs to support their efforts. For several agencies, including USDA, Interior, and NOAA, research and monitoring are very significant activities. USDA provides leadership in developing biological control technologies, as well as research on invasive pathogens and insects of concern to wetlands (as well as forests and rangelands). Defense has a number of research programs focused on aquatic plant problems and zebra mussels. In addition, EPA conducts research on the risks associated with invasive species and monitors the extent of invasive species spread by ecosystem type as part of its Research and Development Authority.

Appendix C: Maine Statutes

CHAPTER 722
H.P. 1843 - L.D. 2581

An Act to Prevent the Spread of Invasive Aquatic Plants

Emergency preamble. Whereas, Acts of the Legislature do not become effective until 90 days after adjournment unless enacted as emergencies; and

Whereas, invasive aquatic plants present an imminent threat to state waters; and

Whereas, it is important to prevent the transport of invasive aquatic plants into the State on boats and trailers because eradication is nearly impossible once an infestation occurs; and

Whereas, the summer boating season will begin prior to 90 days after adjournment; and

Whereas, in the judgment of the Legislature, these facts create an emergency within the meaning of the Constitution of Maine and require the following legislation as immediately necessary for the preservation of the public peace, health and safety; now, therefore,

Be it enacted by the People of the State of Maine as follows:

Sec. 1. 38 MRSA §410-N is enacted to read:

§410-N. Aquatic nuisance species control

1. Definitions. As used in this section and section 419-C, unless the context otherwise indicates, the following terms have the following meanings.

A. "Aquatic plant" means a vascular plant species that requires a permanently flooded freshwater habitat.

B. "Invasive aquatic plant" means a species identified by the department through rulemaking as an invasive aquatic plant or one of the following species:

(1) Eurasian water milfoil, Myriophyllum spicatum;
(2) Variable-leaf water milfoil, Myriophyllum heterophyllum;
(3) Parrot feather, Myriophyllum aquaticum;
(4) Water chestnut, Trapa natans;
(5) Hydrilla, Hydrilla verticillata;
(6) Fanwort, Cabomba caroliniana;
(7) Curly pondweed, Potamogeton crispus;
(8) European naiad, Najas minor;
(9) Brazilian elodea, Egeria densa;
(10) Frogbit, Hydrocharis morsus-ranae; and
(11) Yellow floating heart, Nymphoides peltata.

Rules adopted pursuant to this paragraph are routine technical rules as defined in Title 5, chapter 375, subchapter II-A.

2. Education. The department shall prepare educational materials that inform the public about problems associated with invasive aquatic plants, how to identify invasive aquatic plants, why it is important to prevent the transportation of aquatic plants and the prohibitions relating to aquatic plants contained in section 419-C. The department shall make the materials available to municipalities, lake associations, water quality monitors, law enforcement agents, businesses that sell aquatic plants in the State and other interested individuals.

A. The department shall provide signs for installation at all state boat launch facilities on fresh waters informing the public about the prohibition of aquatic plant transportation on boats and trailers and may provide these signs, as available funds allow, for installation at other boat launch sites including municipal boat launch facilities, campground boat launch facilities and other commonly used launch sites.

B. The department shall work with the Department of Transportation and the Maine Turnpike Authority to provide signs and educational materials on all major roads at the State's borders advising incoming boat owners that state law requires all boats and trailers to be free of aquatic plant material.

3. Control. The department shall investigate and document the occurrence of invasive aquatic plants in state waters and may undertake activities to control invasive aquatic plant populations as follows.

A. The department or a person designated by the department may attempt eradication of an invasive aquatic plant from a water body if determined feasible by the department. If the commissioner determines that eradication activities must be undertaken immediately, a license is not required under section 413 or section 480-C for the use of a physical, chemical or biological control material by the department or a person designated by the department if the use of the control material is specifically related to the immediate eradication of invasive aquatic plant populations in the water body. Prior to undertaking an eradication activity and to the extent practical, the department shall notify landowners whose property is adjacent to the area where the activity will be undertaken.

B. The department may conduct research to test new control methods for the eradication of invasive aquatic plants pursuant to section 362-A.

Sec. 2. 38 MRSA §419-C is enacted to read:

§419-C. Prevention of the spread of invasive aquatic plants

1. Prohibition. A person may not:

A. Transport any aquatic plant or parts of any aquatic plant, including roots, rhizomes, stems, leaves or seeds, on the outside of a vehicle, boat, personal watercraft, boat trailer or other equipment on a public road;

B. Possess, import, cultivate, transport or distribute any invasive aquatic plant or parts of any invasive aquatic plant, including roots, rhizomes, stems, leaves or seeds, in a manner that could cause the plant to get into any state waters; or

C. After September 1, 2000, sell or offer for sale in this State any invasive aquatic plant.

2. Penalty. A person who intentionally violates this section commits a civil violation for which a warning may be issued for the first violation, a forfeiture not to exceed $50 may be adjudged for the 2nd violation and a forfeiture not to exceed $500 may be adjudged for a subsequent violation.

Sec. 3. Report; invasive aquatic species control. The Department of Environmental Protection and the Department of Inland Fisheries and Wildlife shall jointly submit a report on invasive aquatic species control, including recommendations and implementing legislation, to the joint standing committees of the Legislature having jurisdiction over natural resources matters and inland fisheries matters by January 15, 2001. The report must address at least the following:

1. Identification of other biological threats to the State's waters including invasive animal species that may become a nuisance;

2. Further education, awareness and prevention efforts needed to stop the introduction and spread of invasive species;

3. Methods to control the spread of invasive species should any become established in the State, including quarantine authority;

4. Enforcement of the prohibitions in the Maine Revised Statutes, Title 38, section 419-C;

5. The status of cooperation from other state agencies in educating the public about invasive aquatic species; and

6. Recommendations for necessary funding to support the prevention and control of invasive aquatic species.

In preparing the report, the departments shall consult with interested parties, including representatives of the following: the Maine Volunteer Lake Monitoring Program, lake associations, 1akeshore owners, boat owners, sporting interests, business interests, marina owners, campground owners, environmental organizations, other state or federal agencies and interested agencies in neighboring states and provinces. The joint standing committee of the Legislature having jurisdiction over natural resources matters is authorized to report out a bill concerning invasive aquatic species control to the First Regular Session of the 120th Legislature.

Emergency clause. In view of the emergency cited in the preamble, this Act takes effect when approved.

Effective April 14, 2000.

CHAPTER 434

S.P. 630 - L.D. 1812

An Act to Prevent Infestation of Invasive Aquatic Plants and to Control Other Invasive Species

Emergency preamble. Whereas, Acts of the Legislature do not become effective until 90 days after adjournment unless enacted as emergencies; and

Whereas, invasive aquatic plants and nuisance species pose a substantive threat to the environment and economy of the State; and

Whereas, the most common method of spreading invasive aquatic plants is on recreational boats, watercraft trailers and fishing equipment; and

Whereas, Maine's inland waters face an immediate threat of infestation by invasive aquatic plants during the 2001 summer boating season; and

Whereas, in the judgment of the Legislature, these facts create an emergency within the meaning of the Constitution of Maine and require the following legislation as immediately necessary for the preservation of the public peace, health and safety; now, therefore,

Be it enacted by the People of the State of Maine as follows:

PART A

Sec. A-1. 12 MRSA §7791, sub-§1-B is enacted to read:

1-B. Aquatic plant. "Aquatic plant" means a vascular plant species that requires a permanently flooded freshwater habitat.

Sec. A-2. 12 MRSA §7791, sub-§3-A is enacted to read:

3-A. Invasive aquatic plant. "Invasive aquatic plant" means a species of aquatic plant described in Title 38, section 410-N.

Sec. A-3. 12 MRSA §§7794-B and 7794-C are enacted to read:

§7794-B. Lake and river protection sticker

Beginning on January 1, 2002, and by January 1st of each subsequent year, the commissioner shall provide each agent authorized to register watercraft or issue licenses with a sufficient quantity of lake and river protection stickers for that boating season. The sticker must be in 2 parts so that one part of the sticker can be affixed to each side of the bow of a motorboat or personal watercraft. The fee for a sticker is $20 for a motorboat or personal watercraft not registered in the State and $10 for a motorboat or personal watercraft registered in the State.

1. Disposition of sticker revenues. All fees collected by the commissioner from the sale of stickers under this section are paid daily to the Treasurer of State. Notwithstanding section 7800, the treasurer shall credit funds received under this subsection as follows:

A. Sixty percent of the revenues are credited to the Invasive Aquatic Plant and Nuisance Species Fund established in the Department of Environmental Protection under Title 38, section 1863; and

B. Forty percent of the revenues are credited to the Lake and River Protection Fund established in the department under section 7806.

2. Administrative cost. The Legislature shall appropriate to the department in each fiscal year an amount equal to the administrative costs incurred by the department in collecting revenue under this section.

§7794-C. Lake and river protection sticker required

Beginning January 1, 2002, a person may not operate a motorboat or personal watercraft on the inland waters of the State unless a lake and river protection sticker issued under section 7794-B is affixed to both sides of the bow above the water line and approximately 3 inches behind the validation sticker required under section 7794.

Sec. A-4. 12 MRSA §7801, sub-§§37 to 39 are enacted to read:

37. Failure to display lake and river protection sticker. Beginning January 1, 2002, a person who places a motorboat or personal watercraft upon the inland waters of the State without displaying a lake and river protection sticker as required by section 7794-C commits a civil violation

for which a forfeiture of not less than $100 and not more than $250 per violation may be adjudged, except that a citation for a violation of this subsection may not be issued to a person who is also issued a citation at the same time for another violation of any provision of this section. A forfeiture imposed under this subsection may not be waived by the court.

38. Launching a contaminated watercraft. A person who places a watercraft that is contaminated with an invasive aquatic plant upon the inland waters of the State commits a civil violation for which a forfeiture of not less than $500 and not more than $5,000 per violation may be adjudged. A forfeiture imposed under this subsection may not be waived by the court.

39. Operating a watercraft in a quarantined area. A person who operates a watercraft in violation of an order issued under Title 38, section 1864 commits a civil violation for which a forfeiture of not less than $500 and not more than $5,000 per violation may be adjudged. A forfeiture imposed under this subsection may not be waived by the court.

Sec. A-5. 12 MRSA §7806 is enacted to read:

§7806. Lake and River Protection Fund

The Lake and River Protection Fund, referred to in this section as the "fund," is created within the department as a nonlapsing fund. The fund must be administered by the commissioner. The fund is funded from fees collected for lake and river protection stickers issued under section 7794-B and from other funds accepted for those purposes by the commissioner or allocated or appropriated by the Legislature. Money in the fund may be used for enforcing laws pertaining to invasive aquatic plants, inspecting watercraft for invasive aquatic plant materials, educational and informational efforts targeted at invasive aquatic plant prevention, eradication and management activities and the production and distribution of lake and river protection stickers required under section 7794-B.

Sec. A-6. 38 MRSA §419-C, sub-§2, as enacted by PL 1999, c. 722, §2, is amended to read:

2. Penalty. A person who ~~intentionally~~ violates this section commits a civil violation for which ~~a warning may be issued for the first violation~~, a forfeiture not to exceed ~~$50~~ $500 may be adjudged for the ~~2nd~~ first violation and a forfeiture not to exceed ~~$500~~ $2,500 may be adjudged for a subsequent violation.

Sec. A-7. 38 MRSA c. 20-A is enacted to read:

CHAPTER 20-A

PROGRAM TO PREVENT INFESTATION OF AND TO CONTROL INVASIVE AQUATIC PLANTS

§1861. Definitions

As used in this chapter and chapter 20-B, unless the context otherwise indicates, the following terms have the following meanings.

1. Invasive aquatic plant. "Invasive aquatic plant" means a species of aquatic plant described in section 410-N.

2. Nuisance species. "Nuisance species" means an aquatic or terrestrial nonindigenous species that threatens the diversity or abundance of native species, the ecological stability of infested waters or commercial, agricultural, aquacultural or recreational activity dependent on such waters as identified by the department through rulemaking.

3. Watercraft. "Watercraft" has the same meaning as in Title 12, section 7791, subsection 14.

§1862. Program to prevent infestation of and to control invasive aquatic plants

1. Program. The commissioner and the Commissioner of Inland Fisheries and Wildlife jointly shall implement a program to inspect watercraft, watercraft trailers and outboard motors at or near the border of the State and at boat launching sites for the presence of invasive aquatic plants and to provide educational materials to the public and to watercraft owners regarding invasive aquatic plants.

2. Other inspection stations allowed. The program established under this section also may include inspections at boat launching sites on inland waters that are already infested and at boat launching sites on the inland waters that have been identified as most at risk of introduction of invasive aquatic plants.

3. Informational material to be provided. The program established under this section must provide for the distribution of informational material on invasive aquatic plants, including a guide to identifying those

plants, information on how to prevent the spread of those plants and information on the potential environmental impact and other impacts of infestation.

4. Program implementation. During the 2001 boating season, the department and the Department of Inland Fisheries and Wildlife shall spend at least 5,000 person hours inspecting watercraft, watercraft trailers and outboard motors at selected boat launching sites and at no fewer than 10 roadside locations at or near the state border. In 2001, the program established under this section also must include an extensive educational effort involving a variety of media with the goal of informing the public of the risks posed by invasive aquatic plants, how to inspect watercraft, watercraft trailers and outboard motors for the presence of invasive aquatic plant material and how to properly dispose of that material. The program also must include other invasive aquatic plant-related inspection or educational efforts considered appropriate by the commissioner and the Commissioner of Inland Fisheries and Wildlife.

The program in 2002 and subsequent years must be at a level of effort determined by the commissioner and the Commissioner of Inland Fisheries and Wildlife in consultation with the Interagency Task Force on Invasive Aquatic Plant and Nuisance Species, as established in section 1871.

§1863. Invasive Aquatic Plant and Nuisance Species Fund

The Invasive Aquatic Plant and Nuisance Species Fund, referred to in this section as the "fund," is created within the department as a nonlapsing fund. The fund is administered by the commissioner. The fund is funded from fees collected for lake and river protection stickers issued under Title 12, section 7794-B and from other funds accepted for those purposes by the commissioner or allocated or appropriated by the Legislature. Money in the fund may be used only for costs related to conducting inspections under section 1862, conducting invasive aquatic plant prevention, containment, eradication and management activities and reimbursing agencies as necessary for costs associated with conducting or enforcing the provisions of this chapter and chapter 20-B. The commissioner may also use funds to contract with municipalities or other entities to conduct inspection, prevention or eradication programs to protect the inland waters of the State from invasive aquatic plant and nuisance species.

§1864. Emergency authority to regulate surface use

The commissioner and the Commissioner of Inland Fisheries and Wildlife may jointly issue an emergency order to restrict or prohibit the use of any watercraft on all or a portion of a water body that has a confirmed infestation of an invasive aquatic plant. The order must be for a specific period of time and may be issued only when the use of watercraft on that water body threatens to worsen or spread the infestation. The order may require that watercraft on waters affected by the order be taken out of the water only at locations identified in the order and be inspected and cleaned by the department upon removal. If the infested water body is a public drinking water supply, public notification by the commissioner and the Commissioner of Inland Fisheries and Wildlife is required prior to any response action that proposes the use of a chemical control agent. Public notification must include, at a minimum, notification of adjoining municipalities, property owners, drinking water suppliers who use that water supply and other affected persons, and must provide adequate time for public review and comment on the proposed emergency action. Chemical control agents may not be used on a water body that is a public water supply without the prior written consent of each public water supplier using that water body.

PART B

Sec. B-1. 5 MRSA §12004-D, sub-§6 is enacted to read:

6. Interagency Task Force on Invasive Aquatic Plants and Nuisance Species 38 MRSA §1871 Expenses Only

Sec. B-2. 38 MRSA c. 20-B is enacted to read:

CHAPTER 20-B

INVASIVE AQUATIC PLANTS AND NUISANCE SPECIES CONTROL

§1871. Interagency Task Force on Invasive Aquatic Plants and Nuisance Species

The Interagency Task Force on Invasive Aquatic Plants and Nuisance Species, as established by Title 5, section 12004-D, subsection 6 and referred to in this chapter as the "task force," is established to advise the Land and Water Resources Council, established in Title 5, section 3331, on

matters pertaining to research, control and eradication of invasive aquatic plants and nuisance species.

1. Membership. The task force consists of 17 members as follows:

A. The following 5 ex officio voting members:

(1) The commissioner or the commissioner's designee, who serves as the chair of the task force;

(2) The Commissioner of Inland Fisheries and Wildlife or the commissioner's designee;

(3) The Commissioner of Human Services or the commissioner's designee;

(4) The Commissioner of Agriculture, Food and Rural Resources or the commissioner's designee; and

(5) The Commissioner of Conservation or the commissioner's designee; and

B. Twelve members representing the public appointed by the Governor:

(1) One representative of the State's lake associations;

(2) One representative of a statewide recreational watercraft owners association;

(3) One representative of a statewide organization of marina owners;

(4) One representative of a lakes education program;

(5) One representative of public drinking water utilities;

(6) One representative of commercial tree and garden nurseries;

(7) One representative of home gardeners;

(8) One representative of municipal government;

(9) One representative of a statewide sporting association;

(10) One representative of a statewide outdoor recreational group;

(11) One person with demonstrated expertise in lake ecology; and

(12) One public member who has demonstrated experience or interest in the area of threats to fish and wildlife posed by invasive aquatic plants and nuisance species.

2. Terms. Members appointed by the Governor serve 4-year terms, except that, as determined by the Governor, of the initial appointments, 4 must be for 3 years, including the public member and 4 must be for 2 years. Members serve until their successors are appointed. A vacancy must be filled for the remainder of the unexpired term.

3. Advisory group of federal agency representatives. The task force may form an advisory group of federal agency representatives that may include, but is not limited to, representatives of the United States Department of the Interior, United States Fish and Wildlife Service and National Park Service assigned to Acadia National Park; the United States Department of Agriculture; the United States Forest Service within the United States Department of Agriculture; and the United States Environmental Protection Agency.

4. Duties. The task force may make recommendations to the Land and Water Resources Council on:

A. The importation and transportation of invasive aquatic plants and nuisance species;

B. Monitoring and educational programs aimed at the control of invasive aquatic plants and nuisance species ;

C. A comprehensive state invasive aquatic plants and nuisance species management plan that meets the requirements of the National Invasive Specie Act of 1996, 16 United States Code, Section 4722;

D. A statewide inventory of invasive aquatic plants and nuisance species;

E. Methods to improve cooperation of state, provincial, federal and nongovernmental agencies in the area of invasive aquatic plants and nuisance species prevention and control;

F. Recommendations on the feasibility of implementing lake protection assessment districts that allow residents and owners of land within 250 feet of inland waters to assess themselves to raise funds to assist in the prevention and control of invasive aquatic plants; and

G. Other recommendations as necessary to control the introduction of invasive aquatic plants and nuisance species in the State.

5. Regional cooperation. The task force shall work with representatives from federal, state and local agencies and private environmental and commercial interests in the northeastern United States to form a northeastern regional panel to establish priorities and coordinate activities to prevent the spread of milfoil and other invasive aquatic plants and nuisance species in the Northeast.

6. Staff. The department shall provide staff support to the task force.

§1872. Action plan to protect State's inland waters

The task force shall also recommend to the Land and Water Resources Council an actionplan to protect the State's inland waters from invasive aquatic plants and nuisance species. That plan may include, but is not limited to:

1. Identification of inland waters known to be infested. Identification of inland waters of the State that are known to be infested with invasive aquatic plants and nuisance species;

2. Vulnerability assessment. Recommendations on conducting a preliminary vulnerability assessment of the State's largest inland waters to identify the largest inland waters in the State most at risk of infestation by invasive aquatic plants and nuisance species. That assessment may include such factors as the proximity of the inland water body to other infested waters, proximity of major transportation routes, presence of a public watercraft launch, use of the inland water body by transient boaters, the number of lakefront property owners and other factors as the commissioner may determine to be appropriate. The assessment also must identify the most probable vectors or pathways of introduction of invasive aquatic plants and nuisance species and identify those inspection locations most likely to result in identification and prevention of new introductions;

3. Lake monitoring program. Recommendations on a program to monitor inland waters in the State for new introductions of invasive aquatic plants and nuisance species, including recommendations on implementing that program and methods to provide for the periodic inspection of inland waters for new introductions of invasive aquatic plants and nuisance species, particularly in areas close to public watercraft launch facilities;

4. Response program. Recommendations on a response program to deal with new introductions of invasive aquatic plants and nuisance species in inland waters in the State; and

5. Training and public information materials. Recommendations on the development and distribution of training materials and public information materials for use by the public, lake monitors and persons authorized to inspect boats for invasive aquatic plants and nuisance species.

PART C

Sec. C-1. Report to committee. The Commissioner of Environmental Protection and the Commissioner of Inland Fisheries and Wildlife jointly shall report to the Joint Standing Committee on Natural Resources and the Joint Standing Committee on Inland Fisheries and Wildlife no later than January 15, 2002 on the invasive aquatic plant education and inspection program, established in the Maine Revised Statutes, Title 38, section 1862, conducted during the 2001 boating season and on plans for that program for the boating seasons of 2002 and subsequent years. The report must quantify the hours spent by each agency on inspections, the number and type of informational materials produced and distributed and the number, type and location of any enforcement actions taken under the program. The report must also document the actual costs of operating that program in 2001 and the projected cost of operating the program in 2002 and subsequent years. The report shall evaluate the relative cost, efficiency and desirability of providing informational and inspection activities directly by the State and indirectly through contracts with municipalities and other entities.

Sec. C-2. Authority to report out legislation. The Joint Standing Committee on Natural Resources is authorized to report out legislation on invasive aquatic plants and nuisance species to the Second Regular Session of the 120th Legislature.

Sec. C-3. Transfers from the Maine Rainy Day Fund. On July 1, 2001, the State Controller shall transfer the following funds from the Maine Rainy Day Fund established under the Maine Revised Statutes, Title 5, section 1513:

1. Invasive Aquatic Plant and Nuisance Species Fund. Two hundred thirty thousand dollars is transferred from the Maine Rainy Day Fund to the Invasive Aquatic Plant and Nuisance Species Fund established in the Department of Environmental Protection pursuant to Title 38, section 1863; and

2. Lake and River Protection Fund. Three hundred thirty thousand dollars is transferred from the Rainy Day Fund to the Lake and River Protection Fund established in the Department of Inland Fisheries and Wildlife pursuant to Title 12, section 7806.

The Department of Environmental Protection and the Department of Inland Fisheries and Wildlife shall reimburse the Maine Rainy Day Fund in full no later than June 30, 2002 for all funds transferred under this section.

PART D

Sec. D-1. Allocation. The following funds are allocated from Other Special Revenue funds to carry out the purposes of this Act.

	2001-02	**2002-03**
ENVIRONMENTAL PROTECTION, DEPARTMENT OF		
Land and Water Quality		
Positions	(3.000)	(3.000)
Personal Services	$91,572	$178,342
All Other	$155,000	$640,000
Capital Expenditures		$17,000

Allocates funds for one additional Biologist I position to start on September 1, 2001, one additional Environmental Specialist III position to start on January 1, 2002, one additional Environmental Specialist III position to start on March 1, 2002 and operating costs necessary to implement an invasive aquatic plants prevention program.

DEPARTMENT OF ENVIRONMENTAL PROTECTION		
TOTAL	$246,572	$835,342
INLAND FISHERIES AND WILDLIFE, DEPARTMENT OF		
Enforcement Operations - Inland Fisheries and Wildlife		
Positions - Legislative Count		(6.000)
Personal Services	$40,000	$309,828
All Other	$15,000	$80,000
Capital Expenditures		$90,000
TOTAL	$55,000	$479,828
Allocates funds to cover overtime enforcement costs for Game Wardens in fiscal year 2001-02, for 6 additional Game Warden positions beginning in fiscal year 2002-03 and for operating costs necessary to implement an invasive aquatic plants prevention program.		
Licensing Services - Inland Fisheries and Wildlife		
All Other	$140,000	$140,000
Allocates funds for the printing and distribution of lake and river protection stickers.		
Public Information and Education - Division of		
Positions - Nonlegislative Count	(1.534)	(1.534)
Personal Services	$45,891	$48,186
All Other	$30,000	$30,000
TOTAL	$75,891	$78,186

Allocates funds to increase 11 Recreational Safety Coordinator positions from 750 hours per year to 1040 hours per year and for increased operational costs for these positions.

Fisheries and Hatcheries Operations

Positions - Nonlegislative Count	(0.500)	(0.500)
Personal Services	$24,103	$25,308
All Other	$5,000	$5,000
TOTAL	$29,103	$30,308

Allocates funds to fund one part-time Biologist I position and for increased operating costs for this position.

DEPARTMENT OF INLAND FISHERIES AND WILDLIFE TOTAL	$299,994	$728,322
TOTAL ALLOCATIONS	$546,566	$1,563,664

Emergency clause. In view of the emergency cited in the preamble, this Act takes effect when approved.

Effective June 20, 2001.

Appendix D: Advisory List of Invasive Aquatic Species

NOTE: If using website, see separate document.

Appendix E: Sample Fact Sheet

AQUATIC INVASIVE SPECIES
DRAFT FACT SHEET

Maine Department of Inland Fisheries & Wildlife **June 2002**

COMMON CARP (*CYPRINUS CARPIO*)

Carp are the largest members of the minnow family. They are heavy-bodied fish and are usually bronze colored with large scales, each with a dark spot at the base. Their dorsal fin is long, containing one serrated spine in the front of the fin and more than 16 soft rays. They have two barbels on each side of the upper jaw. Native to Asia, common carp was first introduced into this country from Europe in 1876, and has since spread from coast to coast. They are widely distributed in many states, but have only been found in a few coastal rivers and isolated lakes in Maine. Carp tolerate most aquatic habitats, but prefer warm streams or lakes with muddy bottoms where they feed primarily on plankton, insects, and aquatic plants. Spawning in late spring, they broadcast their small, adhesive eggs in shallow, weedy water.

Most anglers consider carp a nuisance because of their mud-bottom feeding habits and tendency to uproot plants while feeding. Feeding carp create considerable turbulence, which results in muddy water. Thus, their feeding areas are unsuitable for more popular sport fish. However, some people fish specifically for carp, which is understandable considering the sporty size some of these fish attain (over 50 pounds). Bow and arrow anglers also take them. In many parts of the world carp are considered a valuable human food resource. They have yet to acquire that reputation in the United States, and it is generally agreed that introduction of carp was a serious mistake. The carp story is an excellent example of the extreme care that must be exercised when one is tempted to "improve" upon the natural distribution of animal species.

Occurrence:	Coastal Maine rivers and a few isolated inland waters.
Biological Vigor:	Carp are very prolific with a single female capable of producing millions of eggs each spring. Carp can grow to over 50 lbs and can live for 20 years. They readily adapt to a variety of habitats. Carp are omnivorous eating a variety of plants and animals.
Maine Pathways:	Carp were originally stocked by federal fisheries managers, but may currently spread as bait, ornamental fishes, research animals, through illegal introductions, in ballast water, and naturally by migration. Dams on Maine rivers have prevented Carp from spreading inland in many locations.
Biological Impacts:	Carp are detrimental to native fish and waterfowl populations because they increase the water's turbidity, uproot and destroy submerged aquatic vegetation that is essential for the survival of native species. Young carp are likely food for other piscivorous animals.
Socio-economical Impacts:	Some people eat carp, and some anglers target carp, however, largely their introduction has been considered a mistake. Carp thrive in eutrophic waters.
Assessment Criteria:	Overall, the likelihood of carp spreading in Maine is high. They are very adaptable, highly fecund, long lived, alter the habitat to their advantage, and are currently impossible to remove from a water without completely depopulating it of all fish species.
More Information:	Fuller, Nico and Williams 1999. Nonindigenous Fishes: Introduced into Inland Waters of the United States.

Written by: Dr. Russell Danner, Maine Department of Inland Fisheries and Wildlife, June 13, 2002

Appendix F: Response to Public Comments

This memorandum presents a summary of the oral and written comments that the Task Force received on the invasive aquatic species action plan. During the month of August, 2002, the Task Force held four meetings around the state, and accepted written comments on the plan.

Attendance at these meetings was sparse; 15 people in Presque Isle (including 2 task force members/ 13 public); 12 in Augusta (3 task force members/6 members of public/2 press/Holly); 18 in Brewer (1 task force member/14 public/3 press); and 27 in Naples (1 task force member/26 public).

The Task Force received 29 written comments from 14 individuals (I), 7 organizations (O), and personnel from three agencies who did not necessarily represent agency policy (DIFW, DEP, and DAFRR). A "C" after DIFW represents the commissioner who shared most of his comments orally with John.

Task Force responses to the comments are indicated below in bold italics. Responses relating to comments for which no change was recommended directly follow the relevant comment. Where plan changes were made, responses are indented below the summarized comment:

GENERAL

1. Plan is well written and comprehensive. Good job in identifying many relevant species issues and articulating a clear plan of work. (3O,DAFRR, 5I)
2. DIFW and DEP deserve praise for efforts to educate citizens about invasive species. Education is the right approach, along with a solid action plan of response for infestations. (O) Place priority on enforcement in problem areas of state rather than blanketing everywhere, then follow-up with specific education(I).
3. Adopt what is most beneficial for all concerned -- education is a good start because of all those who unwittingly do the improper thing(DIFW).
4. Despite positive aspects, plan feels like a group of people sitting in the kitchen discussing plans for a new fire station while the house is on fire(I); Maine's "toughest laws in the nation" are a joke when not enforced with high profile prosecutions(I). Act (adopt plan) while there's still a chance to proceed(I). State should concentrate more on being environmentally appropriate than on politically correct(I). The DEP is not hearing the public. The public is demanding rapid, proactive action, creative solutions and empowerment at the local level. Regulatory authority needs to be shifted to the towns. DEP isn't doing enough and doesn't have the political will to address the invasive plant problem (Naples); and same for DIFW with regard to invasive fish(O,I+).
5. Plan is too plant-oriented(I). Plan should focus just on plants/Plan must address all invasive aquatic species to be eligible for federal funds (Naples/DEP). Need to strengthen emphasis on controlling introductions of fish(O, DIFW, I); plan is woefully inadequate to task of dealing with fish and inaccurate in information presented (for decades, Maine has ignored steady spread of exotic invasive fish and sportsmen and women are exceedingly frustrated(O,I). Pleased to see freshwater invertebrates and fish in plan(I,O); the threat to Maine's wild salmonid resource cannot be exaggerated; expand related measures outlined in the plan(O). Insert "plant and animal" in several locations where Maine's intention to address "invasive aquatic species" is referenced and insert several references acknowledging that limited resources deter/may deter state's ability to respond (DIFW-C). Place more emphasis on Eurasion milfoil and zebra mussels rather than variable milfoil that we should counter by natural and other means(O).
6. Marine invasives component should be eliminated so as not to dilute the mission and effectiveness of freshwater program(DEP). Pleased to see marine issues addressed(I,O).
7. Consensus was decided at Presque Isle meeting that efforts are worthwhile and state should continue with trying to eradicate variable milfoil.

   <u>Response</u>: General response to the plan was largely positive, with most criticism was leveled at the state for not being rapid, proactive, and creative enough, especially in regard to enforcement and inattention to fish. Also, some general concern was expressed about how resources are being/will be allocated.

   The task force responded to these criticisms by addressing specific tasks ever mindful of the twin goals to be as forceful and creative as possible, while focusing on those strategies and tasks that will have the greatest short and long term effects.

PROCESS

8. Is apathy or ineffective education the reason for so few task force and public members at the meetings(I)?

9. Implementation timetable is tight(I).
10. There should be better Task Force representation at public meetings on the plan.

Response: It makes great sense for the task force to be highly visible during implementation of the plan, i.e. to hold press conferences, be present in numbers at key events. The implementation timetable may be tight, but that is something that can be adjusted in each annual review. The primary need is to make sure that critical actions are highlighted and supported. To emphasize this "critical path", the executive summary has been revised to list only the highest priority tasks, which have also been highlighted boldly in the implementation.

PLAN PARTNERS

11. Get more people/agencies involved such as Maine Society for Wetland Scientists, Wildlife Management Institute, Center for Disease Control, Patuxent National Wildlife Refuge/research in regards to migratory birds and U.S. Military regarding wildlife management and protection(I).

Response: the more the merrier is great, but not to the extent that precious staff time and other resources are diverted from critical tasks. These organizations will be added to the interested parties list, and encouraged to contribute to the overall attention of invasive aquatic species issues in Maine.

INTRODUCTION

12. Page 2, What's at Stake: eliminate large and small-mouthed bass from the description of beneficial species(O).
13. Page 3, Biological Consequences, 1. Displace native species: Add an example of non-native fish (perch or bass) doing same thing (DIFW-C). Page 5, Socio-Economic Consequences, Spoil Sport Fisheries: indicate that some invasive species threaten native fish communities (DIFW-C) TF.
14. Page 6, Sidebar: DIFW does not have a "can do" policy and it is not too late to mount a meaningful effort(O).
15. Page 7, Lake infestations have prompted: Broaden instigators of heightened concern to include exotic species of fish(DIFW-C).

Response: The Task Force is highly sensitive to the need to stay focused on, and accomplish its mission well regarding, invasive aquatic plant issues. It also recognizes the equal potential for aquatic community harm from invasive fish species. Accordingly, the Task Force has made the above changes. It is reasonable and necessary to acknowledge the public's frustration with the state's lack of priority on invasive fish, whether the cause be lack of resources, internal fears that the state's stocking program will be undermined, lack of political will, influence of special interests, or whatever. The department has only given, and should not be blamed for giving, the fishing public what it had, up until recently, demanded. Dawning public awareness is precipitating a shift in values, and challenging the Task Force and the bureaucracy act decisively and comprehensively. See also items #17, 19, 23, 30, 44, 45, 46, and 47.

MAINE'S APPROACH

16. Page 13, item 2 under Prevention and Eradication: stop interstate sales and get the word out to Internet suppliers to mention that certain plants are not shipped to Maine, among other states(I).

Response: See item #51.

17. Page 13, item 1 under Selective Control: insert "or fish, introduced to large inland waterbodies" in second sentence after "ocean dynamics." In second paragraph, second sentence, after "vulnerable environments" insert "and eradicate undesirable species when practical. (DIFW-C) It is not clear how the freshwater fish species were separated into the "Prevention and Eradication" and "Selective Control/Impact Management" categories.

Response: Make the changes suggested by the Commissioner have been made.

18. Page 15, Vehicular surface use within infested waters: why can't something be done to control or eliminate boat traffic on Snow Pond (Messalonskee Lake)? ***See Item 39 below.*** Mechanical control: get some rules, guidelines, and training in place. ***Plan calls for this.*** Aquarium trade: do we have to wait until plan is in place to do something about plants already declared illegal? ***No change needed; action is already underway.*** Shouldn't there be a mechanism for informing local associations and authorities when an invasive is found in a water body? (I)

Response: yes, informing local entities is a good idea. The Task Force has added a component under Task 4A1, page 27, requiring state agencies to alert local entities.

ACTION PLAN

LEADING STRATEGIES

19. New strategy: see Perry comments for suggested language setting also a priority on increasing awareness, enforcement, rapid response, and

fishing rules related to illegal introduction/taking of non-native freshwater fish (DIFW-C).

Response**: The proposed language focuses on illegal introductions and makes it clear that the state intends to focus on this issue. It does not offer any indication that the department is willing to consider reviewing its stocking practices, though the department has already made some effort to work to do so (e.g. discussions with Acadia National Park about avoiding the introduction of new species). This is a tough issue for the department -- traditional sporting constituents have voiced strong concerns only about illegal stocking while environmental groups' have questioned legal stocking practices. The question is whether it is realistic to think that DIFW can reign in the illegal side without giving attention to the other as well. Because of the potential for deflection of the plan with this issue, the Task Force has incorporated the Commissioner's proposed language with some modifications. It has also added a specific task (see 3C3a) to the effect that it will work with the department to discuss stocking policy, species list, and other fish matters more fully by some time certain, making accommodation for public input along the way; and strengthened other tasks regarding illegal stocking as appropriate. See also items #17, 23, 30, and 43-46.

20. Future shift in priorities: if more waters become infested, emphasis must shift to containment and eradication(I). ***No change. Emphasis will follow future expediencies.***

LEADERSHIP, COORDINATION AND PLAN MONITORING

21. Funding: Increase fines and use money for enforcement and education not general fund(O,2I). Sticker money should also cover reclamation (fish), w/ DEP's portion currently written as most appropriate for this purpose(DIFW). Concern that funding inadequate to deal with larger problem of plants, fish, marine organisms (Naples). Sticker fee on motorboats only is discriminatory -- canoeists and other non-motorized craft and float planes should be included(5I/general feeling at Brewer & Augusta meetings) or general fund used instead(O). The idea of taxing shoreland owners/entire communities/general fund to pay for lake protection was raised in Brewer with mixed opinions expressed, but attendees generally disagreed w/ increasing boat registration in lieu of sticker. Whereas some Augusta meeting attendees expressed support for increasing boat registration fees to cover impacts of bigger boats, and suggested retaining environmental fines revenues collected within the watersheds in which they are collected. Generate revenues from stickers to be sold to boaters using state boat launches(I). Non-residents should pay even greater sticker fees, which should not be eliminated regardless of whatever changes, are made(2I). Funding should be expanded quickly but so as not unfairly to burden lakeshore owners(I); why not sell stickers at toll booths(I)? One person disagreed with requiring canoeists (with motors) to purchase stickers(I). Enforce sticker law and other provisions of invasives law (I); $10 is not too much to pay(I). Of 2,438 courtesy inspections thus far in 2002: 87% of all boats have stickers; 94% of resident boats have stickers; 80% of all boaters think sticker is reasonable; 84% of resident boats think sticker reasonable (Naples).

    Response**: The state flipflops too often when it establishes programs and the public gets frustrated and combative so there is a great need to evaluate how well the sticker program works before proposing substantive changes. The Task Force does, however, recognize the need for fairness and shared responsibility in protecting and caring for Maine waters, as well as the potential threat of invasive species spreading from the use of non-motorized watercraft and gear. Accordingly, the Task Force will evaluate the funding mechanism and revenue stream in 2003 and consider recommendations for its improvement to the 2004 Legislative session. In the meantime, the Task Force will also administratively request DEP and DIFW to be more creative and aggressive in producing sticker images, educating the public about the sticker, and providing transparent explanations of how funding is being spent to engender pride and participation in the program.

22. Task 1A2: mixed ideas include extending program to marine waters sometime in future, after being clear w/ DMR about purposes and when politically savvy(DEP); limiting program to freshwaters only(DEP); proposal as is(Augusta meeting).

    Response**: Public comment generally supported the breadth of plan, though marine commercial interests may have missed it on their radar screens. There is merit in keeping expectations and the process of integrating DMR into the program simple and focused. This plan largely does that, but the Task Force, in conjunction with DMR, DEP, and DIFW, will clarify details about how estuarine rivers will be integrated into the inspection, education, and sticker programs, during the Task Force's annual review of the program in 2003.

EDUCATION

23. Task 2A1: Make each agency individually responsible for coordinating education activities for the species over which it has control and

provide no mechanism for overall coordination, i.e. DEP plants, DMR marine, DIFW wildlife/fish (DIFW-C). DEP needs to do better job with PR (Naples).

Response: the plan establishes that each agency is responsible for its species/kingdom group, but this particular task does not state this distinction clearly. The Plan has been amended to clarify that responsibility is exercised by each agency, and that the Task Force will hold them collectively accountable for coordination of overarching matters such as consistent logos and messages, through the annual reporting process.

24. Task 2B1: Pleased to see education campaign broadened beyond milfoil (2O). There needs to be more media and TV coverage(Brewer).

    Response: the Task Force will brief and encourage new commissioners and legislative committees when in place after the upcoming election to ensure that existing positions funded by the sticker program are filled.

25. Task 2B1/2: Education process should include encouraging people to join state/national organizations(O). Target more publicity and website information for invasive plants and what they look like and what to do if invasive plants are found(4I). Target municipal officials and agents so they can administer sticker fee program well and educate the public; display posters (including photos of infestations) in town offices and sticker outlets; target other specific groups, i.e. sporting associations/clubs; target students, professors, faculty, research institutions raising plants in aquaria; and find a good way to share information among groups(I). Package the sticker with a brochure(I).

    Response: a new task has been added to ensure training for local officials and vendors who sell stickers. Informally direct staff to take into account other suggestions in agency efforts. The Task Force and agencies will encourage people to join non-governmental organization, in general, to promote greater attention to, and participation in, prevention, detection, and control efforts.

26. Funding: spend more money on education, especially plant identification and using milfoil image on stickers(I). ***No change needed. Plan directs agencies to evaluate the effectiveness of education and other program component annually, along with funding priorities. Agencies try to stretch dollars by piggybacking efforts on existing programs when cost effective, and encourage lake associations and other organizations to help out.***

ADVISORY LIST

27. Task 3A1: State the intent explicitly to give agencies authority to "explicitly prohibit certain species" (I).

    Response: this change has been made as it was intended.

28. Task 3A2: Listing process has the potential to become bureaucratic and political. Must be based upon the best biological and ecological scientific information and logical, concrete, process rather than on public opinion(O, Augusta general agreement). Threat assessment is not good criterion for non-native species list (I-I have no idea anymore what this means!). More tightly define "invasive aquatic species" (I). ***Plan already reflects most of these suggestions. Technical committee will evaluate criteria and definitions as it enters the mire!***
29. Species of fish listed under "Selective Control" can disrupt natural systems; and widespread stocking of these species should be more carefully scrutinized under plan; and other species such as lake trout, brown trout, and rainbow trout should be addressed in non-native locations. (I,2O-one of these organizations did not include lake trout) List of fish needs more discussion(DIFW). Rationale for placing species in management categories needs to be rational; now appears arbitrary(2O: see TroutUnlimited and Maine Audubon). Large and smallmouth bass and yellow and white perch should be included on the "Prevent and Eradicate" list-the single prosecution in Maine was for white perch(O). Chain pickerel and landlocked salmon should also be added to list along with exotic baitfish that may also be present; also include the impact of native smelt introductions from one Maine watershed to another(O). Include land-locked salmon, lamprey, aquaculture escapes, rock bass, togue, brown trout, rainbow trout(I).
30. Include Asian Tiger Mosquito (West Nile Virus) and other invasive insects (I).
31. Consider adding *Azolla*, an aquatic fern(I).
32. Add fungi such as Cercospora, Streptomyces, Blastomyces, fPenicillium, Aspergillus, and fish fungi(I).

    Response: agencies will evaluate the above species items #31, 32, and 33, and others that may arise later, and report listing recommendations back in one year as specified in Task 3A2 and 3C3a.

WATERCRAFT & EQUIPMENT TRANSPORT

33. Brewer meeting attendees agreed that there needs to be more than just a voluntary approach. ***See item #35 below.***
34. Provide mandatory cleaning stations on lakes, high traffic ramps and events, and/or at border crossings; involve SAM and conservation and fish and game clubs, Soil & Water Conservation Districts(see Brewer

meeting, Allen). ***Other states report that cleaning stations: lull people into complacency; are best used for species such as zebra mussels; and have not proven cost-effective. DEP, the Volunteer Lake Monitoring Program, and local organizations will monitor the effectiveness of the new facility on Sebago Lake, as well as experience elsewhere, and report to the Task Force if this approach appears more promising or expedient.***

35. Task 3B1b: there were mixed sentiments on inspections, ranging from recruit wardens to inspect boats throughout the state(I) TO enforce them in selected areas(I), TO use itinerant DIFW inspectors(I) TO do not use wardens at all because enforcement is not going to get the job done(O). Target inspections toward boaters not involved in outdoor/sportsmans organizations such as bass clubs, which have been inspecting at tournaments for over 5 years(I). State needs to be proactive. Make inspections mandatory on vulnerable lakes and for outgoing boats on infested waters, and allow towns to enact hours of operation for boat ramps (I, Naples general agreement). Improve educational information and enforcement at access sites (I, Brewer general agreement) and require boaters to register(I). Internal mechanisms cannot be inspected, i.e. jet skis/cooling water(I). Make boat ramp signs larger(I). Emphasis on volunteers is unrealistic(I). Sebago Lake State Park wash station and inspection program is prototype (Naples).

    <u>Response</u>: voluntary inspections are fraught with loopholes. Something more failsafe is needed -- Maine is only going to get one shot at doing "it" right, so we must be aggressive in finding ways to reduce the risk as much as possible and slow down what may be inevitable. We don't know yet which methods reduce risks best. So field testing as many "good ideas" as possible will help us evaluate and learn from the results. Before the next field season, DEP and DIFW will evaluate the methods, results, and cost-effectiveness of the last two seasons; obtain the legal clarification on related issues specified in Task 3B1d; compare and contrast the relative contribution of education and inspection programs; and recommend creative ways to the Task Force to increase compliance and reduce risks. The task force will address items 36, 38, and 39 below in the same way.

36. Task 3B1c: make application of roadside inspection program contingent upon agencies determining cost effectiveness(DEP). Require every out of state boater to go through truck inspection facilities for inspections(I); ask US Customs to distribute information(I). Target entrance areas to North Maine Woods and other recreation area for roadside inspections for out-of-state boats(I).

    <u>Response</u>: same recommendation as Item 35, along with the change in the first sentence below suggested by DEP:

    <u>Task 3B1c:</u> **Roadside Inspections ♦**

    An outside contractor, *temporary staff, or agency personnel may continue roadside inspections in subsequent seasons if the agencies determine these inspections to be cost effective.* ~~or temporary staff (under what authority?) will stop vehicles used to transport watercraft and gear at selected times and entry points.~~ *The program during 2002* ~~This year's program will likely only~~ involve*d only* the Turnpike rest area at York. Compliance will be voluntary until legal authority for mandatory inspection is clarified, but inspectors will offer verbal and/or written information about how to avoid spreading invasive plants, and to the operators of vehicles from Vermont, New York, upper Midwest, and Quebec information about zebra mussels and other invertebrates.

37. Task 3B2a: indicate what deference will be given to locally developed management plans. How can the risk of ignoring local efforts be balanced with avoiding ill-conceived local plans? (I) Sticker money should be used to relocate any boat launches so as not to lose access. (DIFW)

    <u>Response</u>: this task has been changed to state explicitly that the state will provide guidelines/criteria for state review and approval of local plans as specified in 4C1b.

38. Task 3B2b: eliminate approval of task force regarding institution of case-by-case strategies for controls(DEP). Balance the need for public access with other values rather than emphasizing obligation to ensure access to the exclusion of flexibility in managing infested sites (DEP). Eliminate the establishment of critical thresholds by 2004 and replace w/ an annual or periodic TF review(DEP). Apply strict standards for controlling infested waters, including closing access points (I). Mixed opinion whether DEP should share authority with DIFW over surface uses or water access sites – if an infestation is so severe that boating must be stopped, then all boating ought to be halted(O,I). Restricting access doesn't solve in-lake problem(I). Do not use task force to shut down access(I). When and which private launches should be closed, if at all? What will be done with private ramps if inspections are required at designated public access points? Instead of legal clarification, be proactive at state level and institute enabling legislation authorizing municipalities with vulnerable waterbodies to require mandatory inspections at access and entry points -- this would provide control without limitation(O/Naples general agreement).

Response: ***See response above under item #35. The following changes proposed by DEP have been made in the plan:***
Task 3B2b: **Establish Critical Threshold♦**
DEP and DIFW will monitor infestations or lakes that are likely to be infested and, depending upon the water body, legal authority, and costs and benefits~~, and with Task Force approval,~~ will institute one or more of the following strategies on a case-by-case basis:

- Make physical changes in the design of facilities, e.g. location of channel;
- Require inspection programs during high-traffic events such as open angling tournaments and regattas, or prohibit them altogether;
- Limit boat removal to specific locations/times;
- Require mandatory inspection of all boat removals, and/or
- Regulate public and private access facilities and limit the construction of new ones, taking into account the state's *need to balance the provision of public access with other resource and recreational values*. ~~obligation to ensure that public access to state waters is at least commensurate with private opportunities.~~

39. Task 3B2c: fundamentally change the way waters are accessed. Limit access on infested waters to only places where inspections are present, and eventually apply this policy to all waters. Gate launches when unattended. Involve local police and require a harbormaster on every lake. (I) DEP doesn't have shoreland zoning program staff to monitor use of new sites and doesn't see need for formal rule changes to adopt standards, at least as of this time; implementation shouldn't otherwise be a problem because DIFW develops the bulk of the launch sites and they are part of this plan(DEP – see Madore). Instead of legal clarification, be proactive at state level and institute enabling legislation authorizing municipalities with vulnerable waterbodies to require mandatory inspections at access and entry points -- this would provide control without limitation(O). Develop vulnerability criteria for determining best locations for access sites (see Augusta).
    Response: ***see item #36.***

Land use and environmental controls

40. Rather than enacting new regs, get tough and better enforce current land and water use laws/codes such as shoreland zoning (see recommendations under "Barnes" comments) (O/2I).
    Response: ***strong enforcement of environmental laws such as shoreland zoning and stormwater management are important because native species thrive better in clean environments whereas invasive aquatic species are highly adapted to flourishing in stressed systems. However, even strong enforcement of these laws will be ineffective if invasive aquatic species infest Maine waters. Task 4A2c has been amended to make sure that wardens, state police, and other enforcement personnel are acquainted with regulations relating to invasive aquatic species.***
41. Loosen benthic controls to allow people to create swimming areas in front of shore property. ***The Task Force finds no direct relationship to invasive aquatic species.***

INTRODUCTION INTO WILD

42. Because of the large traffic in seafoods/aquaculture, pay particular attention to Downeast lakes and streams (Salmon/ISA), especially Canadian fish, pet, plant traffic.
43. Task 3C3: the plan does not mention DIFW policies regarding legal stocking - if invasive species cause harm, there should be no new stocking programs involving species listed as invasive(O). In the interest of amphibian and insect conservation, the introduction of any fish into fishless ponds should be prohibited(O). Include more creative and effective ideas regarding curtailment of illegal fish stocking such as developing a traveling display for events, incorporating information into the "Hooked on Fishing" curriculum, and posting information at ramps and popular fishing spots--do no encourage anglers to take as many invasive fish as possible because it is contrary to Maine Bureau of Health warnings about fish consumption(O). The background information inaccurately states the problem because there have not been very many prosecutions—it is rather that wardens do not place high priority on enforcement(O). DIFW currently has only the capacity to reclaim one illegal invasive fish introduction per year; and needs more resources/assistance to effectively monitor and respond to invasive fish issues(DIFW-C).
    Response: ***the Task Force has added a new strategy, 3C3a, requesting DIFW to evaluate policies and programs related to the prevention, detection, and eradication of invasive fish introductions and report needed policy and programmatic changes to the Task Force by September of 2000.***
44. New task: recognize deliberate introduction by fisheries managers and escapes from fish culture facilities as pathways, and develop specific strategies for each. Establish a schedule for DIFW to develop a

specific strategy and a process for ensuring legal introductions with zero risk. Identify procedures for eliminating escapes from hatcheries. (O) ***Existing DIFW and DMR biosecurity measures cover this issue.***

EARLY DETECTION, RAPID RESPONSE, AND MANAGEMENT

45. Task 4B1: Create a rapid response component for fish, not just amend existing protocol(DIFW, DIFW-C, O) and for marine resources(DIFW-C). Include SAM in process (DIFW). Eliminate the term "rapid" as it may elevate public expectations unrealistically given state resources (DIFW-C). Be more specific – see third page, "Save Maine Lakes" comments (in Publiccomment.doc file), describing recommended protocol for rapid response(O). Include predetermined responses for each of the following events: discovery of species previously undocumented; discovery of species exotic to the watershed or waterbody; and accidental introduction of management species into a waterbody(O). Strong feelings that DEP isn't doing enough. Need genuinely RAPID response to new infestations (Naples).
    Response: Task 4B1 has been made more explicit to reflect DIFW's commitment to strengthen it's response to illegal fish introductions.
46. Strategy 4C1: Towns need guidance on how to spend $ on management, how to develop management plans (Naples); need a parallel set of tasks for reducing fish infestations.
    Response: guidance to communities concerning control plans for plants is already specified in the plan. Encouraging similar initiatives for fish is not a high priority at this time, given other competing demands.
47. Task 4C1b: why not grants for prevention as well(I)?
    Response: DEP is phasing in prevention grants, having conducted a small pilot this year and has plans for expansion in upcoming year. Task 4C1b now specifies this.
48. Task 4C1d: clarify in the Implementation Program Table whether responsibility for establishing surface use controls should belong to a single agency to reduce confusion, promote efficiency. Should be DEP because mandate is broader and track record is better(2I). Balance the need for public access with other values versus emphasizing obligation to ensure access (DEP-see Bouchard). Remind municipalities that they can include controls in their comprehensive plans(I).
    Response: the Task Force has no recommendation on which agency(s) should be in charge. The suggested revision below relating to balancing values has been made in the plan, however:
    Task 4C1d: **Surface Use Restrictions On Infested Waters♦**
    DEP and DIFW will develop a procedure for determining when to apply limited-duration surface use restrictions on infested waters. This procedure will take into account the state's *need to balance the provision of public access with other resource and recreational values.* ~~obligation to ensure that public access to state waters is at least commensurate with private opportunities~~. As part of this effort, they will work with the DOC Boating Facility Program, municipalities and lake associations to determine when and how non-state entities could be responsible for plan enforcement and buoy deployment.
49. New task: develop guidelines for use of benthic barriers (see Uecker for details). ***This task is left up to DEP as part of Task 4C2a on plant controls.***
50. Task 4C2c: strengthen language on herbicides and pesticides, and never allow in public supply waters(I). ***The state must review and approve all use of pesticides in surface drinking water supplies and has never been asked to do so, and is exceedingly unlikely to agree if ever asked.*** Address problem of website sales of pesticides, especially misleading ones that say a chemical is "registered for sale" in Maine, i.e. stop interstate sales and get the word out to Internet suppliers to mention that certain plants are not shipped to Maine, among other states(I).
    Response: Tasks 3C1a/b now states explicitly that campaigns against website sales are intended to be part of this initiative.

INVENTORY, RESEARCH, INFORMATION MANAGEMENT

51. Task 5A2: Eliminate mention of "associated invertebrates" from plant baseline inventory and have **DIFW** take charge of them instead(DEP, DIFW-C).
    Response: this change has been made (see also Task 5A3).
52. Task 5A3: conduct additional baseline information for freshwater fish (DIFW-C,O).
    Response: the task force has adopted the DIFW recommendation below to accomplish this:
    Task 5A3: Maine Lakes Inventory
    DIFW will seek funding to expand the lake and pond inventory of fish and other animal species by conducting
    both new surveys of unsurveyed waters and resurveys of waters that have not been visited in many years. These data will become part of the Maine Aquatic Biodiversity database and will be used as a tool for identifying waters of highest natural biodiversity, establish a baseline of ecological conditions prior to invasive species infestation and track distribution of invasive aquatic animal species in the state.

53. Task 5A5: substitute DMR staff, if resources allow, here for DEP coordinator(DEP).

    Response: this change has been made.

54. Each data storage item should mention the use of GIS. (I)

    Response: this change has been made.

55. Task 5B2b: be more proactive and try to get funding for genetic research on variable/Eurasian milfoil and involve our Congressional delegation in the funding search. To what extent has DEP applied for research grants to date? (O) Need more research on finding biological controls and a chemical for milfoil(I).

    Response: The Task Force and state agencies do not have the resources to actively pursue such research but they will be enthusiastic supporters of those who do.

56. Strategy 5C1: add a new objective "Protection of Unique and Sensitive Aquatic Communities." For these, identify three categories of protection and develop protection plans (see TroutUnlimited). ***The issue of "Protection of Unique. . ." categories is implicit in the biodiversity project (5A3) and list vulnerable waters (3B1a).*** Develop lists of contaminated and uncontaminated waters, and the species present in contaminated ones.

    Response: Task 5C1a has been changed to explicitly state that each agency is responsible for tracking the occurrence of invasive species under its authority.

GLOSSARY

57. Include definition of "indigenous," same as "native"(DEP).

    Response: this change has been made.

MISCELLANEOUS

Non-substantive comments, typos, and citation changes have been made. Changes also have been made to the implementation tables to reflect the responses to public comments and to incorporate additional information from DIFW.

Appendix G: Endnotes

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[2] Dana Wallace, former Department of Marine Resources Marine Biologist, personal communication.
[3] *Minnesota Sea Grant Exotic Species Factsheet: rusty crayfish*
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[8] Unites States Geological Survey: Nonindigenous Aquatic Species Factsheet: *Cyprinus carpio* Linnaeus 1758.
[9] Hsu, Tommy. 2000. *A Hedonic Study of the Effects of Lake Water Clarity and Aquatic Plants on Lakefront Property Prices in Vermont*. Unpublished MS Thesis, University of Maine. August 2000, 91 pp.
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[12] *Minnesota Sea Grant Exotic Species Factsheet: rusty crayfish*
[13] Maine Water Utilities Association Position Paper; Invasive Aquatic Plants. January 29, 2002/Cooke, G.D. and R.E. Carlson. *Reservoir Management for Water Quality and THM Precursor Control*. AWWA Research Foundation and the American Water Works Association. December 1989.
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[20] National Invasive Species Council. *Management Plan: Meeting the Invasive Species Challenge*. January 18, 2001.
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