

INVASIVE ANIMALS OF THE ADIRONDACKS



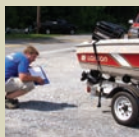
WWW.ADKINVASIVES.COM

WHAT ARE INVASIVE SPECIES?

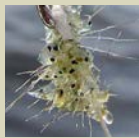
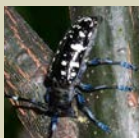
Invasive species are plants, animals, and other organisms either accidentally or intentionally introduced from other places that cause harm to the environment, economy, or human health. In recent years, the rate and risks of invasive species introductions have increased due to human population growth, movement of people and materials, and environmental alteration.

Once established, invasive species negatively impact agriculture, industry, recreation, forestry, fisheries, human health, and the environment. Due to the lack of natural controls and high reproductive ability, invasives can quickly become widespread.

Invasive species change not only the way systems look but also the way they function. Infestations can disrupt forest succession, species composition, water absorption and circulation, nutrient cycling, or even create a toxic environment. They degrade habitat which can reduce the number and variety of fish and wildlife and can impact agricultural systems which can affect crop productivity and our food supply. Invasive species also pose risks to human health and safety by exacerbating allergies and introducing new diseases.



The Adirondack Park Invasive Plant Program (APIPP) is a coalition of organizations and citizens taking action against invasive species in the Adirondack region.



IDENTIFICATION

When identifying invasive species, be aware that some may look similar to native species. Also, looking for the warning signs and symptoms of an infestation may help with detection methods.

MANAGEMENT

Management techniques are different for each species. By knowing the biology of each species, you can prevent well-intentioned control methods from doing more harm than good. Knowing the extent of the invasion will inform the management approach. Also, be informed about the appropriate control methods and permits needed before beginning any management program.

SPREAD PREVENTION

Each of us - from boaters to anglers, campers to climbers, and homeowners to business owners - can help prevent the spread of invasive species.

START NOW

Learn more about the invasive species that are, or have the potential to become, harmful to the health of our public and private lands and waterways.

NATIVE	HISTORICALLY FOUND IN AN AREA
NONNATIVE	INTRODUCED FROM SOMEWHERE ELSE
INVASIVE	CAUSES MEASURABLE HARM TO THE ENVIRONMENT, ECONOMY, OR HUMAN HEALTH
NUISANCE	INTERFERES WITH HUMAN ACTIVITY

TERRESTRIAL INVASIVE ANIMALS

Many terrestrial invasive animals are unintentionally introduced by human movement and the transport of infested materials. Others are introduced for game purposes. Their expansion into natural and agricultural areas now puts at risk the value of our forests and farms and the safety of our urban and suburban communities. Infestations can decrease the health, diversity, and productivity of our forests and farms and limit the economic benefits derived from wood and agricultural products. Invasive animals and forest pests are especially problematic because eradication is often impossible. Best management practices revolve around the early detection of problem species; however, even then, control options may not be available. Contact APIPP if you think you have spotted an invasive animal or for more information on best management practices for safe and appropriate control methods.

QUICK TIPS FOR SPREAD PREVENTION

- ❖ Don't move firewood. Buy firewood where you plan to burn it.
- ❖ Clean gear and outdoor recreation equipment.
- ❖ Buy and plant only safe and approved nursery trees.
- ❖ Carefully inspect trees when transplanting.
- ❖ Do not release any unwanted pets into the wild.



EMERALD ASH BORER

(EAB) *Agrilus planipennis* ORIGIN: ASIA

David Cappaert, Michigan State University

DESCRIPTION EAB has a golden-green body with dark, metallic green wings and a purplish-red abdomen. Adult beetles average 3/8" to 3/4" long and 1/6" wide. EAB emerges in late spring, flying from June to August.

HABITAT EAB requires only their host trees - native ash. In natural forest settings, ash is very common. It is also widely used as a street tree in urban and suburban areas.

THREAT Larvae feed on bark tissue, effectively girdling the tree. EAB has killed tens of millions of trees in the U.S.

MANAGEMENT Eradication is not an option. Reducing the transport of infested ash nursery stock, firewood, unprocessed ash logs, and other ash products can slow the spread. Chemicals and biological controls are being explored. Education is also key.

SYMPTOMS D-shaped holes in the bark, S-shaped larval galleries, branches and shoots that grow from the base of the tree, and excessive woodpecker activity.

Daniel Herms, Ohio State University



Eric R. Day, Virginia Polytechnic Institute and State University



ASIAN LONGHORNED BEETLE

(ALB) *Anoplophora glabripennis* ORIGIN: Asia

Dean Morewood, Health Canada

DESCRIPTION ALB has a glossy black body with white spots on the top of the wings. Adults are 3/4" to 1" long. Antennae are roughly 2 times the body length with distinctive black and white bands. The legs and antennae have a bluish tinge. Adults are present from July to October.

HABITAT ALB attacks hardwood trees including maple, horsechestnut, ash, and more, and can survive in most regions of the country where host trees exist.

THREAT Adults feed on leaves and twigs; larvae feed directly on critical bark layers. Repeated attacks lead to die-back of the tree crown and eventually death.

MANAGEMENT Management includes quarantines in infested areas, cutting, chipping, burning, and ongoing research on insecticides. Prevention includes shipping restrictions and extensive surveys for early detection. Education about using local firewood is also key.

SYMPTOMS Round exit holes 3/8" to 3/4" in diameter, sawdust accumulation, sap oozing from the exit holes, and dead and dying tree limbs with yellowing leaves.

Kenneth R. Law, USDA APHIS PPO



Dean Morewood, Health Canada



SIREX (EUROPEAN) WOODWASP

Sirex noctilio ORIGIN: Eurasia and North Africa

David R. Lance, USDA APHIS PPQ

DESCRIPTION Woodwasps (or horntails) are large, full-bodied insects about 1-1 ½" long. Adult females have dark metallic blue or black bodies with orange legs. The male's head and thorax are metallic blue, and the abdomen is orange at the center and black at the base. Adults emerge from July to September.

HABITAT *Sirex* can inhabit any area containing softwood stands, preying mostly on pine species including Scotch, red, and Eastern white pine.

THREAT While native woodwasps prey on dead or dying pines, *Sirex* preys on healthy, living pines. Females inject a symbiotic fungus, toxic mucus, and eggs into the tree. The fungus and mucus work together and kill the tree in a few weeks or months.

MANAGEMENT Management includes extensive surveys, bio-control research including the use of parasitic nematodes, regulating the transport of wood materials, education and outreach, and applied research.

SYMPTOMS Wilting, yellowing of the tree crown, resin drops at the egg laying sites, and narrow bands of brownish fungal stain in the outer sapwood.

Female ovipositing eggs into the bark of the tree.



Vicky Klasmer, Instituto Nacional de Tecnología Agropecuaria



BROWN SPRUCE LONGHORNED BEETLE

Tetropium fuscum ORIGIN: Europe

Jon Sweeney, Natural Resources Canada

DESCRIPTION This flattened brown beetle is <1" in length and is very similar to native long-horned beetles but has a darker head with reddish-brown antennae about 1/2 the length of its body. They are active June through August.

HABITAT This pest attacks mainly spruce but also fir, pine, and larch species, and rarely hardwoods.

THREAT Its broad host range puts all spruce forests of North America at risk. Eggs are laid under the bark where larvae feed on tissue, severely weakening the tree. With its conspicuous nature and slow development of symptoms, new populations may go undetected for years. It can disperse more than several miles per year.

MANAGEMENT Control includes silvicultural tactics such as cutting and burning infested trees, chemical and biological insecticides, and natural biological control agents including parasitic wasps and woodpeckers.

SYMPTOMS Oval to round holes in bark, sawdust and resin on stems/trunk, and networks of feeding tunnels up to 6 mm across just under the bark. Weakened tree needles fade in color after about a year of infestation.

Jon Sweeney, Natural Resources Canada



Georgette Smith, Canadian Forest Service



BALSAM WOOLLY ADELGID

Adelges piceae ORIGIN: Europe

Robert L. Anderson, USDA Forest Service

DESCRIPTION Adults are tiny, about 1 mm long, and appear dark purple to black in color. They produce a thick layer of a light colored, waxy, wool-like material that covers their body.

HABITAT This insect infests and kills fir trees. North American species are the most sensitive to attack.

THREAT As the adelgids feed on the bark of stems, they release toxins contained in their saliva. These toxins severely weaken the tree, affecting development and growth. Extensive tree mortality has occurred in the Southeast and Northwest U.S.

MANAGEMENT Several species of predatory insects have been introduced into North America, but they are ineffective on a large scale. Applying insecticides by aerial spraying over large areas is not possible, but spraying individual trees has proven effective.

SYMPTOMS Gouting occurs with distinct swellings around the buds and branch nodes as terminal growth is stunted. The foliage in a dying tree generally turns yellow then deep red or brown before the needles fall off and the tree dies.

David Beckman, Idaho
Department of Lands



Great Smoky Mountains National
Park Resource Management Archive



HEMLOCK WOOLLY ADELGID

(HWA) *Adelges tsugae* ORIGIN: Asia

Chris Evans, River to River CWMA

DESCRIPTION HWA is tiny, less than 1/16" long, and is dark reddish-brown to purplish-black in color. Its name derives from a white "wool-like" covering called an ovisac on mature egg laying adults.

HABITAT HWA develops and reproduces on all hemlock species but attacks only Eastern and Carolina hemlocks.

THREAT The adelgid causes hemlock decline and mortality within 4-10 years of infestation in its northern range. During the fall and winter months, developing adelgids feed on young twig tissue, including starch reserves critical to the tree's survival.

MANAGEMENT Moving bird feeders away from hemlocks, removing infested trees from woodlots, and state quarantines may help to slow the spread, while insecticides and biological controls can be used for local eradication.

SYMPTOMS The white, woolly ovisacs can be easily identified on the undersides of hemlock branch tips from late fall to early summer.

Robert L. Anderson, USDA Forest Service



Michael Montgomery, USDA Forest Service



VIBURNUM LEAF BEETLE

Pyrrhalta viburni ORIGIN: Europe

Paul Weston, Cornell University

DESCRIPTION Viburnum leaf beetle adults are brown and about 1/4" long.

HABITAT These beetles have spread into much of the Northeastern U.S. and Canada, infesting only viburnum plants such as the cranberrybush.

THREAT Both the larval and adult stages feed on viburnum plant foliage without adequate time to re-vegetate. Two or three consecutive years of defoliation can cause significant die-back of the canopy and death.

MANAGEMENT Management includes the physical removal and destruction of eggs, larvae, and adults, and the use of pesticides. Several predaceous insects have been effective such as the multicolored Asian lady beetle, larvae of lacewings beetles, and spined soldier bugs. Other methods such as the use of sticky barriers to restrict larval movement are being explored.

SYMPTOMS Characteristic egg lumps in vertical rows on terminal twigs and heavily chewed leaves.

Paul Weston, Cornell University



Milan Zubrik, Forest Research Institute - Slovakia



ALFALFA SNOUT BEETLE

Otiorynchus ligustici ORIGIN: Europe

Gyorgy Csoka, Hungary Forest Research Institute

DESCRIPTION The alfalfa snout beetle is a grey, wingless beetle about 3/8" long.

HABITAT The beetle has been most destructive in northern New York and Ontario where it attacks alfalfa, clovers, and other legumes.

THREAT Larvae feed on the taproot while the adults consume the leaves. Together, they have affected large amounts of northern NY's alfalfa fields, sometimes destroying a crop in a single year and dramatically reducing milk production on affected dairy farms.

MANAGEMENT Since the beetle doesn't fly, infected fields can be managed by strategic crop placement and rotation - keeping alfalfa isolated and surrounded by other non-host crops. Researchers in NY also found that the combination of two species of nematodes appears to cause beetle populations to collapse to manageable levels.

SYMPTOMS Detections can be made during a dry fall from dying plants that are visible in a green field of alfalfa. Clear signs of root gouging can also be seen upon digging up plants.



Root damage from larvae.



EARTHWORMS

Lumbricus spp., *Aporrectodea* spp. **ORIGIN:** Eurasia

Kent Simmons, University of Winnipeg

DESCRIPTION There are many species ranging from 1" to 2" or more in length. In North America, earthworms are mostly brown or variations of brown and yellow.

HABITAT Since the end of the last great Ice Age, very few earthworms were found in most of North America. They were introduced intentionally by European settlers to fertilize land for agriculture. Now, about 1/3 of the more than 180 species found from Canada to Mexico are invasive.

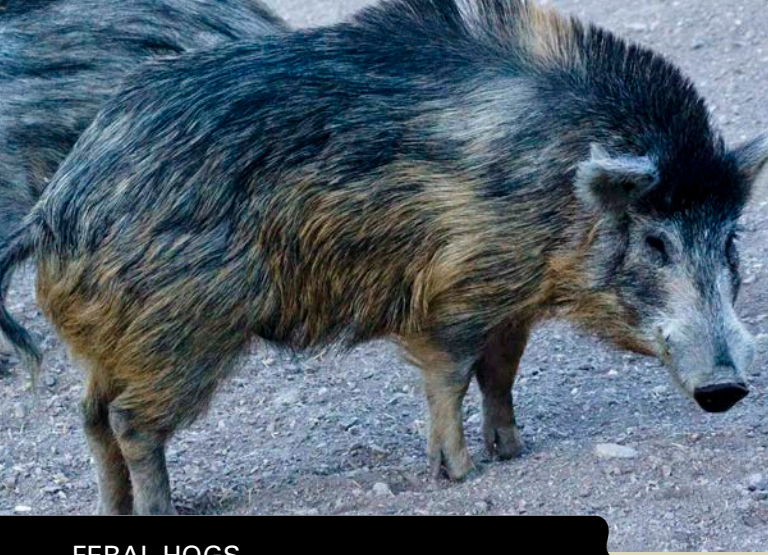
THREAT Earthworms may increase the productivity of soil in lawns and gardens, but they are not helpful in forests that have developed without them. Many organisms depend on a thick layer of leaf litter, or duff. Duff promotes the growth of native plants and trees and prevents soil erosion. Earthworms convert duff to topsoil, changing a forest's entire biology and displacing natives.

MANAGEMENT Little can be done about eliminating worms that are already present in the soil, but it is possible to help prevent their spread. Without the help of humans, earthworms move less than half a mile over 100 years. Regulating soil transport, disposal of unused fishing bait, and earthworms used for compost can help.

Earthworms are not native to the Adirondacks and can alter the form and function of forest systems.



Robert Lee



FERAL HOGS

Sus scrofa ORIGIN: Europe, Asia

Homeland Advisory Group Eradication Program

DESCRIPTION Feral hogs, or feral swine, can include domestic pigs or “pet” pigs that have been released or escaped captivity and “gone wild,” wild boar (native to Eurasia) that escaped from licensed shooting preserves, or a hybrid cross between domestic pigs and wild boar.

HABITAT As a result of their diverse diet, feral hogs can occupy a wide range of habitats including agricultural areas, forests, wetlands, and even suburbs. They are present in over 40 states in the U.S., including NY.

THREAT Feral hogs have very destructive feeding habits, an aggressive nature, the potential to spread disease, and an increasingly growing population. They feed in large quantities on agricultural crops, native vegetation, and wildlife. They destroy suitable habitat, cause erosion, and damage property.

MANAGEMENT Management includes relocation, trapping, hunting, poisoning, sterilization, and oral contraceptives.



Digging and rooting activity of feral hogs damages soils, native plants, and crops.



SUDDEN OAK DEATH

Pathogen: *Phytophthora ramorum* ORIGIN: unknown

Joseph O'Brien, USDA Forest Service

DESCRIPTION Sudden oak death is a plant disease caused by a fungus pathogen.

HABITAT The fungus kills several oak tree species by causing a leaf disease called ramorum dieback. It thrives in cool, wet climates and has been especially damaging along the west coast.

THREAT The fungus affects bark tissue and causes death in one to several years. It is spread by spores and transported nursery stock and resides in the soil in infested areas.

MANAGEMENT Management includes quarantines, nursery shipping regulations, and proper disposal at approved biomass facilities. While there is no cure, preventive chemical treatments can be used to help protect susceptible trees as well as suppress disease progression if applied in the early stages. So far, other options, such as foliar sprays and soil amendments, have not been found effective.

SYMPTOMS Cankers form on stems that bleed a black or reddish ooze that can leave stains. Cankered trees may survive 1 to 3 years but once crown dieback begins, leaves turn from green to pale yellow to brown within a few weeks.

Joseph O'Brien, USDA Forest Service



Joseph O'Brien, USDA Forest Service





WHITE NOSE SYNDROME

Fungus: *Geomyces destructans* ORIGIN: unconfirmed

Al Hicks, NYS DEC

DESCRIPTION White nose syndrome is a newly discovered cold-loving fungus that invades the skin of bats, leaving a visible ring of white fungus around the face, ears, and parts of the body.

HABITAT In the U.S., the fungus was first detected in caves near Albany, NY. It has spread to Mid-Atlantic states and northward into Canada. It is also present in Europe, which may be the fungus' origin.

THREAT The fungus has killed over a million bats, sometimes wiping out 90-100% of individual hibernacula where bats hibernate communally in caves. Summer migrations may increase the chance of transmission. As the primary predators of night-flying insects, bats are crucial to a healthy ecosystem.

MANAGEMENT Much is still unknown about white nose syndrome. Ongoing research is aimed at better understanding the fungus and its spread, providing roosting alternatives, and enhancing communication among researchers, agencies, and the general public.



Impacted bats deplete fat reserves months before their springtime emergence from hibernation and starve to death.

AQUATIC INVASIVE ANIMALS

Aquatic invasive animals and pathogens are a serious threat to Adirondack lakes, ponds, rivers, and streams. These species are not native to Adirondack waters. When introduced, they outcompete or harm beneficial native species, alter the food chain, degrade water quality, spread rapidly, interfere with recreation, and impact the efficiency of water transport systems and equipment. Just a few individuals from several of these species can infest an entire waterway. Once infestations are widespread, control efforts are difficult and costly, if not impossible. Prevention, early detection, and rapid response are keys to successful eradication.

QUICK TIPS FOR SPREAD PREVENTION

- ❖ Check, clean, and dry all boating, angling, and recreational gear before moving between waterways.
 - ❖ Never transport uncertified fish between waters.
 - ❖ Always dispose of unwanted bait in the trash.
 - ❖ Never release unwanted species from home aquariums.
 - ❖ Never release live seafood into the wild.
-



ZEBRA MUSSEL/QUAGGA MUSSEL

Dreissena polymorpha / *Dreissena rostriformis bugensis*

ORIGIN: Eurasia

Randy Westbrooks, U.S. Geological Survey

DESCRIPTION Zebra mussels and the closely related quagga mussels are filter-feeding freshwater bivalve mollusks. Zebra mussels are small, 1/4" to 1 1/2" long, and D-shaped with light and dark brown stripes. The quagga mussel is paler toward the end of the hinge and is slightly larger, about 3/4" wide.

HABITAT Zebra mussels inhabit freshwater to depths of 50 feet and quaggas up to 90 feet, attaching to most surfaces including sand, silt, and harder substrates.

THREAT Invasive mussels displace native species, attach to and cover many surfaces, have sharp shells, and are a nuisance to humans. Although they have some predators, they breed faster than they can be consumed. As filter feeders, they remove particles from the water, affecting the clarity, content, and ultimately the food chain of aquatic ecosystems.

MANAGEMENT Once established, very little can be done apart from manual removal. In closed human systems such as water treatment plants, chemical, thermal, electrical, and biological controls can be used. The best method is prevention by cleaning boats, bait buckets and gear.

Amy Benson, U.S. Geological Survey



Quagga Mussel



Zebra Mussel

Amy Benson, U.S. Geological Survey



SPINY & FISH HOOK WATER FLEAS

Bythotrephes cederstroemi / *Cercopagis bengoi*

ORIGIN: Eurasia

Michigan Sea Grant

DESCRIPTION Spiny and fish hook water fleas are tiny crustaceans less than 1/2" long with long, sharp, barbed tails. The fish hook water flea has a more slender spine and prominent S-shaped loop on the tail. Both species collect in gelatinous globs on fishing equipment and lines.

HABITAT Spiny and fish hook water fleas thrive in deep lakes but can also be found in shallow lakes and rivers.

THREAT They are voracious predators of small zooplankton, like *Daphnia*, an important food for young native fishes. They reproduce rapidly and eggs are capable of lying dormant all winter, resisting drying and freezing. As a result of their sharp spines, smaller fish cannot readily consume them, adding to their explosive populations.

MANAGEMENT No control methods exist. Prevention is key. Since fishing and boating equipment is the most likely means of spread, anglers and water-users must take precautions. Boats and gear should be thoroughly checked, cleaned, and dried before entering new waterways.

Water fleas have long spiny tails that become entangled on fishing lines. No control methods exist for water fleas.



Spiny Water Flea



ASIAN CLAM

Corbicula fluminea ORIGIN: Asia

Emily DeBolt, Lake George Association (LGA)

DESCRIPTION Asian clam is a freshwater bivalve mollusk. The outside shells are yellow-green to brown with elevated concentric rings. If the color chips away, white spots can be seen underneath. The inside of the shells may be light purple. Adults are small, usually less than 1 1/2" in length.

HABITAT This species is found in freshwater throughout the U.S. It is hardy and persistent and can withstand many aquatic habitats, often preferring the warmer, shallower areas near the shore.

THREAT Asian clam displaces highly vulnerable native mollusks that are often already threatened, reduces biodiversity, alters the food chain, may cause algae blooms, damages equipment, and clogs industrial and commercial water systems. They are fast growing and can spread quickly. Able to self-fertilize, one clam can release roughly 350 offspring daily if conditions permit.

MANAGEMENT In closed environments such as power plants, chemical and mechanical methods can be used. Management is very difficult and labor intensive in a natural aquatic system. Stopping aquarium dumping and live food releases, and cleaning boats and bait buckets are critical to preventing its spread.

Emily DeBolt, Lake George Assoc.



Asian clams grow and spread quickly, changing water chemistry and clarity, which may lead to algae blooms.



CHINESE MYSTERY SNAIL

Cipangopaludina chinensis ORIGIN: Asia

Kim Jinsuk

DESCRIPTION The Chinese mystery snail is a large fresh-water snail about 2" in length. The shell is smooth, uniform in color, and light to dark olive-green with 6 to 7 convex, deeply indented whorls. It looks similar to the native banded mystery snail.

HABITAT Snails can be found in a variety of calm water bodies with some form of mud substrate.

THREAT Imported for the food and aquarium industries and pond stocking, escaped snails serve as vectors for the transmission of several parasites and diseases, some of which may infect humans. Their shells can clog water management equipment, and they compete with native snails and fish for food and space.

MANAGEMENT Chinese mystery snails are extremely hard to eradicate. Physical removal is limited and labor intensive, and the snails are too big for some native predators to consume. Chemical options are discouraged because of the snails' ability to "close up" and avoid the outside environment.

Chinese mystery snails serve as vectors for the transmission of several parasites and diseases.



Courtesy of Mail Tribune, Jamie Lusch



RUSTY CRAYFISH

Orconectes rusticus ORIGIN: Ohio and Kentucky

Jeff Gunderson, Minnesota Sea Grant

DESCRIPTION Rusty crayfish resemble native crayfish but can be identified by their more robust claws and by the dark, rusty spots on each side of the carapace (upper part of the shell).

HABITAT Native to the Ohio River Basin, the rusty crayfish is commonly sold and used as bait and spread to several states mostly in the Midwest and Northeast. They inhabit lakes, ponds, and streams, preferring areas that offer rocks, logs, or other debris as cover.

THREAT Rusty crayfish reduce aquatic plant abundance and diversity - affecting habitat for invertebrates and young fish and increasing erosion. They also displace native crayfish by outcompeting them with their high metabolic rate, appetite, and high population densities.

MANAGEMENT No environmentally safe means of eradication exists, but populations may be minimized by intensive harvesting or increasing predator populations. Educating anglers, trappers, and bait dealers is critical to reduce the risk of spreading them to new areas.



Jeff Gunderson

*Learn to identify rusty crayfish.
Never release unwanted bait into
any waterway.*



NEW ZEALAND MUD SNAIL

Potamopyrgus antipodarum ORIGIN: New Zealand

Robyn Draheim, Portland State University

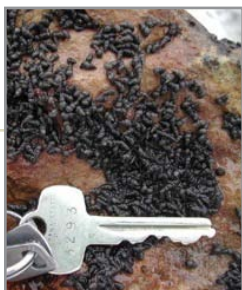
DESCRIPTION New Zealand mud snail is a very small freshwater snail, averaging only 1/5" long. The shell has 7 or 8 whorls with deep grooves and varies from gray and dark brown to light brown.

HABITAT The snail has spread throughout Europe, the Great Lakes, and throughout many Western states. It inhabits fresh and brackish streams and lakes and thrives in disturbed watersheds and along shorelines with silt and organic matter substrates.

THREAT New Zealand mud snail has no natural predators or parasites in the U.S. It reaches staggering concentrations, outcompetes native snails and aquatic insects for food, and affects fish populations. They can live 24 hours without water, survive up to 50 days on a damp surface, and may even withstand passing through the digestive systems of fish and birds.

MANAGEMENT No options exist for eradication in large natural systems. For smaller lakes and ponds, fish hatcheries, and irrigation canals, chemical or physical management may be possible. Educating anglers, boaters, and other water-users is critical to reduce their spread.

New Zealand mud snail can readily attach to boots and waders and reach concentrations above 500,000 per square meter.



D.L. Gustafson, Montana State University



NORTHERN SNAKEHEAD

Channa argus ORIGIN: Asia and Africa

Brian Gratwicke

DESCRIPTION Northern snakehead is an elongated fresh-water fish 2-3 ft in length with a long dorsal fin, large mouth, and sharp teeth.

HABITAT Snakehead are present in several states in the U.S. In its native range it is found in muddy or vegetated ponds, swamps, and slow-moving streams. It could survive in much of North America if it became established.

THREAT Snakeheads have no natural predators outside of their native environment and aggressively compete with native species. They are voracious predators that feed on a wide variety of aquatic fish and animals and reproduce rapidly. Snakeheads can survive on land for up to four days, traveling 1/4 mile by wriggling their bodies and fins and breathing atmospheric air.

MANAGEMENT Once established in large aquatic systems, snakeheads are nearly impossible to eradicate. Control in smaller systems depends on the amount of vegetation, access to the water body, and permissible control methods, such as pesticides. Currently, the possession of snakeheads is illegal in many states.

U.S. Geological Survey Archive



Internet: Source Unknown



ALEWIFE

Alosa pseudoharengus ORIGIN: Atlantic Ocean

John Burrows, Atlantic Salmon Federation

DESCRIPTION Alewife is a species of ocean herring with a bluish-grey to olive back with silvery sides. The body is wide, narrows at the belly, and averages 6" in length. They have large eyes, a prominent black spot near the gill cover, and a forked fin.

HABITAT Alewives are capable of inhabiting freshwater lakes where they spawn. They first spread to the Great Lakes and are now present in inland waters throughout the Eastern U.S.

THREAT Without a natural top predator in many lakes, alewives reach large populations and have been associated with the decline and extinction of many native fish. They decrease zooplankton, a primary food source for many species, and feed directly on the eggs and larval stages of several other fish species.

MANAGEMENT Alewives are often introduced as baitfish or through illegal stocking. Management includes the introduction of top level predators such as various Pacific salmon species. Eradication is extremely hard to achieve since even a few hundred individuals are capable of re-establishing an entire population.

Alewife die-offs create unsightly fishkills and cause removal and disposal problems.



Mary O'Dell, Adirondack Park Agency



ROUND GOBY

Neogobius melanostomus ORIGIN: Eurasia

U.S. Fish and Wildlife Service Archive

DESCRIPTION The round goby is a small, soft-bodied fish with a distinctive black spot on the first dorsal fin. They have large, protruding eyes and range in length from 4" to 10". While juveniles are grey, adult round gobies have grey, black, brown and olive green markings.

HABITAT Round gobies inhabit both fresh and saltwater. They are a bottom dwelling species, preferring sandy or rocky shelves with low silting. They have spread throughout the Great Lakes and into the interior of the U.S.

THREAT The round goby is an aggressive fish that out-competes natives for food, shelter, and nesting sites. They prey heavily on eggs, including those of many popular sport fish. They consume large amounts of invasive mussels containing toxins, posing the risk of bioaccumulation further up the food chain. They can survive in degraded ecosystems and serve as a host to many parasites.

MANAGEMENT While native predatory fish have begun to prey on round gobies, their populations still reach high numbers as a result of their rapid reproduction. Management includes the use of fish pesticides, physical barriers, and bioacoustic and pheromone traps.

Dave Jude, University of Michigan



Round gobies compete with popular game fish and aggressively take bait from hooks.



VIRAL HEMORRHAGIC SEPTICEMIA (VHS) *ORIGIN: Europe*

Andy Noyes, NYS DEC

DESCRIPTION VHS is a rod shaped fish virus.

HABITAT VHS affects all sizes and ages of many fresh and saltwater fish and has caused severe declines in fish populations of the Great Lakes region and Canada.

THREAT VHS causes death from the hemorrhaging of tissues and organs. Although not all infected fish develop the disease, they act as carriers and can spread the disease to other fish. The World Organization of Animal Health has categorized VHS as a transmissible disease with the potential for profound socio-economic consequences.

MANAGEMENT Once infected, there is no known cure. Disease Management Areas have been established in many states with increased regulations on baitfish and cleaning techniques. The education of anglers, boaters, and the bait industry is key to controlling its spread.

SYMPTOMS Tissue hemorrhaging, unusual behavior, anemia, bulging eyes, bloated abdomens, and the rapid onset of death are common symptoms of many fish diseases. Not all infected fish show symptoms. The only way to confirm VHS is to test the fish in a lab.

VHS can be spread when fish are moved from one waterbody to another.



Mohammed Faisal

APIPP

c/o The Nature Conservancy – Adirondack Chapter
P.O. Box 65, Keene Valley, NY 12943
518-576-2082
www.adkinvasives.com

MAKE A DIFFERENCE GET INVOLVED

Invasive animals, pests, and pathogens are creeping into the Adirondacks. They degrade important ecosystems, agricultural lands, and private properties and are costly, if not impossible, to control. They put at risk our scenic, natural, agricultural, and recreational resources - linchpins to the region's economic livelihood.

You can help protect our valuable resources: learn how to identify invasive species and the signs and symptoms of invasion, spread the word about their negative impacts, and join the regional effort to put a stop to the growing threat invasive species pose to the Adirondacks.

ADDITIONAL INFORMATION

<http://www.dec.ny.gov/animals/265.html>
<http://www.agmks.state.ny.us>
<http://nyis.info>
<http://protectyourwaters.org>
<http://dontmovefirewood.org>

CREDITS

Funding for the design of this brochure was provided by the New York State Department of Environmental Conservation through the New York State Environmental Protection Fund to support the Adirondack Park Invasive Plant Program, one of New York's eight Partnerships for Regional Invasive Species Management.