

Aquatic species descriptions:

Species name: *Aphanius (Atherina) boyeri*

Common name: Black Sea Silverside



The Black Sea Silverside is native to the Ponto-Caspian Basin. Mature form measures about 10 to 15 cm in length. They have an elongate, fusiform shape and possess cycloid scales. They have a silver lateral strip along each flank but no lateral line. The back is gray with black spots. The abdomen area is whitish. It has a compressed back and a rounded belly. They live gregariously.

It is believed that this species has escaped from aquariophily activities and facilities. They can tolerate a salinity range between 0-60‰ but their optimal range is that of 3-12‰. They can live in water temperatures between 6 to 25°C. They can also live in fresh and brackish waters. The consequence of their introduction is that they will compete for food with native species by eating zooplankton, crustaceans, benthic organisms and fish larvae. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Benthophilus stellatus*

Common name: Starry Goby



Native to the Ponto-Caspian Basin (Sea of Azov, Caspian Sea, and Black Sea). At maturity, the starry goby can reach a maximum total length of 13.5 cm. It does not need a high concentration of oxygen in its habitat. They can live in freshwaters but prefers brackish water.

If starry gobies inhabit our waters, they have been introduced from sea transport. They compete with benthic native fish, mollusks, crustaceans and worms for food and habitat. They could also be predators of certain native fish. Starry gobies are not very abundant in their native habitat but they have a variety of ecological niches and therefore they could establish themselves in our waters if they ever get the opportunity. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Botrylloides violaceus*

Common name: Violet Tunicate



The Violet Tunicate is becoming increasingly abundant on both the east and west coasts of Canada. *Botrylloides violaceus* is a colonial sea squirt that forms flat sheets that are irregular in outline and adhere to a substrate, with large colonies reaching up to a third of a meter or so in diameter. It grows on a variety of surfaces including docks, boat hulls, buoys, ropes, and pilings, the undersides of rocks, eelgrass (*Zostera marina*) blades and seaweeds. It often overgrows mussels, barnacles, encrusting bryozoans and solitary sea squirts. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Botryllus schlosseri*

Common name: Golden Star Tunicate



B. schlosseri is a colonial sea squirt that typically forms flat sheets 3-4 mm thick and up to 10 cm across. Colonies that overgrow narrow-bladed seaweeds may appear lobate, and colonies growing in stalked, fleshy lobes have been reported in southern Australia. *B. schlosseri* grows on a variety of surfaces which include docks, boat hulls, buoys, ropes, pilings and the undersides of rocks, and on mussels, solitary sea squirts, seaweeds and eelgrass (*Zostera marina*), and they often do well in polluted waters.

Crabs, snails and flatworms have been observed feeding on *B. schlosseri*. *B. schlosseri* can overgrow other attached, filter-feeding organisms and compete with them for food. It is a nuisance fouler on boat hulls and equipment, and can overgrow and compete with cultured oysters and mussels and increase processing costs for these shellfish. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Bythotrephes longimanus*

Common name: Spiny Waterflea



Photo by Pieter Johnson, UW Center for Limnology

Native to Eurasia, this zooplankton is invading the basins of Europe and North America.

Its morphological adaptation such as reproduction by parthenogenesis and the production of resting eggs permits this species to survive in hostile environments and expand their territory. (See Grigorovich *et al*, 1998)

The spiny water flea was introduced to Lake Ontario in 1982 from ballast water and has since spread to all the Great Lakes plus more than 120 inland lakes in Ontario. The spiny water flea eats up to 3 times as much as native zooplankton species, it also competes for prey with native species of juvenile fish. It is still too early to measure the impact the spiny water flea has on aquatic ecosystems, some native fish species will feed on it.

Species name: *Carassius auratus*

Common name: Goldfish



Native to Asia. The average goldfish will grow between 15 and 20 cm long but a 59 cm long fish has been observed. They can tolerate low water temperatures and can withstand a wide range of salinity from freshwater to 17%. They feed on zooplankton, phytoplankton, insect larvae, fish eggs and fry, benthic vegetation and detritus.

There is a very high probability that this species was introduced into our water from aquarium release. Goldfish eating behaviour raises the turbidity in the waters which can kill many species of aquatic plants. Higher concentration of silt in the water can also smother native fish eggs. When aquarium fish are released into wild habitats there is a high risk of new disease or parasite transfer from foreign countries into our waters. The preceding generations quickly lose their bright orange color into a dull olive-brown or bronze dominant color. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007) There is also a possibility that they breed with other fish species such as the common carp, *Cyprinus carpio*, which is a close relative.

Species name: *Carcinus maenus*

Common name: Green Crab



Native to the Atlantic coasts of Europe and northern Africa, from Norway to Mauritania. Contrary to what the green crab's name would lead us to believe, the color of its carapace is variable from dark brown to dark green, usually with yellow granules. The ventral surface is green to yellow or orange to red. The carapace is wider than long. The most distinctive trait to recognize this species is that it has five large triangular spines on each side of its eyes and three small lobes between the eyes. The fourth leg is flattened and pointy. Green crabs can tolerate a wide range of salinity from 4-54‰ and can withstand a range of temperature from 0-33°C, for mainly these reasons they propagate easily in different environments. The larval stage *C.maenus* feeds on zooplankton, bacteria, phytoplankton and detritus and its mature form will feed on quahogs, mussels, aquatic worms, fish, algae and other small crustaceans.

This species is considered one of the 100 worst invasive alien species in the world. They eat profuse quantities of mussels, negatively affecting the mussel culture industries. The green crab may also be a vector of *Profilocollis botulus*, which causes fatalities in the common eider duck, *Somateria mollissima*. They also affect eeling industries because the eel won't enter a trap when there are green crabs inside. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Channa argus*

Common name: Northern Snakehead



Native to China, Korea and Russia. They inhabit only freshwater but have a wide temperature range (0-30 °C). Their torpedo shaped body measures between 85 and 150 cm in total length. Immature fish are golden brown to pale gray and turn dark brown with black splotches as they reach maturity. They have a small head and a large mouth. They possess long dorsal and anal fins. Their optimal ecological niches are swamps, shallow ponds, and slow moving streams with lots of vegetation. The young Northern Snakehead feeds on zooplankton. When they reach about 18 mm long, they start to eat fish larvae and small crustaceans. The mature fish will feed on other fish, frogs, crustaceans, small reptiles, birds and mammals.

It is believed that this species was deliberately released for Asian food markets. This fish can survive underwater for up to four days. They compete with other native predators for food and they pose a potential risk to freshwater ecosystems. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Ciona intestinalis*

Common name: Vase Tunicate (solitary tunicate)



An ascidian native to the waters of northern Europe. Vase tunicates possess a translucent, cylindrical tunic soft to the touch that filters the water for food particles. Their color varies from yellowish to orange. They can grow up to 15 cm in length and 3 cm diameter. Two siphons can be observed at one extremity, the margins of which are sometimes coloured a brighter yellow with orange to red spots. Vase tunicates live in salty waters between 12 to 40 % salinity but prefer environments with salinity levels higher than 30 %. They establish themselves in low intertidal waters to depths of 500 m.

C. intestinalis is the most widely distributed species of tunicate in the world. It is believed that maritime transportation is the main means of dispersal. They can tolerate a wide variety of environments. Their large numbers can considerably reduce the turbidity and food availability of the water stressing native species for food and habitat. Vase tunicates are currently damaging the mussel culture industry of Prince Edward Island. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Clupeonella caspia*

Common name: Black Sea Sprat



The Black Sea Sprat is native to the Ponto-Caspian Basin. They occupy fresh, brackish and salt water. Average total length at maturity is 6 to 12.8 cm. They usually inhabit waters with salinity ranging between 3 to 7% but they are capable of withstanding salinity concentrations of up to 34%. Feed on zooplankton.

It is believed that Black Sea sprats have most likely been introduced into our waters through sea transportation, the impact of their introduction is currently unknown.

(See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Codium fragile*

Common name: Oyster Thief



This green alga is native to Japan and was first detected in 1996 at Caribou, N.S. Oyster thief smothers mussels and oysters, preventing them from opening their shells to filter feed. Starved and weakened shellfish are easy targets for predators. Gas bubbles trapped under dense mats of oyster thief can lift shellfish off their beds, and float away with them. Fouling caused by the alga results in increased labour costs in shellfish harvesting. As well, oyster thief displaces native kelp, a preferred habitat used by many species, including sea urchins and lobster.

Oyster thief is a fast growing green alga that can reach heights of 60 cm (2 feet). Its strange name was given to it because when it attaches to an oyster, the buoyancy of the plant can cause the oyster to float away. Heavy growth of oyster thief in an area can also obscure oyster beds and increase the cost of harvesting. It is able to spread quickly because as fragments of the plant break off, they are able to regenerate a new plant. The plant may also reproduce by releasing spores which can travel large distances before they settle in the substrate and form a new plant. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Colpomenia peregrine*

Common name: Oyster Thief



Found in the Atlantic waters in 1960. This species of Oyster Thief, like its above mentioned cousin, also attaches itself to oysters and floats away with them. (See Leppäkoski *et al*, 2002)

Species name: *Ctenopharyngodon idella*

Common name: Grass Carp



Native to Asia and the former Soviet Union. Grass carp were identified in the Great Lakes and are thought to be present in our watershed. They grow to an impressive 125 cm in total length and may weigh up to 45 kg. They consume tall and submerged aquatic weeds, detritus, insects and other invertebrates. They usually live in freshwater but can also live in waters of salinities up to 10%. They can also tolerate a wide temperature range between 0 and 38 C°.

Grass carp presence could indirectly affect the zooplankton and phytoplankton communities because they decrease the abundance of aquatic vegetation. They compete for food with other native fish and invertebrate. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Dorosoma cepedianum*

Common name: Gizzard Shad



Native to the Mississippi River. Gizzard shad presence was first reported in 1944 in Quebec and they are considered a naturalized fish species. They measure 52 cm in total length on average. The dorsal portion of the body is greyish to silvery blue fading to silver on the sides and to white on the ventral part. They possess a small mouth and a dark spot behind the gill. They also have a thin whip like extension of the dorsal fin.

Gizzard shad are known to compete for phytoplankton with the native fish. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Dreissena polymorpha*

Common name: Zebra Mussel



Native to Europe. Zebra mussels can produce millions of offspring per year. In one location researchers noted that in one square meter, zebra mussel populations jumped from 1000 to 700 000 in six months. Each mature zebra mussel can filter one litre of water every day. There are now enough zebra mussels in Lake Erie to filter the entire volume of the lake once a week. Water intake pipes provide an ideal habitat for zebra mussels because they offer protection from predators and severe weather. The flow of water through the pipes also provides a constant supply of food and removes metabolic waste. Zebra mussels can wipe out whole populations of fish by consuming all of their food supply. Zebra mussels often attach to objects such as boats and boat trailers, and are thus inadvertently transferred from one water body to another by human activities. The U.S. Fish and Wildlife Service estimates that the potential economic impact of the zebra mussel invasion will be \$5 billion over the next 10 years to U.S. and Canadian water users within the Great Lakes region alone. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Eriocheir sinensis*

Common name: Mitten Crab



Native to the Yellow Sea which separates Korea from China. Mitten crabs are a catadromous species, they live in freshwater but return to the sea to breed. They can travel thousands of kilometres in order to breed in salt water and die shortly thereafter. The juvenile mitten crabs will gradually migrate back upstream into freshwater. Mitten crabs can be characterized by a dense hair covering their claws that causes them to resemble mittens and the claws also have white tips. The mitten crab's rough, convex carapace measures between 30 to 100 mm wide. They are olive-green in color and are sometimes mottled and the legs are slightly lighter in color compared to its carapace. This opportunistic species will feed on detritus, algae and aquatic invertebrates.

Mitten crabs are considered one of the 100 worst invasive alien species in the world. Rivers and estuaries are considered risk-prone areas. They compete for food with the native fishes. They have been known to undermine the integrity of the stream banks in Europe and in the United States by making burrows in the intertidal portion of streams in order to protect themselves from predators during low-tide periods. They create tunnels about 12 to 20 cm wide and 20 to 80 cm deep and the density of their tunnels can sometimes reach up to 3 tunnels per m². Mitten crabs are also known to carry the parasite *Paragonimus westermani* which causes the Oriental Lung Flu in mammals, with symptoms similar to those of tuberculosis, humans can contract this disease from eating mitten crab. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Gambusia affinis*

Common name: Mosquitofish



Mosquitofish are native to the freshwaters of southern and eastern United States. They measure on average 5 to 7 cm in total length. Their color varies from dull green to chestnut brown dependant on its ambient environment. The viscera, soft internal organs, can be observed through the skin covering the abdominal area.

It is believed that mosquitofish have been introduced from aquarium release and are now well established in the Great Lakes and in many regions throughout the United States. *G.affinis* is considered one of the 100 worst alien invasive species in the world. They consume a large amount of eggs of various native fish species, a feeding habit that jeopardizes the existence of herbaceous zooplankton fish species therefore increasing the probability that algal bloom occurs. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Gymnocephalus cernuus*

Common name: Eurasian Ruffe



Native to Europe. The Eurasian ruffe usually does not measure more than 15.5 cm in total length and weighs 50 g on average. They belong to the perch family and have the typical shape of a perch. The Eurasian ruffe can be characterized by the presence of a large, spiny, dorsal fin. They have a downturned mouth, brown spots on their body and dark membranes between the spines of their dorsal fin. They are known to endure a wide range of environmental parameters and can tolerate water depths between 0.25 to 85 m.

It is believed that Eurasian ruffe have been introduced into the Great Lakes from the discharge of ballast water from large ships. They compete with native fish for food such as small crustaceans and insect larvae and have known negative effects on native fish populations. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name : *Hemigrapsus sanguineus*

Common name: Asian Shore Crab



Native to the Asia-Pacific region. Asian shore crabs possess a relatively small carapace that usually measures between 35 to 42 mm. Their legs seem to have a banding pattern of dark and light color. The claws are speckled and have a bulbous shape at the base. The claws of the male Asian shore crab are more robust than those of the female. The molted carapace has three spines on each side and its color ranges from green to purple through variations of orange, brown and red. Asian shore crabs thrive in a wide range of temperatures however salinity concentrations may not exceed 24%.

It is believed that Asian shore crab may have been introduced by ballast water released into the Atlantic Ocean. They dominate habitats of native crustaceans and fish and successfully compete for food with rapidly increasing populations. Asian shore crab can produce 50,000 eggs per clutch and lay 3 to 4 clutches in one breeding season (May to September). The larva is suspended for months in the water column before developing into juvenile crab, giving them the opportunity to be dispersed and occupy a larger geographical area. Asian shore crabs are opportunistic omnivores who eat primarily macro algae, salt marsh grass, larval and juvenile fish, amphipods, gastropods, bivalves, barnacles, and polychaetes. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Hypophthalmichthys molitrix*

Common name: Silver Carp



Native to eastern Asia and eastern Russia, it is believed that the silver carp's introduction into Canadian waters is the result of aquaculture facility escape. They grow an impressive total length of 1m and weight 27 kg on average. *H. molitrix* are large and laterally compressed.

Similar to the bighead carp, silver carp feed by filtering organic matter with specialized gills. Their gills can filter detritus as small as 0.02 mm wide. They feed on planktonic matter until the concentrations get too low, then they feed on zooplankton. Silver carp could be competitors for food with some native fish that also feed on plankton. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Hypophthalmichthys nobilis*

Common name: Bighead Carp



This freshwater opportunistic species is native to southern and central China. It has been found in the Great Lakes Basin, in Lake Erie. Bighead carp's earliest introduction may have resulted from escaped individuals from aquaculture facilities. They reach an impressive total length of 1.4 m and weight 40 kg on average. *H. nobilis* has an enlarged head compared to its body, thus its name. Also like *H. molitrix*, they are laterally compressed and large.

Bighead carp have a specialized feeding apparatus that permits them to filter organic matter such as zooplankton. When the concentration of zooplankton is low in their habitat, they will feed on phytoplankton and detritus. Their presence increases pressure on zooplankton which allows the population of phytoplankton to increase unchallenged. The presence of bighead carp is believed to disrupt the food chain forcing native fish populations to relocate. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Lepisosteus platostomus*

Common name: Shortnose Gar



This freshwater opportunistic fish is native to Mississippi. Shortnose gars are currently found in the Great Lakes. They reach an average total length of 83 cm. They have black spots on their median fins and an olive to brown coloration on the dorsal side turning white on the ventral side. Shortnose gars can easily be recognized by their long snout and sharply toothed jaws although the jaws are shorter and larger than the typical gar species.

The impact of their introduction is unknown. Shortnose gars consume more invertebrates than other species of gar and they could possibly be a competitor with other sport fishing species. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Lepomis humilis*

Common name: Orangespotted Sunfish



A freshwater fish native to the Mississippi Basin. Orangespotted sunfish are currently found in the Great Lakes. It is believed that they may have been introduced by the release of bait fish. Their total length measures, on average, 15 cm. The sides of their bodies are olive coloured and have fine golden or emerald dots. The ventral portion of their bodies and the lower fins are reddish. Their operculums are darker and have a pale border. The spawning males have orange-red lines on their body.

It is believed that orangespotted sunfish may compete for food with other native fish; they mostly feed on insect larvae and small crustaceans. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Leuciscus idus*

Common name: Golden Orfe



Native to northern Europe. It is believed that golden orfes have been released into the United States waters through aquaculture facilities. They live in both fresh and brackish water. Their appearance is similar to *Scardinius erythrophthalmus*. The mature form measures 30 to 50 cm on average. Their elongated body is laterally compressed. The dorsal portion of their body is dark green and the lower portion of the side of their body is yellowish-brown with gold or silver highlights, the ventral area is white. The pelvic and anal fins are pink to gold or red to orange in color.

Golden orfes are well established in 9 American States and they may soon find their way in our waters due to human sea transportation. They may compete with the native fishes. The young individuals feed on aquatic plants, insects, molluscs, and crustaceans. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Misgurnus anguillicaudatus*

Common name: Oriental Weatherloach (Oriental Weatherfish)



This freshwater fish is native to eastern Asia. Oriental weatherfish have established themselves in the United States and the Great Lakes. The maximum total length is 25 cm. They possess a long, cylindrical body that resembles an eel. They possess a rounded caudal fin. The dorsal portion of their body is grey-brown and turns pale silver toward the ventral portion of their body. They have a sub-inferior mouth with six barbels. They have thick and fleshy lips. This benthos species feeds mostly on algae, insect larvae, snails, worms, and detritus.

It is believed that oriental weatherfish have been introduced in our waters due to unintentional release. They thrive in murky waters where they can burrow in the bottom substrate. Oriental weatherfish can also inhabit waters with low oxygen concentration because of a specialized intestinal organ that can absorb atmospheric oxygen like a lung. They can live in a wide temperature range and tolerate temperatures as low as 2 °C under experimental conditions. The impact of the introduction is unknown. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Misgurnus fossilis*

Common name: Weatherloach (Weatherfish)



This freshwater fish is native to Europe, from France to Russia. Weatherfish may introduce themselves through aquariophily activities and facilities. The average total length is between 15 and 30 cm. They have an elongated, cylindrical body. All the fins are small and rounded. The head has the shape of a cone and the mouth is surrounded by 10 barbels. The ventral portion of the body is orange with black dots. The flanks are greenish in color and have two dark bands interspaced by two copper-colored bands.

Weatherfish thrive in waters with a high silt concentration and low-current where this nocturnal species can bury itself during the day. They can withstand deoxygenating of the water and high temperatures because of their second respiratory organ that permits them to absorb atmospheric oxygen. Weatherfish feed on insect larvae, small crustaceans, and worms. The impact of their introduction is still unknown. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Neogobius fluviatilis*

Common name: Monkey goby



This freshwater fish is native to the Ponto-Caspian Basin (Sea of Azov, Caspian Sea, and Black Sea). The monkey goby may have been introduced into our waters through sea transport. The average total length is 16 cm. Similarly to other goby species, their pelvic fins form a suction disc.

The impact of their introduction is still unknown. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Neogobius melanostomus*

Common name: Round Goby



This freshwater fish is native to the Ponto-Caspian Basin (Sea of Azov, Caspian Sea, and Black Sea) and Asia. Round gobies have been introduced into the Great Lakes through the release of ballast water. They are found in fresh, salty or brackish water. Their maximum total length is 25 cm and their average total length is between 8 and 15 cm. Immature round gobies are slate gray in color and they become spotted with gray, black, brown, and olive green markings as they mature.

Round gobies inhabit the bottom near shore regions of lakes and rivers. They prefer rocky waterbeds where they can hide. They feed on molluscs, including the zebra mussel, polychaetes, other small fishes, goby eggs and chironomid larvae. Round gobies are a tolerant species and degraded environmental conditions give them a higher probability of survival compared to that of native fishes. Decline of certain native fishes has been observed where the round goby thrives. The spawning adults are known to aggressively protect their nest and take over prime spawning areas. From April to September, the female can spawn up to six times. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Notropis buchanani*

Common name: Ghost Shiner



Native to the Mississippi River. Ghost shiners are found in the Great Lakes. It is believed that they have been introduced from the release of bait fish. This freshwater fish grows on average about 6.4 cm. They have a silvery pigment and are almost transparent.

Ghost shiners prefer shallow waters about 1m deep where submerged vegetation grows. They also prefer waters where silt, clay or detritus is abundant. They are also tolerant to high turbidity. The impact of the introduction is still unknown. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Orconectes rusticus*

Common name: Rusty Crayfish



Native to Ohio, Kentucky and Tennessee. The rusty crayfish has been spread by anglers who use them as bait; its presence was first reported in Quebec in 2001, in Lake Pemichangan and in the Ottawa River. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007) The rusty crayfish has spread to several lakes, rivers, and streams throughout North America. More aggressive than native crayfish species and better able to avoid predation, the rusty crayfish can harm native fish populations through the eating of eggs and juveniles.

Adult rusty crayfish are usually 7-13cm long, with claws that are larger and smoother than many crayfish species with black tips and without the usual white wart-like bumps. Rusty crayfish can displace native crayfish species or hybridize with them. They also can eliminate native aquatic vegetation. Female rusty crayfish can carry fertilized eggs or a male's sperm with them therefore the release of just one female could potentially start a new population.

Species name: *Perca fluviatilis*

Common name: European Perch



Native to Europe and Siberia. The European perch has been introduced to North America, Australia, New Zealand, and South Africa. A predatory species, the juvenile European perch feed on zooplankton, bottom invertebrates, and native juvenile species. Adult European perch feed on invertebrates and native fish species. The European perch body has rough-edged scales and two dorsal fins; the first has 14 spines and the second has branched rays. The anal fin has two spines in front of branched rays. Pelvic fins are set close together. Dorsal colour is green-brown turning to a green-gold on the sides with dark vertical stripes. Ventral area is pale, ventral fins, pelvic fins, and tail are orange-red. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Phenacobius mirabilis*

Common name: Suckermouth Minnow



Native to the Mississippi River. The suckermouth minnow is 2-5 inches long and has a slender body with a mouth on the underside of its head with sucker-like lips. It has 8 dorsal fin rays, and 7 anal fin rays. It has a dark horizontal strip with dark coloured scales above the strip and a pale coloured belly below. The suckermouth minnow is more tolerant of silty waters compared to other species. It is a bottom-dwelling fish that consumes benthic invertebrates. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Phoxinus phoxinus*

Common name: Eurasian Minnow



Native to Eurasia, the Eurasian minnow is a potentially-invasive species that may be transported from the Ponto-Caspian region to our waters by ballast water. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Proteorhinus semilunaris*

Common name: Tubenose Goby



Native to the Black and Caspian seas, the tubenose goby was transported via ballast water to the St. Clair river in the 1990s. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

It has since spread throughout most of the Great Lakes and some connecting water systems. Not as aggressive as the round goby, but competes for food with native species. The tubenose goby feeds on aquatic invertebrates, insect larvae, small crustaceans, worms, small fish and fish spawn. The tubenose goby is brown in colour with two dorsal fins. It has a tube extending from each nostril. It is usually no longer than 11 cm.

Species name: *Scardinius erythrophthalmus*

Common name: Rudd



Native to the Ponto-Caspian Basin (Sea of Azov, Caspian Sea, and Black Sea). Rudd was initially introduced from Europe and has been introduced to many different watersheds in North America primarily through bait bucket release. Its impact is unknown. Rudd is a stocky, deep-bodied fish with a forked tail. Its scales are robustly marked, its back is dark green-brown, sides are brassy yellow and it has a white belly. Its fins are red-orange to red-brown. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

Species name: *Styela Clava*

Common name: Clubbed Tunicate



Native to Asia, West Pacific Ocean, from Korea to Siberia. The clubbed tunicate was transported via ballast water to both the east and west coasts of North America. Its appearance resembles a wooden club; clubbed tunicates prefer shallow waters in protected areas, such as bays and inlets with good water flow. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007)

The clubbed tunicate can grow in high densities, crowding out native species like shellfish, and it can also out-compete native species for food. They can attach to boat hulls and marine floats which can aid in their spread. The adult form of the clubbed tunicate is sedentary but the larval stage can swim and float with the currents. Adults are able to reproduce most of the year. Clubbed tunicates can tolerate a wide temperature and salinity range.

Species name: *Tinca tinca*

Common name: Tench



Native to Europe. Tench were imported to North America by Germany in 1877. It has since been introduced to many regions, some by stock ponds and some by bait release. (See Gouvernement du Québec, Ministère des Ressources naturelles et de la Faune, 2007) Tench are often found in still or slow-moving waters with a clay or muddy bottom and abundant vegetation. They can tolerate low oxygen content, and feed on algae and benthic invertebrates. Tench are brown-green in colour, with a darker back and sides, and a lighter gold-coloured belly. The caudal fin is square in shape but the other fins are more rounded.

Mammal and bird descriptions:

Species name: *Carpodacus mexicanus*

Common name: House Finch



Native to the western United States and Mexico, house finches were illegally sold in New York City and released. Populations of house finches now exist all over eastern North America. The house finch is very adaptable in both urban and rural environments. Large populations can be a nuisance as they may cause monetary losses due to agricultural damages. Male house finches are brown with a red breast, rump, and forehead. They have dark stripes on their underside. Females are brown with no red and have dark stripes to their underside. (See Boesma *et al*, 2006)

Species name: *Columba livia*

Common name: Rock Pigeon



Native to Europe, western Asia, and northern Africa; rock pigeons have been introduced to Asia, North and South America, Australia, and most island systems throughout the world. They have been introduced for food or game sources and as well some domesticated birds have escaped. Rock pigeons have a grey body with a light coloured rump; they have two black bars on secondary wing feathers, a wide black band across the tail and orange-red feet. Body colour can be grey to white, tan, or black. Rock pigeons prefer to live near human habitations; their droppings are very corrosive and can cause damage to structures over time. As well they are carriers of several diseases which can be transmitted to humans or poultry. (See Alexander and Fairbridge, 1999)

Species name: *Odocoileus virginianus*

Common name: White-tailed deer



Named for the white area under their tail, the white-tailed deer has a red-brown coat during the spring and summer months which fades to a grey-brown during the fall and winter. Their bellies and throats are white. White-tailed deer are native to most of North and Central America, and South America as far south as Peru. White-tailed deer are herbivorous, mainly eating the leaves and twigs of different trees and plants. However, they are also “heavy browsers” meaning that they will return time and again to the same grazing sites until nothing is left. Over-abundance of white-tailed deer and over-browsing can cause native plants to die and allow invasive species to get a foothold. Without as many natural predators such as wolves or coyotes to control the population, white-tailed deer are overwhelming many available habitats, causing damage to farmland, gardens and yards. (See Rue, 2004)

Species name: *Passer domesticus*

Common name: House Sparrows



Native to Eurasia, northern Africa, and the Middle East, the house sparrow was introduced in New York City around 1850 and is now one of the most predominant birds in North America. House sparrows are small birds with plumage that is mostly brown, grey, black, and white. The back of its head is brown. Males have a black throat; females do not have black throats and are generally lighter in colour.

The house sparrow is omnivorous; it feeds on seeds, fruit, nuts and some insects. They can cause damage to crops and gardens while foraging. As well, house sparrows compete with many native songbird species; the decline of native bluebird populations is directly related to the house sparrow. They kill adult bluebirds and smash their eggs to take over the nesting site. (See Boesma *et al*, 2006)

Species name: *Rattus norvegicus*

Common name: Norway rat, water rat, sewer rat, brown rat



Probably native to Central Asia and northern Norway. This medium sized rodent has small eyes, hairless ears, and an almost hairless tail that is almost as long as its body. (See Bowers *et al*, 2007) The average length of the body is 9 inches. They possess brown to gray coarse fur on the back and lighter tone of gray on the undersides. This nocturnal and omnivorous species nests in 2 inches diameter burrows underground when not living indoors. (See Adkins, 1998)

They prefer manmade habitat and inhabits Southern Canada from the Atlantic to the pacific coast. A female Norway rat may produce 12 litters of young in one year. (See Bowers *et al*, 2007)

Species name: *Sturnus vulgaris*

Common name: European Starling



Source: Tim Stuart

Native to Eurasia, the European starling has been introduced to New Zealand, Australia, North America, Fiji, and the Caribbean. European Starlings are black in colour with green and purple iridescence. They have a long pointed beak which is yellow in breeding adults and dark grey in juveniles and non-breeding adults.

In North America, European starlings compete with native species for both food and nesting space. They often expel native birds from their nests to use as their own. Large populations of European starlings can damage crops, and consume and foul feed for cattle and poultry. European starlings are aggressive breeders, raising 2-3 broods per year of 4-7 young. They are considered one of the 100 worst invasive alien species. (See Boesma *et al*, 2006)

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