

# Aquatic Species .....at Risk.....

## Mussel Guidebook



# The Importance of Mussels

Mussels are filter feeders that pull nutrients, algae and suspended particles out of the water. Freshwater mussels can filter about 40 L of water a day and live anywhere from 10 to 80 years. In the Thames River, there is an average of 35 mussels in one square metre. Mussels provide a valuable service, keeping our water clean and healthy.

M. C. Barnhart



Using the above numbers...

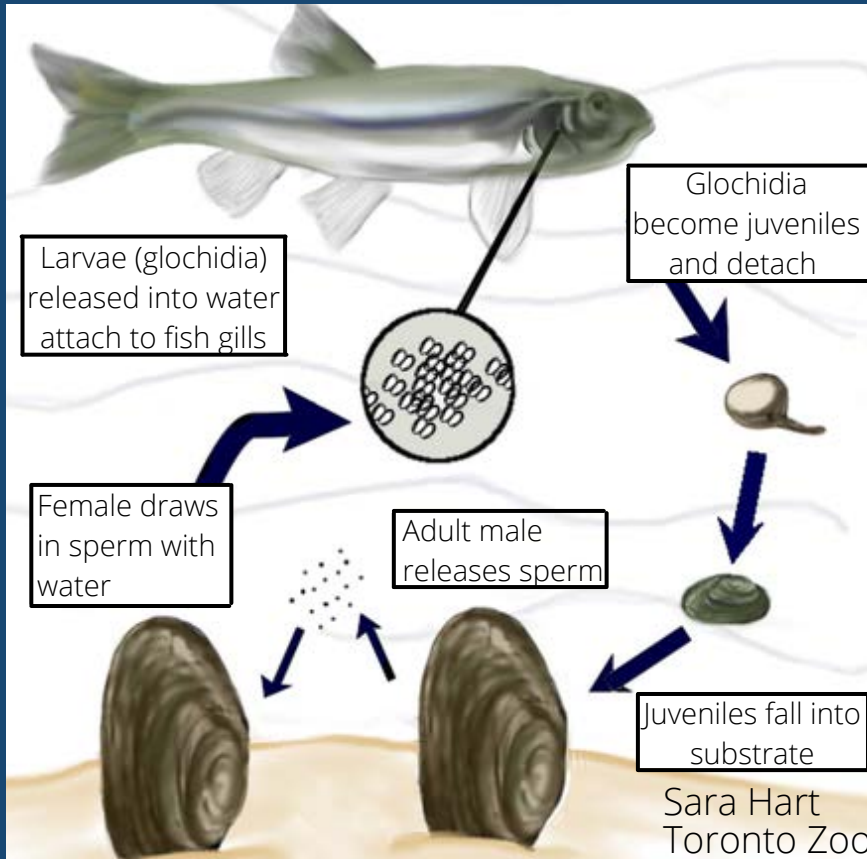
- in a single year, mussels in one square meter, filter 511,000 litres!
- over their life time, mussels in one square meter could filter 5.1 million litres to over 40.8 million litres of water!

This feeding practice also removes contaminants and microplastics, improving the water quality. Mussels are also an important food source for species like muskrats, and even some fish species like the Freshwater Drum. They provide natural structure and habitat for other aquatic organisms and they stabilize the streambed during high water flows. To continue providing all these ecosystem services, mussels rely on healthy fish populations to complete their life cycle.



# The Connection

Mussel larvae, called glochidia, must attach to the gills of a suitable fish host to survive. Here, they absorb nutrients from the fish to grow. Once they have grown into juvenile mussels, they fall off the fish and continue their life cycle in the substrate.



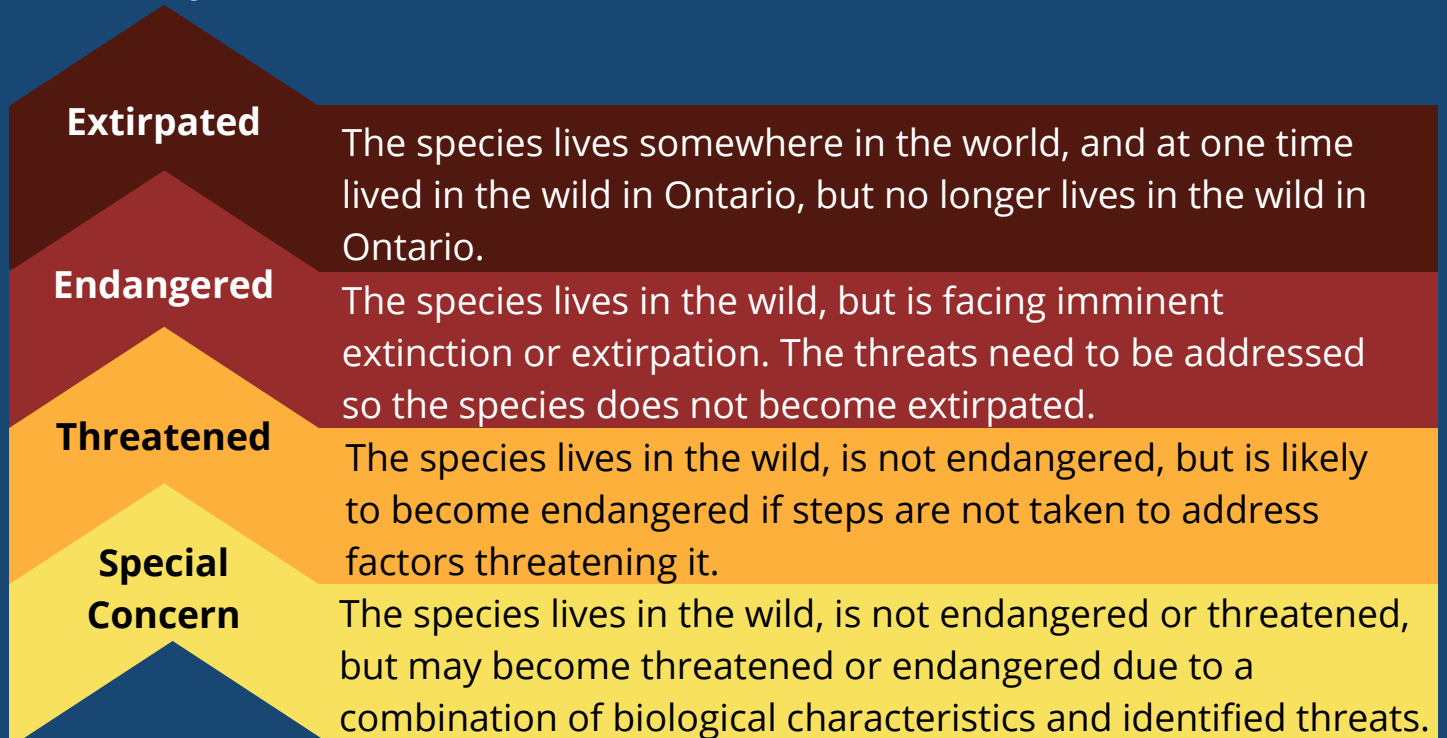
Some mussels have many suitable host species, while others rely on a specific host species. Fish hosts can be found at the bottom of each mussel species at risk (SAR) page. Some of the fish hosts are SAR themselves. You can learn more about these fish in the Species At Risk - Fish Guidebook.

Some mussels create 'lures' that mimic a fish or their food. This attracts the fish host so the glochidia can attach to its gills.



# Species At Risk

Many species of mussels in the Lower Thames Valley Conservation Authority (LTVCA) are now considered to be SAR.



There have been 36 species of mussels found in the LTVCA; 14 species or 39% are considered to be SAR. This loss of diversity puts other freshwater mussels, fish populations and human resources at risk. Continue reading to learn more about the mussel SAR and their distribution within the watershed.

Freshwater mussels are known to be one of the most at risk groups of species. These species will continue to decline unless their threats are addressed. More information about these threats can be found in the The Species at Risk - Threats Guidebook.



# Fawnsfoot

*Truncilla donaciformis* - Endangered



Shawn Staton

- Has dark green, 'V'-shaped markings (known as chevrons)
- Lives in slow-flowing, shallow waters in North America
- Invasive mussels have altered their preferred habitat
- The Thames River likely has one of largest remaining populations in Canada

## HOST



Freshwater Drum

- Feeds on Fawnfoot providing an opportunity for the glochidia to attach to its gills
- Males make a drumming sound to attract females
- Has a notched dorsal fin and long pelvic ray



# Hickorynut

*Obovaria olivaria* - **Endangered**



Philippe Blais

- Has an oval-shaped shell with a beak pointing far forward
- Historically, harvested for use in the pearl button industry
- Prefers large, deep rivers with sandy bottoms
- Likely extirpated from the lower Thames River
- Distribution is limited by its host

## ● ● ● ● ● ● ● ● ● ● **HOST** ● ● ● ● ● ● ● ● ● ●

- Population status in the Thames River is uncertain
- As Lake Sturgeon age, they can become resistant to glochidia attachment

Lake Sturgeon



**Threatened**

# Kidneyshell

*Ptychobranhus fasciolaris* - **Endangered**



Vicki McKay

- Has a kidney-shaped shell with interrupted green rays
- Prefers clear, swift rivers with gravel or sand bottoms
- Found near American Water-willow, a threatened plant
- Not found in the lower Thames River in over 20 years
- Packets of larvae resemble fish fry to fool fish into biting down so glochidia can be released into their gills

● ● ● ● ● ● ● ● ● **HOSTS** ● ● ● ● ● ● ● ● ●



Blackside Darter



Fantail Darter



Johnny Darter



# Lilliput

*Toxolasma parvum* - Endangered



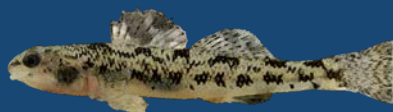
DFO

- Has a small, oval-shaped, smooth shell
- Prefers soft river bottoms with sand, silt and mud
- Sensitive to contaminants (e.g. pesticides and road salt)
- In Canada, this species can only be found in Ontario
- Found in the Thames River, including the tributaries of Baptiste Creek and McGregor Creek
- Glochidia are in packets that resemble insect larvae to fool fish into releasing glochidia into their gills

## HOSTS



Green Sunfish



Johnny Darter



Bluegill



# Northern Riffleshell

*Epioblasma rangiana* - Endangered

Shawn Staton



- Has a thick, squarish, yellow shell with bright green rays
- Prefers riffle areas with coarser substrate
- Siltation can degrade preferred habitats
- It has disappeared from 95% of its range in North America
- Extirpated from the lower Thames watershed
- Has seven identified fish hosts, but Mottled Sculpin and Iowa Darter appear to be the primary hosts

## HOSTS



Iowa Darter



Mottled Sculpin

Other hosts include: Logperch, Blackside Darter, Fantail Darter, Johnny Darter, Rainbow Darter and Brown Trout

# Rayed Bean

*Villosa fabalis* - Endangered



Shawn Staton

- Canada's smallest freshwater mussel
- Its shiny, smooth shell has wavy, dark green lines
- Prefers clear, shallow headwaters
- Can be easily covered and affected by invasive mussels
- In Canada, it is only found in Southern Ontario
- Has been lost from Lake Erie and the lower Thames River
- Their recovery strategy aims to return healthy, self-sustaining populations to the Thames River

## • • • • • HOSTS • • • • •



Largemouth  
Bass



Mottled  
Sculpin



Rainbow  
Darter



Greenside  
Darter



# Round Hickorynut

*Obovaria subrotunda* - Endangered



Vicki McKay

- A small, circular, dark brown mussel with a thick shell
- Prefers moderate to fast moving waters
- Lost from 90% of its former range in Canada
- Extirpated from the Thames River
- Loss of this species is largely attributed to Zebra Mussels

## • • • • • HOST • • • • •

Eastern Sand Darter



**Threatened**

- The Eastern Sand Darter can be found in the lower Thames River and Rondeau Bay
- It prefers sandy habitats where it can bury and camouflage itself
- Greenside Darter is another host species

# Round Pigtoe

*Pleurobema sintoxia* - Endangered



- Has a mahogany-coloured shell with dark growth rings
- Its heavy shell is difficult to open and less likely to be eaten by muskrats
- In Canada, only found in southwestern Ontario
- Found in the Thames River and along the shorelines of Lake St. Clair and Lake Erie
- A long-term recovery goal is to repatriate healthy, self-sustaining populations to the Thames River

## • • • • • HOSTS • • • • •



Bluegill



Northern  
Redbelly Dace



Spotfin  
Shiner



Bluntnose  
Minnow



# Snuffbox

*Epioblasma triquetra* - **Endangered**

Vicki McKay



- Has a thick, triangular-shaped shell
- Identified by green blotches that look like dripping paint
- Prefers clean, clear, swift-flowing water and firm rock, gravel or sand bottoms
- Historically found in Lake Erie, Lake St. Clair and the Thames River, but likely extirpated from these locations
- Its fine teeth hold the Logperch host while it releases glochidia into the gills

## • • • • • **HOST** • • • • •



Logperch

- Logperch roll stones in search of food and sometimes accidentally roll a female Snuffbox
- This bottom dwelling (benthic) fish is negatively impacted by Round Goby

# Threehorn Wartyback

*Obliquaria reflexa* - Threatened



Vicki McKay

- Has a row of “horns” that protrude from its shell
- Prefer large rivers with gravel, sand and muddy bottoms
- Can live up to 18 years
- Major threat is sediment loading which clogs its gills
- Within Canada, it is only found in the Thames, Sydenham and Grand Rivers

## HOSTS



Longnose Dace



Common Shiner

- Both species are part of the minnow (Cyprinidae) family
- They prefer cool, shallow runs of streams and can occasionally be found in lakes



# Purple Wartyback

*Cyclonaias tuberculata* - Threatened



DFO

- Has protrusions or “pimples” across the back two thirds of its round shell
- Often purple on the inside
- Prefers larger rivers with sand to gravel bottoms
- Lost from Lake Erie due to Zebra and Quagga mussels
- Found in the Thames River
- The Flathead Catfish, recently found in the Thames River, is also a host

## • • • • • HOSTS • • • • •



Yellow Bullhead



Black Bullhead



Channel Catfish

# Eastern Pondmussel

*Ligumia nasuta* - Special Concern



Shawn Staton

- Has a dark brown, elongate shell with rough growth lines
- Its greatest threat is the invasive Zebra Mussel
- Found near the mouth of Lake St. Clair, in Rondeau Bay and McGeachy Pond
- Females produce lures that look like the legs of shrimp to attract its fish hosts

## • • • • • HOSTS • • • • •



Pumpkinseed



Brook Stickleback



Yellow Perch



# Mapleleaf

*Quadrula quadrula* - Special Concern



Shawn Staton

- Identified by the two raised ridges of nodules separated by a groove on its yellow-brown shell
- Found in large rivers, lakes and reservoirs
- Its suitable habitats are often in heavily populated areas affected by pollution and runoff
- The Thames River population is one of the most stable and abundant in Ontario

## • • • • • **HOST** • • • • •

- The only Ontario catfish with a forked tail
- The largest catfish native to Canada
- Uses its whiskers (barbels) to feed at night
- Lives in warm lakes and streams



Channel Catfish

# Rainbow

*Villosa iris* - Special Concern



Todd Morris

- Its elongate, oval shell has broken green rays
- Gets its name from the iridescence found inside its shell
- Prefers moderate to strong currents
- Lives near riffles with sandy, rocky or gravelly substrates
- Found in the Thames River, but no longer in Lake Erie
- Females produce lures that look like crayfish to attract fish that feed on crustaceans

## ● ● ● ● ● ● ● ● ● **HOSTS** ● ● ● ● ● ● ● ● ●

- Other hosts include: Largemouth Bass, Greenside Darter, Green Sunfish and Yellow Perch
- Smallmouth Bass' main food source is crayfish



Smallmouth Bass



Rainbow Darter



# Wavy-rayed Lampmussel

*Lampsilis fasciola* - Special Concern



Shawn Staton

- Identified by wavy green lines on its round shell
- Prefers clear, shallow riffles and sand-gravel bottoms
- Glochidia are especially sensitive to road salt pollution
- The Thames River is one of the few locations this mussel can be found in Canada

## HOSTS



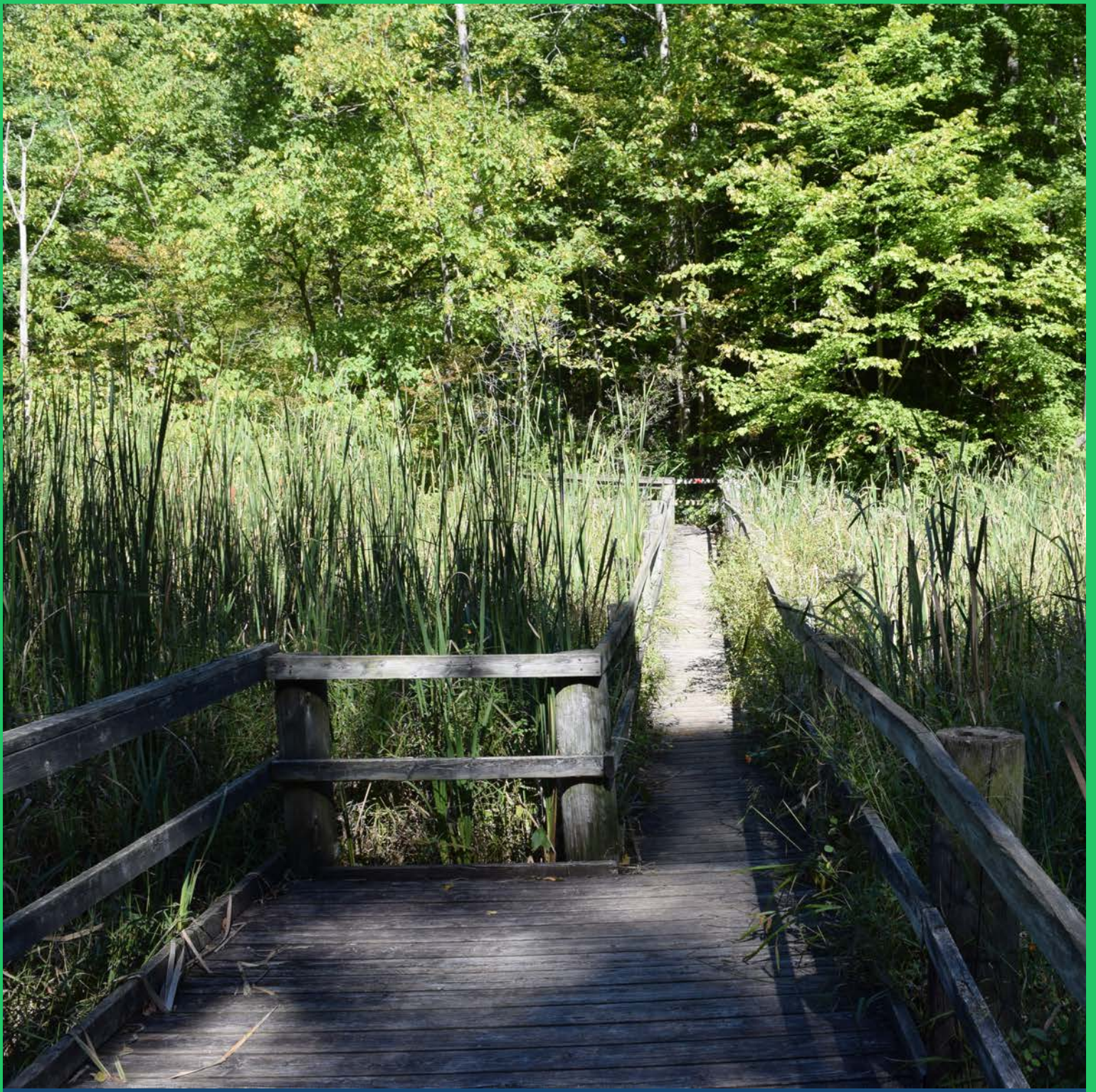
Smallmouth Bass



Largemouth Bass

- Both are visual predators requiring clear waters
- They swim at high speeds to overtake and engulf their prey





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All fish host images courtesy of NYSDEC.



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