

CREDIT RIVER ANGLERS ASSOCIATION

128 QUEEN STREET SOUTH, PO BOX 42093

MISSISSAUGA, ON L5M 1K8

PHONE 905-814-5794 FAX 905-821-0891

WEBSITE : WWW.CRAA.ON.CA E-MAIL : INFO@CRAA.ON.CA



Five year study to determine both positive and negative interaction of resident trout and migratory salmon and trout in the middle reach of the Credit River

Proposal

Permit full access to the Niagara Escarpment (Cataract, Belfountain Dam) for all migratory species (rainbow trout, brown trout, lake trout, brook trout, chinook salmon, coho salmon, Atlantic salmon, American eel, lake sturgeon, white sucker, smallmouth bass, etc.) for a period of five years commencing immediately to study the impacts of the open fishery and to reduce the need for thousands of hours of labour (volunteer and MNR), reduce hatchery demand, substantially increase fishing opportunity in the lake and river and increase economic benefits by potentially millions of dollars.

Executive summary

Chinook salmon are the most valuable specie to the open water Lake Ontario fishery. Rainbow trout are the most valuable specie to the overall fishery (both lake and river). Atlantic salmon are a valued native specie undergoing reintroduction efforts. Brown trout are a popular resident fishery and provide some lake opportunities.

Within the Credit River Fisheries Management Plan (2001-2011), a distinct and specific portion was allocated towards Species Portioning. During the 1997-2000 process special interest groups were opposed to migratory fish moving upstream past Streetsville and Norval Dams. This also prevented access for all native species to move past these dams. The reason given was concerns over impacts to resident brown trout, a non native, naturalized specie. A preliminary environmental assessment was reviewed by AECOM as a contractor for MNR to look at potential barrier locations. None of the three locations stood out as significantly better for a barrier site under the MNR matrix. The only part of the plan that offered any indication was greater access provided greater spawning opportunity for Rainbow trout. Atlantic salmon were included in the plan but no suitable means to ensure their full access up the river was addressed adequately. Pacific salmon were stopped at Streetsville Dam under the plan.

At the same time, 15 years of additional research has been conducted looking at interactions of migratory rainbow trout and resident brown trout with much work done in the Great Lakes region. Additional research has observed many rivers with open access fisheries where all fish can move and mingle as they please. **The fact is, rivers with no manmade barriers have far healthier fisheries and species diversity and rivers with manmade barriers have degraded and often extinct or endangered species.** Research looking at detailed population trends has been completed locally on Whiteman's Creek, a tributary of the Grand River about 100km west of the Credit River. Other detailed studies have been conducted on Great Lakes tributaries in Michigan by researchers Kocik and Taylor. Meanwhile in 1999, MNR's own staff gave professional opinions about interactions that were not shared with the public steering committee for the CRFMP. Much more data is also available from other local tributaries to shed light on the issue. The research shows overwhelmingly that migratory rainbow trout and resident brown trout can co-exist and in fact rainbow trout appear to benefit brown trout numbers and biomass. While some research has shown an competition between the two species on an individual basis within the lab, these studies have failed to look at the overall river system and how the additional diversity creates a sympatric relationship that benefits both species. The bottom line is rainbow trout gain access to suitable spawning grounds and show a subsequent increase in natural reproduction. Meanwhile brown trout feed upon the steelhead fry, parr and smolts and grow faster, have higher

reproduction rates and this leads to higher numbers of brown trout. Diversity is a common biological term to answer the addition of species which have a sum greater than that of the individual parts.

Atlantic salmon also suffer from the existing management scheme. The majority of salmon become stuck below dams and fishways and never reach their spawning grounds because fishways are blocked with screens so fish can be manually separated. We estimate 80% of the 2011 run never passed Streetsville Dam and roughly 90% of the fish lifted never passed Norval Dam. Despite the best efforts of MNR staff and volunteers operating the fishways daily, we simply cannot process fish in a satisfactory manner. The result is the **fish suffer and the reintroduction program is put in jeopardy because the fishways are closed** for manual operation. Only when the fishways are left open did the fish pass quickly and continue their journey up the river to the headwaters as proven by Atlantic salmon movement in summer 2011.

Recent research has also shown that Atlantic salmon juveniles out compete and co-exist with rainbow trout in Lake Ontario tributaries (Dietrich et al, 2008). Research by Trent University and OMNR on Cobourg Creek has also shown that adult resident brown trout are a major predator on Atlantic salmon, with one adult brown trout reported to have 27 floy tags from Atlantic salmon smolts in its stomach (R. Brobowski, OMNR Northwest Science and Technology pers. Comm.). The addition of large numbers of steelhead into the system will serve to reduce brown trout predation upon Atlantic salmon juveniles by adding a new source of prey for the brown trout. Many published research papers have shown brown trout have a negative impact on Atlantic salmon. However they have proven to co-exist on the Credit River based on recent adult returns.

The proposal is to allow unrestricted access for all migratory species for a period of five years (native and naturalized) including Atlantic salmon, rainbow trout, brown trout, brook trout, coho salmon, chinook salmon, smallmouth bass, white sucker, American eel, lake sturgeon and many minnow species. Species that would be blocked are carp and lamprey through timed operation and set up at the Streetsville fishway.

Monitoring of the fishery and changes to the middle river (Norval to Cataract) would be done through MNR and CVC electro-fishing sites. Within the reach there are between 15 and 25 annual research sites that provide excellent baseline data with some sites going back 30 years. These sites will allow managers to observe any changes that occur in the fish population and allow MNR managers to answer what are the actual impacts and how the fishery reacts throughout the entire system.

Meanwhile within the Great Lakes many rivers have fully accessible reaches for all species of fish. These systems have a far greater fishery diversity and show far more stable and wild/naturalized trout and salmon fisheries. There are many examples locally and around the Great Lakes. Resident brown trout appear to not only co-exist, but flourish in the presence of rainbow trout, chinook and coho salmon and other species. These systems include; Ganaraska River, Cobourg Creek, Wilmot Creek, Sopers Creek, Oshawa Creek, Maitland River, Saugeen River, Bighead River, Beaver River, Pine River, Boyne River. Some of the most famed Michigan rivers such as the Pere Marquette have world renowned resident trout fisheries meanwhile having exceptional wild migratory salmon and trout fisheries. The added benefits of having substantial chinook salmon wild reproduction are well documented in the Salmon River, NY where Atlantic salmon and trout yearlings gorge on the chinook fry giving them a tremendous jump start as they migrate to Lake Ontario to become adults.

The fact that locally a very small portion of anglers view fish diversity as negative and impacting 'their' fishery has hurt the overall fish community of the Credit River for far too long. It has had negative impacts on many native species and clearly naturalized game fish such as rainbow trout, chinook and coho salmon have suffered as a result. The evidence to support unrestricted access for all native and naturalized fish is clear. It meets the MNR's goals of diversity, it reduces the demands on MNR hatchery space and MNR costs, it reduces the need for MNR staff time and volunteer time by thousands of hours per year and has the potential to bring millions of dollars in economic benefits to the local economy. It also reduced MNR liability through reduced operations of fishways, fish transfers and stocking.

The fishways have been built; the fish are returning and trying to spawn. Anglers are demanding better local fisheries so they do not have to drive to New York, Pennsylvania and Michigan. Lake anglers are demanding more fish and better opportunities in Port Credit. Local municipalities like Mississauga want the "salmon" put back into the 'salmon capital of Ontario' that Port Credit was once called! Allowing open access to all fish will

achieve all these goals. And after five years if MNR determines through the many existing research sites that the fishery has not benefited they simply have to close the fishways and the upper river will return to the present state. However, we anticipate a substantially improved fishery based on the reproductive potential from the estimated one million square meters of cool/cold water habitat located upstream of Norval Dam! Runs of 20,000 chinook salmon, 20,000 steelhead, thousands of brown trout and thousands of coho and Atlantic salmon are all possible. Meanwhile maintaining the resident brown trout fishery.

Background

Rainbow trout and brown trout have both been present in the Credit River for over a century from stocking, strays, pond escapes and natural colonization from other watersheds. While little stream data exists prior to 1957, there are reports of both species dating to the 1920's and throughout the 30's and 40's within the upper Credit River and other tributaries from anglers. From the 1950's to the present day rainbow and brown trout are found in the Forks of the Credit and tributaries throughout the river. The MNR initiated a major stocking program in the late 1970's for rainbow trout where yearlings were stocked in the Forks and Inglewood reaches. Between 1978 and 1984 fishways were built at both Streetsville and Norval dams. For a period in the early 1980's steelhead had access to the Forks of the Credit and substantial natural reproduction followed. The MNR Guelph district operated the old Norval fishway and allowed unrestricted rainbow trout passage up to 1986 past Norval Dam (J. Reed, owner of Norval Dam, personal communication).

In 1988 MNR created a fish management plan for the Credit River and installed an electro barrier above the town of Inglewood on or about 1988-89 to stop lake run rainbow trout from entering the Forks of the Credit. This was done without public consultation and was based on complaints from anglers within a local fishing club, TU, Greg Clark Chapter. Anglers complained that the brown trout fishery was damaged by the presence of rainbow trout (steelhead) and that the browns were eaten, displaced, stressed and that fewer brown trout were available to be caught. Of interest, the MNR staff at the time was Jack Imhof, a long time TU member and presently TU's national biologist. Changes were made, fish were stopped and the migratory fishery crashed with no scientific evidence or proof that rainbow trout impacted the brown trout population in the Forks of the Credit River. The barrier also failed within one year due to poor construction techniques as anodes built from 2x10 lumber were simply undermined and washed away from spring floods.

By 1986-87 the Norval fishway ceased function due to structural changes in the dam from the power house failing and removal of flash boards from the dam. No attempts were made to rectify the problem at Norval until the fishway was re-built in 2011. During late 1980's through to the late 1990's, MNR – Lake Ontario Management Unit (LOMU) also collected sampling at ten sites, all but one above the Norval dam to determine rainbow trout production for the lake. MNR data shows reproduction was virtually zero in the 1990's above Norval. Ongoing research shows rainbow trout reproduction below Norval is extremely low. Anglers success for catching rainbow trout dropped 5 fold between 1987 and 1992 as runs declined dramatically from lower reproduction rates.

Streetsville has been the site of long ongoing attempts to pass rainbow trout and other species with volunteers from Credit River Anglers Association (CRAA) volunteering to operate the ladder since 1990. From 1990 to 1994 fish were simply lifted over the dam and in 1993 CRAA realized they could not pass Norval and reach suitable spawning grounds. In 1995 and 1996 CRAA transported 300 adult rainbows past Norval each spring under MNR direction and released the fish directly above Norval dam. Some of the fish were reported in the Forks of the Credit in 1995 and 1996 and again local fly fishing clubs (TU and IWFFC) complained about competition and impacts on brown trout. The transfers ceased as the CRFMP began discussions in 1997-98. By 2003, as the Credit's steelhead run was at its lowest point in the past 25 years, CRAA and MNR worked on a project to transfer wild rainbow trout past Norval Dam to Silver Creek directly to test if they would stay in the tributary. Fish were tagged and transported by volunteers from CRAA and spawning was monitored with redd counts. The transfers increased with minimal evidence of straying from 30 fish in 2004 to over 1,700 fish in 2010/2011. Reproduction rates for steelhead in Silver and Black Creeks skyrocketed from 2004 to 2011 based on many survey sites conducted by CVC/MNR annually. Over the past seven years roughly half a dozen tagged fish were reported above the Papermill dam, yet in that period over 6,000 were tagged and transferred to the Silver/Black Creek system.

In 2010 the CRFMP also agreed that all brown trout would have open access to the entire river based on MNR genetics review that both resident and migratory brown trout are related. This has opened the entire river to brown trout, a non native specie imported from Europe. Meanwhile, other prominent sport fisheries have suffered (rainbow, coho, chinook), as well as native (Atlantic salmon, smallmouth bass, white sucker, etc) over attempted protection of this non native specie (brown trout) in the Forks of the Credit.

Summary of fish access:

It has been clearly determined that once access was removed for migratory fish past the Norval Dam that their numbers crashed and a fishery was lost. The first proof of lost access causing the destruction of a fishery occurred in the 1800's with Atlantic salmon. In the past 30 years we have seen one of Ontario's top rainbow trout rivers go from thousands of anglers (ranked 4th most popular fishing destination by MNR in 1994 survey), to a river with minimal angler use, millions of dollars in lost economic benefits and a rainbow trout run that declined by as much as 85% (based on steelhead population estimates from mark-recapture at Streetsville dam and angler success).

Proposal to open fish access for a five year study:

The proposed 5-year study is intended to evaluate the effects on the fish community of allowing all native and naturalized species full access through the Credit River from Streetsville, through the new Norval fishway, up to the first natural or man-made barrier (Cataract, Belfountain dam). The intention of allowing this access is to facilitate migration to high quality spawning and nursery habitat of the re-introduced extirpated Atlantic salmon, as well as rainbow trout, chinook salmon, coho salmon, smallmouth bass, lake trout, sturgeon, American eel, coho salmon, white sucker and dozens of native minnow species. Currently, natural reproduction of migratory salmonids is severely limited by the amount of spawning and nursery habitat below Norval and populations generally are maintained through stocking. The goal of the ministry has been to create naturally reproducing self-sustaining fish population; therefore an additional component of this 5 year study will determine to what level these species can propagate, and their interactions with the current fish population.

The rationale behind the proposed allowance for full mixed species access comes from nearby examples including; Cobourg Creek, Ganaraska River, Beaver River, Bighead River, Saugeen River, Grand River, Whiteman's Creek, Nottawasaga River (Boyne, Pine), Maitland River, Bowmanville Creek, Duffin's Creek, Oshawa Creek, and Salmon River, NY. Full access through reaches of these rivers has shown that a mixed assemblage of species is possible without the localized extirpation of one species, thus allowing for self-sustaining wild populations of all salmonids.

The existing management plan has stopped all migratory fish at dams. Pacific salmon at Streetsville, Rainbow trout and Brown trout at Norval. Starting in 2004 highly labour intensive adult transfers began to Silver and Black Creek to build wild populations while isolating the rainbow trout from the main river. The intent was to 'protect' resident brown trout populations in the Forks at the request of special interest groups that were concerned about brown trout and to be in compliance with the Management Plan. The transfers alone have shown an increase of roughly 5,000+ wild rainbow trout returning to the river by 2010-11. Meanwhile, habitat in the vast majority of the reach above Norval is not suitable for brook trout due to lack of spawning sites, groundwater upwellings and water being too warm in summer. Brown trout being fall spawners have difficulty spawning in most of the reach due to high sediment levels (Jim Bowlby, personal communication). MNR and CVC have detailed electro-fishing sites and most sites show very, very low trout biomass and many sites in the main river between Inglewood and Norval have well below average overall biomass. **Brown trout have not been able to use the majority of the habitat and brook trout cannot survive in it.** It is estimated that close to one million square meters of potential salmon and trout habitat sits empty. Access to this will determine if this habitat can be utilized by other salmonids and to what extent. With the adult transfers being carried forward by an NGO it is also questionable should the NGO discontinue these transfers, whether the OMNR has capacity to continue, therefore habitat utilization by the fish themselves is a subsequent benefit to this study

The past two years we estimate over 80% of returning Atlantic salmon were stuck below Streetsville dam, even with daily lifts by MNR crews. In 2011 close to 90% out of the 40+/- Atlantic salmon passed at Streetsville were

not passed at Norval. By manually lifting and segregating fish the program has effectively stopped over 95% of the run from reaching the upper river and spawning grounds. Further evidence was shown in July 2011 when MNR opened the Norval fishway due to warm weather. Over 40 adult Atlantic salmon had been spotted in the pool below but none lifted in the fishway. Yet within weeks of the ladder being left open, three adult Atlantic salmon were sampled 40 km above Norval and the group of fish below the dam had disappeared.

With Pacific salmon stopped at Streetsville the fishway becomes plugged with chinook and coho salmon. Smaller salmon and trout are forced out, drop back and give up. Over 30% of the Atlantic salmon lifted this year came from below the ladder, behind the chinook salmon. The effort to catch them represented roughly 2% of the effort used by an MNR crew to attain the balance of fish. Atlantic salmon, brown trout and rainbow trout were all observed to drop back down the river 500m to 2 km below the chinooks and hold in pools away from the high densities of the larger salmon. They were witnessed to spawn in severely degraded water below Streetsville. The outcome of spawning being zero reproduction and survival due primarily to thermal stress, high sediment levels, poor spawning habitat and anchor ice. Thus the present operating strategy of manual lifts and segregating fish species is the major hurdle in the restoration of Atlantic salmon.

Brown trout, coho salmon, rainbow trout and Atlantic salmon CANNOT reproduce successfully below Streetsville or Norval Dams on the main stem of the Credit River. Water temperatures exceed 30 C and high sediment, flooding, anchor ice and extremely low levels of groundwater prevent successful reproduction of these species. This is primarily caused by the geology of the watershed which runs through a clay plain from Norval to Port Credit where groundwater is 99% lower than sections above Norval (MOE groundwater study, 1992). Land use, urban areas, agriculture and lost top soils further reduce the potential for reproduction in the lower river.

The present management for rainbow trout allows volunteers to manually lift and transfer wild Rainbow Trout by truck to Black and Silver Creek, a small tributary of the Credit River that enters 200m above Norval Dam. The fish that are tagged, transferred and monitored for movement, spawning and reproduction. Less than 10 tagged fish have been reported in the upper main river out of roughly 6,000 that have been tagged and moved, demonstrating the fish stay where they are transferred too. Electro-fishing data has shown a dramatic increase in juvenile rainbow trout levels in the tributary. Angler success and returns to the fish way and mark-recapture population work show the rainbow trout run has increased from a low of 3,000 fish in 2003 to a level exceeding 10,000 in 2011 as a result. However, the status quo is highly labour intensive, expensive, puts volunteers and MNR staff at greater risk of injury and the lifting and management hurts other fish migrations by having the fishway closed and not allowing access to other species including some native fish populations. (i.e. white sucker, smallmouth bass, etc).

Impacts on Resident trout

Special interest groups focused on short reaches of the Credit have for years expressed concerns that allowing rainbow trout and salmon into the upper river will ruin the resident brown trout fishery. Yet no evidence has been provided that such impacts will occur. The past 15-20 years has allowed for research and data collection on many local rivers that have provided evidence to the contrary, rainbow trout, even Pacific salmon and brown trout can co-exist and that species interaction has not had a detrimental effect on any one or as a whole all species.

The MNR and Grand River Conservation Authority (GRCA) 20 year study on Whiteman's Creek provides the best example of a segregated resident brown trout fishery opened to migratory rainbow trout access and its subsequent impact on the fishery and the economics of the watershed. Whiteman's Creek is similar in size and volume to the middle Credit (Inglewood to Forks), has related brown trout and related rainbow trout to the Credit River and is about 100 km away southwest of the Credit system. It is a perfect case study. The following comes from MNR research and is included as appendix 1, by Larry Halyk, MNR.

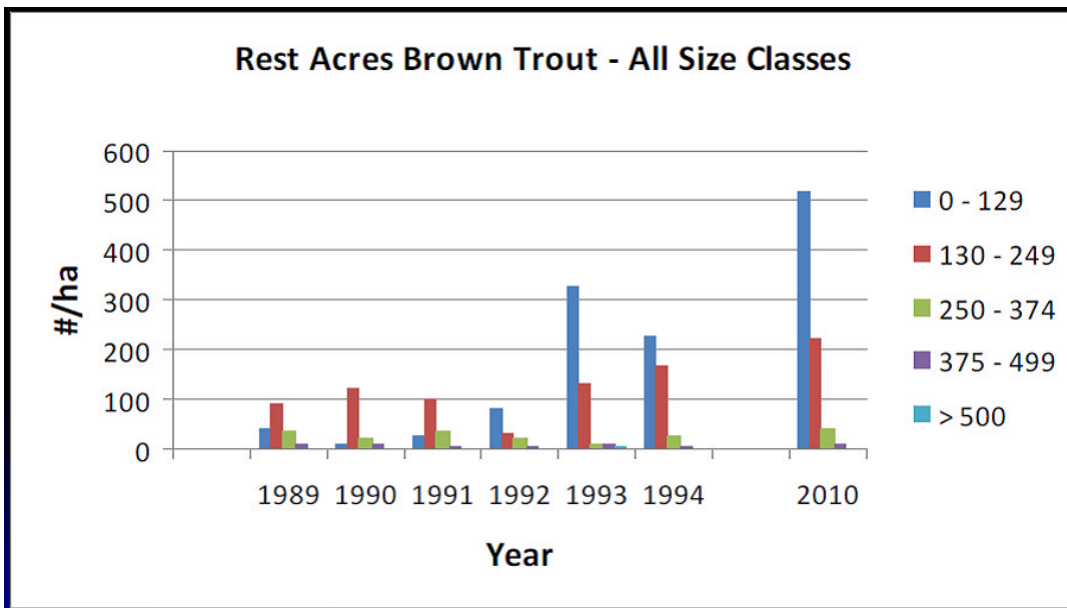
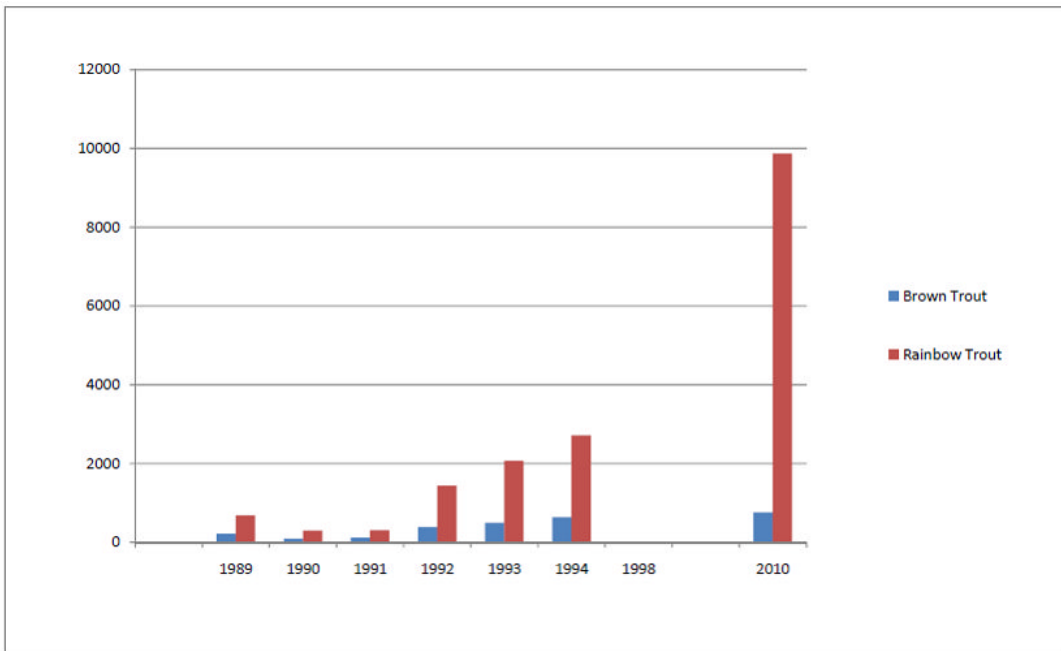
Prior to 1992, the Lorne dam on the Grand River prevented rainbow trout from accessing Whiteman's Creek. It had similar regulations to the Forks of the Credit and a similar fishery for resident brown trout. The dam failed and a very small run of rainbow trout entered the tributary. The graphs clearly show how rainbow trout have exploded in Whiteman's Creek in the past 20 years from almost zero and brown trout numbers have increased!

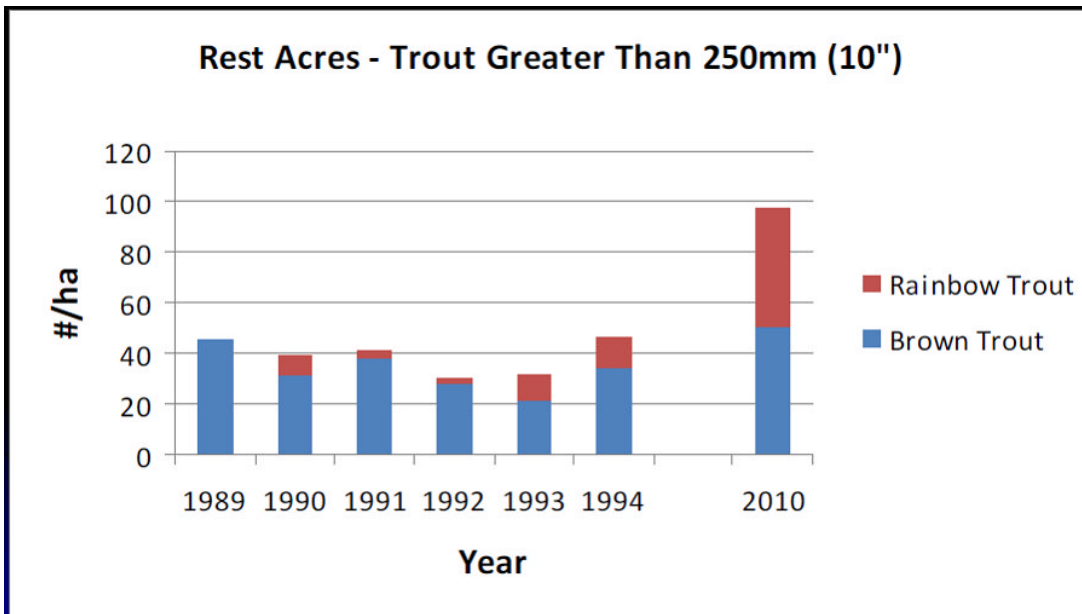
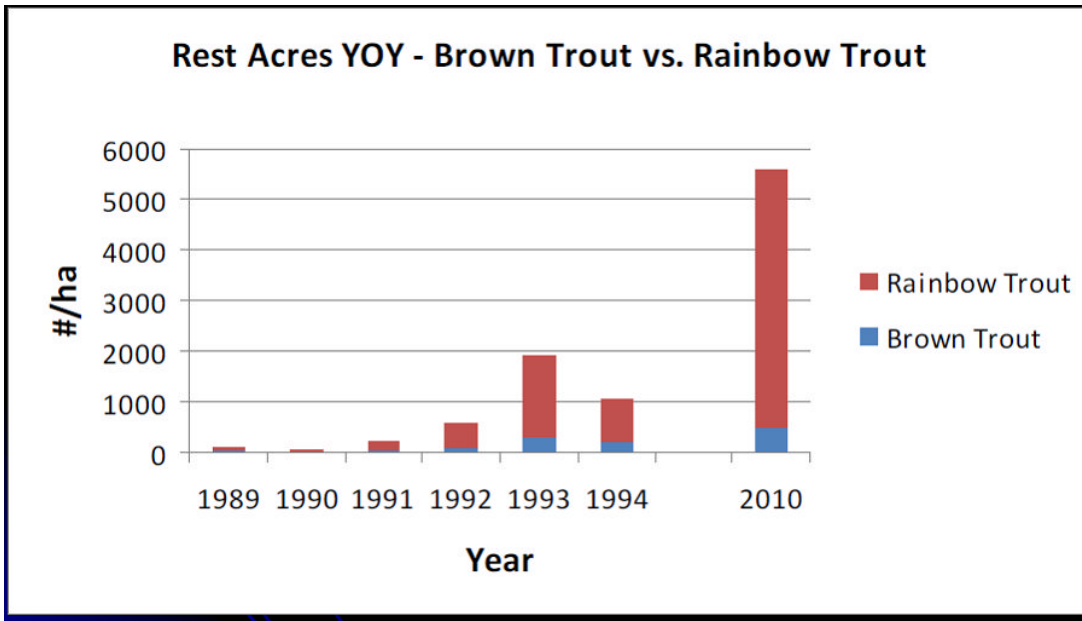
Brown trout increased in both quantity of fish and average size of fish. We anticipate a similar scenario to unfold on the Credit River in terms of these two species and their interaction.

It is believed that juvenile rainbow trout provide an additional food resource for the brown trout, and the evidence of browns feedings on rainbows is proven by recent MNR research at Whiteman's Creek. So with full and unobstructed access rainbow trout and resident brown trout have shown they not only coexist, but have a symbiotic relationship. There has been angler discussion in personal communications stating they are harder to catch, yet many guides using the resource have stated that a different alignment of angling tactics have in fact increased their catch rates.

Figures 1 through 4 (from Halyk, 2010)

Whiteman's Creek – Abundance of rainbow and brown trout over time:





What has not been well documented is the impact this new wild, self sustaining fishery has had on the local economy and how it has increased fishing opportunities. The resident brown fishery still exists on Whiteman's Creek. In fact there are now a resident rainbow population in addition to the migratory population, adding to the fishery. But the increased run of migratory rainbow trout has caused a massive influx of new anglers year round to utilize this new resource. To describe it, in the early 1990's it was rare for anyone to trout fish in Caledonia and Brantford or along the main river to Paris. By 2010 it was common to see 20-50 trout anglers at Caledonia in fall and winter on any given day, as well as a few dozen at Brantford, below the confluence at Whiteman's Creek, towards Paris and into the Nith River. This translates into thousands of hours of angler effort every week for 4-8 months that has been made possible by fish access past one dam into Whiteman's Creek! We anticipate similar but far more substantial growth on the Credit River as a result of a wild, self sustaining fishery that has access to the entire watershed.

Within the Credit River the improving run of rainbow trout (estimated at 10,000 in 2010) has already shown a substantial increase in angler effort and economic benefits to the lower Credit River. The average weekday in November 2010-11 saw 30-60 anglers fishing the golf course section with higher angler participation on

weekends! This is in addition to 50-100 anglers per day fishing Erindale and dozens more fishing at Port Credit. We estimate angler effort has exceeded 1,000 hours per day (for weekdays) on the lower Credit River this fall for three consecutive months! This increase is worth hundreds of thousands of dollars to the local economy and with runs increasing the economic benefits will be into the millions of dollars.

Recently there was an economic study done on the Credit River, commissioned by Credit Valley Conservation and it clearly defined rainbow trout as the most valuable and viable economic resource on the Credit River over other fish species. It was extrapolated via the economic model and based on assumptive population extractions that with access to this additional habitat the value of the Credit River fishery would increase by several million dollars.

Open Access for all salmonids:

Chinook salmon and coho salmon are clearly a naturalized specie in Lake Ontario and the Credit River. The fin clipping program has proven that between 30-60% of the chinook salmon in Lake Ontario are in fact wild fish. Eastern Ontario rivers including Cobourg, Ganaraska, Wilmot, Oshawa and Bowmanville all have substantial runs of wild coho and chinook salmon. Most of these rivers have no salmon stocking and none of them have trout stocking whatsoever, yet they have substantial runs of all the species including coho, chinook, rainbow trout and brown trout, in addition to excellent resident brown trout. One angler reported catching over 50 lake run brown trout in the upper Ganaraska in September 2011 over two days of fishing and losing that many more. Another angler reported catching 30 coho in Bowmanville Creek in one outing this fall. Top days for chinook and rainbow trout often produce over 50 hookups for experienced anglers during peak runs.

Many other Southern Ontario rivers have all these species coexisting in a symbiotic relationship. The Bighead River in Meaford, Ontario boasts a substantial run of wild rainbow trout. It also has a substantial run of wild chinook salmon and has an excellent resident brown trout fishery in the upper river where both steelhead and salmon have unrestricted access. The same goes for the Beaver River where chinook salmon and steelhead are seen spawning far above an electro-barrier that was installed to segregate brown trout in Kimberly. The resident brown trout are plentiful in this reach, as are juvenile rainbow trout and brook trout. Meanwhile the river supports a run of several thousand chinook salmon with no stocking, in addition to many thousands of wild rainbow trout. The Boyne and Pine Rivers, tributaries of the Nottawasaga also have some of the highest densities of wild chinook salmon and steelhead and they too have huge resident brown trout populations.

Conclusion:

Species diversity is a primary goal of the MNR. Reducing the need for hatchery fish is a priority for MNR. Reducing the costs of sustaining a fishery is a priority of the MNR. Reducing the hours staff must spend to sustain a fishery, such as operating fishways and reducing the need for volunteers is a priority for MNR. Reducing the risk of liability for both staff and volunteers is a priority for MNR. Creating and sustaining a great fishery and the economic benefits that fishery has are a priority for MNR. All of these priorities can be met by allowing unrestricted access for all native and naturalized species up the Credit River by simply opening the fish ladders and allowing the fish to go where they please!

As we view local systems we clearly see a pattern that species diversity is a great benefit to the fishery and rivers with no barriers. We see that all the species coexist in southern Ontario rivers and evidence clearly shows there are many substantial benefits to the fish community by having the salmonid diversity. There is a huge cost savings to MNR and a huge reduction in liability exposure for MNR and NGO's by reducing the manpower needed to artificially lift and segregate the fish.

The benefits of wild chinook salmon have been further proven by NY State on the Salmon River. NYSDEC now estimates the Salmon River produces between 4 million and 10 million wild chinook salmon fry every spring. They also estimate as much as 50% of the chinook salmon fry are preyed upon by yearling coho, rainbow, brown and Atlantic salmon as they all migrate to Lake Ontario (Fran Verdoliva, Jim Johnson, personal communication). The availability of millions of wild chinook salmon fry proves to be a valuable food source for migrating yearling salmon and trout. NYSDEC also noted that Atlantic salmon yearlings had the highest predation rate of chinook salmon fry at 56% (NYSDEC personal communication)

If seasonal access to rainbow trout were given in spring only and Pacific Salmon still stopped than the fishery will still suffer and the Atlantic Salmon program will be doomed to failure. Most rivers in southern Ontario have upwards of half their rainbow trout run in the fall. By preventing fall run trout to access spawning grounds the genetic diversity of the population will be impacted and the population will suffer by potentially not allowing enough genetic diversification. The chinook and coho fishery will continue to rely solely on stocking of the Credit River and the Port Credit lake fishery will continue to suffer. CVC electrofishing monitoring has shown most of the tributaries between Streetsville and Norval able to support natural reproduction of species like Coho Salmon, when they are able to access above Streetsville Dam. This demonstrates that a diverse, naturalized population of this specie is possible, without the need to maintain hatchery program to sustain them.

Timing Windows

With the Credit's management plan about to undergo a review process we believe that the timing for this program should commence prior to the Spring 2012. With the OMNR limited capacity the management plan could potentially not be altered for a period of 5 plus years. This proposed 5 year study will allow ample time for MNR managers to see the quantitative effects of open access and specie interaction. It could potentially allow for a new management strategy on the Credit River where naturally self-sustaining fish populations are the desired goal. Within that time frame due to the chinook salmon marking program carried out by OMNR the recruitment of chinook salmon will also be answered and their classification may change from one of a put and delay take animal to one that is ranked in the same state as a naturalized fish. We are requesting this proposed study commence prior to spring fishway operations which normally begin after March 15 of each year.

Our proposal is to allow all native and naturalized species open access to the entire watershed to the first natural barrier above Norval for a 5 year period to study the interaction of species mix. It is our position that by allowing open access the fishery will respond in a very positive way, with substantial increases in Atlantic Salmon access, substantial increase in wild Rainbow Trout returns, substantial increases in Pacific Salmon reproduction thus reducing the need for stocking without having a negative effect on the resident Brown Trout fishery as has been evidenced in local watersheds. Due to the transient nature of all these fish populations we know that once this study is completed and should the management direction be to continue with the current operation, these system's will return to their current state fairly quickly, negating and long term effect positive or negative.

Pros:

- Reduce volunteer work by thousands of hours to run fishways, etc
- Improve fish passage for Atlantic salmon by up to 95%
- Improve migratory rainbow trout passage by up to 100%
- Improve passage for brown trout, white sucker, smallmouth bass, etc
- Reduce MNR staff fishway operations by hundreds of hours
- Ensure Atlantic salmon can fully reach their spawning grounds without human intervention and the stress and mortality associated with it!
- Reduce need for chinook salmon and coho salmon stocking by subsequent natural reproduction
- Provide detailed proof to the question of species interaction
- Increased trout and salmon fishery that would add millions in economic benefits to the Credit watershed including Port Credit, Mississauga, Halton, Brampton and Caledon.
- Substantially reduce liability risk for staff and volunteers.

Cons:

- Potential 5 year impact to resident brown trout (no evidence to suggest this will occur)

References:

Dietrich, J.P., J.N. Bowlby, B.J. Morrison, and N.E. Jones. 2008. The impacts of Atlantic Salmon stocking on Rainbow Trout in Barnum House Creek, Lake Ontario. *Journal of Great Lakes Research* 34(3). 495-505.

Halyk, Larry. 2010. Presentation given to Brantford Rod and Gun Club.

Kocik J.F., and W.W. Taylor. 1994. Summer survival and growth of brown trout with and without steelhead under equal total salmonine densities in an artificial stream. *Transactions of the American Fisheries Society*. 123: 931-938.

MOE study, 1992. Groundwater Resources of the Credit River.