



**Grand River
Tailwater Fisheries
Management Plan
*2005-2010***



This Publication should be cited as follows:

Ontario Ministry of Natural Resources. 2004. Grand River Tailwater Fisheries Management Plan: 2005– 2010. Ontario Ministry of Natural Resources—Guelph District.. 36p..

MNR # 51933

ISBN : 0-7794-7447-3

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Printed in Ontario Canada.

Copies of this publication are available from:

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Grand River Tailwater Fisheries Management Plan 2005 - 2010
ISBN : 0-7794-7447-3
MNR # 51933

Acknowledgements



Many partners have made this plan possible. Partner groups include:

Belwood Lake Cottager's Association, Belwood Lake Conservation Area, Department of Fisheries & Oceans Canada (DFO), Friends of the Grand River (FOGR), Grand Guides Co-Op, Grand River Conservation Authority (GRCA), Izaak Walton Fly Fishing Club, Ontario Ministry of Natural Resources (MNR), Ontario Streams Township of Centre Wellington, Trout Unlimited Canada (TU) and Wellington County Stewardship Council.

There were also numerous individuals who have dedicated their time and contributed information and comments to the management of this fishery and the development of the Grand River Tailwater Fisheries Management Plan.

However, the most important acknowledgement is to the Grand River which has inspired these partners to pitch in and make this Canadian Heritage River a vital part of our community.

Tailwater Management Plan Steering Committee

The following people have played a key role in combining information from various agencies and public consultation into the Grand River Tailwater Fisheries Management Plan. Their passion and expertise on the fishery and local environment was invaluable. This plan will direct management on the Grand River tailwater for years to come.

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About a Grand Fishery

The Shand Dam was built by the Grand River Conservation Authority to address issues of low flow augmentation and flood control of the Grand River. An additional benefit of this water control structure is discharge of cold water creating a "tailwater" which provides conditions suitable to support trout populations for approximately 28 km downstream of the Shand Dam to the covered bridge at West Montrose (see map on page 16 & 17).

Ever since the creation of the Shand Dam and Belwood Reservoir in 1942, it was known that the cold-water below the Shand Dam would support certain types of salmonids on a limited basis. Brown trout and rainbow trout were stocked on a sporadic basis in the tailwater from 1946 – 1965 and from 1971– 1988. Stocking of rainbow trout indicated that this reach of river had some potential to create a trout fishery in a near-urban area.

Collection of water temperature data in the cold water release area below the Shand Dam during the mid 1980's indicated that there might be the potential for establishing a trout fishery at least on a put-grow-take basis. Further research indicated that brown trout might be a more prudent choice due to this species ability to tolerate warmer and more turbid waters than brook trout or rainbow trout.

The upper Grand River brown trout program began in 1989 was made possible through the cooperation of MNR, GRCA and Trout Unlimited.

It was found that these trout grew exceptionally well. Subsequent stocking and some natural reproduction lead to good populations and growth rates of brown trout. This in turn lead to increased angling pressure. The fishery has now evolved to provide an extraordinary brown trout fishery.

This document will highlight the biological, social and economic developments of this fishery and the issues that it faces.



What is a "Tailwater Fishery"
A "tailwater" fishery is created when water from a bottom release dam changes the river environment below the dam. In the case of the Shand Dam the water released is colder than the water that would normally be flowing through this reach of river. This cold water means that species like trout that would otherwise not survive here can thrive in the tailwater of the Shand Dam.

The Grand River varies in character throughout this 28km reach and includes an upper reach between the Shand Dam and the town of Fergus where the river is bedrock controlled and heavily influenced by the Dam. The middle reach is

characterised by limestone outcrops and a higher gradient river in a somewhat confined channel. This middle reach extends from the Town of Fergus down to the Low Level Bridge below the Elora Gorge. Finally, the lower reach of the tailwater offers a wider profile, lower gradient river valley with more gravel substrate and more groundwater inputs.

The entire reach of the Grand River tailwater is relatively well buffered from surrounding land-use. Many people are surprised when they step down into the river valley right in the town of Fergus or Elora and they cannot see the urban development that surrounds the river. The same can be said through the lower reaches of the river where farm fields are often located just behind a row of sheltering trees at the top of the river bank. Much of this land is owned by the GRCA.

Trout populations thrive in the upper and middle reaches of the Tailwater and there are good populations of brown trout in the lower reach, but the lower reach is more susceptible to the effects of frazzle and anchor ice in winter and high water temperatures in summer.

Part of the success of the Grand River Tailwater can be attributed to the cooperation and dedication of volunteers and agency representatives that take an active role in managing this fishery.

Special regulations were adopted on this fishery to protect fish in a heavily utilized fishery. Safe and available public access is another element that helps give the Grand its reputation as an excellent fishery. The efforts of Friends of the Grand River and other volunteers result in keeping the river and surrounding environment clean and of good quality. The fish stocking program is yet another cornerstone of this fishery. Volunteers and agency representatives place approximately 23,000 yearling trout in the river throughout the tailwater reach annually. These fish grow quickly on the prolific bug hatches and other food items they can find on this productive river.



The Grand River provides an ideal environment for people to enjoy a world-class angling experience. There are good populations of large brown trout, a beautiful river valley, clean water and groups of volunteers that take care to provide safe access to this fishery.

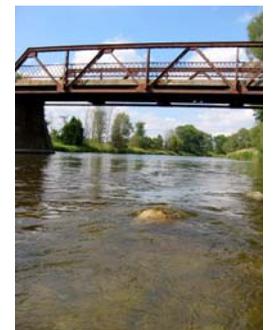
Since its development starting in 1989 the Grand River Tailwater Fishery has grown into one of the best recognized brown trout fisheries in North America. Despite this success, the management of this resource has been done largely “from-the-hip” by the Ontario Ministry of Natural Resources (OMNR) with the assistance of the Grand River Conservation Authority (GRCA), Friends of the Grand River (FOGR) and many other stakeholders. To guide this resource into the future the Grand River Fisheries Management Plan completed in 1998 identified that a plan specific to the unique issues facing the reach of river below the Shand Dam was needed.

In 1999 work was initiated by the OMNR, GRCA and FOGR to develop a Management Plan. These efforts included hosting of two public meetings one in Elora in 2000 and another in 2001 in Cambridge. From the second public meeting a steering committee was struck to develop the plan.

The steering committee held regular meetings for almost two years to identify the goals and issues facing the Grand River Tailwater. Discussions led to suggested strategies and tactics to address these issues.

Throughout this process information was compiled for a “Background Document”. This document will describe the many activities that have taken place over the past several years in the tailwater area. It will also include the physical characteristics of the area, the land-use and the management activities that have shaped this fishery. This will be a helpful road map to guide managers.

The plan is intended to outline and encourage a coordinated effort among the stakeholder groups to maintain or improve this fishery for the future. This plan will be reviewed by an “Implementation Committee” every five years and updated as needed to address new priorities in this fishery. The implementation committee will be guided by the ‘Best Bets’ outlined in this document.



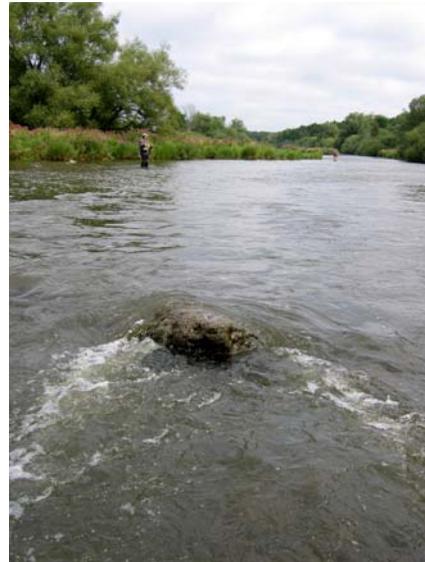
Goals of the Grand River Tailwater Management Plan

Goal A

The goal of this plan is to maintain or improve the high quality coldwater fishery found in the Grand River Tailwater

Goal B

The Grand River Tailwater currently provides an environment conducive to excellent angling experiences. The goal of this plan is to maintain or increase the quality of these experiences.



The Planning Process

Planning Process Summary

The need for a plan to manage the tailwater reach of the Grand River was identified in the Grand River Fisheries Management Plan (GRFMP) in 1998 by GRCA and MNR. The development of a plan for this reach of river was identified as one of the GRFMP's 42 'Best Bets'. Efforts to initiate the creation of this tailwater management plan occurred in 2000 and in 2001. An initial public meeting was held in Elora in October 2000. A second public meeting was held in Cambridge in December 2001 followed by a Steering Committee being struck that consisted of a mix of agency representatives and identified stakeholder groups. This group met eight times between February 2002 and April 2004 to synthesise the materials provided by resource managers and the public through the two earlier public meetings. A core group representing MNR, GRCA and FOGR also met twice to go over details of the Tailwater Decision Making Matrix and the Best Bets List.

The Steering Committee was responsible for development of the Terms of Reference for the Tailwater Management Committee, the *Grand River Tailwater Fishery Background Report* and the *Final Draft Grand River Tailwater Management Plan* which includes the "Tailwater Decision Making Matrix" and the "Tailwater Best Bets List".

The Tailwater Decision Making Matrix

One of the more challenging tasks undertaken by the Steering Committee was developing a framework to make this plan concise and easy to follow. There was also a need to organize a wide assortment of information, data, ideas and thoughts concerning management of the Tailwater reach of the Grand River obtained from agency representatives, stakeholder groups and input from the public meetings. To compile information in a organized fashion, the Steering Committee looked to the Grand River Fisheries Management Plan for structure and direction. The "Issues", "Strategies" and "Tactics" framework fit well with this sub-plan. However, the Steering Committee decided that they wanted an easier way to trace the decision making process. For this reason the "Tailwater Decision Making Matrix" identifies the issues facing the tailwater. Beside each "Issue" are associated "Strategies" and "Tactics" designed to address each particular issue.

Tailwater Plan Best Bets

The next step was to organize and identify the key elements. To do this the stakeholders were asked to rank the "Issues" found in the Tailwater Decision Making Matrix most important to their organizations. This exercise will be a valuable tool for the implementation committee to use to set priorities.

The "Best Bets" presented in the Grand River Tailwater Fisheries Management Plan were developed by the Steering Committee. They provide direction the for managers and stakeholders to implement this plan.

The "Best Bets" have not been ranked in this plan. They have been put into various categories. There are many additional tactics found in the planning matrix. These additional tactics could be implemented at a later date. The implementation committee will review the circumstances and opportunities associated with each "Best Bet" and offer the appropriate tactics to address the goals of the Grand River Tailwater Fisheries Management Plan.



Development of the Grand River Tailwater Fishery Management Plan



Rationale for Development of this Plan

It has been over 15 years since the initiation of the Upper Grand River Brown Trout program. The original proposal for the introduction of brown trout to this portion of the Grand River was to re-create a coldwater fishery and to re-establish a self-sustaining fish community dominated by a coldwater, top-level predator. Historically, this position had been taken by brook trout (prior to mid-1800's) and more recently by smallmouth bass and northern pike.



The creation of the Grand River Fisheries Management Plan (OMNR and GRCA 1998) identified the need to develop reach or sub-watershed specific plans in a number of locations within the watershed. These specific plans were to go beyond the more general management recommendations for the sub-watershed in the overall plan and to identify the goals, objectives, strategies and tactics for management of these smaller units.



For the Grand River Tailwater there was an identified need to manage the existing fishery and a desire to establish a self-sustaining population of brown trout in this portion of the Grand River. Most other considerations for fishery management were not articulated in a plan.



Intent of the Grand River Tailwater Management Plan

The GRFMP plan is intended to guide the management of the Grand River's fishery in the area below the Shand Dam to West Montrose. Included in this plan are the river's habitat, fish community, water quality, harvest, access and regulations.



The planning process is designed to engage all users of this resource. Once engaged they will work through a process to develop a set of mutually agreeable management plans that can be agreed upon. The plan is intended to act as the guiding document to the three key management agencies interested in fisheries management: Ontario Ministry of Natural Resources (MNR); Department of Fisheries and Oceans (DFO); Grand River Conservation Authority (GRCA).



The plan is also intended to be the guide for all activities undertaken in co-operation with all these agencies and partners interested in the Grand River Tailwater fishery. The life of this plan is the next five years, at which time the document will be reviewed to meet new issues that may have arisen concerning the tailwater.

Grand River Tailwater Best Bets



Fish Habitat Management Activities

Fish Habitat Enhancement

1. Continue with habitat improvements in the tributaries and main stem to improve fish habitat for all life stages of brown trout.
2. Decrease channel width, improve water temperatures and promote the mixing of river substrates in the main channel of the Grand River by implementing projects like the large cover placement project and examining the potential for channel mobilization flows.
3. Identify the impacts of dams and on-line impoundments. Promote their removal or modification where warranted through education and if necessary financial incentives.



Water Quality Improvement

4. Support and promote water quality enhancement programs and stewardship activities on the Grand River and tributaries like Carroll Creek, Swan Creek and the Irvine Creek to improve water quality entering the Grand River.
5. Implement the water quality recommendations of the Upper Grand Subwatershed Study (1999) in the area above and around Belwood Lake.
6. Initiate the "Yellow Fish Road" program in Fergus and Elora.
7. Promote the use of the best technology available for storm-water management in the area of influence of the tailwater reach.
8. Work with municipalities to retrofit storm-water management systems that do not have proper water quality treatment.

Fisheries Management Activities

Stocking Program

9. Continue with the partnership of MNR, FOGR, GRCA and others to stock 20,000 - 25,000 yearling brown trout in the tailwater reach of the Grand River each spring and to stock fall fingerlings in appropriate tributaries to promote spawning in tributaries.



Regulations and Enforcement

10. The MNR and committee will support and pursue the completion of a variation order to extend the special regulations between the 2nd Line Garafraxa and the Belwood Lake Conservation Area Park boundary.
11. Continue to provide a mix of angling opportunities that can be utilized including special regulations areas and catch and harvest areas in the tailwater.
12. Support programs like River Watch and the Fish & Wildlife Guardian program to compliment traditional enforcement measures.
13. Maintain signage indicating the location of special regulations areas.
14. Increase the enforcement presence on the river during times when illegal harvest of brown trout is expected.
15. Develop minimum standards and a 'Code of Ethics' for commercial guides.
16. MNR enforcement staff will set targets to increase the level of monitoring of the local commercial baitfish harvest industry to appropriate levels.

Grand River Tailwater Best Bets (cont.)

Community Participation

Access

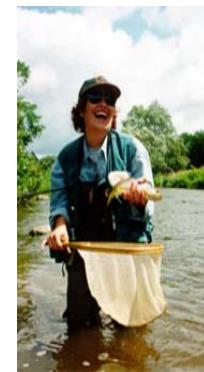
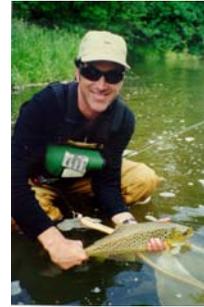
17. Continue to maintain and/or improve parking areas and access points to the fishing in the tail-water.
18. Identify where access to the river is lacking and develop additional access points as required.
19. Continue to provide signage and garbage kiosks at major access points.
20. Produce maps of access points which will be used by municipalities and others to promote fishing opportunities available in the tailwater.
- 21.

Education

21. Develop a communications plan about the dependency of the fishery on the Shand Dam and reservoir. It will include the operating objectives and standard operating practices and constraints of Shand Dam. Options for doing this include a poster, a sign at the Dam or inclusion on the GRCA and partner websites.
22. Post a code of ethics for use of public access points and develop brochures promoting access and the fishery.
23. Provide education about the economic value of the fishery and an opportunity for anglers, local municipalities and the general public to participate in the protection and enhancement of the fishery.
24. Provide more education concerning fishing seasons and safe landing and handling of fish to increase survival rate of fish being released.
25. Educate the angling public about fish species at risk in the tail-water.
26. Encourage the development and promotion of a code of ethics for anglers and angling guides.
27. Make information concerning water quality improvements in the watershed more accessible to the public. This would include the recent UV upgrades in local STP's and other appropriate studies completed by academia and management agencies.
28. Educate the public about the value, practises, regulations and reporting requirements of the commercial baitfish harvest industry.
29. Work with local schools to bring education concerning the fishery and local environment into the schools. This can be accomplished through the Yellow Fish Road Program and other opportunities to incorporate habitat management into the school curriculum.

Funding & Implementation Activities

30. Establish an Implementation Committee for the Tailwater Plan that brings various partners together to share their resources, expertise and abilities to implement "best bets" in the tailwater reach. These partners should include representation from management agencies, Non government organizations and local educational institutions.
31. Work with the Grand River Fisheries Management Plan Implementation Committee to tap into the significant support available through this group.
32. Apply the Exceptional Waters Process to this reach of river in order to engage landowners, other interest groups, anglers and municipalities in the better management and protection of the river and valley.
33. Consider hiring a coordinator to help facilitate partnerships, develop new partners, and implement recommended "best bets".



34. Prepare an implementation plan to initiate the Best Bets outlined in the Grand River Tailwater Management Plan.
35. Develop a business model and marketing plan/package for the tail-water fishery to help develop and solicit support from the corporate sector and local community. Implement those tactics which are "best bets" that will encourage the participation of corporations and businesses that are interested in fisheries and the river.

Research & Monitoring

Summarizing and Consolidating Existing Research Data

36. Summarize the results of past monitoring activities in the tailwater reach, identify gaps in monitoring and look for means of consolidating efforts. Synthesize the existing literature on management issues associated with tail-water trout fisheries.
37. Conduct a workshop or symposium to present information and discuss future research required in the tailwater reach.

Fish Habitat Research & Monitoring

38. Conduct Class Environmental Assessment required for the implementation of the large cover placement projects. Complete technical documents and plans in order to implement one or more large cover placement projects.
39. Identify and then improve critical habitat needs in the tail-water reach. These critical habitats include, summer and winter refuge areas, nursery habitat and spawning habitat.
40. Support research designed to determine the impact of barriers and dams on fish communities, fish habitat quality and fish migration.
41. Support efforts to learn more about the habitat requirements of aquatic species at risk in the tailwater reach and incorporate these findings into habitat management decisions.

Fish Population Data Collection

42. Use creel survey, angler perception information and fishery assessment data in conjunction with growth rates, condition and biomass production data to determine if a change in the stocking strategy (density, age-class, locations, etc.) can better accomplish fishery goals.
43. Continue to fin clip yearling brown trout being stocked in the river to monitor natural reproduction, growth rates and year class strength in the tailwater.
44. Train and use fishing guides and local angling club members to assist in data collection and monitoring.

Water Quality and Temperature Monitoring

45. Obtain summer water temperature data from throughout the tailwater reach to help determine the impact of dams, tributaries, groundwater discharge, riparian vegetation and the structure of the river on water temperature and water quality.
46. Install water quality monitoring stations where gaps presently exist in the existing water quality monitoring program and review the water quality monitoring program in the tailwater reach.
47. Encourage the GRCA and partners to develop a water quality plan for Belwood Reservoir.

Grand River Tailwater Issues, Strategies & Tactics Matrix

Issues

Fish Habitat Issues

1. Inadequate understanding and communication of the primary objectives of the Belwood Reservoir which are to provide flood control and low flow augmentation and the dependency of the fishery on this source of cooler water.

2. There is often inadequate data to make sound habitat management decisions

3. Geological constraints on fish habitat and community (lack of well sorted substrate, shallow pool depths, over wide cross-sections, poorly defined riffle crests, etc...)

4. Fish habitat may be impacted by the presence of dams and online ponds in the tailwater reach. Dams reduce downstream movements of stream bed load, decrease water quality and possibly increase water temperatures downstream. Dams also provide limits to the amount of water GRCA can discharge from the Shand Dam.

Water Quality Issues (Temperature Issues)

5. Suspected stress and mortality of fish from high temperatures in summer.

Strategies

Inform the public about the dam operations mandates and how the reservoir supports/effects the fishery.

Conduct a review of the scientific literature to attempt to define factors that limit brown trout survival and production in similar tailwater fisheries in North America. Develop a data collection strategy and secure resources to complete habitat studies that help make management decisions based on science.

Identify and understand the geologically distinct reaches in order to properly manage the fishery. Improve winter and summer refuge habitat in lower reaches of the tailwater by implementing the Aquatic Habitat Enhancement Projects (Parish Geomorphic, 2000). Research the feasibility of gravel replenishment below the Shand Dam in the upper reach to improve spawning habitat and diversity of food web.

Undertake an assessment of the effects of dams and online ponds in the tailwater. Devise ways to work with owners of dams and impoundments to eliminate or reduce the impacts of these features on fish populations and habitat. Consider the merits of dam removal on an individual basis as these structures come up for repair or replacement. Note that there are natural barriers to fish movement in this reach of river that cannot be mitigated.

Ascertain if water temperatures, water quality, flow volumes and oxygen levels throughout the tailwater are significant factors. Improve dissolved oxygen conditions by decreasing water temperatures in the tail-water reach. Identify areas of major groundwater discharge. Determine major groundwater active areas of the tailwater.

Tactics

- Develop communications activities with respect to the operating objectives and standard operating practices and constraints of Shand Dam and the multipurpose reservoir system in the Grand River Watershed. This could be achieved through a well designed poster or inclusion in the GRCA Web site.
- Work with partners including DFO, MNR, GRCA, TU, FOG, Universities and others to complete required studies.
- Focus studies on Fish survival study, temperature surveys, affects of barriers, nursery surveys, tributary habitat, growth study, etc.
- Hold a research symposium to get key players together to highlight ongoing and completed research
- Use a research symposium to identify information needed to direct future management decisions on the tail water.
- Synthesize and consolidate the data on management issues associated with tail-water trout fisheries.
- Verify the distinct geomorphic/geologic units of the tailwater (i.e. boundaries, barriers, gradients, stream types, substrate, temperature
- Conduct Class Environmental Assessment required to implement large cover placement projects.
- Complete technical documents and plans for one or several large cover placement projects.
- Solicit funds from various sources to complete one or several projects and monitor effectiveness.
- Complete remainder of projects if monitoring indicates cost-effectiveness.
- Investigate bedload movements bed armouring, imbeddedness and substrate quality in the Grand River and its potential impacts on fish habitat.
- Obtain both point and longitudinal summer water temperature data from upstream and downstream of impoundments to quantify thermal effect (3 dams on Grand River, 1 dam on Irvine Creek, 1 dam on Carroll Creek tributary).
- Investigate the habitat changes positive or negative to the river caused by impoundment of water behind dams.
- Educate the public concerning the impacts that dams and on-line ponds can have on fish habitat and environmental functions.
- Provide financial incentives to help remove dams and on-line ponds where possible.
- Support research designed to determine the impact of barriers and fish communities (Watershed Science Centre, Trent University) and fish migration.
- Examine opportunities to decrease water temperatures of tributaries through buffers and channel morphology changes.
- Determine need and locations for thermal refuges for mid-summer and mid-winter conditions. Implement recommendations of large cover placement proposal to decrease channel width and improve water temperatures in the main channel of the Grand.
- Monitor temperatures upstream and downstream of the three impoundments on the Grand and the impoundments on Carroll and Irvine River to determine effects on temperature in the system.
- Summarize the existing monitoring activities, examine gaps and look for means of consolidating efforts.
- Continue to monitor the thermal regime of the river and identify reaches where rapid temperature changes occur. This will be done using data loggers and a by placing a temperature probe in the Salem gauge station.
- Use radio telemetry in brown trout to determine areas frequently used during times of thermal stress.
- Educate the public concerning the low water response recommendations on the GRCA web site and stresses placed on fish during times of high temperature and stress.

Grand River Tailwater Issues, Strategies & Tactics Matrix

Issue

Water Quality Issues (Temperature Issues)

6. Inadequate understanding and communication on the purpose and operation of the Belwood Reservoir for low flow augmentation

7. Perceived negative impact on water quality due to Sewage Treatment Plant discharges

Water Quality Issues – Nutrients

8. Excessive sediment and nutrient loading into the river

Water Quality Issues - Sediment

9. Urban water quality Impacts from storm-water

10. Water quality impacts from land-use on Belwood Lake and the Grand River above Belwood Lake.

Fish Habitat Issues

11. Inadequate documentation of trends in water quality information concerning the benefit of water quality improvements undertaken on the tail-water reach.

Fish Community Issues

12. Inadequate information on how the current management of the tail-water fishery affects fish species at risk

Strategies

Educate the public via posters and web site postings to inform people about the dam operations mandates and the possible effects on the fishery.

Educate the public as to the improvements in sewage treatment technology. Communicate to the public that the quality of treated water being put into the river is adequate for fish needs.

Engage the community and landowners in land and water stewardship programs that benefit the Grand tailwater and surrounding environments.

Ensure that municipalities understand the importance of storm water quality treatment for new developments. Ensure that municipalities, developers and consultants are aware that they should apply Best Management Practices for quantity and quality control of storm-water.

Determine impacts on water quality of Belwood Lake and Grand River upstream of Belwood Lake and determine appropriate actions to improve water quality leaving Belwood Lake.

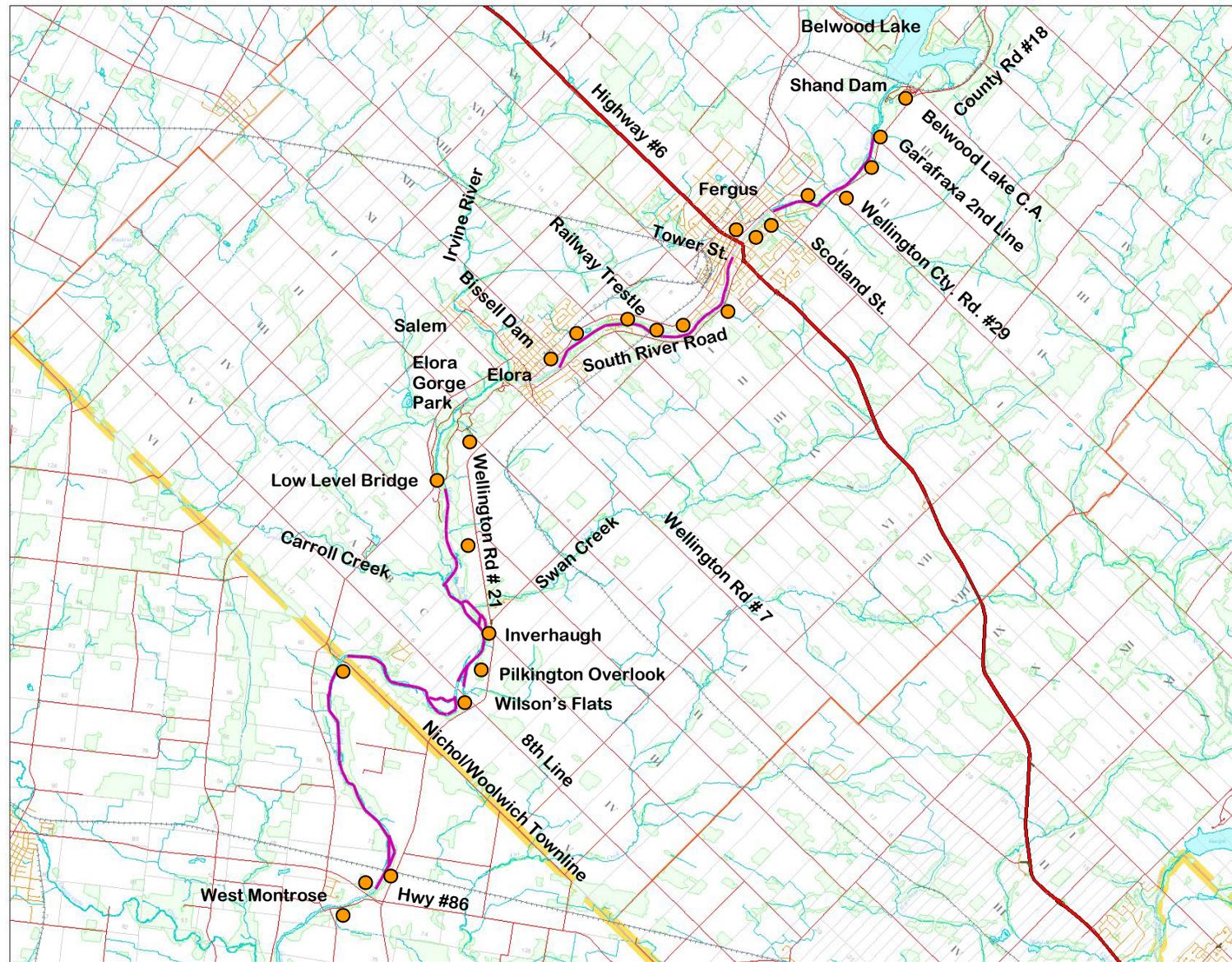
The need for a water quality monitoring station at West Montrose should be considered within the context of a monitoring/water quality plan for the tailwater reach and the Grand River in general. After considering the need in the context of an overall plan, the appropriate level of monitoring should be specified for the West Montrose station.

Management of the tail-water fishery including habitat management should consider the needs of COSEWIC species.

Tactics

- Use articles in local newspapers, posters, signs Conservation Area tabloids and the GRCA Web site to let the public know about the operational procedures and purposes of the Shand Dam.
- Report on water quality data collected to the fisheries management community and the public.
- Make information concerning water quality improvements in the watershed more available to the public. This would include the recent UV upgrades in local STP's and other appropriate studies completed by academia and management agencies.
- The thermal impacts either positive or negative of the sewage treatment plants that discharge to this reach should be investigated/assessed.
- Promote rural water quality improvement programs and support work of NGO's planting trees in this area
- Support and promote the Rural Water Quality Program and stewardship activities on tributaries like Carroll Creek, Swan Creek and the Irvine Creek to improve water quality entering the Grand River
- Biosolid and septage management needs to be considered on lands surrounding and upstream of the tail-water reach. Examine new ways to manage riparian floodplains, Locate reaches where healthy riparian floodplain forests can be established.
- Plant buffer strips along side the main stem of the Grand and tributaries and promote cattle exclusion fencing to provide water quality and temperature improvements.
- Initiate the "Yellow Fish Road" program in Fergus and Elora.
- Work with municipalities to retrofit storm water management systems that presently have no water quality treatment.
- Promote work on innovative storm-water BMP retrofits (e.g. S.W.A.M.P. program)
- Identify and distribute BMP for storm-water management technology, manuals and info sources to local consultants.
- Promote the use of best technology available are used in the area of influence of the tail-water reach
- Identify urban drainage areas that have storm-water treatment.
- Identify and address issues surrounding West Nile virus and goose problems related to the wet portion of the storm-water quality ponds need to be addressed.
- Support the use of BMP's concerning water quality in the area above and around Belwood Lake.
- Synthesis the data from existing research concerning water quality trends in the water entering Belwood Lake and leaving Belwood Lake.
- Support the Rural Water Quality Program and other stewardship initiatives in this area.
- Develop partnerships with various interest groups to help monitor water quality in Belwood Lake.
- Implement the findings of the upper Grand River Watershed Study.
- Set up a monitoring station at West Montrose to determine the changes in WQ from the Shand Dam to this point.
- Report on existing Water quality data in the tailwater Reach.
- Synthesise existing data on Water quality invertebrates etc.. Into a shared data base.
- Continue the use of data loggers throughout the tail water reach to monitor temperature.
- Support efforts to learn more about the habitat requirements of fish species at risk in the tailwater and incorporate these findings into habitat management activities.
- Examine the COSEWIC species at risk that are present in the tail-water and the habitat needs of these species.
- Educate the angling public about fish species at risk in the tailwater. Support research designed to determine the impact of barriers and fish communities (Watershed Science Centre, Trent University, Environment Canada and MNR) and fish migration.

The Grand River Tailwater Area



Legend

-  County Boundary
-  Lake & River
-  Forest/ Woodlot
-  Highway
-  Regional Road
-  Special Regulation Area
Single barbless hooks
No organic bait
Release all trout
-  Public Access Point



Scale 1:130,000

This map is for illustrative purposes only. Do not rely on it as being a precise indicator of routes, locations of features, nor as a guide to navigation. This map may contain errors and/or omissions.

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Grand River Tailwater Issues, Strategies & Tactics Matrix

Issue

13. Angler perception that the commercial baitfish industry has an impact on the fish

Brown Trout Management Issues

14. Inadequate information on the optimal brown trout stocking rate to maintain or improve the quality of the fishery.

15. Current distribution of stocked fish may not be optimal considering the differences in the tailwater reach between the Shand Dam and West Montrose.

16. Maintenance of the quality of brown trout that can be caught in the river

17. Illegal catch and harvest of brown trout specifically upstream of Fergus

18. There is insufficient evidence to evaluate the importance of natural recruitment of brown trout in the tail-water reach.

Financial Issues

19. Inadequate financial resources and physical resources to implement strategies and tactics

Strategies

Cooperate with local baitfish harvesters to address concerns and perceived concerns, regarding harvest of baitfish in the tail-water reach.

Define what we mean by "quality" (perhaps consider a measure such as "proportional stock density"). Obtain sufficient information to determine the optimal brown trout stocking rate to maintain or improve the quality of the fishery (must determine what "optimal" is this will require information on growth rates, length:wt relationships, condition factors).

Synthesize water temperature data collected on this reach and fish survey data to determine areas used by brown trout throughout the summer and monitor angler success with fish over two years old. Collect additional data to address data gaps. Collate present knowledge on concentrations of brown trout during critical times throughout the year (summer & winter stress periods) to see the numbers and locations of these fish especially between Inverhaugh and West Montrose.

Continue the current stocking and special regulations practices until such a time that new information indicates a change is required to meet fishery goals. tailwater fishery.

Consider options to reduce illegal out-of-season trout fishing.

Strive towards improving the habitat within the tail-water for all life stages of brown trout and continue with the stocking program to maintain the high quality fishery present at this time.

Use innovative means to fund projects through government, non government organizations and the private sector.

Tactics

- Better education and exchange of information is required between the commercial bait industry and public (e.g., anglers and land owners) regarding harvesting practices (e.g., related to trespass, ethics, sustainability, etc.)
- Increase the level of monitoring of the baitfish industry.
- Conduct a creel survey, fisheries assessment and angler perception survey to gain adequate information to make informed decisions concerning the brown trout fishery.
- Synthesize the data and information for Richard Brown's Ph.D. thesis and work being done by Mike Zimmer on the Credit River.
- Use available data in conjunction with growth rates, condition and biomass production data to see if a change in the stocking rate can accomplish fishery goals.
- In the interim, continue with the partnership among MNR, FOGR, GRCA and others to stock 20,000 - 25,000
- Initiate an angler log book program and creel survey to help monitor angler success in the tail-water reach.
- Conduct a creel/anglers perceptions survey to monitor angler success and perceptions in a measurable manner.
- The stocking program and distribution should consider barriers when determining optimal stocking levels.
- Conduct surveys using electro-fishing, radio telemetry studies and other methods to determine brown trout density and habitat use in the lower reach of the tailwater between the Elora Gorge and West Montrose.
- Evaluate existing stocking strategy and modify as needs indicate.
- Continue with the current stocking distribution plan until data indicates a change would be beneficial.
- Support and pursue a variance order to extend the area covered by Special Regulations from the 2nd Line Garafra upstream to the Belwood Conservation Area boundary.
- Provide more education concerning safe landing and handling of fish to increase survival rate of caught fish in special regulation areas.
- Continue stocking the tail-water stretch of the river with 20,000 - 25,000 fin clipped, yearling brown trout.
- Continue with current special angling regulations that apply to approximately 80% of the length of the tailwater.
- Make the local and angling community aware of people who have been charged with fisheries offences in the tailwater reach
- Increase signage at access points and include 'soft' enforcement messages in promotional information.
- Increase enforcement presence on the river during times when illegal harvest of brown trout is expected. Support programs like River Watch and the Fish & Wildlife Guardian program that promote education and cooperation to support traditional enforcement practices.
- Continue to fin clip brown trout being stocked in the river so it will be possible to monitor natural reproduction, growth rates and year class strength in the tail-water.
- Work to identify and/or improve critical habitat needs for brown trout in the tail-water reach.
- Strongly support habitat improvements in the tributaries and if possible the main stem to address inadequacies in fish habitat for all life stages of brown trout.
- Continue stocking of fingerling brown trout in suitable tributaries to promote natural reproduction.
- Identify and promote the economic benefits that this fishery provides the communities of Fergus, Elora and beyond.
- Develop a business model and marketing plan/package for the tail-water fishery to help develop and solicit support from the corporate sector.
- Keep key NGO groups involved with the planning process to help get programs off the ground.
- Encourage people and businesses to participate in the management of the river with the partner groups.
- Acknowledge corporate sponsors who help with projects that require assistance (large structures, river watch, garbage kiosks...)
- Advise government agencies to the value of this fishery and the fact that its improvement requires financial, technical and professional support and resources.

Grand River Tailwater Issues, Strategies & Tactics Matrix

Issue Management of the Angling Experience

Fishery Perception

20. Inadequate information on what constitutes a "quality angling experience"

21. Lack of understanding of the value of the fishery and how groups and individuals can become involved.

Public Access

22 Public access points require improvements and monitoring for safety issues.

23. Inadequate information on location of public access points

24. Conflicts regarding access to resource and private property rights

25. Trying to find the balance between providing and promoting public access and maintaining the quality angling experience

26. Maintain a high quality environment in all reaches of the river.

Strategies

Define and promote the concept of a "quality angling experience".

Define and promote the value of the fishery resources we have in the Grand River tailwater. Produce a media plan to inform the public about this fishery and the strides that partners have made to establish and maintain this fishery resource.

Further develop a managed access program and trail system plan. This plan will address the safety at steep banks/footing/erosion, consider parking issues, determine how reasonable access is provided to the river, protection of the resource and landowner privacy and rights.

Improve and promote public access locations via various media and stakeholders.

Promote stewardship public access points to alleviate most private property concerns.

Access is critical to a quality fishery and through quality access facilities appropriate to the section of river this high quality experience can be maintained. A balance between easy safe access and crowding needs to be examined for each existing and new access point.

Community ownership and pride in the river and its valley will help maintain and improve a high quality environment. Encourage stewardship through projects that manage riparian vegetation, wildlife habitat and water quality. Additional items to improve the environment would include planting of shelter belts and screening, improving wildlife habitat through projects like the osprey nesting platform installation, and distributing access points along the river to reduce overuse.

Tactics

- Conduct a follow-up study on the work of Plummer (1996) to determine the satisfaction level of anglers and other pertinent details concerning the angling experience.
- Implement the recommendations of follow-up study to the work of Plumber (1996) concerning angler satisfaction.
- Produce an information Tabloid to describe the many activities that have been happening in the tail water reach over the past several years.
- Pursue other forms of media like television, radio, newspaper and magazine pieces that will highlight the area.
- Continue with signage and garbage kiosks at major access points.
- Review current access points and identify new areas for managed access development.
- Complete accesses to the river to complement existing parking areas along the river. Use public lands (Township, GRCA, municipal right-of-way) properties to access development projects and consult local landowners about what is happening with the access development and address concerns on an individual basis.
- Monitoring and improvements to access points to be completed in partnership among landowners, NGOs and government agencies.
- Produce maps which will be promoted by municipalities.
- Develop a code of ethics for use of public access points that is posted on a sign at the access points.
- Respect for private landowners could again be included in the various media avenues. and access brochures
- Buffering with planted trees and screening is an option if landowner conflicts arise surrounding established public access points.
- Reinforce the message that these access points are only made possible through community support.
- Continue to maintain and improve parking areas to provide excellent access to the fishing in the tail-water.
- Continue to review the limited access parking sites to control crowding in areas of high use.
- Support work of groups completing riparian tree planting initiatives.
- Consider applying the Exceptional Waters Process to this reach of river in order to engage landowners, other interest groups, anglers and municipalities.
- Encourage workshops and other education events that target landowners and their possible contributions to improved rural water quality.
- Management and protection for specific species should be considered on an individual basis. (e.g. The Osprey Nesting platform project).
- Support tree planting initiatives in the watershed by various NGO's, GRCA, municipalities and MNR.
- Support programs to assist wildlife in the region and continue to improve the environmental quality of the tail-water area's riparian habitats
- Provide education and an opportunity for anglers to participate in keeping the river clean.
- Support the Friends of the Grand River 's River Watch and Garbage Kiosk programs in the river reach and municipal efforts to maintain and improve water quality



Grand River Tailwater Issues, Strategies & Tactics Matrix

Issue

Angling Opportunities

27. Maintaining the quality of the angling experience as the fishery becomes more popular

28. Commercial Guiding is an issue in the tailwater

29. Liability issues associated with commercial enterprises (guiding) associated with the fishery

Financial Issues

30. Inadequate financial resources and physical resources to implement strategies and tactics

Strategies

Use a combination of regulatory control, stewardship and education to provide a quality angling experience in the face of increased angling pressure.

Encourage the creation of local guiding association. Improve communications between landowners and guide services. Review legal requirements of guide services.

Since liability concerns can impact commercial enterprise, advise and support initiatives addressing liability.

Seek opportunities for financial support and 'in-kind' services. Encourage stakeholder and community involvement in the fishery.



Tactics

- Maintain areas where a variety of angling techniques can be utilized. (e.g. special regulation areas and areas where sustainable harvest can occur).
- Consider amending Ontario Fishery Regulations to provide additional fishing opportunities as well as affording protection to brown trout reproductive activity if data indicates a change would be beneficial to the fishery.
- Encourage and promote the formation of a local guiding association.
- Encourage the development of a code of ethics for anglers and angling guides that can be posted at access points along the tail-water reach.
- Use guides to help with value added items like data collection and monitoring work.
- Develop minimum standards and a Code of Ethics for commercial guides including having insurance.
- Encourage the GRCA and municipalities to place signage in key locations to identify their property.
- Encourage the creation of a local guiding association.
- Channel funds to assist with major undertakings through the Grand River Foundation or a similar avenue.
- Develop a Marketing plan/package to help solicit support from the corporate sector. (Video complete, pamphlet in development).
- Implement complimentary programs to generate revenue that can be dedicated to fisheries programs/projects in the Grand River tailwater
- Develop a marketing plan that promotes the "best bets" options, while continuing to invite the participation of corporations and businesses that can be linked to fisheries.
- Foster partnerships that can get various projects completed through blending skills and resources to complete projects.
- Encourage people to join NGO's that participate in the management of the river through their partners.
- Encourage corporate sponsors to help with projects that require financial assistance (large structures, river watch, garbage kiosks...).



History of the Grand River Tailwater Fishery

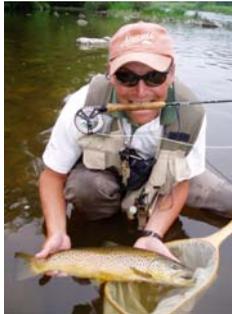
Early to mid-1800s

- This reach was identified as a viable brook trout fishery in the main Grand downstream to Kitchener in the early to mid 1800's. Many brook trout populations in southern Ontario and across Canada historically exhibited very complex life histories, using large rivers for over-wintering and feeding until summer (see Figure 1 from Geoff Power's chapter in *Charr*, Balon, E. 1970).
- Flow stability of the upper watershed changed between 1860 and 1870. Prior to this period, the great swamp upstream of present day Grand Valley held water during spring melts, creating a one-month-long spring high-water period. Between 1860 and 1870 land grants are issued to the swamp, and it was drained for agriculture. The first major damaging floods on the Grand were recorded beginning in the early 1870s
- The excellent brook trout fishery in the Elora area was more or less gone by the mid 1870's.



1880-1940s

- The entire Grand River basin was settled. The river deteriorated drastically from a water quality perspective (Dunham called the river of the early 1900's "an ineffectual malodorous sewer," circa 1906) Dunham 1945. The river also became extremely sensitive to drought conditions (e.g. 1930s).
- Development of first river management commission in Canada for municipalities of the Grand River happened in late 1930s.



1940-1970s

- Shand Dam (Belwood Reservoir) built for flood control downstream in 1940s
- Ontario Department of Lands and Forests planted brown trout in and around Elora in the late 1950s until early 1960s; GRCA and MNR, (Lands and Forests' successor) stocked Kamloops rainbows as well.
- Agencies like Ministry of the Environment (MOE) and municipalities worked to reduce pollution of the day – typically by improving Sewage treatment plants, reducing industrial sources, etc.
- GRCA stocked Belwood Lake with rainbow trout and northern pike to control stunted perch population in 1970.
- Some rainbows were also stocked in the Grand River below Shand Dam and appeared to survive and grow. Stocking occurred in river 1971– 1980's.



1980s

- Water Management Strategy developed for water supply, STPs and population growth. Low-flow and dissolved oxygen targets set for Kitchener, Cambridge, and Brantford – The Belwood Reservoir was identified as critical in providing low-flow augmentation.

- The Grand River between Belwood Lake and West Montrose in late 1970s to early 1980s evolved into a very good pike fishing area.
- Jack Imhof of MNR discusses possible reasons for low population numbers of YOY and juvenile Smallmouth Bass in the Elora – West Montrose reach with Jim Bowlby, University of Guelph graduate interested in trout. Jim suggests that the water may be too cold for YOY and juvenile smallmouth bass development (bio-energetics issue -- small bass cannot develop enough fat reserves in this reach to survive a normal winter). Bowlby suggested that MNR and GRCA collect temperature data and examine maximum and minimum temperature recordings for this reach of river.
- MNR/GRCA notes that the number of pike downstream of the reservoir was increasing but lack of extended flood events are a significant constraint. Pike spawn in the floodplain and require the flooded areas to hold water and provide access to the river for approximately three to four weeks. With a flood-control system, the river usually only covers the floodplain for one to two weeks. Habitat requirements for pike clean, cool/cold water with thermal optima very close to brown trout.
- GRCA completes max/min temperature surveys in 1985-86.
- Review of the 1970s stocking data confirms that the bottom draw from Shand Dam provides cold, but nutrient-rich water. Imhof, Halyk and Yerex discuss the possibility of re-establishing a coldwater fishery in this reach of the Grand River.
- MNR initiates District Fisheries Management Plans – 7 District Plans apply to Grand River watershed but Cambridge (now Guelph) District outlines some special items: "consider creating a trout fishery downstream of Belwood Reservoir"; create more fishing opportunities"; and "reduce harvest of trout on small coldwater streams by providing alternate opportunities"
- An article in *Ontario Out of Doors* Magazine calls the Grand River a "Waiting Giant" as a fishery.
- Angler license dollars help MNR stock 2-3 thousand 'catchable' hatchery rainbows below the Belwood Reservoir in 1986 & 1987.



1988

- MNR and GRCA received a request to meet with the newly-formed Grand River Chapter of Trout Unlimited Canada (TUC) (Walt Crawford, President) MNR decided to further test the viability of the tailwater reach's coldwater habitat by planting 60,000 surplus fall fingerling rainbow trout
- Discussion occurred that revolved around the implementation of Cambridge District Fisheries Management Plan proposals and about appropriate species to be stocked. Temperature ranges and habitat quality appeared to be marginal for re-introducing brook trout so an alternative salmonid was considered. It was decided not to continue with rainbow (other than as a test) and to consider brown trout.



History of the Grand River Tailwater Fishery (cont.)

- The decision to stock brown trout to create a self-sustaining, stream resident, high-quality fishery was formally proposed by Walt Crawford, TUC; Larry Halyk, Cambridge District MNR; Jack Imhof, Fisheries Branch MNR; and Warren Yerex, GRCA
- With substantial support from these partners, MNR staff requested brown trout from provincial hatchery.
- **1989**
- In May, 1989, 10,000 yearling brown trout were distributed in the Grand River from the Belwood Conservation Area to Wilson's Flats (Inverhaugh) by MNR, TUC and partners.
- An electro-fishing survey found excellent survival and growth in both spring and fall. This re-affirmed commitment to introduce brown trout to this section of river.
- **1990**
- Stocking of brown trout continued with each year having a unique finclip – more than 400,000 have been stocked to date (2004). Additional electro-fishing was done to determine survival and growth rates.
- **1991- 1994**
- Early electro-fishing results indicate incredible growth rates for stocked fish . A fall spawning survey was conducted in 1991 to determine if the fish were trying to spawn. An initial concern was that there was very little good spawning habitat between Shand Dam and Fergus, limited spawning habitat between Fergus and Elora (downstream of Trestle) and possibly good spawning habitat between the low-level bridge at Elora Gorge Conservation Area and West Montrose.
- TUC created a spawning channel upstream of the Garafraxa 2nd Line Bridge in 1991 in order to provide some spawning area for browns in this section. Approximately 3-5 redds are noted but spring floods blew the channel out.
- In November, 1991 emergency repairs to valve in Shand Dam resulted in sediment being released in the tail-water section and flows were below one CMS.
- DFO began a Liaison Committee (agency and public representatives) to improve communication about river management activities
- To increase the genetic vigour of brown trout in the system in order to improve the chances of natural reproduction wild brown trout were collected and released into tailwater from Big Creek tributaries and Whiteman's Creek (1993).
- Discussions between partners suggested that if the objective was to develop a self-sustaining fishery, there is a need to reduce angler mortality to provide every chance for the trout to mature and spawn. Therefore a proposal to make some of the tailwater a catch-and-release fishery.



- Following extensive public consultation in 1992/1993 it was concluded that catch and release regulations be adopted for part of the tailwater reach.
- Three areas of 3 Special Regulations were created between 2nd Line Garafraxa and Wilson's Flats (Pilkington Concession 7/8)
- A fly fishing specialty store opened in Fergus in 1993 as a response to the increasing interest in the brown trout fishery of the Upper Grand River. Other retail outlets saw a dramatic increase in sales of trout fishing and fly fishing equipment.
- An information brochure was developed by the MNR, the Ministry of Tourism and Recreation, TUC, and the GRCA to promote the tailwater area and the Grand in general. It quickly sold out.
- An attempt was made to develop a methodology to assess the relative success or failure of spawning on the tail-water area (MNR/TUC December 1994).
- The Izaak Walton Fly Fishing Club provides funds to install the first temperature logger downstream of the Shand Dam.
- Commercial guiding began at this time and the number of guides working the river has increased ever since.
- Interest in TUC chapter declines due to differences between Ontario chapters and the National Office. Many believe that a new, made-in-Ontario organization was needed.
- **1995/ 1996**
- Friends of the Grand River (FOGR) is formed in February 1995. A board of directors was elected and projects adopted. The projects included: placing and maintaining garbage kiosks at main river access points; annual tree planting projects; road cleanup (Adopt-a-Road) through partnership with the County of Wellington and the Township of Centre Wellington (then Town of Fergus). This organization is still active and engaged in these and many other projects.
- A meeting held between MNR, GRCA, DFO and FOGR to discuss the issue of lack of spawning success by brown trout. A 'hypothesis of effect' table was created to help guide possible research projects. The first question, are the eggs viable?
- First redds excavated in the 'Trestle' section. Brown trout eggs were found, and later hatched which then developed into swim-up stage at CCIW/DFO lab. This determined that the eggs were viable.
- Friends of Carroll Creek, FOGR and partners begin daunting task of rehabilitating Carroll Creek (a significant coldwater tributary). The projects that they took on included tree planting, in-stream structure placement and restricting cattle access. Cattle fencing became an annual chore for this group. By 2003, approximately 6km of cattle fencing is being erected each season and then taken down in the fall.



- MNR research scientists (terrestrial and aquatic) began a study of the impact of agricultural activity on Carroll Creek and the results of fencing on the health of the system under the “Settled Landscapes Initiative.”
- “Grand Opportunities Fly Fishing Forum” is held at Belwood Lake CA to celebrate fly fishing on the Grand River this will become an annual event.
- MNR and area Universities initiated the Carroll Creek Research Project.
- The tail-water fishery was the subject of “Fly Fishing the Grand River” a fishing guide book (April 1995) . It becomes a national bestseller.
- “The Article” was written in *Fly Fisherman* magazine in September ,1995, – the river had been discovered!
- Further articles in *Ontario Out of Doors*, *Outdoor Canada*, *Mid-Atlantic Fly-fishing Guide* attracted attention from all over the world
- GRCA Daily River Flow Information Line was created for river users – fishermen, kayakers, canoeists to provide them with current conditions information. It also improved communications with these users and reduced direct inquiries to the GRCA.
- Fly-fishing guides began to use the tail-water section for business opportunities.
- A University of Guelph economic impact study, sponsored by IWFFC, TUC and FOGR concluded that more than \$1.8 million annually was attracted to the economies of Fergus and Elora annually as a direct result of fly-fishing.
- Auser survey conducted by Lakehead University student Ryan Plummer indicated enormous use by American anglers (Plummer 1995).
- MNR presented FOGR with Certificate of Appreciation for its initiative in setting up the River Watch program.

1997/98

- The use of the turbine at Shand Dam in late August 1997, resulted in approximately 275 brown trout dying between the Dam and 2nd Line Bridge. Examination showed very low dissolved oxygen concentrations in turbine outflow. As a result, a water quality station was installed in the dam, with another WQ station downstream housing the monitoring equipment purchased with the assistance of IWFFC. Dam Safety Study determined design and construction of a stilling basin would improve water mixing and increase dissolved oxygen levels.
- FOGR funded a mobile Hydrolab purchased by the GRCA to allow better water quality monitoring in areas of concern.
- MNR sponsors a GRCA study into habitat value of tributaries and river from Wilson’s Flats to West Montrose. The report published in 1997 confirmed the presence of poor habitat quality in the river, especially downstream of Elora .

- MNR initiates a ‘Riffle Study’ to investigate characteristics and quality of existing brown trout spawning habitat in the reach between Elora and West Montrose. The project was undertaken with minimal dollars, but help and support from local hydrogeologist. The study was based on the Hypothesis of Effect tables developed for the brown trout spawning issue.
- Ad-hoc maintenance of the Beatty Dam in Fergus raises concerns about the eventual fate of this structure
- Questions about spawning success, access, extending the special regulations section were brought to managers by the FOGR and other concerned anglers.
- FOGR, MNR, GRCA collected and stocked wild brown trout from Sydenham River into the tailwater reach.
- In 1998 the FOGR instituted a Memorial Award to Centre Wellington District High School student involved in work on the Grand River. It was given in memory of FOGR founding director William Hooks.
- MNR, assisted by FOGR, stocked 20,000 brown trout in the spring and 40,000 in the fall of 1998. This brought the total number of brown trout stocked to 260,000.
- FOGR, with MNR CFWIP funding, completed an improvement project to Black Creek, a small coldwater tributary in the Upper Section. A 500-metre stretch of creek was upgraded.
- Centre Wellington District High School continues to hatch brown trout eggs. The fry were releasing into tributaries of the Grand River.
- The public was asked to participate in the development of the Grand River Fisheries Management Plan through committee and public open houses.
- University of Waterloo (Rich Brown/Dr. Geoff Power) conducted research into winter habitat preferences and impacts of winter ice formation on fish population.
- The GRCA Fishing Report goes on the Internet and other business websites are developed that feature the river and fishing.
- The GRFMP completed in November 1998 recommends the development of a Tailwater Plan for the Grand River below Shand Dam. An ‘Action’ (Implementation) committee and ‘Marketing/finance’ committee were formed.
- MNR, with partners, initiated background data collection in 1998 for the “Large Cover Placement Project,” Elora Gorge to West Montrose section. This study examined concerns identified in several sources: the Thompson report on habitat quality (over-summer and over-winter); Rich Brown’s Ph.D thesis (over-winter habitat and flood escape habitat); and the Hypothesis of Effect table.
- The FOGR was presented with a Certificate of Appreciation by the GRCA for its volunteers’ conservation efforts.

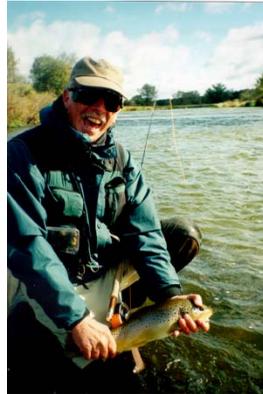


History of the Grand River Tailwater Fishery (cont.)

- FOGR embarked on Project 2000+. Project 2000+ examined having a possible aquatic education centre in Elora (partnered with Elora Centre for Environmental Excellence and Human Resources Development Canada) a community outreach program improved access points and developed signage and landowner information needs.

1999

- The FOGR and other partners began to implement recommendations of GRFM Plan through: Projects 2000 and 2000+. The projects included improved access points, benthic biomonitoring, tributary rehabilitation, tree planting, River Watch Program, spawning surveys, website development and communication tools development.
- FOGR began a multi-year project on Swan Creek at Brubacher Farm, Cty Rd. 7. It included tree planting, cattle fencing (by 2002 using hard fencing) and stream bank work.
- Wilfrid Laurier University biology faculty Dr. Jane Rutherford and Dr. Ed Kott integrated research plans and student project research with objectives of the GRFMP. Some of the work was based on Project 2000 and the FOGR.
- Elora Trout Festival becomes a reality, coinciding with Grand Opportunities event at Belwood Lake Conservation Area.
- The GRCA, with partners begins work on updating late-1970s Water Management Plan (Basin Study) model including the Tail-water section as part of overall Grand River Watershed Water Quality/Quantity Plan. The plan considers consequences of projected 30 per cent increase in watershed population in next 20 years as well as possible climate change in next 40-60 years.
- The Grand River watershed experienced drought conditions (similar to the 1930s and 1960s) in 1998 so partners respond with a co-ordinated Fish Health Hazard Signage Program in an attempt to protect the fish population.
- A new Web page on the GRCA Website illustrated weekly max/min temperatures.
- It was determined that more than 80 per cent of entire flow in Grand River, in Kitchener, in summer of 1998 and 1999 originated in reservoir storage.
- A commitment was made to complete the development of a 5- to 10-year Grand River Tailwater Plan by the middle of 2000 that would outline the future management of this 28-kilometer reach of the Grand River.
- Results of Project 2000 data collection began to be assembled. The data collected includes information on:– invertebrates, stream temperatures, property ownership and social surveys. Other projects resulted in improved accesses and signage.
- Proposed projects under the Large Cover Program are identified and report completed.



- A riffle study report completed suggested that in-gravel water quality may not be the issue of lack of reproductive success. Suggested cause could be high percentage of fines in the substrate and poor riffle profiles (Imhof 1996, 1997, Parish 1998).
- FOGR was mentioned by Lieutenant Governor of Ontario Hilary Weston in the Speech from the Throne at the opening of the provincial legislature as a fine example of a volunteer organization. She commended the group for its work contributing to sustainability of the environment in Centre Wellington.

2000

- The FOGR embarked on a biological research program that investigated brown trout egg development, substrate conditions, etc. They partnered with University of Waterloo, Wilfrid Laurier U and MNR (MNR was the primary funder through Protection and Enhancement Fund).
- The FOGR and Simpson Screenprint installed 1m x 1.3m interpretive signs at main river access points.
- The FOGR embarks on Geographic Information System (GIS) project to map/record events and improvements on tailwater reach. Partnered with Niagara College.
- The FOGR adopted the “best bet” from GRFMP – partner involvement in monitoring and university partnership as part of major research project
- MNR develops draft Tailwater Plan collating existing plans, proposals and information.
- FOGR takes over the lead role in the “Grand Opportunities Fly Fishing Forum held at Belwood Lake CA and raised over \$2000 for river improvements through the event.
- The value of a highly managed river system is recognized by the Thiess Award (Australia). The award for the best managed river system in the world as presented to GRCA. GRCA representatives called it a tribute to all of the partners that have contributed their time, talents and funding to improve the Grand River and its tributaries.
- Flow information and water quality data being updated daily on GRCA Website.
- Friends of Carroll Creek Continues work to improve this tributary with tree planting and cattle fencing initiatives.
- The FOGR annual projects now include: continuing tree planting, fish stocking, stream rehabilitation, Grand Opportunities Fly Fishing Forum and providing displays at various outdoors shows.



History of the Grand River Tailwater Fishery (cont.)

- FOGR undertook redd excavation (April 2000) and reports on findings provided to agencies. Live elutheroembryos were found above 2nd Line Garafraxa and in the Elora–Fergus (Trestle) area, but not downstream from Pilkington/Woolwich Townline.
- There was a Public Meeting held in Elora to help complete the Tailwater Management Plan. Over 60 people participated.
- The Township of Centre Wellington, the new amalgamated municipality
- taking in old West Garafraxa, Nichol, Pilkington Townships, the Town of Fergus and Village of Elora, adopts new coat of arms with brown trout as the “supporters” on either side of the heraldic design.

2001

- The FOGR placed 22 dataloggers in the tailwater section (including tributaries) as part of a temperature-monitoring program. FOGR purchased dataloggers and associated equipment for this purpose with CFWIP assistance and with funds raised with the support of Sage Fly Rods of Bainbridge, WA. Data was shared with partners.
- Public Meeting held in Cambridge to gain public input for the Tailwater Management Plan. Over 80 people in attendance.
- Ultra violet technology replaces chlorine in the treatment of the outflow from the Fergus Sewage Treatment Plant.
- Electro shocking by MNR and FOGR volunteers near the Trestle resulted in finding “the fish”, the first hard evidence of a naturally produced brown trout in the Grand River tailwater.

2002

- Steering Committee created to direct the completion of the Grand River Tailwater Management Plan.
- The FOGR recognized by MNR Wellington-Waterloo area as a CFWIP-participating volunteer organization.
- FOGR placed temperature data loggers in area of Beatty Dam.
- FOGR volunteers float the lower reach of the Grand tailwater to try and find significant areas of groundwater influx. No pools of cold water are apparent, but water temperatures are consistently at the threshold for trout survival through the entire reach despite a wide profile and hot sunny day.



2003

- The FOGR undertook a study to determine the number of wild fish upstream of Bissell Dam through collection of small, unclipped fish prior to the annual stocking.
- The Success of Grand River brown trout program resulted in an Environmental Assessment to replicate the program in the tail-waters of the Conestoga River. Completed in July and stocking commences in Fall 2003.
- The MNR provided funding to FOGR to make access improvements at three sites along the river. FOGR and Ontario Stewardship Rangers completed work at Garafraxa Second Line, Can Robert St. and the Railway Trestle fishing access sites.



2004

- The Tailwater Steering Committee continued to meet.
- The Final Public Meeting concerning the Grand River Tailwater Fisheries Management Plan was held in Elora in May 2004.
- The Beatty Dam partially fails followed by the whole dam being removed by the Township of Centre Wellington. Negotiations surrounding the status of Beatty Dam’s future took place among the Township, DFO, MNR and FOGR.
- Waterloo Wellington Ontario Stewardship Rangers and FOGR volunteers clean-up around and above the Beatty Dam site. Over 20 cubic metres of debris is removed including car parts, bicycles and signs.
- The Tailwater Plan was submitted for EBR Posting in July 2004.
- Galvanized metal stairs were installed by FOGR with the help of MNR at Blondies and Second Line Garafraxa.
- A meeting to review the Environmental Bill of Rights posting comments was held in early October 2004. People who posted concerns to the EBR posting and Steering Committee were at this meeting. Some plan modifications were implemented.
- Partner interest in starting an “Implementation Committee” was expressed.
- The Grand River Tailwater Management Plan was reposted to the EBR in November 2004 and only one comment is received.
- Plan was printed and distributed for early 2005.



Grand River Tailwater Fisheries Management Plan 2005-2010



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