



Regulatory Options for Managing Rainbow Trout Recreational Fisheries in Ontario

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Proposal for Managing Rainbow Trout Sport Fisheries in Ontario

This report describes the regulatory options for the management of rainbow trout (*Oncorhynchus mykiss*) sport fisheries in Ontario. The options are based on current scientific knowledge on the effectiveness of various regulations for managing rainbow trout. They are a combination of management strategies designed to maximize angling opportunities while protecting rainbow trout populations from over-exploitation.

The goal of this approach is to ensure that regulations can be rationalized on a sound biological basis to achieve resource sustainability while, at the same time, streamlining and simplifying Ontario's fishing regulations and maximizing angling opportunities.

In order to provide consistency to the management of rainbow trout in Ontario, the regulatory options contained herein are the only options to be used in the development of any new regulations for rainbow trout. Where the existing regulations do not conform to the approach outlined in this report, they should be analyzed using the criteria set out in the provincial Approvals in Principle process.

Border waters and/or the Great Lakes that have international or interprovincial agreements in place may be considered exceptions to the rainbow trout tool kit if they do not conform to the tool kit recommendation. For those waters where agreements are not currently in place, the harmonization of multi-jurisdictional regulations should be sought and, where possible, be compatible with the rainbow trout regulatory tool kit.

Introduction

Although the native range of the rainbow trout includes the Pacific Ocean and freshwater systems west of the Rocky Mountains (Scott and Crossman 1973), its range has been extended through introduction to include many parts of the world (MacCrimmon and Gots 1972).

Anadromous rainbow trout (spawning in tributary streams and reaching maturity in the ocean or lake environment) are known as steelhead. They were first introduced into the Great Lakes in 1876 in the AuSable River on the Michigan side of Lake Huron. Introductions to Lakes Ontario (1878), Michigan (1880), Erie (1882), and Superior (1883) followed shortly thereafter (MacCrimmon and Gots 1972).

In most of the Great Lakes, natural reproduction of rainbow trout was quite evident by the 1920s. With the introduction of sea lamprey (*Petromyzon marinus*), the abundance of rainbow trout declined through the 1940s and 1950s (MacCrimmon and Gots 1972).

The onset of effective sea lamprey control in the late 1960s in most of the Great Lakes (Swanson 1985) enabled rainbow trout populations to expand. Hurricane Hazel impacted Southern Ontario in 1954 and may have also played an important role in improving the existing habitat and opening up additional stream habitats to migratory rainbow trout (Gonder 2005). Flood flows generated by this storm destroyed many dams and natural barriers to migration which restricted access into tributary systems and cleaned fine sediment from underlying spawning habitat. Further, fishway construction in the 1960s and 1970s provided access to new spawning and nursery habitats in several large Great Lakes tributaries enhancing the production of young rainbow trout (Gonder 2005). The elimination of physical and biological constraints on rainbow trout by the late-1960s appeared to

contribute to the development of strong populations in the Great Lakes.

Relatively strong rainbow trout populations currently exist in all Canadian waters of the Great Lakes. Although the habitat of Lake Erie is the least conducive to this species, naturalized populations have developed in a few suitable tributaries. Many tributaries in Lakes Superior, Huron and Ontario are quite suitable to this species and significant populations (and associated fisheries) have developed.

Rainbow trout populations increased in the late 1960s which resulted in the development of a large and attractive sport fishery targeting this species (MacCrimmon and Gots 1972). Although the most intensive sport fishing effort seemed to follow the opening of the trout season in late April, stream fishing for early-migrating rainbow trout during the fall and winter months also became popular. Rainbow trout populations seemed to be strong, even when faced with increasing pressure from angler harvest from the 1960s to the early 1980s. The Ontario Ministry of Natural Resources (MNR) responded by liberalizing open seasons for this species. Extended fall seasons were implemented in the lower reaches of major river systems starting in the 1960s. An all-year open season policy was adopted in the open waters of the Great Lakes and at certain river mouths in the 1970s and led to the development of early spring river mouth and winter ice fisheries. Opportunities to fish for rainbow trout became available on a year-round basis.

With the development of salmon fisheries in most of the Canadian Great Lakes in the 1980s boat fishing became much more popular and rainbow trout became an alternative species that was either incidentally or intentionally targeted in open-waters by the expanded Great Lakes sport fishing fleet.

Increased fishing pressure and poor environmental conditions appear to have contributed to declining abundance of rainbow trout in many areas of the Canadian Great Lakes in the late 1980s and early 1990s (Gonder 2005). Both Lakes Superior and Huron responded to this situation with more restrictive sport fishing regulations in 1999. Lake Ontario managers have also expressed concerns with declining wild fish abundance and recruitment, and are currently reviewing options for more protective measures (Marion Daniels, OMNR, Peterborough, Ontario. pers. comm.).

Rainbow trout are currently being stocked in all of the Great Lakes. Several fishing clubs run private, provincially sanctioned hatcheries for rainbow trout stocking in Lake Huron (seven operations), Lake Ontario (two operations) and Lake Erie (one operation). In addition, MNR currently stocks rainbow trout in Lakes Ontario and Erie. American agencies also stock significant number of rainbow trout into the Great Lakes. According to the Joint Strategic Plan for Management of Great Lakes Fisheries (GLFC 1997), the stocking of rainbow trout in the Great Lakes is intended to rehabilitate streams with poor natural reproduction or provide put-grow-and-take fisheries in areas lacking reproductive habitat. Significant levels of natural reproduction of rainbow trout occur in all the Great Lakes. The management of rainbow trout in each Great Lake will also be influenced by fish community objectives which are revised, through the Great Lakes Fishery Commission, approximately every five years. Future management objectives for rainbow trout could therefore change following potential revisions to Fish Community Objectives for an individual lake.

Rainbow trout populations in Ontario waters of Lake Superior are solely supported by natural reproduction. Granite bedrock tributaries result in nutrient deprived systems. This combined with a harsh climatic regime requires more specialized regulations than lower Great Lakes. In order to maximize recruitment, repeat spawning levels should be maintained at > 55% (Kwain 1981, Seelbach and Miller 1993, George 1994). Data collected from Portage Creek, a Lake Superior tributary, illustrates the value of a large repeat spawning component in the production of a strong year class and maximizing adult population size (J. George, OMNR, Thunder Bay, Ontario. pers. comm.).

Rainbow trout also provide important fisheries in inland lakes and ponds. In 2004, a total of 268,673 rainbow trout were stocked in 143 different inland waters. In most cases, rainbow trout are stocked to provide artificial fisheries in order to diversify local angling opportunities and divert angling pressure away from heavily exploited waters.

It is estimated that the catch of rainbow trout in Ontario in 2000 was approximately 690,000 fish with more than 273,000 (39.6%) being harvested (Economic and Policy Analysis Directorate 2003). The Great Lakes accounted for 74.5 and 76.3% of these totals, respectively. Lake Huron had the highest catch (53%) and harvest (65%) of all the Great Lakes with Lake Ontario second at 38% and 20% respectively (Economic and Policy Analysis Directorate 2003).

Rainbow Trout Biology

The rainbow trout of the Great Lakes are generally anadromous. Life history typically begins with the deposition of fertilized eggs in nests constructed in riffle areas of tributary streams. The progeny usually remain in streams as "parr" for a period ranging between a few months to three years before moving to the lake. As parr move downstream the biological phenomenon of smoltification occurs with the fish turning to a silvery colour. Once in the Great Lakes, fish grow rapidly and can mature in as little as one year (generally males). Populations of rainbow trout returning to streams to spawn are composed of fish of a variety of ages and sizes (MacCrimmon and Gots 1972).

Successful reproduction of rainbow trout in ponds and inland streams is dependant on suitable gravel substrate for nest construction. Occasionally there is evidence of shoal spawners. Landlocked populations do not undergo smoltification but can reach maturity at earlier ages and usually at much smaller sizes than anadromous fish (MacCrimmon and Gots 1972).

The vast majority of naturalized populations in the Great Lakes are spring spawners although fall-spawning hatchery stocks have been documented (MacCrimmon and Gots 1972). In many large river systems a proportion of the spawning rainbow trout population migrates into their home stream during the fall, where they overwinter and spawn in late winter or early spring. The majority of adults delay their stream migration until ice out in late winter however (Dodge and MacCrimmon 1971, MacCrimmon and Gordon 1981, Seelbach 1993, WDNR 1998).

As spring water temperatures begin to increase towards 5 °C adult rainbow trout move upriver towards spawning habitats (Biette et al. 1981). Females dig redds in shallow riffles, runs and tail-outs of pools where the stream bottom consists of gravel two to ten centimeters in diameter (Greeley 1932, Dodge 1967). After excavating a pit in the gravel with their tail, the female may deposit up to 2,000 eggs per kilogram of body weight which are fertilized by attendant males (DuBois and Plaster 1989). Although many male fish may be seen at one time in the vicinity of a spawning redd, females can outnumber males in the spawning population often by 2:1 or greater (Hassinger et al. 1974, Biette et al. 1981, Seelbach 1993). The male fish appear to outnumber females on the spawning grounds because they move from one female to the next as spent females leave their redds and new, ripe females arrive on the spawning grounds (Gonder 2005).

With most of the spawning activity completed by the end of May the spent rainbow trout often move into deep, slow moving pools to recuperate from the rigors of reproduction (Gonder 2005). Natural mortality is approximately 20% for females and 40% for males (Dodge 1967, J. George OMNR, Thunder Bay, Ontario pers. comm.). Surviving post-spawn fish may resume feeding activity in the stream environment before returning to the lake.

Where angling harvest is low adult rainbow trout, particularly females, may survive to make several spawning runs (Dodge 1967, Biette et al. 1981, Swanson 1985, Seelbach, 1993). George (OMNR,

Thunder Bay, Ontario. pers. comm.) documented repeat spawning of female fish from seven to nine years in a lightly exploited Lake Superior tributary. These multiple spawning fish, referred to as repeat spawners, are claimed to spawn in higher quality habitats which leads to increased egg survival and are thought to produce better quality and greater numbers of eggs. The presence of repeat spawners buffers against poor maiden (i.e., first time) spawner abundance and the subsequent losses in egg deposition. They also buffer against detrimental environmental conditions which can lead to poor survival rates of young-of-the-year rainbow trout (Gonder 2005). George (2005 unpublished data) found a direct correlation between high repeat spawning numbers and strong year class recruitment in Portage Creek, Lake Superior. High numbers of repeat spawners are generally indicative of low levels of exploitation and harvest.

Regulatory Options

Few examples of the relative effects of angling regulations changes on the health of rainbow trout populations exist in the literature (Valliant et al. 2003). The majority of recommendations for streamlining of sport fishing regulations proposed in this document for rainbow trout are based on knowledge that has been gained through regulation changes that have been enacted in Ontario waters over time.

Open/Closed Seasons

Most of the existing fishing divisions are open all year, or open-all-year except for December 24th (Table 1). There are currently seven different Division-wide open seasons for rainbow trout and nine exceptions by waterbody (Table 2 and Appendix 1).

Table 1. Current (2005) Division-wide open seasons for rainbow trout in Ontario. (OMNR, 2005)

Season	Division (s)
Open all year	1, 7, 8, 11, 14, 16, 17, 18, 26
Open all year except December 24th	2, 12A, 15, 19, 20, 21, 22/22A, 23, 24, 25, 29, 30, 31, 32, 33, 34, 35
January 1- March 7 & Saturday before Victoria Day- October 15	27
January 1- September 30	9, 10
Last Friday in April- September 30	12
Last Saturday in April- December 31	28
Last Saturday in April- September 30	3, 4, 5, 6, 13

Table 2. Open season exceptions for rainbow trout in Ontario.

Season	Watebody
Year-round open season	Several streams and rivers in FMZ 16 and 17
January 1 - Friday before last Saturday in April; October 1 - December 31	Mayhew Creek
January 1 – March 15; Saturday before Victoria Day – December 31	Lake Nosbonsing
January 1 – March 31; last Saturday in April – September 15	Pinery Park pond
January 1 – March 31; last Saturday in April – September 30	Several lakes and ponds in Grey County
Last Saturday in April – December 31 (extended fall season)	Elgin County
Last Saturday in April – December 31 (extended fall season)	Several streams and river in FMZ 16 and 17.
First Saturday in May – September 30	Maitland River
June 1 – September 30	Several streams in Grey and Bruce counties

Greater consistency among the existing seasons is required to make the regulations easier to understand while still providing protection to vulnerable migratory rainbow trout prior to spawning in areas of high fishing pressure. The proposed seasons are consistent with those proposed for other migratory salmonids to ensure simplicity, and to remove the ability of unscrupulous anglers from fishing for rainbow trout during a closed season while claiming to be targeting other salmonids.

Fisheries management zones 16 and 17, adjacent to Lakes Huron, Erie, and Ontario, require a closed season to ensure fishing pressure for adult rainbow trout is maintained at sustainable levels. Several other southern Ontario Fisheries Management Zones adjacent to the Great Lakes (i.e., FMZs 10, 11, 15, and 18) do not have tributaries which support anadromous runs of rainbow trout but do have inland put-and-take fisheries. Therefore, they do not require this closed season. Due to lower fishing pressure and stricter bag limits, a closed season for rainbow trout is not required for Lake Superior tributaries.

Although Manitoulin and Cockburn Islands are situated in the Fisheries Management Zone 10 (combined with the north shore of Lake Huron) they have rainbow trout streams with characteristics similar to southern Ontario. Therefore it is proposed to provide these islands with the same rainbow trout fishing seasons as southern Ontario Divisions.

Recommended Seasons

- **The rainbow trout fishing season for all Great Lakes proper (open waters) should be open all year.**
- **Open seasons for rainbow trout in inland waters should conform to one of the following standards:**
 - (i) The rainbow trout fishing season for all Lake Superior tributaries and all other Fisheries Management Zones with put-grow-and-take only fisheries should be open all year.**
 - (ii) The rainbow trout fishing season should extend from the fourth Saturday in April to September 30 for Southern and Central Ontario Divisions with Lakes Ontario, Erie, or Huron tributaries including Manitoulin and Cockburn Islands.**

- Year-round open seasons and extended fall seasons for specific Great Lakes tributaries and river mouths should be maintained.
- When rainbow trout is not present in a Fisheries Management Zone there should be a closed season.

Catch and Possession Limits

Catch limit is defined as the number of fish that an angler is allowed to catch and keep in one day. The possession limit is the number of fish an angler is allowed to legally possess any time whether on-hand, in cold storage or in transit. In most cases, possession limits are the same as one day's catch limit. The concept behind catch and possession regulations is to limit the harvest, to equitably distribute the resource among users, promote an ethical use of the resource, and to convey a realistic expectation regarding biological capacity of the rainbow trout resource.

There are currently three Division-wide catch and possession limits for rainbow trout in the province of Ontario (Table 3) and five exceptions by waterbody (Table 4 and Appendix 2). In all cases, the catch limit is the same as the possession limit.

Table 3. Current (2005) catch and possession limits for rainbow trout in Ontario.

Division	Catch limit by license type		Possession limit by license type	
	Sport	Conservation	Sport	Conservation
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 12A, 13, 14, 15, 17, 18 (except L. Superior tribs.), 19 (except L. Superior tribs.), 20, 21 (except L. Superior tribs.), 22/22A, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33 (except L. Superior tribs.), 34, 35 (north of latitude 45°15'N)	5	2	5	2
16, 18 (L. Superior tribs.), 19 (L. Superior tribs.), 23 (East of the Pic River), 35 (south of latitude 45°15'N),	2	1	2	1
21 (L. Superior tribs.), 33 (L. Superior tribs.), 23 (West of the Pic River)	1	1	1	1

Table 4. Current (2005) catch and possession regulation exceptions (by type of angling licence) for rainbow trout in Ontario.

Catch (Possession) Limit	Waterbody
0 Sport, 0 Conservation (0/0)	Portions of the Credit and Grand Rivers
2 Sport, 1 Conservation (2/1)	Designated streams and rivers in FMZ 16 and tributaries of Lake Superior
1 Sport, 0 Conservation (1/0)	Portion of the Grand River
1 Sport, 1 Conservation (1/1)	Whiteman's Creek and designated Lake Superior tributaries
3 Sport, 2 Conservation (3/2)	Big Sound, Parry Sound

Bag limit reductions of 2 for the holder of a sport fish licence and 1 for the holder of a conservation licence were instituted in much of Lake Huron in 1999 in an attempt to address concerns of declining abundance of older fish. This change has stabilized the decline and slightly increased the population in the Nottawasaga River (D. Gonder, OMNR, Owen Sound, Ontario. pers. comm.).

Anecdotal information from anglers in the Sault Ste Marie region suggests that the rainbow trout fishery on eastern Lake Superior has not improved with a two fish limit that was also adopted in 1999. (J. George, OMNR, Thunder Bay, Ontario. pers. comm.). Conversely, in western Lake Superior a bag limit reduction to one fish for the holder of either a sport fishing licence or a conservation licence appears to have improved the fisheries in many streams (J. George, OMNR, Thunder Bay, Ontario. pers. comm.). Bag limits of 1 fish for a sport fishing licence and 0 for a conservation licence in the lower Grand River have also resulted in improved rainbow trout populations (L. Halyk, OMNR, Guelph, Ontario. pers. comm.).

These results suggest that, in areas of high fishing pressure and low stream productivity, bag limits higher than 1 will not improve rainbow trout populations and more restrictive regulations may be required.

The open water rainbow trout fishery in Lake Erie is almost exclusively maintained by stocking programs and is essentially a put-and-take fishery. Therefore, the bag limits recommended correspond to those recommended for other put-and-take fisheries.

Recommended Catch and Possession Limits

- **Catch and possession limits for rainbow trout should remain at 5 fish (holders of a sport fishing licence) or 2 fish (holders of a conservation licence) for inland put-grow-and-take angling opportunities as well as Lake Erie.**
- **For Lake Superior and the tributary watersheds north of Superior as well as for rainbow trout populations with conservation concerns a limit of 1 fish for holders of a sport fishing licence and 0 fish for holders of a Conservation licence is recommended.**
- **The catch and possession limit on all other Great Lake Fisheries Management Zones, including FMZ's with Great Lakes watershed tributaries that support runs of anadromous rainbow trout should be reviewed on a zone by zone basis and include broad public consultation. The objective should be to reduce the limit to either 1 or 2 fish in all Great Lakes Fisheries Management Zones depending on the results of public consultation.**

- **Rainbow trout should continue to be considered as part of an aggregate limit with other trout and salmon.**

Size Limits

Size-based regulations should reduce the biological impacts of angling but not restrict angling opportunities. Size limit regulations are usually intended to increase the size of fish caught, maximize yield, and protect brood stock while maintaining angling quality at often increased levels of effort. There are three basic types of size limits: (1) minimum size limit whereby all fish below a certain size must be released; (2) slot size limit under which all fish within a designated range must either be released (protected slot) or can be retained (harvested slot); and (3) maximum size limit where all fish above a designated size must be released. Size-based regulations require a thorough knowledge of growth rates, maturation schedules, and recruitment for an individual fish population.

The following guidelines are provided for evaluating the potential of a size limit regulation for rainbow trout:

- Select the most appropriate type of size limit based on characteristics of the rainbow trout population and the objectives of the regulation. Protected slot size limits should be utilized in cases where there is good natural reproduction, slow growth of younger fish and high angling effort. Maximum size limits should only be used in instances where there is low density of brood stock and where natural recruitment is low.
- Ensure that biological information is collected and utilized to rationalize the use of size limit regulations.
- Only one type of size limit regulation should be utilized on an individual waterbody.
- Do not vary size limits over the course of the angling season.
- Evaluate the success/failure of size limit regulations based on the original goals and objectives.
- There is an expectation of clients to have a diversity of angling opportunities and fishing quality. Some businesses depend on it. In cases where single stakeholders are the primary stewards of the resource, voluntary actions initiated by the stakeholder would be preferred to legislative changes. In shared resources where stakeholders cannot agree on managing towards a certain attribute such as fishing quality, it may be necessary to legislate “quality fishing” regulations. Such goals would likely require the consideration of a sized-based regulation.

Currently there are only two different size restrictions being utilized in the management of rainbow trout in Ontario (Table 5).

Table 5. Current (2005) size restrictions for rainbow trout in Ontario.

(4) Whiteman's Creek	<ul style="list-style-type: none"> • Catch and possession limit of one (1), 50 cm minimum size limit (rainbow and brown trout).
(21) McIntyre R.; (21) Neebing R.	<ul style="list-style-type: none"> • Catch and possession limit of one (1), minimum length of 69 cm.

The size limit on Whiteman's Creek was initiated in 1990 as a method to control the harvest of young brown trout. It has had the added benefit of limiting the harvest of young juvenile rainbow trout. At the time it was created there were few migratory rainbow trout in the creek but they now have much better access to this area of the Grand River watershed. This section also has artificial

bait-only restrictions so much of the sport fishing is conducted by anglers practicing voluntary catch-and-release. The area has not been monitored by creels in many years so the true effectiveness of the size restriction has not been validated (L. Halyk, OMNR, Guelph, Ontario. pers. comm.).

Size restrictions on McIntyre and Neebing Rivers implemented in 2000 have not resulted in a significant increase in rainbow trout abundance (J. George, pers. comm.). However, these actions may have helped to prevent a further decline in these populations given that these tributaries are subjected to some of the highest fishing pressure on Lake Superior. Continued monitoring and assessment is vital to determine the longer term suitability of these regulations in the management of rainbow trout.

The use of a protected slot regulation for rainbow trout was proposed for Lake Huron in the 1990s. This proposal was considered desirable since boat anglers generally capture smaller fish and shore anglers capture larger fish and either a minimum or maximum size limit to reduce harvest would have disproportionately affected one of these angler groups. The slot regulation proposal was, however, deemed socially unacceptable at the time and was not implemented despite concerns that the other regulation changes enacted at the time (bag limit reductions and river specific season restrictions) were unlikely to have significant success in improving fish populations. The lack of improvement in the majority of Lake Huron rainbow trout populations since 1999 may support another review of the protected slot regulation. Should such a proposal be adopted, it would need to be treated as experimental, be thoroughly evaluated, and the results shared with other managers across the Province.

Size Limit Recommendations

- **Generally, the use of size limit regulations is not recommended as a widespread regulatory tool for rainbow trout in Ontario.**
- **Size limit regulations can be considered on designated waters being managed to provide high quality angling opportunities.**
- **The use of a protected slot regulation should be considered for situations in the Great Lakes where boat anglers capture smaller fish and shore anglers capture larger fish and where additional reductions in harvest levels are necessary.**
- **Assessment of the two existing size-based regulations should be communicated province-wide to provide direction to other managers of rainbow trout populations on the suitability of this type of regulation.**
- **The creation of any future size limit regulations must be thoroughly rationalized, fully evaluated, and results shared with other fisheries managers.**

Fish Sanctuaries

Fish sanctuaries are designated areas where all fishing is prohibited. Sanctuaries can be seasonal in nature or extend for the entire year.

Since target species for fish sanctuaries are not specifically denoted in the regulations, it is not possible to list those created to protect rainbow trout. However, there are a number of sanctuaries which undoubtedly had the main purpose of protecting spring spawning rainbow trout.

Seasonal fish sanctuaries are a legitimate regulatory tool where required (e.g. major spawning areas, areas immediately downstream of barriers, etc.).

Recommended Use of Fish Sanctuaries

- **Fish sanctuaries for rainbow trout in the Great Lakes should be standardized to the following date: Fourth Saturday in April to May 31.**
- **Existing fish sanctuaries below dams and barriers on Great Lakes tributaries should be maintained.**

Special Regulations

Special regulations are those that differ considerably from province-wide regulations and are designed to recycle all or a portion of the anglers creel (Imhof 1989). They may include restrictions on gear (e.g. artificial flies only, barbless hooks only), or bait (e.g., artificial vs. live bait), as well as harvest (e.g. catch-and-release only). Special regulations must be established based on valid biological criteria and with well established objectives.

Special regulations are usually implemented in heavily-fished waters to prevent overexploitation or in waters where management goals are to provide increased catch rates or the opportunity to catch large fish. These types of regulations are based on the assumption that trout can be angled several times during the fishing season and released with no significant mortality. Hooking mortality is generally low for rainbow trout but varies according to a number of factors including gear type, bait, air and water temperatures, air exposure, and the amount of handling.

There are relatively few instances of special regulations for rainbow trout in Ontario. Existing regulations include the use of artificial lures and barbless hooks in combination or individually. There are also four waters which are restricted to artificial flies only and/or have reduced catch and possession limits (Appendix 3).

Catch-and-release angling has resulted in increased abundance in rainbow trout populations in both the Grand River (Lake Erie watershed) (L. Halyk, OMNR, Guelph, Ontario. pers. comm.) and Portage Creek (Lake Superior watershed) (J. George, OMNR, Thunder Bay, Ontario. pers. comm.). The Portage Creek location is not controlled by regulation but by private land access and voluntary implementation by the land owner. In addition, the Grand River has fishing gear restrictions which have generally made it more difficult to catch rainbow trout. Both of these locations serve as examples that significantly reducing or eliminating harvest can have dramatic results in increasing both spawning biomass and recruitment of rainbow trout.

Studies have shown that rainbow trout can survive being caught and released (Klein 1965; Horak and Klein 1967, Reingold 1975, Mongillo 1984, Taylor and White 1992). While artificial and egg baits generally result in less than 10% mortality, other natural baits can result in mortalities of up to 50% (Mongillo 1984). Although the benefits of barbless versus barbed hooks continues to be debated (Turek and Brett 1997) the banning of live or natural bait has proven benefits to catch and release survival (Mongillo 1984). In addition, survival appears higher with treble hooks versus single hooks when attached to artificial baits. Larger single hooks fished with bait may cause less mortality than smaller single hooks (Mongillo 1984). This may justify a critical examination of existing special regulations.

Currently there are no restrictions on the use of roe (fish eggs) when angling for rainbow trout. Using rainbow trout roe (or eggs from other species) in spawn bags for drift fishing is a very popular and effective method of catching rainbow trout in river systems. The desire to obtain roe from gravid female rainbow trout has led to enforcement issues on many areas of the Great Lakes (D. Weltz, OMNR, Owen Sound, Ontario. pers. comm.). Anglers often exclusively seek female fish and have been witnessed catching, removing eggs and releasing fish, and are believed to harvest eggs from more fish than their legal limit. The desire to obtain rainbow trout roe for use as bait has resulted in illegal angling activity and the development of an illegal trade. Although the use of eggs as bait allows for better post-release survival, in many cases fish are either harvested for eggs or stripped and released which likely significantly reduces survival.

Proposing some control on the collection and use of roe has met resistance when attempted in the past. Given the apparent escalating problem of illegal roe collection and sale, declining rainbow trout abundance in many locations of the Province, and the effectiveness of roe in catching rainbow trout, the Province should conduct a review of the roe situation and assess options for any future action. The development of a DNA database for wild rainbow trout would assist in prosecution. Currently retail outlets selling roe claim that they purchased the eggs from private hatcheries. Without a genetic database little can be done to follow up and prosecute those illegally selling roe from wild rainbow trout.

Education is needed to make anglers aware that catching, stripping and releasing wild rainbow trout is an ethically questionable practice. At the very least anglers should be informed that they should not exceed current bag limits when collecting eggs.

Recommendations for Special Regulations

- **Special regulations should only be implemented where there are clear management objectives, where there is widespread public support and where they can be fully evaluated.**
- **Special regulations should only be considered when exploitation is exceptionally heavy or where the goal is to provide unique angling opportunities. Special regulations which can be considered on designated waters include use of artificial flies/lures only, and/or the use of barbless hooks.**
- **Catch-and-release only regulations (zero catch and possession limit) may be considered in some cases for designated waters (or sections thereof) being managed to provide a high quality angling experience or where there are serious conservation issues.**
- **Assessment on the existing areas with special regulations should be communicated provincially to provide direction to other managers of rainbow trout on the suitability of this type of regulation.**
- **The Province should review the usage of roe as bait from a policy perspective. The status of illegal roe collection and sale, and the associated increased efficiency of angler success should be assessed.**
- **Anglers should be informed of the legal aspects of roe collection and provided guidelines on best handling practices and methods of releasing fish.**
- **Seek the development of a DNA rainbow trout database for use in prosecuting the illegal trade of wild fish roe.**

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Appendix 1. Ontario waters currently having open season exceptions for rainbow trout.

Season	(Division) Waterbody
Year Round Open Season	<ul style="list-style-type: none"> • (3) Ausable River. (Hwy. 21 to L. Huron); • (3) Big Creek (Regional Rd. 21 to L. Erie); • (3) Black Creek. (Hwy. 3 to L. Erie); • (3) Fifteen Mile Creek. (Queen Elizabeth Way to L. Ontario); • (3) Forty Mile Creek. (Queen Elizabeth Way to L. Ontario); • (3) Lynn River. (Misner Dam to Lake Erie); • (3) North Thames River. (main branch only Middlesex County); • (3) Rondeau Bay (Waters fronting Kent County), • (3) Sixteen Mile Creek. (Queen Elizabeth Way to L. Ontario); • (3) Thames River. (main branch only) (Elgin County and Middlesex County); • (3) Trout Pond of Waterford Ponds (City of Nanticoke); • (3) Twelve Mile Creek. (Lakeport Road to L. Ontario); • (3) Twenty Mile Creek. (Queen Elizabeth Way to L. Ontario); • (3) Young's (Ryerse) Creek. (downstream side of lakeshore rd. bridge to waters edge of L. Erie at Port Ryerse). • (4) Bayfield River (Hwy. 21 to L. Huron); • (4) Bighead River. (Hwy. 26 bridge to Georgian Bay); • (4) Bronte Creek. (Hwy. 2 to L. Ontario); • (4) Coldwater River. (County Rd. 19 to Georgian Bay); • (4) Credit River and tributaries. (south side of the Queen Elizabeth Way bridge downstream to L. Ontario and from the north side of the Dundas St. bridge upstream to the south side of the Hwy. 403 bridge); • (4) Grindstone Creek. (Hwy. 2 (Plains Road) to Hamilton Harbour); • (4) Humber River. (Eglinton Ave. to L. Ontario); • (4) Maitland River. (Hwy. 21 to L. Huron); • (4) Nottawasaga River. (Boyne R. to Georgian Bay); • (4) Oakville Creek. (Sixteen Mile Ck.) (Hwy. 2 to L. Ontario); • (4) Penetangore River. (Queen Street, Kincardine, to L. Huron);

	<ul style="list-style-type: none"> • (4) Pottawatomi River. (intersection of 15th St. W. and 7th Ave. W., Owen Sound, to Georgian Bay); • (4) Rouge River. (Hwy. 2 to L. Ontario); • (4) Sauble River. (440 m (1444 ft.) downstream from lowest edge of Sauble Falls to Lake Huron). • (4) Saugeen River (cement abutments below Denny's Dam to L. Huron); • (4) Spencer Creek. (Hwy. 102 (Cootes Dr.) to L. Ontario); • (4) Sydenham River. (point 177 m (581 ft.) downstream from Mill Dam, Owen Sound, to Georgian Bay); • (4) Telfer (Bothwell's) Creek. (bridge on County Rd. 15 to Georgian Bay),; • (6) Cobourg Brook (Cobourg Creek/Factory Creek) (southerly limit of the C.N.R. right-of-way to L. Ontario); • (6) Gages Creek. (southerly limit of C.N.R. right-of-way to L. Ontario); • (6) Ganaraska River (between the southerly limit of the C.N.R. right-of-way and Lake Ontario); • (6) Regional Municipality of Durham (all waters between the southerly limit of the C.N.R. right-of-way and L. Ontario).
January 1- Friday before last Saturday in April & October 1- December 31	<ul style="list-style-type: none"> • (7) Mayhew Creek.
January 1- March 15 & Saturday before Victoria Day- December 31	<ul style="list-style-type: none"> • (15) Lake Nosbonsing
January 1- March 31 & Last Saturday in April- September 15	<ul style="list-style-type: none"> • (3) Pinery Park Pond
January 1- March 31 & Last Saturday in April- September 30	<ul style="list-style-type: none"> • (4) Bells Lake., • (4) Eugenia Lake., • (4) Irish Lake., • (4) Wilcox Lake., • (4) Wilder Lake., • (4) Williams Lake.
Last Saturday in April – December 31 <i>(Extended Fall Season for Rainbow Trout)</i>	<ul style="list-style-type: none"> • (3) Elgin County;
Last Saturday in April – December 31 <i>(Extended Fall Season for Rainbow Trout and Brown Trout)</i>	<ul style="list-style-type: none"> • (3&4) Grand River (25 m (82 ft.) downstream of Wilkes Dam, Brantford, downstream to L. Erie); • (3) Big Creek. (south of Quance Dam to Regional Rd. 21); • (3) Big Otter Creek. (Bayham Twp.); • (3) Little Otter Creek. (East branch of Big Otter Creek); • (3) Young's (Ryerse) Creek. (mill dam on Lot 23, Conc. III, Charlotteville Twp., to L. Erie). • (4) Bayfield River. – (Hwy. 4 to Hwy. 21); • (4) Beaver River. (Thornbury Dam to Georgian Bay); • (4) Bighead River. (St. Vincent Twp.);

	<ul style="list-style-type: none"> • (4) Bronte Creek. (Hwy. 5 to the unopened road allowance at Rebecca Street, Oakville); • (4) Grand River. (line across 100 m (328 ft.) downstream of the Hwy. 2 bridge, Paris, downstream to pedestrian and service bridge upstream (west) of Brant Conservation Area, Brantford); • (4) Hog Creek. (C.P.R. bridge to Georgian Bay); • (4) Humber River. (Eglinton Ave. to Steeles Ave., Toronto); • (4) Little Sauble River. (Hwy. 21 to L. Huron); • (4) Maitland River. (County Rd. 4 to Hwy. 21); • (4) Nine Mile (Lucknow) River. (County Rd. 86 to L. Huron); • (4) North River. (MacLaughlins Falls to Matchedash Bay (Georgian Bay)); • (4) Sauble River. (Sauble Falls L. Huron); • (4) Saugeen River. (Truax Dam (Walkerton) to westerly edge of the abutments of Denny's Dam); • (4) Sturgeon River and tributaries (including mouth of Sturgeon River at Georgian Bay); • (6) Northumberland County (all waters downstream of Hwy. 2, except Ganaraska R. which may only be fished downstream of the south side of the C.P.R. bridge); • (6) Regional Municipality of Durham (all waters between Hwy. 2 to the southerly limit of the C.N.R. right-of-way).
First Saturday in May- September 30	(4) Maitland River.
June 1- September 30	(4) Judge Creek., (4) Mill Creek., (4) Orchard (Centreville) Creek., (4) Parkhead Creek., (4) Pretty River., (4) Silver Creek.

Appendix 2. Ontario waters currently having exceptions to the catch and possession limit for rainbow trout.

Waterbody (Division)	Catch limit by license type		Possession limit by license type	
	Sport	Conservation	Sport	Conservation
<ul style="list-style-type: none"> • (4) Credit River and tribs – upstream of Old Baseline Road Bridge • (4) Grand River – between the former town of Paris and Brantford from a line across the Grand River in Paris at 100 m downstream of the Hwy. 2 bridge downstream to the pedestrian and service bridge that crosses the Grand River on an angle upstream (west) of the Brant Conservation Area in the City of Brantford • (4) Grand River: between the West Garafraxa 2nd Line and Scotland Street in the Town of Fergus; between Tower Street in the Town of Fergus and the Bissell Dam in Nichol Twp.; between 100 m (328 ft.) downstream of a bridge located at the southern boundary of the Elora Gorge Conservation Area and a point 100 m (328 ft.) upstream of Pilkington 2nd Line in Pilkington Twp. between 100 m (328 ft.) downstream of Pilkington 2nd Line bridge and 100 m (328 ft.) upstream of Pilkington Twp. and Woolwich Twp. boundary line; between 	0	0	0	0

100 m (328 ft.) downstream of Pilkington Twp. and Woolwich Twp. boundary line and 100 m (328 ft.) upstream of Hwy. 86 bridge.				
<ul style="list-style-type: none"> • (3) All of the rivers and streams and watersheds in the Twp. of Bosanquet and those portions of Sarnia, Plympton, and Warwick Twps. north of Hwy. #402 in Lambton County; and in Middlesex County including the entire Twps. of West Williams, East Williams and McGillivray. • (4) All of the rivers and streams and their watersheds flowing into Lake Huron and Georgian Bay in Bruce, Dufferin, Grey, Huron, Perth and Simcoe counties. • (18&19) all tribs of Lk. Superior 	2	1	2	1
<ul style="list-style-type: none"> • (3&4) Grand River (Wilkes Dam, Brantford to Lk. Erie) (Oct. 1 – Dec. 31) 	1	0	1	0
<ul style="list-style-type: none"> • (4) Whiteman's Ck. (part of aggregate catch), (21&33) all tribs of Lk. Superior 	1	1	1	1
<ul style="list-style-type: none"> • (16) Big Sound of Parry Sound 	3	2	3	2

Appendix 3. Current (2005) special regulations for rainbow trout in Ontario.

<ul style="list-style-type: none"> • (4) Grand River: 4 (between the West Garafraxa 2nd Line and Scotland Street in the Town of Fergus; between Tower Street in the Town of Fergus and the Bissell Dam in Nichol Twp.; between 100 m (328 ft.) downstream of a bridge located at the southern boundary of the Elora Gorge Conservation Area and a point 100 m (328 ft.) upstream of Pilkington 2nd Line in Pilkington Twp.; between 100 m (328 ft.) downstream of Pilkington 2nd Line bridge and 100 m (328 ft.) upstream of Pilkington Twp. and Woolwich Twp. boundary line; between 100 m (328 ft.) downstream of Pilkington Twp. and Woolwich Twp. Boundary line and 100 m (328 ft.) upstream of Hwy. 86 bridge). 	<ul style="list-style-type: none"> • Artificial lures with a single barbless hook must be used.
<ul style="list-style-type: none"> • (4) Grand River – between the former town of Paris and Brantford from a line across the Grand River in Paris at 100 m downstream of the Hwy. 2 bridge downstream to the pedestrian and service bridge that crosses the Grand River on an angle upstream (west) of the Brant Conservation Area in the City of Brantford • (4) Whiteman's Creek 	<ul style="list-style-type: none"> • Artificial lures with a barbless hook must be used.
<ul style="list-style-type: none"> • (4) Credit River and tributaries - upstream of Old Baseline Road, Town of Caledon, Regional Municipality of Peel. 	<ul style="list-style-type: none"> • Artificial lures with a single barbless hook must be used. • No live organic bait allowed.
<ul style="list-style-type: none"> • (18) East Goulais River (from Laughing Lake in Menard Twp. to the Goulais River). • (18) Garden River (from Ranger Lake to Garden Lake). 	<ul style="list-style-type: none"> • Only artificial flies can be used as bait.
<ul style="list-style-type: none"> • (21) Arrow River 	<ul style="list-style-type: none"> • Barbless hooks must be used. • Only artificial lures can be used as bait between the Robbins/Hartington Township Line

	<p>and its confluence with the Pigeon River in Devon Twp.</p> <ul style="list-style-type: none"> • Only artificial flies can be used as bait between the dam on Arrow Lake (Hardwick Twp.) and the Robbins/Hartington Township line.
<p>(4) Grand River – between the former town of Paris and Brantford from a line across the Grand River in Paris at 100 m downstream of the Hwy. 2 bridge downstream to the pedestrian and service bridge that crosses the Grand River on an angle upstream (west) of the Brant Conservation Area in the City of Brantford</p>	<ul style="list-style-type: none"> • No fishing from Mar. 1 to Friday before the last Saturday in April. For brown and rainbow trout, walleye, northern pike and smallmouth bass.