6 ISSUES, RESOURCE VALUES AND INTERESTS

A number of issues, resource values and interests of importance to stakeholders within the Muskoka River system were identified during the preparation of the background information document (A&A, 2003a). These issues included:

- preliminary issues based on background data
- agency and public consultation issues
- MNR issues
- waterpower producer issues
- First Nation Issues.

This section summarizes the major issues identified by the end of Phase One of the planning process. The final list of issues/considerations used in the assessment of potential changes to water management for each structure in the system is presented in Section 9.

6.1 Issues Identified from Background Data

6.1.1 Natural Environment Issues and Concerns

Specific fish and wildlife concerns applicable to water management planning (i.e., those concerns related to water levels and flows) in the Muskoka River system were identified during the background information review. Specific concerns, which are discussed in detail below, include:

- fall and winter water level drawdown and lake trout spawning, egg incubation and fry emergence
- walleye spawning, incubation and fry emergence at walleye spawning sites in the watershed
- water level fluctuations and fish habitat in Matthias head pond
- brook trout habitat and Big East River flows (below McCraney, Camp and Tasso lake dams)
- water level fluctuations and loon nesting
- water level fluctuations and wetland and littoral zone habitats.

Lake Trout and Fall/Winter Drawdown

Lake trout are one of the most sought after game fish species in the Muskoka River watershed. As such, healthy lake trout populations represent an important component of the economic and recreational aspects of the area. Lake trout deposit their eggs in the fall in areas of the lakes that have clean, well oxygenated substrates with plenty of interstitial spaces and good water circulation. Eggs and early life stages remain within the substrate until approximately late-April to mid-May, when they disperse to open water environments. Spawning depth typically ranges from 0.5 to 2.0 m, but may be as shallow as a few centimeters. Lake trout are therefore vulnerable to water level manipulation/fluctuation, especially during the winter incubation/ hatching and spring fry development periods. Decreasing water levels during the winter/spring period can expose spawning areas, resulting in desiccation and freezing of eggs and/or early life stages.

The Hackner-Holden agreement, which governs the manipulation of water levels in the major reservoirs/lakes in the watershed, was originally developed in 1940 to more effectively utilize the available water resources for hydropower production while protecting navigation and recreational interests (i.e., reduce the potential for spring flooding on recreational lakes). It was amended in 1969 to balance the needs of hydropower production with the needs of lake trout stocks and recreational users. Lake trout protection measures (i.e. fall and winter drawdown levels) were based on information available at that time regarding lake trout spawning, incubation, and fry emergence and dispersal. A fall drawdown was initiated on many of the lakes to encourage lake trout to spawn deeper, and hence be less susceptible to the successive winter drawdown. At that time, it was known that lake trout eggs hatch by early February, and provided the rationale to limit the winter drawdown on the majority of the lakes to no more than 1.5 to 2 ft (45 to 60 cm) below the previous fall's October 15 water level before March 1. In this manner, developing eggs would be protected, and further lowering of water levels would be undertaken after March 1 (after eggs had hatched). However, what was not known at that time, is that the early life stage fry remain within the spawning substrate for a period of up to 3 months before dispersing to open water. Thus, the practice of limiting the extent of the winter drawdown before March 1 may not be having the desired positive effect on lake trout populations, and may be negative, depending on the amount of the post March 1 drawdown, and the characteristics of lake trout

populations within individual lakes (i.e., depth of spawning shoals, proportion that utilize shoals within the drawdown range, etc). The ideal situation in terms of providing the most protection to lake trout stocks would be one where the winter drawdown level is no lower than the fall drawdown elevation.

Information on spawning shoal depth and susceptibility of lake trout eggs and/or fry to winter drawdown was subsequently obtained for those lakes within the watershed for which data was available from MNR files. Information was compiled and provided for consideration in the development of water management practices for lake trout lakes.

Walleye Spawning Below Dams

Walleye are known to spawn below several dams in the Muskoka River watershed, including the spillway channel below the South Falls dam and in the Moon River below Moon Falls. Walleye spawning, egg incubation and fry emergence can be susceptible to the impacts of water management. In a natural stream setting, walleye typically spawn when water levels are rising or stable, and depend on a slowly receding hydrograph to prevent exposure and desiccation of eggs prior to hatching. Abnormally high flows/water levels during the spawning period may encourage walleye to spawn in areas that will be dewatered prior to the end of the incubation period.

The present water management regime in the watershed includes a number of measures designed to maintain and/or enhance some of these important walleye spawning habitats (Section 5). Habitat improvements have been undertaken and a specified minimum flow (3 m^3/s) is provided at South Falls to enhance spawning habitat and survival of eggs and fry. Further complications at both sites include a protracted spawning period, as fish respond to rising and falling temperature cues.

The area immediately below Moon Falls on the Moon River is an historically significant spawning area for walleye, with progeny from this area historically providing the basis for a destination fishery in Georgian Bay. MNR records indicate that the spawning population using this area has declined substantially, although a reduced population (compared to historic data) still utilizes this area as a spawning location.

Since 1969, MNR and OPG have attempted to maintain a consistent, targeted flow of 14 m^3/s in the Moon River for the duration of walleye spawning and egg incubation periods in the months of April and May. This quantity was thought to have been identified as a target in the Hackner-Holden Agreement, although historic documentation is lacking in this regard. A flow of 14 m^3/s was considered the quantity that could be provided from one year to the next through April and May, while also minimizing the impact on power production at OPG facilities on the Musquash River. A higher flow value was not chosen as the target as it could not be provided on a consistent basis, which was thought to be essential to yearly production of walleye at this site. However, in reality, flows are often variable, with high volume, short duration peaks above the targeted 14 m^3/s a common occurrence.

Further observations and investigations have revealed that managing for stable, low flows on the Moon River often results in unanticipated peaks in flow when rain events or sudden snowmelt events occur within the watershed. These events cause dramatically increased outflow from the watershed, requiring excess water to be passed down the Moon River as the hydropower facilities on the Musquash River typically pass a maximum of 85 m^3/s (the other outflow channel for the watershed). These peaks in flow increase water levels below Moon Falls and allow spawning walleye to access habitat that will be dewatered as flows recede. This results in stranding of walleye eggs deposited during these high flows. In recent years, a lower consistent flow (8 m^3/s) has been targeted due to dry conditions in the watershed. As a whole, the fluctuations in flows in the Moon River are a result of water withdrawal for hydro generation (by OPG) coupled with a limited ability (by MNR) to store/control spring runoff in upstream lakes and provide flow into the latter part of the incubation period for walleye. Further information on studies undertaken to investigate the relationship between Moon River walleye population dynamics and flow is contained within the Background Information Report, Addendum 1 (Acres, 2005).

Other known or potential walleye spawning locations in the Muskoka River watershed include constructed habitat below the Bala Dams, and natural habitat downstream of Fox Lake dam (at Hoodstown rapids), and potential spawning sites below the Go Home Lake dam on the Musquash River. Limited information is available regarding the status of walleye spawning at these sites and further investigations (i.e., habitat mapping, flow measurement

and/or spawning surveys) may be necessary to determine if there is any potential for improvement (i.e., by providing increased or more stable flows or improved habitat during the spring spawning and incubation period).

Fish Habitat in Matthias Head Pond

Water level fluctuations within the Matthias Falls head pond during the spring and early summer period (i.e., May 1987 and 2001) have been noted to dewater shorelines along the edge of the reservoir, and potentially affect fish habitat. While water level fluctuations are a common occurrence on natural systems, they generally occur slowly and have both seasonal and annual components. Rapid, large magnitude water level fluctuations pose a concern for aquatic organisms and fish that have restricted mobility and/or ability to quickly respond to a water level change. The degree and extent of water level fluctuation has been identified as a concern on other riverine reaches within the river system as well.

Brook Trout in the Big East River below McCraney Lake

McCraney Lake dam is one of several headwater lakes that discharge into the Big East River. The concrete dam contains an overflow spillway, a sluice structure (not operated) and an operational valve. Presently, the valve is opened between mid-August and mid-October (2 to 3 m^3/s release) to augment late summer flows on the Big East River. This release results in a 3-m drawdown of the lake, and little or no flow in the reach immediately below the dam after the valve is closed. Stranding of brook trout and other fish species has been observed below the dam after closure of the valve.

The Big East River is an important cold-water river in the watershed, and has been the focus of recent efforts to improve brook trout habitat (i.e., removal of Finlayson Dam). Brook trout spawning typically occurs from late September to November (Scott and Crossman, 1973) with eggs deposited in excavated nests (redds) on gravel substrate in shallow streams with areas of groundwater upwelling. The reduction in flows to the Big East River, commencing mid-October, due to the closure of the valve in the McCraney Lake dam, may be adversely affecting brook trout spawning and/or egg and fry development. Continued flow limitations into the winter months (i.e., as the lake refills to its overflow level) could also reduce brook trout over-wintering habitat or lead to exposure/freezing of eggs in redds.

Other headwater lakes in the upper portion of the Big East watershed that contain dams (i.e., Camp and Tasso lakes) are operated primarily to maintain a stable summer water level for recreational interests. A lack of water in river sections during the summer would reduce the amount of refuge habitat (i.e., deep, well oxygenated pools that allow fish to escape the heat of the summer), and also affect the quantity and quality of benthic invertebrate habitat, which brook trout depend on for food. Opportunities to enhance flow management for brook trout should be further investigated.

Water Level Fluctuations and Loon Nesting

The Common Loon generally breeds on lakes of the Canadian Shield and northward, with a few pairs along the edge of the Shield in southern Ontario. Larger lakes are preferred, and may support several pairs in visually separated bays, while smaller lakes (generally >5 ha) usually support only one pair (Cadman et. al., 1988). Nesting and incubation occurs in late spring-early summer, with nests constructed close to the water's edge, and often on small islands or points (sometimes on beaver lodges or on floating islands in marshes). Loons generally produce one or two, rarely three, eggs per year (McIntyre and Barr, 1997). Due to their proximity to the water's edge, nests are susceptible to water level manipulation during the incubation period (for approximately 1 month), and may be flooded out by rising water levels. If eggs from early nesting attempts are lost, a second attempt may be made. A large decline in water level, particularly on a low gradient shoreline, can also be a concern, as adult loons have difficulty traveling on land. Low water levels after nesting may also subject eggs and hatchlings to increased mortality from terrestrial predators. Upon hatching, the young (chicks) are downy and able to move about the water by themselves. Chicks up to 2 weeks old can often be observed riding on the back of one of their parents, and their survival is less affected by human disturbance (Cadman et al., 1988).
In addition to water level manipulation, loon populations and loon reproductive success are sensitive to impacts resulting from numerous other factors, including lake acidity, mercury poisoning, lead poisoning (due to ingestion of lead sinkers and shot), loss of nesting sites due to shoreline development, and/or disturbance of nesting due to human activity (Weeber, 1999). During the background information review, it was noted that the loon population of Smoke Lake does not appear to be affected by present water management activities. Comments from public consultation noted that current water management activities may be adversely affecting Fox Lake loon

populations, and suggested an earlier drawdown to the summer level as a potential solution. It was unclear whether current water management practices on other lakes within the system were affecting loon nesting success (see Section 8.2.2).

Impacts of Water Level and Flow Fluctuations on Wetland Habitats

Wetland habitats are among the most ecologically productive environments in Canada. They provide essential habitat for many species of fish and wildlife (including birds, mammals, insects, amphibians and reptiles) as well as important social and biological functions including flood attenuation, water quality improvement and low flow augmentation. The effects of water level management on wetland development and composition are not fully understood at this time, although several large scale studies are underway in the Great Lakes basin to determine how water level/flow management may be impacting wetlands (IJC, 1999).

Wetlands provide essential habitat for spawning, nursery and feeding for many of the fish species that are found in the Muskoka River watershed. Species such as northern pike and muskellunge utilize seasonally flooded wetland habitats (i.e., within the floodplains of rivers or in lakeshore marshes) for spawning and as a juvenile nursery in the spring. Spawning and egg incubation are particularly susceptible to negative impacts resulting from water level manipulation. Decreased flood levels (e.g., as a result of measures to minimize flood damage to shoreline property) may inhibit access to spawning grounds (i.e., seasonally flooded sedge meadows), thereby denying fish a suitable place to spawn. A quicker spring drawdown to the preferred summer water level (as may be desired by recreational users) may impact incubating eggs or early life stages by stranding them on the floodplain.

Water management could also have significant impacts on furbearers (beaver and muskrat), amphibian and reptile populations in the Muskoka River watershed, primarily due to their dependency on wetlands and riparian zones (i.e., use of temporary wetland ponds and seasonally flooded shoreline pools for breeding and early life stages). Water management strategies aimed at reducing the impact of high spring levels on structures and recreational properties may eliminate access to the floodplain habitats necessary for propagation of these species.

Impacts of Water Level and Flow Fluctuations on Littoral Zones

The littoral zone of lakes and rivers (i.e., shallow waters along shorelines) provides essential feeding, breeding and cover habitat for many of the fish species in the Muskoka River watershed. Most of the spawning areas identified for lake trout, walleye, northern pike and muskellunge are closely associated with the shoreline, and are for the most part, located in fairly shallow (less than 2 m deep) water. As well, major prey species (minnows, perch, sunfish, aquatic invertebrates, crayfish, etc) are largely found in the littoral zone, and rely heavily on shallow areas for their reproduction and foraging requirements. Water management activities that excessively impact littoral zone habitat quality and quantity, may in turn impact fish community dynamics and population levels.

6.1.2 Socioeconomic Issues and Concerns

The following socioeconomic issues were identified during the collection of the background information presented in this document.

Public Safety

- Spring freshet and other storm events passed through the system without loss of life.
- Maintain access for emergency vehicles.
- Extreme fluctuations minimized.
- Public access to and safety around water control structures (particularly the downstream areas during high flow events).
- Municipal, commercial and industrial water taking and waste discharges (adequate quantities and flows).
- Clean and sufficient quantity of water (flowing, not stagnant) for swimming and other nonconsumptive uses such as bathing, washing clothes, etc (i.e., summer low flow in South Branch near Fraserburg).
- Stability of winter ice cover (for winter recreational activities – ice fishing, snowmobiling, cross country skiing, etc).

- Stable and consistent water depths and river flows during summer recreational boating season (as related to personal safety).

Property

- Flood management to protect shoreline infrastructure (docks, shorewalls, boathouses, cottages, homes, resorts, businesses, etc).

- Limited floodplain mapping (not throughout entire river system).

- Minimize shoreline erosion (erosion prone sites at Kawagama Lake, Fox Lake, Lake of Bays, and on Big East River at Arrowhead Provincial Park).

- Residences and businesses within floodplain that may be flooded during high flow events (i.e., Big East River, Huntsville and Bracebridge urban cores).

- Avoidance of ice damage to infrastructure (boathouses, shorewalls, docks).

- Residential and seasonal water taking (shoreline water intakes).

- Real estate values.

Economic (Tourism/Recreation/Power)

- Tourist industry (resorts, lodges, camps, cottages) requires stable summer water levels for water based recreational activities (boating, water skiing, fishing, canoeing, swimming, etc).

- Local and provincial tourism strategies rely on the natural beauty and attraction of the Muskoka area, including the waterways (lakes, rivers, waterway and provincial parks, etc).

- Power producers require consistent flow on a regular basis to maintain their ability to supply residents with electricity.

- Preservation of historic and archaeological sites of interest.

- Aesthetics/attraction of heritage and scenic sites (historical and natural heritage sites, falls, chutes, etc).

- Fishing opportunities need to be maintained or enhanced by protection of habitat (spawning, rearing, foraging, resting, etc) and provision of an appropriate flow regime during specific life stages (as required).

- River flows for higher energy recreational pursuits (canoeing, kayaking, white water rafting, etc).

- Impacts of development (cottages, resorts, lodges, camps, marinas, golf courses, etc) on water quality and the natural environment.

- Protection of Muskoka Heritage Areas and Ontario Living Legacy (OLL) sites.

- New opportunities for power production.

Navigation

Navigation of recreational and commercial vessels can be affected by both water levels and in some limited cases (especially near control structures) water velocity. Issues are related to adequate water depth for safe navigation of the lakes and access to shoreline structures such as docks and boathouses.

- Specific water bodies that are managed for commercial and/or recreational navigational purposes include:
  - Huntsville Lakes (Vernon, Peninsula and Fairy), including the canal between Fairy and Peninsula lakes, the Huntsville lock, and the downstream reach of the North Branch Muskoka River to Mary Lake.
  - Muskoka Lakes (Muskoka, Joseph and Rosseau) including the mouth of the Muskoka River in Bracebridge, the large and small lock in Port Carling, and associated reaches and ports of call.
  - Algonquin Park lakes and canoe routes.
  - Lake of Bays (commercial tour boat).

From a previous study, "Water Management Improvement Study of the Muskoka River System" (MacLaren Plansearch, 1985) a number of constraints to navigation were identified (see Table 6.1).

Table 6.1
Navigational Constraints

Lake	Navigation Constraints
Gray Lake	• Low water levels below Big Eddy dam on Friday nights affect access to Gray Lake cottages
Moon River - Bala Reach	• Fluctuating water levels may affect unattended boats (i.e. fixed docks are sensitive to changing water levels) • Low water reduces access to docks, shorelines and beaches • High discharge can cause strong currents, particularly along the north shoreline • High flows through the Moon Chutes cause strong currents at the constriction and is dangerous to boaters
Rosseau and Joseph	• Maintenance of water levels in the upper conservation zone to provide adequate draft for numerous docks and boathouses • Lowering of water levels >0.15 m below rule curve will create boating hazards within the shallow portions of the lake • Minimum draft should be maintained until freeze-up to enable the movement of construction barges. • Potential navigation difficulties for larger cruise vessels
Indian River	• Large and small lock at Port Carling • When Lake Muskoka water level is 0.10 m below the rule curve, a rock ridge in the channel downstream of the smaller lock interferes with the passage of pleasure craft and tour boats
Lake Muskoka	• Water access to Beaumaris Marina and Alport Bay on the Muskoka River may be difficult with lower levels • Minimum draft should be maintained until freeze-up to enable the movement of construction barges.

Table 6.1
Navigational Constraints

Lake	Navigation Constraints
Mary Lake	• Releases from Mary Lake dam must be coordinated with the Huntsville Locks Dam (releases enter Mary Lake in 2 hours) • Navigation problems occur at the entrance to Mary Lake on the North Muskoka River when levels fall below the rule curve due to a sand bar • Low water levels may prohibit larger craft and commercial tour vessels from traveling downstream from the lock to Mary Lake (downstream entrance to lock)
McCraney Lake	• Low late summer lake levels restrict canoe access to Rain and Sawyer Lakes
Vernon, Fairy and Peninsula	• Shallow water depths in the nearshore makes navigation and dockage difficult • On connecting waterways (Canal, Muskoka River), shallow waters (below rule curve) may expose rocks and outcrops
Big East River	• Low flows during summer create unsatisfactory conditions for boating (below Arrowhead Park) and canoeing
Kawagama Lake	• Docks appear to have been adjusted to deal with draw down of 0.39 m over the summer period • Limited road access results in increased water access which may be difficult in shallow near shore areas • Unexpected lowering of water levels may strand unattended boat • Low water levels affect access between Lake Kawagama and Bear Lake.
Oxtongue Lake	• Rock dam does not provide sufficient regulation of summer water levels

Source - MacLaren Plansearch (1985) (4-16 to 4-25)

Miscellaneous Socioeconomic Issues

- Historic water management practices have set the precedent for future expectations.

- Recreational season has expanded beyond the traditional ‘July/August’ summer period to span from early May to late October – more recreational users for a longer time period.

- Communication of significant events to affected parties.

6.1.3 Engineering Issues

The current water management strategies for MNR operated dams are based on the Hackner-Holden Agreement, which was developed to provide a solution to the various demands for water within the watershed. Recreational use of the watershed has continued to increase since that time, and current operational strategies have attempted to keep pace with those changes by means of small adjustments. Engineering issues pertaining to the operation of the dams include:

- reduced budgets and staff levels
- operations react to rising or falling water levels, no ability to forecast flow and flood changes and act accordingly
- ability to pass flood flows through the system with minimal impact to existing infrastructure (roads, bridges, docks, boathouses, cottages, etc)
- dam integrity and safety
- engineering methods to reduce costs of operations.

6.2 Agency and Public Consultation Issues

6.2.1 Agency Consultation Issues

A number of agencies were contacted at the beginning of the study. The purpose of agency consultation as a component of the water management planning process was to:

- inform the various levels of government and local municipalities of the water management planning process
- receive input to the water management planning process with respect to the collection of background data and/or jurisdictional matters of an agency/municipal-specific nature in the Muskoka River watershed

- determine any issues/concerns they might have with respect to current operational practices

Besides ongoing input from MNR personnel, the following federal, provincial and municipal government agencies were consulted during the water management planning process:

Federal Government
- Environment Canada
- Canadian Coast Guard
- Fisheries and Oceans Canada
- Department of Indian and Northern Affairs
- Parks Canada (Georgian Bay Islands National Park)

Ontario Government
- Ministry of the Environment
- Ministry of Tourism and Recreation
- Ministry of Northern Development and Mines
- Ontario Native Affairs Secretariat
- Ministry of Transportation
- Ministry of Agriculture, Food and Rural Affairs
- Ministry of Municipal Affairs and Housing
- Leslie M. Frost Natural Resource Centre
- Ontario Parks (Algonquin Provincial Park)

Municipal Government and Planning Boards
- District of Muskoka
- County of Haliburton
- Township of Georgian Bay
- Township of the Archipelago
- Township of Seguin
- Township of Dysart
- Township of McMurrich/Monteith
- Township of Muskoka Lakes
- Township of Lake of Bays
- Township of Algonquin Highlands
- Town of Bracebridge
- Town of Huntsville
- Town of Kearney
- Town of Gravenhurst
- Archipelago Planning Board
- Parry Sound Area Planning Board

Power Companies/Associations

- Orillia Power Corporation
- Ontario Power Generation (Evergreen Energy Division)
- Bracebridge Generation Limited
- Algonquin Power
- Ontario Waterpower Association

The mechanisms that were used to ensure adequate opportunities for agency input to the planning process were as follows:

- Pre-public release information session (May 29, 2002).

- Mailouts.

- Telephone contacts to request background data and/or to discuss specific matters pertaining to policy interpretation.

- Meeting with municipal councils and/or representatives to discuss aspects of the water management planning process.

Table 6.2 summarizes the comments received in writing from agencies (A&A, 2003a.

Table 6.2
Agency Consultation Comments

Agency	Comments
Ministry of Transportation	"No concerns at this time". Requested that the Ministry be informed of any proposed changes in water levels or increase in flow rates as this might impact downstream structures.
Ministry of Municipal Affairs and Housing	"Our office has no concerns with the proposal"
Ministry of Culture	"A principal concern of this office is the adverse effects that undertakings such as the above mentioned might have on cultural heritage resources. If any development projects proposed as a result of this study have the potential to impact cultural heritage resources, then our office would recommend that a heritage assessment be conducted…If any significant heritage or archaeological resources are identified, then any negative impacts will have to be mitigated by either avoidance or excavation…The Local Archaeological Conservation Committee within your study area should be contacted."

Table 6.2
Agency Consultation Comments

Agency	Comments
Canadian Coast Guard	Dams are named works under the Navigable Waters Protection Act and require approval under Section 5(1). Existing structures can be approved under Section 6(4) and any modifications can be approved under Section 10.
Environment Canada	Provided a list of legislation relevant to the study. Recommended that the study identify all Valued Ecosystem Components that could be potentially impacted by water level and flow manipulations and then develop a plan which has due regard for these components in concert with identified water users in the watershed.

6.2.2 Public Consultation Issues

Public consultation is an integral component of the water management planning process. The consultation record is provided in its entirety in Appendix D, while a summary of the issues identified by the public is provided below. Table 6.3 summarizes the major issues and concerns, as identified from the open house questionnaire. Specific issues and concerns are summarized below on a sub-watershed basis.

Table 6.3
Summary of Public Issues and Concerns

Issue*	Number of Comments				Nature of Comments
	North Branch	South Branch	Lower Watershed	Total	
Low Water (26%)	7	53	5	65	Navigation Property Damage (boats, docks) Access to property Ability to draw water Freezing intake lines Decreasing property values Smelly water Dry wells Recreation Fish and wildlife
Water Level Fluctuation (27%)	7	50	10	67	Fish and wildlife Wetlands Scenery Water Quality Makes navigation dangerous Access to/from property (can strand owners) Impossible to construct docks at correct levels Impacts trapping

Table 6.3
Summary of Public Issues and Concerns

Issue*	Number of Comments				Nature of Comments
	North Branch	South Branch	Lower Watershed	Total	
High Water (17%)	8	31	4	43	Property damage (i.e., docks and boathouses) Damage resulting from ice Loss of property frontage Shoreline erosion Loss of beach area Fish and wildlife habitat Navigational concerns Flooding of wells Impacts to cruise line navigation
Water Quality (13%)	4	24	3	31	Drinking water Recreational use (i.e., swimming) Fish and wildlife Stagnation / no natural flushing Contamination through faulty septic systems
Winter Drawdown (3%)	1	6		7	Lake trout spawning, incubation and hatching Littoral zone ecology
Fish & Wildlife (10%)	3	20	3	26	Management not geared towards them Fish populations decreasing Water level fluctuations affecting loon nesting Lack of habitat More attention to levels during spawning Dried up fish eggs in the South Muskoka Moon River fish populations
Shoreline Erosion (3%)	1	6		7	Loss of property Fish and wildlife Water quality
Siltation (1%)		1	1	2	Impairs navigation Fish and wildlife

* Percent compared to all issues identified.

North Branch

Of the 18 ratings received for the current water management practices on the North Branch, 72% identified it as being excellent, good or adequate, while 28% identified it as poor. The most common concerns of respondents from the North Branch of the Muskoka River were low water (23%), water level fluctuation (23%) and high water (26%). The largest single number of responses came from residents of Mary Lake (8 comments) with water level fluctuation, resulting in impacts to property, being the primary concern. However, the majority of responses regarding Mary Lake identified the present water management strategy as excellent or good, with only one adequate rating. Specific responses regarding the Huntsville Lakes (Vernon, Peninsula and Fairy) identified the present management as adequate to poor.

South Branch

Overall, the greatest number of responses within the watershed (118 or 72%) came from residents of the South Branch of the Muskoka River. The most common issues were low water levels (28%), water level fluctuation (26%), high water levels (16%) and poor water quality (13%). However, results for different river reaches and lakes in the South Branch were markedly different. The one response received from the headwaters of the South Branch (Little Joe Lake) indicated that present management was adequate and that water levels should remain the same (i.e., through this water management study). Two responses from Oxtongue Lake indicated that operation of Tea Lake Dam resulted in rapid variation of the water levels in the lake, resulting in dry wells in the summer, damage to boats due to grounding during low water or damage to docks (and/or docks floating away) during high water levels.

The most commonly cited problem from Kawagama Lake respondents was high spring water levels, which result in shoreline erosion, loss of beach area, loss of property frontage, and impacts on boat docking and navigation. Levels in excess of 15 cm above the normal summer water levels were indicated to result in typical high water problems. Other common issues and concerns included the degree of water level fluctuation, the effects of winter drawdown on lake trout populations, and other fish and wildlife concerns. Low water levels in winter and early spring also resulted in freezing of water lines and low well levels. Several respondents felt that Lake of Bays and Muskoka Lake levels were controlled at the expense of Kawagama Lake property owners.

The most frequently cited problem from Lake of Bays respondents was high water levels resulting in shoreline erosion, property damage, loss of beaches, and fisheries issues. The effect of winter drawdown on lake trout was one of the primary concerns.

The greatest number of responses received from any one area in the entire watershed came for the South Branch, in the reach from Baysville Dam to Matthias Falls. Of these, 79% indicated that current water management practices were poor and 18% indicated that they were only adequate. Low water levels were the primary concern in this reach (38% of all comments received). Commonly cited problems resulting from low water included restricted access their water-access only property, impaired ability to draw

domestic water and damage to water pumps, adverse effects on fish and wildlife, effects on property values, and foul smelling river water. Water level fluctuation [which some respondents indicated as being up to 1.5 m (5 ft) on a daily basis] was the next most commonly indicated problem (31%). Water level fluctuation was directly indicated as affecting fish and wildlife, wetlands, water quality and the scenic value of the river. Water quality, especially for drinking water, was also a common concern among residents. Many respondents indicated that the concerns of lakes upstream from this reach (i.e., Lake of Bays and Kawagama) are being met without any attention given to the effects on downstream uses. Respondents indicated that maintaining more consistent water levels would be the preferred solution to water management issues in this reach.

Lower Watershed

The greatest number of responses from the lower watershed (7) came from residents located below the Bala Dams, of which, 3 were from residents of Bala Reach (from Bala to Ragged Rapids) and 4 were concerning the Moon River below the Moon Dam. All seven responses indicated that the current management practices were poor. Bala Reach concerns pertained to the high degree of water level fluctuation (i.e., high water floods properties and causes damage, while low water leaves docks high and dry, and may damage boats and impair access), while fisheries management issues were of paramount concern to Moon River residents. Residents feel that water level fluctuations and low water during the walleye-spawning period is inhibiting spawning and incubation success, and may be the primary cause of the walleye population collapse. Also of concern was stagnation (i.e., poor water quality) of the Moon River during the summer months. Some respondents indicated that the Muskoka Lakes (i.e., Muskoka, Rosseau and Joseph) were receiving priority treatment at the expense of downstream areas (i.e., Moon and Musquash River), with not enough consideration being given to the effects of Bala dam operation on downstream uses.

The primary concern of Lake Muskoka residents was high water levels during ice break up and the spring freshet, which result in property damage (i.e., to docks and boathouses). However, all responses from this lake indicated that the present management was excellent, good or adequate. Single responses from each of Rosseau Lake and the Indian River rated current water management practices as excellent.

One response from Gray Lake on the Musquash River (prior to Go-Home Lake) indicated that the rapid variation in the water level of the river presented a dangerous situation for navigation and access to their water-access only property. It was noted that access to property was possible by boat one day (because of sufficient water levels), but quickly falling levels the next day had stranded them because water levels have dropped so low as to make navigation dangerous or impossible.

6.3 MNR Issues

6.3.1 Provincial Policy Issues

Any potential changes to the water management strategies for the Muskoka River system will need to be consistent with current provincial direction and policy, such as:

- Algonquin Park Master Plan and amendments
- Ontario Living Legacy Land Use Strategy
- District Land Use Guidelines
- District Fisheries Management Plans and updates/revisions
- Forest Management Plans
- Provincial Policy Statement (2005)
- Our Sustainable Future.

6.3.2 Resource Management Issues

Fish and wildlife issues identified during the collection of background information are documented in Section 6.1.1 above, and included those areas within the river system that were identified by MNR as being of primary concern. These areas are:

- South Falls (walleye spawning and egg incubation)
- Moon River (walleye spawning and egg incubation).

In each case, the concerns relate to the provision of an adequate and constant flow within the area utilized by the majority of the spawning population. Specifics for each area are as follows.

South Falls

The provision of a constant flow at South Falls requires cooperation and coordination between MNR (Baysville dam), OPC (Matthiasville dam) and OPG (Hanna Chute and South Falls dams). Presently, OPG installs a block within the stop logs at the South Falls dam to ensure that 3 m^3/s (100 cfs) is passed into the spillway and through the walleye spawning and incubation area. MNR concerns relate to the variable daily/hourly flows arriving at the South Falls dam, which provide further flow fluctuations on top of the relatively stable discharge from the blocked stop logs. Higher flows/levels encourage walleye to spawn above the preferred spawning area, and essentially "wastes" some of the spawning effort as eggs at higher elevations are usually dewatered before the end of the incubation period.

Moon River

Flow to the walleye spawning area in the lower reaches of the Moon River (at Moon Falls) is provided through the Moon Dam which is operated in conjunction with the Bala dams and Ragged Rapids GS to provide the following flows during the corresponding hydrologic periods (as per MNR Dam Operations Manual):

Normal Spring	Maintain a constant flow of 40 m^3/s for the period from April 15 to June 1
Wet Spring	Maintain a constant flow of 60 m^3/s for the period from April 15 to June 1
Dry Spring	Maintain a constant flow of 15 m^3/s for the period from April 15 to June 1.

However, the ability to provide the above-noted flows is extremely difficult, as storage in the upstream watershed is limited, and spring water management is a balance between walleye spawning needs, flood protection on upstream lakes and river reaches, and power generation. Provision of 15 m^3/s during dry conditions has been difficult, and a minimum flow of 8 m^3/s has been tested and utilized during dry years as a more sustainable alternative. The effectiveness of either 8 or 15 m^3/s in providing sufficient production of walleye to maintain the Georgian Bay population is uncertain. The relationship between Moon River flows and habitat quality for walleye spawning and incubation are significant issues.

6.3.3 Operational Issues

One of MNR's primary issues is the manpower and the costs associated with operating and maintaining the various water control structures on the Muskoka River system.

Recent government policy statements indicate that MNR is no longer in the business of operating dams and maintaining waterways for recreational pursuits (MNR, 1999a). However, the Muskoka River system is different from most other river systems within the province of Ontario, in that a formal agreement (Hackner-Holden) is in place which outlines the operating procedures for each MNR controlled dam within the system. While MNR has continued to refine their operations over the years to integrate the concerns of other users of the resource (river/lake system) into their operational plans, many of the benefits to the power producers on the systems that were built into the original "rule curves" still exist. The degree to which various users benefit from MNR's operation of these dams is largely unquantified.

6.4 Power Producer Issues and Comments

Power producers (OPG, OPC, BG, AP) also identified their issues with the current operation of the Muskoka River system, as follows:

- **Divestment of MNR Structures** – concern was expressed that future divestment of a Crown owned resource to a recreation based group (such as a Cottage Association) could impact flows and the financial viability of current waterpower operations.

- **Education of the General Public** – it was noted that a general lack of knowledge concerning dams, waterpower facilities and their operations can lead to misunderstanding and improper allocation of blame for flow events outside the normal range of operations. The current infrastructure (dams and powerhouses) cannot control all naturally occurring events.

- **Smoothing of Flows** – less fluctuation in flows received from upstream facilities would enhance operational performance and generally be more beneficial to all stakeholders.

Recent government renewable energy initiatives recognize waterpower has important social benefits, including: displacement of greenhouse gases, decreasing respiratory illness and disease, reduction of smog and load following ability (i.e., the ability of waterpower to make quick changes in generation output to meet consumer needs). Waterpower, as a form of "green" power, achieves these objectives by reducing smog and greenhouse gases and associated health and ecosystem effects.

6.5 First Nation Issues

The Wahta Mohawks are the only First Nation community within the area of influence of this WMP. A meeting was held with the Chief and Administrative Assistant early in the planning process to discuss the consultation process and identify preliminary issues. The issues identified as a result of that meeting are as follows:

- Environmental Quality is a primary concern – factors such as stagnation of the water in the Moon River during the summer, timing and adequacy of flows for the Moon River walleye spawning population, and the Georgian Bay ecosystem as related to food quality and the impact of chemicals.

- OPG's Ragged Rapids and Big Eddy Stations – health and safety issues on the Musquash River associated with facility operation, and the need to occasionally pass high flows down the Moon River during traditionally low flow periods. Also the changes to water and sediment quality in a river system as a result of hydropower development.

- Priority of Interests – concern that the interests of upstream recreational users will take precedence over environmental quality issues. Environmental quality should supercede recreational interests.

- Compliance with approved water management strategies – monitoring and policing to ensure that approved plan is adhered to.

It was noted that both the Moon and Musquash rivers traverse First Nation lands. It was felt that the return to a more natural flow regime (daily and seasonal) would improve environmental conditions and the quality of both river ecosystems.