

The Implications of Successful Fisheries Management: A Decade of Experience With The Upper Grand River Tailwater Fishery

Ryan Plummer

Brock University
St. Catharines, Ontario, Canada
Stockholm Resilience Centre
Stockholm, Sweden
rplummer@brocku.ca

Cory Kulczycki

University of Alberta
Edmonton, Alberta, Canada
ck14@ualberta.ca

John FitzGibbon

University of Guelph
Guelph, Ontario, Canada
jfitzgib@uoguelph.ca

Michael Lück

Auckland University of Technology
Auckland, New Zealand
mlueck@aut.ac.nz

Jonas Velaniškis

University of Guelph
Guelph, Ontario, Canada
jvelanis@uoguelph.ca

Abstract

Managers of recreational fisheries have traditionally focused on biophysical factors related to the provision and maintenance of fish stocks. However, human dimensions and community development are equally important considerations. This paper highlights the angling experiences, economic impacts, and community development associated with the creation of a brown trout fishery in the upper section of the Grand River in Ontario, Canada. Results are presented from a series of four surveys conducted on this reach of river over the past decade. Findings build upon traditional measures of success and encompass other factors linked to the fishery. Considering these often unintended implications from successful fisheries management makes clear the importance of broadening fishery considerations beyond biophysical elements. The study highlights the potential for developing nature-based recreation amenities as a strategy for broadening the economic development base in rural communities and an ongoing need for fisheries managers to work with members of the community.

Keywords: human dimensions of fisheries management, economic impacts, rural economic development, community development, Grand River, Canada

1.0 Introduction

The shifting landscape of rural life in Western countries has raised significant challenges for community leaders to overcome in order to maintain and improve the quality of rural livelihoods. Involuntary out-migration, demographic change, and economic restructuring are interrelated issues affecting life in the countryside and central to the future of rural viability (Athiyaman & Walzer, 2008; Douglas, 1994; Lück & Altobelli, 2009; Waldenström & Westholm, 2009; Wilson, Fesenmaier, Fesenmaier, & Van Es, 2001). Of particular concern are communities in peripheral areas, i.e., those that are at the “outermost boundary of any area” (Brown & Hall, 2000, p. 1). While rural towns have been experiencing an epidemic decline for at least the last four decades, the recent global economic crisis has painfully elevated the problematic nature of rural economies, often characterized as single-industry towns highly constrained by dependency on national and international trade. Boom-and-bust economic cycles have particularly plagued rural communities in Canada and the western United States, where both private and public interests have not prioritized community-centered approaches to development (Graves, Weiler, & Tynon, 2009; Markey, Halseth, & Manson, 2008). For example, a study of rural counties in the United States by Artz and Orazem (2006) found that the most successful rural counties of the 1970s are no longer rural today and that a large number of currently rural counties are experiencing a brain drain to metropolitan counties. In other parts of the world, such as Norway and Australia, the crisis of rural decline is manifested through reduced profitability among farmers and environmental degradation in the countryside (Bjørkhaug & Richards, 2008). Communities and local governments across the Western world increasingly recognize the need to diversify local economies and improve the quality of life for their constituents by pursuing novel avenues and means for rural development while rethinking both the scale and the nature of development projects.

The long, pressing need to improve rural status has inspired both researchers and practitioners in community life to refocus on communities as the source and the ultimate beneficiary of development projects. The broad discipline of community development has emerged as an unconventional way forward for rural communities to engage in self-directive intervention recognizing and capitalizing on interconnections among actors, actions, and beneficiaries that provide the foundation for rural community welfare and community fabric. Undoubtedly, each rural community is unique, due to the vast geographic, socioeconomic, and cultural landscapes. While Canada and the United States share a pattern of amenity-based tourism and recreation development shaped by unplanned market forces in the second half of the last century, there are also some important differences—rail development in Canada connected a sparse population living within a vast geographical context while an extensive highway network developed in the United States to connect local urban populations to the countryside (Gartner, 2004). In both countries, rural destination communities are heavily dependent on recreational expenditure from local populations rather than international arrivals (Gartner, 2004, 2005). The differences among North American rural communities also influence the application of community development in practice; it means many things to many people and is ultimately aimed at self-directed improvement of all aspects of community life, i.e., education, recreation, and health (Sanders, 1970).

A subset of community development is the notion of community economic development (CED). This further-defined notion is gaining popularity as an approach for rural communities to expand economic opportunities at the local level by means that appropriately fit local countrysides and improve both the socioeconomic and the ecological aspects supporting rural life (Douglas, 1994; Houghton, 1999; Markey, Pierce, Vodden, & Roseland, 2005). CED is essentially concerned with rural development rooted in participatory action and intervention by members of community and organizations that act on the behalf of the community to bring about positive economic change (Douglas, 1994). It is development by the community for the benefit of the community, ultimately aiming at improving community economic well-being with the expectation that such improvements translate into positive changes in other aspects of community life. Although many rural communities face practical and conceptual limitations in understanding or subscribing to the CED approach, some evidence suggests that communities and rural organizations across Canada actively engage in self-directed development projects that correspond with the principles of community development and CED (Markey et al., 2005).

Canadian literature is limited in establishing links between the role of recreation and community development (Stebbins, 2000). Therefore, the focal point of this paper is on recreation-based amenity development as a method for improving socioeconomic and ecological welfare for rural life. In the United States, a study of recreation and tourism effects on rural well-being, produced by the Economic Research Service of the United States Department of Agriculture, concluded that while the development of recreational amenities for tourism may create certain challenges for rural residents (e.g., pressures on infrastructure associated with rapid growth cases), rural tourism and recreation development was generally good and improved socioeconomic well-being for the locale (Reeder & Brown, 2005).

Recreational activities are central aspects of the public good and an integral aspect of community life (Douglas, 1987; Pedlar, 1996), yet the contributing value of developing recreational amenities to the broader process of CED has received limited attention in empirical studies (Bergstrom, Cordell, Ashley & Watson, 1990). Gartner (2004, 2005), in an analysis of attributes-based tourism in the rural United States, and to a lesser extent in Canada, depicts the development of rural tourism in North America as largely driven by single-attribute recreation marketing and development, arguing for the need to move toward a more holistic approach of benefits-based rural tourism development. However, from a community development perspective, an introduction of amenity-based recreation for consumption provides a valuable alternative for rural communities to diversify the local economy while avoiding the need for destination branding, which requires significant investment. The latter is particularly important considering that in many rural areas the promotion of tourist amenities is synonymous with the promotion of small-business operations characterized by small enterprises, which are often family centered (Fleischer & Pizam, 1997; Galston & Baehler, 1995; Wales Tourist Board, 1994).

There is value in examining the role of leisure and recreation within the rural community and amenity context. Pedlar (1996) concluded that community development occurs when members of a community participate in an activity that leads to the improvement of one or more identifiable community aspects. Community well-being is directly tied to the well-being of individual members,

who may engage in recreational activities independently (Stebbins, 2000). Stebbins (2000) distinguishes leisure activities as casual *and* serious, pointing out that the latter quality is closely tied to community development. Serious leisure includes activities that are distinct from the routine of everyday life and require a certain amount of skill to participate in. They may include activities for individual development (recreation) not directly tied to community welfare or activities directly affecting aspects of community life such as volunteering. People engaged in serious leisure, regardless for whose benefit, often see it as a building block to self-actualization.

In addition to recreation as an outlet for individual and thus community development, the self-directed development of recreation-based amenities in rural regions is gaining attention as an alternative tool for economic diversification (Gan, 1998; Garrod, Wornell, & Youell, 2006; Hammer, 2008). In British Columbia, as well as in other Canadian provinces, countryside resources are increasingly recognized as having recreational value to be consumed as a service rather than a trade commodity. Emerging evidence in the provincial policy arena suggests a parallel shift. Recent advancements in British Columbia forestry policy allows community forest operators to generate revenue from Crown land by managing sections of public land as a venue for commercial, recreation-based activities (McIlveen & Bradshaw, 2009). This practice of transforming rural land use from extraction to recreation is well established in the United States, where large tracts of scenic and wild, government-owned land were set aside for recreational use at the turn of the last century. During World War II, rural tourism development in the United States became closely associated with recreational use on publicly owned lands (Gartner, 2004). Today, many successful American rural destinations are situated bordering publicly owned lands. In Canada, a few large-scale rural tourism destinations have developed, under strict supervision of Parks Canada, within the federally owned lands in Banff National Park in Alberta. It is important to note that exemplary tourism destinations such as Banff or Whistler in western Canada are unlikely to resemble the typical character or the economic base of small-town Canada. Excessively developed and well-frequented rural destinations are also prone to what Gates and Pryor (1993) refer to as *Aspenization*, where amenity-led growth in pristine rural environments invokes negative social and economic impacts on local communities. However, at the local level, there is evidence from cases across Canada of rural communities that do not base their economies solely on tourism which have incorporated recreation-based amenity development as a way to compensate for some of the losses in the resource-extraction sector (Flora, Fey, Bregendahl, & Friel, 2004).

The economic benefits associated with recreation-based amenity development are potentially accessible to local communities, which claim ownership over aspects of rural landscapes. The inevitable shift within rural economies in North America and Western Europe from the primary-resource-extraction sector (farming, manufacturing, and commercial fishing) to the tertiary service sector, which provides services to metropolitan centers, has been well documented (Bergstrom, Cordell, Ashley, & Watson, 1990; Bollman, 1999; Garrod et al., 2006; Hammer, 2008; Mann & Jeanneaux, 2009; Wilson et al., 2001). The emerging trend of economic development in rural areas is increasingly associated with location-specific recreation amenities; more importantly, the approach is shifting toward viewing rural resources as *countryside capital*, where investment in the

development of sustainable recreational amenities has the potential for becoming part of a broader development strategy (Garrod et al., 2006).

The availability of nature-based recreational amenities has broad implications for rural communities exceeding the direct and indirect impacts on the local economy. It has been linked to population growth (a major pursuit among rural municipalities in North America experiencing population decline) as well as business relocation to the periphery (Hammer, 2008). Garrod and others (2006) examined countryside capital investments among rural stakeholders in the United Kingdom and found that, in practice, investors in preserving and enriching the rural character, whether public, private, or voluntary, rarely consider the economic value of investing in countryside capital, which enhances rural recreational amenities, as the primary goal for investment. Rather, the common aim of rural capital investors was found to be the preservation and conservation of culture and nature. Investors were identified to form a wide array of countryside stakeholders, including national government agencies, local authorities, voluntary conservation groups, charitable organizations, and private landowners (Garrod et al., 2006). Subsequently, investment in countryside preservation offers indirect benefits to rural tourists, businesses, and communities who both enjoy the preservation of rural character and access financial gains. Typically, such investors are also key actors in local community development efforts.

Douglas (1994) suggests that sectoral, area-specific, and program-driven economic development initiatives address opportunities and issues central to (a) specific sectors that have the potential for generating economic value (i.e., tourism and recreational amenity development), (b) physical areas within local communities that may benefit the local economy through identifying opportunities and collective action to implement plans, and (c) government agency-driven programs that are designed to aid communities on a regional level in pursuing local economic development. It is important to note that although individually the three examples of local economic development are not designed to foster a holistic approach to the comanagement of countryside capital, when blended together they present a potential for comanagement.

One of the focuses of this paper is on the economic impacts of a fishery in southern Ontario on local communities. While internationally there is a growing interest in the potential that outdoor recreation activities can have on rural development (Bergstrom et al., 1990; Borch, 2004; English & Bergstrom, 1994; Garrod et al., 2006; Hammer, 2008; Upneja, Shafer, Seo, & Yoon, 2001), there is a gap in Canadian research on recognizing the potential value of recreation-based amenities to rural communities. Although both tourism and recreation activities may produce important economic impacts, it is tourism that has gained the attention of governments and the private sector as an important form of economic and regional development over outdoor recreation (Hall, 2003), which in recent research often falls under the general topic of tourism. Consequently, “the economic development potential of outdoor recreation has been almost completely ignored in the literature” (Bergstrom et al., 1990, p. 29).

This paper examines social and economic implications from 1996 to 2006 associated with creating the tailwater fishery on the Upper Grand River in Ontario. The following section provides an overview of the Grand River Tailwater Fishery and of fisheries management in Canada and the United States. Research methods used to gain information over the 10-year period are subsequently outlined. Results

are then presented on the angling experience and the economic impact of the fishery. The paper concludes by reflecting upon the lessons learned regarding social and economic implications of creating a so-called successful fishery.

2.0 Recreational Angling and the Grand River Tailwater Fishery

In Canada, rivers exhibiting outstanding natural, human, and recreational characteristics are recognized through the Canadian Heritage Rivers Program. The Grand River, located in southern Ontario, exemplifies these characteristics and has earned acclaim for its fishing. In 1987 the release of cold water from the Shand Dam led stakeholders to identify, through the provincial fisheries planning process, the potential to create a tailwater fishery. A wild strain of Ganaraska River brown trout, *Salmo trutta* (L.), was introduced and an ambitious stocking program was initiated in 1989. A total of 92,500 yearling brown trout were released from 1989 to 1993, and 15,000 to 20,000 have been released in each subsequent year. The stocking program was a resounding success, as the trout thrived and exhibited exceptional growth rates; yearling trout grew to 26–30 inches and 7 to 9 pounds by the mid-1990s (Bastian, 1995).

Those involved with the creation of the fishery were deeply concerned about overexploitation and sought to implement “special angling regulations.” Imhof (1989, p. 18) writes, “the use of special regulations should be part of a district fisheries management strategy where high quality resident salmonid streams occur and where optimum production is limited because of one or more biological or sociological conditions.” Based on this rationale, special angling regulations (known as *catch and release* and also called *no-kill zones*) were established in three sections of the tailwater fishery. Although literature on hooking mortality is far from conclusive (see Ferguson & Tufts, 1992; Taylor & White, 1992), additional conditions requiring artificial lures and single barb-less hooks were also added.

The ambitious stocking program and application of novel fishing regulations garnered much interest because the fishery offered an ideal situation for fly-fishing for those living within the most densely populated area of Ontario. News of the new fishery spread quickly within the fishing fraternity, as reports appeared in popular sporting magazines in Canada and the United States. In a feature article written for *Fly Fisherman* magazine, Bastian (1995, p. 32) observed, “the Grand River offers world-class brown-trout fishing comparable to the best in North America, and the river is still improving.”

The creation and development of the tailwater fishery on the Grand River is particularly interesting because it illuminates the need to incorporate human dimensions in fisheries management. It also presents an opportunity to explore the development of recreational fisheries as a potential strategy for community development beneficial to both social and economic aspects of community life. Ditton (1996) observed that *fisheries management* presents an interesting paradox from a social science perspective because it refers to a social system consisting of fish, harvesters, and associated infrastructure while such management practices largely remain the purview of biologists, aquatic ecologists, and fishery scientists who strongly focus on resource protection. Despite the persistence of this traditional view, the rationale for incorporating human dimensions research is growing in areas such as surrogate biology, angler profiles, evaluation, longitudinal understanding, and management plans (Ditton, 1996).

Recreational angling is immensely popular in North America. The United States Fish and Wildlife Service has been collecting information about recreational fisheries since 1955 and in its most recent report asserts, “fishing continues to be a favorite pastime in the United States” (U.S. Fish & Wildlife Service, 2007). Results from the most recent survey, conducted in 2001, revealed that 34.1 million U.S. residents over the age of 16 angled, a decline of 4% from 1991 (U.S. Fish & Wildlife Service, 2007). An effort to collect comparable information in Canada is undertaken by Fisheries and Oceans Canada (2000). Results of the Survey of Recreational Fishing in Canada for 2000 revealed that 3.6 million adults angled in Canada, a decline from 4.2 million in 1995.

Given this considerable interest in recreational angling, the need for fisheries management to concern itself with people has become a truism. Nevertheless, making gains for human dimensions in fisheries management has been a persistent challenge. Ditton (1996, p. 76) writes, “fisheries management as people management is still galling to many; that is not what attracted them to the fisheries management profession. Fisheries management was supposed to be about protecting the resource; resource users are seen as problematic.” Despite the persistence of this traditional view of fisheries management, human dimensions research is making some inroads.

Much effort has been directed at better understanding the anglers, their experience, and related impacts. While the collection of demographic information has become standard, research falling under the human dimensions umbrella has explored a diverse range of variables, including trip (situational) satisfaction (e.g., Graefe & Fedler, 1986; Haworth, 1983; Holland & Ditton, 1992; Salmi, Toivonen, & Mikkola, 2006; Sutton, 2003), values and behaviors (e.g., Gigliotti & Peyton, 1993; Lawrence, 2005), and motivations (e.g., Fedler & Ditton, 1994; Finn & Loomis, 2001; Schramm & Gerard, 2004). Incorporating angler attributes with a focus on the experience has also been pursued. Hudgins (1984), for example, investigated the circumstances surrounding fishing trips from which he developed a conceptual structure highlighting the means-based nature of the experience. Perhaps the best-known and well-developed line of research regarding the changing nature of the angling experience comes from the concept of recreation specialization. Bryan (1977) used the example of trout fishermen to create a typology of anglers based on participation, technique employed, and setting preferences. While his original work has been thoroughly critiqued (see Ditton, Loomis, & Choi, 1992), it has also fostered many additional works (e.g., McIntyre & Pigram, 1992; Salz & Loomis, 2005). In light of declining rates of participation in North America, an “understanding of why people do not fish or do not fish often is needed if participation in fishing is to be encouraged” (Aas, 1995, p. 631).

Some explanation regarding the decline in recreational fishing may be explained by the work of Schreyer and Knopf (1984). They argue that when change occurs within a recreational setting, existing users may be displaced by management decisions, which lead to dissatisfaction among certain users. Their exploration led to a typology of users and their motives. Those who may be more susceptible to changes occurring in a recreational place may thus choose to engage in a different activity or search for an alternative venue for the same activity in order to maintain their experience. Schreyer and Knopf (1984) also suggest that the most endangered recreationists are persons most attuned to the resource, its specificity, and the

relative uniqueness of a particular setting, suggesting that change in the setting may harm those who originally benefit the most from a particular resource.

Enthusiasm regarding resource economics and outdoor recreation is well established. The approach emerged appreciably in the 1960s with increases in participation rates, consideration of broader policy objectives by public agencies, and the possibility of linking human preference to environmental integrity (Hanley & Wright, 2003). In reflecting upon more than 40 years of research concerning economics and outdoor recreation, it is important to distinguish between recreation/environmental economists who are interested in the value of the resource itself and regional economists who seek to ascertain the impact that visitors have on a local area (Hanley & Wright, 2003). The former have received considerable interest and attention associated with recreational angling using a variety of methods such as consumer surplus models, travel cost methods, and contingent valuation. The most general of these are national estimates of value. In the United States US\$36 billion were spent on items exclusively attributable to recreational angling in 2001 (U.S. Fish & Wildlife Service, 2007). The equivalent type of expenditures in Canada by anglers was Can\$2.3 billion, with resident anglers averaging Can\$533.00 per angler (Fisheries and Oceans Canada, 2000). Research into angler spending is particularly useful to government decision makers, wildlife resource managers, and communities dependent on rural resources (Upneja et al., 2001). It is also likely to aid in the process of reconceptualizing rural resources as a countryside capital for recreation (Garrod et al., 2006).

3.0 Materials and Methods

This paper presents information on the Upper Grand River Tailwater Fishery that was gathered from 1996 to 2006 through four separate surveys. Recognition of the increasing number of anglers using the tailwater fishery since it was created in 1993 prompted the initiation of two surveys, which were conducted in 1996. The first survey was designed to collect baseline information about anglers and their experiences using the Upper Grand River. In the absence of existing information on angling activities in this area a systematic stratified random sampling procedure with 30% of the season being sampled was employed. The sample was further divided according to two distinct portions of the fishery: the portion comprising sections governed by special angling regulations and the portion comprising sections not governed by such regulations. Surveys were administered at randomly selected access points within each portion.

Smith (1996) conducted a second survey of anglers in 1996 to determine the regional economic impact of the fishery. (His survey instrument was structured into four parts—demographic information, angling activity, economic expenditures, and local services and attractions—and was administered to anglers at access points throughout the fishery. Because the population size was unknown, “it was determined that a sample of 300 anglers would lead to an acceptable maximum error of between 5[% and] 6% on any population size greater than 300” [Smith 1996, p. 15].) As identified in the literature portion of this paper, it is essential to differentiate between the value of a resource and an economic impact. Economic impact analysis measures the economic implications of an activity and involves an estimate of direct impacts and indirect impacts, typically achieved by modeling the regional economy (Armstrong & Taylor, 1985; Johnson & Moore, 1993; Smith, 1996). Economic impact analysis is challenging because of the use of

a multiplier to capture the total effects on a specific economic system (Propst & Gavrilis, 1987; Redston & Thomas, 1986). An alternative to multiplier estimation is followed here by employing the Municipal Recreation Economic Impact Model developed by FitzGibbon and Reid (1987). This model was specifically designed so that municipalities could determine the economic impact of recreation activities and is appropriate for the small scale of regional analysis (FitzGibbon & Reid, 1987; Smith, 1996). Each procedural step of the model is discussed in the following results section.

In 2000 an opportunity arose to have field researchers conduct intercept surveys with anglers. Due to the financial and temporal limitations, a stratified random sampling procedure involving all public access points was not possible. Despite this limitation, the prospect of collecting some information for making comparisons was viewed as constructive. Surveys occurred at various access points along the 26-km reach of river and were conducted for a total of 16 days.

The most recent survey of the Upper Grand River fishery was conducted in 2006. It was specifically designed to be consistent with the two surveys conducted in 1996 and encompassed questions about the anglers using the fishery, the fishery experience, and the economic impacts of the fishery. After the high water in the spring, 15% of the total season length (22 days) was randomly sampled. The Municipal Recreation Economic Impact Model (FitzGibbon & Reid, 1987) was again utilized to gauge the economic impact of the fishery.

4.0 Results

4.1 The Angling Experience

Given the absence of baseline information, in 1996 an effort was made to identify and systematically survey all known public access points. A total of 119 surveys were successfully completed in the 26-km reach of river. Although an equal amount of time was spent in each section of the tailwater fishery, 72% of the respondents ($n = 119$) were contacted in the sections of the river containing special angling regulations. The initial survey also clearly illustrated that the distribution of angling pressure in each of the two portions was not uniform: three access points accounted for 62.8% of the anglers contacted in the special regulation sections and three access points accounted for 72.7% of anglers fishing in other sections. Although the practice of sampling all access points in a stratified random manner did not continue in the 2000 and 2006 surveys, the pattern of use appeared to be consistent, with 74.2% ($n = 89$) and 64.5% ($n = 136$) of respondents being contacted in areas containing special angling regulations in 2000 and 2006, respectively. In an effort to conservatively estimate the number of anglers using the fishery, the average number of people contacted per hour at each site was multiplied by the length of the season using information collected by the systematic stratified random sampling in 1996. Assuming a 10-hour fishing day and 25% weather (high-water) factor, approximately 6,312 people angled the tailwater fishery in 1996.

The angling experience is determined by a number of factors. Central among these are success in catching fish of quality. In each of the surveys conducted, respondents were asked to report the amount of time they had fished in the special regulation (i.e., no-kill) zones and/or other (i.e., kill) zones in the tailwater fishery, the number of brown trout they had caught, and the number of brown trout they

had caught exceeding 18 inches in length. Tables 1 and 2 summarize the average amount of time reported, average number of brown trout caught (any size and large fish), and catch rates derived from this data. Overall, anglers appear to fish longer, catch more fish, and more big fish in the areas of the tailwater fishery designated with special angling regulations.

Table 1. *Effort and Success Among Anglers in the No-Kill Zones of the Upper Grand River Tailwater Fishery on Survey Dates*

Measurement	1996 (n = 86)	2000 (n = 70)	2006 (n = 77)
Average number of hours fished in no-kill zones	2.51	2.77 (1.57 SD)	2.69 (2.55 SD)
Average number of brown trout caught in no-kill zones	2.16	1.70 (2.06 SD)	2.83 (7.14 SD)
No-kill zone catch rate	0.86 fish/hr 70 min/fish	0.61 fish/hr 98 min/fish	1.05 fish/hr 57 min/fish
Average number of brown trout caught in no-kill zones that were greater than 18 inches in length	0.01 \bar{X}	0.01 \bar{X} (0.12 SD)	0.18 \bar{X} (0.87 SD)
No-kill zone catch rate of fish > 18 inches	0.005 fish/hr 200 hr/fish	0.005 fish/hr 200 hr/fish	0.07 fish/hr 14.29 hr/fish

Table 2. *Effort and Success Among Anglers in the Kill Zones of the Upper Grand River Tailwater Fishery on Survey Dates*

Measurement	1996 (n = 33)	2000 (n = 3)	2006 (n = 53)
Average number of hours fished in kill zones	1.96	1.33 (0.58 SD)	2.34 (1.50 SD)
Average number of brown trout caught in kill zones	0.75 \bar{X}	0 \bar{X} (0 SD)	1.13 \bar{X} (2.44 SD)
Kill-zone catch rate	0.39 fish/hr 153 min/fish	0	0.48 fish/hr 124 min/fish
Average number of brown trout caught in kill zones that were greater than 18 inches in length	0	0	0.2 \bar{X} (0.14 SD)
Kill-zone catch rate of fish > 18 inches	0	0	.008 fish/hr 125 hr/fish

Many other aspects also contribute to a high-quality angling experience, such as aesthetics, satisfaction, and other setting attributes (Graefe & Fedler, 1986). Since this particular fishery was created by resource management agencies and volunteers and was subject to novel special angling regulations in Ontario, a series of specific questions was posed to respondents concerning satisfaction and setting attributes (e.g., regulations and management). Table 3 summarizes

the responses to these questions across the three surveys. The results of this line of questioning clearly indicate that (a) most respondents only started to fish in this location after creation of the fishery in 1993; (b) special angling regulations are largely perceived by respondents to be positive; and (c) if respondents had a choice (i.e., they were not bound by regulations) they would overwhelmingly choose to release all brown trout caught. Despite some small variations over the three surveys, satisfaction of respondents with the fishery has remained very strong. Affirmation of the superior efforts by management agencies related to the fishery has been consistently above 95%.

Table 3. *Angler Satisfaction of Special Angling Regulations, Catch Preferences, and the Upper Grand River Fishery*

Question	Possible responses	% respondents in 1996	% respondents in 2000	% respondents in 2006
Did you fish in the Upper Grand River prior to establishment of the no-kill zones in 1993?	No	<i>n</i> (86) 77.9	<i>n</i> (64) 76.6	<i>n</i> (136) 82.4
	Yes	22.1	23.4	17.6
Do the special angling regulations on the Grand River affect you	in a positive way?	<i>n</i> (119) 79	<i>n</i> (87) 60.9	<i>n</i> (136) 69.12
	in a negative way?	1.7	0	3.68
	in no way?	19.3	39.1	27.21
If you had a choice, would your preference be to	keep your limit of 5 brown trout?	<i>n</i> (119) 1.7	<i>n</i> (86) 0	<i>n</i> (136) 2.94
	keep 2 brown trout that are suitable for eating?	17.6	20.9	26.47
	release all trout?	80.7	79.1	70.59
Do you believe that the no-kill zones on the Upper Grand River are economically beneficial?	No	<i>n</i> (117) 1.7	<i>n</i> (84) 0	<i>n</i> (122) 9
	Yes	98.3	100	91
How satisfied are you with the Grand River no-kill zone brown trout fishery?	Very satisfied	<i>n</i> (118) 73.7	<i>n</i> (87) 81.6	<i>n</i> (134) 58.21
	Satisfied	17.6	9.2	26.87
	Neutral	7.6	4.6	11.94
	Dissatisfied	0.8	0	2.24
	Very dissatisfied	0	4.6	0.75
Are the managing agencies and organizations doing a good job?	No	<i>n</i> (114) 2.6	<i>n</i> (79) 5	<i>n</i> (119) 5
	Yes	97.4	95	95

Information was also gathered about the characteristics of fishing trips to the Upper Grand River and the characteristics of the anglers (respondents). Despite establishment of the fishery in 1993, at least 15% of respondents surveyed indicated that it was their first time fishing the Upper Grand River. Most fishing trips to the Upper Grand River can be classified as single-day use, evidenced by the high frequency of fishing trips made per year, average length of the typical fishing trip, and relatively small proportion of respondents who used any form of accommodation. The greatest change in the nature of fishing trips appears to be in the anglers' place of residence, as the proportion from the United States has declined from 27.2% in 1996 to 6.6% in 2006. While several forces could influence this change, interviews with purveyors of tackle and river guides suggest that the numbers of American anglers sharply declined after 9/11 and have remained low due to SARS and the strength of the American dollar (K. Collins, personal communication, December 11, 2007). This change is reflected in other characteristics of fishing trips, such as the average distance traveled to the fishery, which declined from 279 km in 1996 to 98.34 km in 2006. Other implications include the frequency of resource use and trip duration. In 1996 residents of Ontario made as many as 100 trips per season while 12 trips was the maximum for Americans. The number of trips also influences trip type, as 90% of Ontario residents reported that their fishing trip was a day event, whereas 55% of respondents from the United States reported multiple-day experiences in 1996. Despite these changes, people angling in the Upper Grand River tended to be middle aged, male, and well educated.

Anglers were also asked for positive and negative comments about the fishery. Feedback regarding the fishery from the 1996 survey was largely positive and confirmed the quantitative findings presented above. Themes that emerged from the qualitative data focused on the quantity and quality of fish, the foresight and appropriateness of actions by resource management agencies, and other setting attributes. Illustrative of the positive feedback was the comment of a respondent who said, "I never saw such a place, [such] good scenery. Someone should be thanked." Critical themes also emerged in which respondents noted the need for increased enforcement of regulations, the presence of crowding/angling pressure, and the need to move toward self-sustaining populations of fish. Similar themes emerged from the qualitative analysis of comments in the 2006 survey. Anglers said the angling experience was satisfying and they appreciated the responsible agencies and organizations. For example, one angler remarked, "I love this area! [It is an] undiscovered treasure." A second critical theme to emerge from the data was aimed at constructively improving the fishery and/or protecting the resource. This theme included the need for more enforcement and the expansion of special angling regulations. Unlike the initial survey, crowding and angling pressure was only mentioned by two respondents in 2006. Other constructive suggestions that emerged from the qualitative analysis focused on habitat improvement and establishment of sustainable fish populations and enhancement of access points and signage.

4.2 Economic Impact

Determining expenditures per day by anglers to fish the Upper Grand River is a critical part of determining the total economic impact of the fishery. Anglers were asked to report expenditures made for their specific fishing trip to the Upper Grand

River in both the 1996 and 2006 surveys. Average daily expenditures were allocated among seven categories as well as disaggregated between single-day use and multiday use, as presented in Table 4. The average daily expenses for single-day use appear to have declined substantially for travel, food and beverage, and fishing equipment. This decline may largely be explainable by the changing distribution of anglers using the fishery and fewer anglers requiring major equipment purchases.

Table 4. *Average Daily Expenditures for Single-Day Use and Multiday Use (Can\$)*

	Type of expenditure						Total
	Travel	Food & beverage	Lodging	Fishing equip.	Guiding	Gifts, clothing, & other	
Single-day use 1996	24.30	31.66	0.00	51.57 ^c	0.0	5.67	114.40
Single-day use 2006	13.27	8.07	5.37	6.25 ^e	3.24	3.74	39.94
Multiday use 1996 ^a	11.03	27.06	25.48	15.37 ^d	2.25	4.08	86.07
Multiday use 2006 ^b	11.67	22.27	30.37	5.51 ^e	0.50	6.37	76.69

^aDerived from the 1996 economic impact survey ($n = 300$).

^bDerived from the 2006 angler and economic impact survey ($n = 136$).

^cThe average daily expenditure for fishing instruction for single-day use in 1996 was \$1.20.

^dThe average daily expenditure for fishing instruction for multiday use in 1996 was \$0.80.

^eThe average daily expenditure for fishing instruction for single-day and multiday use in 2006 was \$0.0.

Because information on the number of anglers who visited the upper portion of the Grand River was not available in 1996, the total number of person fishing days was estimated from the number of cars parked daily at access points during weekdays and weekend days in the fishing season and the number of people in each vehicle. Interviewing professional guides, purveyors of tackle, and resource managers resulted in estimates of 35 vehicles per weekday and 70 vehicles per weekend day. Combining this information with an estimated 1.5 people per vehicle, a total of 10,395 total person fishing days was arrived at for the 1996 season (Smith, 1996). Estimating the total number of person fishing days is distinct from estimating the total number of anglers fishing (as done above), as the former considers the number of days in a fishing trip for each angler. In 2006 it was estimated that 47 vehicles per weekday and 84 vehicles per weekend day were present, with an average of 1.5 people per vehicle. Therefore, there were approximately 13,299 total person fishing days in 2006. The average daily

expenditures were then combined with the total person fishing days to arrive at the total direct economic impact, as detailed in Table 3.

An estimate of the indirect impacts was made using the Municipal Recreation Economic Impact Model (FitzGibbon & Reid, 1987). The first step involves arriving at the local economic multiplier. This is achieved by multiplying the total number of households by the average household income and multiplying the product by the constant value of 1.465 (Smith, 1996). Using 1990 Statistics Canada Census data the local economic product was \$302,583,187.60 (Smith, 1996). The second step involves determining the population potential of the region. Fergus and Elora are considered one community center and the population potential was 11,201 in 1996. The local economic multiplier is arrived at by dividing the region’s population by the population potential to yield a “population potential factor” of 1. Using the above calculations, a local economic multiplier is identified from tables used with the Municipal Recreation Economic Impact Model (FitzGibbon & Reid, 1987). A multiplier of 1.22 was appropriate in 1996 (Smith, 1996). Employing the same method in 2006 (using 2001 Statistics Canada Census data) revealed a local economic product of \$866,304,101.97, a population potential of 13,813, and consequently a multiplier of 1.28. Applying these multipliers to the direct impacts yields the indirect impacts of the Upper Grand River fishery. Recognizing that some days of the angling season are not fishable due to high water and that weather influences participation, the economic impact was adjusted based on a weather factor of 25%. Table 5 provides the total economic impact of the fishery for each of the seasons studied. The tailwater fishery contributed a total of \$1,052,538.48 to the regional economies of Fergus and Elora in 1996 (Smith, 1996) and \$603,925.24 in 2006. Reasons for this decline may include the increase in similar fisheries opportunities during the previous 5 years, the decrease in the number of Americans using the fishery, and the change in spending habits, specifically the reduction in purchasing fishing equipment.

Table 5. *Total Economic Impact of the Grand River Brown Trout Fishery (Seasonal) (Can\$)**

	1996			2006		
	Direct	Indirect	Total	Direct	Indirect	Total
Travel	175,792.65	38,674.39	214,467.04	130,229.21	36,464.18	166,693.39
Food & beverage	242,095.39	53,260.99	295,356.38	109,935.65	30,781.98	140,717.63
Lodging	26,221.60	5,768.75	31,990.35	84,441.57	23,643.64	108,085.21
Fishing equipment	364,799.01	8,055.78	445,054.79	76,703.74	21,405.04	98,108.78
Fishing instruction	8,943.86	1,967.65	10,911.51	1,208.25	338.31	1,546.56
Guiding	2,315.49	509.40	2,824.89	31,127.54	8,715.71	39,843.25
Gifts, clothing, & other	42,568.46	9,365.06	51,933.52	38,170.63	10,687.78	48,858.41
Total	862,736.46	189,802	1,052,538.48	471,816.59	132,108.65	603,925.24

*Presuming a 25% weather factor.

5.0 Discussion and Conclusion

This research has taken a social science perspective to examine the social and economic benefits of creating the Upper Grand River brown trout fishery. It reports on four studies undertaken during the past decade and highlights social and economic implications from the creation of a recreational fishery and novel application of special angling regulations. This closing section reflects upon some of the salient lessons learned.

Creation of the Upper Grand River Tailwater Fishery was initiated because suitable biophysical conditions were recognized by fishery managers and local volunteers. In the absence of similar experiments in the Province of Ontario the potential ramifications were at the time largely unknown. By traditional fisheries management criteria of success, the tailwater fishery permits the growth and development of fish and provides considerable angling opportunities. Thousands of anglers have been attracted to the 26-km reach of river, most of whom did not fish it prior to 1993. These anglers report frequently catching brown trout.

The development of a recreation-based amenity within this stretch of the Grand River illuminates socioeconomic benefits for those who fish the fishery and those who volunteer to manage the river stretch. Such development has also proved beneficial for maintaining the livelihoods of local communities in the region. Understanding anglers using the resource (or who may use the resource) and the experience they seek is important. Success of the fishery can be explained to a large extent because the fisheries management measures in place are consistent with the desires of the anglers surveyed. Respondents consistently indicated that implementation of special angling regulations had a positive effect on them and if given a choice they would release all fish. The consistently positive level of satisfaction with the fishery and high regard for management agencies should therefore not be surprising, as the special angling regulations are congruent with the experience sought by anglers. Results reported in this paper also indicate that high levels of satisfaction are possible without keeping fish, thereby confirming the diversity of attributes that contribute to the angling experience (Graefe & Fedler, 1986). Although the users surveyed were largely satisfied with the fishing experience, it is conceivable that new special regulations coupled with an increased presence of anglers at the designated stretch of the Grand River are factors that may have displaced some anglers and other river users who used this setting prior to 1993, when the fishery was created. The results of this study provide limited insight into this issue, as the majority of respondents did not fish in the reach of river prior to 1993. Schreyer and Knopf (1984) refer to this possibility as *social succession* in a recreation setting.

Fishing in the Upper Grand River fishery seems to have contributed to the personal development and self-actualization of the anglers involved. For the angler, fishing is meaningful as a personal pastime and as a way to raise awareness of the effectiveness of environmental management practices in the fishery. From the community development perspective, it is also important to consider not only the anglers who travel from out of town but also local community members who have access to the fishery for serious leisure. The high rates of participation and satisfaction with the tailwater fishery raise the possibility of implementing similar approaches elsewhere. They also raise a challenge for managers, as this research documents that such regulations may concentrate fishing effort. Gaining such information is critical to making strategic investments in amenities (e.g., parking,

garbage disposal, and washroom facilities) that enhance visitors' experiences and prevent environmental degradation. Managers should also consider the potential implications for original resource users before forming strategies that may change the recreational setting.

From a serious leisure perspective, development, management, and operation of the Upper Grand River Tailwater Fishery have directly affected local community development. A local volunteer group formed to aid in the creation and operation of the Upper Grand River Tailwater Fishery, and through the survey years the group played a key role in managing conflict among landowners who reside on the banks of the fishery and initially had reservations regarding the increase in angler participation in the river stretch. The operation of this group was perhaps the key component in the community development process allowing for other social and economic benefits to occur. Stebbins (2000) points out that even though volunteerism has a number of powerful personal rewards associated with personal achievement and growth, it is also the central force in the self-directed community development process with significant contributions to community welfare. Volunteers provide a great variety of programs and services without which community development, especially in the rural context, would be limited to individual actions for self-benefit or processes relying on public funding.

Although the fisheries managers did not set out with the goal of fostering regional economic development, as is often the case in efforts to preserve and enhance rural character, the results of this research certainly underscore this potential. This work contributes to the identified need for research in this area by Bergstrom et al. (1990). The estimated angler expenditure in the region exhibits the value that outdoor recreation-based amenities add to local economies; this demonstrates the potential in other rural areas to pursue outdoor recreation and fisheries development as an aspect of community economic development. It is also important to note that local populations are the primary users of countryside capital. The results of the four surveys confirmed earlier observations that the majority of visitors to the periphery are domestic populations often residing in relatively close proximity to recreational amenities available in the countryside (Gartner, 2004, 2005). Furthermore, the growth of outdoor recreation-based amenity development in rural settings provides an alternative to traditional economic growth models associated with capital formation and technological innovation. In contrast, rural-based recreation development focuses on preserving or restoring the natural condition. Hammer (2008) examined recreation-led rural development in Norway and called this shift toward ancestral pastime *innovative traditionalism*. In the Grand River fishery case, the community, in partnership with public agencies, was able to attract a substantial level of expenditure associated with angling only with minimal enhancements of existing infrastructure (parking and washroom facilities) and enrichment of environmental and angling practices in the river stretch. Major investments in infrastructure were not needed. This history directly corresponds with the CED principle of economic development that does not offset the ecological status of community space.

While the Municipal Recreation Economic Impact Model was utilized to determine an appropriate economic multiplier and thereby determine the total economic impact of the tailwater fishery, there are numerous other contributions that this model does not capture. These include the establishment of tackle shops, attraction of services such as guiding to the area, and general awareness of the community.

Individuals taking up residence in the region due to the fishery, as well as hosting major fishery-related events (e.g., Canadian Fly Fishing Championships) are additional contributions (S. May, personal communication, December 13, 2007).

Collecting social and economic information about recreation fisheries is a valuable initial step in fostering investigations of human dimensions. Experience from a decade of research on the tailwater fishery in the Grand River reinforces the need to further expand the range of considerations. While economic impacts are often assumed to be positive to the local economy, other noneconomic costs need to be considered. In the case of the tailwater fishery, landowners said they thought they were suddenly inundated by anglers in their backyard and expressed concerns about issues of trespassing and vandalism, liability, and general disturbances to rural life. In addition, original river users may have been displaced by social succession brought about by new special regulations in the fishery. These experiences confirm that outdoor recreation cannot be considered in isolation from the environment, broadly defined, in which it occurs (Hall & Page, 2002). It is also consistent with studies investigating the effects of tourism on residents (e.g., McGehee & Andereck, 2004; Tosun, 2002), as well as investigations of conflict in recreational settings (e.g., Hammit & Schneider, 2000). In this particular case, a local organization (Friends of the Grand River) was formed in response to many of these issues and has worked diligently to establish access points, distribute information, and work with management agencies for the betterment of the resource.

Collecting a diversity of information about the angling experience and economic impact of a fishery is particularly valuable for the evaluation of fisheries management from a holistic perspective. Consideration of other influences may include (a) the consistency between the novel application of regulations and angler preferences, (b) the ability to strategically respond to issues that arise, and (c) the engagement and willingness to work collaboratively with landowners and the local community. While traditional notions of success in recreational fisheries remain important, policy makers, managers, and researchers are encouraged to broadly consider the myriad influences fisheries may have.

6.0 Acknowledgements

The authors would like to thank Rhonda Koster for organizing this special issue and the anonymous reviewer for providing insightful comments on an earlier draft of this paper. Our appreciation is also extended to the numerous individuals and organizations associated with the fishery who generously gave their time and assistance over the course of this research, as well as the research assistants who helped with the data collection. Friends of the Grand River, Izaak Walton Fly Fishing Club, Trout Unlimited Canada, and the University of Guelph, School of Rural Planning and Development, generously gave funding to support this research.

7.0 References

- Aas, Ø. (1995). Constraints on sportfishing and effect of management actions to increase participation rates in fishing. *North American Journal of Fisheries Management*, 15, 631–638.
- Artz, G. M., & Orazem, P. F. (2006). Reexamining rural decline: How changing rural classifications affect perceived growth. *The Review of Regional Studies*, 36(2), 163–191.
- Athiyaman, A., & Walzer, N. (2008). Strategies to enhance and maintain quality of life: The case of nonmetropolitan Illinois. *Journal of Rural and Community Development*, 3, 41–59.
- Armstrong, H., & Taylor, J. (1985). *Regional economics & policy*, London: Philip Allan.
- Bastian, D. (1995). Ontario's Grand River. *Fly Fisherman*, 26, 33–35; 73–77.
- Bergstrom, J. C., Cordell, H. K., Ashley, G. A., & Watson, A. E. (1990). Economic impacts of recreational spending on rural areas: A case study. *Economic Development Quarterly*, 4, 29–39.
- Bjørkhaug, H., & Richards, C. A. (2008). Multifunctional agriculture in policy and practice? A comparative analysis of Norway and Australia. *Journal of Rural Studies*, 24, 98–111.
- Bollman, R. D. (1999). Factors associated with local economic growth (Statistics Canada Report). *Rural and small town Canada analysis bulletin*, 1(6). Retrieved June, 07, 2009, from <http://www.statcan.gc.ca/pub/21-006-x/21-006-x1998006-eng.pdf>
- Borch, T. (2004). Sustainable management of marine fishing tourism: Some lessons from Norway. *Tourism in Marine Environments*, 1(1), 49–57.
- Brown, F., & Hall, D. (2000). Introduction: The paradox of peripherality. In F. Brown & D. Hall (Eds.), *Tourism in peripheral areas*. Clevedon, UK: Channel View Publications.
- Bryan, H. (1977). Leisure value systems and recreational specialization: The case of the trout fisherman. *Journal of Leisure Research*, 9, 174–187.
- Ditton, B. R. (1996). Human dimensions in fisheries. In A. Ewert (Ed.), *Natural resource management: The human dimension*, Boulder, CO: Westview Press.
- Ditton, B. R., Loomis, D. K., & Choi, S. (1992). Recreation specialization: Re-conceptualization from a social world's perspective. *Journal of Leisure Research*, 24, 33–51.
- Douglas, D. J. A. (1987). Community development: Scope, issues, potentials. *Journal of Community Development*, March, 16–23.
- Douglas, D. J. A. (1994) *Community economic development in Canada* (1st vol.), Toronto, ON, Canada: McGraw-Hill Ryerson.
- English, D. B., & Bergstrom, J. C. (1994). The conceptual links between recreation site development and regional economic impacts. *Journal of Regional Science*, 34, 599–611.

- Ferguson, R. A., & Tufts, B. L. (1992). Physiological effects of brief air exposure in exhaustively exercised Rainbow trout *Oncorhynchus mykiss*: Implications for “catch and release” fisheries. *Canadian Journal of Fish and Aquatic Science*, 49, 1157–1162.
- Fedler, A. J., & Ditton, R. B. (1994). Understanding angler motivations in fisheries management. *Fisheries*, 19, 6–13.
- Finn, K. L., & Loomis, D. K. (2001). The importance of catch motives to recreational anglers: The effects of catch satiation and deprivation. *Human Dimensions of Wildlife*, 6, 173–187.
- Fisheries and Oceans Canada. (2000). 2000 Survey of recreational fishing in Canada. Ottawa: Department of Fisheries and Oceans Canada. Retrieved January 10, 2007, from http://www.dfo-mpo.gc.ca/communic/statistics/recreational/canada/2000/Summary/Direct_e.htm
- FitzGibbon, J., & Reid, D. (1987). An economic approach to the evaluation of municipal recreation expenditures. *Recreation Research Review*, 13, 22–27.
- Fleischer, A., & Pizam, A. (1997). Rural tourism in Israel. *Tourism Management*, 18, 367–372.
- Flora, C., Fey, S., Bregendahl, C., & Friel, J. (2004). *Rural community and economic development case study review*. East Lansing, MI: North Central Regional Center for Rural Development. Retrieved October 18, 2008, from <http://www.ncrcrd.iastate.edu/projects/benedum/casestudysummaries.pdf>
- Galston, W. A., & Baehler, K. J. (1995). *Rural development in the United States: Connecting theory, practice and possibilities*. Washington, DC: Island Press.
- Gan, C. (1998). Leisure and recreation: An economic perspective. In H. C. Perkins & G. Cushman (Eds.), *Time out? Leisure, recreation and tourism in New Zealand and Australia* (pp. 327–342). Auckland, NZ: Addison Wesley Longman.
- Garrod, B., Wornell, R., & Youell, R. (2006). Re-conceptualizing rural resources as countryside capital: The case of rural tourism. *Journal of Rural Studies*, 22, 117–128.
- Gartner, W. C. (2004). Rural tourism development in the USA. *International Journal of Tourism Research*, 6, 151–164.
- Gartner, W. C. (2005). A perspective on rural tourism development. *The Journal of Regional Analysis and Policy*, 35(1), 33–42.
- Gates, D., & Pryor, T. (1993, December 27). Chic comes to Crested Butte. *Newsweek*, 122(26), 45.
- Gigliotti, L. M., & Peyton, R. B. (1993). Values and behaviors of trout anglers, and their attitudes towards fishery management, relative to membership in fishing organizations: A Michigan case study. *North American Journal of Fisheries Management*, 13, 492–501.
- Graefe, A. R., & Fedler, A. J. (1986). Situational and subjective determinants of satisfaction in marine recreational fishing. *Leisure Sciences*, 8, 275, 293.
- Graves, P. E., Weiler, W., & Tynon, E. E. (2009). The economics of ghost towns. *Journal of Regional Analysis and Policy*, 39(2), 131–140.

- Hall, C. M. (2003). *Introduction to tourism: Dimensions and issues*. Frenchs Forest, New South Wales, AU: Hospitality Press.
- Hall, C. M., & Page, S. J. (2002). *The geography of tourism and recreation: Environment space and place*. London: Routledge.
- Hammer, R. B. (2008). Recreation and rural development in Norway: Nature versus culture. *Scandinavian Journal of Hospitality and Tourism*, 8(2), 176–186.
- Hammitt, W. E., & Schneider, I. E. (2000). Recreation conflict management. In W. C. Gartner & D. W. Lime (Eds.), *Trends in outdoor recreation, leisure and tourism* (pp. 347–356). New York: CABI Publishing.
- Hanley, N., & Wright, R. E. (2003). Valuing recreational resources using choice experiments: Mountaineering in Scotland. In N. Hanley, W. D. Shaw, & R. E. Wright (Eds.), *The new economics of outdoor recreation*. Cheltenham, UK: Edward Elgar Publishing Limited.
- Haughton, G. (1999). Community economic development: Challenges of theory, method and practice. In G. Haughton (Ed.), *Community economic development*. London: Stationery Office.
- Haworth, J. T. (1983). Satisfaction statements and the study of angling in the United Kingdom. *Leisure Sciences*, 5, 181–196.
- Holland, S. M., & Ditton, R. B. (1992). Fishing trip satisfaction: A typology of anglers. *North American Journal of Fisheries Management*, 12, 28–33.
- Hudgins, M. D. (1984). Structure of the angling experience. *Transactions of the American Fisheries Society*, 113, 750–759.
- Imhof, J. G. (1989). *Special angling regulations: Usefulness and their application for wild salmonid management in Ontario rivers* (Discussion Paper). Maple, ON, Canada: Ontario Ministry of Natural Resources.
- Johnson, R. L., & Moore, E. (1993). Tourism impact estimation. *Annals of Tourism Research*, 20, 279–288.
- Lawrence, K. S. (2005). Assessing the value of recreational sea angling in South West England. *Fisheries Management and Ecology*, 12, 369–375.
- Lück, M., & Altobelli, R. D. (2009). Coastal tourism as motor for community development: The story of Kaikoura, New Zealand. In R. K. Dowling & C. Pforr (Eds.), *Coastal Tourism Development* (pp. 292–306). Elmsford, NY: Cognizant Communication Corp.
- Mann, C., & Jeanneaux, P. (2009). Two approaches for understanding land-use conflict to improve rural planning and management. *Journal of Rural and Community Development*, 4(1), 118–141.
- Markey, S., Halseth, G., & Manson, G. (2008). Challenging the inevitability of rural decline: Advancing the policy of place in northern British Columbia. *Journal of Rural Studies*, 24, 409–421.
- Markey, S., Pierce, J. T., Vodden, K., & Roseland, M. (2005). *Second growth: Community economic development in rural British Columbia*. Vancouver, BC, Canada: UBC Press.

- McGehee, N. G., & Andereck, K. L. (2004). Factors influencing residents' support of tourism. *Journal of Travel Research*, 43, 131–140.
- McIlveen, K., & Bradshaw, B. (2009). Community forestry in British Columbia, Canada: The role of local community support and participation. *Local Environment*, 14(2), 193–205.
- McIntyre, N., & Pigram, J. J. (1992). Recreation specialization reexamined: The case of vehicle-based campers. *Leisure Sciences*, 14, 3–15.
- Pedlar, A. (1996). Community development: What does it mean for recreation and leisure? *Journal of Applied Recreation Research*, 21, 5–23.
- Propst, D. B., & Gavrilis, D. G. (1987). Role of economic impact assessment procedures in recreational fisheries management. *North American Journal of Fisheries Management*, 11(6), 450–460.
- Redston, C., & Thomas, D. (1986). *An economic impact study of the proposed Pwllheli Marina scheme*. Aberystwyth, UK: The University College of Wales.
- Reeder, R. J., & Brown, D. M. (2005). *Recreation, tourism, and rural well-being* (A Report from the Economic Research Service ERR-7). Washington, DC: Economic Research Service, United States Department of Agriculture.
- Salmi, P., Toivonen, A. L., & Mikkola, J. (2006). Impact of summer cottage residence on recreational fishing participation in Finland. *Fisheries Management and Ecology*, 13, 275–283.
- Sanders, I. T. (1970). The concept of community development. In L. J. Cary (Ed.), *Community development as a process*. Columbia, MO: University of Missouri Press.
- Salz, R. J., & Loomis, D. K. (2005). Recreation specialization and anglers' attitudes towards restricted fishing areas. *Human Dimensions of Wildlife*, 10, 187–199.
- Schramm, H. L., & Gerard, P. D. (2004). Temporal changes in fishing motivation among fishing club anglers in the United States. *Fisheries Management and Ecology*, 11, 313–321.
- Schreyer, R., & Knopf, R. C. (1984). The dynamics of change in outdoor recreation environments: Some equity issues. *Journal of Park and Recreation Administration*, 2(1), 9–19.
- Smith, A. (1996). *Economic impact analysis of sport fishing on the Upper Grand River: A methodology*. Unpublished master's thesis, School of Rural Planning and Development, University of Guelph, Guelph, Ontario, Canada.
- Stebbins, R. A. (2000). Leisure education, serious leisure and community development. In A. Sivan & H. Ruskin (Eds.), *Leisure education, community development, and populations with special needs*. Wallingford, Oxon, England: CAB International.
- Sutton, S. G. (2003). Personal and situational determinants of catch-and-release choice of freshwater anglers. *Human Dimensions of Wildlife*, 8, 109–126.

- Taylor, M. J., & White, K. R. (1992). A meta-analysis of hooking mortality of nonanadromous trout. *North American Journal of Fisheries Management*, 12, 760–767.
- Tosun, C. (2002). Host perceptions of impacts: A comparative tourism study. *Annals of Tourism Research*, 29(1), 231–253.
- Upneja, A., Shafer, E. L., Seo, W., & Yoon, J. (2001). Economic benefits of sport fishing and angler wildlife watching in Pennsylvania. *Journal of Travel Research*, 40, 68–78.
- U.S. Fish and Wildlife Service. (2007). National survey of fishing, hunting, and wildlife-associated recreation. Retrieved January 10, 2007, from <http://www.federalaid.fws.gov/surveys/surveys.html>
- Waldenström, C., & Westholm, E. (2009). The natural resource turn: Challenges for rural research and policy. *Journal of Rural and Community Development*, 4(1), 102–117.
- Wales Tourist Board. (1994). *Tourism 2000: A strategy for Wales*. Wales: Research and Corporate Planning Department. Cardiff, Wales: Tourist Board, The Stationery Office.
- Wilson, S., Fesenmaier, D. R., Fesenmaier, J., & Van Es, J. C. (2001). Factors for success in rural tourism development. *Journal of Travel Research*, 40, 132–138.