

# AN INTEGRATED AND STRATEGIC APPROACH TO NATURAL RESOURCE MANAGEMENT FOR TOURISM: MEETING THE CHALLENGES OF HOLISTIC SUSTAINABILITY

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## Abstract

This paper discusses the holistic sustainability of a natural resource use for tourism; namely, the River Moy salmon fishery in Ireland. Concepts from a model of integrated rural tourism are applied to assess the management system followed. Sustainability through an integrated approach should be pursued in a strategic way, following PORTER (1996), with: (i) clearly defined objectives, supported by (ii) appropriate actions, and (iii) reinforced by networking with stakeholders, locally and extra-locally. The results illustrate that a model of integrated management within a strategic framework permits key strengths and weaknesses in a system of natural resource management for tourism to be identified.

**Key words:** holistic sustainability; salmon fishery; strategic evaluation.

## Résumé

Cet article traite de la durabilité holistique de l'utilisation d'une ressource naturelle pour le tourisme, en utilisant l'exemple de la pêche de saumon de la rivière Moy en Irlande. Les concepts d'un modèle de tourisme rural intégré sont appliqués pour évaluer le système de gestion qui est suivi. La durabilité à travers une approche intégrée devrait être poursuivie de manière stratégique, à la suite de PORTER (1996), avec: (i) des objectifs clairement définis, soutenus par (ii) des actions appropriées, et (iii) renforcés par un travail en réseau qui maximise les liens avec les parties prenantes locales et extra-locales. Les résultats montrent qu'un modèle de gestion intégrée dans un cadre stratégique permet d'identifier les principales forces et faiblesses d'un système de gestion des ressources naturelles pour le tourisme

**Mots clés:** durabilité holistique; la pêche au saumon; évaluation stratégique.

## 1. Introduction

Natural resources may be viewed as forms of 'countryside capital' that, when properly managed, can contribute to environmental, economic and socio-cultural sustainability (Garrod et al., 2006; Saarinen, 2006). Identifying appropriate management approaches is challenging because many

stakeholders are often involved. Particular attention is given to the use of networks and networking (Rydin & Falleth, 2006; Prell et al., 2009). This paper is designed to analyse a natural resource of high ecological value that is intrinsically dependent on sustainable management and that is used for tourism purposes. This resource is the River Moy in western Ireland, a highly productive salmon fishery (Figure 1). The analysis draws on concepts from integrated rural tourism (IRT) which is defined as “tourism that is explicitly linked to the economic, social, cultural, natural and human resources of the localities in which it takes place” (Saxena et al., 2007, 351). Saxena et al. (2007) identify IRT as having seven features: (i) promotion of sustainability of the natural resource base, economy, society and culture; (ii) empowerment of local people (e.g., through income, employment and providing some influence over tourism development); (iii) incorporation of local ownership and involvement (which includes State ownership here, as explained), which are recognised as being more conducive to the protection of resources and the retention of expenditure locally than is international ownership, where profits may flow overseas; (iv) being of a scale appropriate to location (e.g., avoidance of large-scale developments in small villages and towns); (v) being complementary to instead of conflicting with other local activities and *vice-versa* (e.g., a lack of conflict with agriculture); (vi) involve networking with appropriate stakeholders locally and extra-locally (e.g., nationally and, possibly, internationally); and (vii) the networking should be embedded in the local resource base and society but also appropriately dis-embedded (e.g., a capacity to attract tourists nationally and internationally).

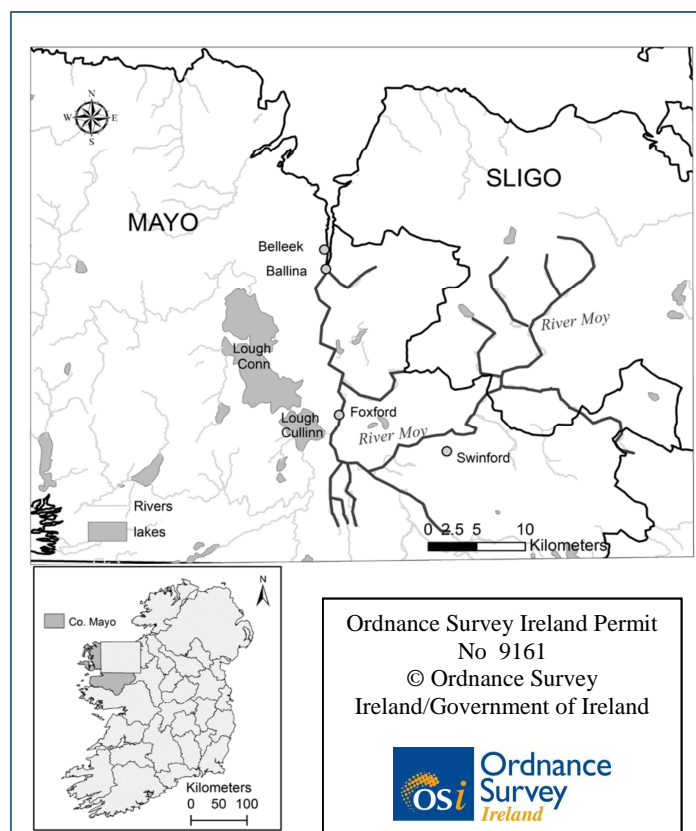


Figure 1- The River Moy catchment area  
Source: Ordnance Survey of Ireland

The seven features of IRT are interrelated and together should contribute to attaining holistic sustainability of the resources on which tourism depends. Ideally, sustainability through an integrated approach should be pursued in a strategic way, where the activities undertaken reinforce each other (Cawley & Gillmor, 2008a, 2008b). This approach draws on Porter's (1996) work on strategy in the firm which he proposes as reinforcing the adding of value along the value chain so as to maximise the financial returns for the owner. Porter (1996) identifies a strategic approach as having three orders: (i) clearly defined objectives which form the strategy; (ii) activities that reinforce the strategy; and (iii) features that optimise the activities. Cawley & Gillmor (2008a, 2008b) have adapted Porter's (1996) concepts relating to strategy to the context of IRT, in a qualitative way. In this adaptation, value has meaning in terms of contributing to environment, society and culture as well as economy. First, there should be clearly defined objectives to promote holistic sustainability and empower local people. This may be conceptualised, in the case of the River Moy, as being the conservation of salmon stocks as an ecological resource, the maintenance of a productive fishery as a recreational resource and contributing to 'empowerment' of the local economy, society and culture (Table 1). Second, actions should be taken to support the attainment of sustainability. These involve the types of ownership, complementarity/lack of conflict between maintaining salmon stocks and other resource uses within the river basin, and appropriate scales of use. Third, networking by the fisheries management with individuals and organisations should be embedded in local (and regional) structures and appropriately dis-embedded to national and international levels in order to maximise the benefits that accrue locally (Jenkins, 2000; Cawley et al., 2007). This framework was applied to analyse the management of the River Moy as a resource for angling and identify the extent to which value was being added or lost, as understood qualitatively. The sources and methods are now introduced, the river is discussed, and the findings and conclusion follow.

Table 1- A strategic approach to integrated resource use

<b>Porter (1996)</b>	<b>IRT (Cawley and Gillmor, 2008a, 2008b)</b>
First order- strategic objectives	Holistic sustainability and local empowerment
Second order- supportive actions	Ownership, complementarity, appropriate scale
Third order- maximisation of benefits	Appropriate embedded and dis-embedded networking

Source: "Integrated rural tourism: concepts and practice" (Cawley & Gillmor, 2008a, 2008b).

## 2. Sources and methods

The research is based on two extended interviews and comments on drafts of the findings between June 2016 and February 2017 with the River Moy management staff. The fishery staff, in the town of Ballina, County Mayo (Figure 1), are employed by Inland Fisheries Ireland (IFI) which is responsible for inland fisheries in the Irish State and operates, currently, under the aegis of the Department of Communications, Climate Action and Environment (DCCAE) (Cawley, 2017). This paper relates to the River Moy but the staff have responsibility also for other river systems in the Ballina-Western Region Fisheries Basin (B-WRFB). Discussion took place also with a salmon

research scientist and a representative of the Office of Public Works relating, in the latter instance, to the improvement of conditions for the hatching of eggs and the development of salmon fry in river beds. This discussion informs the research. The interviews and communications with the River Moy management staff, which are cited here, were designed to: identify the history of salmon fishing on the river; the management systems followed, including the strategic objectives; the methods used to attain the objectives, including the networking that was undertaken with all pertinent state and private individuals and organisations locally, regionally, nationally and internationally; the extent to which the objectives were attained, any problems that arose and the measures taken to offset those problems. Critical analysis was also conducted on more than one hundred documents. The documents related to: Irish salmon and sea trout fisheries policy; research on wild salmon; methods used to protect the stocks of fish and how threats to those stocks were offset; changes in annual catches of wild salmon on Irish rivers since the 1990s; sources and incidences of water pollution of salmon fisheries; methods employed to protect the quality of the water and the agencies involved; and reports relating to expenditure by national and international salmon anglers. The web sites analysed were: the IFI web site and that of the Moy Fishery; the web sites of four private fisheries on the River Moy; three angling club fisheries; and those of three qualified fishery guides. Observation of salmon anglers, permit sellers and tackle shops was conducted also in the towns of Ballina, Foxford and Swinford, the main salmon angling locations on the River Moy. The analysis involved critical qualitative assessment of the various sources and, as pertinent, evaluation of the evidence against the principles associated with a strategic approach to the promotion of holistic sustainability. Strengths and weaknesses are identified.

### **3. Salmon angling and the River Moy**

The lifecycle of the salmon is dependent on the ecology of the river where it is born, matures and returns to spawn after, usually, one or two years spent at sea. It is also dependent on climatic and environmental changes that affect its feeding grounds at sea, trawling for other fish and the potential for contracting parasites from farmed salmon in river estuaries. Following spawning, many salmon die because of the loss of energy involved and because they do not feed in fresh water. Some succeed in returning to the sea and come back to spawn again.

The River Moy is Ireland's most productive salmon rod angling destination and accounted for 20% of all catches by rod and line in 2014 (IFI, 2015a). It flows through Ballina town and drains a catchment area of just over 2000 km<sup>2</sup> in counties Mayo and Sligo (Figure 1). The fishery in Ballina and its environs comprises approximately 2.5 km of tidal water and approximately 1.8 km of single bank freshwater. It consists of seven separate 'beats' (defined areas of the river channel). Anglers are usually required to book in advance in order to fish on six of these beats. A seventh beat, the Point, is available to local members of the Ballina Salmon Anglers Association for a seasonal permit of €25. An eight beat further downstream, the Community Beat, is reserved for local members of the Ballina Traditional Angling Club, which leases it from the IFI at a nominal fee (€5 annually). There are seventeen fisheries between Ballina and Foxford, owned and managed by IFI, private individuals and angling associations and clubs (referred to as clubs from here on).

When the Irish State was established, in 1922, the fishing rights on many rivers were privately owned. During the twentieth century, some of these rights were purchased by the State. In 1987, the fishing rights on the River Moy in Ballina were purchased from a private company which had extracted salmon commercially with traps and nets in the past (Cooke, 2011). All trapping and netting ceased in 1998, because of declining numbers of salmon. Since then, the River Moy has been managed exclusively as a recreational fishery and the river in Ballina and several other areas along its length are now under the management of IFI. The Moy attracts many thousands of anglers of up to 30 different nationalities annually. Some 5087 angling licences were sold in the B-WRBD, in which the Moy is the main salmon river, in 2014 (IFI, 2015a, Table 18). The value accruing is an important contribution to the economy of Ballina and the surrounding region, as discussed below.

#### **4. An integrated approach to resource use: the River Moy**

Porter's (1996) concepts of strategy, reinforcing actions and appropriate maximisation of benefits are now discussed in the context of the River Moy, with reference to the principles of integrated management.

##### **4.1. Strategy: promoting the holistic sustainability of salmon angling**

Game angling, which includes sea trout as well as salmon, is regulated by IFI. The principal functions of IFI, are set out in Section 7(2) of the Inland Fisheries Act of 2010 and relate to the conservation and protection, management, development and improvement and business development of inland fisheries, including sea angling (IFI, 2015b, 5) (Table 2). These functions prioritise environmental sustainability, providing a resource for tourism as a social function and making economic contributions to the State and locally.

Table 2 summarises the main strategic actions in which regional IFI staff engage. Long-term conservation of the resource is a key objective. The annual extraction of fish is determined by the Standing Scientific Committee on Salmon, based on research. Maintaining counts of fish going up river informs the controls that need to be applied and a new weir and counting mechanism was installed in Ballina in 2011 for this purpose. The protection of the salmon stocks and the quality of the inland waters and the gravel beds in which salmon spawn, eggs are hatched and develop as fry, are of central importance. Control of predator species also takes place.

The fisheries manager explained (interview #1) that management involves a range of measures to protect the stocks of adult fish through licensing, issuing of permits, monitoring of catches, patrolling and imposition of sanctions, including legal prosecution, for breaches of regulations. Specific measures, designed to prevent the depletion of stocks, include a closed season which varies between

Table 2- Legally defined functions of IFI as they apply to the River Moy catchment

<b>Function and Actions</b>
<p><b>Conservation and protection of stocks</b></p> <ul style="list-style-type: none"> <li>• Long-term sustainable management of the resource</li> <li>• Implementation of the Fisheries Acts and the Water Pollution Acts, 1977 and 1990</li> </ul>
<p><b>Management</b></p> <ul style="list-style-type: none"> <li>• Issuing of angling licences and permits to control the pressure that comes on the resource</li> <li>• Surveillance and protection of fish stocks and imposition of sanctions</li> </ul>
<p><b>Development and improvement</b></p> <ul style="list-style-type: none"> <li>• Work to protect habitat for fish</li> <li>• Improving physical access to the river for anglers</li> </ul>
<p><b>Business development</b></p> <ul style="list-style-type: none"> <li>• Developing the tourism potential by promoting salmon angling through local, national and international media</li> </ul>

Source: Cawley (2017, 57).

rivers (from 1 February to 30 September on the Moy) (IFI, 2016a). A game angling licence must be held and can be purchased for periods from one day to one year. A permit is also required, which relates to a particular date and stretch of water (beat), and could cost up to €120 per day in the high season in 2017. There is a limit on the number of salmon that may be removed from the water daily (three between 12th May and the 31st August and one during the early and later parts of the season) and seasonally (ten salmon). Once that limit is reached, angling may continue on the Moy but the fish must be released back into the river. A plastic tag must be placed in the gills of fish removed from the water and the details of those caught and released must be entered in a log book, which should be returned to IFI at the end of the season. In order to protect the fish stocks, the sale of salmon caught by rod and line on the Moy is prohibited and illegal. Patrolling takes place to prevent poaching (illegal fishing with nets). State fisheries officers have extensive powers of search, to impose on-the-spot fines for minor misdemeanours and prosecute in the case of serious breaches of fisheries regulations (fisheries manager, interview #1).

The development and improvement of fisheries involves on-going survey and assessment of habitats by IFI. Restoration activities include major works to reinstate gravel beds and spawning grounds, which were damaged through deepening of the River Moy during the 1960s. A Salmon Conservation Fund provides grants of up to €15,000 for small scale improvements (e.g., weed removal) to private fisheries and angling clubs which contribute to the scheme by remitting fees from angling licences sold (fisheries manager, interview #2). Other recent work by IFI includes providing access for disabled anglers at one beat, parking spaces, signage and physical access to the river. Since 2016, under the National Strategy for Angling Development, a fishery owner or club may apply to IFI for a grant for capital works to provide physical access to the river, also funded from licence fees (fisheries manager, interview #2).

Business development is gaining growing attention as a revenue source. IFI staff liaise directly with anglers from local to international level, with the Regional Tourism Organisation and with Fáilte

Ireland (the National Tourism Development Authority) in this context. At a national level, a dedicated marketing officer promotes salmon angling nationally and internationally.

Since 1998, the State no longer gains financially from sales of salmon from the River Moy but receives income from sales of licences and permits by the fishery office in Ballina, through the internet and by other approved agents (angling clubs and shops) (fisheries manager, interview #2). This money is remitted to IFI centrally but some returns as grants for fisheries improvement through the Salmon Conservation Fund and grants to provide physical access to the river (IFI, 2015b, 43).

Based on figures relating to the number of anglers purchasing different types of licences, it may be estimated that some €252,000 was collected in licence fees in the wider regional fisheries basin, in 2014 (IFI, 2015a, Table 19). Income from sales of permits is not published by IFI or by private and angling club fisheries, so it is difficult to obtain information in that regard. A national survey of anglers in 2014/15 estimated average net annual expenditure (excluding travel costs and leakage, and including a multiplier) by Irish and overseas salmon and sea trout anglers as being €1628 per person (IFI, 2015c, Table 14). This gives an estimated total contribution of about €8.28m to the Western Regional Fisheries Basin (based on 5087 licences being sold). Some anglers purchase more than one licence but some also spend more than the average. Recent research findings suggest that a visiting angler to the Moy, who stays overnight, spends €387(excluding travel costs) (Grilli et al., 2017, 7). Many domestic anglers make multiple trips to fish, consisting of one or more days, and overseas anglers usually spend several days when they visit (TDI, 2013; Grilli et al., 2017).

Salmon (and sea trout) angling on the River Moy is, therefore, an important source of income locally during the main season, between April and early September. Accommodation providers (including some private fisheries), restaurants, public houses and tackle shops in Ballina, Foxford and Swinford reap the greatest financial benefits. Direct full-time employment in salmon fisheries on the Moy is limited. IFI employs three full-time, two part-time and two seasonal staff (in February 2017). The largest private fishery and one angling club each employ a full-time manager. The smaller private fisheries and angling clubs employ a seasonal manager on a basic salary, supplemented by a percentage of the fishing permits sold. Further seasonal employment (usually for about two people) is provided by fisheries for water keepers (who patrol to prevent poaching) and for local angling guides who provide advice on the best places to fish. Three professional angling guides host anglers throughout the year for coarse fish (pike, perch and other species), as well as game angling in season.

The largescale extraction of salmon from the River Moy in Ballina dates to the 16th century when the first weir was built by Franciscan monks, but it known that earlier weirs existed downstream (Cooke, 2011). The identity of Ballina is closely associated historically with salmon angling. Anglers are also a constant presence, locally, especially between April and early September. Fáilte Ireland awarded Ballina the title of *Salmon Capital of Ireland* in 2008 which is expressed in a logo (Figure 2). The elements include a salmon, the spire of St Muredach's Cathedral, after which the Cathedral beat on the river is named, and icons that represent the sea, rivers, lakes, countryside, mountains and the sun. Ballina is being promoted as a salmon angling destination located in an attractive physical environment.



Figure 2- Ballina salmon capital of Ireland  
Source: Cawley (2017, 57)

The River Moy and angling are also celebrated in an annual Ballina Salmon Festival, held in mid-July. Prizes are awarded for the largest salmon caught during the festival by a local and by a visiting angler. IFI staff members register the weights of the catch. In recent years, two officially-qualified fishing guides provide free lessons in fly-casting on the Cathedral beat, during a half-day, for young people under 18 years of age. The beat is made available free by IFI, in order to promote the culture of angling. The association with the river is further underlined in a competition for the *Lady of the Moy* who presides over the festival.

#### **4.2. Reinforcing actions to support the strategy**

In a strategic approach to integrated resource management, holistic sustainability of the resource base through the retention or adding of value should be supported by features of the ownership, complementarity with other activities and appropriate scale of use.

##### ***Ownership***

The River Moy is both a public and a private resource. The fishing rights to different stretches of the river are owned by the State and private owners, both of whom lease rights to local angling clubs. Public ownership of large stretches of the river brings benefits to owners and lessors of fishing rights, who gain from the research and remedial works undertaken by IFI. These activities include applied fisheries management, conducted to measure the attainment of salmon conservation limits and control invasive aquatic species (IFI, 2016a), and the extensive improvement of gravel beds for the laying and hatching of eggs that has taken place in collaboration with the Office of Public Works. Private owners and clubs who remit licence fees are also eligible to apply for the Salmon Conservation Fund grants to conduct improvement of the salmon habitat in the stretches of river that they own or lease (IFI, 2014). Stakeholders involved in providing physical access for angling may apply for grants, for that purpose, under the National Strategy for Angling Development.

Public ownership brings other benefits to local angling club members. In addition to the two beats made available to the Ballina Traditional Angling Club and the Ballina Salmon Anglers



Association, at nominal rates, members of both have access to the Cathedral beat after 6 pm each day. That beat is also free to anglers under 18 years of age after 6 pm. Such preferential access is designed to encourage a sense of ownership and responsibility towards the resource among local anglers and to reduce poaching and illegal fishing. Private fisheries and local angling clubs also supplement the work of IFI by employing water keepers to patrol the areas that they own or lease to prevent illegal angling and poaching.

Poaching was widespread on Irish salmon rivers when they were in private ownership, which was resented. It was hoped that poaching would decline when the commercial nets were removed from the River Moy in 1998, because of declining fish stocks. The fisheries manager explained that between 1998 and 2008, when Ireland's economy was growing rapidly and there was high employment, poaching declined as a supplementary source of income. However, because of the suspension of the commercial fishery on the Moy, there is a low availability of wild salmon on sale. Some consumers are willing to pay high prices for wild salmon and illegal fishing increased when the economy went into recession after 2008. In order to combat this practice, a confidential telephone line has been introduced where members of the public can report irregular angling activities to IFI (Kildarestreet.com, 2014). Where successful prosecutions ensue, the Minister for DCCAE has advised that the details should be published widely to deter the activity and encourage public reporting.

### ***Complementarity with other uses of land and water***

The absence of polluting substances in the water is critically important for the conservation of wild salmon stocks. Conflicts and loss of value arise from uses of water or land that cause eutrophication in streams, rivers, lakes and estuaries. Fish kills can arise in cases of severe pollution. The fisheries manager explained that, in the late 1990s, particular threats came from run-off from certain agricultural practices, including silage storage pits. Baled silage has now replaced pit silage for the most part, reducing the threat. Run-off from slurry spread on fields during rainfall conditions continues to be an occasional problem, as do leakage of pollutants from industrial workings and of nutrients from leaf decay, following the clear-felling of forested areas. The IFI staff monitor potentially deleterious activities and the public may use the confidential telephone line referred to above to report incidents. A range of EU legislation is also serving to reduce threats.

The Moy catchment is part of the European Natura 2000 network and is designated as a Special Area of Conservation, under the EU Habitats Directive (the salmon is recognised as an Annex II species worthy of protection). The estuary and the river as far as the village of Belleek are also designated as a Special Protected Area, under the EU Birds Directive, as are the two main lakes, Lough Conn and Lough Cuillin (EC, 2016a) (Figure 1). The National Parks and Wildlife Service is responsible for the protection of Natura 2000 habitats in Ireland and monitors all activities that might have implications for the designated species (NPWS, 2016).

The EU Nitrates Directive of 1991 (part of the Water Framework Directive) promotes good farming practices to prevent nitrates from polluting ground and surface waters (EC, 2016b). Under this Directive, water quality is monitored by county councils, the national Environmental Protection Agency

and the Department of Agriculture. The fisheries manager explained that reduced densities of grazing livestock and reduced application of fertilizers have helped to reduce pollution. If the IFI staff become aware of pollution incidents in the river catchment, they alert the other relevant authorities and work with them to secure whatever prosecutions might be required. The Ground Water Directive of 2008 relates specifically to the quality of (under)groundwater and has particular pertinence to septic tanks associated with private residences, where seepage into groundwater may eventually enter streams and lakes (EC, 2008).

### ***Issues of scale***

The physical scale of planned construction developments may have potentially negative implications for adjoining fishery waters through escape of solids and chemicals. Planning applications by the public for physical developments are notified by Mayo and Sligo county councils to IFI and are closely monitored. Reports from the public relating to incidences of pollution or inappropriate developments are investigated (IFI, 2015a). Developments by county councils and public agencies such as *Coillte* (the state forestry company), which can affect extensive areas, are also monitored and tension can arise between IFI and these bodies.

### **4.3. Maximising on the resource**

Networking is of particular importance, both locally and extra-locally, in order to maximise on the actions designed to attain holistic sustainability and prevent the loss of or add to value (Saxena et al., 2007; Cawley & Gillmor, 2008a, 2008b). Local networking (local to the river, the county and the region) should be closely linked into or embedded in local social systems and the resource base. Appropriate extra-local, dis-embedded, networking to national and international levels is also necessary to access funding and specialist technical knowledge and, particularly, to attract anglers, because of insufficient local demand to meet the State's expectations of revenue generation. Some of the principal forms of local and extra-local networking engaged in by the IFI staff in Ballina are listed in Table 3 according to key functions.

In conducting its statutory functions to conserve and protect salmon stocks, the IFI in Ballina engages with a wide range of agencies at local and extra-local levels. These include Mayo and Sligo county councils in the context of: monitoring applications from the public to the councils for planning permission for developments in the River Moy catchment, and control of pollution. As noted, in the context of scale, IFI also monitors the councils' own construction works which may potentially impact negatively on the catchment, and makes representations as necessary. At a regional level, networking occurs with a range of state agencies: the National Parks and Wildlife Service with regard to the protection of ecosystems; *Teagasc*- the Farm and Food Development Authority- in providing information to farmers; and *Coillte* with reference to planned development or clearing of forests by them. At a national level, on-going communication takes place with IFI and the DCCA, as required. The Standing Scientific Committee on Salmon provides information on which the annual extraction of

fish is based. The Environmental Protection Agency and the Department of Agriculture are important sources of information relating to water quality. Legal action against polluters may be pursued collaboratively with the former in particular. Relations with the national Marine Institute have been marked by tension recently because of the latter's support of aquaculture within the critical distance of the coast and estuarial areas where IFI research has shown that threats may be posed to wild salmon. Major road building projects involve contacts with the National Roads Authority. The North Atlantic Salmon Conservation Organisation provides information about salmon stocks internationally.

Table 3- Networking by IFI staff in Ballina by function and geographical level

<b>Local, county and region</b>	<b>National and international</b>
<b>Conservation and protection of stocks</b>	
<ul style="list-style-type: none"> <li>• Mayo and Sligo county councils</li> <li>• National Parks and Wildlife Service</li> <li>• Teagasc</li> <li>• Coillte</li> </ul>	<ul style="list-style-type: none"> <li>• IFI</li> <li>• DCCAE</li> <li>• Standing Scientific Committee on Salmon</li> <li>• Environmental Protection Agency</li> <li>• Department of Agriculture</li> <li>• Marine Institute</li> <li>• National Roads Authority</li> <li>• North Atlantic Salmon Conservation Organisation</li> </ul>
<b>Management</b>	
<ul style="list-style-type: none"> <li>• Anglers</li> <li>• Private fisheries and angling clubs</li> </ul>	<ul style="list-style-type: none"> <li>• Anglers</li> <li>• IFI</li> <li>• DCCA</li> </ul>
<b>Development and improvement</b>	
<ul style="list-style-type: none"> <li>• Office of Public Works</li> <li>• Private fisheries, local angling clubs</li> <li>• Research institutions</li> </ul>	<ul style="list-style-type: none"> <li>• Office of Public Works</li> <li>• IFI</li> </ul>
<b>Business development</b>	
<ul style="list-style-type: none"> <li>• Anglers</li> <li>• A private residential fishery</li> <li>• Regional Tourism Organisation</li> <li>• Ballina Salmon Festival Committee</li> </ul>	<ul style="list-style-type: none"> <li>• Anglers nationally and internationally</li> <li>• National and international tourism promotion agencies</li> </ul>

Source: Cawley (2017, 60)

In managing the fishery, IFI staff have on-going contact with anglers and would-be anglers, from local to international levels, for sales of licences and permits and booking of slots on beats on the river in Ballina. A member of staff also visits each fishery on the River Moy weekly during the angling season and collects details of the numbers and weights of salmon caught. Regular on-going contact also takes place with the parent IFI body nationally.

As noted earlier, IFI works in collaboration with the Office of Public Works in developing and improving the River Moy as an environment for salmon. Networking occurs, nationally, in the planning of restoration of gravel beds for spawning and hatching and, locally, in implementing works on the river. There is also extensive contact with private fisheries and angling clubs locally and with IFI nationally in administering grants for fisheries improvement and providing physical access to the river.

Researchers at the National University of Ireland Galway and the Galway-Mayo and Sligo Institutes of Technology are regional sources of scientific information.

The development and marketing of salmon angling as a tourist activity involves networking with anglers at various geographical levels through a wide range of media. The latter include a web cam on the most productive beat on the River Moy in Ballina, a weekly E-zine, daily reports on catches of salmon during the season and Facebook and Twitter posts. Marketing activities include collaboration with a private residential fishery in providing access for their clients to the Moy in Ballina and collaboration with the Salmon Angling Festival Committee. Contacts take place with the Regional Tourism Organisation to promote and market salmon angling to tour operators and agents. At a national level, a specialist IFI marketing officer works with Fáilte Ireland in national and international promotion.

## 5. Conclusions

Natural resources are of growing importance for tourism purposes and finding methods of attaining holistic sustainability is receiving increased attention (Rydin & Falleth, 2006; Prell et al., 2009). This paper reported the results of applying a strategic and integrated model to assess the factors that impinge on holistic sustainability in a salmon angling river used for tourism (Cawley & Gillmor, 2008a, 2008b). Evidence was found of the retention and adding of value to the resource and also of threats that require on-going attention.

A clearly defined strategy is in place and supported by staff actions to promote the holistic sustainability of the River Moy and its salmon stocks and contribute to local society, economy and culture. A range of actions support the strategy and these actions are operationalised through extensive networking at a range of levels from the local to the international.

State ownership of extensive stretches of the river involves management and conservation works that serve to protect the value of the resource. Private fisheries, local angling clubs and society benefit from these activities. This conservation work is further supported through the Salmon Conservation Grant Scheme which many private fisheries and angling clubs are eligible to apply for. Special measures are taken to nurture a sense of ownership and responsibility among local anglers, including young people. Nevertheless poaching and illegal angling continue. Since 2014, reporting of poaching and pollution incidents through a confidential telephone number has resulted in successful court prosecutions. These prosecutions are advertised widely as a deterrent to these threats to the intrinsic and monetary value of the resource.

Conflicts arise with agriculture, construction activities and clear-felling of forests which are sources of localised water pollution and contribute to loss of environmental and monetary value through a decline in salmon stocks. Tensions can arise with other state agencies and point to a need for greater consultation and networking with IFI when potentially harmful developments are being planned (Prell et al., 2009). More generally, EU legislation and enhanced monitoring by a range of state agencies are highly supportive of the remit of IFI in maintaining the intrinsic value of the fisheries'

waters and the salmon stocks. Extensive networking takes place locally, regionally, nationally and internationally (as required), with anglers and with a wide range of agencies, in support of the strategy and in implementing the measures for its attainment.

The evidence illustrates that analysis, based on principles of integration within a strategic framework, can provide insights into the strengths and weaknesses of the methods used to promote the holistic sustainability of a natural resource used for tourism purposes (Cawley & Gillmor, 2008a, 2008b; Cawley, 2017). The model permits the interrelationships and tensions between the resource and its management and other resources and stakeholders to be identified in a systematic way. Given the absence of a comprehensive framework for river basin management in Ireland, this framework offers one approach to monitoring the extent to which holistic sustainability is being attained.

## 6. Bibliography

- CAWLEY, M. (2017). A strategic approach to protecting the sustainability of a natural heritage and tourism resource: the River Moy, Ireland. *Bulletin de la Société Géographique de Liège*, 69, 53-62.
- CAWLEY, M. & GILLMOR, D.A. (2008a). Integrated rural tourism: concepts and practice. *Annals of Tourism Research*, 35, 316-337.
- CAWLEY, M. & GILLMOR, D.A. (2008b). Turismo rural integrado: teoría y práctica. *Annals of Tourism Research en Espagnol*, 10, 73-97.
- CAWLEY, M., MARSAT, J-B., & GILLMOR, D.A. (2007). Promoting integrated rural tourism: comparative perspectives on institutional networking in France and Ireland. *Tourism Geographies*, 9, 405-420.
- COOKE, D. (2011). Ballina salmon weir, Tidy Towns Heritage Award winner. *Heritage News*, Winter 2011/Spring 2012, ISSN-1393-9777, 20-21.
- EC (EUROPEAN COMMISSION). (2008). *Groundwater protection in Europe, the new Groundwater Directive*. <http://ec.europa.eu/environment/water/water-framework/groundwater/resource.htm>. [Accessed 5 May 2016].
- EC (EUROPEAN COMMISSION). (2016a). *Natura 2000*. [http://ec.europa.eu/environment/nature/natura2000/index\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/index_en.htm). [Accessed 1 July 2016].
- EC (EUROPEAN COMMISSION). (2016b). *The Nitrates Directive*. [http://ec.europa.eu/environment/water/water-nitrates/index\\_en.html](http://ec.europa.eu/environment/water/water-nitrates/index_en.html). [Accessed 1 July 2016].
- GARROD, B., WORNELL, R., & YUELL, R. (2006). Re-conceptualising rural resources as countryside capital: the case of rural tourism. *Journal of Rural Studies*, 27, 117-128.
- GRILLI, G., LANDGRAF, G., CURTIS, J., & HYNES, S. (2017). The value of tourist angling: a travel cost method estimation of demand for two destination salmon rivers in Ireland. *Working Paper No. 570, August 2017*. Dublin: Economic and Social Research Institute.
- IFI (INLAND FISHERIES IRELAND). (2014). *Salmon Conservation Fund report*. Dublin: IFI.
- IFI (INLAND FISHERIES IRELAND). (2015a). *Wild salmon and sea trout statistics report 2014*. Dublin: IFI.
- IFI (INLAND FISHERIES IRELAND). (2015b). *Annual report 2014*. Dublin: IFI.
- IFI (INLAND FISHERIES IRELAND). (2015c). *National strategy for angling development: the economic contribution of salmon and sea trout angling in Ireland 2015*. Dublin: IFI. <http://www.fisheriesireland.ie/socio-economics/527-the-economic-contribution-of-salmon-and-sea-trout-angling-in-ireland>. [Accessed 3 June 2016].

- IFI (INLAND FISHERIES IRELAND). (2016a). *Fisheries research and protection*. Dublin: IFI. <http://www.fisheriesireland.ie/Research-and-Development/fisheries-research.html>. [Accessed 5 May 2016].
- IFI (INLAND FISHERIES IRELAND). (2016b). *Management of the wild salmon fisheries*. Dublin: IFI. <http://www.fisheriesireland.ie/Salmon-Regulations/salmon-regulations.html>. [Accessed 3 June 2016].
- JENKINS, T. (2000). Commentary, putting modernity into practice: endogenous development and the role of traditional cultures in the rural development of marginal regions. *Ecological Economics*, 34, 301-314.
- KILDARESTREET.COM. (2014). Depletion of inland fish stocks and impacts of estuary poaching: Inland Fisheries Ireland. *Joint Oireachtas Committee on Transport and Communications*, Wednesday, 22 October 2014. <https://www.kildarestreet.com/committees/?id=2014-10-22a.804>. [Accessed 3 June 2016].
- NPWS (NATIONAL PARKS AND WILDLIFE SERVICE). (2016), *Natura 2000*. <https://www.npws.ie/faq/natura2000>. [Accessed 30 June 2016].
- PORTER, M. (1996). What is strategy? *Harvard Business Review*, 74, 61-78.
- PRELL, C., HUBACEK, K., & REED, M. (2009). Stakeholder analysis and social network analysis in natural resource management. *Society & Natural Resources*, 22, 501-518.
- RYDIN, Y. & FALLETH, E. (Eds.). (2006). *Networks and institutions in natural resource management*. Cheltenham: Edward Elgar.
- SAARINEN, J. (2006). Traditions of sustainability in tourism studies. *Annals of Tourism Research*, 33, 1121-1140.
- SAXENA, G., CLARK, G., OLIVER, T., & ILBERY, B. (2007). Conceptualising integrated rural tourism. *Tourism Geographies*, 9, 347-370.
- TDI (TOURISM DEVELOPMENT INTERNATIONAL). (2013). *Socio-economic study of recreational angling in Ireland, prepared on behalf of IFI*. Dublin: TDI.

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### **Acknowledgements**

Dr Siobhán Comer is thanked for her help in preparing Figure 1. The River Moy management staff and the other interviewees are thanked for their contributions, as is Dr Stephen Hynes, Director, Socio-Economic Marine Research Unit, NUI Galway, for bringing the research by Grilli et al. (2017) to my attention.