Angling Ecotourism: Issues, Guidelines and Experience from Kamchatka

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Recreational fishing is an important component of the tourism industry and an important component of regional economies around the world. When angling tourists reach threatened freshwater ecosystems, however, there is a risk of degrading the very fishery and landscapes that attracted them, thwarting long-term economic development prospects and reducing biodiversity. Following the emergence of catch-and-release recreational fishing, we believe that angling can be legitimately considered a form of ecotourism that contributes positively to conservation, science, and local or regional economic development. With successful angling ecotourism projects, anglers and local populations can become viable constituencies for conservation. We describe the angler-sponsored research programme of the Kamchatka Steelhead Project as one case study where many aspects of a successful ecotourism project were present. We then propose guidelines for future angling ecotourism projects and address opportunities and obstacles to the continued development of angling ecotourism.

Keywords: angling, consumptive ecotourism, recreational fishing, Russia, salmon

Introduction

Angling, or recreational fishing, is one of the most popular outdoor activities in North America. In the United States, over 34 million people participated in recreational angling and 29.4 million recreational fishing licenses were issued in 2001 (American Sportfishing Association, 2004; USFWS, 2002). The revenues from fishing licenses support fish and wildlife management agencies at all levels of government, and the expenditures from recreational fishing contribute to local and regional economies, especially in regions where fisheries have been preserved in pristine or near-pristine conditions. Recreational fishing in Alaska is a $1 billion per year industry, more than $500 million of which comes in direct in-state expenditures, including money spent on guides, supplies, accommodations and provisions. More than 11,000 Alaskans are employed to support the recreational fishing industry, many of them in regions that are otherwise job-poor (American Sportfishing Association, 2003). The value of these expenditures is multiplied as funds ripple through regional economies (American Sportfishing Association, 1996).

Reviews of recreational fishing tourism tend to focus on the economic impact of anglers travelling from one location to another in search of quality angling experiences (Ditton *et al.*, 2002). Other analyses, however, have argued that a fish caught by a recreational angler may be worth 40 times more to the economy than the same fish caught as part of a commercial harvest (Hayden, 2000). The 1994 value to British Columbia, Canada (consumer, worker and

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business surplus, plus government revenue) of its 431,000 commercially-caught chinook in that year has been calculated at CDN$8.2 million, while the value from 239,000 recreationally-caught fish has been calculated at CDN$96.5 million (Gislason, 2001). Well-regulated recreational fishing is an economically viable use of a natural resource that can be both lucrative and sustainable for local communities and ecosystems.

Despite its attractiveness as a vehicle for economic development and sustainability, recreational fishing ventures in vulnerable ecosystems like those of Alaska pose potentially serious ecological risks. Shortsighted choices made by tourism promoters and regulatory agencies in terms of lodging and transportation options, energy and resource use, visitor quotas, and fishing techniques can degrade fisheries and stress the ecological resources of water bodies. Practiced recklessly, recreational fishing can lead to overfishing just as commercial fishing can. In the United States, for example, the recreational fishing sector is responsible for 23% of landings of 'species of concern' (Coleman *et al.*, 2004).

Promoting a sustainable model for angling ecotourism is in the interest of natural resource managers, environmentalists, tourism promotion agencies, and local communities. In parts of the world, recreational fishing may be the primary tourism attraction and, if pursued as ecotourism, could form a vital component of sustainable development. To date, the literature has not examined the acceptable forms of angling ecotourism and only one regional ecotourism certification body has issued guidelines (Nature's Best, Sweden). It would be wise to address and discuss the issues in a comprehensive way rather than wait for ecotourism certification bodies or entrepreneurs to take the lead.

Angling as Ecotourism

Perhaps the two fundamental attractions of ecotourism are that it can contribute positively both to conservation efforts and to local economies (Honey, 1999). While angling tourism holds these potentials, the literature has not clarified the status of angling tourism in regards to ecotourism.

The concept of ecotourism encompasses three primary dimensions: a focus on nature, sustainable management, and environmental education (Blamey, 2001). These aspects position ecotourism primarily as a subset of nature tourism and entirely as a subset of sustainable tourism (Weaver, 2001). Traditionally, the limit to viewing angling as a form of ecotourism has focused on the character of its environmental impacts without engaging with the question of whether or not those impacts are sustainable over the long term. Fishing is typically viewed as a consumptive activity that provides products – though the status of catch and release fishing is uncertain – and the implicit argument is that non-consumptive activities, which provide experiences, have lower impacts and therefore should uniquely qualify as ecotourism (Weaver, 2001).

There are problems with using the consumptive/non-consumptive dichotomy to define ecotourism, however, since all tourism involves consumption on some level. Virtually all forms of tourism burn fossil fuels in transportation, produce cumulative impacts from visitor footprints, and use resources to

produce souvenirs (Weaver, 2001). It would be more appropriate to place tourism activities along a continuum that examines the particular impacts of each activity in detail and acknowledges that most tourism activities provide both products and experiences (Vaske *et al.*, 1982). It is likely that most capture fishing would fall closer to the consumptive side of this continuum, while catch and release fishing would lie nearer to the middle.

Other, similar criteria have also been proposed as essential points for ecotourism. Duffus and Dearden (1990) draw a line by examining the mindset of the participant and excluding activities where the goal is to remove an organism from the natural world. Fennell (2000) has argued for a 'moral principle' to be included in definitions of ecotourism that would identify activities 'founded upon respect for plants and animals'. These two subjective metrics, however, are problematic criteria for defining ecotourism due to their emphasis on process and intent rather than performance. If defined solely by process, ecotourism may look good on paper and yet still irreparably harm the environment, as has been seen in the attempts to certify ecotourism ventures (Honey & Rome, 2001) or in case studies of failed ecotourism ventures. Performance on the ground must be the defining criteria of ecotourism.

The major definitions of ecotourism, including those of Ceballos-Lascuráin, The Ecotourism Society, the Ecotourism Association of Australia, the National Ecotourism Strategy of Australia, and Tickell (all quoted in Blamey, 2001), support this view by placing emphasis on sustainability and minimal impact rather than non-consumption *per se.* For example, The Ecotourism Society's definition is 'responsible travel to natural areas which conserves the environment and improves the well-being of local people' (1991). The National Ecotourism Strategy of Australia mentions that ecotourism is 'managed to be ecologically sustainable', which involves an 'appropriate return to the local community and long-term conservation of the resource' (Allcock *et al.*, 1994). Honey (1999) argues that, while generally non-consumptive, ecotourism can include consumptive activities such as hunting if they are 'sustainable industries based on renewable resources'.

Recreational fishing can be a sustainable industry when pursued responsibly. Without ignoring the poor status of overfished species, there exist many fish populations around the world that are healthy and can support small-scale extraction in ways that will not diminish future population health. For the purposes of angling ecotourism, the emergence and widespread acceptance of catch-and-release recreational fishing has created an unprecedented opportunity. Valuable sport fisheries in both saltwater and freshwater have recently been converted primarily to catch-and-release. By regulation, the most accessible and popular wild steelhead fisheries in British Columbia are managed on a catch-and-release basis (Hooton, 2002a).

Other advances in angler ethics also contribute to the potential sustainability of recreational fishing. The National Marine Fisheries Service Code of Angling Ethics, developed with the participation of both angling groups and conservationists, specifies limiting catch to the desired species and size and using techniques that minimise harm to fish when releasing them (NMFS, 1999).

These approaches include many techniques. Fly hooks, for example, typically catch in the periphery of a fish's jaws or mouth and produce less damage than

the deeper hookings of lures and, in particular, bait. Post-release mortality rates in steelhead fisheries in British Columbia, Canada, range from 10% for bait fishing and 3% for lures to 1% for fly-fishing (Hooton, 2002b). Reduced exposure to air (under 30 seconds for salmonids), handling with wet hands, and reduced 'playing' with a fish are also thought to decrease mortality rates in catch and release fishing (Catch and Release Foundation, 2001; Hooton, 2002b). Avoiding the use of non-native species as live bait and unwashed fishing gear in multiple waters can lower the risk of disease and invasive species being introduced into a river (Aquatic Nuisance Species Task Force, 2001).

More generally, several practices can reduce angler 'efficiency' (catch per unit effort), including the avoidance of bait, fishing from shore rather than boats, fly-fishing rather than spincasting, and using barbless hooks. For example, the probability of capture in flyfishing may be as low as one-fifth that of bait fishing (Hooton, 2002b). By reducing the number of fish caught per angler, a river's carrying capacity can support a larger number of fishermen, thereby providing a greater economic opportunity for the region. With healthy populations and moderate levels of fishing, the inevitable impacts on fish populations may be minimal and sustainable for the natural ecosystems in which a recreational fishing ecotourism operation occurs.

Beyond environmental sustainability, however, ecotourism's concept of sustainable management includes economic and social considerations (Blamey, 2001; Honey, 1999). Minimising negative impacts is an identifying aspect of sustainable tourism, while ecotourism is additionally expected to contribute positively to conservation and local economies (Honey & Rome, 2001).

With this in mind, recreational fishing ecotourism presents particular opportunities to enhance conservation activities and local communities through new and alternative revenue streams. Fishing permits, a concept with which anglers are familiar, provide a straightforward method to raise funds for conservation or economic development, while park fees are an alternative method. The intensely local experience of fishing in a given water body has the potential to convince tourists to make direct donations for local conservation efforts if such channels are readily available. These donations can be facilitated and encouraged by travel operations.

Similar to many other forms of ecotourism, recreational fishing trips are often guided. Properly trained, these guides and other staff can be hired from local communities. Products and services for the fishing operation can be procured locally to maximise local economic impact. Where the infrastructure or capacity to provide tourism services and products locally does not exist, tourism operators can assist in developing these capabilities.

In Costa Rica, tourists practicing catch and release angling for billfish spent $17.8 million in the 1993–1994 season (Ditton & Grimes, 1995). British Columbia's Skeena River steelhead fishery, also managed on a catch and relase basis, is worth at least $1.9 million per year (Wild Steelhead Coalition, 2000). The Togiak National Wildlife Refuge in Alaska provides more than 50 jobs and contributes more than $1.5 million to the local economy (Togiak National Wildlife Refuge Core Planning Team, 2001).

Properly managed and practiced, recreational fishing ecotourism has a great potential to contribute positively to conservation and local development efforts

while engaging in a sustainable activity. Implementing ecotourism on the ground, however, may be a complex task.

Case Study: Kamchatka Steelhead Project

Kamchatka is a 1250 km peninsula in the far east of the Russian Federation, bordered to the east by the Pacific Ocean and to the west by the Sea of Okhotsk. Economic development on this remote peninsula has been sparse due to historical isolation of the region under the Soviet Union, and large areas of the peninsula have been left relatively wild. Poaching is widespread, however, in part due to high unemployment rates, and constitutes a major threat to the health of certain salmon runs. Oil and gas development, which would pose a serious threat to salmon habitat, is being considered as an economic development strategy. There are few plans for the sustainable use of regional renewable resources, and ecotourism has been called the 'best opportunity for an environmentally sustainable industry employing a broad range of local people' (Newell, 2004). In the early to mid-1990s, however, tourism infrastructure was either scarce or non-existent.

From 1994–2003, a partnership between the Wild Salmon Center (Portland, Oregon, USA), and the Ichthyology Department of Moscow State University (Moscow, Russia) operated an angler-sponsored scientific research programme on the Kamchatka peninsula. The Flathead Lake Biological Station of the University of Montana (Missoula, Montana, USA) also joined this effort in later years.

The angler-sponsored programme was designed to fund scientific expeditions and was one of the pioneers in bringing paying foreigners to the peninsula. Before its transfer in 2002 to an independent non-profit, the angler-sponsor programme was part of the Kamchatka Steelhead Project (KSP), a 20-year research effort dedicated to the study and conservation of Kamchatka's *Oncorhynchus (parasalmo) mykiss*[1] – both the anadromous steelhead (*syomga*) and resident rainbow trout (*mikizha*) life histories. The steelhead and other salmonids of Kamchatka are unique for their large sizes, healthy populations, and wide range of life histories. Some individual river systems in Kamchatka host as many as six species of Pacific salmon, plus grayling, varieties of trout, and three species of char. In total, the rivers of Kamchatka are believed to serve as the spawning grounds for as much as one-quarter of Pacific salmon stocks. Numerous human communities rely upon these healthy salmon stocks, as do half of the global population of Steller's sea eagles, the world's largest population of brown bears, and 1800 Steller's sea lions (Griffin & Rahr, 2002).

Participants in the programme included scientists from the United States and Russia and conservation-minded anglers from the United States and elsewhere. Anglers supported the conservation mission both by funding the scientific research and by directly assisting in the collection of biological samples through catch and release fly-fishing. This is a method shown to have low post-release mortality in steelhead (Hooton, 2002b). After an angler caught a fish, the angler and researchers collected data on length, girth, weight, sex, scales (to determine life history), and tissue samples for genetic and protein

analysis. Individual fish were tagged to track migrations and determine population structure.

The logistics of bringing visitors to Kamchatka were, and remain, complex, but can provide many opportunities for economic benefits to accrue at the regional and local levels, if properly planned. Anglers flew on Magadan Air, a regionally-owned airline for whom the programme was a major client. Anglers typically spent one night during the trip in a hotel in Petropavlosk-Kamchatskiy, the capital of Kamchatka. Due to the remoteness of the region, Russian helicopters were used extensively for transport to and from fishing lodges. The camps and lodges were small in scale and were Russian-owned. Local outfitters ran the trips in Kamchatka and cooks were hired locally, while guides came from Russia and the United States.

As local guides' language and service skills did not meet client expectations, the programme began to train guides from a pool of current students and graduates of the English language faculty of a local university. These efforts built critical local capacity for tourism. However, guide training did not emphasise natural history and guides typically placed little emphasis on education while in the field.

From 1994–2003, more than 600 angler-sponsors participated in expeditions supporting the Kamchatka Steelhead Project. At the programme's peak in 2002, an estimated $650,000 in one year was contributed to the economy of the Kamchatka Peninsula through expenditures on local outfitters, helicopter transportation, and field expenses (Klimenko, 2004). Trip costs were high, making this a relatively elite activity, but such expenses may be unavoidable in areas of the world where travel and logistical costs are significant. High accessibility costs are also undoubtedly a key factor in the health of the studied steelhead populations.

The programme's major scientific advances include the discovery of five distinct life histories of *O. mykiss* in Western Kamchatka and the observation of anadromous *O. mykiss* parents producing resident rainbow trout offspring, and vice versa. Scientific papers were published from this project in the Journal of Ichthyology and other leading Russian and international journals (Kuzichshin *et al.*, 2002; Pavlov *et al.*, 2001; Savvaitova *et al.*, 1999; also see Wild Salmon Center, 2003). In addition, the presence of anglers and scientists on remote salmon-rich rivers during the spawning season caused reductions in illegal poaching for caviar, the primary threat to these salmon populations (Rahr, pers comm, 2003).

Environmental impacts of the programme included the heavy reliance on air travel, a necessity given the landscape but also an energy-intensive mode of travel. Lodge construction involved the installation of helicopter pads and other landscape modifications. Power at the lodges was produced with diesel generators, the fuel for which also had to be flown in. The project conducted feasibility studies into renewable sources of energy, including wind, solar and micro-hydro, but was not able to implement any of these proposals due to high costs.

Overall, however, environmental impacts would be considered low, primarily due to the small size of the angling and research operations and the efforts made to spread trips out over the fishing season and over the length

of the river. On the healthy rivers where the trips occurred, mortality due to catch and release fly-fishing was not a significant factor. In the rare cases of direct steelhead mortality, the fish were taken for full laboratory analyses as part of the expedition's mortality take quota, issued by the Federal Ministry of Natural Resources. Cultural impacts were also low or non-existent, though in this case a key factor was the isolation of tourists in wilderness areas.

Kamchatka Steelhead Project's angler-sponsored research programme offers one case study of a partnership between conservation groups, research teams, anglers, and local organisations that may serve as a valuable model for future angling ecotourism operations. Such operations would need to more fully implement educational and interpretive aspects to be considered ecotourism, however. While the Kamchatka project model may not be appropriate in all contexts, it demonstrates angling with a strong conservation science orientation, firm standards for environmental protection, partnerships between diverse groups, and progress towards sustainable development and local community involvement. The project produced tangible benefits to conservation through discouragement of poaching activities, increased knowledge about salmon and steelhead biology, donations to a conservation non-profit, support for local economic development through outfitter payments, and increased local and worldwide visibility for the threats facing a globally-important ecosystem. Potential future donors to Kamchatka conservation efforts were also identified.

With this case study as an innovative example, angling ecotourism has to potential to make a viable contribution to both regional economic development and social and environmental sustainability.

Guidelines for Angling Ecotourism

To assist in the development of new ecotourism ventures and to evaluate operations marketed as ecotourism, many certification and eco-labelling programmes have been developed over the past decades, including over 250 voluntary initiatives around the world (Honey & Rome, 2001; NACEC, 2000). In referring to codes of conduct, a similar concept, Issaverdis (2001) commented that these initiatives can 'play a part in the overall continuum of developing industry professionalism and can be a useful means of introducing standards to sectors of the tourism industry'.

All such efforts must be based on firm standards and guidelines, but to date, angling ecotourism standards do not exist in the literature and the only ecotourism body to issue angling ecotourism certification criteria – in Swedish – is Nature's Best (The Swedish Ecotourism Association and The Swedish Travel and Tourism Council, 2002a). Given the vast numbers of angling tourists, standards are a pressing concern.

Any guidelines should flow naturally from the definitions of ecotourism. Greater direction, however, can be found in expanded descriptions such as Honey's (1999) eight characteristics of ecotourism: (1) involves travel to natural sites; (2) minimises impact; (3) builds environmental awareness; (4) provides direct financial benefits for conservation; (5) provides financial benefits and empowerment for local communities; (6) respects local culture;

(7) is sensitive to the host country's political environment and social climate; and (8) supports human rights and international labour agreements. A comparable example is the six overarching criteria of the successful Nature's Best ecotourism certification programme in Sweden: (1) respect the limitations of the destination – minimise negative impact in nature and culture; (2) support the local economy; (3) make all the company's operations environmentally sustainable; (4) contribute actively to conservation; (5) promote the joy of discovery, knowledge and respect; and (6) quality and safety all the way through (The Swedish Ecotourism Association and The Swedish Travel and Tourism Council, 2002a).

Out of the above and other examples, we distilled the following six primary areas that guidelines should address in describing angling ecotourism.

Nature experience

While many recreational fishing tourism operations will focus on catching large fish and/or many fish, an ecotourism operation needs to take a broader perspective and view the fish within the complex ecosystem needed for their survival. By building clients' appreciation for the beauty and complexity of these ecosystems through direct fishing experiences, ecotourism can enlist their support for place-based conservation efforts.

Client expectations, impressions, and lessons are shaped from the moment they choose an ecotourism programme, and therefore ecotourism operations need to have clear objectives from their first interaction with potential clients (Gruin & Rogers, 2004).

Location

Tourism operations are centered around direct experiences and appreciation of fresh or salt water ecosystems and their native fish.

Marketing

Trips are advertised and sold to clients explicitly as angling ecotourism trips or as angling ecotourism components in broader tourism packages.

Education and interpretation

Education is a central aspect of many ecotourism definitions due to its power to build an 'intellectual, emotional and even spiritual connection between people and places' (Weiler & Ham, 2001). In all interactions, operators should accurately describe the ecosystem in which anglers will be fishing as well as the cultures of surrounding areas. Education can occur through direct interactions between clients and guides, as well as through reading materials, maps, and poster boards. Fish are important components of many aquatic ecosystems and anglers should be informed of the many processes that contribute to a healthy ecosystem – salmon for example support terrestrial ecosystems by carrying marine nutrients upstream during their spawning migrations (Cederholm *et al.*, 1999). In order to build future stewards, clients should be informed of the major threats to ecosystems and cultures, the conservation efforts being conducted in the area, and what they can do to help these efforts.

As fishing guides will likely be a client's primary contact in an angling ecotourism operation, guide training is a critical aspect of a high-quality

experience. Training pertinent to the broader goals of ecotourism will be especially important in the angling ecotourism sector, since guides will likely come from a recreational fishing background where the traditional focus is typically more tightly restricted to catching numerous large fish.

Knowledge sharing

Tourism operators share their knowledge of local ecosystems and cultures, and the knowledge of other competent bodies, with customers before and during operations in order to build awareness, respect, and a sense of stewardship.

Guide training

Guides are trained in the natural history of the area, local cultures, and sustainable tour operating techniques.

Environmentally-sustainable operations

It is important to understand whether a particular water body is appropriate for angling ecotourism and to know the level of angling that the ecosystem can support sustainably. The case study demonstrated how consultation with independent biologists and non-governmental conservation groups can help in finding answers to these questions. Government biologists can also provide assistance.

We suggest setting overall fish mortality limits for the tourism sector in order to avoid 'tragedy of the commons' situations where cumulative impacts from individuals add together to far exceed an ecosystem's carrying capacity (see Hardin, 1968). For ease of application, limits should be set by species and water basin – or other appropriate stock definitions – and businesses should coordinate with other tour operators in the area to remain within those limits. Fish mortality is the sum of all killed fish as well as expected mortalities from released fish given relevant mortality rates.

Tour operators and regulatory agencies also need to recognise the cumulative impacts of visitors and limit overall numbers to what the ecosystem can withstand without adverse effects (Honey, 1999). In recreational fisheries more intensively used than those in the case study, an effective regulatory, compliance, and enforcement regime may be necessary to ensure that angling and other activities are sustainably managed. A limited entry fishery may be necessary, whether imposed by the government through the issuance of permits or self-enforced among tour operators in the region. These tactics limit impact on the fishery and, when enforced through permits, generate revenue for management agencies (British Columbia Ministry of Agriculture, Food & Fisheries, 2001; Togiak National Wildlife Refuge Core Planning Team, 2001; United States Fish & Wildlife Service, 2002).

Both the case study and the earlier discussion of recreational fishing as a sustainable activity provided examples of angling techniques that can be employed in angling ecotourism. As one of possibly a variety of techniques, catch and release flyfishing provides a proven method to ensure broad angling opportunities while limiting harm to hooked fish. More generally, several practices were discussed that can reduce angler efficiency, harm to released fish, and the spread of disease and invasive species. Locally applicable

laws and guidelines should also be followed as a minimum but often not sufficient step towards sustainable operations (The Swedish Ecotourism Association and The Swedish Travel and Tourism Council, 2002b) Implementing all of these techniques may require extensive angler education.

More generally, angling ecotourism operations, as for all ecotourism operations, need to conduct their general operations in an environmentally-sustainable manner with minimal negative impact (Blamey, 2001). The infrastructure required for recreational fishing operations typically includes lodges, transportation, and, at times, remote field camps. Minimising impacts may require the use of four-stroke rather than two-stroke engines on motorboats, energy efficiency and energy conservation in lodging, renewable energy generation, recycling plans, and the use of environmentally-friendly alternatives to conventional fuels and chemicals.

Planning

Businesses and management agencies know the status of fish populations in their region of operation and the threats to these populations. Businesses operate within biological limits so that impacts from recreational fishing ecotourism will be minimal and sustainable given other pressures on the populations.

Angling practices

All fish are caught and handled using methods that limit fish injury and mortality to minimal and sustainable levels. Anglers abide by applicable fisheries laws and regulations.

General operations

All aspects of the ecotourism operation are conducted so as to minimise the consumption of natural resources and reduce the production of waste and pollution.

Respect for local cultures

For indigenous and local cultures around the world, fishing has played important subsistence, economic, and cultural roles. The annual migrations of salmon, for example, have structured societies from the Ainu in Japan to the Tlingit in Alaska (Roche & McHutchison, 1998). Cultural aspects may provide a rich way to connect angler tourists to the traditions of an area or to learn about sustainable use. By the same token, tourism operations need to respect traditional customs surrounding fish and local community needs for fish resources. In Alaska, many native and non-native households continue to rely on locally available food for 'essential economic, nutritional, cultural and social benefits' (Kelso, 1982). The complexities involved in cultural matters will require careful cooperation between tour operators and local or indigenous communities. The most effective dialogues will likely begin early in the ecotourism planning process.

Interaction with cultures

Operators and clients are respectful of local and indigenous traditions and needs regarding fish, land, and other resources.

Contribution to conservation, monitoring, and research

The ecotourism concept includes the need to actively support conservation efforts (Blamey, 2001; Honey, 1999). This can occur through fees, business donations, and client donations, as well through participation in rehabilitation projects or scientific monitoring (Blamey, 2001).

As many recreational anglers are used to buying fishing permits, fees may be a particularly applicable method for governments or resource management agencies to raise funds for conservation. The case study showed, however, that the tour operator is probably not the appropriate actor to levy these fees. A more productive example for tour operator contributions may be a formula whereby businesses donate a percentage of yearly profits to conservation programmes (Alaska Wildland Adventures, 2004). This strategy requires strong partnerships with local conservation groups. The case study showed how this can occur when such groups are included in planning from the outset.

In most parts of the world, a large opportunity also exists for angling ecotourism to participate directly in fisheries monitoring and research. Even in the United States, where a large agency structure supports fisheries data collection, information on recreational fisheries and fish populations are lacking (Donofrio, 2004). Throughout Far Eastern Russia, where the case study was located, scientific work is only just beginning to examine salmon distribution and population trends in many river basins (Augerot, in press). By enlisting angling ecotourism operations as partners in ecosystem monitoring, conservation efforts can gain access to more of the information they need to accomplish their goals.

Given the decentralised nature of tour operators, it seems unlikely that an appropriate data collection protocol will be developed or data aggregated in meaningful ways without cooperation between tour operators and scientists in the academic, non-governmental, or governmental sector. Preferably, all angling ecotourism operators in an area would participate in the same program using common standards, metrics, and data reporting formats. Data collection will likely include keeping accurate and thorough records of the size, weight, sex, and species of the fish caught and reporting data to the appropriate groups. These catch statistics are also important for evaluating an operation's environmental impacts (The Swedish Ecotourism Association and The Swedish Travel and Tourism Council, 2002b).

Conservation

Tour operators support local conservation efforts through donations and cooperation and as well as by informing anglers about conservation organisations.

Monitoring and research

Tour operators and guides work in cooperation with academic researchers, conservation groups, and/or government scientists to monitor and research fish populations and other environmental indicators. Accurate catch statistics are maintained.

Contribution to local economies

Ecotourism can contribute to local economies in many ways, including foreign exchange earnings, employment, infrastructure development, long-term economic stability, and economic diversification (Blamey, 2001). Preferential purchasing of local goods and services along with opportunities for residents to directly market crafts and other products to visitors can also play a part of these efforts. In the case study, ecotourism provided an alternative source of employment for communities that were turning to destructive practices such as poaching. Ecotourism can thus provide a strong economic incentive for resource protection (Blamey, 2001). By demonstrating the economic value of a sustainably used resource, ecotourism can lead local communities to value healthy ecosystems and waters rich with fish (The Swedish Ecotourism Association and The Swedish Travel and Tourism Council, 2002b).

Ideally, ecotourism must also contribute to the transfer of economic and political control to the local scale, a difficult and time-consuming process (Honey, 1999). In the case study, small steps were made in this direction by training guides locally. Local and/or indigenous involvement in ecotourism operations and planning is an important component of building capacity and sustainable development.

Local residents

Significant economic benefits from angling ecotourism operations accrue to local residents in a manner that builds local support for resource protection.

Opportunities and Challenges for Angling Ecotourism

As both recreational fishing and tourism expand in economically and ecologically important fisheries worldwide, the need to define angling ecotourism grows more pressing. It is necessary to set a high standard that recognises the need to conserve ecosystems and sets limits on the overall impact of anglers. In addition to promoting conservation and benefiting local economies, that high standard will add value for environmentally-conscious tourism operators and recreational fishing guides by enabling them to selectively market their services to discriminating customers and charge premium prices on the basis of a fishery's environmental attributes.

Despite these promising opportunities, there are challenges looming in the near future. Should the term 'angling ecotourism' or 'recreational fishing ecotourism' enter into common usage, it is likely that many tour operators and recreational fishing guides will use it in promotional material. Many of them will be sincere and diligent in their desire to minimise environmental impacts and promote conservation, but some will not.

As the vernacular of environmentalism has grown more prevalent, the number of travellers on ecotours has increased, but the conservation missions, ecological integrity of nature sites, and environmental education components have all been diminished (Honey, 1999). Travel industry 'greenwashing' of conventional tourism has devalued the market worth of ecotourism organisations and sustainably managed tour companies, crowding some out of the market. In certain pristine and hitherto-remote regions, ecotourism has even served as

a Trojan horse – attracting sustainable levels of tourism at first, before conventional mass tourism operations respond to growing demand (Butler, 1990).

Predictably, the environmental and social infrastructure of a region can be quickly stressed and degraded by increased numbers of visitors. Kamchatka is not currently subject to these demands, but some recreational fisheries of Alaska and British Columbia already suffer from overfishing and habitat degradation. Examples of degradation include erosion on riverbanks, noise pollution from motorboats, and improper disposal of human waste (Togiak National Wildlife Refuge Core Planning Team, 2001).

At the same time, regions wishing to use angling ecotourism as a form of economic development need to understand the limitations on the market for world-class angling tourism on the scale enjoyed by areas like Alaska. A clear attraction needs to be present, such as the steelhead in Kamchatka or the giant king salmon of the Kenai River in Alaska. When logistics are more complex or when tourists must travel larger distances for fishing, the cost of transportation will limit the potential tourism market to wealthier individuals. Certain regions may want to focus on local angling ecotourism markets, rather than trying to compete at the international scale. Regardless of the scale, angling ecotourism should almost always be considered in the context of a broader ecotourism development strategy that includes a diversity of ecotourism forms such as wildlife watching, photographic expeditions, adventure trips, agritourism, and ethnotourism.

For angling ecotourism to avoid the pitfalls encountered by other ecotourism ventures, conservation groups, fisheries regulatory agencies, local communities, and tourism operators must cooperate early and operate in good faith. They cannot expect the problems and possible contradictions of angling ecotourism to be solved from the outside. While certification bodies provide general ecotourism guidelines, the specifics of angling ecotourism remain largely ignored. For angling ecotourism to mature from a vague, loosely-applied concept to a thoughtfully implemented practice, carefully formulated standards and guidelines will be needed.

Conclusion

As angling tourism expands, it brings with it not only great opportunities, but threats to sensitive and ecologically valuable fisheries worldwide. In the case study we present, anglers played an active role in advancing the scientific understanding of the salmonid fisheries of Kamchatka. Not only did the low-impact angling fund the activity of fisheries conservation groups, but it directly contributed to data-gathering and environmental monitoring of the fishery. This study is only one of many possible examples, however, and more work is needed to examine fully the various challenges and opportunities presented by angling ecotourism.

To provide better clarity to the angling ecotourism concept, we propose guidelines for this activity designed specifically to minimise environmental impacts, generate support for local economic development, and contribute directly to conservation. Our specific principles are applicable in a range of ecosystems and emphasise the need for cooperation between stakeholders.

While angling ecotourism is an exciting and highly promising venture, it faces threats and challenges discussed above, particularly the danger of 'greenwashing' and the use of the ecotourism label to promote conventional, unsustainable angling tourism. For angling ecotourism to succeed, there is a pressing need to set high standards and coordinate the actions of all stakeholders. All parties will play integral roles in making angling ecotourism a valid and vital tool for science, conservation and sustainable development.

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Note

1. By international convention, steelhead is usually designated as *Oncorhynchus mykiss.* In the Russian Federation, the designation *parasalmo mykiss* is preferred. The discrepancy has not yet been reconciled.

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