"Completely Empowering": A Qualitative Study of the Impact of Technology on the Wilderness Experience in New Zealand

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Abstract—Recent academic literature has expressed concern over the potential impact of the increasing types and levels of electronic (largely communication-related) technology brought by visitors into the wilderness. A key issue has been perceived changes in risk-taking behavior by wilderness and backcountry users. Despite these concerns, extremely limited empirical assessment of the potential impact of technology such as cell phones, global positioning systems and personal locator beacons on wilderness users and the wilderness experience has been undertaken. Do users share the same unease about the use of these technologies as wilderness researchers and managers? This study uses a qualitative approach to assess New Zealand outdoor recreationists' perceptions of how these and other forms of technology influence their wilderness experiences. Four themes were generated from the data collected through semi-structured interviews. The results show that users' feelings about their use of new recreation equipment is directly opposed to the concerns expressed in the literature: the technology embedded within all types of recreation equipment are almost completely empowering and positive for users, principally by providing increased comfort, safety and access.

Introduction

The complex relationship between modern technology and wilderness has intensified in the 21st century. One topic that has emerged over the last 10 years is the potential impact of various new technologies on the wilderness experience. Many electronic communication devices can now be easily carried into the wilderness, and some commentators suggest the use or mere presence of these types of technologies has already changed the essence of the wilderness experience and wilderness management (Ewert and Shultis, 1999; Stankey, 2000; Shultis, 2001).

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The invisibility of some technologies is maintained in the more recent explorations of the dangers of technology for wilderness. Certain technologies, such as cell phones, global positioning systems (GPS) units, and personal locator beacons, are often noted as having serious, negative impacts for wilderness and wilderness managers (e.g., Roggenbuck, 2000; Borrie, 2000, Stankey, 2000; Dickson, 2004), while other technologies (e.g., new lightweight fabrics and metals for equipment such as clothing, tents, stoves, ice axes, etc.) seem to be ignored by critics.

This study attempts to explore whether the use of an increasing amount of technology by wilderness users influences the nature of the wilderness experience, and if so, how and why? To develop a better understanding of the relationship between wilderness users and their use of technology and the perceived impact of these technologies on their wilderness experiences, an interpretive approach to data collection and analysis was undertaken. Thematic analysis was used to assess data generated from semi-structured interviews of backcountry recreationists in New Zealand. After the related literature on these subjects are reviewed, the themes generated from this data are used to assess outdoor recreationists' conceptualization of the relationship between technology and nature, and their thoughts on if and how their wilderness experiences are impacted by the technology they bring into the backcountry.

Literature Review

The complexity of our relationship with technology, especially in a wilderness setting, led Freimund and Borrie (1998, p. 22) to lament that

> There is a lack of clear direction about how to manage information and communication in or about wilderness. . . . In essence, our crystal ball is becoming increasingly cloudy. Therefore, how should we assess the relative appropriateness of varied technologies in and about wilderness? How can we determine what is good technology and what is bad for wilderness?

Currently there is very limited empirical data assessing the impact of technology on the wilderness experience. The vast majority of literature on this issue—from wilderness researchers primarily based in the United States — has largely been based on personal anecdotes, and typically follow the traditional, realist conceptualization of the wilderness as an antithesis of technology (Shultis, 2012). Normally, a negative, deterministic perspective on certain forms of technology used in wilderness is demonstrated (i.e., researchers believe that

negative impacts automatically and systematically derive from the increased use of new, primarily communication-based technology in wilderness) (e.g., Hollenhorst, 1995; Borrie and Freimund, 1997; Borrie, 2000, Stankey, 2000; Dickson, 2004).

Pohl (1998, p. 156) expressed a common, key concern when she warned that "Our wilderness experiences run the risk of becoming more like virtual wilderness when technological devices do the work for us. They separate us from our environment and create a false sense of accomplishment". Or, as McIntyre queried, "Is it likely that today's wilderness user, cocooned in fibrepile and goretex, on a brief (1 or 2 day) trip into the wilderness, feels oneness, humility, and immersion" (1998, p. 179) – that is, the key attributes associated with a traditional wilderness experience? Wiley (1995) suggests that the concerns expressed in the existing literature could be reflected in four primary concerns:

1. Risk versus security – what is the relationship between the use of technology and perceived risk in natural settings? Does technology change the amount or type of risks taken by recreationists?
2. Solitude versus connectivity – can increasing levels and types of technology used in wilderness maintain or extinguish the solitude that 'traditional' wilderness was supposed to provide? Can one be 'connected' (e,g., To the internet or e-mail) in wilderness and still have solitude?
3. Mediation versus direct experience – does technology allow recreationists to 'skip' the direct experiences (both positive and negative) that some consider necessary to create safe recreational experiences?
4. Knowledge versus the unknown – how does technology influence the known and unknown during a wilderness experience? If, for example, specific information on weather conditions can always be accessed, does this lead to a different type of recreational experience?

These questions have often been repeated in the literature, but have gone unanswered by empirical research. Only very recently have a very small number of empirical studies, though often exploratory or unpublished, started to assess these and related topics. Pope and Martin (2011), in one of the few empirical, peer reviewed studies on the topic (see also Martin and Pope, 2012), assessed attitudes towards technology among 235 wilderness users in California; they deemed 55% of the sample exhibited 'pro-technology' and 45% 'anti-technology' attitudes. The former group felt that technology increased one's safety in wilderness, and were more likely than the 'anti-technology' group to use technology to request a rescue, take chances that could increase risk if they had technology with them, and believe that technology can successfully substitute for skill, experience, and knowledge" (p. 23). They also identified themselves as more likely to take risks than those in the anti-technology camp. The anti-technology group "felt quite strongly that technology cannot substitute for skill, experience, and knowledge, were very unlikely to take chances that could increase risk just because they had technology with them, and did not agree

that technology reduced dangers and made them feel safer in the wilderness" (p. 23).

An unpublished PhD in New Zealand also helps illuminate the relationship between wilderness use and technology in New Zealand. Wray (2009) studied the meaning of wilderness and the wilderness experience among experienced wilderness users in the Fiordland region of New Zealand, and suggested the increasing use of technology as the fourth major threat to the recreational use of New Zealand's wilderness (after increasing use, numbers of tourists and commercialization). Wray notes "The deliberate actions taken by some study participants to avoid using new technologies demonstrate their commitment to the wilderness ideal, and also highlight the cultural and historic values associated with wilderness in New Zealand (i.e. nostalgia for a past way of life)" (2009, p. 262). However, she also notes that "Despite the apparent aversion to technology in wilderness, almost all respondents in this study used some form of modern equipment to aid them in their wilderness trip – whether it was clothing, travel gear, communication devices or motorized transport" (p. 262-263), which reflects the conflicted relationship our culture has with wilderness: we use technology to escape technology.

Methods _____

Given the complexity of the broader relationship between society and technology, the lack of empirical data on the specific impacts of technology on backcountry recreationists, and the likelihood of the importance of contextual factors in the perception of these potential impacts of recreationists, the interpretive perspective offered by a qualitative approach to data collection and analysis was chosen for this study. As the objective of this research, like all qualitative research, is to gain a deeper understanding of the topic rather than predict specific attitudes or behaviors in a representative sample, non-probabilistic sampling methods of convenience and snowball sampling were followed. Potential interviewees were contacted in three New Zealand cities through the tramping (i.e., backpacking) clubs throughout New Zealand. Tramping clubs in New Zealand have long served critical roles in introducing New Zealanders to 'the bush' (i.e., natural environments) and include a range of wilderness users, from beginner to expert. After briefly noting my research project either by monthly club meetings (if possible) or e-mail (if no meeting were scheduled during time spent in the area), several potential contacts were identified, and if interviewed, additional potential contacts were then identified by respondents. Interviews continued until data saturation was reached. In this study, 12 in-depth (60-90 minute) interviews were completed before I determined that sufficient data had been collected (i.e., no significant, new data emerged from the interviews). Interviews were taped and transcribed soon after the interviews were completed. All interviews and analysis were undertaken by the author to maximize the truthworthiness and reliability of the data collection and analysis. To ensure respondents' confidentiality and anonymity, pseudonyms are used throughout this paper.

Data Analysis

Consistent with the epistemological stance of interpretive inquiry and semi-structured interviews, data analysis was an iterative process, where coding and the identification of themes occurred throughout the interview and analysis phases of the research. As the data was gathered, the author began identifying codes that arose from the data, and through reflexive assessment. After all interviews were completed, coding continued until several common themes emerged; final coding and themes shifted to a more theoretical level of analysis, based on a continuous review of the relevant literature and existing conceptual perspectives from a multidisciplinary perspective.

Results _____

A wide range of recreationists were interviewed in an attempt to include an inclusive selection of socio-demographic variables and experiences. As noted in Table 1, a range of both young and older, beginner and expert, male and female backcountry recreationists were included in the thematic analysis, although the respondents tended to be more experienced backcountry recreationists; this was probably a reflection of each respondent being a tramping club member.

Four themes were identified and will be further explored:

1. recreation technology is embedded, often invisible and contextual;
2. only the positive impacts of technology on the backcountry experience were identified, with increased comfort, safety and access being the main benefits;
3. 'imagining' with new technology/equipment occurred; and
4. only others over-rely on or have too much technology.

a) Technology is Embedded, Invisible and Contextual

When first queried, respondents associated the term 'technology' with primarily electronic items such as computers. Respondents did not at first associate the term 'technology'

with backcountry recreation equipment. However, when specifically asked what outdoor recreation equipment they felt was technology, most noted that through continuous engineering and mass manufacturing of recreation equipment, several specific pieces of equipment could be identified as technology: again, electronic equipment such as cell phones and GPS units were most often mentioned, as were new fabrics (e.g., GoretexTM). Climbing gear such as ice axes, crampons, and carabiners were mentioned more than 'basic' tramping gear (by both trampers and climbers), but a wide range of equipment were identified as technology after prompting (e.g., footwear, packs, clothing). The identification of contemporary equipment being considered technology was often associated with noting the relatively simple equipment used in the 'old days'.

When asked what recreation equipment they would consider NOT to be technology, an interesting trend emerged, one that suggests the hidden, embedded and contextual nature of technology in contemporary society. The respondents usually paused to consider the question, then after giving it some thought acknowledged that all equipment was technology. This statement was often combined with a sense of surprise at this newfound conceptualization of technology and its relationship to recreation equipment:

> "Now that you put it that way, it's a difficult one. I mean, if you look at, say, a pack, for example, I mean some of the technology seems maybe to be simpler like a carry bag or pack or a bicycle, but they are all technical things….So I guess it is all technology when you look at it" (Cyril).

> "When you get a chance to think about it, and you know what's happened over the last how many years, you think, well, it is technology, isn't it: everything is technology" (Heidi).

All respondents finally concluded that in many different ways, all recreation equipment was a form of technology: therefore, for the remainder of the paper, these two terms will be considered equivalent. The incremental nature of changes to recreation equipment, and the desire of visitors to use new equipment were often noted as having obscured the technological aspect of recreation equipment.

Table 1—Characteristics of Interviewees

Name (alias)	Age	Main Backcountry Activity	Average Number of Nights[a]	Number of Years Experience[b]	Self-Reported Experience Level
'Bob'	21	Climbing	25	4	intermediate
'Cyril'	59	Cycling	21	41	expert
'Debbie'	55	Tramping	8	37	intermediate
'Evan'	58	Tramping/climbing	25	40	expert
'Flo'	38	Tramping/climbing	20	25	intermediate
'George'	62	Tramping	40	34	expert
'Heidi'	35	Climbing	12	5	beginner
'Ida'	42	Tramping	100	20	expert
'Jay'	48	Tramping	100	28	expert
'Ken'	30	Tramping/climbing	45	12	expert
'Larry'	74	Tramping	5	20	intermediate
'Martin'	38	Tramping	15	18	intermediate

[a] Average number of nights spent in backcountry over the last two years, not including day trips.
[b] Numbers of years spent pursuing backcountry recreation independently as an adult (i.e., from 18 years of age).

b) Only Positive Impacts of Technology on the Backcountry Experience were Identified, with Increased Comfort, Safety, and Access Being the Main Benefits

The goals that interviewees set for their backcountry trips reflected the 'traditional' motivations identified in the literature (e.g., enjoy nature, relaxation, escape, and achievement/challenge). When asked how technology helped meet these goals, respondents focused on the increased comfort, safety and reliability of modern technology. The same benefits were expressed when recreationists were asked how technology affected their backcountry experience itself later in the interview. The decreased weight of new equipment and its impact on increased comfort and access to natural areas were particularly emphasized:

> "I think that's the big thing, in that the gear [i.e., equipment] helps because it means that you are comfortable (Bob).

> "I think technology is also an incredible – it's not just necessarily comfort, it's also the safety aspect, increased the safety for instance because of new technology: jackets, sleeping bags, insulating packs, whatever you like… It's more than just warmth, it's actual survival that's being increased by technology" (Evan).

> "I just feel that it's completely empowering. I see nothing negative in it" (Ida)

> "Well, it allows – it definitely allows us to do a lot of activities safer…and easier, from the sense that a lot of the changes have been the equipment is now lighter that it used to be, particularly when it is wet" (Ken).

The development and use of new technology was also seen to be inevitable: for example, Heidi suggested that "it's just the way of the world. You can't say that technology is wrong, because everything is technology, isn't it? It has to move forward: if it didn't move forward, we'd all be caught in a time warp".

By making backcountry easier, safer and more comfortable in all types of weather, several people suggested that equipment made them more likely to take trips. Another aspect of feeling safer and more comfortable commonly expressed involved being able to take more risks while in the backcountry:

> "I think there's no doubt that people are able to do some of the things that we couldn't have done some years ago, because they do have gear, they can survive in all these [conditions] – they can push the limits" (Cyril).

> "You will be more inclined to wander and not worry about, you know, you'd just be bolder because you'd know where you are and so you would be able to navigate more skillfully" (Ida)

> "It enhances the experience because it means that you can witness without feeling any sense of threat much more dramatic conditions. …You can do things with confidence… you can stand there and laugh at the wind and all the rest of it and you can be completely secure" (Jay).

All respondents could quickly and clearly identify these benefits of technology. Most could also identify potential ways in which technology could block the goals they set for backcountry recreation or have negative implications for their backcountry experiences. Some suggested that technology "increases the potential for conflict between different types of [users] as well as increasing the overall numbers" of recreationists (Evan); similarly, George noted technology "makes it easier for lots of other people to go into the hills and that takes away from the 'being alone' factor". However, few interviewees identified how their use of technology impacted their own experiences; normally, others' use of technology was noted as blocking their goals. Recreation conflicts between trampers and mountain bikes were noted numerous times, but particular attention was placed on the conflict created by noise (e.g., aircraft, cell phones, mountain radios and personal music players). The 'un-naturalness' of these noises in the backcountry seemed to be the property that affected most respondents: it affected the ability of recreationists to escape civilization and achieve solitude. For Jay, a cell phone "brought the real world too much into where we were"; Debbie noted that "going out in the mountains is to be away from technology… when you have increasing technology like these new electronics it sort of defeats the purpose".

Recreationists could be bothered by various noise issues, but seemed to have healthy coping strategies to enable them to continue to enjoy the trip. In addition, the short-term use of cell phones, mountain radios or aircraft for safety-related reasons (e.g., rescue, obtaining weather forecasts, making pick-up arrangements) was always supported, but their 'non-essential' use (e.g., chatting with friends or checking in at the office) was universally considered to be inappropriate.

Older/more experienced recreationists tended to believe that younger/less experienced users enjoyed accumulating equipment for its own sake, and felt the need to have more equipment. While older/experienced users focused on light weight (i.e., comfort), brought less equipment with them, and took different types and levels of equipment based on the goals of the trip, they felt that younger/less experienced visitors often brought too much equipment in the backcountry:

> "As you get more experienced you have a much better idea of what equipment, exactly what you really need. I think when you are very inexperienced, you tend to take away too much probably, but inessential things, coffee makers and all that sort of crap, electric razors for God's sake" (George)

> "You can buy things for the sake of having them….There are some, they become fanatical on everything that is new that is out" (Larry).

While there were a limited number of young/less experienced visitors in the sample, they often shyly admitted to being 'gear freaks' (i.e., people who enjoy researching, buying and using new equipment) and acknowledged the lure of using new tools in the backcountry. Heidi, a younger climber, supports the suggestion that status may play a part, as she noted "it's more of a status thing, it's like men with cars…I mean you don't really have to have it but it's good to have it". Jay also admitted he "had to restrain myself from bragging about it [i.e., having new equipment] to people…, but sometimes I weaken", and Larry noted that "one upmanship" definitely existed among outdoor recreationists.

c) 'Imagining' with New Technology/ Equipment Occurred

An issue not previously noted in the literature relates to the consumption of recreation equipment. By looking at new equipment at retail stores and reading about the specifications and characteristics of these items in magazines, recreationists were able to 'imagine' new experiences and adventures that these pieces of equipment might enable. Debbie referred to it as "dreaming", about

> what you could do and getting enthusiasm. You then start and think of what you've got and what trips you could do, and what'll be nice, and keep fit again, and get back out and make the time to do more trips and gives you ideas, motivates you to actually think about getting out there.

Ida suggested "It's probably the only window shopping I do enjoy … probably because I know about it and I've got a strong interest in it and it will empower me so much, you know. Having a decent down jacket, you know, will keep you so warm". Jay put it this way:

> In my mind I'm running over all the places where I would be using it in the conditions and so it's sort of a rehearsal thing, it's like a mental rehearsal and you look at – I'd look at a stove and when I am looking at it, I'm not just seeing the stove, I'm sort of like imagining where I would be and thinking about using it and thinking what I'm seeing on this new stove, how it would measure up, so I am living it in my mind".

Not all people enjoyed shopping for equipment. Flo, for example, simply stated, "I hate shopping", and would only get new equipment when necessary. Some older respondents again suggested that younger people bought too much equipment, suggesting it was "partly advertising, it's partly keeping up with your mates I guess, and, I don't know, people just like spending money" (George). Cyril thought "they're buying all this stuff and they don't think they can do it unless they have all that stuff and it's actually not true".

 The value of other people modeling new equipment was also noted by several people; by seeing what new technology other people were using, they could make decisions about whether this equipment would be useful for them. Similarly, looking at new equipment while window shopping allowed people to "keep up to date" with what was available at retail outlets (Ken). Martin suggested that

> I think you are influenced a bit by the equipment that other people have, I think almost invariably you compare [it] with your equipment and what they may have and just weigh up the pros and cons. Because I think probably everyone is looking to improve their overall equipment … within the constraints they may have budget-wise.

Most noted that this 'imagining' related to the increased comfort, safety and lightness the new technology would offer, although the impact of new technology of altering risk taking was also mentioned.

d) Only Others Over-Rely On or Have Too Much Technology

When asked if they ever relied too much on their technology while in the backcountry, no one admitted to personally over-relying, but most noted that 'other people' could rely too much on technology. George did admit that "We all pile into our cars and drive about 500 kilometers to go on a walk for a week, we rely on that technology very much", and that dehydrated food packages created "a lot of litter". But most suggested that while they recognized they relied on technology, they did not 'over-rely' on it, mainly due to the level of experience they had in assessing the conditions and what equipment they needed to successfully and safely complete a trip:

> "I think your knowledge of the mountains and knowledge of survival and that sort of thing should make it possible for you to make a decision about how much you are actually going to need all that technology to make it a good experience, but you can overdo it. …[S]ome people need more and why they have all that stuff …it gives them a sense of security but in actual fact what they need is experience and knowledge" (Cyril)

> "I think it [technology] can make you too dependent on technology.…Yeah, they are using them [GPS] all the time and they kind of need to have that security in a way, so they don't trust their judgment from experience to actually sort of get them out of trouble" (Debbie)

Some felt that other people, less experienced backcountry users, could rely on technology too much, as they didn't have the experience necessary to cope with conditions that might arise if the technology failed or conditions became worse:

> "I can see people going out into areas that perhaps they shouldn't because they have got their GPS, which basically tells them where they are, and they don't have these skills to help them cope with that particular type of country…. basically, I think people can abuse it and probably do abuse it" (Flo)

Discussion and Conclusion _____

For most respondents, recreation equipment was typically not normally originally associated with the term 'technology', and the continuous advancement of technology obscured the highly technological nature of many aspects of 'traditional' recreation equipment (e.g., tents, sleeping bags, clothing, stoves, etc.). Electronic equipment such as cell phones and GPS units seemed to be more 'visible' as technology: both the academic and popular gaze is focused on a limited type of technology used in the wilderness. After being asked what equipment was not technology, respondents acknowledged that all their outdoor recreation equipment had some technological element, and there after equated the terms 'technology' and 'recreation equipment'.

As previously noted, wilderness researchers tend to focus on the negative aspects of increasing use of technology in the wilderness, especially its potential impacts on risk perceptions and risk taking. However, respondents in this study almost completely focused on the positive aspects of technology use, particularly increased comfort (with lightweight materials, warmth and dryness the most important factors), safety and the ability to enable or simplify access and visitation. While users admitted it was theoretically possible for the proliferation of technology to have negative impacts on the wilderness experience (e.g., recreation conflicts), and could often identify example of when this happened (largely due to 'unnatural' noise being introduced), in practice the ability

of recent technological advances in recreation equipment to make wilderness users feel more comfortable, safer and less physically demanding was considered to have almost revolutionary, positive impacts on the wilderness experience. For example, older users noted that lightweight materials and new equipment (e.g., walking poles) allowed them to continue visiting the backcountry despite decreasing health and strength. All users felt new technology allowed them to expand their limits and provide new challenges while maintaining safety and security in the wilderness.

Respondents did not directly elucidate the possible conundrum of using technology in order to escape the technological world, although some seemed aware of its existence. Winner (1986, p. 5) has suggested a "technological somnambulism" exists in Western society that blocks any meaningful examination of the unforeseen impacts of technology on our daily lives, and this seemed to be occurring in the wilderness as well. In addition, the consumption (purchasing) of new recreational equipment provided a very meaningful ability for users to imagine how the new equipment could provide even greater opportunities for new challenges and experiences as well as greater comfort and safety in and access to recreational areas. The process of "imagining" has never been identified in the literature and deserves additional study.

The seemingly irresistible allure of technology seemed to be in part determined by its ability to provide these new challenges and greater abilities while allowing for a more comfortable, safer experience. Respondents actively examined new equipment in stores and magazines and scanned other recreationists in the field for new potential gear.

Respondents were loath to suggest that any limitations should be placed upon the use of technology in wilderness areas, with the possible exception of when the purpose of use caused considerable recreation conflicts. These potential conflicts seemed to occur when the use of certain equipment – again, especially communication-related equipment—was not undertaken for reasons related to increased comfort, safety or access. The use of a cellphone to simply chat with a friend was considered inappropriate, but calling to confirm pick up times, check in or call for help was appropriate. This makes the potential management of technology much more difficult for park and resource managers, as it may not be the technology itself which causes conflicts, but rather its intended purpose.

In summary, Pohl (1998, p. 156) expressed the concern that "Our wilderness experiences run the risk of becoming more like virtual wilderness when technological devices do the work for us. They separate us from our environment and create a false sense of accomplishment". The respondents in this study had a very different perspective. Respondents were passionate about how technological advances in recreation equipment allowed them to be more comfortable, feel safer and gain easier access to and within the wilderness. While there was an acknowledgment that too much technology could potentially block some of the goals they set for their experiences, this was not of great concern, as they felt they had the experience and knowledge to avoid over-relying on technology, had coping strategies to deal with conflicts, and decided on a trip by trip basis what technology they brought into the wilderness. The primacy of comfort is also interesting, with this concept being almost totally ignored in the literature (but see Dimmock, 2009).

Both the positive and negative aspects of technology in changing risk perceptions and risk taking deserve further study. However, these respondents suggest that the ability of technology to increase comfort and safety and encourage wilderness use may prove to be at least equal to the dangers of technology espoused in the existing literature.

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