Menstrual waste in the backcountry

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Abstract

The literature on menstrual waste disposal methods is limited and consequently little is understood about women's management of menstruation in the backcountry. This study investigated how women manage menstrual waste in the backcountry, in the light of potential environmental degradation. Personal interviews were conducted to determine the methods of menstrual waste disposal that are used in New Zealand's backcountry alpine, bush and coastal terrain. Hygiene and discretion were identified as major factors of concern for women in dealing with menstruation, and lack of information about appropriate menstrual disposal practices in the outdoors was reported. Menstruation has a restraining effect on levels of enjoyment and comfort experienced during outdoor activities. Carrying home used products was considered the best method of menstrual waste disposal.

1. Introduction

This study investigates women's practices of menstrual waste disposal in backcountry areas, and the potential environmental impact of these practices, with a view to identifying the personally and socially acceptable practices which are least degrading to the natural environment.

Popular concern about environmental degradation, coupled with the effects of rising numbers of backcountry recreationists, suggests that outdoor people in general will be conscious of their rubbish and toiletting practices. However, a recent study (Lynch, 1992a) suggested that young women engaging in outdoor pursuits are unfamiliar with adequate methods of dealing with menstrual waste once they leave the security of flush toilets and four-walled privacy. This would seem to have implications for the adequacy of information about waste disposal methods, potentially resulting in environmental degradation, as well as implications for the quality of backcountry recreation experienced by women.

In this study, "backcountry" refers to non-urban areas, primarily undisturbed, where access to facilities such as toilets is not guaranteed. This includes much of the Department of Conservation estate. Environmental degradation refers to any impact on the natural environment which causes harm to plants, animals, soil structures, water quality, air quality, or aesthetic qualities. Menstrual waste means by-products of menstruation and menstrual management and includes items such as sanitary pads, tampons, human bodily excretions, product wrapping, and toilet paper.

National and international published literature since 1980 on the composition of menstrual waste, the interaction of that waste with the natural environment (soil, water, and air), and the sociological and psychological factors influencing the management of menstruation is reviewed in Part 2 of this report. Literature on the topic of menstruation is not abundant, an indication of the social

sensitivity of the subject and of the gendered nature of much research. Themes which emerge from the available literature deal with the physiology of menstruation, the social context of menstruation, education about menstruation, types of menstrual wear and its interaction with the environment and, finally, disposal menstrual products. The ideas that people have about menstruation, and the dissemination of information about, it affects how menstruation is managed in both urban and backcountry contexts. These ideas will also have an influence on the type of menstrual products available and the acceptability of them to individual women. The products themselves emanate from a culture which utilises its natural resources in certain ways, and the composition of menstrual products, as well as the subsequent interaction of them with ecosystems, is an expression of that resource manipulation. The disposal of menstrual waste therefore is heavily influenced by the social and cultural factors which this study explores.

2. Menstruation in context

2.1 THE PHYSIOLOGY AND EXPERIENCE OF. MENSTRUATION

Menstruation is a cyclical event occurring during the reproductive phase of a woman's life. It involves the discharge of blood, mucous and endometrial shreds from the lining of the uterus (Saxton, 1981; Harlow, 1969).

According to Reame (1983:40) "most investigators agree that there is a. dramatic variation among women in the nature and amount of monthly flow although the average menstrual blood loss is considered to be 30ml and the average flow of four days duration". The reality and normality of menstrual pain is also a matter of disagreement and is so subject to the influence of sex-political assumptions that Laws (1990) suggests assumed psychological pain may be given unwarranted emphasis while genuine physical pain may be underestimated. Given the large discrepancies among experts about what constitutes a "normal" menstrual cycle and history, the present study will make explicit the experience of interviewees rather than assume a "typical" pattern that may be foreign to them all.

2.2 THE SOCIAL CONTEXT OF MENSTRUATION

Beliefs about menstruation and the practices which surround it provide the social settings within which women manage their menses. Within contemporary New Zealand society there are several ethnic groups, each with different traditions relating to menstruation and the disposal of menstrual waste. Only the historical practices of the two major groups, Maori and Pakeha, will be considered here.

Traditional Maori society placed certain restrictions on the behaviour of menstruating women, within a context of female modesty about the genital area, and these restrictions related particularly to food gathering, cultivation and preparation but also included bathing in rivers and riding horses (Heuer, 1972; Dann, 1986). Nineteenth century studies of traditional Maori society provide very little information on how women dealt with the menstrual flow although recently MacDonald (1974) discussed the use of mosses, lichen, hoheria bark and flax floss as diapers and coverings for babies, providing hygienic containment and disposal of waste. Menstrual discharge may have been managed using similar materials. Observances of specific hygiene practices had both practical and ritual importance, and some remain today. Maori spiritual values are strongly associated with the land and the cultural and bicultural issues menstruation raises in this context require careful consideration. However, talking about menstruation, at least with Pakeha researchers, is especially inappropriate for some Maori women (Dann, 1986) and a general review of Maori practices of menstrual management must therefore be left to Maori women themselves to publish. Comment on the extent to which contemporary Maori women's experiences of outdoor activities while menstruating is different to the experiences of Pakeha women is therefore beyond the scope of this study.

Within the Pakeha tradition t:iere have been no strict social prescriptions for over a century regarding what menstruating women may or may not do, although until recently there have been stigmas attached to bathing and washing one's hair while menstruating, and taking vigorous exercise, all of which have now been discredited (Laws, 1990). Indeed, the experience of young women in New Zealand and other western societies since the 1950s has been active public encouragement (particularly by menstrual product advertisers) to engage in a full range of physical and mental activities during their periods (Newton, 1992; Clarke and Gilroy, 1993).

In an extensive discussion of taboos and etiquettes relating to menstruation in contemporary Britain, Laws (1990) found only one: "The rule behind all the others seems to be that women may not draw men's attention to menstruation in any way" (Laws, 1990:43). The only exception to this rule is that a man in an intimate (usually sexual) relationship with a woman may be given information about that particular woman's menstrual experiences. Similar rules have been observed in the United States and in India (Chandra and Chaturvedi, 1992; Marglin, 1992) although Buckley and Gottlieb (1988) argue that a universal "menstrual taboo" does not exist but that cultures construct arbitrary, symbolic, contextualised meanings around the monthly flow. Law's rule seems applicable to New Zealand society. Advertising of "sanitary products" seems to contradict it, but a closer examination of the etiquette surrounding "sanpro" (sanitary protection products) advertising serves to confirm how the rule is upheld. Euphemisms abound (e.g., "sanitary protection" rather than menstrual wear; "period", "off-days", rather than menstruation or bleeding); "such euphemisms are rarely positive" according to Clarke and Gilroy (1993:13), and "reflect the negative way in which menstruation is thought of; for example, 'having the blues'; the curse".

Television "sanpro" advertising began in 1970s (USA) and 1980s (UK) but not without complaint (Treneman, 1989). The ads themselves were subject to a list of 11 guidelines, which included showing only packages of pads or tampons and no unwrapped towels or tampons, not using women under 15 years of age in the commercials, and not featuring men in commercials (Laws, 1990). New Zealand women are not necessarily happy with sanpro ads either (Roe, 1992a). While some are informative, they influence the way women think about themselves and their menses. Some women are embarrassed that this intimate side of women's lives is exposed to the male public; conversely others reject the emphasis on hiding menstruation with "slimmer" pads and "more convenient" tampons. There is protest over encouraging use of products when they are not necessary (the "in-between times"), over the idea that menstruation is a burden, and over the image of the "free, liberated woman" who menstruates without stress or pain (Roe, 1992a), thus denying the real pain that some women experience. These advertisements reinforce the myth (Wolf, 1991) that women should always be "beautiful" with smooth, graceful, healthy, odour-free, sexually alluring bodies.

Men, to honour the rule regulating their knowledge of menstruation, satisfy their curiosity about it as soon as they enter an intimate relationship with a woman and then conceal this knowledge in humour, according to Laws (1990). However, they retain misconceptions about menstruation, including the belief that it is a "polluted" discharge, a source of irrationality or emotional volatility in women, and as something affecting the sexual availability of women to men and therefore affecting the sexual enjoyment of men (Laws, 1990). Women do not link sexuality and menstruation so closely, but they absorb the messages about the "shamefulness" of menstruation (Roe, 1992a). It is within this context of social ambivalence, where menstruation is regarded as both "normal" and yet at the same time "not quite nice" enough to discuss openly and frankly, that New Zealand women, Maori and Pakeha, must negotiate decisions regarding appropriate behaviours and activities during menstruation. This context is not significantly modified when women enter the backcountry, where they have previously been and still remain a minority (Booth, 1989). Meyer (1989:59) has advised "women traipsing round in the great outdoors ... to develop a discreet, environmental approach to menstruation". Nowhere, it seems, are women free of the social requirement to keep their menstruation secret, and this has obvious implications for women menstruating in less convenient outdoor situations.

2.3 MENSTRUAL EDUCATION

Ideas about menstruation are derived by young New Zealand women from families, peers, the mass media and formal schooling as part of the health syllabus. Much emphasis is put on hygiene with girls being instructed to wash their hands before and after changing pads and tampons, and to change their menstrual wear as often as necessary to keep feeling fresh and to avoid odour (Newton, 1992). Echoing Laws, Newton argues "that the preoccupation with hygiene has much more to do with ensuring "protection" not from infections

but from other people - especially boys - knowing that girls have their periods" (Newton, 1992:16).

Hygiene concerns have a medical basis, too. Risk of vaginal infections and Toxic Shock Syndrome (TSS) are minimised by using lowest absorbency tampons whenever possible, changing tampons regularly (every four to six hours), washing hands before and afterwards and using tampons only for menstrual discharge (Consumer, 1992). A survey of Belgian women aged between 12 and 67 years, produced information on actual practices. It reported that "women had exactly the same changing habits whether they wore tampons or pads" and used higher absorbency products, changing them more regularly than four to five hourly at the beginning of their period. Both frequency of changing and product absorbency reduced toward the end of the period (Consumer, 1992).

Puberty talks also inform boys and girls that women experience moodiness, irritability and emotional volatility as a result of the changes in hormone balances associated with menstruation. This is of concern, according to Newton (1992), as these effects may be exaggerated and viewed negatively to the disadvantage of women in general and the advantage of the multi-million dollar PMS (Pre Menstrual Syndrome) and HRT (Hormone Replacement Therapy) industries. What is taught about menstruation in New Zealand schools and homes must influence the knowledge and attitudes with which women manage their menses in the backcountry. The preoccupation with hygiene is an issue which deserves further exploration as an influence on the participation of women in outdoor activities.

The education young women get about menstruation has been found to be lacking in many respects (Newton, 1992). Embarrassment disrupts communication in some families (Consumer, 1992; George and Murcott, 1992), discretion halts adequate social discourse on the subject and advertising campaigns by product manufacturers "seek to motivate us to buy their product and convince us that somehow without it we are undesirable, messy, lacking in confidence and doomed to a life of inactivity" (Clarke and Gilroy, 1993:13). Participation in physical activity, however, runs the risk of exposing evidence of menstruation, either because pads are difficult to conceal, or due to leakage during strenuous exercise. This causes a dilemma that some young women choose to resolve by refraining from physical activity (Prendergast, 1989) and clearly has implications for women beginning to participate in backcountry pursuits.

2.4 MENSTRUAL WEAR

Menstruation has been managed in many ways across time and culture. Some women have let their menses flow freely, but there is also a long tradition in making internal and external menstrual wear from available products. Indigenous Canadian women are reported to have utilised peat moss (Sphagnum spp) for menstrual management (Cameron, cited in Roe, 1992b) and as this moss has been known for centuries for its absorbency and mild antiseptic properties and is found in a wide range of habitats throughout the world (Roe, 1992b) it is likely that it has been used by women extensively for this purpose.

"[D]ry grasses, plant fibres, animal hair and fur, feathers and spiderwebs" have all been potentially available to women in the past for collecting menstrual discharge, with efficiency of method enhanced as weaving technologies advanced (Dadd, 1990; Roe, 1992b:10). In New Zealand, there is evidence that some Maori women continue to use mosses for menstrual management today (Roe, 1992b).

What Western women usually wear to collect menstrual flow has changed dramatically during the course of the twentieth century from cloth rags which were washable and reusable to disposable cellucotton pads and cotton (or cotton and rayon) tampons. Disposable pads (also known as sanitary towels, napkins or sanpads) were developed originally for use by overworked nurses during World War I (Maddux, 1975) and were commonly attached with elasticised belts and safety pins, although underpants designed to hold them were also available. These have largely been superseded by pads with an adhesive strip on the underside to hold them in place on the underwear. Plastic backing is now common as extra protection against leakage. In 1933, the first internal tampons became commercially available (Consumer's Association Ltd, 1991; Kroesa, 1990). Menstrual wear is a major part of the personal care product industry which manufactures items designed to contain and conceal human excretia. These products, which are characterised by absorbency and relative concealment when in use, include tampons, panty-liners, menstrual pads, incontinence shields, maternity pads and disposable infant diapers (Kroesa, 1990). The word "sanitary" is often used in conjunction with these products for marketing purposes and to indicate that the products are bleached, although not sterile (Roe, 1992b). Both pads and tampons come in a range of absorbancies. Since the 1960s the use of synthetic and modified natural absorbent polymers (known as "superabsorbents") have allowed the manufacture of smaller, thinner, more discreet, more absorbent products (Roe, 1992b). Although absorbency ratings may differ between manufacturers (Consumers Association Ltd, 1991; Consumer, 1992) physical size of each product still increases with absorbency and size will be a factor in the volume of waste created by menstrual management in the backcountry.

By the 1970s, tampons were the preferred form of menstrual wear for westernised women, especially women in the 14-35 age group (Kroesa, 1990) within which many outdoor recreationists fall (Booth, 1989). Seventy percent of New Zealand women are reported to prefer tampons to pads - a higher percentage than any other country (Consumer, 1992), but there are no available statistics for use of other forms of menstrual wear. A World Health Organisation Survey (in Treneman, 1989) found that one percent of British women and 57 percent of Egyptian women use home-made sanitary towels. Tampons are generally chosen for their convenience, although not all women can use them. Those who do would use on average 6000-7000 tampons during their reproductive years (Women's Environmental Network, 1989). Disposability has become an important aspect of the demand for menstrual products and it is this environmental issue with which the present study is concerned. In Britain, for example, the 14 million menstruating women in 1989 spent 150 million pounds on throw-away menstrual products (Roe, 1992b). Sales of such products are expected to rise as the ages of onset of menarche and menopause widen in developed countries and as manufacturers discover new markets in developing

countries and market new products such as panty-liners (Roe, 1992b). "Regular" sized, adhesive-style sanitary pads form the largest sector of the current market, but panty-liners are the fastest growing sector (Kroesa, 1990). Panty-liners are marketed as back-ups to tampons on heavy flow days, for use alone on light flow days and for use on inter-menstrual days to protect panties from the usual vaginal secretions (Clarke and Gilroy, 1993).

While disposable menstrual wear has been hailed as an advance for women in terms of comfort and convenience, it contributes to the human impact on the environment. There are also health concerns with the use of tampons. Toxic Shock Syndrome (TSS) resulting in death was first associated with wearing tampons in the 1970s. As a result, the super-absorbent tampons which were most implicated in TSS were withdrawn from production and women were advised to use the less absorbent types of tampon, changing them more frequently (Roe, 1992b). Clearly, environmental health may suffer under an increase in use of disposable products.

While tampon use may make backcountry recreation more accessible to women, facilities for menstrual waste disposal and menstrual hygiene are often minimal, and this may lead women to adopt different menstrual management practices from those used at home. For this reason, interviewees were asked what products they use both at home and outdoors and why they use them. Alternative products were identified during the course of this study. Reusable menstrual pads are available in New Zealand and from overseas, as are non-chlorine bleached tampons. Sea sponges are available locally at pharmacies, and an internally-worn rubber "cup" which collects menstrual flow is imported (Lynch, 1993a). It is also possible to use the contraceptive diaphragm as a cup to collect the menstrual flow (THAW, n.d.). A British group have produced sanitary wear disposal bags to encourage women to take their waste products home from beaches and parks. These have been available in New Zealand (Y's Eyes, 1993). Re-usable products such as those discussed above may be useful choices for women to use in the backcountry.

2.5 COMPOSITION OF MENSTRUAL WEAR

All North American and most Australian sanitary product manufacturers use chlorine-bleached kraft or sulphate pulp to produce the fluff pulp used in disposable absorbent sanitary products (Kroesa, 1990). Superabsorbent pads contain rayon, a synthetic fabric, which is made through a complicated chemical process, involving intensive chlorine bleaching. Scented and non-scented, deodorised and non-deodorised pads are available. Many of the chemicals used in deodorants are organochlorines, designed to kill bacteria and other micro-organisms (Kroesa, 1990) which may include the micro-flora in the soil where such articles are buried, thus delaying their decomposition.

Absorbency has both physical and chemical properties. The state-of-the-art absorbent core is air-laid cellulose fibre mixed with absorbent polymer (Brannon-Peppas and Harland, 1990). Many water soluble polymers have been made into absorbent compositions, but the industry standard has become lightly cross-linked partially neutralised polyacrylic acid. Cellulose fibres retain about

their own weight in aqueous fluids, however, "superabsorbents" typically retain thirty to fifty times their own weight of fluid (e.g., urine, blood). The bulk of aqueous fluid retained in a "superabsorbent" is in a "gelled" state (Brannon-Peppas and Harland, 1990). Sanitary products also contain traces of dioxin as well as the related chemical furan (Kroesa, 1990).

Recent entrants to the New Zealand market have been pads which have an absorbent core of processed peat moss. These products appear superior to many other pads in terms of absorbency and comfort, although they rely on a plastic backing shield, and the pads are also individually wrapped in plastic (Roe, 1992b). Plastic wrapping is not unique to these products but it exceeds that used in other products. Tampons are packaged individually in either paper or plastic and boxed in cardboard which in turn may be plastic wrapped. The collective packaging is less of a concern in the backcountry situation than the individual wrapping which is most likely to be retained until time of use.

2.6 INTERACTION WITH THE NATURAL ENVIRONMENT

Very little information is currently available on the environmental effect of menstrual waste disposal, as waste management literature has not traditionally separated menstrual waste from general toilet waste.

Synthetic superabsorbent polymers are soil conditioners, developed to aid plant establishment and growth in drought-prone situations. Cross-linked polyacrylamide expands upon contact with water creating a reservoir of moisture (Woodhouse and Johnson, 1991; Johnson and Leach, 1990). It is interesting to speculate on the effect of quantities of superabsorbent polymers buried in the soil on water availability to native New Zealand and invasive plant species (for example, in the vicinity of a popular backcountry bivi area). Further research into this effect may be required in the future.

Public health and safety nuisances from unmanaged waste disposal are: pest breeding and sustenance by providing harbourage and food supply for rats, flies and other vermin; the possibility of direct disease transmission; air pollution in the form of smoke and odour; potential fire hazard; potential to pollute surface and groundwater; and aesthetic considerations (National Center for Resource Recovery, 1974; Sanks & Asano, 1976). It is now well recognised that viruses retain their infectivity and survive in soils for up to six months, without significant interference from existing soil microflora. Viruses survive better at low rather than high temperatures and at soil moisture contents below 10% (uncommon in most backcountry areas in New Zealand) (Bitton, 1980). The major transport agent of pollutants in soil is water. Percolation through even the coarsest soil will remove bacteria and viruses within a few metres - 92-97% of micro-organisms are removed in the upper 1cm layer of the soil (Sanks and Asano, 1976). The decomposition rate of human excrement is greatly influenced by: soil types and textures; filterability (as measured in percolation rates); moisture content; slope of terrain; general exposure; insect inhabitation; pH; and temperature. The length of time required for decomposition of buried

human excrement and deactivation of associated bacteria under the best conditions is more than a year (Meyer, 1989; Cole, 1989).

2.7 WASTE DISPOSAL

During the 1980s, as the problem of general waste disposal compounded in westernised societies, it became apparent that menstrual wear disposal posed particular environmental problems. The Women's Environmental Network (WEN) was founded in Britain in 1988 to address environmental issues affecting women. One of the first issues addressed by WEN was "the sanitary protection scandal" (Costello *et al*, 1991) which examined the implications for both the environment and human health in the manufacture, bleaching and disposal of sanitary pads, tampons and babies' nappies. The disposal problems associated with menstrual wear can be summed up as effects on water resources and land resources:

- disposal of menstrual wear via sewage systems can lead to blockages of those systems, and cause millions of plastic strips to be dumped into the sea, where they remain indefinitely, causing visible pollution and endangering wildlife. Tampons, similarly, take up to 6 months to biodegrade at sea.
- disposal of sanpads, tampons and associated packaging via dumping leads to additional non-biodegradable burdens on reducing landfill space (WEN Newsletter, n.d.).

As a result of these findings, WEN recommended never flushing disposable menstrual wear (despite the advice of manufacturers) and using reusable menstrual wear instead of disposable varieties. WEN does not mention burning as an option for sanitary wear disposal, although burners are often provided for disposal in women's toilets in New Zealand and elsewhere. The addition of plastic to sanpads makes burning a less attractive option due to toxin release (WEN, 1989). A hot home fire would be adequate to dispose of menstrual wear but is not noticeably recommended. Toxin release would still be a concern as would the over-riding etiquette that women keep their menstruation a secret.

The Australian Wilderness Society advises wilderness recreationists to remove all their waste from the bush, including excrement, used toilet paper and menstrual wear. The Society does acknowledge, however, that some people will find this idea "too appalling" and suggests the option of taking a trowel into the bush to bury waste (ODT, 1992). Meyer (1989) recommends disposal of human excrement by burial in a shallow hole (<30cm deep) 50m from a surface water body. Information concerning paper, plastic and other synthetic products suggests that different guidelines are required for menstrual waste in the backcountry. In general, paper degrades only slowly and many plastics are inert (Sanitary Engineering Research Laboratory, 1969; Staudinger, 1970). Tampons, for example, degrade little, if any, in conventional landfills, and though they are claimed to be completely biodegradable, this process "takes up to 30 days in a sewerage [sic] digester, but can take up to six times longer in the sea and many years if anaerobic conditions prevail ..." (Consumer Association Ltd, 1991). Toxic chemicals may be released as degradation of synthetic products occurs and incineration may lead to toxic pollution, including dioxin emission (Oakland, 1988).

The extent of the potential pollution problem in backcountry areas has not been highlighted in the literature; indeed one author (Cole, 1989) argues that human waste in the wilderness is not a problem in itself - it only becomes a problem when other humans come into contact with it. Tampons are mentioned briefly by Cole (1989) as waste that should be packed out (except in grizzly bear country for safety reasons) or burnt on a very hot fire, never buried. However, there are dangers in times of high fire risk with burning paper products, including tampons (Cole, 1989).

The general consensus of popular backcountry literature is that in the absence of specific toilet facilities human bodily waste should be buried less than 30cm below the surface, in the top soil layer, enabling optimum bacterial decomposition. Careful site selection is essential~ to avoid the contamination of surface and underground water bodies and the transmission of potentially harmful viruses. Menstrual waste products are only infrequently mentioned and when they are it is advised that, like other paper and synthetic based articles, they should be carried out to avoid potential soil, water, air or visual pollution (Ministry for the Environment, 1988; Montgomery, 1982; Abbott and Mullins, 1983; Gates, 1981; Meyer, 1989; Capper, 1986).

Meyer (1989) advises that menstrual wear can be burned in campfires, rather than carried out, although the latter is her recommended method. She suggests having a day's supply of products handy in waterproof bags along with additional bags in which used products can be contained. The day supply can be renewed each evening from a bulk supply deeper in one's pack or bag, and used materials can then be collected in an outside pocket of a pack, or other suitable container, depending on the recreational activity (Meyer, 1989). Woodswomen, a Minneapolis, USA, outdoor recreation agency aims to pack out all waste but burns used menstrual products when it is possible and appropriate to create a very hot fire. Predatory animals (e.g., bears) are kept at bay by storing used waste away from campsites overnight, then carrying it in air tight, zip lock plastic bags that are enclosed in a second plastic garbage bag. When sponges are used, women participants are advised to rinse them using treated water away from any ground water source (Lynch, 1993b). This advice is oriented towards the American outdoor recreation scene, where tent camps, campfires, and pack horses are more usual than in New Zealand. The present study asks women what they do in typical New Zealand conditions using huts, fuel burners and back packs.

3. Method of investigation

3.1 INTERVIEWS

In-depth, personal, audio-taped interviews with 41 women were analysed. A "snowball" sampling technique was used to identify interviewees. Characteristics sought in interviewees were that they be female, with

experience of menstruation (either current or past), and be active users of backcountry areas for recreational purposes.

3.2 ACTIVITY CATEGORIES

Representation of each of the following backcountry activity categories was attained (number of interviewees given in parentheses):

High alpine terrain

- High use - multi-day trips and/or more than 20 days per year (8)
- Medium use - overnight trips and/or 10-20 days per year (3)
- Low use - occasional half-day or day trips (3)

Bush terrain

- High use - multi-day trips and/or more than 20 days per year (9)
- Medium use - overnight trips and/or 10-20 days per year (4)
- Low use - occasional half-day or day trips (3)

Coastal terrain

- High use - multi-day trips and/or more than 20 days per year (6)
- Medium use - overnight trips and/or 10-20 days per year (3)
- Low use - occasional half-day or day trips (2)

Activity participation level of the sample was influenced by the sampling method, thereby skewed toward higher levels of participation. Future research may target the less experienced outdoor participants. Over two thirds (68.3%) of the sample interviewed lived in the Canterbury conservancy area, while the rest (31.7%) lived in the Otago Conservancy. Geographical distribution was influenced by the sampling procedure though actively contained within these two conservancies. Interviewee ages ranged from 19 to 60 years (median and mean = 35 years). The majority of these women identified themselves as New Zealand European/Pakeha (87.80, with representation also from New Zealand Maori women (7.4%) and others (4.8% - Canadian, Anglo-Indian). Cross-cultural comparison was neither intended nor attempted. Women in the sample were from backgrounds consistent with the general characteristics for active outdoor recreation participants (Booth, 1989).

3.3 ANALYSIS

Data from interviews was analyzed after transcription by identifying themes raised by interviewees and drawing common elements and meanings from them. Numerical data is given in the discussion in order to illustrate the strength of a response within the sample of women studied. This information is reported in parentheses either as the number of respondents who shared the same view or as a percentage of the total number of responses where more than one response could be given by an individual. Where direct quotations from transcripts are used, they are exemplars, given with the informants pseudonym in parentheses.

4. Results

4.1 EXPERIENCE OF MENSTRUATION

For the women in this study, menstruation occurs on average every 30 days (range 20-32 days) and changes with age. Volume and duration of menses decreases and the occurrence of menstruation is less regular as menopause nears. Changes to an individuals menstrual pattern also occur with child-bearing, use of contraceptive drugs, and for some, with changes in regular daily routine. Ninety-one percent of the women interviewed reported that their periods occurred each month as expected ("regular"). Nine percent could not always be sure when a period may occur ("irregular"). In terms of outdoor recreation, irregularity may mean that individuals take menstrual products with them on all trips just in case a period occurs. On the other hand, women who know they are likely to begin menstruating while they are in the backcountry may well use products for a day or two beforehand so that they do not get "caught out" (i.e., bleed without a product in place). In this case more products are apt to be deposited than those actually used for the bleeding. This small point indicates the complexity of menstrual management issues women face when away from easily accessible facilities.

Five days was the average duration of any one menstrual period (range 2-7 days) with bleeding typically heavier on the first two days than on later days. Some respondents also reported pain and abdominal cramps. The duration and heaviness of a period influences how it is managed - which products are used, how often they are changed, and activity participation, as discussed in the following sections.

4.2 GENERAL PRODUCT USE

The number of products used during menstruation is directly linked to an individual's particular menstrual flow, concerns about health and availability of time and facilities for changing. The majority of respondents (61%) change their menstrual products three to four hourly during their days of heaviest bleeding, and less frequently on other days. Twenty-one per cent of respondents change less frequently than the majority and eighteen percent change more frequently than the majority. The number of products used per menstrual period is shown in Table 1.

TABLE 1: NUMBER OF PRODUCTS USED PER MENSTRUAL PERIOD.

Number of products used per menstrual period	1-10	11-20	21-30	31-40	41+
Frequency of respondents reporting this usage	6	23	8	3	1

Management of menstruation is achieved by using a single type or a combination of the commercially available products. Sixty-three percent of interviewees indicated that they use tampons, sixteen percent used pads and twenty-one percent used panty-liners. Two women had previously used sea sponges instead of tampons but no longer did so. Of those using tampons, twice as many (42%) use the non-applicator style than the number using tampons with applicators (21%). The use of panty-liners with tampons, or just panty-liners on light-flow days, was common. The reasons for using a particular product or not using another product fell into four categories: hygiene and health, comfort (physical and psychological) and convenience, economy, and disposal.

Tampons with applicators were described as more hygienic than those without applicators especially when one's hands would not necessarily be very clean. This concern with hygiene was also recorded by women who primarily use pads, partly due to a dislike of "putting something which is not hygienic into an hygienic area ... you're invading a sterile environment when you use tampons... " (Sylvia). Neither the vagina nor sanitary products are actually sterile, but both are "hygienic" in that sanitary products have been "sanitised" by being bleached and the vagina continuously sheds cells and fluid which could harbour harmful bacteria (Lynch, 1993c). Sponges were reported to become odorous after a few uses and tend to break up slowly with the possible problematic consequence of leaving particles in the vagina. Two respondents recorded concerns about the link between tampon use and cervical cancer, and with the absorption of moisture from the body when using tampons.

Tampon users considered this product to be more comfortable than pads, especially during physical activity, including water activities. Pads tended to chafe the legs when walking for long periods of time. Cardboard applicators were uncomfortable or difficult to use for three respondents while non-applicator tampons, pads and panty-liners were all reported to cause discomfort for a few by not staying in place. Psychological comfort was assisted by the use of pads or panty-liners in conjunction with tampons, when heavy bleeding might otherwise be visible on the underwear or outer garments (e.g., when doing strenuous activities). Sponges were also reported to leak when bleeding was heavy, and rinsing them out posed problems where hand basins were not situated inside the toilet cubicle. Similarly, secrecy of menstruation was a problem for pad-wearers in situations when clothing was tight or scant (e.g., wearing tights or swimming suits) or where the odour of the menses was obvious.

Pads were convenient to use in "emergency" situations and at night to avoid getting up to change a tampon. Several women reported using only pads or panty-liners on the last days of their periods when flow was minimal. This reduced the need to change tampons regularly and allowed them to minimise the number of changes required. Two respondents reported using panty-liners to keep their underwear clean (even when not menstruating), and in one case panty-liners were changed rather than changing underwear on outdoor trips so that the inconvenience of having to wash blood stained underwear was avoided. Tampons were generally deemed more convenient than pads as their smaller, compact size takes up less space in pockets and bags and are therefore

more discrete. Tampons with applicators are also apt to get squashed or bent rendering them ineffective.

In terms of economy, tampons without applicators were considered cheaper than the applicator style, and both types were considered cheaper than pads. Panty-liners were reported by one respondent as cheaper than both tampons and pads, but were seen as unnecessary by another. The two women who had used sponges indicated that because they tend to break up they would need to be renewed each month or sooner thus reducing any cost advantage they might have held over other products.

Disposability was the fourth element in discerning preference between products. Tampons without applicators are usually wrapped individually in plastic, and while this was identified as a positive factor for hygiene it was also identified as a problem for disposal. Disposal of the tampon itself was considered easy. Applicators were considered by some to be unnecessary, wasteful of resources and an additional burden for disposal. Comment was also passed on the packaging of some pads which was greater than that of tampons in general (especially those pads packaged in individual plastic pockets). This was a convenience for pad-users who utilised the plastic pockets to help keep unused pads dry and to re-wrap used pads where instant disposal was not appropriate.

4.3 DISPOSAL IN GENERAL

Menstrual products are disposed of by the majority of users in the easiest and most convenient way. Eighty percent of users flushed tampons down the toilet at home and work. Disposal of applicators was not mentioned except by three respondents who stated specifically that they flushed applicators while two others put them into the rubbish bin. Sixteen percent of users indicated that tampons are disposed of in the household rubbish and the remaining four percent burned their used tampons in an incinerator or home fire. Pads and panty-liners tended to be wrapped in (usually) toilet paper and placed in rubbish bins (73%) or burned (27%). One third (33%) of all responses regarding methods of disposal indicated that where sani-bins of any description are available in toilet cubicles specifically for menstrual waste these are the principle disposal method employed.

Informants who disposed of tampons via the toilet did so because it is easy, convenient, habitual, and rids them of the waste quickly. They also believe that the sewage system can cope with menstrual waste material. For one respondent, fear of her menstrual waste being seen if it was in the rubbish at home meant that flushing it was her only viable option. Four respondents, however, stated that their lack of faith in the ability of sewage systems to transport tampon material without blocking, and to then completely degrade the material, had lead them to use an alternative disposal method (in each case by putting tampons in the rubbish). Pads and panty-liners tend to be disposed of in the most convenient manner also - either in a fire where one is available or in the rubbish system. Using the toilet for these products was not an option for these women as sewage blockages would most likely result.

4.4 HYGIENE IN GENERAL

Handwashing and showering or bathing are the major forms of hygiene observed during the menstrual period by the women in this study. All women washed their hands after visiting the toilet and showered or bathed at least once a day while they were menstruating. For most (37) this latter practice was no different from what they would normally do the rest of the month. Many women (18) also washed their hands before visiting the toilet in order to limit the potential for bacteria to enter the vagina. Frequent changing of menstrual products was an important hygiene practice for seven women. Maintaining these practices in the outdoors may have implications for the way in which women manage their menstruation and disposal of menstrual products in the backcountry.

4.5 SOCIAL INFLUENCES ON MENSTRUATION

Despite the social customs restricting conversation about menstruating in some contexts, most women stated that although they "wouldn't go and announce it at morning breakfast" (Gretchen), they would not have a problem with others finding out that they were menstruating, and if they did need to ask someone for a tampon, or let others know that they were feeling tired or in pain they would not have difficulty doing so. Openness about menstruation for older women, however, depended partly on the social acceptance of such talk when they began menstruating and others reported that they would only let other people know if they thought it was appropriate-

"I think anyone reasonably young can cope ... But I think older people ... don't want to know anything about bottoms or whatever. So you just don't share any of that information. It's more for their own level of embarrassment ... (Gretchen).

Discretion regarding the fact that one is menstruating does not appear to be a major concern, then, for the women in this study. Discretion regarding the artifacts and practical expression of menstruation is discussed below.

5. Menstruation in the outdoors

5.1 HYGIENE

In general, women try to maintain their hygiene practices in the outdoors but it is usually difficult if not impossible to do so, largely due to inadequate water sources. Hygiene concerns centred on ensuring bacteria or other foreign matter was not introduced to the vagina when changing menstrual products and taking steps to avoid exposing oneself to the risk of Toxic Shock Syndrome.

The issue of handwashing was mentioned by 30 respondents, whose major comment was the difficulty of being able to wash their hands adequately before

and after changing menstrual products, especially in situations such as "rockclimbing when I've got chalk on my fingers" (Gretchen) or "if you've been handling ropes ... [and] your hands are really black" (Joyce). Handwashing practices were adapted to accommodate the situation by "rub[bing] my hands with light gravel or whatever to clean them after insertion ... "(Leanne), "wash[ing] my hands ... in a puddle, somewhere" (Liza), "put[ting] your hands in the snow" (Rosalind), "us[ing] grasses and leaves to wipe my hands on" (Jane) or "wash[ing] my hands with my drinking water" (Maria). Four respondents reported that inability to wash their hands did not present for them a hygiene problem even though they "get a bit mucky and grubby" (Mandy) while another four stated that they are consciously careful of hygiene when they are outdoors. Users of pads may feel more inclined to wash as the pads "chafe and the blood would stick to your pubic hair" (Emma).

Changing of menstrual products as regularly as recommended was "a bit of hassle, especially like on a long climb or in the mountains" (Gretchen; 9 respondents). Seven women stated that if they "couldn't get back to a but or to a toilet to change it, then you might use a tampon for longer ..." (Denise), or ·when I'm out I would wear a pad and a tampon, so that I don't need to change so often" (Sarah). Changing was a particular problem for Jane on one long kayak trip:- " ... I was thinking, 'I don't want to be sitting in my boat with a tampon in me for about four or five hours', and I thought 'Oh, I'll just play around at a short rapid you can get in and out of whenever you want'. I would have had to find a waterproof container for my tampons ... to take in the boat with me so I could change a tampon if I needed to. Or else I was going to bleed in my boat... I ended up just doing the whole trip anyway, because they said I was a wimp, and [I] just didn't change it" (Jane).

Reducing the frequency of changing tampons avoided changing them in inconvenient circumstances.

Hygiene concerns affected the products some women used, notably the use of applicator tampons when hands couldn't always be cleaned adequately (3 respondents) and the use of pre-moistened towelettes for hand-washing (2 respondents). Bathing or body-washing in the backcountry was achieved by fourteen women by splashing with cold water, a skinny dip on a fine day, a sponge bath from a basin taken away from the river, or going for a swim. Fifteen others reported that their outdoor activities meant bathing was just not possible. This was "just something you've got to put up with ... climbers are called `smellies' and it doesn't matter if they're male or female or whether they've got their period or not ..." (Sally). Not washing can result in body odour which "can be embarrassing for some women. Because when they do get their period they do smell quite strongly" (Sally) and some women were particularly sensitive to this as jenny noted-

"I'm more conscious of perhaps changing underwear and aware that you could start smelling ... I think as much as anything it's that you're aware that the smell could be unpleasant for other people ..." (Jenny).

Lack of opportunity to wash may not deter women from participation but does appear to have a significant impact on some womns' enjoyment of outdoor recreational experiences in the backcountry. For many (24) participants in this study, having a period while outdoors was "a bit of a hassle" (Moira) but for

most the "hassle" was "annoying ... but not [a] major problem" (Heidi). Only two of the forty-one interviewees specifically stated that they avoid outdoor pursuit activities during menstruation - one by avoiding trips altogether at that time and the other by using the contraceptive pill to manipulate her cycle. As a general rule, then, women in this study would prefer not to have to deal with menstruation in the backcountry but would not sacrifice their recreational opportunities to avoid doing so.

5.2 DISCRETION

Keeping menstruation a secret in the outdoors was not crucial for thirty-five interviewees. These women " ... don't usually tell anyone but ... also don't make a point of hiding the fact" (Claire) because although "... it's not ... something that you go around blabbing to everyone at the first chance ... it doesn't particularly worry or embarrass ..." (Maggie) them either. Four women specifically mentioned feelings of embarrassment if they had to tell others, particularly men (apart from sexual partners) that they had their periods. Older women recalled that when younger, menstruation "was absolutely secret" (Meredith), " ... a secret shame of women ..." (Jean). Younger women also reported that when it came to telling men, or people they don't know, they would " ... perhaps feel a bit shy ... " (Tess). In four cases where women were reluctant to tell others it was because " ... [t]hey're usually more embarrassed than I am" (Gretchen). The need for privacy created difficulties for washing oneself and more importantly for changing menstrual products. Communal backcountry huts, physical proximity to other people in recreational activities such as mountaineering and canoeing, and the terrain itself were commented on in this regard by nine women. "Hav[ing] a pee in the open" was tolerable "but changing a tampon's different" (Katherine), and even when "tramping with women ... you like a bit of privacy for changing" (Liza). "Just finding somewhere to [change] tampons is the main problem" (Isabel) and is "often difficult in a climbing situation" (Jean). One way the problem is solved is to "make what I consider to be an issue of it" (Jean) by:

> "tell[ing] my climbing partner that I need to change a tampon ... But I have been in situations where I've just put my pack down, sat on my pack, and turned away. [And I've said] 'Turn away, don't look back until I say so'. And it does bother me having to say that I'm going to have to do it. So I would tend to avoid that situation, if possible" (Jean).

Six respondents specifically stated that other people, male or female, are generally understanding of women's needs during menstruation. For these women, being discrete about menstruation provides a challenge but one that is overcome without undue embarrassment in most situations. In general, then, women experience menstruation in the backcountry as a tolerated annoyance.

5.3 MENSTRUATION AFFECTS OUTDOOR ACTIVITIES

While menstruation generally did not deter women from their outdoor recreation, it did have an effect on it, albeit for most (31) a small one. Mandy, for example, reported that:

"It did [influence me] when I was younger, now it doesn't at all. I've just gotten bigger and braver, and sometimes when I've been out climbing and haven't been able change a pad, and have just ended up with reasonably blood soaked trousers, I just think 'Well, that's too bad'. I remember once a male colleague was really concerned because my trousers were wet and frozen. Sometimes I think 'Oh, what a bother'. But usually it doesn't stop me doing anything. It doesn't stop me going surfing, even though the area I live in has got a lot of sharks. I'd still go surfing with my period, although a lot of women don't" (Mandy).

Eighteen interviewees indicated that despite physical and emotional discomfort, such as feeling "not as strong on my first day ... not up to your normal strength and standard of capabilities" (Sally), emotionally "wiped out" (Gretchen), and getting "really bad stomach cramps" (Maggie), they don't let menstruation deter them from the outdoors. Levels of enjoyment of the outdoors change with menstruation as the following statement indicates:

" ... whenever we've got a trip coming up, I'll go (counting the days) 'Oh great, I' m going to be fine'. It's more rejoicing that the level of enjoyment is likely to be more [without menstruating], but it doesn't actually stop me going and doing something" (Zena).

This rejoicing and relief is felt because, as Molly said, menstruation "definitely affects my activity, I'm a lot slower" (Molly). Pain and lethargy were reported to have similar effects on activity Qemma, Freda). For nine women, menstruation limited their participation in outdoor recreation to some extent. They would be "more likely to go away for a tramping trip or for something more low key ... rather than something adrenalin-rushing" (Gretchen) because of "stomach cramps on the first couple of days" (Maggie) and not "feel[ing] mentally or physically in the right frame of mind to do it" (Rosalind).

Katie, who stated that her menstruation usually has no effect on her backcountry recreation spoke of one experience when potential embarrassment did actually stop her from participating. She recalled:

" ... we were rafting. I was doing an instructing course ... and I forgot that I was going to get my period ... I had a wet suit on, and I didn't have any [menstrual products] with me and I thought 'Oh my God, what am I going to do?'. So I did whatever they asked me to do, but I couldn't get fully into it, because I was just scared that blood might come through and it would be so embarrassing. I didn't participate as much as I would have liked to. So in the end I arranged to come back on another day, because I was so embarrassed it might show ..." (Katie).

Menstruation has some effect then, on the backcountry recreation of many women, if not on the frequency of participation, then certainly on the quality and enjoyment of participation. Conversely, there is evidence that outdoor

activities affect menstruation. Five women reported that they have utilised their contraceptive pill to manipulate their periods. Freda recounted her reasons for doing so-

"I didn't have to worry about it. And it meant simple things like I won't have to go to the toilet as often. That's a pain if you're in a sea kayak ... You're also getting wet all the time, too. That's a real pain with a pad ... [I]t is difficult in terms of pollution and carrying extra tampons it's nicer not to carry [used tampons] around" (Freda).

Additionally, four women stated that participation in outdoor activities has the effect of altering the timing and/or the volume of their menses. Two women reported that their periods have not occurred when they have been in the backcountry, two reported that it usually arrived earlier than normal, and one stated that it was often shorter in duration. Menstruation then, influences, and is influenced by, backcountry recreation. It has a restraining effect on the level of enjoyment that women experience in the outdoors.

5.4 DISPOSAL OF MENSTRUAL PRODUCTS IN THE OUTDOORS

Women whose backcountry recreation lead them to be near but facilities use (usually long drop) toilets provided to dispose of their menstrual waste (25 responses). Others (16) did not commonly recreate near huts or in areas where the available sewage system could successfully process tampons (e.g., on boats) therefore the use of toilets was not an option for them.

Most of the women who did use the toilets (23) did so because "it was easier" (Emma) or because they felt there was "not much else you can do" (Maria). Three women stated that if travelling from but to but they would carry their used tampons, pads and panty-liners with them in plastic bags and dispose of them at the next but toilet. However, Freda differentiated between products she would dispose of there (tampons and applicators) and those she would carry out (pads). Disposal in toilets was not without it's ethical dilemmas for one woman for it meant still leaving them in the backcountry environment-

" ... if there's a but with a long-drop I'll often just drop it **down there, and** think to myself 'You shouldn't have done that... I don't like dropping them down the long drop but I don't feel so bad about that because there's a lot of other stuff down there" (Leanne).

Thirty-five women mentioned that they would bury their menstrual waste, or parts of it, at least in some specific situations. Burying was acceptable because "it's probably going to breakdown a lot quicker if it's in the ground" (Rosalind; 5 women) and " ... you don't want other people to see it" (Vicky). The discretion with which women feel they must dispose of their waste is evident. Thirteen women specifically mentioned a need to hide evidence of their menses, both in reference to burying it and putting it in toilets:

" ... where the toilet doesn't get emptied for a month [waste products] start coming up over the seat, and then you can't really dispose of them because everyone ... will see [them] ..." (Gretchen), and "in places overseas where all

garbage and people matter had to be bagged ... [the tampon] would just get wrapped up and dropped discretely in the corner so that it wasn't obvious to anyone what it was" (Alex).

There was also some concern expressed about the possibility of buried menstrual waste being dug up again by animals (6 responses) or inadvertently by other people (2 responses). For 12 women burying was not the preferred disposal method but in certain circumstances it was the one they used-

"Whenever I've had to leave one outdoors ... I think `I shouldn't be doing this'. But I haven't really a lot of alternatives. Or the alternative is really messy and inconvenient and I can't be bothered dealing with it" (Sally).

On long tramping, climbing or ski-touring trips where one is "out in the middle of nowhere in the snow" women have "just left them there in loo paper" (Claire) " ... but begrudgingly, not willingly. It's a situation you're forced into" (Sally). It was necessary in these cases to bury or leave waste under snow or rocks because "you don't want to carry smelly blood around with you" (Meredith). Where individuals use a variety of disposal methods the bush environment is seen as most conducive to burying while other methods (mainly carrying out and also burning) are used in rocky or alpine environments. Ease with which the products can be disposed of appears to be a major factor in women's choices of methods, with environmental concern a secondary consideration as the following statement indicates-

"[I'd] burn or bury ... Whichever is the easiest to do at the time. I think I prefer always to burn them if I can ... Because [burning] gets rid of it completely, in my mind. Burying, you don't really know. It's still in the ground. It's still got to decompose" (Jenny).

Techniques for burying menstrual waste centred on the style Emma used-

"You're usually wearing boots. So you ... kick a decent hole with your boot and bury it ... then cover it over with soil and leaf litter and then stones on top of that ..." (Emma).

Two women specifically stated that they would bury their waste "deeply", that is "with a depth of about six inches" (Wendy). Another four specifically stated that they would bury "probably quite shallow, but in the soil and then put the leaves back on" (Alice). Eight women reported burning their menstrual waste, three using this as their main form of disposal, as it is considered " ... cleaner, less odoursome ..." (Molly) and " ... you can dispose of them cleanly and efficiently ..." (Desiree). These women would " ... use a cooking fire after dinner to burn used products" (Mandy), especially if they were with just their partner, or "just surreptitiously throw them in the fire last thing at night" (Sally). Discretion is once again a major consideration with this disposal technique:

" ... I don't do it while people are around. You pick your moment. After everybody's cooked [their meals]" (Molly) and they're not sitting around it because " ... it's pretty yucky to bring them out ... it's just not something that's socially done ..." (Zena), "the smell is not very nice" (Sally) and "wrappings have a habit of revealing what's being burnt ... those few moments to engulf the thing in flames. I can remember thinking 'Oh my God, I hope nobody comes in just at this moment"' (Liz).

However in a lot of places it's no longer appropriate to have fires and in some womns' experiences tampons "... don't burn because they're so wet" (Sally). The alpine situation appears to have mixed merits for burning of menstrual products. Claire reported burning them when she had the option of using a but toilet "which is emptied over the glacier when it is full", however the logistics of alpine recreation may conspire against this practice generally as Sally explains: "There's no way you could burn them, not on their own. In a high alpine situation you keep all your fuel for your primus to cook meals, to melt water ... to carry that weight around just to burn a tampon I think is false economy. You've just got to travel light. The more weight you carry the slower you go, the more dangerous it is". (Sally).

Cultural and environmental/economic factors may also impact on the efficacy of burning, for instance, " ... in Nepal you're not supposed to put things in the fire. Because the fire is sacred and the smoke goes up to the gods. And if you burn anything like that you're insulting the gods"; additionally "you shouldn't have fires at all anyway because the wood's in so short supply" (Sally).

Carrying menstrual waste out of the backcountry and disposing of it elsewhere was the third major disposal method used by the women in this study. Carrying out was considered "not very pleasant" but "it's definitely better than leaving the stuff there" (Leanne). Eleven women reported carrying out as their preferred or main method if disposal in toilets was not possible, while twelve used this method in specific conditions, for example " ... if there's hard ground that you can't bury them" (Desiree) or "in the snow above the bushline" (Jean). Coastal areas, on rivers and at sea were other situations where women reported they would carry out their waste. Type of product appears to have some effect on likelihood of waste being carried out- " ... pads are so much cleaner to [carry out] than tampons" (Jenny), so users of pads and panty-liners in the outdoors may be more inclined to bring their waste products back with them. Additionally, pads are " ... backed with the plastic which will not disintegrate" (Desiree) and panty-liners have a lining that's plastic so these items tend to be carried out. Among the women who bury or burn their waste, plastic backing on panty-liners, pads, and the plastic wrappings of tampons tend to be carried out (6 women). For three women carrying out was only an option when other disposal methods were unavailable.

Techniques for carrying waste out consisted mainly of wrapping used products in extra toilet paper, placing them in paper (1 response) or plastic (8 responses) bags, and then carrying them " ...triple-bagged" (Joyce) "in the top pocket of my pack, ... not where you've got your clothes and food ..." (Sally). A personal supply of toilet paper assisted this process. The women who tend to carry out their used products characteristically do so because " ... it does take a while to decompose" (Katie). For five women concerns about water-borne or fly-borne disease, originating from buried menstrual waste, caused them to question the practice of burying and to consider alternatives.

Whatever their disposal practices most (30) of the women interviewed shared an environmental ethic based on caring for and protecting the environment for itself, and so that others may have pleasant experiences after them: " I don't want to leave them in the environment. I believe in taking out what I take in. Particularly in the form of rubbish. And that's rubbish" (Jocelyn).

5.5 DISPOSAL AFFECTING ACTIVITY

Despite the ethical standpoint just mentioned, 25 women stated that disposal of menstrual waste would not influence their outdoor activity while one woman responded that she might make slight alterations to her plans to accommodate disposal of menstrual waste (i.e., "detour slightly to go to a hut" (Sarah)). For others, outdoor activity was not affected per se, but the backcountry environment "influences where [they] change a tampon." (Jane). For instance, .you might hold off for a while till you can find a place where you can change, bury, or discretely shove it in a bag and take it back out with you" (Desiree).

5.6 ENVIRONMENTAL IMPACTS OF DISPOSING OF MENSTRUAL WASTE

Eight of the women interviewed had not consciously considered the environmental impacts of disposing of menstrual waste in the backcountry until they became involved in this research. Thirty-three women reported that they do consider environmental impacts and when asked what these impacts might be two thought it would " be fairly minimal" (Coral) especially " ... on land ... as I would have thought it would eventually rot down in the toilet paper" (Claire). The majority felt that the impacts were more significant, particularly "the visual impact" (Desiree) which is "an eyesore" according to Molly and fourteen others. Seeing menstrual waste, human faecal matter, toilet paper and used tissues detracts from the outdoor experience for nine women who stated that "it's a pretty unpleasant thing to find" (Moira) as "[i]t spoils the whole pristine scene" (Sally) and "it will have an effect on other people's sensibility as they come across it" (Moira).

Degradation of the quality of the backcountry environment by rubbish was an impact identified by twenty women. Plastic components of menstrual products were a particular concern for three informants. Water pollution was identified as a health hazard to human users of an area (4 respondents). Interviewees considered that " ... you need to be really really careful to have [waste] away from any water ..." (Emma) as " ... all the bertie germs do get leached out of wherever they've been dug in and eventually filtered down to the river systems" (Leanne). "It's not hygienic" (Molly), there are "problems with giardia ... even in a glaciated area, it's going to heat up over summer, and it can stink and rot and fester" (Moira). Specific environmental impacts identified included the effect of "the chemicals they use in the bleaching process which end up in the soil" (Rosalind). Liza felt that " ... as far as the earth goes, burying tampons doesn't do any harm" but Freda was of the opinion that " ... the paper ... must have an impact on nutrients and plant growth ... [and] the actual waste itself ... must alter the structure of the soil ...". Stella attempted to reduce the impact on the flora by trying to " ... find a place [where] I'm not going to disturb any plants" before going to the toilet. On the other hand, Meredith's efforts to reduce the amount of paper left in the bush led her to " ... never take toilet paper in the bush with us. We look for a suitable large leaf or small moss to wipe [our] selves with".

Interactions between fauna and menstrual waste (four responses) focused on the resulting visual pollution if animals and birds (e.g., "the kea, who have a go at everything" (Molly)), dug up used products. Degree of environmental impact was considered to vary with use (12 respondents), for example " ... fewer women climbers go into the alpine areas" (Moira) but there are " ... lots and lots of women tramping in the bush" so "there would be quite a lot of disturbance to the environment" (Alice). Areas of very high usage tend to have adequate toilet facilities according to Heidi, but Zena's concern was that " ... we're now trying to get more women into the outdoors and that will have an increasing impact all the time".

Although interviewees identified a number of environmental impacts resulting from the disposal of menstrual waste, none had firmer evidence than anecdotal observations and generalisations for their views. A strong call was made for information to be made available to women about alternative products and appropriate practices.

5.7 TACKLING ENVIRONMENTAL IMPACT

When asked what could be done about the environmental impact of menstrual waste disposal in the backcountry, thirty-one women reported that " ... information needs to be available and circulated ... about what the best practices are ..." (Alice), " ... especially for people who aren't out there all the time, or just aren't sure what to do ... you need to be able to find out and for some people it's obviously embarrassing to ask" (Louise). According to Katie " ... people don't mind ... being environmentally sensitive. [It] makes them feel quite good ... being in the outdoors and doing the right thing". To be convincing, information provided would have to include ecological facts about "the impacts that bad practices have on the environment" (Alice), and the level of urgency placed on cleaning up. Menstrual waste disposal practices have developed more out of a concern for inconvenience to humans than for deterioration to the environment -

" Normally you're told not to flush pads down a toilet because it clogs up the sewage system, not because the plastic ends up out in the harbours..." (Freda). As a result, women are ill-informed about "downstream" effects.

There was a call for more openness about menstruation and menstrual waste disposal from five interviewees who felt that " ... it should be as freely discussed as we are discussing the giardia problem" (Emma). The results of such openness would be of benefit to both the environment and women's outdoor experiences as not knowing "proper backcountry toilet techniques ... prevents participation in outdoor activities and encourages bad habits. By discussing these issues before they become a problem it can help make everyone more comfortable" (Louise).

Information dissemination and general education about menstruation in the outdoors could be achieved by way of pamphlets similar to those produced for giardia education and the environmental care code (8 responses) and through outdoor education courses at school and outdoor centres (12 responses). Structured opportunities for information dissemination were advised by

interviewees rather than only informal avenues because the latter may not always be reliable as in the case of young women introduced to the backcountry by male peers. Similarly, all-female groupings may not ensure the issue is tackled according to Jemma:

"No-one ever really talked to me [about it], and I tramp with women all the time. We haven't really ever considered that our waste might be a problem in the backcountry, and yet we're very conscious about everything else in there. We pick up other people's rubbish and plastic as we walk through. Maybe we need some education as well."

Targeting young women was viewed as particularly fruitful, as "they are a captive audience" (Moira) and are "normally people who are just starting to go out in the outdoors" (Joyce). They do not get adequate information at the present time and are frequently "thrown into a communal bunk situation where there's no privacy" (Aroha). Without education in toiletting practices they are "probably far too embarrassed to ask for information" (Aroha) and "teachers never tell you, so you just blunder your way along ... you talk to the other girls about it but nobody is fully informed enough" (Katie). As a result, "they have no idea how to handle that sort of thing in the outdoors" (Joyce). Education is needed in schools " ... to teach young women that it isn't a hassle ... they shouldn't be embarrassed by it" (Molly). Tramping and other outdoor clubs, outdoor recreation groups, visitor centres, guide books, backcountry huts, toilet facilities, outdoor recreation magazines, outdoor education centres, are other suggested avenues for disseminating this information.

If carrying out is the most environmentally defensible way to deal with menstrual waste then development of containers and other equipment to facilitate this method is required. There will also have to be publicity indicating that carrying used products is "acceptable and easy and doesn't smell and you wouldn't have to look at it" (Zena). In short, the solution appears to be two-pronged - "making women aware of what's actually happening and then giving them an alternative" (Rosalind).

5.8 ALTERNATIVES

Use of disposable tampons and pads to manage menses has led women to dispose of the used products in the most convenient way - for many this is to bury them. Burial is considered unacceptable by many people as the literature and interviews indicate, so alternatives are sought. Acceptable solutions may be found by altering either the products used or current disposal methods, or both. The emphasis is on alternatives which reduce the amount of waste left in the backcountry environment, which suggests the use of reusable products, and/or disposing of waste by burning it or carrying it out.

Half the women in this sample were aware sea sponges can be worn internally although only five had actually done so. Eleven others knew of reusable pads. One had used a contraceptive diaphragm as a menstrual receptacle and the others were not aware of any alternatives to disposables. When informed of the range of alternatives available, the majority of the interviewees found the idea of an alternative acceptable. Ten women indicated an interest in using sea-

sponges, eight in using an internal "cup" device, and five in reusable pads. Another fourteen said that they would use an alternative product if they were convinced it was important enough to do so. Four would not voluntarily alter the products they used. Major reasons for the popularity of internal devices were privacy (they can't be seen when in use), convenience (easy to wash and use) and comfort. Concern about hygiene with, leakage from, and rinsing of, reusable devices was voiced. Rinsing before re-using products was identified as a particular difficulty and a potential source of embarrassment, especially where water was not available in the privacy of the toilet site.

Only three informants were unaware of disposal methods other than burying. Burning and carrying out were otherwise widely acknowledged. Eighteen women stated that they would be prepared 'to use an alternative disposal method, and for twelve it would be carrying out. Three would not entertain this option and six would burn their waste when appropriate. Alternative methods, if they were to be adopted, had to be convenient for the women concerned. In light of this need, burning was identified as problematic due to the issues of privacy, effectiveness, social acceptability, toxin release from the combustion of plastics and environmental impact of fires. Unless disposal of waste in but toilets becomes unacceptable, it is unlikely that women will burn their used products in proximity to such facilities. Backcountry users would be more likely to burn used products where there are no toilet facilities, especially when it means reducing the volume of waste materials being carried out.

6. Summary

The women in this study are typical of women generally in their social experiences of menstruation. Hygiene, discretion and privacy are central concerns in their choice of menstrual management practices. Education about menstrual management is widely considered to be insufficient, resulting in an unnecessary lack of confidence which undermines some women's participation in physical recreation activities.

Menstrual wear used by women in backcountry recreation is currently limited to disposable pads and tampons. This product use reflects the general trend of tampon use by two thirds of the menstruating population. Products are chosen for their effectiveness, discretion, comfort and disposability. Women manage and dispose of their menstrual waste in home environments in the most clean and convenient manner available and prefer to continue doing so when in the backcountry. Handwashing is a major concern when outdoors, as is discretion and privacy in communal living situations. Menstruation influences, and is influenced by, backcountry recreation. It has a restraining effect on the level of enjoyment that women experience in their outdoor pursuit activities. While the women in this study would not sacrifice their recreational opportunities because of their periods, they would prefer not to have to deal with menstruation in the backcountry.

Menstrual products consist of various combinations of cotton, rayon and super-absorbent polymers. Some toxic chemicals (organo-chlorines, dioxin, furan) are present. Products also contain plastics (e.g., the waterproof lining of pads) and/or are packaged in plastic. Toxification of soil and waterways, artificial soil conditioning, accumulation of rubbish and degradation of aesthetic qualities are potential consequences of the interaction of menstrual waste with the backcountry environment. These effects are well recognised by the women studied. There was a strong call made for information to be made available to women about alternative products and appropriate disposal practices. Schools, tramping and other outdoor clubs, outdoor recreation groups, visitor centres, guide books, backcountry huts, toilet facilities, outdoor recreation magazines, outdoor education centres, were suggested avenues for the dissemination of this information.

It is generally recommended in the outdoor recreation literature that human waste should be buried in the soil layer and covered over, or that it should be carried out and disposed of via urban refuse systems. Burning of waste is a less frequently advised option and opinions differ over the efficacy and ethics of both burning and burying.

Wherever possible, women in this study dispose of their menstrual waste by way of the facilities provided at back-country huts. Where this is not possible, the majority bury their waste, a quarter of the sample usually carry it out and a smaller number burn it.

The concept of using alternative re-usable products was well accepted among the interviewees, although a significant proportion sought convincing evidence of the necessity to use such alternatives. Internal devices were more popular than external styles but none were without some factor of inconvenience as trial results indicate. Information about alternative products was sought by many interviewees.

Burning and carrying out were identified as acceptable alternative disposal practices, however burning is seen as the more problematic of the two options.

7. Conclusions

1. There is general understanding by the women studied that disposal of menstrual waste in the outdoors leaves non- or very slowly decomposing material at the disposal site, potentially creating both ecological and aesthetic pollution.
2. Menstrual waste is primarily buried by backcountry recreation participants.
3. Insufficient information is available to women on the environmental impacts of menstrual waste and on alternative behaviours which reduce the impact.
4. Optimal disposal methods for each of the three terrain conditions considered are similar. Carrying out was considered the ideal for all waste in backcountry areas. Burning of paper and cotton-based products was also

considered to be acceptable, though often difficult. Burial of menstrual waste is indicated only as a secondary option and only away from bodies of water in places where the soil structure is sufficient to allow decomposition to occur.

5. Backcountry recreation resource managers have a vital role to play in informing the public about the impact of their recreational behaviours and of how to reduce those impacts.

8. Suggestions

INFORMATION

- Use the words "carry home" instead of "carry out" on all literature in order to encourage backcountry recreationists to take all rubbish home rather than dump it in the first convenient receptacle i.e., at a hut, or a roadside.
- Pamphlets such as "Finding a Toilet in New Zealand" should make specific reference to menstrual waste in order to heighten public awareness of the need to dispose of this material appropriately. At present, the pamphlet encourages people to "bury human waste" which includes menstrual waste by default. Suggested wording: "Be careful to bury human excrement and carry home paper and sanitary products".
- A separate pamphlet could be produced which deals specifically with menstrual waste and which contains information on the environmental effects of leaving used menstrual products in the backcountry and gives information on the availability of alternative disposal methods.
- Information such as the package on alternative menstrual products produced by the Nelson Environment Centre (Nelson Environment Centre, 1993) could be distributed to information centres and other appropriate outlets; backcountry recreation agencies, backcountry tourism agencies, tourist accommodation agencies and outdoor education agencies so that the public can become more informed about the issue of waste in backcountry areas.
- All outdoor recreation clubs, outdoor education centres, schools, and outdoor recreation tourism agencies should be informed on the appropriate disposal of menstrual waste.

EDUCATION

- All people involved in outdoor education, outdoor recreation, and backcountry tourism, should be educated on the issues surrounding menstruation in the backcountry and potential solutions to these issues.
- All conservation estate managers, outdoor education, outdoor recreation and backcountry tourism managers should be educated about the issues

surrounding menstruation in the backcountry and the disposal of menstrual waste so that appropriate policies can be developed and implemented.

FACILITIES AND EQUIPMENT

- Make specific mention of menstrual waste in notices about waste disposal displayed on toilet facilities and in huts to highlight the need to include this waste in rubbish carried home. The words "including sanitary products" should be added to statements which advise people to carry home all their rubbish.
- "Carry-home" bags provided by DoC or other agencies could include specific mention of menstrual waste. The words "including sanitary products" could be added where appropriate.
- "Carry-home" bags could be available in dark colours and with air-tight closures to facilitate carrying-home of used menstrual products
- Signs placed in all backcountry toilet facilities should clearly indicate whether or not menstrual waste can be disposed of via the toilet system, and what alternative methods are to be used if not the toilet.
- Hand wash facilities should be provided inside all toilet cubicles in order to facilitate general hygiene and the washing of reusable menstrual products.
- Development of a reusable container for the carrying home of used menstrual products could be encouraged so that reliance on disposable plastic bags is reduced in the long term.

OTHER

- Research should be conducted on potential health problems arising from a policy of carrying home waste from the backcountry. Encouraging people to carry home waste (including used toilet paper, menstrual products and infant diapers) may result in health problems arising from the dumping of faecal matter and blood in either road-end rubbish receptacles or urban refuse tips.
- Any agency developing policy about the disposal of menstrual waste should seek Maori advice regarding the impact of waste disposal practices on Maori spiritual values associated with land and water, and use this advice to inform policy.

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11. Appendix 1
Interview schedule

Backcountry Menstrual Waste Research Project

Department of Parks, Recreation and Tourism
Lincoln University

Cover Sheet

Name:

Address:

Phone:

Times during 1993 you know you will be unavailable for checking transcript:

Pseudonym: 1.

2.

3.

Age:

Occupation:

Ethnicity:

Major backcountry activities:
(Please state)

Alpine

Bush

Coast

Level of Participation:
(Please circle)

Multi-day trips and/or more than 20 days per year

Overnight trips and/or 10-20 trips per year

Occassional half-day or day trips

BACKCOUNTRY MENSTRUAL WASTE DISPOSAL STUDY

CONSENT FORM

Thank you for allowing us to conduct an interview with you.

We ask that you read, fill out, sign and return this form to protect your privacy and interests. This form will remain with your interview transcript. The tape recording of your interview will be wiped on completion of the study.

Interviewees Name:
Address:
Interviewers Name:
Commissioning Body:

1, PLACEMENT.

I agree that the transcript of my interview may be archived at Lincoln University.

2. ACCESS.

I agree to the transcript of my interview being made available to, and/or copies supplied to, bona fide researchers on the conditions I state below:

I wish to exclude the material nominated below:

3. PUBLICATION (delete one option):

Consent Option One:
I consent to the use of information in my interview for the Backcountry Menstrual Waste Disposal Study being used for publications relating to this research.

OR

Consent Option Two:
I consent to the use of information in my interview for the Backcountry Menstrual Waste Disposal Study being used for publications relating to this research under the following condition(s):

Signature of Interviewee:
Date:

Signature of Interviewer:
Date:

Your consent to any or all of the terms above may be withdrawn at any time by notifying the researcher at the address below:

Pip Lynch, Department of Parks, Recreation and Tourism, P. O. Box 84, Lincoln University, Canterbury.
PH (03) 3252-811 ext 8179 Fax (03) 3253-857

12. Appendix 2 Activities interviewees participated in

NB: Frequencies exceed the number of interviewees as individuals participated in more than one activity:

Area	Activity	Frequency of Response
Alpine terrain	Skiing	10
	Mountaineering/ Rockclimbing	20
	Tramping/Campmg	9
Bush Terrain	Rockclimbing	3
	Mountain biking	1
	Tramping/Camping	36
	Kayaking/Canoeing/ Rafting	7
Coastal Terrain	Horse Trekking	1
	Biking	1
	Kayaking/Canoeing/ Rafting	13
	Windsurfing/ Surfing/Sailing	5
	Swimming	1
	Tramping/Camping	9