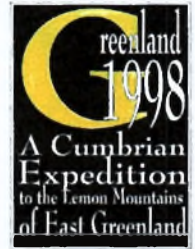


## Cumbria – East Greenland Expedition 1998



# Expedition Report

A mountaineering expedition  
to the Lemon Mountains  
area of east Greenland



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# 1. Summary

The Cumbria – East Greenland Expedition 1998 travelled from Glasgow to Iceland and then by ski plane to land on the Cocker Gletscher in the Lemon Mountains of east Greenland. The expedition team of nine climbers completed a series of first ascents in the area around base camp over the next two and a half weeks, despite the relatively unsettled weather conditions that prevailed during this period. The team then journeyed for six days out to the coastal airstrip at Sodalen where they were picked up and flown back to Iceland.

Though primarily a mountaineering trip, throughout our time in East Greenland members also recorded observations of birds and vascular plants in a number of different locations.

Steve Brailey – Expedition Leader

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## **2. Acknowledgements**

We must express our thanks to the following. Without them, this expedition would not have been the success it was:

The Mount Everest Foundation  
The British Mountaineering Council  
Arnar Por Stefansson  
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Marty Hetherington

Elsa Brailey, Chris Haslam and the other expedition wives and partners

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### 3. Introduction

In 1994 I was fortunate enough to be invited on the East Greenland Expedition to the Lemon Mountains area. We traveled to Greenland on an old RNLI ocean going lifeboat, and although we managed a number of successful ascents, the sea ice prevented us from visiting the area we had originally intended. Looking across to the main area of the Lemon Mountains from one of the summits we climbed I vowed to return one day, though next time it would be using a ski equipped plane. This was not only to shorten the journey time to Greenland but also to avoid the chance of encountering another force 8 storm across the Denmark Strait!

The Cumbria-East Greenland Expedition left Glasgow airport on 18<sup>th</sup> July after a year of preparation. In Iceland we were lucky enough to meet up with some old and new friends from the mountain rescue teams in Reykjavik and Isafjodur. Their hospitality was truly overwhelming.

We had planned to airdrop the majority of our equipment and food from a Piper Chieftain, expedition members flying in a Twin Otter and landing on the glacier. On the evening of 18<sup>th</sup> July we were informed by the Greenland authorities that our planned airdrop could not go ahead. We were fortunate to be able to arrange two Twin Otter flights instead, but at an increased cost. On 19<sup>th</sup> July we flew from Isafjodur in two groups by ski equipped Twin Otter. The condition of the glaciers made it impossible for us to land on the Chisel Gletscher as we had planned. Fortunately though, it was possible to land on our second choice glacier just south of Mejsle.



The weather conditions when we arrived were less than perfect. By the time the second Twin Otter flight arrived it was snowing and the cloud level had dropped to around the height of the landing site. We were very impressed with the skill of the pilots and the capability of planes that are about 20 years old.

We assembled our pulks and moved the equipment in two journeys to a base camp (photo) just below the south face of Crystal Peak.

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## 4. The Climbs

Further information on the climbs undertaken in Appendix B towards the end of the report.

### Thunder Road

Descending and crossing two glaciers was the starting task of this climb. To get from Base camp to the foot of the mountain was a six hour trek. We felt very much alone and at points wished we had not attempted such a long journey so near the start of the Expedition. It took us about an hour to ski up to the ice fall half way to the main col that we were heading for. It was at this point that we left the skis to pick up later. The snow cover on the glacier was mostly complete and very few of the crevasses were open.

We weaved our way up and through the ice fall taking it on the right hand side. The crevasses were surprisingly large and took about an hour to get round or over. I was pleased that we were not working at altitude. Once we were above the ice fall we climbed the remaining 45 to 50 degree ice slope on the left hand side.

We reached the col approximately three hours after leaving the Fredericksborg glacier. The col was rocky with some plant life. We were tired as we had been on the move for nine or ten hours at this point. The ridge running left to the summit was technically easy. We crossed several small summits and a higher col. We would descend from this point as we decided that the way we had come up would not be a good way down in the softer snow of the afternoon.



The summit ridge which was formed of bright red granite and held an abundance of plant life. It took about 2 hours to reach summit after the lower col with one small area of technical difficulty 300 feet below the summit. The summit was a round snow dome heavily corniced on the north side (photo left).

We descended from the higher col onto a small glacier underneath the north face of the summit. The snow was soft at this point and we moved very slowly. We had decided to make it back to where we had left the skis and bivi there for the night. Very tired we flopped into our bivi, sixteen hours after we had left the base camp. We had a fitful night with no hot food, as the stove was not working. Bursts of sunshine kept hitting us as the sun rose and fell behind the horizon to the north. We got up after six hours in the bivi and took ten hours to reverse our route to base camp.

On the return journey we had decided to head for the flatter area approximately half a mile up the Frederiksborg glacier. At first this seemed to go in our favour, we were lead into a false sense of security. At about the half way point we came across a mass of glacial rivers.

Apart from the smallest these were impossible to cross, either being too wide or the banks being too steep and a long way off the river. We finally found the point where the whole system of rivers disappeared down a massive hole producing a massive roaring noise. Ian and I shrugged our shoulders and gulped, we were veterans of the ice flow now!

Colin Dulson

## Isobelar

At 10.00pm on a beautiful clear sunlit night myself and Gwyn Lewis set off to explore the group of three distinct pinnacles behind base camp. Conditions on the glacier were perfect as the temperature was quite low. Unfortunately not far from camp we started to encounter increasingly large crevasse problems, which was a feature of the entire trip.

We pressed on until we eventually reached the Bergschrund at the base of the first pinnacle. The glacier above led to a Col and what would be an easy scramble to the summit of the first and second pinnacles. Instead of this climb we decided to take a look at the third pinnacle and began a rising traverse towards a distinctive col between the third pinnacle and a much larger mountain. On very friable rock we reached the Col at 1.00am. I proceed solo along the ridge and up the last 100 metres to the top of the pinnacle. The climbing was easy but was in very poor, loose condition. The descent proved, as usual, to be more difficult. The reward was the summit panorama which opened up towards Icon Peak was superb.

Sitting here on the first day of the expedition by myself enjoying the view in the warm midnight sun was exactly what I'd come to Greenland to find. Another point of note was finding in this most inhospitable of places a beautiful little red flower! The journey back to base camp was just as difficult and long and resulted in me popping into a small crevasse from which I extricated myself.

We arrived back in camp at 4.00am.

Overall the route would be graded PD (alpine)

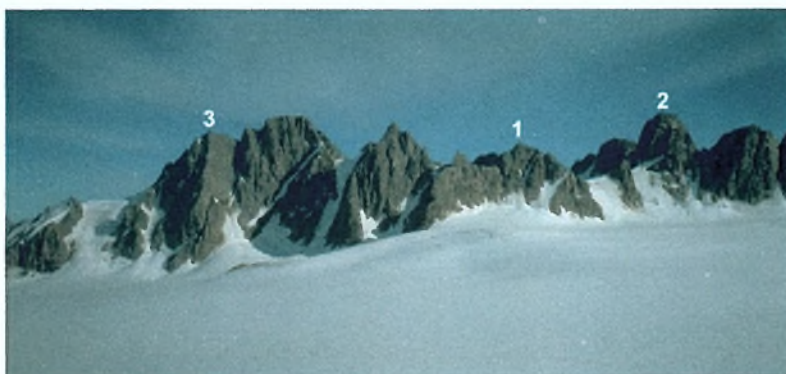
David Wilson

## Laurenar

Pete Dawson and myself set off on skis on good hard snow across the Cocker Gletscher at 4.00am. The target a peak distinguished by a left to right snow slope reaching the summit ridge at mid height to the left of an obvious Col.

After approximately 2 hours skiing we reached the avalanche cone at the foot of the climb. We roped up at the Bergschrund which presented no difficulties onto good neve of about 70degree. The ramp led up the face with good rock protection to the left.

Three full pitches of grade 2/3 (Scottish) saw us reach the main ridge where we stopped for breakfast.



The weather was increasingly becoming overcast and warmer and we debated whether to continue. Our decision to continue was based on the observation of how slow weather seemed to come in. We scrambled along the ridge moving together. The rock was very friable but we were pleased to find several plants including a small tree for Keith Miller's Botanical survey.

After a few hundred metres the ridge steepened to provide a full 50metre pitch which we graded VD. The pitch brought us again onto a rising rock ridge on which we encountered several little difficulties (fun). We arrived at the summit at 11.00am (photo, peak 1).

We retraced our route back to where the ice climb joined the ridge but decided to carry on down the ridge to the distinctive large col. Once here we began a protracted descent of the glacier in very warm conditions with water running everywhere!

Eventually, plodding back to where we left the ski's at 1.00pm.

The route back to the camp was pure fun, unroped, heels clipped, two of the worst skiers, as downhill we covered the distance back to camp, jumping several crevasses, in 30 minutes!

Laurenar proved to be an enjoyable short day out offering ice and rock climbing and some fantastic exposure. Overall, we graded the route AD.

David Wilson

## **Mejslen – SW Ridge of South summit**

The temperature during the day and night had not varied by many degrees at all during the expedition so far. It had been raining during the morning and cleared up at midday, so a shorter climbing trip was planned up the unclimbed SW ridge of the Chisel group. We had been looking at it a lot as it dominated our eastern view. There was just one obvious steepening at three quarters height, near the intrusion.

The group of Colin Dulson, Dave Wilson, Keith Miller and Pete Dawson set off at 1pm saying that they would be back for a late supper that night. Little did they know that they would return at 11.30am the next day!

The skis were better than the snowshoes for crossing the widening crevasses. The weather had turned very sunny. Keith had forgotten his crampons, so he snowshoed up the first easy slope encountered. The route started badly up a very poor gully, with lots of rocks falling around the four. Pete and Dave reached the top of the gully and Pete made an airy climb around a blind corner. A drop of 200m was below their feet. The slabs above were excellent quality, steep solid rock with good holds, around severe grade. They then moved together for several hundred metres, until the rock steepened.

A beautiful sharp ridge lead up to the Skiergard Intrusion. The intrusion was a jumble of large brown blocks perched on top of each other, running up from the bottom of the mountain. It may be possible to abseil down this in an emergency. The view down to the base camp was stunning – fantastic colours mixing together and a backdrop of the Kangerdlugssuaq Fjord, filled with large ice bergs. The temperature felt a little cold if the group stopped. Climbing the intrusion was like climbing a giants staircase. Unfortunately the intrusion stopped at a gap of over 50m, with a huge drop between. The only way up was to climb up a steep wall – a pitch of at least hard very severe. The rucksacks were hoisted up on the excess rope. The failure of the emergency beacon was in peoples minds for a while. Some really nice chimney pitches followed, with the drops on each side easing off a little.

Pete Dawson

## **Lilevat**

This climb was a late decision between Dave Wilson and myself to climb a summit on the ridge to the south of the base camp. We spent some time trying to convince Gwyn and Jeff to come along. We were successful in convincing Gwyn but not Jeff. The three of us set off at about eight o'clock in the morning, having made yet another stupidly incorrect judgment on the time it would take to climb the peak. It took about one and a half hours to ski to the bottom of the climb. The start was a steep small glacier that lead up to the ridge and to what I had determined was a snow ramp that lead to the summit.

Gwyn decided that he did not wish to climb as the route we were about to take was not his cup of tea. Dave and I convinced him to climb on a little but he retreated after about 500 feet. Gwyn went and sat on his rucksack for the next nine hours until we returned from a successful bit on the summit.

We climbed up to the small icefall and had some interesting escapades getting through the small but complicated crevasse system. We climbed the left hand side of the glacier to reach the snow capped col after about an hour and a half of lung testing climbing. We crossed the top of the col on some very slushy snow with masses of water running under some of the snow layers. We headed for the foot of a rock spur. Our plan was to go underneath the spur and onto the second steeper part of the glacier. Due to the snow conditions we decided to rock climb through to the steeper section by climbing through a natural cleft in the rock spur. This turned out to be about 200 feet of fairly easy climbing which lead us half way up the section of glacier that would eventually lead us to the higher smaller col where the snow and ice finished. The top section of the glacier was steep bad quality ice that had seen lots of rock fall. It was not an enjoyable place to be. In three full pitches we made it through to the small col. We decided to leave all the snow and ice gear at this stage as we would not need it for the rock ridge that would lead westward to the summit.

The ridge we covered in short pitches on very loose rock, the grade reached a maximum of hard severe. I climbed in rock boots and Dave climbed in mountain boots. For the most part I was grateful for

the rock boots except that it left me in the best position to reverse all the rock sections on the way down.

We reached the small eastern summit of the main mountain (photo, peak 3). We had intended to carry on to the main square topped summit. To reach the main summit would have been an extra four hours of climbing, as the ground was loose and precarious. We decided that with Gwyn still left sitting on the glacier that we would leave the main summit to the next set of adventurers.

The decent was to exactly reverse our route up and took just as long. We had reached the summit in five hours from the main glacier. When we were reversing the top steep section of the glacier we had a near miss when a rock fall landed on the spot that I had decided to move off only a minute before. I looked skyward and carried on down the glacier. We finally returned to a very board and pleased to see us Gwyn. We donned skis and returned to base camp in about an hour and a half. This time at least we were only four hours out on our estimated climb and journey time, but chuffed with ourselves.

Colin Dulson

## Crystal Peak

Keith Miller and Pete Dawson had already tried to circle the mountain, but had been unable to cross the final ergschrund on the eastern glacier system. This trip had made them realize an ascent of the peak would prove to be challenging and worthwhile. On the same day other members of the expedition had viewed the western approaches to Crystal Peak whilst exploring a route to Icon Peak (to be climbed later in the expedition). They reported that the crevasses appeared very broken and wide, making an ascent from that side difficult.



A few days later, setting off at 11pm on Wednesday 22nd July, Keith and Pete found a route on the right flank of the crevassed area that actually was relatively straight forward and safe. It only took a couple of hours to reach the col between the Chisel area and Crystal Peak. The views over the Chisel Gletscher were stunning. Both thought that a journey from Cocker Gletscher to Chisel Gletscher, via this western crevassed area would be an achievable adventure. From this col a route down to Chisel Gletscher looks possible down the most northerly trending gully, keeping to the eastern edge. This would all be possible on skis or snow shoes.

The sun was already warming the north face, a spectacular snow covered expanse of broken ice and snow. The skis and snowshoes were left at the col and a way was found over the bergschrund by a thin snow bridge. The eve was excellent and there was quick progress onto the main ridge – a sharp fin with glistening drops on either side. The start of the ridge was split by a strange metre wide crevasse. The hole/crevasse crossed the route and fell on either side onto the glacier below, a length of 7/800m. Keith and Pete roped up and carried on along the easy angled ridge line. There were wonderful views at all times. The ridge steepened up to approx. 30° to make lovely climbing. As the angle increased to

approx. 45° the snow became softer and no real belays were available. A harder section was encountered near a little shoulder, grade 3 Scottish, but a belay was found in the rocks sticking out of the snow. The final steep part of the snow ridge was reached by a teetering scramble over these rocks. The route now made a rising traverse crossing the main north face, which was approx. 600m high at this point. It was about 7am and the sun was stronger now. The snow was taking a soft crystalline quality that was truly beautiful to look at but was becoming lethal to climb on. The top only looked 200/300m higher though and Keith and Pete decided to risk going on. The belays were crumbling as

ice axes were banged in. It was one of the best feelings in the world to be climbing in such a place with a close friend. The north face certainly helped concentration and the feeling of isolation.

Pete Dawson

## Eljam

Almost directly south of base camp was a snow/ice col that separated a line of rock peaks. Immediately to the left of the col was Laurenar, climbed by Dave and Pete. To the right was another peak with an interesting ramp running right across its front face. On 29<sup>th</sup> July Pete Dawson, Ian Cousins, Keith Miller, Chris Cookson and myself set off across the Cocker Gletscher to the foot of the col. There was a choice of two snow/ice slopes to ascend to the top of the col. The left hand slope was not only in better condition but also a slightly easier angle. From the top of the col we all traversed right over the top of the other snow/ice slope and then across an exposed traverse which led to the rock ramp we had seen from base camp. After following the rock ramp for a short distance we arrived at a prominent corner. At this point Chris, Pete and Keith decided to attempt to find a route up the face to the right of the corner. Ian and myself continued along the ramp as far as we could across the face, approximately 500m. There were glorious views down and along the Side Gletscher from here. We then followed a ridge line towards the summit (photo, peak 2). Using a series of ramps and ledges we moved left and then back right until we came out on easy rock leading to the summit (Voie Normale – Alpine PD).

Chris, Pete and Keith's line proved to be more technically demanding (Early morning madness – Alpine D). They arrived on the summit two and a half hours after Ian and myself. We all followed the easier line in descent.

Steve Brailey

## Icon Peak

Icon Peak was attempted three times while we were at base camp. The first unsuccessful attempt took ,Jeff Haslam, Chris Cookson and I down the Cocker Gletscher in a south westerly direction, around a large crevasse/serac area and then up a series of snow/ice ramps in a generally north western direction to the summit of a snow dome we called Dome de Jenel. This ascent was completed in generally good conditions, mostly on skis and snow shoes. However, Jeff did disappear into a crevasse up to his waste on the final section of the ascent.

From the glacier below it had appeared that this summit would probably be connected to a ridge continuing up to the summit of Icon Peak. Unfortunately, there turned out to be a large glacial basin between the top of the dome and our target ridge. We spent time on the dome summit checking possible routes on surrounding peaks and then descended by the same route.



On the second unsuccessful attempt Pete Dawson, Chris Cookson and I attempted to avoid the trek around the large crevasse/serac area by climbing its right hand edge. Unfortunately, the poor snow conditions that made the large snow bridges unsafe and meant we had to retreat. In good conditions this would have probably been the most direct route onto the glacier below the north eastern face of Icon Peak.

For the third attempt we followed the original route around the crevasse/serac area and traversed the right hand side of Dome de Jenel onto the glacier running below Icon Peak's north east face. We followed this glacier in a generally north western direction to below Icon Peak. The early section of this



glacier was heavily crevassed. There appeared to be two possible routes, one following the left hand skyline ridge, the other up a central snow/ice face which broke out right and then back left towards the summit. We decided to follow the latter route which proved initially to be objectively safe and straight forward technically. The condition of the snow/ice was good, weather superb, and we made rapid progress. As we completed the ascending traverse back left the sun rose and we were treated to a truly magnificent panorama. The route steepened on the final snow/ice dome towards the summit. The gradient eased for the final few hundred metres over what looked like innocuous ground. For this section I was

taking the lead and was greatly surprised and dismayed to find myself hanging free about 20ft down an enormous crevasse. I'd fallen through a thin ice sheet, cleverly concealed by fresh wind blown snow. I found it impossible to climb out myself using prussics as they quickly froze solid. The others in the party dropped a second rope and a combination all our pulling efforts brought me out about half an hour after I'd fallen in. We found an alternative route around this section of ground and were on the summit only a few minutes later (Alpine PD+). The summit view can only be described as the best I have ever seen; the peaks stretching miles to the north and south, the ice cap in land, the ice bergs out in the Denmark Strait.

We followed the same route in descent. Conditions had deteriorated rapidly in the sections exposed to the sun. We were quite often up to our thighs in snow, which we had walked over only a couple of hours earlier.

Steve Brailey

## Mo's Couloir

With only around 24 hours left before we were due to start the walk out and less than perfect conditions I was looking for a suitable objective. I'd had my eye on an attractive 'S' gully system which seemed somehow Scottish in nature (well to me anyway). With limited time and the warm conditions I didn't think it suitable, but Keith suggested an open couloir to the right which seemed quite feasible. Having packed quickly, we then set off roped together to cross the Cocker glacier, only for me to realise that I hadn't packed a helmet. Not wanting to waste time by going back I decided to press on. Running down the centre of the couloir was a small stream which disappeared near the bottom into a rather large looking bergschrund. Leading up to the bergschrund was a cone of soft snow. The obvious place to cross and get access to the couloir proper appeared to be where this stream disappeared. Treading as lightly as possible, I struggled with soft snow until I was safely across and perched on the steep far wall of the bergschrund. From here the only decent ice appeared to be either side of the stream so I moved up on placements effectively straddling the flowing water until after about ten metres when it was possible to move left to slightly easier ground. At the end of the next rope length I found a belay under a small overhang on the left side of the couloir. The sun was now just catching the buttress at the top of the route and as I moved back right into the couloir a number of rocks whizzed past and I moved quickly back left for cover. This wasn't the place to be without a helmet, in fact this probably wasn't the place to be at all! Moving back right again I decided to keep going, so moving as quickly as possible I hugged the left edge of the couloir before again belaying beneath a small roof. Two more pitches, the last traversing under the buttress that had been bombarding us with rocks from time to time, saw us at the top of the couloir. To move along the ridge in either direction looked serious due to its loose and broken appearance. After a quick chat with Keith and a few photos of the surrounding area we decided to retreat. The way back was reasonably uneventful particularly as the sun was no longer shining on the top of the route and thus the number of rocks 'bombing' past was minimal. Having safely returned to camp, we just had time to eat before packing for the trek out.

Chris Cookson

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## 5. The journey out

We had originally allowed 4 days for the journey out but decided that we had better increase this to 7, with the hope of being able to explore some peaks on the way, as it happened we arrived at Sodalen the evening before we were due to be picked up.

There were two alternatives to the journey, one descending the huge Frederiksborg Gletscher and the other, a more roundabout journey that would entail us climbing to an altitude of 1210 metres. We decided on the latter due to poor snow conditions, but we still had to cross the Frederiksborg that is 8k wide and heavily crevassed.

To make use of the best conditions we decided to travel at "night" when the snow would be a little more firmer. The first leg across the Frederiksborg took us 10hrs to cover a distance of approximately 11km, we were carrying about 25k and pulling an additional 20 – 30k to add to the pleasure.

The second leg was to the top of a col at an altitude of 1210m and a distance of 13k. This was the most rewarding part of the journey with the scenery changing constantly.

The third leg (15k) was very arduous, as the terrain now consisted of 1.8m high ridges which had to be either navigated around or climbed over. This part of the journey ended in a huge icefall, again very heavily crevassed.



The fourth leg was fairly straight forward as it entailed descending a long (18k) dry glacier towards the coast.

After a rest day, we then burned our pulks and after waiting for the residue to cool down carried it, and the rest of our equipment up and over the final obstacle, a 300m high slope of mixed scree and boulders. The campsite that night would be the first on "solid" ground for over three weeks.

The final days journey to Sodalen was just a matter of

keeping going. It involved a short section of steep ground then a long haul (8k) to the airstrip. One slightly worrying factor was the amount the glacier had retreated in only 4 years.

After an exciting river crossing we were able to relax and spend a bit of time drying out gear before the pickup the following day.

The composite aerial photograph in Appendix G shows our route out from base camp. The circles indicate the location of our camps.

Jeff Haslam

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## 6. Equipment

The only item of equipment which let us down seriously was the Jotron emergency radio beacon. We had sent it to be serviced and for a new battery to be fitted shortly before we left England. When we arrived at base camp we were dismayed to find that the test signal did not operate. This left the team in a very vulnerable and potentially very serious situation. There would have been very little we could do to assist a climber sustaining a serious injury or illness e.g. appendix. There were a number of occasions when climbers considered this situation whilst attempting in difficult routes or hanging from ropes in crevasses.

The first aid equipment proved to be excellent. Apart from blisters and minor cuts/abrasions the only serious injury was sustained by Keith Miller. A sling and bandages were used to support his injured shoulder. This was later diagnosed back home in Scotland as nerve damage. We feel this could have been caused by the repeated jarring of the shoulders caused when pulling pulks over rough terrain. It could also have been caused when Keith was nearly pulled backwards into a crevasse on the journey out.

The pulks, designed by Tony Magorrian and based on a plastic sledge, were outstanding. They withstood six days of punishing terrain on the journey out.

Three members of the expedition, including myself, used TSL snowshoes for glacier travel (these are available from Troll in the UK). We found them extremely useful and quick to put on and take off. They are also very compact when attached to a rucksack, a distinct advantage over the skis and skins. The only disadvantage was their increased tendency to fall through snow bridges. Clearly, a climber's weight is more favourably distributed over the longer skis.

The Terra Nova tents all performed well and can be recommended for the area and conditions encountered.

The MSR Whisperlite stoves caused problems with aviation fuel. They were quite often very difficult to light, the stoves and pans were also left coated in black soot. I would recommend taking a more reliable and cleaner fuel e.g. Coleman fuel. The extra cost would be more than justified.

Other items which proved popular with expedition members, and were enviously admired by those who didn't have them were: Thermarest chairs, Platypus/hozer drinking system.

A full equipment list can be found in Appendix N.

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## 7. Biological Report

### Birds

Though primarily a mountaineering trip, throughout our time in East Greenland I recorded my observations of birds and vascular plants. These records were supplemented by other members of the group.

Few birds were seen during our time on glaciated terrain, though small groups of Snow Buntings were seen on several occasions. The following is a full list of my observations:

Red-throated Diver    *Gavia stellata*

10 August                      5 on the Northeastern Twin Lake

Ptarmigan                      *Lagopus mutus*

26-27 July                      Four groups of droppings noted along Mejslen South, SW ridge

11 August                      Group comprising 2 adults and 6 young observed on col between Twin Lakes and Sødalen

Ringed Plover                      *Charadrius hiaticula*

12 August                      2 at Sødalen

Golden Plover                      *Pluvialis apricaria*

12 August                      at least 4 at Sødalen

Ivory Gull                      *Pagophila eburnea*

21 July                      Pete Dawson noticed a white gull fly past the south-east side of Crystal Peak. Unfortunately I did not see the bird. However we discussed identification within a couple of minutes of observation and from Pete's description I concluded that it was an Ivory Gull. Checking the literature back in Scotland has done nothing to contradict this view.

Raven                      *Corvus corax*

04 August                      1 flew directly in to the site of burning rubbish close to Base Camp, investigated and flew off south-eastwards

Snow Bunting                      *Plectrophenax nivalis*

24 July                      1 flew past Base Camp

26-27 July                      Small groups (up to 4) seen several times Mejslen South, SW ridge

31 July                      Group of 6 (including 2 adult males) seen on northern edge of Cocker Gletscher SE of Icon Peak

10 August                      At least 3 seen on northern side of the Northeastern Twin Lake

11 August                      4 observed on col between Twin Lakes and Sødalen

12 August                      at least 3 at Sødalen

### Mammals

No mammals at all were observed.

## Plants

With the help of other team members vascular plants were recorded throughout the trip, the majority of species being familiar to me from botanising in Scotland and Norway. Specimens of unfamiliar species were taken, most subsequently being identified.

Around Base Camp, and on the peaks climbed or attempted, plants were limited to small patches of fine gravel and thin soils, particularly where there was significant water seepage. Given the predominantly glacial terrain and inhospitable conditions this is not surprising. However, where suitable niches occurred an impressive variety of vascular plants was often found, sometimes growing most luxuriantly. Late snow-lie was often a feature of the sites recorded.

On the trek out from Base Camp to Sødalen when we left the glacier flowing southwestwards into the head of Watkins Fjord we left glacial terrain. From this glacier over the ridge to the northeastern of the Twin Lakes and on, over a second col, down to Sødalen the ground was entirely rocky and more stable. Vascular plants were much more abundant with extensive areas of ground flora and dwarf shrubs. Habitats included snow-patches, fjell-field solifluction soils and scree.

Additionally records were made of four familiar species of lichen.

The four main sites / areas from which records were made are:

- 1) 31°51'W 68°25'N  
Base Camp area on glacial plateau at top of Cocker Gletscher: lowest south slopes (1000m) of Crystal Peak. Patches of gravel and thin soil on ledges or at edges of scree. As late snow-lie was a feature of these sites the habitat could best be described as snow-patches.
- 2) 31°47'W 68°26'N  
On SW ridge of Mejslen South East. Very small patches of gravel and thin soil on small ledges.
- 3) 31°26'W 68°16'N - 31°26'W 68°15'N  
Over rocky ridge, between glacier flowing southwestwards into head of Watkins Fjord and the northeastern of the Twin Lakes. Habitats included snow-patches, fjell-field solifluction soils and scree.
- 4) 31°26'W 68°14'N - 31°26'W 68°13'N  
Between northeastern of the Twin Lakes and Sødalen, over rocky col. Fjell-field, snow-patches and solifluction soils were present.

|                             | Area 1 | Area 2 | Area 3 | Area 4 |
|-----------------------------|--------|--------|--------|--------|
| <i>Ranunculus glacialis</i> | ✓      | ✓      |        |        |
| <i>Papaver radicatum</i>    | ✓      | ✓      |        |        |
| <i>Cerastium alpinum</i>    | ✓      | ✓      | ✓      | ✓      |
| <i>Lychnis alpina</i>       |        |        |        | ✓      |
| <i>Silene acaulis</i>       | ✓      |        | ✓      | ✓      |
| <i>Persicaria vivipara</i>  | ✓      | ✓      | ✓      |        |
| <i>Oxyria digyna</i>        | ✓      | ✓      | ✓      | ✓      |
| <i>Salix glauca</i>         |        |        |        | ✓      |
| <i>Salix herbacea</i>       | ✓      | ✓      | ✓      | ✓      |
| <i>Salix arctica</i>        | ?      | ?      | ✓      | ✓      |
| <i>Arabis alpina</i>        |        |        |        | ✓      |
| <i>Draba nivalis</i>        |        |        | ✓      | ✓      |
| <i>Empetrum nigrum</i>      | ✓      | ✓      | ✓      | ✓      |
| <i>Cassiope tetragona</i>   |        |        | ✓      | ✓      |
| <i>Vaccinium uliginosum</i> |        | ✓      | ✓      | ✓      |

|                                 | Area 1 | Area 2 | Area 3 | Area 4 |
|---------------------------------|--------|--------|--------|--------|
| <i>Sedum rosea</i>              | ✓      | ✓      |        |        |
| <i>Saxifraga nivalis</i>        | ✓      | ✓      | ✓      | ✓      |
| <i>Saxifraga oppositifolia</i>  | ✓      | ✓      | ✓      | ✓      |
| <i>Saxifraga aizoides</i>       |        |        |        | ✓      |
| <i>Saxifraga cernua</i>         | ✓      | ✓      |        | ✓      |
| <i>Saxifraga cespitosa</i>      | ✓      | ✓      | ✓      | ✓      |
| <i>Potentilla tridentata</i>    |        |        | ✓      | ✓      |
| <i>Sibbaldia procumbens</i>     |        |        |        | ✓      |
| <i>Chamerion latifolium</i>     |        | ✓      |        | ✓      |
| <i>Bartsia alpina</i>           |        |        | ✓      | ✓      |
| <i>Campanula giesekiana</i>     | ✓      | ✓      |        |        |
| <i>Antennaria</i> sp.           |        | ✓      |        |        |
| <i>Erigeron uniflorus</i>       | ✓      | ✓      |        |        |
| <i>Juncus trifidus</i>          | ✓      | ✓      | ✓      | ✓      |
| <i>Luzula spicata</i>           |        |        | ✓      | ✓      |
| <i>Luzula arctica</i>           | ✓      |        |        |        |
| <i>Kobresia myosuroides</i>     |        |        | ✓      |        |
| <i>Phleum alpinum</i>           |        |        |        | ✓      |
| <i>Cetraria islandica</i>       |        |        | ✓      |        |
| <i>Cetraria nivalis</i>         |        |        | ✓      |        |
| <i>Rhizocarpon geographicum</i> | ✓      | ✓      | ✓      |        |
| <i>Solorina crocea</i>          | ✓      | ✓      | ✓      |        |

Keith Miller  
21 December 1998

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## 8. Conclusions

I would like to thank all the members of the expedition for their support and assistance with organising the expedition. My lasting impression will be the team work that showed itself in so many ways before, during and after the expedition. This experience has confirmed my long held view that the most important ingredient for a successful expedition is the members and how well they operate as a team.

This is undoubtedly one of the most beautiful and interesting mountain areas in the world. Those who visit the Arctic seem to go back again, usually time and time again. I can now understand why.

All rubbish from the expedition was burnt, carried out to Sodalen and flown back to Iceland. One five litre container of aviation fuel was left hidden in a rock cairn on a large erratic boulder in between the left hand and central glacial ice falls coming down from the south face of Crystal Peak, directly opposite our base camp site.

I was very concerned on the trek out to Sodalen to note the level of glacial retreat since my last visit to the area in 1994. The two photographs in Appendix M demonstrate this most effectively. Although some of the differences can be accounted for by the increased snow cover in 1994, much of the area, which is now rock, was glacial ice that I skied across in 1994.

If I were organising an expedition to the same area in the future I would endeavour to travel out and back one month earlier. This would make the glacier conditions much safer and certainly more pleasant.

Steve Brailey



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## 9. Appendix A – Expedition members

Steve Brailey 40 - Himalayan, Greenland expeditions, 6 Alpine seasons, Cockermouth MRT



Jeff Haslam 45 - 2 African, Himalayan expeditions, Norway, 3 Alpine seasons, Cockermouth MRT



Pete Dawson 37 - African expeditions, 6 Alpine seasons, Cockermouth MRT

Ian Cousins 23 - Himalayan expedition, South Africa climbing, 2 Alpine seasons, Cockermouth MRT



Gwyn Lewis 40 - 2 Himalayan expeditions, 5 Alpine seasons, Cockermouth MRT



Keith Miller 40 - 2 Norway, 12 Alpine seasons



Dave Wilson 38 - 2 Himalayan expeditions, 2 Greenland expeditions, 3 Alpine seasons

Colin Dulson 35- Himalaya, 5 Alpine seasons



Chris Cookson 30 - 3 Himalayan expeditions,  
5 Alpine seasons,  
Cockermouth MRT



## 10. Appendix B - Routes climbed/attempted

| Date        | Peak                  | Location          | Height  | Route                           | Grade | Climbers   | Successful?                  |
|-------------|-----------------------|-------------------|---------|---------------------------------|-------|--|------------------------------|
| 21 July 98  | Thunder Road          | 31°30'W 68°26'N   | * 1700m | West ridge                      | PD+   | Colin Dulson, Ian Cousins  | Y                            |
| 21 July 98  | Dome de Jenel         | 31°58'W 68°24.6'N | * 1700m | South face                      | PD    | Jeff Haslam, Steve Brailey, Chris Cookson                            | Y                            |
| 21 July 98  | Isobelar              | 31°54'W 68°25.8'N | * 1550m | SE ridge                        | PD    | David Wilson, Gwyn Lewis   | Y                            |
| 22 July 98  | Crystal Peak          | 31°52'W 68°26.2'N | * 2100m | NW ridge                        |       | Pete Dawson, Keith Miller  | N (Poor snow/ice conditions) |
| 23 July 98  | Laurenar              | 31°48'W 68°23.9'N | * 1550m | NW ridge                        | AD    | Pete Dawson, Dave Wilson   | Y                            |
| 26 July 98  | South summit, Mejslen | 31°47'W 68°27'N   | * 1950m | SW ridge                        | TD+   | Pete Dawson, Dave Wilson, Colin Dulson, Keith Miller                 | Y                            |
| 29 July 98  | Eljam                 | 31°50'W 68°23.6'N | * 1650m | NE face                         | PD+   | Ian Cousins, Steve Brailey   | Y                            |
| 29 July 98  | Eljam                 | 31°50'W 68°23.6'N | * 1650m | Early Morning Madness (NE face) | D+    | Chris Cookson, Pete Dawson, Keith Miller                             | Y                            |
| 30 July 98  | Lilevat               | 31°46'W 68°24'N   | * 1650m | East ridge                      | TD    | Colin Dulson, Dave Wilson  | Y                            |
| 31 July 98  | Icon Peak             | 32°01'W 68°25.5'N | 2050m   | East face                       | PD+   | Steve Brailey, Pete Dawson, Chris Cookson, Keith Miller, Ian Cousins | Y                            |
| 3 August 98 | Unnamed               | 31°51'W 68°23.5'N | * 1650m | Mo's Couloir, North face        |       | Keith Miller, Chris Cookson  | N (Condition of snow/ice)    |
| 3 August 98 | Crystal Peak          | 31°52'W 68°26.2'N | * 2100m | East Couloir                    |       | Colin Dulson, Pete Dawson  | N (Insurmountable rock band) |

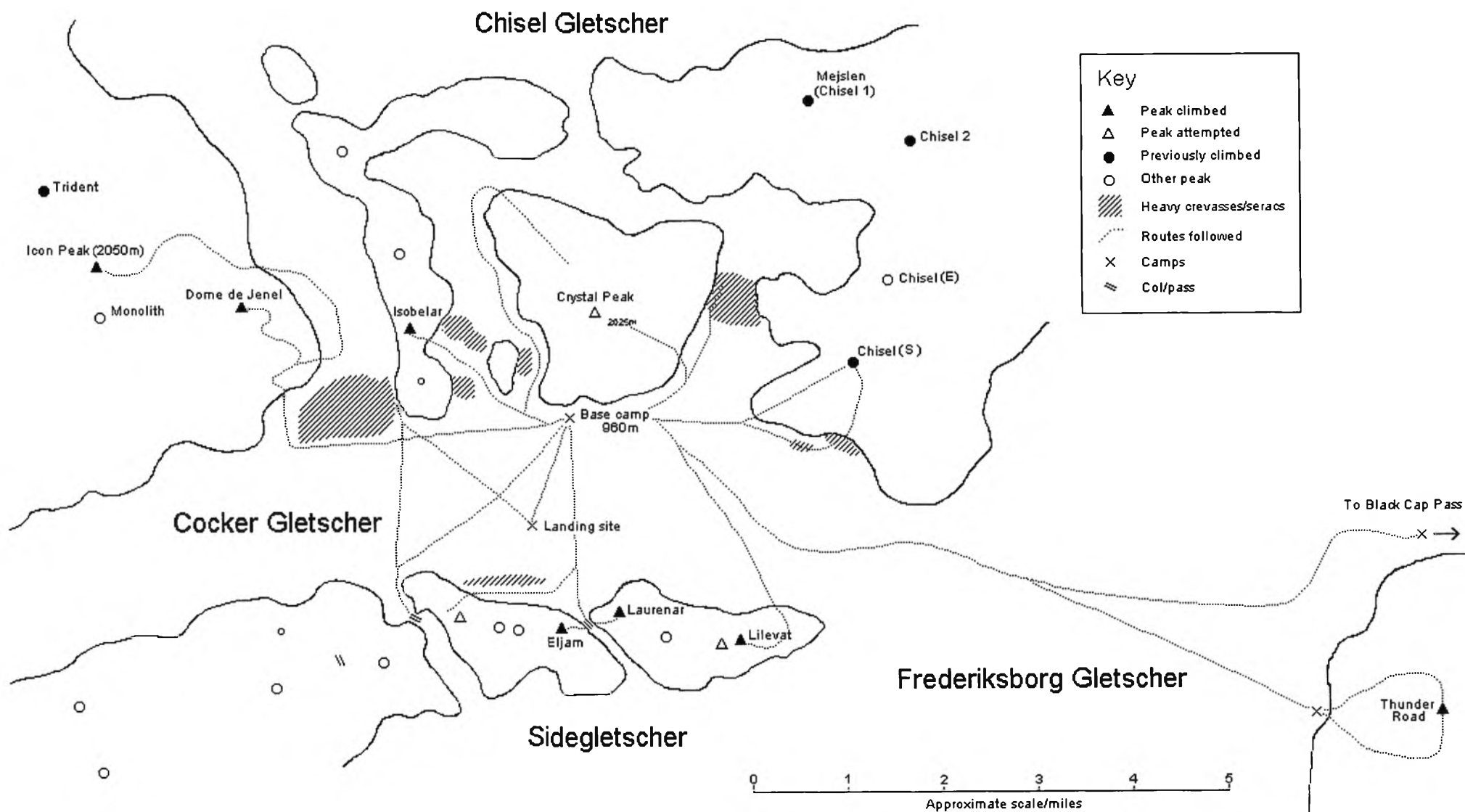
\* Approximate height only

## 11. Appendix C - Previous Expeditions in the Lemon Mountain area

| Year | Expedition <u>leader</u> and members  | Area visited  | Peaks climbed  |
|------|---|---|--|
| 1932 | <u>L.R Wager</u> & ?  | Fredericksborg Glacier  | None   |
| 1937 | <u>L.R.Wager</u> , Jack Longland, Augustine Courtauld   | Kangerdlugssuaq region  | Gunnbjorns Fjeld, 60 miles NE of Kangerdlugssuaq   |
| 197? | <u>Stan Woolley</u> & ?   | Frederiksborg Glacier   | Mitivangkat (W)  |
| 1987 | <u>Stan Woolley</u> , Robin Knox-Johnson, Rob Ferguson, Steve McCabe & ?  | Gunnbjorns Fjeld, Kangerdlugssuaq region, flew out from Sodalen                 | Gunnbjorns Fjeld   |
| 1990 | <u>Stan Woolley</u> , Phil Bartlett, Ted Courtney, Dr Iain Campbell, John Richardson, Rob Ferguson, Jim Lowther, Dave Woolley, Mike Parsons | Northern area of Konprins Frederiks Bjerger. Flew in and out from ice cap       | P2600 67°57'N 33°57'W from N, and 'Matterhorn Peak' 5 miles away by SW ridge, plus 10 other minor summits  |
| 1991 | <u>Chris Bonnington</u> , Jim Lowther, Robin Knox-Johnson   | Frederiksborg Glacier, failed to climb peak thought to be Cathedral, but wasn't |  |
| 1992 | <u>Phil Bartlett</u> , Rob Illingworth, Gary Baum, Mike & Jenny Woolridge, Barry Mills, David Stewart-Smith, Bill Pelkey, Luke Hughes       | Lindbergs, Fredriksberg Glacier, out from Sodalen                               | Cathedral, Sara's Peak, Mitre, Chisel (SE), Coxcomb, Rubble Peak, Mitivangkat (E), Cymbroggi   |
| 1993 | <u>Chris Bonnington</u> , Graham Little, Jim Lowther, Rob Ferguson  | Flew to Chisel Glacier area, out from Sodalen                                   | Beacon (NE face/E ridge), Mejslen/Chisel (N face), Ivory Tower (NE face), Trident (NE face), Needle (SW pillar). Failed Citadel (probably highest in Chisel glacier area). |
| 1994 | <u>Dave Wilson</u> , Steve Brailey, Graeme Nicholson, Richie Donnison, Ian Burn, Phil Chapple, Anne Goudie, Phil Richardson                 |   | P1010 ?° ?'N ?° ?'W, P1800 ?° ?'N ?° ?'W, Gabbrofeld group   |
| 1994 | <u>Tom Wally</u> and also Korean Expedition   | Gunnbjorns Fjeld, out from Sodalen  | Gunnbjorns Fjeld   |
| 1995 | <u>Derek Fordham</u> & ?  | Gunnbjorns Fjeld, out from Sodalen  | Gunnbjorns Fjeld   |

The Cumbria East Greenland Expedition 98 cannot be held responsible for any inaccuracies in the information supplied in this table.

## 12. Appendix D - Map of the Expedition Climbing Area

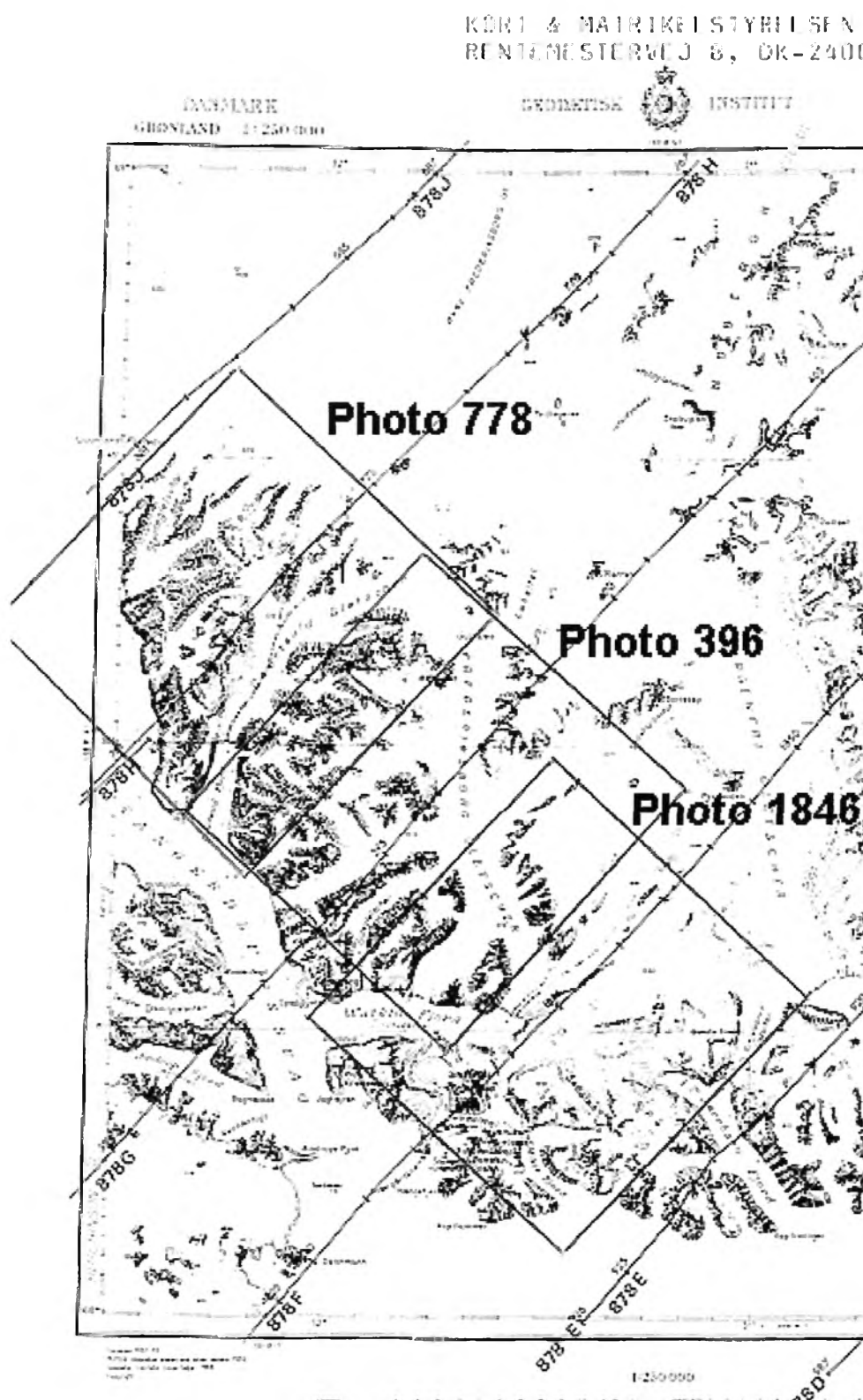


## 13. Appendix E - Contacts

|                                | Address  | Telephone         | e-mail  |
|--------------------------------|--|-------------------|---|
| Steve Brailey                  | 14 Limetree Crescent<br>Cockermouth<br>Cumbria<br>CA13 9HW   | (01900) 827916    | steve@lakesit.demon.co.uk<br>steveb@itmswcc.demon.co.uk |
| Aerial photographs             | Kort & Matrikelstyrelsen<br>Rentemestvej 8<br>DK-2400<br>Kobenhavn, Denmark                                      | +45 35 87 50 50   | kms@kms.min.dk  |
| Expedition permit              | Iris Madsen<br>Danish Polar Center<br>Strandgade 100H<br>DK-1401<br>Kobenhavn, Denmark                           | (+45) 32 88 01 00 | im@dpc.dk   |
| Radio permit                   | Soeren Lynge<br>Radioadministration<br>Post Office Box 1002<br>DK-3900<br>Nuuk                                   | +299 32 31 20     | sly@tele.gl   |
| Icelandair (Iceland-Greenland) | Fridrik Adolfsson<br>Flugfelag Islands hf./Air Iceland<br>Akureyri Airport<br>Box 400<br>602 Akureyri<br>Iceland | +0354 461 2101    | fridr@icelandair.is                                     |
| Maps                           | Stanfords<br>12-14 Long Acre<br>Covent Garden<br>London<br>WC2E 9LP  | 0171 836 1321     |   |
| Icelandair (Glasgow-Iceland)   | 172 Tottenham Court Road<br>London<br>W1P 0LY  | 0171 3885599      | london@icelandair.is                                    |

## 14. Appendix F - Map and Aerial photographs

The map (Sheet 68 0.3 Kangerdlugssuaq) and aerial photographs shown below: covered our expedition area:



## 15. Appendix G - Composite Aerial Photograph



## 16. Appendix H - Chronology

| Day | Date      |   | Weather        |
|-----|-----------|---|----------------|
| Sat | 18 July   | Glasgow to Keflavik and then Reykjavik, Reykjavik to Isafjordur   | Fine           |
| Sun | 19 July   | Isafjordur to Cocker Gletscher, two twin otter flights, set up base camp  | Some snow/rain |
| Mon | 20 July   | Base camp, building igloos etc.   | Fine           |
| Tue | 21 July   | Ian & Colin - Thunder Road<br>Dave & Gwyn - Isobelar<br>Keith & Pete glacier excursion NE<br>Steve, Jeff and Chris - Dome de Jenel  | Fine           |
| Wed | 22 July   | Steve, Chris and Dave - Icon Peak failed attempt, poor snow/ice conditions<br>Keith & Pete - 1 <sup>st</sup> top on NW ridge en-route for Crystal Peak, ran out of gear<br>Chris, Gwyn & Jeff - Glacier excursion W | Fine           |
| Thu | 23 July   | Pete & Dave - Laurenar  | Rain pm        |
| Fri | 24 July   | Base camp   | Rain           |
| Sat | 25 July   | Base camp   | Rain           |
| Sun | 26 July   | Pete, Dave, Colin & Keith - South summit of Mejslen via SW ridge  | Fine           |
| Mon | 27 July   | Base camp   | Rain           |
| Tue | 28 July   | Base camp   | Rain           |
| Wed | 29 July   | Steve & Ian - Eljam via Route Normale<br>Chris, Pete & Keith - Eljam via Early Morning Madness  | Fine           |
| Thu | 30 July   | Colin, Dave & Gwyn - Lilevat  | Fine           |
| Fri | 31 July   | Steve, Chris, Pete, Ian & Keith - Icon Peak   | Fine           |
| Sat | 1 August  | Base camp   | Rain           |
| Sun | 2 August  | Base camp   | Rain           |
| Mon | 3 August  | Pete & Colin - East Couloir of Crystal Peak, stopped 200m short by rock band<br>Keith & Chris - Nomos couloir<br>Steve & Jeff - Glacier excursion   | Fine           |
| Tue | 4 August  | From base camp across Fredericksborg Gletscher to camp 1  | Fine           |
| Wed | 5 August  | Camp 1 to Black Cap Pass and Camp 2   | Fine           |
| Thu | 6 August  | Camp 2 down head of Sodalen Gletscher to Camp 3   | Fine           |
| Fri | 7 August  | Camp 3 down Sodalen Gletscher to Camp 4 below gully   | Rain pm        |
| Sat | 8 August  | Camp 4  | Rain           |
| Sun | 9 August  | Camp 4 up gully and across to Camp 5 next to twin lakes   | Rain           |
| Mon | 10 August | Three members returned to Camp 4 for gear   | Rain           |

|     |           |  |                              |
|-----|-----------|--|------------------------------|
|     |           | Three other members took gear ahead to Sodalen valley  |                              |
| Tue | 11 August | Camp 5 to Camp 6 at Sodalen airstrip                   | Rain                         |
| Wed | 12 August | Picked up by Twin Otter at 12:30pm, flown to Isafjodur | Fine                         |
| Thu | 13 August | Isafjordur to Reykjavik                                | Fine                         |
| Fri | 14 August | Reykjavik and Blue Lagoon                              | Fine                         |
| Sat | 15 August | Excursion to geysers, Gulfoss etc.                     | Fine                         |
| Sun | 16 August | Keflavik to Glasgow                                    | Fine Iceland<br>Rain Glasgow |

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## 17. Appendix I - Accounts

### Income

|                 |          |
|-----------------|----------|
| Members, grants | 18413.03 |
|-----------------|----------|

### Expenditure

#### Flights

|                                   |         |
|-----------------------------------|---------|
| Icelandair flight tickets         | 2225.25 |
| Icelandair internal flights       | 751.26  |
| Greenland flights, 1st payment    | 5000.00 |
| Greenland flights, 2nd payment    | 6118.00 |
| SWIFT wire transfer payment costs | 30.00   |

#### Freight

|                                    |        |
|------------------------------------|--------|
| Freight to Iceland                 | 640.00 |
| Lynx freight                       | 88.13  |
| Freight cost (UK)                  | 25.00  |
| Local handling charge - Icelandair | 48.00  |

#### Insurance, permits, gun

|                                       |        |
|---------------------------------------|--------|
| Insurance (inc. BMC membership for 4) | 978.00 |
| Radio permit                          | 60.15  |
| Gun                                   | 174.00 |
| Gun license                           | 43.00  |
| Jotron recalibration                  | 55.81  |

#### Food

|                           |        |
|---------------------------|--------|
| Caterite food             | 434.88 |
| Hi-Five drink             | 100.46 |
| Isostar drink             | 141.32 |
| Westler foods (Wayfarers) | 364.50 |
| Iceland food shopping     | 202.59 |
| Isafjordur restaurant     | 111.85 |

#### Equipment

|                                  |        |
|----------------------------------|--------|
| Aerial photographs               | 33.67  |
| Toilet roll                      | 6.93   |
| Bivi bags                        | 17.91  |
| Greenland maps                   | 63.55  |
| Drugs/medical, Allinsons         | 90.00  |
| Thunderflashes                   | 30.80  |
| Sledges for pulks                | 56.00  |
| Blue barrels                     | 207.27 |
| Blue barrels (Karakoram)         | 50.00  |
| Stove repair kit and accessories | 19.00  |

#### Misc.

|                                |       |
|--------------------------------|-------|
| MEF visit London, travel costs | 38.00 |
| T-Shirts                       | 81.00 |
| Icon flag                      | 7.50  |
| Sundries, gifts etc.           | 62.67 |
| Sponsor slide show expences    | 43.53 |
| Report expences                | 13.00 |

|              |                 |
|--------------|-----------------|
| <b>Total</b> | <b>18413.03</b> |
|--------------|-----------------|

## 18. Appendix J - Medical Equipment

| Item                            | Qty       | Use/Dosage   |
|---------------------------------|-----------|--|
| Syringes - 3ml                  | ?         | Injecting Lignocaine - @ 20ml injected around site of wound  |
| Needles - No 25 + White needles | ?         |  |
| Sutures 2/0 catgut, 4/0 nylon   | ?         | Large Wounds   |
| Hypodermic Needles - No 20      | ?         | Injections   |
| Surgical gloves                 | ?         |  |
| Artery forceps                  | 1pr       | Suturing   |
| Steristrips                     |           | Small Wounds   |
| Amethocaine                     | 1         | Local anaesthetic for eyes   |
| Cimetidine                      | 400mg x30 | Severe indigestion - 1 tab 3 x day   |
| Cyclomorph                      | 5         | Analgesic - intra muscular - 10mg - repeat 4 hourly  |
| Paracetamol                     | 20        | General analgesic  |
| Naproxen                        | 50        | Analgesic / anti inflammatory. 250mg - 3 - 4 daily   |
| Cephalosporin                   | 100       | General antibiotic- chest, ENT skin and urinary. 250mg 4 daily - for 5 days                                  |
| Metronidazole                   | 20        | Antibiotic - severe gut infections. poss dirty smelly wounds when combined with Cephalosporin. 400mg 2 daily |
| Erythromycin                    | 40        | Antibiotic suitable for penicillin allergy. Skin infections / sore throats. 250mg 4 daily                    |
| Dexamethasone                   | 10        | To reduce brain swelling. 3 daily reduce gradually. Consider medivac if used.                                |
| Diazepam - 5mg                  | 30        | Sedative for anxiety. 3 daily. Or sleeping tab - 1 at night. Beware effect next day.                         |
| Stemetil                        | 5         | Injection for violent sickness.  |
| Salbutamol                      | 1-2       | Asthma   |
| Skintglue                       | 1         | Medium Wounds - use on flat dry wounds   |
| Providone - iodine              | ?         | Cleaning Wounds  |
| Lignocaine                      | 2% x 20ml | Local Anaesthetic  |
| Hydrocortisone 2.5%             | 3gx3      | Skin rashes etc  |
| Imodium                         | 40        | Kathmandu quickstep?? - 2 immediately then 1 after each dance.   |
| Lozenges                        | 1 tin     | Sore Throat  |
| Alcohol Swabs                   | ?         | 1st aid  |
| Elastoplast Strip               | 3         | 1st aid  |

| Item                   | Qty | Use/Dosage       |
|------------------------|-----|------------------|
| Adhesive Tape          | 2   | 1st aid          |
| Triangular Bandage     | 1   | 1st aid          |
| Crepe Bandage          | 1   | 1st aid          |
| Finger Dressing        | 2   | 1st aid          |
| Melolin Dressing L,M,S | 3   | 1st aid          |
| Tweezers               | 1   | 1st aid          |
| Fucidin                | 1   | Antibiotic Cream |
| Scissors               | 1   | 1st aid          |
| Thermometer            | 1   |                  |
| Splint                 | 1   | 1st aid          |
| Cervical Collar M, L   | 1   | 1st aid          |
| Airway                 | 1   | 1st aid          |

Jeff Haslam

## 19. Appendix K - Food menu

When devising this menu we took into consideration variety, not only in meals but also in type of meal i.e. Wayfayer and Bean Feast. It is hoped that flexibility will allow for the meals to be cooked in two's thus allowing for any pair who wished, to spend time away from "base camp."

| Day       | Breakfast                        | Lunch <sup>1</sup>                      | Dinner  | Supper   |
|-----------|----------------------------------|---|---|----------|
| Saturday  | Porridge + 2 x crispbreads & jam | Cereal bar + Mars Bar + penguin biscuit | Soup <sup>2</sup><br>Wayfayer hot pot & smash<br>Wayfayer Choc pud & choc sauce             | Biscuits |
| Sunday    | Muesli + 2 x crispbreads & jam   | Cereal bar + Snicker + Kit Kat          | Soup<br>Beanfeast mild curry+ rice<br>Apple pie&custard                                     | Biscuits |
| Monday    | Porridge + 2 x crispbreads & jam | Cereal bar + Mars Bar + penguin biscuit | Soup<br>Wayfayer Chicken casserole & smash<br>Wayfayer fruit dumplings & butterscotch sauce | Biscuits |
| Tuesday   | Muesli + 2 x crispbreads & jam   | Cereal bar + Snicker + Kit Kat          | Soup<br>Beanfeast bolognaise sauce & spaggetti<br>Semolina & ginger cake                    | Biscuits |
| Wednesday | Porridge + 2 x crispbreads & jam | Cereal bar + Mars Bar + penguin biscuit | Soup<br>Wayfayer beans, sausage & tomato sauce + smash<br>Wayfayer Choc Pud & choc sauce    | Biscuits |
| Thursday  | Muesli + 2 x crispbreads & jam   | Cereal bar + Snicker + Kit Kat          | Soup<br>Pasta, pepperoni & cheese sauce<br>Fruit cake & custard                             | Biscuits |
| Friday    | Porridge + 2 x crispbreads & jam | Cereal bar + Mars Bar + penguin biscuit | Soup<br>Beanfeast Bolognaise<br>Angel delight <sup>3</sup> & biscuit base                   | Biscuits |

In addition to the above drinks will be available: 4 X hot drinks (tea, coffee or chocolate – please state preference) 1ltr high 5 or Isostar 1ltr fruit drink – orange or apple & blackcurrant.

<sup>1</sup> Can be supplemented by personal choice as part of weight allowance

<sup>2</sup> Either Chicken or Tomato or Veg

<sup>3</sup> Assorted flavours

## 20. Appendix L – Food quantities

| Item                     | Actual      | Serving  | Per serving | Measure    |
|--------------------------|-------------|----------|-------------|------------|
| Porridge                 | 4k          | 144      | 27g         | 7 tblsp    |
| Muesli                   | 12k         | 108      | 111g        | 13 tblsp   |
| Crispbreads              | 504         | 252      | 2           |            |
| Jam                      | 5.4         | 252      | 21g         | 0.75 tblsp |
| Nutri-grain bars         | 256         | 252      | 1 +4        |            |
| Mars bars                | 144         | 144      | 1           |            |
| Snickers bars            | 108         | 108      | 1           |            |
| Penguin biscuits         | 144         | 144      | 1           |            |
| Kit-kats                 | 108         | 128      | 1 + 20      |            |
|                          |             |          |             |            |
| Soup                     | 252         | 252      |             |            |
| Wayfayer hot pot         | 36          | 36       | 1           |            |
| Wayfayer chicken cass    | 36          | 36       | 1           |            |
| Wayfarer beans & sausage | 36          | 36       | 1           |            |
| Wayfarer choc pud        | 72          | 72       | 1           |            |
| Wayfarer fruit dumplings | 36          | 36       | 1           |            |
| Beanfeast mild curry     | 36          |          |             |            |
| Beanfeast bolognaise     | 72          |          |             |            |
| Smoked sausage           | 18          | 36       | 0.5         |            |
| Cheese sauce             | 7.5L        | 36       | 208ml       |            |
| Rice                     | 5k          | 36       | 138g        | 0.5 mug    |
| Pasta                    | 3k          | 36       | 83g         | 0.75 mug   |
| Spaghetti                | 3k          | 36       | 83g         |            |
| Noodles                  | 3.75k       | 36       | 104g        |            |
| Smash                    | 4k          | 108      | 37g         | 9 tblsp    |
| Fruit pies               | 36          | 36       | 1 slice     |            |
| Ginger cake              | 36          | 36       | 1 slice     |            |
| Fruit cake               | 36          | 36       | 1 slice     |            |
| Angel delight            | 36 servings | 48       |             |            |
| Digestive Biscuits       | 108         | 108      | 3           |            |
| Custard                  | 108         | 16.2ltrs | 150ml       |            |

| Item            | Requirement | Actual   | Per serving    |
|-----------------|-------------|----------|----------------|
| Biscuits        | 1008        | 4K       | 4              |
| Tea bags        | 756         | 1100     | 4 cups per day |
| Coffee          | 420g        | 500g     | 1tsp per day   |
| Chocolate drink | 420g        | 2k       | ?              |
| Isostar         | 126 ltrs    | 150ltrs  |                |
| High 5          | 126 ltrs    | 140 ltrs |                |
| Powdered milk   | 63 ltrs     | 60ltrs   | 238ml          |
|                 |             |          |                |
| Plastic bags    |             |          |                |
| Lighters        |             |          |                |
| Matches         |             |          |                |

Jeff Haslam & Chris Cookson

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## 21. Appendix M – Glacier Photographs

The photographs below show the extent of glacial retreat in the area around 68°14'N 31°.



1994



1998

## 22. Appendix N - Equipment list

The following equipment list was prepared to calculate the weight of equipment that would be taken on the Twin Otter flight with the nine expedition members and the personal equipment allowance for each member:

|                         | Weight/g | Shared by | Net/g | Personal Allowance | Twin-Otter Flight out |
|-------------------------|----------|-----------|-------|--------------------|-----------------------|
| Expedition rucksac      | 2000     | 1         | 2000  | 2000               |                       |
| Plastic boots           | 2000     | 1         | 2000  | 2000               | 18000                 |
| Gaiters                 | 350      | 1         | 350   | 350                | 3150                  |
| Rock slippers/boots     | 550      | 1         | 550   | 550                |                       |
| Goretex jacket          | 750      | 1         | 750   | 750                | 6750                  |
| Goretex salopettes      | 800      | 1         | 800   | 800                |                       |
| Fleece salopettes       | 500      | 1         | 500   | 500                | 4500                  |
| Fleece jacket           | 625      | 1         | 625   | 625                | 5625                  |
| Duvet jacket            | 700      | 1         | 700   | 700                |                       |
| Pertex top              | 250      | 1         | 250   | 250                |                       |
| Ron Hills 1             | 200      | 1         | 200   | 200                | 1800                  |
| Ron Hills 2             | 200      | 1         | 200   | 200                |                       |
| Lifa top 1              | 300      | 1         | 300   | 300                |                       |
| Lifa top 2              | 200      | 1         | 200   | 200                | 1800                  |
| Socks 1                 | 150      | 1         | 150   | 150                |                       |
| Socks 2                 | 200      | 1         | 200   | 200                | 1800                  |
| Fleece gloves           | 50       | 1         | 50    | 50                 | 450                   |
| Goretex gloves          | 250      | 1         | 250   | 250                |                       |
| Hat                     | 100      | 1         | 100   | 100                |                       |
| Lifa balaclava          | 0        | 1         | 0     | 0                  |                       |
| U/wear x 3              | 150      | 1         | 150   | 150                | 450                   |
| Rope, 50m x 9mm         | 2600     | 1.125     | 2311  |                    |                       |
| Harness, alpine l/w     | 350      | 1         | 350   | 350                |                       |
| Knife                   | 40       | 1         | 40    | 40                 |                       |
| Wires x 9               | 325      | 2         | 163   |                    |                       |
| Friends x 3             | 400      | 2         | 200   |                    |                       |
| Tie offs x 12           | 1400     | 2         | 700   |                    |                       |
| Slings x 4              | 80       | 2         | 40    |                    |                       |
| Krabs x 4               | 300      | 2         | 150   |                    |                       |
| Pegs x 3                | 275      | 2         | 138   |                    |                       |
| Deadman/boy/stake       | 220      | 2         | 110   |                    |                       |
| Titanium ice screws x 2 | 200      | 2         | 100   |                    |                       |
| Belay/abseil plate      | 100      | 1         | 100   | 100                |                       |
| Pulley                  | 55       | 1         | 55    | 55                 |                       |
| Abseil cord/tat         | 0        | 1         | 0     | 0                  |                       |

|                                    |      |   |             |             |      |
|------------------------------------|------|---|-------------|-------------|------|
| Helmet                             | 460  | 1 | 460         | 460         |      |
| Ice axes                           | 1550 | 1 | 1550        | 1550        |      |
| Crampons                           | 1250 | 1 | 1250        | 1250        |      |
| Skis & bindings/Snow shoes         | 3000 | 1 | 3000        | 3000        |      |
| Ski poles                          | 570  | 1 | 570         | 570         |      |
| Pulk and frame                     | 1550 | 1 | 1550        | 1550        |      |
| Gear/food bag                      | 240  | 1 | 240         | 240         |      |
| Tent                               | 4400 | 2 | 2200        |             |      |
| Bivi bag                           | 920  | 1 | 920         | 920         |      |
| Karimat - Expedition               | 480  | 1 | 520         | 520         |      |
| Thermorest                         | 710  | 1 | 710         | 710         |      |
| Sleeping bag                       | 1500 | 1 | 1500        | 1500        |      |
| MSR stove & lighter                | 450  | 2 | 225         |             | 1350 |
| Stainless pans                     | 620  | 2 | 310         |             |      |
| Cleaning sponge                    | 0    | 2 | 0           |             |      |
| Sigg water bottle 1L               | 150  | 1 | 150         | 150         |      |
| Cutlery                            | 90   | 1 | 150         | 150         |      |
| Mug                                | 75   | 1 | 75          | 75          |      |
| Personal 1st aid kit               | 400  | 2 | 200         | 200         |      |
| Soap                               | 200  | 1 | 200         | 200         |      |
| Shampoo                            | 200  | 1 | 200         | 200         |      |
| Toothbrush                         | 0    | 1 | 0           | 0           |      |
| Tooth paste                        | 100  | 1 | 100         | 100         |      |
| Small towel                        | 220  | 1 | 220         | 220         |      |
| Altimeter/watch                    | 0    | 1 | 0           |             | 0    |
| Glacier glasses                    | 150  | 1 | 150         | 150         | 1350 |
| Compass                            | 0    | 1 | 0           | 0           | 0    |
| Camera                             | 400  | 1 | 400         | 400         | 3600 |
| Camera batteries                   | 30   | 1 | 30          | 30          |      |
| Film x 4                           | 60   | 1 | 60          | 60          |      |
| Sun block & cream                  | 250  | 1 | 250         | 250         |      |
| Head torch                         | 200  | 1 | 200         | 200         |      |
| Head torch batteries x 1           | 175  | 1 | 175         | 175         |      |
| Toilet rolls (9 x 4)               | 5400 | 9 | 600         |             |      |
| Book/luxury item/personal food     | 600  | 1 | 600         | 600         |      |
| <b>Total personal equipment/kg</b> |      |   | <b>33.5</b> | <b>26.3</b> |      |
| <b>Shared by all members</b>       |      |   |             |             |      |
| PSB                                | 500  | 9 | 56          |             | 500  |
| File                               | 250  | 9 | 28          |             |      |
| 1st aid kit                        | 800  | 9 | 89          |             |      |
| Snow shovels (2)                   | 1120 | 9 | 124         |             |      |
| Snow saw                           | 350  | 9 | 39          |             |      |

|            |      |   |     |  |      |
|------------|------|---|-----|--|------|
| Binoculars | 450  | 9 | 50  |  | 450  |
| Rifle      | 3400 | 9 | 378 |  | 3400 |
| Ammunition | 500  | 9 | 56  |  | 500  |

|                            |  |  |             |  |             |
|----------------------------|--|--|-------------|--|-------------|
| <b>Total per person/kg</b> |  |  | <b>34.3</b> |  | <b>55.0</b> |
|----------------------------|--|--|-------------|--|-------------|

|                           |       |   |      |  |  |
|---------------------------|-------|---|------|--|--|
| Plastic gear containers   | 60000 | 9 | 6667 |  |  |
| (2 MSR 1ltr bot. per day) | 32240 | 9 | 3582 |  |  |

|                       |             |  |             |  |             |
|-----------------------|-------------|--|-------------|--|-------------|
| <b>Disposables/kg</b> | <b>92.2</b> |  | <b>10.2</b> |  | <b>32.2</b> |
|-----------------------|-------------|--|-------------|--|-------------|

|                                       |  |  |  |  |             |
|---------------------------------------|--|--|--|--|-------------|
| <b>Total including disposables/kg</b> |  |  |  |  | <b>87.2</b> |
|---------------------------------------|--|--|--|--|-------------|

#### Food weight

|                          | grams  | kg    |
|--------------------------|--------|-------|
| Total per person day     | 887    | 0.9   |
| Total per person 26 days | 23056  | 23.1  |
| Total 9 people           | 207500 | 207.5 |