

The Tien Shan

The Mountains of Heaven

A Greentours Tour Report

8th – 24th June 2004

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Daily Reports by Chris Gardner

Day 1 8th June UK to Almaty

We all met up from our various flights into Frankfurt except Graham and Pernille who I tracked down on the plane to Almaty. Formalities at the airport had changed since my last visit and we all breezed through immigration, baggage collection and even customs, which seemed to have disappeared altogether. Vladimir met us all at the airport and whisked us to our bus – and what a bus – what it lacked in speed it made up for in internal heating. After a rather warm and slow ascent up to Chimbulak we reached our hotel and settled in for a few hours sleep as Corncrakes rasped from the unseen herbage.

Day 2 9th June Chimbulak Ski Lift

A beautiful sunny day greeted our bleary eyes and after a late breakfast we were off to the ski lift that would whisk us up the mountain to see the many alpine delights, although even around the hotel there was an abundance of tall pink *Pedicularis amoena* and the even taller *Ranunculus grandiflora* as Grey-headed Goldfinches jangled from the wires overhead. From the ski lift we passed over masses of white *Anemone protracta*, the strange dark purple heads of *Allium atosanguineum* and pink drumsticks of *Primula algida*. Tree Pipits were singing and displaying from the tops of spruce and Anna glimpsed a Himalayan Snowcock as we rose up on the second lift (these elusive birds were frequently heard whistling mournfully from the scree but seldom seen).

From the end of second lift Vladimir opted to walk us up the next section where we found many *Viola altaica* in both cream and purple forms, *Callianthemum alatavicum*, *Eriotrichium villosum* and a few of the singularly coloured *Trollius lilacinus* an extraordinary species with (uncharacteristically for the genus) palest lilac, translucent petals the flowers borne near snow patches before the leaves have appeared. Most of us reached the pass at 3100 metres with great mountain views and big patches of snow still remaining. Nearby Vlad found hundreds of the unusual *Tulipa heterophylla* a species that can't seem to decide if it's a fritillary or a tulip. These were mixed in with many *Tulipa dasystemon* and *Allium atosanguineum* and on a rocky knoll were also *Oxytropis glacialis* and *Chorispora bungeana* a pretty pink crucifer. Walking back down there was a pair of Red-mantled Rosefinch and near the ski lift station a patch of *Gentiana krylovii* (*verna*) and several *Rhodiola linearifolia* growing among the plentiful *Primula algida*. Further down was a superb drift of *Trollius lilacinus*, singing Black-throated Accentor and a

Lammergeier that only Vlad saw because we were all too busy looking at flowers to notice.

Most of us took the ski lift down where we enjoyed a relaxing cold beer/tea in the restaurant.

Day 3 10th June Tjuksu Gate

It was another sunny morning as we lumbered up the rocky road in our old bus. Immediately around the bus were *Parapyrum anemonoides*, *Saxifraga sibirica* and *Anemone protracta* and only a short walk along the track beside a small stream we found some superb *Primula nivalis* a big handsome species with deep magenta flowers and large smooth leaves. Growing alongside these were the delicate pink flowers of *Cortusa broteroi* and two daisies, yellow *Doronicum turkestanicum* and orange *Erigeron aurantiacum*. Singing from atop a shrubby willow was a gorgeous male Himalayan Rubythroat and overhead we saw not one but three Lammergeier circling the mountains, even coming in to land on high ledges from time to time. Also around about were Common Rosefinch, Yellow-browed Warbler, Grey Wagtail and Owen and I watched a pair of Golden Eagles glide past one of which seemed to be carrying an ex-marmot in its talons. Indeed a short climb further up found a Red Marmot watching us keenly from a distance and perhaps wondering where his friend had just disappeared too. The track continued uphill passing the remaining big snow patches. On sheer cliffs above these were big bluish patches of *Paraquilegia anemonoides*, sadly inaccessible, but on the flat were some fine *Chorispora bungeana* an attractive pink-flowered alpine crucifer.

By mid-morning we reached a flatter area where there were yellow and orange *Pedicularis oederi*, lots of both tulips, violets and also more *Oxytropis brachycarpa*, *Trollius lilacinus* and a stand of *Thermopsis alpinus* a big bright yellow pea that's rampant if let loose in the garden. Graham and Pernille walked on towards the dam where they saw a pair of Guldenstadt's Redstarts, the rest of us wandered back for lunch finding *Pedicularis alatavica* and at the picnic site itself enjoyed great views of a Merlin perched in a spruce.

Everyone favoured a walk back to the hotel over the bus (!). By now things were warming up with several butterflies on the wing including *Erebia turanica*, Yellow-legged Tortoiseshell, Small Tortoiseshell, Brimstone, Orange-tip, Queen of Spain Fritillary and an Apollo species. In the spruce I tracked down a Three-toed Woodpecker that was drumming and there were many Yellow-browed and Greenish Warblers. Lower down the banks were full of lilac *Geranium collinum*, *Dracocephalum imperbe* and *Trollius dshungaricus*, in fact the latter carpeted the opposite slopes of the valley along with the big buttercup *Ranunculus grandiflorus* and giant glaucous-leaved yellow-spiked *Ligularia grandiflora*.

The restaurant once again served up the coldest beer in Kazakstan.

Day 4 11th June Lower Meadows

The skies were clearer than ever this morning as we wandered down the sealed mountain road peering over and into the lush meadows and woods that covered all the slopes. There were masses of pale blue Jacob's Ladder *Polemonium caucasicum*, intense deepest wine-red *Aquilegia atrovinosa* and the tall spires of pink *Pedicularis amoena*. The lovely fragrance of white *Rosa alberti* filled the air and along a sidetrack was *Clematis (Atragene) sibirica* scrambling in the shrubs. Tucked among the thick herbage was a colony of Coral-root Orchids

Corallorhiza trigyna a diminutive saprophytic species.

Greenish Warblers, Rosefinches, Mistle Thrushes and a very obliging Songar Tit marked our progress down, finally reaching a lush meadow full of marsh orchids *Dactylorhiza umbrosa*, Monkshood *Aconitum leucostomum*, stands of purplish *Phlomis purpurea* and in the wet streamside flushes were both pink and pure white forms of *Cortusa broteroi*. Butterflies were well and truly on the wing down here with the marbled grey *Coenonympha sunbecca*, *Parnassius tienshanica*, Mazarine Blue, Pale Clouded Yellow, Wood White and *Erebia turanica*.

Crossing the slope we passed through a haze of bistort, columbine, lousewort and pale blue *Lappula tienshanica* before reaching another herb rich area with stands of the fine yellow *Eremostachys speciosa* and the endemic *Oxytropis glacialis*. We returned to the road, below which plunged a deep river valley where a Blue Whistling Thrush appeared briefly before the bus arrived with our lunch. After lunch we trundled back up to the hotel where we packed our bags leaving for Almaty at 3pm, stopping for a brief look at the city from the huge avalanche dam above the Medeo Ice Rink. Many local people were about including several wedding parties and others enjoying horseback rides along the dam. Fighting through Almaty we picked up our train tickets and then discovered the timetable had changed and the train departed sooner than expected – no time for postcards after all.

Once aboard we settled into our sleeper compartments, spending time watching the expansive steppe scenery slip past as well as the numerous birds including Roller, Bee-eater, Lesser Grey Shrike, Montagu's Harrier, Ruddy Shelduck, a pair of Little Bustard and a huge colony of Rose-coloured Starlings nesting in a long rocky cutting. The restaurant car proved popular with some notably Alistair and John who befriended the locals and furthered Anglo-Kazak relations no end with numerous vodka toasts.

Day 5 12th June Dzabagly and the Karatau

Arriving at 6.30am we were soon in Dzabagly for breakfast and then off across the steppe passing through typical Kazak towns and villages, where every house seemed to have their window frames and doors painted the same shade of bright blue (the cheapest colour paint at Kazak B&Q no doubt). A pit stop for fuel allowed some to sample the delights of the modern open-air Kazak privy – definitely a case of whistle while you work. Climbing gently into the ancient Precambrian rocks of the Karatau Mountains we reached the Kujuk Pass where massed spires of the elegant white *Eremurus tianshanicus* spread over the slopes and bushes of *Acanthophyllum pungens* were smothered in pink flowers that proved a magnet for hundreds of big *Chazara enervata*, Eastern Marbled White and Spotted Fritillary butterflies. There were various onions on the dry slopes including the bluish *Allium caesium* and *Allium caeruleum*, *Allium kuyukense* and the fine pinkish-red *Allium trachyscandum* along with Persian Rose *Hulthemia persica*, the unusual purple *Dodartia orientalis*, Lady's Bedstraw *Galium verum* and a Skullcap *Scutellaria kurssanovii*. There had been a mass emergence of cicadas and they were smothering many bushes producing their trademark racket and flying off in clouds as we passed. Along with these were several weird and wonderful locusts and mantids and a Chukar scuttled away trying to draw attention from her chicks most of which eluded us save for one little bird that huddled under a stone and froze allowing us close views.

We continued onto the Karasai Gorge where by now it was very hot (unusually so). The Rose-coloured Starlings had failed to show up this year (they are dependent on locust populations) but we ventured into the gorge in search of other birds anyway. There were many odonata with Black-tailed Skimmers, darters and Banded Agrions flitting about the stream. Vladimir led us to an occupied Egyptian Vulture nest where we were able to see an adult at the nest and then overhead cruised a posse of Long-legged Buzzard, Black, Griffon and a second Egyptian Vulture. Eastern Rock Nuthatches were vociferous and active and Vlad showed us their long-time nest, a rock hard construction of mud, stones and anything else they could plaster together. Walking out of the valley we found Red-headed Bunting and Pied Wheatear plus a smattering of starlings.

Lunch was taken in the welcome shade of the Berkara Valley's ash trees. This rather incongruous area of riverine woodland is one of several remnant areas from Kazakstan's past when woodland would have been much more widespread. Nonetheless these areas still harbour an interesting array of species and even around the picnic site were several Nightingales, Upcher's Warbler and three Golden Orioles. Some of us opted to stay in the shade while the rest of us walked along the valley following the stream from where the odd Marsh Frog leapt out. There were many Holly Blue, a Bee Hawkmoth and several *Pseudothecla lunulata* hairstreaks.

Then in a shady grove we found a fantastic collection of nests. First of all two Penduline Tit nests, then those of both Spotted Flycatcher and the Paradise Flycatcher. What was really special was all were occupied and we spent some time watching the comings and goings from the various nests. Vladimir meanwhile had been overcome with heat and excitement and spent most of the time rolling in the stream. He also collected the wings of over ten species of butterfly that had been caught by the Paradise Flycatchers. These long-tailed, chestnut coloured birds are rather special and quite the last thing you would expect to find in the vast steppes of Kazakstan. We walked back to find that everyone else had also been watching Paradise Flycatchers near the bus all the time.

One last stop was made at Taskol Lake where there were many Common and Little Terns, Red-crested Pochard, Great Crested Grebe, Marsh Harrier and Clamorous Reed Warblers and views across the steppe to the rising walls of the snow-capped Tien Shan.

Day 6 13th June Koksai Gorge

Our destination today was higher and cooler than yesterday, a mountain valley in the far east of the Aksu-Dzabagly National Park. We stopped first to look at Ters Lake a huge body of water where we tried in vain to find any Demoiselle Cranes. There were instead plenty of Grey Heron, a few Black-winged Stilt, Yellow-legged Gull, Redshank, a Garganey and two Shovelers. All along the roadside was the ubiquitous *Sophora alopecuroides* a tall dense-headed cream-flowered legume and further on we stopped briefly for a closer look at a large Rose-coloured Starling colony that was occupying the rocky walls of one of the lake's dammed outlets.

The drive now was through typical Central Asian villages lined with poplars and houses with rendered walls painted with simple designs or surrounded by now familiar blue railings and gates. On the open farmland and steppe approaching the park we saw some wonderful birds with four Black-bellied Sandgrouse, a Little Bustard, Montagu's Harrier and Calandra Lark. By now we had crossed into Kirgizstan (no border controls out here) and the magnificent sight of Manas the highest peak in the area rose up in front of us, a towering 4480m. Below it flowed

the Koksai River that had also cut an eponymous gorge. We spent some time exploring this spectacular defile, a product of eroded conglomerate rocks, with towers and fluted cliff walls. The many crevices were home to numerous Kestrel and Lesser Kestrel, whereas the grassland topping the cliffs were a sea of blue *Gentiana olivieri* and from our viewpoint we also found several *Iris songarica*.

There were fields of *Eremurus fusca* as we continued up the Kirgizstan side of the valley to our picnic site where a stream flowed under many semi-defoliated willows (caterpillars had been hard at work) and scattered beneath were *Cortusa turkestanica* and *Dactylorhiza umbrosa*. Around muddy puddles were lovely orange-yellow Romanov's Clouded Yellow *Colias romanovii*, Cardinals and Black-veined White.

After lunch we walked further up the valley finding many more orchids and deep blue-flowered *Ixiolirion tartaricum* whilst along the fast flowing river we saw Brown Dipper, Blue Whistling Thrush and Vlad pointed out an unoccupied Golden Eagle nest. Entering a narrower stretch of valley we found many roses and honeysuckles in flower along with more eremurus included some hybrid forms (*x regeli*) and the hairy borage *Onosma irritans*. On the way back non-believers of my eagle-marmot experience presented me with a marmot foot and then span a yarn about seeing another eagle fly off leaving behind the foot – the sad thing is I almost went for it!

We paused to photograph a blue form of *Iris sogdiana* and the fields of *Eremurus fusca* and then shortly before Dzabagly Vlad pointed out our route for tomorrow's big ride up into the park to the Mountain House. Anna, meanwhile, had predicted a change in the weather.

Day 7 14th June Mashat Gorge

In the morning the change in the weather had duly arrived and it rained heavy showers into the early afternoon. This rather quelled our riding zeal or what there was of it as we paced about in various states of riding apparel. A late morning trip to the museum gave us an extra insight into the park with 3D models, photographs and too many stuffed animals. The ride was by now abandoned with the track too slippery for horses and the vital luggage and supply truck to make a safe journey.

Instead Vladimir took us an hour down the road to the Mashat Gorge, a place of stepped conglomerate cliffs and more importantly a place where the sun was shining. We soon saw a whole array of colourful birds with Bee-eater, two Kingfishers and several Golden Orioles. The latter were very active with assertive females chasing males from bush to bush giving us some excellent views. Other birds included Red-headed Bunting, Lesser Kestrel, Long-legged Buzzard and Eastern Rock Nuthatch and alongside the river were numerous dazzling Banded Agrions with shining blue-green bodies and Golden-ringed Dragonflies, while butterflies included *Lasiommata eversmanni*, *Athamanthia alexandra* and Eastern Marbled White. The dry cliffs supported an array of flowers with fine patches of the yellow *Scutellaria immaculata*, white *Alcea nudiflora*, the slightly spiny pink *Centaurea squarrosa* and the cotton-like seedpods of *Astragalus severzowii*.

Day 8 15th June To the Mountain House

A completely clear and sunny morning meant we were soon in the saddle and riding up towards the Mountain House, our mounts taking us through meadows full of creamy yellow *Iris sogdiana*, the spidery inflorescences of *Polygonum undulatum* and masses of blue *Polygala hybrida*. We stopped after an hour to ease our slightly sore muscles and take in the views back to the village and of the snowy peaks ahead of us, before we continued on towards Halfway House along a track filled by the delicious fragrance of the hundreds of *Rosa alberti* that were in full flower. From Halfway House we set off to explore the waterfall area on foot passing superb stands of *Morina kokanica*, big plants of the glaucous-leaved giant fennel *Ferula penninervis*, bright red seed heads of rhubarb *Rheum maximowiczii* (a favourite with the local bears) and pink *Linum olgae*. Descending a short way to the impressive falls, that because of the tilt in the rock strata seem to be falling at a curious angle, we found the blue bells of *Campanula albertii* growing in crevices in the rocks and a calling Rock Bunting. Back on the track we carried on to a stand of Burning Bush *Dictamnus angustifolius* growing amidst toxic *Prangos* leaves that we took care not to touch as the sap induces a photochemical reaction with the sun on the skin producing blisters. Butterflies were flying fast in the warm sun with many *Chazara enervata*, Pale Clouded Yellow, Cardinal, Peacock and Mazarine Blue.

We had lunch at Halfway House then Graham and I set off early to walk part of the way up onto the plateau where there were stands of tall purplish spikes of *Eremurus regeli* and several Eastern Stonechats. Riders and walkers all stopped at a spring where a short paddle up the moss-lined stream produced a mass of superb flowers with many delicate sprays of *Cortusa turkestanica* mixed in with dark *Aquilegia atrovinosa*, the pale blue bells of *Codonopsis clematidea* all beautifully marked inside and the tallest *Dactylorhiza umbrosa* I've ever seen – at least 60cm (two-feet) tall.

Most people walked on to the Mountain House from here (a little saddle sore) where our various accommodations awaited. These included two traditional Kazak yurts – large felt tents formerly very widely used by the traditionally nomadic Kazak people as comfortable dry mobile homes as they wandered across the vast steppes of Central Asia. However, they seemed a little daunting today largely because of the (unpredictable) emergence of thousands of horseflies many of which were settling on the yurts. Vladimir assured us they only lasted a few days and thankfully they seemed to only bite horses and not people.

Shirley had opted to drive up with the baggage truck and while waiting for us to turn up she had seen a bear high on the slopes and later on after dinner I rediscovered probably the same animal, a female with a cub that was rushing about the steep slopes above oblivious to any danger.

Day 9 16th June Ulkun Kaindi

We were now at two thousand metres altitude and the intention today was to wander slowly up to the extensive snow patches lodged within the neighbouring Ulkun Kaindi valley. After a gradual incline that still left us a little breathless we reached large drifts of yellow and red striped *Tulipa kaufmanniana* among which was a scattering of *Tulipa dasystemonoides*, pink and white *Corydalis ledebouriana* and bright yellow *Colchicum luteum*. Along a side valley Vladimir had spotted a few brilliant red *Tulipa griegii* still in flower and this prompted David, Pat, Alistair and Michael to clamber up for a better look where there was also the big onion *Allium karataviense*. The rest of us continued up watching three Golden Eagles cruise past the

distant cliffs as we walked past meadows of white *Anemone protracta* and climbed up past the first snow to an area of crags beset with stunning pink *Primula minkwitzsiae* and white *Androsace villosa*.

Two horsemen arrived with our cooked lunch as well as tea, coffee, jams and biscuits. Vladimir began calling instructions to somewhere above our picnic site to Graham who was returning from his attempt at the peak and various other attempts at sliding back down again - we soon patched him up. After a very pleasant lunch some of us decided to continue upwards in search of alpine jewels others wandered back to the house. Alongside the big snow patch that filled the upper valley were fabulous groups of a beautiful sky-blue Juno Iris *Iris caerulea* and higher still we found a single yellow *Iris orchioides*. Crossing the snows to a prominent buttress of rock there were still some delicate *Paraquilegia anemonoides* in flower and endemic *Stephanocaryum olgae* a lovely blue borage growing together with more *Primula minkwitzsiae*.

Various techniques in skiing and tobogganing got some of us down a lot faster than others and back at the mountain house we were able to enjoy a cold beer, compote or tea. That evening Graham and Pernille went in search of Nightjars and came back having seen two birds on the slopes above the house.

Day 10 17th June The Pass

The steep thousand-metre climb up to the pass takes under an hour by horse and our strong mounts were variously motivated to take us up. We flushed out two Quail early on and then after a rest halfway reached the highest snow patches wreathed in arcs of *Tulipa kaufmanniana* and gorgeous drifts of orange-yellow *Trollius altaicus*. The views from the top were quite magnificent along the length of the Little Aksu Valley as it plunged steeply down to the foaming waters below and then rose up the other side to the top of snow-clad four thousand metre Bugalutor one of the highest peaks in the park and still unclimbed. The warm weather had driven the Ibex on to distant snow patches to avoid the biting flies, but Alistair and I also saw a few animals much closer on the opposite flank of the valley along with a female Red Deer (a rare sight in the park). All around was an alpine garden of lavender-blue *Aster alpinus*, silver-leaved yellow *Potentilla holoserica*, *Pulsatilla campanella* and *Callianthemum alatavicum* and following the ridge along to a rugged col there were *Saxifraga alberti* and *Lloydia serotina*. In the flattened junipers was the odd Brown Accentor, on the scree a few Shorelark and in the air a Black Vulture circled some way off.

A very relaxing lunch was had and afterwards we ambled about photographing, dozed, sketched the scenery or climbed a little higher along the ridge. It remained gloriously cloudless all afternoon in fact all day and it was a reluctant descent. The horses had been led down and we pottered our way down – very pleasant as we passed vast sheets of anemones and many other flowers.

Vladimir and I rode out with Eileen and John shortly after our return to look at the Bronze and Iron Age carvings at Baidaksai, where they were able to take rubbings of the old hunter's art – depicting ibex and red deer. We also flushed a Nightjar that had problems settling in the strong breeze and offered wonderful views of its cryptic plumage.

Day 11 18th June Baidaksai or a walk down

Because of the rain enforced delay three days ago Graham, Pernille, Alistair and Owen were happy to remain up at the mountain house for another day, whilst the rest of the group descended with Vladimir to Dzabagly. It was a hot ride up to Baidaksai where we watched over a pool complex to find only a family of Mallards in residence. There were no mammals on the screes – no doubt they were on the cool snows elsewhere – so we carried on up to a below big snow patch, dismounted then walked up to search for *Korolkovia severzovii*. On the way up Owen startled a Haly's Pit Viper right beside the snow and it instantly coiled up and froze in striking position, allowing good (careful) photos to be taken.

Reaching the *Korolkovia* site some searching found only plants in seed (it was an early season this year) but a Lammergeier and a big flock of Alpine Choughs flew over to make amends and besides it was a relaxing place after yesterday's efforts. We had lunch then contoured across to the rock art past stream gullies lined with trollius and flushed out two Grey Partridge. A final amble back down to the house found Alistair's precious yurt disappeared and his belongings moved to the ladies yurt!

Day 12 19th June Walk down or Aksu Canyon

A leisurely start saw us walking back along the main track down to the river as the mountains behind us showed a bit more cloud this morning. Around the river there were many butterflies including High Brown Fritillary, Queen of Spain Fritillary and *Parnassius apollonius* and also fine stands of *Codonopsis clematidea*, *Delphinium confusum*, *Polygonum coronarium* and aromatic *Salvia* sp. Turning off into the meadows full of more delphiniums, *Hypericum scabrum* and heavy swathes of *Ligularia grandiflora* we reached the juniper woods and almost immediately found a small flock of Rufous-naped Tits. There were many Nightingales and pausing in the shade for a while we were beautifully serenaded with their incomparable song.

We passed through a series of birch groves with streams lined with *Cortusa turkestanica*, orchids, delicate pink tubular *Polygonatum roseum* and wintergreen *Pyrola rotundifolia* interspersed with drier meadows where families of Chukar scuttled along the paths in front flanked by the towering stems of *Paraligusticum discolor*. Moving through the lovely scenery Quail called from deep cover and as we neared our lunch spot near the Halfway House waterfall Nina and staff from the baggage truck began to call out and gesture from the other side of the valley. They drew our attention to a very close female Ibex that moved off only slowly. Lunch was in the cool shade of birch trees and afterwards Owen and I walked the rest of the way through the now familiar scenery of the park, with countless *Chazara enervata* zipping along the track and a White-capped Bunting by the waterfall, whilst the others rode back. We all met up on time for the bus back to Yevgeny's house where the rest of the group were having spent the day at a hot Aksu Canyon ... (I'll send this bit on if Vladimir sends it to us!).

After a final meal we said our goodbyes to our cooks and the horsemen before driving to the train station. There was a bit of a rush here as the timetable had been moved forward and we had only a few minutes to load everything aboard the train. Panic over we settled in for another ride across the step passing the Karatau Mountains once again, their slopes bristling with thousands of *Eremurus tianshanicus* in the late afternoon light.

Day 13 20th June The Observatory

Arriving into a warm Almaty at 9am we drove a short way for breakfast at a café and then up into the mountains once again. After a bit of bus trouble on the way up we eventually made it to the bizarre collection of buildings that are the Observatory, with several domes housing telescopes and huge dishes listening to whatever the universe has to offer (or more likely the latest Russian soap operas). Wrecked equipment and dilapidated buildings were further testimony to its former importance to astronomy, but now it does a good job of accommodating tourists at nearly three thousand metres altitude. Chris was ill at this point so no account for rest of day – ed!

Day 14 21st June Cosmos Station

Clear and sunny and driving up in altogether better vehicles, below us we could see the glacier blue waters of Big Almaty Lake and the extraordinary Observatory buildings. Stopping by an old moraine we were soon among flowers including three species of violet; *Viola altaica*, *Viola tianshanica* and *Viola rupestris*, a few Frog Orchids *Coeloglossum viride* and Edelweiss. A Stoat made a sudden appearance snaking across and under the boulders, swiftly moving through the moraine in search of Susliks. Hodgson's Mountain Finch, Red-mantled Rosefinch and Water Pipit flew across the slopes and higher up a Lammergeier cruised overhead watching perhaps a compromised Pernille almost behind a boulder (unseen by ourselves but nothing escapes a raptors eye!). The rundown Cosmos Station is where various unsavoury heavy water experiments were carried out during the cold war and to photograph the station, as we were able to today would have landed us in decided hot water back then. Nowadays the wonderful spread of alpinism up here at 3300metres is for anyone to see and we immediately found *Oxytropis glacialis* and *Trollius lilacinus* and further up the slope came *Lloydia serotina*, mats of *Sibbaldia procumbens*, cushions of *Androsace akbeitalensis*, yellow *Pedicularis oederi* and five species of *Saxifraga*; *sibirica*, *macrocalyx*, *cernua*, *hirculus* and lovely cushions of *Saxifraga oppositifolia*. In the higher crags were superb plants of *Paraquilegia anemonoides* and hopping about the rocks were three Altai Accentors. On the way down we also tracked down a handsome male Guldenstadt's Redstart among the huge glacial boulders.

After a lunch among the rusty remnants of the Soviet era most of the group walked back down to the Observatory. Those that drove down saw a big fat marmot cross the road in front of them. The pleasant descent was across short alpine turf studded with flowers with huge drifts of both colour forms of *Viola altaica*, countless *Primula algida* and in wet flushes groups of vivid *Primula nivalis* including a pure white form. The lower slopes were full of bright orange poppies *Papaver croceum*, forget-me-not, *phlomis purpurea* and *Dracocephalum grandiflorum* sporting its sumptuous, improbably blue flowers. Hodgson's Mountain Finches were common and Himalayan Snowcock called from high on the screes, whilst near the Observatory were Tree Pipit and a superb male Himalayan Rubythroat singing from a juniper. It was a relaxing sunny afternoon.

Day 15 22nd June Big Almaty Lake

Attempts to effectively photograph the night sky were thwarted by light cloud, but the early birdwatching group saw Black-throated Accentors, Greenish and Yellow Browed Warblers, at least two Himalayan Rubythroats, a brief glimpse of White-winged Grosbeak and a number of

Grey Marmots feeding around their colony across the grassy valley.

The day was spent around Big Almaty Lake, a lake glacial lake that is dammed at its outlet. Walking around the shore we flushed six Ruddy Shelduck and then saw eight well-grown chicks swimming out across the cool blue lake. Beyond the lake an impressive glacier nestled into the valley way up on the Kirgizstan border, the valley flanked all the way up with row upon row of perfectly straight dark green spruce. Nearing the braided river that feed the lake we were looking out for a very special bird – the Ibisbill – a singularly beautiful wader they nest only on braided mountain rivers. Then we found one, seeing it only because it flew at first, once alighted their plumage melts into the rocky background. Vladimir then managed to find another two Ibisbill, which most people saw at very close range – a rare treat. Elsewhere in the rocky outwash plain were a number of bizarre *Schmalhausenia nidulans*, a strange thistle relative. Poppies were everywhere and drifts of *Dracocephalum imberbe* and *Geranium albiflorum* and in a wet flush near the weatherman's cottage were many pale pink *Pedicularis rhinanthoides*. Many butterflies were gathering by a stream with Mazarine Blue, what was almost certainly *Glaucopteryx charybdis*, Blues, Mountain Argus, Eastern Pale Clouded Yellow, Spotted Fritillary, *Melitaea minerva*, *Parnassius apollonius* and Small Tortoiseshells. Rosefinches, Tree Pipits and Red-fronted Serins called from the spruce as we wandered back for lunch although Graham, Pernille and Alistair chose to carry on up the valley.

A leisurely afternoon was enjoyed around the meadows of the Observatory or wherever. An evening photo shoot by Shirley and myself saw the mountains at their golden best and also a Red-mantled Rosefinch atop a spruce.

Day 16 23rd June Observatory and Almaty

Overnight rain had thrown wreathing mists around the mountains, but conditions were improving as we set off across the immediate moraines and woods towards meadows and a large marmot colony. A number of animals were standing sentry whilst other fed and in the short meadow turf itself were big clumps of *Dracocephalum grandiflorum*. White-winged Grosbeaks put in fleeting appearances, but the main quarry was the elusive Severtsov's Tit Warbler. Vladimir had glimpsed one earlier but whilst talking to some fellow British birdwatchers a female appeared flitting about the scree and juniper for a few minutes.

It was all too soon time to descend again to Almaty and leave the wonderful Tien Shan behind. We still managed a couple of stops, one in the shady spruce forest to look for *Clematis sibirica* and then lower down a leg stretch near a pool found numerous *Aeshnas*, Hungarian Glider and a Black Kite. Reaching Almaty we slowly checked into the Jetysu Hotel (Russian bureaucracy is still alive and well in this hotel) before Vladimir took most of us on a brief tour of the city taking in the famous Zenkov Cathedral, the War Memorial, the market and a spin through the streets. Our last meal that evening was in restaurant with a great domed ceiling painted with scenes from former kazak life on the steppes – a bit like a giant yurt really.

A few snatched hours of sleep and it was time for the early morning trip to the airport and the flight to the UK. As for myself I was at that time snoozing in the back of a van driving across the steppe to begin a lengthy sixty-kilometre horse trek into the Almatinsky mountains, but that's another sore story altogether.

Systematic List Number 3(a) Flowers in the Zalasskiy Alatau

The nomenclature is taken from the flora of the Aksu-Dzhabagly (1973 with, for some species, a 1997 update) Anna Ivaschenko has provided all other nomenclature and more modern nomenclature where appropriate. This first flower list refers to those species observed in the mountains above Almaty known as the Zalasskiy Alatau. Species recorded this year but not in 2003 are annotated 2004, and conversely those not recorded this year are marked [not in 2004']

A summary of the itinerary in the Zalasskiy Alatau Mountains :-

June 9 th	Cimbulak Ski-lift
June 10 th	Tjuk-su Valley and Gate
June 11 th	Below Cimbulak and Almaty
June 20 th	Journey to Gaish Astronomical Observatory above Big Almaty Lake – environs.
June 21 st	The Cosmos Station.
June 22 nd	Big Almaty Lake and the Observatory area
June 23 rd	Journey to Almaty

Athyriaceae

<i>Cystopteris filix-fragilis</i>	Locally frequent in damp rocky areas, often in shade
<i>Dryopteris filix-mas</i>	Scattered

Ophioglossaceae

<i>Botrychium lunaria</i>	Common in short alpine turf e.g. Observatory 2004
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Equisetaceae

<i>Equisetum arvense</i>	Big Almaty Lake
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Aspleniaceae

<i>Asplenium septentrionale</i>	Cimbulak
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Pinaceae

<i>Picea schrenkiana</i>	The Tien Shan Spruce. locally dominant
<i>Pinus sylvestris</i>	Planted

Cupressaceae

<i>Juniperus pseudosabina</i>	Locally dominant at higher altitudes
<i>Juniperus sibirica</i>	Locally dominant at higher altitudes

Poaceae

<i>[Agrostis turkestanica</i>	Above Cimbulak not 2004]
<i>Alopecurus pratensis</i>	
<i>Anthoxanthum alpinum</i>	Cosmos station
<i>Dactylis glomerata</i>	Widespread and common
<i>Deschampsia koelerioides</i>	
<i>Festuca alaica</i>	
<i>Festuca valesiaca</i>	
<i>Helictotrichon pubescens</i>	Widespread
<i>[Hordeum turkestanicum</i>	Not 2004]
<i>Phleum alpinum</i>	Widespread at high altitudes
<i>Poa alpina</i>	Widespread and common at higher altitudes
<i>Poa angustifolia</i>	Widespread
<i>Poa annua</i>	
<i>[Poa bulbosa</i>	Not 2004]
<i>Poa pratensis</i>	Widespread and common
<i>Trisetum spicatum</i>	

Cyperaceae

<i>Carex melanantha</i>	Widespread
<i>Carex melanostachya</i>	Cimbulak
<i>Carex riparia</i>	Cimbulak
<i>Cobresia capilliformis</i>	Cosmos station

Juncaceae

<i>Luzula pallescens</i>	Cimbulak
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Liliaceae

<i>Eremurus fuscus</i>	Medium yellow-brownish flowered fox-tail lily
[<i>Eremurus robustus</i>	In flower below Big Almaty Lake. Not 2004]
<i>Gagea emarginata</i>	Cosmos Station and Cimbulak
<i>Gagea filiformis</i>	Widespread
[<i>Gagea turkestanica</i>	Big Almaty Lake not 2004]
<i>Gagea michaelis</i>	Big Almaty Lake
[<i>Gagea neo-popovii</i>	Scarce not 2004]
<i>Lloydia serotina</i>	Widespread at high altitude
<i>Tulipa dasystemon</i>	Scattered. Generally near snowmelt – rather similar to the next species although tepals less strongly pointed
<i>Tulipa heterophylla</i>	Locally frequent at high altitudes. A strange-looking tulip with pale greeny-yellow petals often lined with dark. Was formerly in a different genus
<i>Tulipa ostrowskiana</i>	Recorded at Cimbulak for the first time in 2003 and again in 2004 in seed
[<i>Allium amblyophyllum</i>	not 2004]
<i>Allium atrosanguineum</i>	Very common at higher altitudes. Short with dark blackish-red flowers in a tight head
[<i>Allium caesium</i>	Cimbulak not 2004]
[<i>Allium caeruleum</i>	Near Almaty not 2004]
<i>Allium fetisovii</i>	2004
<i>Allium karelini</i>	Scattered at high altitudes. Not seen in 2003.
<i>Allium platyspathium</i>	Locally common. Not in 2003.
<i>Allium polyphyllum</i>	Widespread
<i>Allium schoenoprasoides</i>	Widespread at high altitudes - small chive like <i>Allium</i> .

Orchidaceae

<i>Dactylorhiza umbrosa</i>	Locally abundant in wet flushes at low-mid altitudes. Typical dactylorhichid with wedge-shaped well patterned lip - as variable in characters as other members of the genus!
<i>Coeloglossum viride</i>	Occasional in meadows. Very red-green flowers
<i>Corallorhiza trifida</i>	Shady banks below Cim Bulak Hotel 2004

Iridaceae

<i>Crocus alatavicus</i>	seeding only
[<i>Iris alberti</i>	In seed near Almaty not 2004]

Salicaceae

<i>Salix alatavica</i>	
[<i>Salix iliensis</i>	not 2004]
<i>Populus tremula</i>	

Betulaceae

<i>Betula pendula</i>	
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Urticaceae

<i>Urtica dioica</i>	Widespread
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Santalaceae

[<i>Thesium alatavicum</i>	Scattered. Not in 2004.]
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Cannabaceae

[Cannabis sativa] Roadsides in Almaty not 2004]

Polgonaceae

Oxyria digyna Local at high altitudes.
Polygonum coriarium Cimbulak
Polygonum nitens Widespread
Polygonum songoricum Scattered at higher altitudes
Polygonatum viviparum Locally abundant
Rheum wittroekii Widespread and low-mid altitudes
Rumex acetosa Widespread and common
Rumex tianshanicus Scattered

Caryophyllaceae

[Arenaria serpyllifolia] Scattered not 2004]
[Cerastrium arvense] not 2004]
Cerastium cerastoides Locally abundant at mid altitudes
Cerastium dahuricum Locally common - the big broad-leaved *Cerastium*
Cerastium tianschanicum Cosmos station
[Dianthus tianshanicus] Above Big Almaty Lake. Not in 2004]
Herniaria hirsuta Occasional
Melandrium triste
Minuartia verna Widespread
Minuartia kryloviana Occasional at mid to high altitudes
Silene graminifolia Scattered
[Silene latifolia (vulgaris)] Widespread. Not in 2004]
Stellaria graminea Scattered. Lesser Stitchwort.
Thylacospermium caespitosum Locally common at higher altitudes. The amazing vegetable sheep – some fine specimens among the rocks above Cimbulak

Ranunculaceae

Aconitum leucostomum Widespread in mid-level meadows. Tall. White to dirty maroon coloured flowers – very like orientale
[Aconitum songoricum] Cimbulak not 2004]
Aconitum rotundifolium In leaf at Cosmos station
Anemone protracta AD & locally abundant at mid-high altitudes. Slopes, screes and streambanks – also by snowmelt. The abundant *Anemone narcissiflora* look-alike
Aquilegia atrovinosa Locally frequent at mid altitudes. Streams and damp screes, also in *Juniperus turkestanicus*. A stunning dark wine-coloured *aquilegia*
Atragene (Clematis) sibirica Locally frequent at mid altitude. A beautiful trailing shrub with long-petalled white flowers.
Callianthemum alatavicum Widespread at high altitudes – pretty white ‘anemone’ like flower with corydalis like foliage
[Ceratocephalus testiculatus] Big Almaty Lake 2003 not 2004]
Delphinium iliense
Oxygraphis glacialis Cosmos Station near Snow melt, a bit like a celandine!
Paraquilegia anemonoides Locally abundant with some superb cushions in flower above the Cosmos Station. Rocks, cliffs and screes at high altitude – a stunning plant with patches of dissect glaucous foliage up to two feet across often totally obscured by a mass of white to blue anemone like flowers
Paraparyum anemonoides Scattered – anemone-like, small white flowers
Pulsatilla campanella Locally abundant at mid to high altitudes. Drier slopes, screes and near snowmelt
Ranunculus alberti Locally common at high altitudes
Ranunculus grandifolius Scattered at high altitudes
[Ranunculus rubrocalyx] Cosmos station not 2004]
[Ranunculus longicaulis] not 2004]
Ranunculus popovii 2004
[Ranunculus transiliensis] Not in 2004]
Thalictrum alpinum Common at high altitude

<i>[Thalictrum minus</i>	Gaish. Not in 2004]
<i>Thalictrum simplex</i>	Scattered
<i>Trollius dshungaricus</i>	Locally frequent at mid altitudes. Large golden-yellow flowers – less orange than <i>Trollius altaicus</i>
<i>Trollius lilacinus</i>	Possibly the most beautiful plant in the region!

Berberidaceae

<i>Berberis sphaerocarpa</i>	Cimbulak
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Papaveraceae

<i>[Chelidonium majus</i>	Cimbulak not 2004]
<i>Glaucium squamigerum</i>	
<i>Papaver croceum</i>	Locally frequent at mid altitudes
<i>Papaver tianshanicum</i>	At high altitude – e.g. by the Cosmos Station. Smaller and with a different leaf shape than previous species
<i>[Roemeria refracta</i>	Tjuk-Su – a plant in a garden. The red poppy with the long thin fruits not 2004]

Fumariaceae

<i>Corydalis glaucescens</i>	Cosmos station
<i>Corydalis capnoides</i>	Cimbulak 2004.
<i>Corydalis gortschakovii</i>	Local at mid-high altitudes.
<i>[Cysticorydalis fedtschenkoana</i>	Cosmos Station. Not in 2004]

Cruciferae

<i>Barbarea plantaginea (=arquata)</i>	Scattered
<i>Capsella bursa-pastoris</i>	Tjuk-Su
<i>[Cardamine impatiens</i>	Cimbulak not 2004]
<i>Chorispora bungeana</i>	Locally frequent at higher altitudes – a very beautiful plant
<i>Draba alpina</i>	Common at high altitude
<i>[Draba huetii</i>	Cimbulak not 2004]
<i>Draba nemorosa</i>	Big Almaty Lake
<i>[Draba stenocarpa</i>	Big Almaty Lake not 2004]
<i>Draba subamplexicaulis</i>	Scattered
<i>Erysimum croceum</i>	Scattered in meadows. A very striking bright orange flower
<i>Erysimum marschallianum</i>	Cimbulak
<i>Eutrema integrifolium</i>	Widespread
<i>[Eutrema edwardsii</i>	Local at high altitudes not 2004]
<i>[Isatis tinctoria</i>	
2004]	not
<i>Neuroloma stenophylla</i>	
<i>Smelowskia calycina</i>	Cosmos Station
<i>Taphrospermum altaicum</i>	Locally frequent at higher altitudes
<i>[Thlaspi arvense</i>	Scattered. Not in 2004]
<i>Turritis glabra</i>	

Crassulaceae

<i>Rhodiola coccinea</i>	Locally common at mid-high altitudes– distinctive. Small with brilliant orange-red ‘flowers’. In wet areas.
<i>Rhodiola linearifolia</i>	Widespread
<i>Rhodiola semenovii</i>	Tjuk-su Valley. Tall with a pyramidal white inflorescence and densely packed bright green foliage
<i>Sedum ewersii</i>	Local at higher altitudes
<i>Sedum hybridum</i>	Widespread at mid altitudes

Saxifragaceae

<i>Chrysosplenium nudicaule</i>	Scattered in wet areas at higher altitudes
<i>Parnassia laxmanni</i>	Widespread. Has the facies of a <i>Cerastium</i> !
<i>Ribes meyeri</i>	Scattered
<i>Saxifraga cernua</i>	Cosmos Station 2004

<i>Saxifraga hirculus</i>	Locally abundant at high altitude especially in wet flushes
<i>Saxifraga macrocalyx</i>	Cosmos Station 2004
<i>Saxifraga oppositifolia</i>	Scattered at higher altitudes
<i>Saxifraga sibirica</i>	Widespread and very common
[<i>Saxifraga stenophylla</i>	Scattered at higher altitudes, like a smaller non-cushion forming <i>hirculus</i> not 2004]

Rosaceae

[<i>Agrimonia asiatica</i>	Near Almaty not 2004]
<i>Alchemilla tianshanica</i>	Widespread and common
<i>Alchemilla sibirica</i>	2004
<i>Armeniaca vulgaris</i>	Scattered
<i>Cotoneaster oligantha</i>	2004
[<i>Crataegus almatensis</i>	not 2004]
<i>Dasiphora phyllocalyx</i>	Shrubby Cinquefoil
<i>Fragaria viridis</i>	Widespread
<i>Geum urbanum</i>	
<i>Geum rivale</i>	
[<i>Malus sieversii</i>	Cimbulak not 2004]
<i>Potentilla asiatica</i>	Widespread - a 'recta'-like species
[<i>Potentilla biflora</i>	Scattered not 2004
[<i>Potentilla bifurca</i>	Cimbulak - the pinnate-leaved <i>Potentilla</i> . Not in 2004]
<i>Potentilla desetorum</i>	Scattered
<i>Potentilla evestita</i>	Scattered. Not in 2003.
<i>Potentilla gelida</i>	Locally common
<i>Potentilla multifida</i>	Scattered
<i>Potentilla nervosa</i>	Scattered at higher altitudes
<i>Potentilla nivea</i>	very small with whitish leaves 2004
<i>Potentilla orientalis</i>	Cimbulak
[<i>Potentilla strigosa</i>	Not in 2004]
<i>Rosa alberti</i>	Widespread
<i>Rosa platyacantha</i>	Cimbulak. Yellow flowers.
<i>Rubus caesium</i>	Cimbulak
<i>Rubus idaeus</i>	Locally common
[<i>Rubus saxatilis</i>	
2004]	not in
<i>Sibbaldia tetrandra</i>	Widespread at higher altitudes
<i>Sorbus tianshanica</i>	Locally common
[<i>Spiraea tianshanica</i>	Widespread not 2004 – this may have been re-identified as the next species]
<i>Spiraea lasiocarpa</i>	2004

Adoxaceae

<i>Adoxa moschatelliana</i>	Common in damp meadows under shade
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Fabaceae

<i>Astragalus alatavicus</i>	
<i>Astragalus alpinus</i>	Widespread – the European Alpine Milk Vetch
<i>Astragalus lithophilus</i>	Scattered
<i>Astragalus schanginianus</i>	Cimbulak
[<i>Glycyrrhiza glabra</i>	Near Almaty not 2004]
[<i>Hedysarum montanum</i>	Big Almaty Lake not 2004]
[<i>Hedysarum neglectum</i>	Locally common not 2004]
<i>Hedysarum semenowii</i>	Widespread
[<i>Lathyrus pratensis</i>	Widespread not 2004]
[<i>Lathyrus pisiformis</i>	Big Almaty Lake not 2004]
[<i>Lathyrus tuberosus</i>	Near Almaty not 2004]
[<i>Medicago lupulina</i>	Occasional at low altitude not 2004]
<i>Melilotus officinalis</i>	
<i>Orobanchus luteus</i>	
<i>Oxytropis almatensis</i>	Tjuk-su and the Observatory area

<i>Oxytropis brachycarpa</i>	Big Almaty Lake
<i>Oxytropis chionobia</i>	Scattered
<i>Oxytropis lapponica</i>	Big Almaty Lake
<i>Oxytropis recognita</i>	Big Almaty Lake
<i>Oxytropis sewerzovii</i>	Widespread
<i>Sophora alopecuroides</i>	Cimbulak
<i>Thermopsis alpina</i>	Locally common on slopes at mid-high altitude. A large woolly lupin-like species – not seen in flower. Low growing
<i>Trifolium pratense</i>	Widespread
<i>Trifolium repens</i>	Widespread
<i>Vicia cracca</i>	Widespread
<i>Vicia sepium</i>	

Geraniaceae

<i>Geranium albiflorum</i>	Locally frequent in meAdows. Small white flowers
<i>Geranium collinum</i>	Widespread in various forms
<i>Geranium rectum</i>	Locally common in meAdows
<i>Geranium saxatile</i>	Cosmos Station. Like a stunted high altitude version of <i>pratense</i> . Not in 2003.

Rutaceae

Dictamnus angustifolius

Polygalaceae

Polygala hybrida Widespread at mid altitudes. The common milkwort.

Euphorbiaceae

Euphorbia tianschanica Widespread

Celastraceae

[*Euonymus semenovii* Cimbulak not 2004]

Aceraceae

[*Acer negundo* Alien. Not 2004]

Balsaminaceae

Impatiens parviflora

Malvaceae

[*Alcea nudiflora* Not in 2004]
 [*Lavatera thuringiaca* Scattered at low-mid altitudes. Not in 2004]

Clusiaceae

[*Hypericum hirsutum* Cimbulak not 2004]

Tamaricaceae

Myricaria squamosa Above Big Almaty Lake

Violaceae

Viola acutifolia Local in meAdows above Big Almaty Lake – a rather leggy version of *Viola biflora* with leaves very pointed

Viola altaica Locally abundant at mid - high altitudes. Beautiful ‘mountain pansy’ type coming in two colours – one purple with some yellow in centre and the other creamy-yellow with dark lines

Viola biflora Tjuk-su Gate

Viola modestula 2004

Viola rupestris Observatory area

Viola tianshanica Widespread

[*Viola suavis* Cimbulak not 2004]

Elaeagnaceae

Hippophae rhamnoides En route to observatory

Cucurbitaceae

[Bryonia alba Near Almaty not 2004]

Onagraceae

Chamaenerium angustifolium Frequent by riversides at low altitude
Chamaenerium latifolium In river gravels at high altitude above Big Almaty Lake – the short one with the big red-pink flowers!
[Epilobium subnivale Above Big Almaty Lake. Not in 2004]
[Epilobium hirsutum Cimbulak. Not in 2004]

Apiaceae

Aegopodium alpestre Scattered
Angelica brevicaulis Locally common
[Angelica decurrens Cimbulak not 2004]
Anthriscus aemula = *A. sylvestris*. Widespread.
[Bupleurum aureum Cimbulak. Not 2004]
Ferula stylosa 2004
Heracleum dissectum Scattered. By streams.
Pachypleurum condensatum
Schultzia albiflora Common – low growing umbel
[Semenovia transiliensis Widespread not 2004?]
Vicatia conifolia Widespread at mid-high altitudes
(=*Carum atosanguineum*)

Pyrolaceae

[Moneses uniflora Below Big Almaty Lake. Not in 2004]
[Orthilia secunda Cimbulak not 2004]
[Pyrola minor Scattered under spruce woods not 2004]

Primulaceae

Androsace akbeitalensis Occasional at mid-high altitudes
Androsace fedtschenkoi Scattered. Basal rosette with a flower stalk terminating in an umbel of creamy-white flowers. Annual
Cortusa broteroi Locally abundant in wet areas at low-high altitudes. Similar to next species but with elongate white and dark stigmal area in centre of flower
Primula algida Widespread and often abundant at higher altitudes – some particularly fine forms including a pure white one (2004). Very small flowered pinky-purple Primula with 'normal' looking leaves
[Primula kaufmanniana Locally frequent at high altitudes not 2004]
Primula nivalis Widespread.
Primula turkestanica Apparently a distinct species from the above but the differences did seem unconvincing. 2004

Gentianaceae

[Gentiana algida White species found in next valley below the Cosmos station. Not in 2004]
[Gentiana barbata In seed not in 2004]
Gentiana falcata High altitudes – flowers a little like a *Lomatogonium*. Not in 2003.
Gentiana karelini Widespread at high altitudes. Minute! Not in 2003.
Gentiana kaufmanniana Scattered
[Gentiana tianshanica In seed not in 2004]
[Gentiana turkestanorum not in 2004]
Gentiana uniflora = *G. krylovii* = *G. verna* (2004) In a small corrie near the second stage of the Cimbulak ski lift

Polemoniaceae

Polemonium caucasicum = *P. caeruleum* (2004) Jacob's Ladder. Locally frequent at low altitudes

Boraginaceae

Asperugo procumbens Scattered
Echium vulgare Widespread
Eritrichium villosum Scattered
Lappula tianshanica Widespread
Myosotis asiatica Widespread
Myosotis micrantha 2004

Labiatae

Dracocephalum grandiflorum Locally abundant in meadows at mid to high altitude. A very striking species with large brilliant blue flowers – often growing in stands
Dracocephalum imberbe Widespread – often on rocks
Dracocephalum nutans Scattered
Dracocephalum stamineum Big Almaty Lake
Eremostachys speciosa Cimbulak
Lamium album Widespread
Mentha asiatica
Origanum vulgare
Phlomis oreophila Locally common at high altitude
Salvia deserta Common at lower altitudes
Thymus seravschanicus Widespread

Scrophulariaceae

Lagotis integrifolia Cosmos Station
Pedicularis alatauca Cosmos Station. Pale pink flowers, very white hairy inflorescence
Pedicularis amoena Widespread
Pedicularis dolichorrhiza Locally abundant at mid to high altitudes. The common yellow and white (or creamy) flowered louseworts
Pedicularis pubiflora Scattered
Pedicularis oederi Locally common at mid-high altitude in the Almaty area. Distinctive with bi-coloured (cream and brown) flowers
Pedicularis rhinanthoides Uncommon in wet flushes above Big Almaty Lake
Scrophularia incisa Big Almaty Lake
[Scrophularia alata Cimbulak not 2004]
[Verbascum songoricum Widespread not 2004]
[Verbascum thapsus Scattered not 2004]
Veronica beccabunga Scattered
Veronica chamaedrys Widespread
Veronica porphyriana Locally common in mid-high level turf. Beautiful dark blue spicate species
Veronica serpyllifolia Cimbulak

Rubiaceae

[Galium septentrionale not 2004]
[Galium aparine not 2004]

Caprifoliaceae

Lonicera hispida Tjuk-su and above Cimbulak. Big flowers
Lonicera humilis Scattered
Lonicera karelinii Near Big Almaty Lake. Two largish bi-coloured flowers
Lonicera semenovi Big Almaty Lake

Valerianaceae

[Patrinia intermedia Scattered. Tight head of bright yellow flowers. Not in 2004]
Valeriana turkestanica Cimbulak

Campanulaceae

<i>[adenophora himalayana</i>	Common in turf around the observatory and above Big Almaty Lake. Fairly standard looking bellflower! Not 2004]
<i>Campanula glomerata</i>	Widespread. The European Clustered Bellflower with a distinctive capitate inflorescence
<i>Codonopsis klematidea</i>	Widespread. Streamsides, Juniper and spruce forest and damp slopes. Large pale blue bells with orange and black stigma and anthers. Foetid.
Asteraceae	
<i>Alfredia nivea</i>	Scattered
<i>Achillea millefolium</i>	
<i>Artemisia absinthium</i>	Widespread
<i>Artemisia aschurbajevii</i>	Around observatory
<i>Artemisia santolinifolia</i>	Locally frequent at higher altitudes
<i>[Artemisia sieversiana</i>	Not 2004]
<i>Artemisia vulgaris</i>	Widespread
<i>Aster alpinus</i>	Widespread at mid-high altitudes
<i>Centaurea rhapontica</i>	Near Almaty.
<i>Cicerbita azurea</i>	Widespread.
<i>[Cicerbita tianschanica</i>	not 2004]
<i>Cirsium semenovii</i>	Widespread.
<i>[Cousinia umbrosa</i>	Cimbulak not 2004]
<i>Crepis multicaulis</i>	2004
<i>[Crepis sibirica</i>	Cimbulak not 2004]
<i>Doronicum turkestanorum</i>	Frequent in meadows and woods at low-high altitude
<i>Erigeron auranticus</i>	Common at high altitude in the Almaty area. Gold-coloured flowers
<i>Erigeron heterochaeta</i>	Scattered. Like Alpine Aster in appearance
<i>Erigeron lachnocephalus</i>	Big Almaty Lake. Mauve.
<i>Erigeron seravschanicus</i>	Above Big Almaty Lake and at the Cosmos Station
<i>Hieracium dublitzkii</i>	
<i>[Inula helenium</i>	Cimbulak not 2004]
<i>[Inula macrophylla</i>	not 2004]
<i>Leontopodium fedtschenkoanum</i>	Widespread at altitude
<i>Leontopodium ochroleucum</i>	Cosmos Station
<i>[Ligularia heterophylla</i>	Cosmos Station and above Big Almaty Lake not 2004]
<i>Ligularia macrophylla</i>	Locally dominant in rich meadows at mid altitudes, also up to high altitudes
<i>Picris similis</i>	In leaf
<i>Pyrethrum alpinum</i>	Big Almaty Lake
<i>Rhaponticum sordida</i>	In leaf
<i>Saussurea elegans</i>	
<i>Saussurea gnaphaloides</i>	Cosmos Station. Purple virtually stemless flowers amid grey leaf rosettes
<i>Saussurea schanginiana</i>	Cosmos Station
<i>Schmalhausenia nidulans</i>	Quite common around the observatory, up towards the Cosmos Station and above Big Almaty Lake. Really the most bizarre-looking thistle with flowers stuck on the sides and top of a very robust stem and with a large basal set of very spiny leaves!
<i>[Taraxacum lilaceum</i>	Scattered at high altitudes – odd dandelion with funnel-shaped lemon flowers. Not in 2004]
<i>Taraxacum officinale</i>	At mid-high altitudes!
<i>Tripleurospermum ambiguum</i>	Widespread
<i>Tripleurospermum iroborum</i>	Cim Bulak 2004
<i>Tussilago farfara</i>	

Systematic List Number 3(b) Flowers of Aksu Djabagly area

A summary of the itinerary –

June 12 th	Kuyuk Pass, Karasay Gorge, and Berkara
June 13 th	Koksai Gorge
June 14 th	Mashat Gorge
June 15 th	Journey to Mountain House
June 16 th	Ulkun Kaindi Valley
June 17 th	Ulkun Kaindi Pass
June 18 th	Baidaksai/Return to Djabagly
June 19 th	Return to Djabagly/Aksu Canyon

Polypodiaceae

<i>[Asplenium viride]</i>	Not in 2004]
<i>Cystopteris filix-fragilis</i>	
<i>[Dryopteris filix-mas]</i>	Not in 2004]
<i>[Asplenium ruta-muraria]</i>	Not in 2004]

Typhaceae

<i>Typha angustifolia</i>	Scattered
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Alismataceae

<i>Alisma loeselii</i>	Darbaza Lake.
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Butomaceae

<i>Butomias umbellatus</i>	Ters
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Equisitaceae

<i>Equisetum arvense</i>	Scattered.
<i>[Equisetum ramossissimum]</i>	not in 2004]

Cupressaceae

<i>Juniperus turkestanica</i>	Locally dominant at altitudes of 2600 – 3150m
<i>Juniperus seravschanica</i>	Locally dominant at mid altitudes
<i>Juniperus semiglobosa</i>	Locally dominant at mid altitudes
<i>[Juniperus sabina]</i>	Koksai Gorge. Not in 2004]

Ephedraceae

<i>Ephedra equisetina</i>	Frequent in all areas
<i>[Ephedra fedtschenkoana]</i>	Ulkun Kaindi Pass not 2004]
<i>Ephedra intermedia</i>	Kuyuk Pass

Poaceae

<i>Achnatherum caragana</i>	
<i>Achnatherum splendens</i>	
<i>Aegilops crassa</i>	
<i>Aegilops cylindrica</i>	
<i>Agropyron pectinatum</i>	
<i>Agrostis gigantea</i>	
<i>Alopecurus pratensis</i>	
<i>Alopecurus himalaicus</i>	
<i>Anisantha tektorium</i>	
<i>Bromus danthoniae</i>	
<i>Bromus japonicus</i>	
<i>Bromus inermis</i>	Locally frequent
<i>Bromus oxydon</i>	

<i>Bromus sewerzowii</i>	
<i>Calamagrostis epigeios</i>	Koksai Gorge and near Halfway House. Not in 2003.
<i>Calamagrostis dubia</i>	Ulkun Kaindi Valley
<i>Cynodon dactylon</i>	
<i>Dactylis glomerata</i>	Widespread and common
<i>Dactylus himalayensis</i>	
<i>Elymus drobovii</i>	
<i>Elytrigia trichophora</i>	Scattered
<i>Elytrigia repens</i>	
<i>Festuca olgae</i>	
<i>Festuca gigantea</i>	
<i>Festuca pratensis</i>	
<i>Festuca valesiaca</i>	
<i>Helictotrichin hookeri</i>	Ulkun Kaindi Pass
<i>Hordeum bulbosum</i>	Widespread and abundant
<i>Hordeum leporinum</i>	
<i>Hordeum turkestanicum</i>	
<i>Koeleria cristata</i>	
<i>Leymus aemulans</i>	Kshi Kaindi
<i>Lolium perenne</i>	
<i>Melica inaequiglumis</i>	
<i>Phalarioides arundinacea</i>	Koksai Gorge.
<i>Phleum alpinum</i>	Ulkun Kaindi .
<i>Phleum paniculatum</i>	
<i>Phleum phleoides</i>	Locally frequent in meadows adows at low-mid altitudes
<i>Phragmites australis</i>	
<i>Poa alpina</i>	Ulkun Kaindi Pass.
<i>Poa angustifolia</i>	
<i>Poa bulbosa</i>	
<i>Poa nemoralis</i>	
<i>Poa pratensis</i>	Widespread and common
<i>Poa relaxa</i>	Locally frequent
<i>Sclerochloa dura</i>	
<i>Stipa capillata</i>	Locally frequent at lower altitudes
<i>Stipa caucasica</i>	Locally abundant at low-mid altitudes
<i>Stipa kirghisorum</i>	Scattered
<i>Stipa lessingiana</i>	
<i>Taeniatherum crinitum</i>	Scattered

Araceae

Arum korolkovii Aksu-Dzhabagly

Colchicaceae

Colchicum luteum By snow in the Ulkun Kaindi valley 2004

Liliaceae

Eremurus lactiflorus A few in Aksu-Dzhabagly in seed at Kuyuk Pass, and in at Aksu Gorge. Sparse flowered Spike of largish white flowers. Inflated round seed capsules distinctive.

Eremurus regelii Locally abundant at low - mid altitudes. Tall (up to 2.5m) dense flowered spike of brownish flowers. Seed capsules small round and variously ridged. Hybridises with *fuscus* at Koksai Gorge.

Eremurus sogdianus 2004

Eremurus tianshanicus Tall columnar densish spike of off-white flowers. Kuyuk Pass. Superb displays 2004

Eremurus fuscus x E. regelii Koksia Gorge 2004

Gagea capillifolia Ulkun Kaindi Valley.

Gagea dshungarica High altitudes in the reserve.

Gagea emarginata Locally common in the reserve.

Gagea filiformis Ulkun Kaindi Valley, Pass, and Baidaksai.

<i>Gagea gageoides</i>	2004
<i>Gagea minutiflora</i>	Ulkun Kaindi Valley, Pass, and Baidaksai.
<i>Gagea olgae</i>	Ulkun Kaindi Pass.
<i>Gagea turkestanica</i>	Ulkun Kaindi Pass and Valley.
<i>Gagea vvedenskyi</i>	A few in the reserve.
<i>Gagea ugamica</i>	Ulkun Kaindi Pass and Baidaksai.
<i>Korolkovia severzovii</i>	Some found in seed at Baidaksai 2004
<i>Lloydia serotina</i>	Snowdon lily. Ulkun Kaindi Pass.
<i>Rhinopetalum stenanthorum</i>	Noted in seed. Seed capsules about 12mm long and 12mm diameter with strong ridges
<i>Polygonatum roseum</i>	Occasional at low altitude. Mostly along stream banks. More upright than following species with pale pink to light rose flowers, normally two per whorl of leaves
<i>Polygonatum severzovii</i>	
<i>Tulipa bifloriformis</i>	In seed at Koksai.
<i>Tulipa dasystemonoides</i>	Locally abundant on snowmelt from mid to high altitudes. Narrow pointed white tepals with a yellow centre and two long and narrow leaves (5-8mm)
<i>Tulipa greigii</i>	Red Data Book species. Frequent at low altitude in seed. A few in flower in Ulkun Kaindi Valley.
<i>Tulipa kaufmanniana</i>	Red Data Book species. Locally abundant at mid-high altitudes - usually seen in flower next to snowmelt. Rather blunt bright yellow tepals of very variable size, leaves normally 2, between 10 and 40mm wide, up to 150mm long, unspotted
<i>[Tulipa orthopoda</i>	In seed at Kuyuk Pass not 2004].
<i>Tulipa turkestanica</i>	Some plants in flower in Ulkun Kaindi Valley, and in flower on Pass.
<i>Allium barszczewskii</i>	Locally common at low-mid altitude. Sparse red flowers.
<i>Allium caesium</i>	Widespread – the larger blue allium.
<i>Allium coeruleum</i>	Locally frequent at low altitudes. The little blue one.
<i>Allium collis-magni</i>	Berkara
<i>Allium drobovii</i>	Widespread in bud – large pale one
<i>Allium fedtschenkoanum</i>	Locally common at high altitude on lush meadows below snowmelt. Ulkun Kaindi Pass and Baidaksai
<i>Allium fetissoyii</i>	Widespread
<i>Allium filidens</i>	Berkara and Steppe Lakes
<i>Allium hymenorhizum</i>	Probably the most common allium - rather ordinary looking with quite large hemispherical heads of pale pink flowers
<i>Allium karataviense</i>	Occasional on dry stoney slopes and screes at low-mid altitudes, usually on south facing slopes. Flowering in Ulkun Kaindi 2004
<i>[Allium kokanicum</i>	Scattered. Not in 2004]
<i>Allium kuyukense</i>	Kuyuk Pass
<i>Allium oreophilum</i>	Ulkun Kaindi Pass – beautiful dwarf rich red-maroon flowered species on Screes.
<i>Allium polyphyllum</i>	Common at high altitude – distinctive layered leaves
<i>Allium sewerzovii</i>	Locally frequent
<i>Allium trachyscordum</i>	Kuyuk Pass

Amaryllidaceae

<i>Ixiolirion tataricum</i>	Locally abundant at low-high altitudes. Blue flowers like a flared campanula in appearance
<i>Ungernia severzovii</i>	In leaf at Aksu Gorge. Large brick red bloom when in flower, leaves rather like an <i>Eremurus</i> but more in the arrangement of a <i>Juno</i> Iris. Likes very dry slopes

Iridaceae

<i>[Crocus alatavicus</i>	In seed at Baidaksai 2003 not in 2004]
<i>Iris korolkovii</i>	Some fine flowers at Aksu in 2003
<i>Iris sogdiana</i>	Locally abundant at low-mid altitude. Rather foetid leaves about 15mm across. Flower white with some yellow at base of very narrow standards and falls. Sometimes suffused with pink or mauve. Damp areas and meadows.

<i>Iris (Juno) coerulea</i>	Locally frequent at low-mid altitudes. Slopes and screes. In flower in Ulkun Kaindi Valley. Elegant <i>Juno</i> iris with rather narrower leaves than following species - not as widely white-margined either. Sky-blue flowers.
<i>Iris (Juno) orchioides</i>	Locally frequent at mid-high altitudes - only noted on either side of the Ulkun Kaindi pass - most common on south facing stabilised scree slopes on the Aksu side of the pass. More leaves than precious species with wide white margin, overall a rather bigger plant - gorgeous yellow flowers. Only one found in flower 2004.
<i>Iris songorica</i>	In flower at the Koksai Gorge 2004 (in leaf Kuyuk Pass 2003)

Orchidaceae

<i>Epipactis helleborine (=latifolia)</i>	Scattered. Broad-leaved Helleborine!
<i>Dactylorhiza umbrosa</i>	Locally abundant in wet flushes at low-mid altitudes. Typical dactylorhiza with wedge-shaped well patterned lip - as variable in characters as other members of the genus!

Salicaceae

<i>Populus talassica</i>	
<i>Salix excelsa</i>	Dzhabagly
<i>Salix neidzwieckii</i>	In the reserve

Betulaceae

<i>Betula talassica</i>	Locally frequent along streams in juniper forest. This species has very pale, almost white bark
<i>Betula turkestanica</i>	Locally frequent along streams at low-mid altitudes. Reddish tinge to bark. Apparent intermediates noted.

Ulmaceae

<i>Celtis caucasica</i>	Aksu
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Urticaceae

<i>Parietaria micrantha</i>	
<i>Urtica dioica</i>	Widespread

Santalaceae

<i>Thesium brevibracteatum</i>	
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Polygonaceae

<i>Atraphaxis pyrifolia</i>	Locally common
[<i>Atraphaxis frutescens</i>	Kuyuk Pass not 2004]
<i>Oxyria digyna</i>	Local at high altitudes – much commoner in the latter area
[<i>Polygonum amphibum</i>	Ters Lake not 2004]
<i>Polygonum aviculare</i>	not 2004]
<i>Polygonum coriarium</i>	Widespread. The 'Alpine Bistort' look-alike
<i>Polygonum hissaricum</i>	Ulkun Kaindi Valley and Pass
<i>Polygonatum nitens</i>	Frequent at mid altitudes. Columnar spike - looking rather like a normal Bistort
<i>Polygonum undulatum</i>	Common at mid-high altitudes
<i>Polygonum viviparum</i>	2004
<i>Rheum maximowiczii</i>	Scattered at low to mid altitudes. The 'Rhubarb'-like plant with large leaves and a spike of very red dock-like flowers
<i>Rumex crispus</i>	Widespread

Chenopodiaceae

<i>Ceratoides latens</i>	Steppe lakes
<i>Chenopodium foliosum</i>	Around the Mountain House
<i>Rhaphidophyton regelii</i>	Red Data Book species. Occasional at low altitudes.

Caryophyllaceae

<i>Acanthophyllum pungens</i>	Steppe lakes
<i>Allochrysa gypsophiloides</i>	Red Data Book species. Aksu Canyon. Sprays of white <i>Gypsophila</i> like flowers
<i>Arenaria griffithii</i>	Baidaksai
[<i>Arenaria serpyllifolia</i>	not 2004]
<i>Cerastium arvense</i>	Widespread
<i>Cerastium bungeanum</i>	Widespread
<i>Cerastium dahuricum</i>	Widespread
<i>Cerastium lithospermifolium</i>	Ulkun Kaindi Pass
[<i>Dianthus hoeltzeri</i>	Scattered on drier slopes everywhere. Not in 2004]
[<i>Dianthus karataviensis</i>	Scattered. Not in 2004]
<i>Dianthus tetralepis</i>	Taskol
<i>Gypsophila cephalotes</i>	Ulkun Kaindi Pass
<i>Herniaria hirsuta</i>	Widespread
<i>Melandrium turkestanicum</i>	Scattered
<i>Petrorhagia alpina</i>	= <i>Tunica stricta</i> (2004) Common in the reserve
<i>Silene brachuica</i>	Kuyuk Pass
<i>Silene kuschakewiczii</i>	Scattered
<i>Silene venosa</i>	Steppe lakes
<i>Silene latifolia (vulgaris)</i>	Widespread
<i>Silene volgensis</i>	Koksai Gorge
<i>Stellaria graminea</i>	Widespread. Lesser Stitchwort.
<i>Vaccaria pyramidata</i>	Dzhabagly
<i>Velezia rigida</i>	2004

Ranunculaceae

<i>Aconitum talassicum</i>	Noted in the small spring behind the Halfway House and in the Koksai Gorge. Small Monkshood with bright light blue flowers. In leaf 2004.
<i>adonis parviflora</i>	Noted in the reserve
<i>Anemone protracta</i>	Locally abundant at mid-high altitudes. Slopes, screes and streambanks – also by snowmelt. The abundant <i>Anemone narcissiflora</i> look-alike
<i>Anemone petiolulosa</i>	In seed in the reserve
<i>Aquilegia atrovinosa</i>	Locally frequent at mid altitudes. Streams and damp screes, also in <i>Juniperus turkestanicus</i> . A stunning dark wine-coloured <i>aquilegia</i>
[<i>Batrachium divaricatum</i>	Ters Lake not 2004]
<i>Callianthemum alatavicum</i>	Pretty white ‘anemone’ like flower with corydalis like foliage
<i>Clematis orientalis</i>	Noted in seed
<i>Delphinium confusum</i>	
<i>Delphinium semibarbatum</i>	Near Taskol
<i>Erianthis longistipitata</i>	Noted in leaf
<i>Paraquilegia anemonoides</i>	= <i>grandiflora</i> (2004)Ulkun Kaindi Pass. Cushions in flower. Rocks, cliffs and screes at high altitude – a stunning plant with patches of dissect glaucous foliage up to two feet across often totally obscured by a mass of white to blue anemone like flowers
<i>Paraperyum anemonoides</i>	2004
<i>Pulsatilla campanella</i>	Locally abundant at mid to high altitudes. Drier slopes, screes and near Snowmelt
<i>Ranunculus paucidentatus</i>	Scattered in the reserve
<i>Ranunculus polyanthemus</i>	Scattered - very similar to <i>Ranunculus acris</i> or Meadow Buttercup
<i>Ranunculus regelianus</i>	Scattered in the reserve
<i>Ranunculus rufosepalus</i>	Noted from stabilised screes on the south (Aksu) side of the Ulkun Kaindi Pass and in the Valley and Baidaksai
<i>Thalictrum isopyroides</i>	Ulkun Kaindi Pass and Valley, and Kuyuk Pass
<i>Thalictrum minus</i>	Widespread
<i>Thalictrum simplex</i>	Widespread at low to mid altitudes.
<i>Trollius altaicus</i>	Locally abundant at mid to high altitudes. Large orange-yellow Globeflower with a relatively open flower. Damp areas, streambanks and snowmelt

Berberidaceae

<i>Berberis oblonga</i>	
[<i>Gymnospermium alberti</i>	Baidaksai 2003 not in 2004]

Papaveraceae

<i>Glaucium fimbriigerum</i>	Kuyuk Pass and steppe lakes
[<i>Glaucium elegans</i>	Kuyuk Pass not 2004]
<i>Glaucium squamigerum</i>	
<i>Papaver croceum</i>	Locally common on Ulkun Kaindi Pass and Valley.
[<i>Papaver litwinovii</i>	not 2004]
<i>Roemeria refracta</i>	Widespread

Fumariaceae

<i>Corydalis gortschakovii</i>	Noted from north facing slopes among <i>Juniperus turkestanicus</i> scrub on the Ulkun Kaindi pass and valley. Probably 2004.
<i>Corydalis ledebouriana</i>	Ulkun Kaindi Valley and Baidaksai where common
[<i>Fumaria vaillantii</i>	Kuyuk Pass not 2004]

Capparidaceae

<i>Capparis spinosa</i>	= <i>herbacea</i> (2004) Karatau
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Cruciferae

<i>Alyssum stenostachyum</i>	Kuyuk Pass
<i>Arabis kokanica</i>	Ulkun Kaindi Pass
<i>Brassica campestris</i>	2004
<i>Camelina microcarpa</i>	Taskol
<i>Capsella bursa-pastoris</i>	
<i>Crambe orientalis</i>	Scattered
<i>Draba lanceolata</i>	2004
[<i>Draba melanopus</i>	Ulkun Kaindi Pass not 2004]
[<i>Draba talassica</i>	Ulkun Kaindi Pass not 2004]
<i>Erysimum diffusum</i>	Scattered
<i>Erysimum humillimum</i>	
[<i>Megacarpaea orbiculata</i>	not 2004]
<i>Parrya albidum</i>	Local on the Ulkun Kaindi Pass and Valley. 2004
<i>Sisymbrium loeselii</i>	
[<i>Sisymbrium brassiciforme</i>	Kuyuk Pass not 2004]
<i>Thlaspi perfoliatum</i>	Widespread
<i>Turritis glabra</i>	Widespread

Crassulaceae

<i>Pseudosedum longidentatum</i>	Baidaksai
<i>Rhodiola heterodontha</i>	Common around Ulkun Kaindi and Baidaksai
[<i>Rhodiola semenovii</i>	Local in wet areas in the Ulkun Kaindi Valley and Baidaksai. Tall with a pyramidal white inflorescence and densely packed bright green foliage. Not 2004]
<i>Rosularia alpestris</i>	Ulkun Kaindi Valley, Pass, and Baidaksai
<i>Rosularia turkestanica</i>	
<i>Sedum alberti</i>	Aksu and baidaksai
[<i>Sedum pentapetalum</i>	Aksu not 2004]

Saxifragaceae

<i>Parnassia palustris</i>	Scattered in wet flushes – in leaf
<i>Ribes meyeri</i>	
<i>Saxifraga alberti</i>	Ulkun Kaindi Pass
<i>Saxifraga sibirica</i>	Scattered

Rosaceae

[<i>Amygdalus petunnikovii</i>	A shrubby 'Almond'. Aksu not 2004]
[<i>Amygdalus communis</i>	not 2004]
<i>Amygdalus spinosissima</i>	2004

<i>Alchemilla retropilosa</i>	Baidaksai
<i>Cerasus erythrocarpa</i>	Aksu
<i>Cerasus tianshanica</i>	Frequent at low to mid altitudes. The virtually procumbent little cherry
<i>Cotoneaster multiflorus</i>	Scattered
<i>Cotoneaster karatavica</i>	2004
[<i>Crataegus korolkovii</i>	Baidaksai not 2004]
[<i>Crataegus pontica</i>	Noted from the Aksu Gorge not 2004]
<i>Crataegus turkestanica</i>	Widespread
[<i>Dasiphora phyllocalyx</i>	Occasional at low-mid altitudes. Shrubby Cinquefoil not 2004]
<i>Geum urbanum</i>	Widespread
<i>Hulthemia persica</i>	Kuyuk Pass
[<i>Malus niedzwetzkyana</i>	Scattered. Not 2004]
<i>Malus sieversii</i>	Scattered
<i>Orthurus kokainicus</i>	
<i>Padellus mahaleb</i>	Scattered
<i>Potentilla asiatica</i>	Widespread - a ' <i>recta</i> '-like species
<i>Potentilla desertorum</i>	2004
<i>Potentilla fedtschenkoana</i>	Locally frequent
<i>Potentilla gelida</i>	Ulkun Kaindi Pass and Valley. Not in 2003
<i>Potentilla hololeuca</i>	Locally common on the Ulkun Kaindi Pass and Valley - very silvery hairy
<i>Potentilla orientalis</i>	Locally common
<i>Potentilla songorica</i>	Aksu
[<i>Potentilla supina</i>	Steppe Lakes 2003 not 2004]
<i>Potentilla reptans</i>	Berkara
<i>Potentilla transcaspia</i>	Occasional low-mid altitudes. Another ' <i>recta</i> '-like species but this time with grey undersides to the leaves
<i>Poterium polygamum</i>	Scattered – salad burnet!
<i>Prunus sogdiana (divaricata)</i>	
<i>Pyrus regelli</i>	
<i>Rosa alberti</i>	Widespread
<i>Rosa beggeriana</i>	2004
<i>Rosa korymbifera</i>	Karatau
<i>Rosa fedtschenkoana</i>	Locally common at low-mid altitudes. Large white flowers
<i>Rosa hissarica</i>	Ulkun Kaindi Valley
<i>Rosa kokanica</i>	Common at low altitudes. A rather scrappy looking <i>Rosa</i> with many sharp spines
<i>Rosa maracandica</i>	Scattered
<i>Rosa nanothamnos</i>	Aksu Gorge. Small white flowers – only about 2cm across
<i>Rosa platycantha</i>	2004
<i>Rubus caesium</i>	Scattered
<i>Sanguisorba alpina</i>	Locally dominant along streams at low to mid altitudes. Bears like it!
<i>Sanguisorba officinalis</i>	Occasional at low to mid altitudes in meadows
<i>Sorbus persica</i>	Locally frequent at low altitude
<i>Spiraea hypericifolia</i>	Widespread
<i>Spiraea pilosa</i>	Locally common

Papilionaceae

[*Halimodendron holodendrum* Karatau not in 2004]

Fabaceae

<i>Astragalus abolinii</i>	Aksu
<i>Astragalus aksaricus</i>	Ulkun Kaindi Pass and Valley
[<i>Astragalus alaicus</i>	Ulkun Kaindi Valley. Not in 2004]
[<i>Astragalus alopecias</i>	Koksai Gorge. Not in 2004]
<i>Astragalus anisomerus</i>	Widespread. Yellow flowers
<i>Astragalus atrovinosus</i>	Widespread
<i>Astragalus ashuturi</i>	Ulkun Kaindi Pass
[<i>Astragalus fedtschenkoanus</i>	Ulkun Kaindi Valley not in 2004]
<i>Astragalus inaequalifolius</i>	
[<i>Astragalus krauseanus</i>	Aksu 2003. Yellow flowers not 2004]

<i>[Astragalus lanuginosus</i>	Karasai and Kuyuk Pass 2003 not 2004]
<i>[Astragalus macrotropis</i>	Aksu 2003 not 2004]
<i>Astragalus megalomerus</i>	Aksu
<i>[Astragalus nematodes</i>	Kuyuk Pass 2003 not 2004]
<i>Astragalus neo-lipskyanus</i>	Scattered at lower altitudes
<i>Astragalus pachyrrhizus</i>	Steppe Lakes and in seed at Aksu
<i>[Astragalus platyphyllos</i>	Kuyuk Pass not 2004]
<i>[Astragalus pseudomacropterus</i>	Not in 2004]
<i>[Astragalus schmalhauseni</i>	Kuyuk Pass not 2004]
<i>Astragalus schrenkianus</i>	Kuyuk Pass not in flower
<i>Astragalus severzowii</i>	Occasional at low to mid altitudes. One of the most distinctive <i>Astragalus</i> 's. Up to 70cm tall with yellow flowers and amazing furry white seedpods which are up to 20mm across
<i>Astragalus sieversianus</i>	Scattered
<i>Astragalus skorniakovii</i>	Aksu
<i>Astragalus ugamicus</i>	Scattered
<i>[Cicer flexuosum</i>	Noted from low-mid altitudes. South-facing. Not in 2004]
<i>Cicer songoricum</i>	Mid-altitudes. Ulkun Kaindi Pass etc.
<i>[Glycyrrhiza aspera</i>	Kuyuk Pass and Berkara not in 2004]
<i>Glycyrrhiza uralensis</i>	Berkara
<i>Hedysarum acutifolium</i>	Ulkun Kaindi Pass
<i>Hedysarum talassicus (cephalotes)</i>	Occasional at mid altitudes - the very beautiful bright pink flowered <i>Hedysarum</i>
<i>[Hedysarum fedtschenkoanum</i>	Locally frequent at mid altitudes. Not in 2004. Very beautiful 'furry' species which had reddish-purplish-pink flowers – two other species in the complex – taxonomically difficult]
<i>Hedysarum flavescens</i>	Occasional along riversides at low-mid altitudes
<i>Hedysarum sewerzovii</i>	Aksu
<i>Hedysarum tashkenticum</i>	2004
<i>Lathyrus pratensis</i>	Widespread
<i>Medicago lupulina</i>	Widespread
<i>Medicago minima</i>	Aksu
<i>Medicago sativa</i>	Steppe Lakes
<i>Medicago rigidula</i>	2004
<i>Medicago tianshanica</i>	Widespread
<i>Melilotus officinalis</i>	Widespread
<i>Melissitus tianshanicus</i>	2004
<i>Merystrotropis triphylla</i>	Kuyuk Pass
<i>Onobrychis chorassanica</i>	Koksai Gorge. Not in 2003
<i>Onobrychis echidna</i>	Occasional. The spiny domed shrub with purple flowers
<i>Onobrychis grandis</i>	Aksu
<i>Onobrychis sativa</i>	In cultivation
<i>Oxytropis albovillosa</i>	Ulkun Kaindi Pass
<i>[Oxytropis auliatensis</i>	not 2004]
<i>Oxytropis caespitulosa</i>	2004
<i>Oxytropis talassica</i>	Ulkun Kaindi Pass and Valley – tall and red-purple
<i>Oxytropis trichocalycina</i>	Aksu
<i>Trifolium pratense</i>	Widespread
<i>Trifolium repens</i>	Widespread
<i>Vicia kokanica</i>	Locally common
<i>Vicia tenuifolia</i>	Common at low altitude. Resembles <i>Vicia cracca</i> and

Geraniaceae

<i>Erodium cicutarium</i>	Karasai and Aksu.
<i>Geranium collinum</i>	Widespread in various forms
<i>Geranium divaricatum</i>	Karasai and Aksu
<i>[Geranium pusillum</i>	Aksu not 2004]
<i>Geranium pratense</i>	2004
<i>Geranium saxatile</i>	Locally common at mid to high altitudes. Like a stunted high altitude version of <i>pratense</i>
<i>Geranium transversale</i>	Baidaksai

Biebersteiniaceae*Biebsteinia multifida*

2004

Linaceae*Linum altaicum*

Locally frequent at high altitude. The big blue one

*Linum olgae*Locally frequent at low altitude. The large pink flowered *Linum**Linum pallescens*

Aksu

[Linum corymbulosum

Taskol 2003 not 2004]

Rutaceae*Dictamnus angustifolius*

Local at low-mid altitudes in Kshi Kaindi

Haplophyllum latifolium

Aksu

Haplophyllum perforatum

Kuyuk Pass

Polygalaceae*Polygala hybrida*

Widespread at mid altitudes. The common milkwort

Euphorbiaceae*Euphorbia humilis*

Occasional at mid-high altitudes

Euphorbia jaxartica

Scattered

[Euphorbia seravschanica

Occasional at mid-high altitudes

Euphorbia talastavica

Ulkun Kaindi Pass and Valley

Anacardiaceae*Pistacea vera*

2004

Celastraceae*Euonymus koopmannii*Endangered species. Occasional. Rather different from west European members of the genus, looking rather like a *Rubiacean* with whorls of leaves, 4-merous brown flowers and a sprawling herbaceous habit.**Aceraceae***Acer semenovii*

Berkara

Balsaminaceae*Impatiens parviflora*

Karatau

Rhamnaceae*Rhamnus cathartica*

Occasional at low altitudes

Rhamnus coriacea

Aksu Gorge

Vitaceae*Vitis vinifera*

Berkara

Malvaceae*Alcea nudiflora*

Common along tracks and roads.

Malva neglecta

Scattered

Tamaraciceae*Tamarix ramosissima***Guttiferae***Hypericum elongatum*

Locally abundant especially at mid altitudes. An elongate inflorescence of rather large pale yellow flowers

Hypericum perforatum

Widespread

Hypericum scabrum Locally abundant at low to mid altitudes. Flattish topped heads of bright yellow flowers and a rough (scabrid) stem

Violaceae

Viola biflora At c.2500-2700m in the Ulkun Kaindi Valley growing in rock crevices in cliffs.
Viola modestula (occulta) Scattered
Viola rupestris Scattered
Viola suavis 2004

Elaeagnaceae

Elaeagnus angustifolius Aksu Canyon
Hippophae rhamnoides Occasional at low altitudes.

Thymelaeaceae

[*Thymelaea passerina* Taskol 2003 not 2004]

Onograceae

Chamaenaerium angustifolium 2004
[*Epilobium tianschanicum* not 2004]
[*Epilobium hirsutum* not 2004]
Epilobium velutinum Steppe Lakes

Apiaceae

Aegopodium podagraria Widespread
Aegopodium alpestre Koksai Gorge. Not in 2003
Angelica decurrens 2004
[*Anthriscus glacialis* Baidaksai 2003 not 2004]
Bupleurum tianshanicum Scattered at mid altitudes and in the Aksu Canyon
Carum carvi Scattered.
[*Conioselinum tataricum* Baidaksai not 2004]
Conium maculatum
[*Daucus carota* Steppe Lakes not 2004]
Elaeosticta alliodes Steppe Lakes
Elaeosticta setaceae Scattered
Ferula karatavienses Scattered
Ferula karatavica Aksu Canyon and Kuyuk Pass
Ferula leucographa 2004
Ferula pseudoreoselinum=kirjalovii 2004
Ferula penninervis Locally frequent at low-mid altitudes
Ferula samarkandica Scattered.
Ferula talassica (renardii) Ulkun Kaindi Pass and Valley.
Ferula tenuisecta Locally dominant especially at low altitudes but locally frequent even at high altitudes
Heracleum dissectum Scattered. By streams in the Kshi Kaindi
Ligusticum talassica Ulkun Kaindi Pass
[*Kosopoljanskia turkestanica* Not in 2004]
Mediasia macrophylla Locally common
[*Melabaila tordyloides* Widespread not 2004]
[*Muretia transitoria* Locally frequent at low altitude. Tall, slender with small yellow umbel not 2004]
[*Oedibasis apiculata* Scattered. Not in 2004]
[*Oedibasis platycarpa* not 2004]
Paraligusticum discolor Locally abundant at low-mid altitudes
Prangos pabularia Locally abundant at low altitudes
Prangos uloptera Steppe Lakes
[*Psammogeton barszczovii* Steppe Lakes 2003 not 2004]
Scandix stellata Scattered
Scaligera setaceae Locally common
Schtschurovskia meifolia Ulkun Kaindi Pass and Valley

<i>Schrenkia congesta</i>	Juniper forests
<i>Schrenkia golickeana</i>	Widespread
<i>Schrenkia involucrata</i>	2004
[<i>Schrenkia vaginata</i>	Kuyuk Pass 2003 not 2004]
<i>Schtschurovskia meifolia</i>	Scattered
<i>Selinum coriacium</i>	Scattered
<i>Selinum kultiassovii</i>	Aksu
<i>Seseli schrenkiana</i>	Very common
[<i>Seseli talassica</i>	Scattered not 2004]
<i>Torilis leptophylla</i>	Berkara
<i>Turgenia latifolia</i>	2004
<i>Vicatia coniifolia</i>	Widespread at mid-high altitudes

Pyrolaceae

<i>Pyrola rotundifolia</i>	Locally frequent in damp birch/willow groves, e.g. in the Ulkun Kaindi and Kshi Kaindi
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Primulaceae

<i>Anagallis arvensis</i>	Widespread
<i>Androsace fedtschenkoi</i>	Locally abundant at high altitudes. Cushion forming perennial with leaves c. 2mm wide in a rosette where the leaves curve upwards but the rosette stays relatively open. White flowers with yellow or red eye
<i>Androsace sericea</i>	Locally abundant in wet flushes at low-mid altitudes. A very beautiful plant with large semi-orbicular toothed leaves of a bright green, rather rough on the upper surface and umbels of pink-purple flowers
<i>Cortusa turkistanica</i>	By recent snowmelt and meadows at mid to high altitudes. The very small flowered pinky-purple <i>Primula</i> with 'normal' looking leaves
<i>Primula algida</i>	On rocks and cliffs at mid to high altitudes, usually north facing. Noted in upper Ulkun Kaindi Valley. Larger, brighter pink-red flowers than previous species with distinctive orbicular leaves. Habitat also distinctive - normally only found in rock crevices although occasionally also on screes
<i>Primula minkwitziae</i>	

Plumbaginaceae

<i>Acantholimon alberti</i>	Locally frequent at low to mid altitudes
<i>Acantholimon aulieatense</i>	Steppe Lakes
[<i>Limonium myrianthum</i>	Taskol. Not 2004]
[<i>Limonium gmellinii</i>	Taskol. Not 2004]

Oleaceae

<i>Fraxinus sogdiana</i>	Berkara
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Gentianaceae

[<i>Centaurium pulchellum</i>	Steppe Lakes and Berkara not 2004]
<i>Gentiana karelini</i>	Ulkun Kaindi Pass. Minute!
<i>Gentiana olivieri</i>	Locally frequent in seed on all types of ground from low-mid altitudes
[<i>Gentiana tianshanica</i>	Ulkun Kaindi Pass not 2004]
[<i>Gentiana turkestanorum</i>	Ulkun Kaindi Valley not 2004]
<i>Swerztia variabilis</i>	Wet flushes in Baidiksai valley, in bud

Convolvulaceae

<i>Convolvulus arvensis</i>	Scattered
<i>Convolvulus lineatus</i>	Occasional at low altitudes
<i>Convolvulus pseudocantabricus</i>	

Cuscutaceae

[<i>Cuscuta brevistyla</i>	Koksai Gorge. Not in 2004]
[<i>Cuscuta campestris</i>	not in 2004]

[*Cuscuta engelmannii*
Cuscuta lehmanniana Ulkun Kaindi Valley not 2004]
2004

Boraginaceae

Anchusa italica
Asperugo procumbens

Low altitudes in the reserve

Echium italicum

Echium vulgare

Lappula microcarpa

Widespread

Lindelofia macrostyla

Karasai. Substantial '*symphytum*'-like borage with far-protruding style

Lindelofia tschimganica

By snowmelt at Baidaksai – orange-flowered

Lithospermum officinale

Macrotomia euchroma

Upper Ulkun Kaindi Valley

Macrotomia ugamensis

Locally frequent at mid to high altitudes. Both species of *Macrotomia* have dark purple-black flowers, and linear-spatulate leaves and grow to about 20cm. The above species has much narrower leaves (c.10mm maximum) and is much greyer hairy with darker flowers

Myosotis asiatica

Widespread

[*Myosotis micrantha*

Baidaksai not 2004]

Myosotis suaveolens

Scattered

Onosma dichroanthum

Aksu

Onosma irritans

Ulkun Kaindi Valley

[*Rhynchospermum arvense*

Scattered not 2004]

[*Rindera echinata*

In seed at Aksu not 2004]

Rindera oblongifolia

Ulkun Kaindi Valley and in seed at Aksu

Rindera tianshanica

2004

[*Rochelia campanulata*

Kuyuk Pass in seed not 2004]

[*Rochelia cardiosepala*

Kuyuk Pass in seed not 2004]

Solenanthus circinnatus

Scattered

Stephanocaryum olgae

Growing on rock faces and in crevices at about 2400m - 2500m in the Ulkun Kaindi Valley. Flowers like an *Eritrichium* or a large sky-blue *Myosotis*, grows quite tight against the rock-face

[*Trachelanthus korolkovii*

Aksu not 2004]

Trichodesma incanum

2004

Labiatae

[*Acinos graveolens*

Aksu not 2004]

Betonica foliosa

Locally abundant at low altitudes

Dracocephalum integrifolium

Scattered – leaves undivided. Rocky places

Dracocephalum nutans

Widespread

Eremostachys karatavica

Kuyuk Pass

Eremostachys speciosa

Occasional at mid altitudes

Eremostachys tianshanica

Ulkun Kaindi Pass – short robust species with very white hairy inflorescence and orange flowers

Lagochilus platycalyx

Kuyuk Pass

Lagochilus tianschanicus

Ulkun Kaindi Pass

Lamium album

Leonurus turkestanicus

Lophanthus schrenkii

In leaf in Ulkun Kaindi Valley

[*Mentha arvensis*

Ters Lake not 2004]

Mentha asiatica

Widespread

Nepeta cataria

Karatau

Nepeta mariae

Ulkun Kaindi Pass and Baidaksai

Nepeta pannonica

Locally abundant in meadows at low altitude.

Nepeta ucrainica

Aksu 2003

Origanum tyttanthum

Frequent at low to mid altitudes

Phlomis brachystegia

Scattered

Phlomis salicifolia

Aksu canyon etc

Pseudermostachys sewerzowii

Aksu

Salvia deserta

Locally abundant at low altitudes

<i>[Salvia sclarea</i>	Steppe Lakes not 2004]
<i>Salvia aethiopsis</i>	Steppe Lakes
<i>Salvia virgata</i>	2004
<i>Scutellaria cordifrons</i>	Locally frequent in the Ulkun Valley and Pass
<i>Scutellaria immaculata</i>	Aksu Gorge
<i>Scutellaria kurssanovii</i>	Taskol, Kuyuk Pass and Karasai
<i>[Scutellaria lincezevskii</i>	Ulkun Kaindi Pass not 2004]
<i>[Scutellaria subcaespitosa</i>	Aksu 2003 not 2004]
<i>Stachyopsis oblongata</i>	Ulkun Kaindi Valley and Pass, and Baidaksai
<i>Thymus karatavicus</i>	Scattered
<i>Ziziphora bungeana</i>	Widespread
<i>[Ziziphora clinopodioides</i>	Ulkun Kaindi Pass and Valley, Koksai. Not in 2004]
<i>[Ziziphora pamiroalaica</i>	Ulkun Kaindi Pass not in 2004]
<i>Ziziphora tenuior</i>	Steppe Lakes

Solanaceae

[Hyoscyamus niger not 2004]

Scrophulariaceae

<i>Bungeana vesiculifera</i>	2004
<i>Dodartia orientalis</i>	Scattered
<i>Euphrasia tartarica</i>	Scattered
<i>Leptorhabdos parviflora</i>	2004
<i>Linaria popovii</i>	Berkara.
<i>Pedicularis dolichorrhiza</i>	Locally abundant at mid to high altitudes. The common yellow and white (or creamy) flowered lousewort
<i>[Pedicularis dubia</i>	Locally common at mid-high altitude. The other creamy one. Not 2004]
<i>Pedicularis korolkowii</i>	2004
<i>Pedicularis olgae</i>	Very widespread. Red – an early flowerer
<i>Pedicularis talassica</i>	2004
<i>Rhinanthus songaricus</i>	Occasional at mid altitudes.
<i>Scrophularia incisa</i>	Ulkun Kaindi Valley. By streams
<i>Scrophularia alata</i>	
<i>Verbascum songoricum</i>	Widespread and common
<i>[Verbascum turkestanicum</i>	not 2004]
<i>Veronica anagallis-aquatica</i>	
<i>Veronica beccabunga</i>	Widespread
<i>[Veronica laeta</i>	Baidaksai, in bud not in 2004]
<i>Veronica spuria</i>	Scattered at low to mid altitude. Another large 'spicate' <i>veronica</i>
<i>Veronica tienshanica</i>	2004

Orobanchaceae

<i>[Orobanche amoena</i>	Koksai. Not in 2004]
<i>[Orobanche kotschyi</i>	not in 2004]
<i>Orobanche sordida</i>	Ulkun Kaindi Pass.
<i>[Orobanche uralensis</i>	Taskol not in 2004]

Lentibulariaceae

[Utricularia vulgaris not in 2004]

Plantaginaceae

<i>[Plantago arachnoidea</i>	Ulkun Kaindi Pass not 2004]
<i>Plantago lanceolata</i>	Locally frequent at low to mid altitude
<i>Plantago major</i>	
<i>[Plantago maritima</i>	Steppe Lakes not in 2004]

Rubiaceae

[Asperula humifusa Steppe Lakes not 2004]

<i>Asperula setosa</i>	Scattered
<i>Callipeltis cucullaris</i>	Aksu Canyon, Koksai
[<i>Crucianella exasperata</i>	Steppe Lakes not 2004]
[<i>Galium aparine</i>	not 2004]
<i>Galium karataviense</i>	Scattered in the reserve
<i>Galium pamiro-alaicum</i> = <i>G. verum</i>	(2004) Frequent at low to mid altitudes
<i>Galium septentrionale</i>	At low to mid altitudes
<i>Galium tenuissimum</i>	Scattered
<i>Galium verticillatum</i>	Steppe Lakes and Kuyuk Pass
<i>Rubia regelii</i>	On rocks on the Ulkun Kaindi Pass

Caprifoliaceae

[<i>Lonicera cinerea</i>	Ulkun Kaindi Pass and Valley not 2004]
<i>Lonicera karelinii</i>	Frequent at low to mid altitudes. Two largish bi-coloured flowers
<i>Lonicera microphylla</i>	Frequent at high altitudes, particularly Ulkun Kaindi pass.
<i>Lonicera nummulariifolia</i>	Locally abundant at low to middle altitudes.
[<i>Lonicera olgae</i>	Ulkun Kaindi Pass not 2004]
<i>Lonicera stanantha</i>	2004
<i>Lonicera tianshanica</i>	Quite common at mid altitudes

Valerianaceae

<i>Valeriana fedtschenkoi</i>	Occasional at mid to high altitudes
<i>Valeriana ficariifolia</i>	

Morinaceae

<i>Morina kokanica</i>	Noted from among the Juniper forest around the halfway house where it was quite common and in the Ulkun Kaindi Valley
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Dipsacaceae

<i>Dipsacus azureus</i>	Occasional at low to mid altitudes
<i>Scabiosa micrantha</i>	Aksu
<i>Scabiosa songarica</i>	Scattered

Campanulaceae

<i>Asyneuma argutum</i>	Quite common at low-mid altitude. 2003 in bud
<i>Campanula alberti</i>	
[<i>Campanula capusii</i> (= <i>lehmanniana</i>)	Rocks and cliffs on the Ulkun Kaindi Pass. Tends to grow in inaccessible localities - only the first was approachable and then with difficulty. Narrow strap shaped leaves, stems in a cluster to 30cm with single large open blue 'bellflower'. Style undivided. Not 2004]
<i>Campanula glomerata</i>	Widespread. The European Clustered Bellflower with a distinctive capitate inflorescence
[<i>Cylindrocarpa severzovii</i>	Ulkun Kaindi Pass 2003. Endemic. Not in 2004]
<i>Sergia severzovii</i>	Aksu Gorge where reasonably common along south facing cliffs - particularly near the top. A very slight plant with rather open 1cm long blue flowers and narrow toothed strap shaped leaves. 2003 in leaf.
<i>Codonopsis klematidea</i>	Widespread. Streamsides, Juniper and spruce forest and damp slopes. Large pale blue bells with orange and black stigma and anthers. Foetid.

Asteraceae

<i>Achillea biebersteinii</i> (= <i>micrantha</i>)	Widespread. Bright yellow.
<i>Achillea filipendulina</i>	Widespread. Bright yellow
<i>Achillea millefolium</i>	Widespread
[<i>Acroptilon australe</i>	Steppe Lakes not 2004]
<i>Arctium tomentosum</i>	Widespread. Very much liked by the horses!
<i>Artemisia absinthium</i>	Widespread
[<i>Artemisia aschurbajevii</i>	Ulkun Kaindi Pass and Valley. Not 2004]
<i>Artemisia dracunculus</i>	Widespread
<i>Artemisia karatavica</i>	Karatau

<i>Artemisia persica</i>	Ulkun Kaindi Valley etc.
<i>Artemisia rutifolia</i>	Aksu Canyon, Karatau and Baidaksai
<i>Artemisia santolinifolia</i>	Locally frequent at higher altitudes
[<i>Artemisia serotina</i>	Taskol and Kuyuk Pass not 2004]
<i>Artemisia vulgaris</i>	Widespread
<i>Aster alpinus</i>	Widespread at mid-high altitudes
[<i>Aster canescens</i>	Koksai Gorge. Not in 2004]
[<i>Aster popovii</i>	Cliffs in the Koksai Gorge. Not in 2004]
<i>Carduus nutans</i>	
<i>Carthamnus lanatus</i>	Karatau
<i>Centaurea iberica</i>	Common along roadsides. Not in 2003
[<i>Centaurea depressa</i>	not 2004]
<i>Centaurea ruthenica</i>	Ulkun Kaindi Pass and Valley – largish yellow flowers
<i>Centaurea squarrosa</i>	Scattered
[<i>Centaurea pulchella</i>	Karasai. Not 2004]
[<i>Chardinia orientalis</i>	Aksu Gorge not 2004]
[<i>Chondrilla aspera</i>	Steppe Lakes not 2004]
<i>Cirsium incanum</i>	Steppe Lakes
[<i>Cichorium intybus</i>	not 2004]
<i>Cousinia albertii</i>	Berkara
<i>Cousinia caespitosa</i>	Ulkun Kaindi Pass and Valley
<i>Cousinia fetissovii</i>	Ulkun Kaindi Valley (bud) and Baidaksai
<i>Cousinia karatavica</i>	Steppe Lakes and Karatau
<i>Cousinia microcarpa</i>	Scattered
<i>Cousinia munkwitziae</i>	Occasional at low altitudes
<i>Cousinia severtzowii</i>	Widespread
[<i>Cousinia sydariensis</i>	Steppe Lakes not 2004]
<i>Cousinia umbrosa</i>	Widespread
[<i>Crepis oreades</i>	Ulkun Kaindi Pass and Valley. Not in 2004]
<i>Crupina vulgaris</i>	Aksu
<i>Echinops karatavicus</i>	Karasai and Aksu
[<i>Echinops talassicus</i>	Scattered not 2004]
<i>Echinops tschimganicus</i>	Widespread
<i>Erigeron cabulicus</i>	Frequent at mid-high altitude. Orange! Not in 2003
[<i>Erigeron chorrosanicus</i>	In bud. Not 2004]
<i>Erigeron pallidus</i>	Pale cream. Aksu
<i>Erigeron pseuderigeron</i>	Koksai Gorge. Not in 2003
[<i>Erigeron seravshaicus</i>	Not in 2004]
<i>Filago arvensis</i>	Aksu Canyon, Kuyuk Pass
<i>Galatella coriacea</i>	Occasional in meadows – aster-like
<i>Handelia trichophylla</i>	Koksai Gorge. Not in 2003
<i>Helichrysum maracandicum</i>	Widespread
<i>Hieraceum echioides</i>	Widespread.
<i>Hieraceum virosum</i>	
<i>Inula macrophylla</i>	Aksu Canyon.
<i>Inula rhizocephala</i>	Koksai Gorge and Ulkun Kaindi Valley and Pass. Not in 2003
<i>Jurinea algida</i>	Ulkun Kaindi Pass
<i>Koelinia linearis</i>	2004
[<i>Leontopodium ochroleucum</i>	Ulkun Kaindi Pass 200 not 2004]3
[<i>Ligularia karataviensis</i>	Aksu not 2004]
<i>Ligularia macrophylla</i>	Locally dominant in rich meadows especially at mid altitudes, also up to high altitudes
<i>Ligularia songorica</i>	Widespread
[<i>Ligularis talassica</i>	Leaves at Baidaksai not 2004]
<i>Olgaea pectinata</i>	
<i>Onopordon acanthium</i>	Scattered
<i>Pentanema albertoregelia</i>	2004
<i>Pyrethrum tianshanicum</i>	Ulkun Kaindi Valley and Baidaksai
<i>Pyrethrum transiliense</i>	Ulkun Kaindi Pass and Valley. Not in 2003
[<i>Scorzonera franchtii</i>	Scattered not 2004]

<i>Scorzonera inconspicua</i>	Widespread
<i>Scorzonera petrovii</i>	2004
[<i>Scorzonera turkestanica</i>	Scattered. Not in 2004]
[<i>Senecio racemulifer</i>	Ulkun Kaindi Valley. Not in 2004]
<i>Solidago dahurica</i> (=virgaurea)	Widespread
[<i>Steptirhamphus crassicaulis</i>	Kuyuk Pass not 2004]
[<i>Syreitschikovia spinulosa</i>	Ulkun Kaindi Pass. Very rare – known only from this spot in the reserve and only a few outside it! Not in 2004]
<i>Tanacetum pseudachillea</i>	Widespread
<i>Taraxacum officinale</i>	
<i>Tragopogon marginifolius</i>	Aksu
<i>Tragopogon pseudomajor</i>	Aksu
[<i>Tragopogon pratensis</i>	Scattered not 2004]
<i>Tragopogon turkestanicus</i>	Widespread
<i>Tragopogon vvedenskyi</i>	Karasai
<i>Trichanthemis radiata</i>	Koksai Gorge
<i>Tripleurospermum inodorum</i>	Widespread
<i>Tussilago farfara</i>	Widespread
<i>Xeranthemum longipapposum</i>	Kuyuk Pass

Some Naturalised Species

<i>Armeniaca vulgaris</i>	
<i>Salix alba</i>	Aksu Canyon
<i>Caragana arborens</i>	Planted above the mountain house!

Systematic List Number 2 Butterflies

The taxonomy and nomenclature for the following list has been taken from 'Die Tagfalter Nordwestasiens' by Lukhtanov and Lukhtanov (1994). As an indication of abundance the number of days out of fifteen on which each species was seen is given. AD = Aksu-Dzhabagly Reserve. CB = Cim Bulak, OB = Obeservatory

Papilionidae

Swallowtail	<i>Papilio machaon</i> <i>Parnassius tienshanicus</i> <i>Parnassius apollonius</i>	Common in AD with several seen every day 7/15 Subspecies <i>chimganus</i> . Seen most days in AD 6/15 Scattered
Clouded Apollo	<i>Parnassius mnemosyne</i>	Subspecies <i>valentinae</i> Common in AD and CB 9/15

Pieridae

Orange-Tip	<i>Anthocharis cardamines</i>	Frequent in AD & CB 4/15
Black-veined White	<i>Aporia crataegi</i>	Very common in AD 8/15
Eastern Pale Clouded Yellow	<i>Colias erate</i>	Common in AD & OB 6/15
Pale Clouded Yellow	<i>Colias hyale</i> <i>Colias romanovi</i>	Scattered CB & AD 2/15 Several by the stream at Koksai Gorge picnic site 1/15
Brimstone	<i>Gonepteryx rhami</i>	Only at CB 2/15
Wood White	<i>Leptidea sinapis</i>	Scattered 3/15
Green-veined White	<i>Pieris napi muechi</i>	Only at CB 2/15
Small White	<i>Pieris rapae</i>	Scarce only CB 1/15

Lycaenidae

	<i>Pseudothecle lunulata</i>	Subspecies <i>acaudata</i> . A common hairstreak at Berkara 1/15
Holly Blue	<i>Celastrina argiolus</i>	Only recorded once in AD 1/15
Osiris Blue	<i>Cupido osiris</i>	Scarce in AD 1/15
Green-underside Blue	<i>Glaucopsyche alexis</i> <i>Glaucopsyche charybdis</i>	Frequent in AD 3/15 Big Almaty Lake – highly distinctive markings on the underside seem to fit this species or possibly Odd-spot Blue. Drinking near the weatherman's cottage 1/15
Brown Argus	<i>Aricia agestis</i>	Common in AD 5/15
Mountain Argus	<i>Aricia artaxerxes</i>	Big Almaty Lake 1/15
Mazarine Blue	<i>Cyaniris semiargus</i>	Very common in AD, the lower meadows at CB and the OB 7/15
	<i>Athamanthia alexandra</i>	Seen once in AD 1/15
Common Blue	<i>Polyommatus icarus</i>	Frequent in AD & the OB 4/15

Nymphalidae

High Brown Fritillary	<i>Argynnis adippe</i>	Numbers were building as we left AD 2/15
Cardinal	<i>Argynnis pandora</i>	Common and impressive species in AD 7/15
Queen of Spain Fritillary	<i>Issoria lathonia</i>	Very common in all areas 10/15
Spotted Fritillary	<i>Melitaea didyma</i> ssp. <i>turkestanica</i>	Common on Kujuk pass, AD and at the OB 6/15
Lesser Spotted Fritillary	<i>Melitaea trivia</i> ssp. <i>catapelia</i> <i>Melitaea minerva</i>	Only at Big Almaty Lake 1/15 Only at Big Almaty Lake 1/15
Hungarian Glider	<i>Neptis rivularis</i>	A few in Ad but more common at Aksu and OB 3/15
Yellow-legged Tortoiseshell	<i>Nymphalis xanthomelas</i>	Common in AD also at CB & OB 7/15
Small Tortoiseshell	<i>Aglais urticae</i>	Even more common than the previous species 9/15
Peacock	<i>Inachis io</i>	Common in AD and at OB 7/15
Painted Lady	<i>Cynthia cardui</i>	A few records in AD 3/15

Libytheidae

Nettle-Tree Butterfly	<i>Libythea celtis</i>	Berkara and another at Koksai Gorge 2/15
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Satyridae

	<i>Chazara enervata</i>	Abundant at Kujuk Pass and in AD 8/15
	<i>Coenonympha nolkeni</i>	Very common in AD 6/15
	<i>Coenonympha sunbecca</i>	Meadows below CB and also one day in AD 2/15
Oriental Meadow Brown	<i>Hyponphele lupina</i>	Only recorded on Kujuk Pass 1/15
Central Asian Marbled White	<i>Melanargia parce</i>	Seen at Kujuk Pass & Aksu 2/15
	<i>Lasiommata eversmanni</i>	Mashat Gorge
	<i>Erebia turanica</i>	Several at CB and OB 3/15

Hesperiidae

Yellow-banded Skipper	<i>Pyrgus sidae</i>	Frequent in the reserve AD 3/15
Small Skipper	<i>Thymelicus sylvestris</i>	Occasional in AD 2/15

	T a l g a r P a s s	T u y u k s u G a t e	S a r y s a y G a r e a	K u y u k , K a r a s a y , B e r k a r a , T a s k o l	T e r s L a k e , K o k s a y	M a s h a t c a n y o n	U p p e r U l k e n K a i n d y	U p p e r U l k e n K a i n d y v a l l e y	U l k e n K a i n d y p a s s	D o w n t o J a b a g l y a n d B a i d a k s a y	D o w n t o J a b a g l y a n d A k s u c a n y o n	U p t o G a i s h	K o s m o s t a t i o n	B i g A l m a t y l a k e	D o w n t o A l m a t y c i t y
	J u n 9	J u n 1 0	J u n 1 1	J u n 1 2	J u n 1 3	J u n 1 4	J u n 1 5	J u n 1 6	J u n 1 7	J u n 1 8	J u n 1 9	J u n 2 0	J u n 2 1	J u n 2 2	J u n 2 3

- + - at dozen level
- ++ - at hundred level
- +++ - at thousand level
- F - feathers
- tr - track, footprint
- dr - droppings
- dig - diggings
- Podiceps cristatus* Great Crested Grebe
- Egretta alba* Great Egret
- Ardea cinerea* Grey Heron
- Ciconia nigra* Black Stork

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