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July 9, 2009

Men Jensen, Superintendent
Wrangell-St. Elias National Park & Preserve
P.O. Box 439
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Dear Meg,

Thanks for giving the OK for Stephens and me to get together regarding scouting for win-win solutions to camping and bear food-conditioning issues at Donoho. Here's what I've come up with so far on resources/environment, issues and management options for the area, hopefully contributing to the ongoing discussion you're hosting with stakeholders.

After talking with Stephens, I hiked over to Donoho Basin with Matt Vial of SEAG May 29-31. That gave me a chance to do some environmental planning field work in the north end of the basin, while Matt and I looked at options for group camping there and we came up with a recommendation for location of two additional NPS bear-resistant food lockers. Stephens joined us briefly when the helicopter flew in with the lockers. After the trip, Stephens and I met again in Kennecott to talk about what we'd learned. The following benefits from that fieldwork and discussion, along with my previous experience with personal trips and leading groups at Donoho and elsewhere in Wrangell-St. Elias, and my previous research and writing about the place. Opinions are my own.

Contents of this letter

After introducing Donoho Basin, including recreational uses & history and natural values & resources, I describe four issues associated with increasing visitation: bear safety and food-conditioning, sanitation, trampling & erosion, and solitude/large group access. Then for each issue, I evaluate some management options. The conclusion is a table summarizing these issues and suggesting interim and longer-term actions. A portfolio of photos and maps follows the text.

Some limitations

1. Field work did not cover terrain east of the main stream channel in North Donoho. Access to this area from the main basin trail requires fording during high water, but it may include a number of attractive, isolated campsites for one or two tents and deserves further study.
2. In this letter, I don't specifically identify freedom from regulation as a value or resource of significance in Wrangell-St. Elias, though it's implied in some of the analysis

here (as in the wilderness management literature generally) and worthy of independent consideration in the context of seeking minimum effective management tools.
3. My perspective is influenced by my family relationship with St. Elias Guides and my involvement with the Wildlands Studies program hosted by the Wrangell Mountains Center, which sometimes camps large groups at Donoho, counterbalanced to some extent by my personal trips in the basin and highly-valued experience of solitude in the Wrangells backcountry.

North Donoho Basin in context

The north end of Donoho Basin is nexus for the network of backpacking routes in the upper Kennicott Valley. It provides a relatively safe and comfortable dry-land alternative to ice camping; close access to glacier hiking and climbing; multiple potential visually isolated campsites; a spectacular setting; and diverse natural history including forest, wetland, high-density bear habitat and multiple, intricate Holocene moraines; with some of the Wrangells' lushest alpine flower meadows in day-hiking distance. Unusual for Wrangell-St. Elias, Donoho Basin is within one day's walk from a road-accessible trailhead at Kennecott.

Recreational use history

Because of these attributes, hikers have been camping in Donoho Basin since near the beginning of recreational backpacking in the Wrangells. Bob Jacobs, founder of St. Elias Alpine Guides, established what has become the standard camping area in north Donoho (adjacent to the present NPS food lockers) as a base camp for his groups and opened the trail through the basin from the Root Glacier to this camp for use by his clients. Recently, the number of guided and unguided groups and individuals reaching the basin has increased, though the basic pattern of use by location and type has not changed. Bears have been a concern from the beginning: Wildlands Studies students from McCarthy's Old Hardware Store encountered a persistent black bear, while camping at Donoho in 1983.

Environment/resources

South of Gates moraines: North Donoho Basin is bisected by a set of Gates Glacier Little Ice Age (LIA, approximately 1850) terminal moraine ridges. Southeast of these moraines the valley floor is flat with stream and lake sediments, including lakes bounded by silty flats and wet meadows, with spruce, willow and alder in better drained areas and on hillsides. Several drainage slots in the Kennicott Glacier LIA moraine bounding the valley on the southwest further indicate that the valley floor received large volumes of water and sediments during the LIA maximum, and thus that present soil and vegetation there has likely developed during the past ~150 years in an environment that may not yet be in equilibrium. Flats along the lake south of the Gates LIA moraine are plowed by bear digs for roots in herbaceous vegetation. The basin trail goes directly through this dig area, and its use is shared by bears and people. Because of wet and/or uneven ground, there is little camping in the basin between the Root Glacier moraine and the Gates moraine, except for a dry, largely unvegetated silty flat just south of the Gates moraine, sometimes used by groups and near a supercub strip, which provides the only air access.

North of Gates moraines: Northwest of the Gates LIA terminal moraine, the Gates Glacier is rapidly retreating, leaving an expanse of moraine hills, present and former watercourses and alluvium, ponds and silt flats, visually and geologically complex. Some soil with associated successional vegetation has developed on and near the LIA moraines, including extensive soapberry growth, thus prime black bear feeding area. Upstream of there, soil is sparse or nonexistent, rocky, or often waterlogged on silt flats. All of this area is in rapid transition, with recently abandoned stream channels and, near the glacier, isolated ice-cored moraine oozing water and mud. Large size and numbers of rocks in some stream courses indicates major episodic flood events, though I am unsure if these recur annually during Hidden Lake breakouts or if these deposits are relics from when the glacier edge was closer, perhaps as recently as a decade ago. Present landforms and vegetation do not necessarily reflect conditions even a few years in the past or in the future. Planning would best take this instability into account.

Gates Fosse & Bear Bowl: To the north, Gates Glacier lateral moraines create a hiking route between Donoho Basin and the lush expanse of alpine meadow on the backside of Donoho Peak. Both bears and people travel this corridor. Flower displays are some of the best in the Wrangells. Habitat characteristics are reflected in the local name "Bear Bowl." Approaching Bear Bowl, lateral moraine and the adjacent fosse are covered with fragile alpine meadow. Parts of Bear Bowl itself are less sensitive, with deeper and more resilient soil. Between the basin and upper Bear Bowl, camping opportunities are limited and confined, on environmentally sensitive sites.

Summary of existing recreational use impacts: Except for the combined wildlife/human trail through the basin, which is intermittent in sections; the minimal supercub strip; and the existing camping area with its adjacent NPS bear lockers, Donoho Basin is presently physically unchanged by recreational use. As in most of Wrangell-St. Elias, visitors generally drink directly from streams, unfiltered, a rare and precious attribute. Water quality adjacent to and downstream of camping areas is untested; given human use levels, it may be suspect.

Issues

Bear safety and food conditioning: Donoho Basin overlays prime hiking and camping with prime bear habitat, primarily black bears in the basin itself, with primarily grizzly habitat in nearby alpine areas . The existing, heavily used camping area is in the midst of dense soapberry growth, and the trail through the basin is shared by people and by bears accessing the soapberries and alpine meadows and digging for roots on trailside flats. Bear encounters and food conditioning are thus chronic and longstanding. Opportunities for observing bears and learning about bear ecology are excellent. In these regards Donoho, along with the McCarthy area generally, are exceptional rather than typical for most of Wrangell-St. Elias. Our Wildlands Studies student groups often go through an entire backpacking season without seeing a bear outside the McCarthy-Kennecott-Donoho zone. Evaluations of bear safety and food conditioning issues in this area are not necessarily applicable elsewhere.

Sanitation: Lack of developed organic soil on and north of the Gates LIA moraine makes latrine placement difficult. The existing camping area is relatively well placed for sanitation, adjacent to hillsides with some rocky, shallow organic soil, away from flowing water. It is also at the lower end of the area of attractive camping spots, reducing chances for pollution of drinking water sources upstream, though potentially contaminating the main channel through the basin. While no quantitative evaluation has been done, from my experience camping with groups there, it seems likely that the potential latrine area near the existing campground will be insufficient for sustained use at recent levels. The main stream and adjacent ponds there may already be infected with Giardia and bacteria. They have not been tested.

Outlying Donoho areas are more vulnerable. Multiple attractive camping spots on more recently deglaciated terrain are far from organic soil. Latrines on permeable alluvium there would be obvious pollution sources. Unvegetated but stable moraine with clays and silts inhibiting water flow may provide suitable latrine sites, as may perhaps clay-silt flats. These call for further study, since their suitability would allow significant expansion of camping options consistent with maintaining water quality. Water flow of all streams is into the Donoho Basin, so pollution anywhere potentially affects the whole downstream drainage.

Trampling and erosion: Most of the *Dryas* at the existing camping area has been killed by trampling, with much but not all of the damage happening in the past few years. The significance of the change is aesthetic and experiential: In the past, campers perceived no signs of previous human presence, with very high wilderness quality (though not legally designated Wilderness). That is no longer the case. Because the total percentage of the basin affected is small, ecological impacts are inconsequential. Campsite impact is not apparent elsewhere, yet. In addition to the intermittent main human/wildlife trail through the basin, informal trails are beginning to show on routes from the NPS bear lockers to more isolated camping spots. Such trails on dry moraine can be long-lasting. Again, the impact is on aesthetics and human experience.

Delicate, pristine alpine meadows north of Donoho Basin at Bear Bowl and in the Gates Fosse are vulnerable to damage, which could happen quickly with just one large group or multiple smaller groups walking single-file or camping on sensitive terrain. Parts of Bear Bowl with moist, deep soil likely would recover within a year or two. But thinner soil areas, including the route between Donoho Basin and Bear Bowl, are vulnerable to lasting aesthetic impact. Once trails and campsites start to harden there, they would tend to attract additional use and damage would accelerate.

Solitude/large group access: The baseline for wilderness experience in Wrangell-St. Elias is the opportunity for complete solitude, with the possibility of feeling as the first people in the place. One of the special attributes of the McCarthy-Kennecott area has been the ability to find this quality within a short distance of the towns. Encounter with even one other party much alters that experience; multiple encounters change it further. By lower 48 standards, Donoho Basin remains uncrowded wilderness, except for use concentrated at the existing camping area. Other parties are sometimes encountered along

the main trail. Depending on location, in open areas north of the Gates LIA moraine, hikers and camps are easily visible from a distance. By Wrangells standards, this is crowding, and solitude is compromised.

But also, regulation of numbers or sizes of parties to protect solitude raises the prospect of excluding lower-budget individuals and groups. The Kennicott Valley, including Donoho Basin, may be the best place in Alaska for individuals and groups to experience spectacular glacier landscapes without air charter. Given financial constraints, programming objectives, and staffing requirements, youth and educational programs often require a group size of 15-25, including both participants and staff, in addition to inexpensive surface access.

Compared with other locations near the Kennicott and Root Glaciers, North Donoho has more space to camp groups separated from each other and from travel routes. It thus offers perhaps the best option for large group camping in the Kennicott Valley beyond the immediate McCarthy-Kennecott corridor (not considering McCarthy Creek).

Options

Options for bear safety and food conditioning: The two primary options are physically protecting food and maximizing correct human behavior. In addition, moving camping away from soapberry and peavine feeding areas might also help, though a bear smelling food can easily cross the basin to reach a camp. Bears food conditioned in McCarthy-Kennecott can reach Donoho, so even good camping practices may not prevent threats to human safety. If safety issues persist, electric fencing around tenting areas may be an option for protecting people.

Specifically, the following can contribute to achieving best practice:

1. Physically protect human food using a combination of individually carried canisters and NPS lockers: Since standard canisters carry up to ~5-6 days food, locker capacity is needed for longer trips if these canisters are used. Camping need not be concentrated near the lockers: On arrival, hikers can deposit overflow food in the lockers, then go on to dispersed camps, returning days later to replenish supplies. Most parties would need to visit the lockers only twice, at the beginning of their stay and before continuing on out of the basin.

   The weakness in this system is that parties intending to reach the lockers may not reach them, camping short of their destination with overflow food unprotected. Inexperienced parties are more likely find themselves in this situation. If unexpectedly unable to get to lockers, professionally guided groups could be required to follow the protocol of stationing staff members to guard food overnight. Thus locker use at north Donoho may be more appropriate for guided groups than for private parties.

   For a general park policy on bear locker placement, lockers might best be placed only at portals where their use does not require successfully hiking to a

destination. Such places include airstrips and at or near trailheads, but not north Donoho. However, this policy requires feasible methods for carrying more than the capacity of a standard canister. Known options include larger canisters, which Wildlands Studies expects to test this summer, and electric fencing. Since fences must be used by trained people following appropriate protocol, they are not a solution for the general public. The issue is unresolved.

Because the combination of lockers and canisters is available at north Donoho for larger groups, the electric fence option for food protection need not be considered for this location.

2. Implement protocols for camping in bear country: Components include how to keep a clean camp; spacing of tenting, cooking and food storage areas; and double-checking to be sure bear attractants are safely stowed before leaving camp and at bedtime. Groups with guides or identified leaders can have established oversight procedures to assure compliance. Commercial groups can be required and others strongly encouraged to meet with park rangers beforehand.

Education for bear safety should include not only what to do, but also well-defined, clear and concise protocols, including for example a bed-time camp check, the group will use to be sure it is done right every time. In my experience with groups at Donoho and elsewhere in the Wrangells, an essential element in implementing such protocols is well-trained, experienced and committed leadership. I have not seen correlations with group size, but have with establishment of clear lines of authoritative communication between leaders and participants, and with leaders' attitude.

3. Consider moving camping off of prime bear habitat: If the sanitation issue can be solved, there are multiple camping areas on more recently deglaciated terrain, away from dense soapberry and peavine growth attractive to bears. Moving the bear lockers from their existing location north to open moraine overlooking such sites would help redirect camping. That move would also reduce trampling impact on *Dryas*, but requires first addressing sanitation. Over time, camping areas are likely to shift, as soapberry grows on new sites and ice retreat makes new terrain available.

4. Consider fencing to protect campers: If all else fails and there is a continuing threat to human safety, a tenting area could be encircled by an electric fence, permanently installed so available to the public or portable, to be erected by qualified groups. Though the fenced area could be located to be relatively inconspicuous, any permanent fence would be a human construction in an otherwise visibly wild place, perhaps worth considering if the alternative is camping closure.

Options for sanitation: To minimize chances of water pollution, until information about sanitation at other sites is gathered, camping is best focused adjacent to dry,

vegetated moraine slopes with soil development and away from surface water. The existing camping area meets these criteria. An area to the north identified as a potential new group camping spot also has access to suitable terrain. Alternatively, NPS could provide contained toilets, serviced by helicopter, though those would alter the experience of an otherwise wild place and would be expensive to maintain.

If drinking-quality surface water is seen as a special resource of Wrangell-St. Elias, then research is needed to assess the latrine capacity of the existing camping area and evaluate alternative areas, including answering the following questions with accurate information about water flow and organic decomposition rates. While some results will be site-specific, the answers will be significant for glacier edge backcountry management throughout Wrangell-St. Elias and elsewhere in interior Alaska mountain parks.

1. What is the suitability of (a) moraine, (b) rocky alluvium and (c) silt flats for latrine placement in locations with and without soil development?
2. How important is soil development and vegetation for locating latrines?
3. How and where should latrines be dug in each type of terrain where they are appropriate?
3. What is the latrine capacity of the existing camping area in vistor-days/year?
4. To what extent can general conclusions be given for suitability of each terrain type, and when must they be site-specific? If site-specific, are there straightforward methods for group leaders or NPS rangers to assess sites in the field?

Options for trampling and erosion: If leave-no-trace guidelines are generally followed, the main visible impact of camping is killing by trampling of *Dryas*, the primary ground cover in many of the best camping spots. It is especially difficult for larger groups to avoid *Dryas* on multiple pathways between tents and between tents and cooking areas. At north Donoho a solution is to move camping, particularly for groups, from the existing camping area to unvegetated ground. Options include the large potential camping area nearby to the north or, if sanitation issues are resolved, onto the gravel delta on the edge of the lake to the northeast. Erosion by trailing can be minimized by group leaders identifying walking routes on hard surfaces and asking they be used. It would not make sense to move part of a group to a new site, with the remainder camping at the existing site, since that would likely lead to a network of informal trails connecting the two.

Perhaps more significant is preventing impact to fragile meadows north of Donoho Basin before lasting damage begins.

Options for solitude/large group access: A central issue is the conflict between Wrangells-quality solitude and the opportunity for more people to experience the park. There is no evident solution to this dilemma, though mitigations are possible. The value decisions involved seem appropriate for a formal Park Service planning process, with full public involvement in their resolution.

Mitigations include:

1. Directing larger groups to designated campsites which are as much as possible out of sight and sound of other campers and their usual travel routes. The potential group campsite north of the existing camping area may be the best option. To reduce their effect on others, a larger group would best camp as a unit there or in another relatively isolated spot, and would stay away as much as possible from the existing camping area commonly used by others.

2. Making public the itineraries of larger groups, so that others can plan accordingly and so that multiple parties don't unexpectedly end up at the same campsite together. This scheduling could be informal, by collaboration of the organizations and guide companies regularly visiting the basin, or formal, through NPS registration and publication. Formal registration would lead to more complete results, while also imposing new regulation and bureaucracy. Some sort of scheduling coordination for groups would be useful now not only for Donoho, but also for camps on the Kennicott Glacier and at the upper Kennicott Fosse airstrip.

Other implications: If NPS limits the number of parties or size of groups in Donoho Basin, then human use of the Kennicott Glacier area as a whole is decreased and/or travel is re-routed to bypass the basin. Requiring an ice camp and removing the option of nearby on-land camping in cold, wet weather has safety implications. Routing large groups through Bear Bowl and over the back of Donoho Ridge would impact alpine meadows.

Conclusions

Issue	Interim actions	Long-term actions
Bear safety & food conditioning Situation: Chronic problems with aggressive bears food conditioned at Donoho or in McCarthy-Kennecott. Goal: Allowing safe co-existence of bears and people by preventing food conditioning of bears and keeping bear attractants out of campsites.	1. Continue to require use of hard-sided food canisters and NPS provided lockers. 2. Establish protocols for group behavior and supervision. 3. Require commercial groups and recommend all groups meet with rangers before camping. 4. Move group camping away from existing area in soapberries.	1. Also consider requiring ranger information session for all campers. 2. Also consider moving lockers away from soapberry/peavine area to bare ground to the north. (Sanitation issues must be solved first.) 4. Also consider electric fenced camping area if needed for human safety.
Sanitation Situation: Latrines in areas of poor or non-existent organic soil may contaminate streams and lakes. Suitability of bare ground for latrines unevaluated. Goal: Maintaining drinking-quality surface water by proper disposal of human waste.	1. For the interim, encourage camping near organic soil, such as the existing camping area and nearby alternatives. 2. Include Donoho-specific protocols for sanitation and latrine placement in ranger info sessions with visitors	1. Study suitability of Donoho vegetated & unvegetated moraines, alluvium and silt flats for latrine sites. 2. Based on study findings, recommend specific sites and criteria for locating camps. 3. Study options for and make recommendations regarding waste disposal on glacier ice.
Tramping and erosion Situation: Existing camping area heavily impacted by trampling of *Dryas*; One intermittent main trail through the basin; informal trails beginning to form in North Donoho; otherwise pristine. Goal: To the maximum extent possible, maintaining the experience of hiking and camping on ground unaltered by people.	1. Move group camping from existing impacted *Dryas* flats to more recently deglaciated ground to the north. 2. Include discussion of *Dryas* vulnerability in ranger info sessions. 3. Limit group size in nearby alpine meadows to prevent lasting damage.	1. Consider re-directing all campers away from existing, impacted camping area to allow recovery. 2. Evaluate routes and campsites in the Kennicott Basin suitable for large groups to assess selective relaxing of group size limits in some alpine meadows on a site-specific basis.
Solitude/large group access Situation: Wrangells-quality solitude is being compromised by increasing numbers of people, including large groups, coming to experience the Donoho Basin. Goal: Maximize opportunities for wilderness solitude within walking distance of McCarthy-Kennecott, including Donoho, and access by youth and education groups.	1. Re-direct large groups to hike and camp as much as possible out of sight and sound of the existing camping area and the main trail through Donoho Basin. 2. Implement informal schedule keeping of group routes and camps in Donoho Basin, to allow organizations to coordinate their activities and the public to know when and where groups will be traveling.	1. Evaluate consequences of the interim mitigations. 2. Through a formal NPS planning process, decide an appropriate balance between maintaining solitude and allowing access to Donoho and the Kennicott Valley by larger numbers of people and groups using available mitigations. 3. Consider benefits and downsides of requiring camping registration at Donoho. 4. Consider expanding scheduling coordination to Kennicott Glacier ice camps and the upper Kennicott Fosse.

Meg, thanks for the opportunity to participate in this discussion and for your initiative in bringing us together to work on Donoho Basin issues – looking forward to the conversation in Kennecott on July 15.

Sincerely,

Ben Shaine

cc:
Eric Veach, Norah Martinez, Stephens Harper, National Park Service
Gaia and Wayne Marrs, St. Elias Alpine Guides
Mike Murphy, Kennicott Wilderness Guides
Jeremy Pataky, Wrangell Mountains Center
Melissa Blair, National Parks Conservation Association

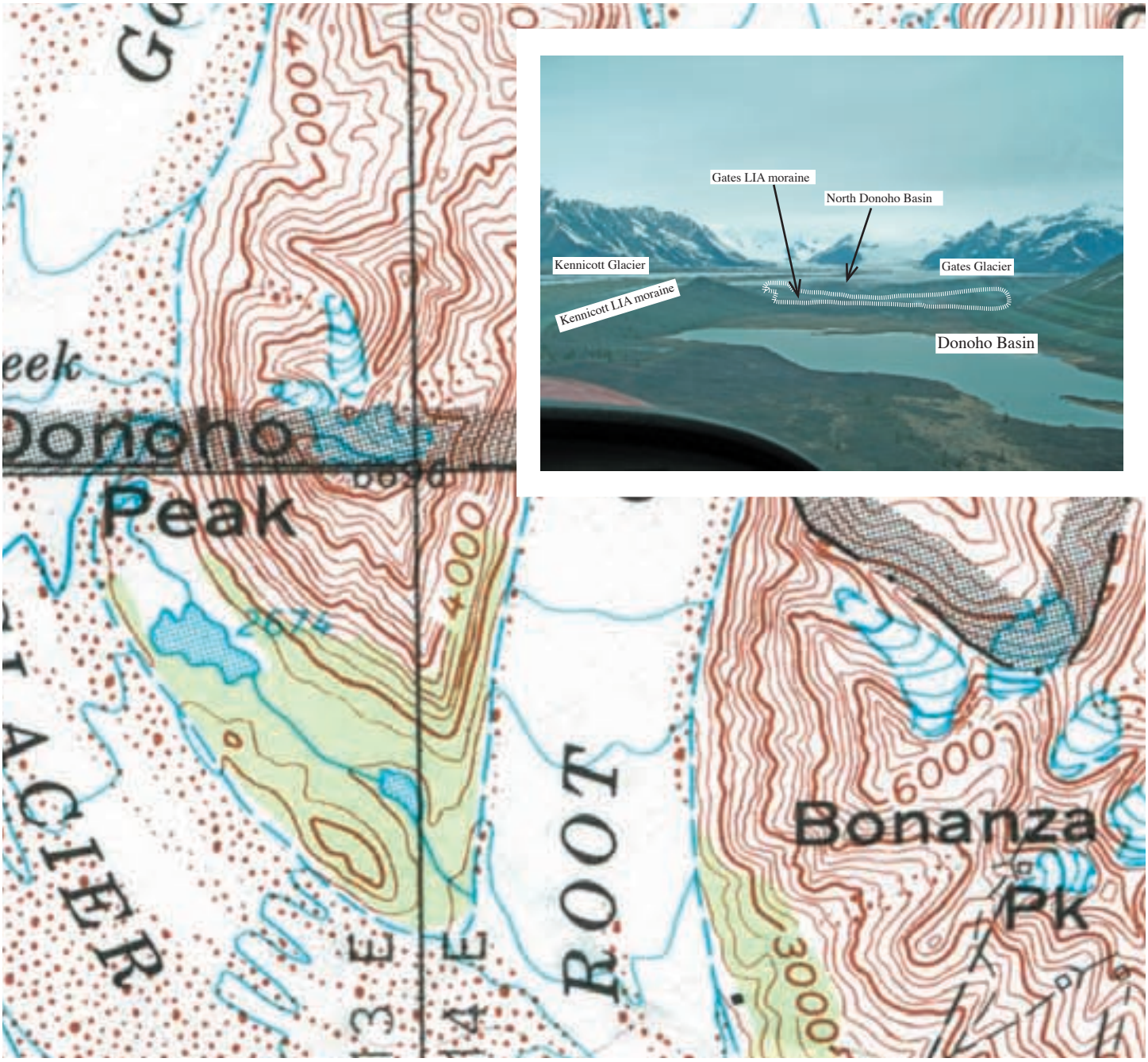
attached:
maps and photos

Photos & Maps - North Donoho Basin recreational use issues & options

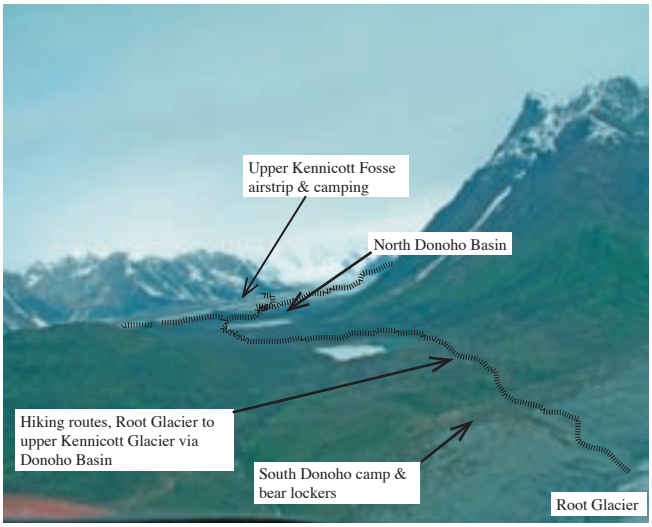
Ben Shaine

July, 2009

Looking north from Park Service installed bear lockers on the Little Ice Age terminal moraine; existing camping area is in the foreground.

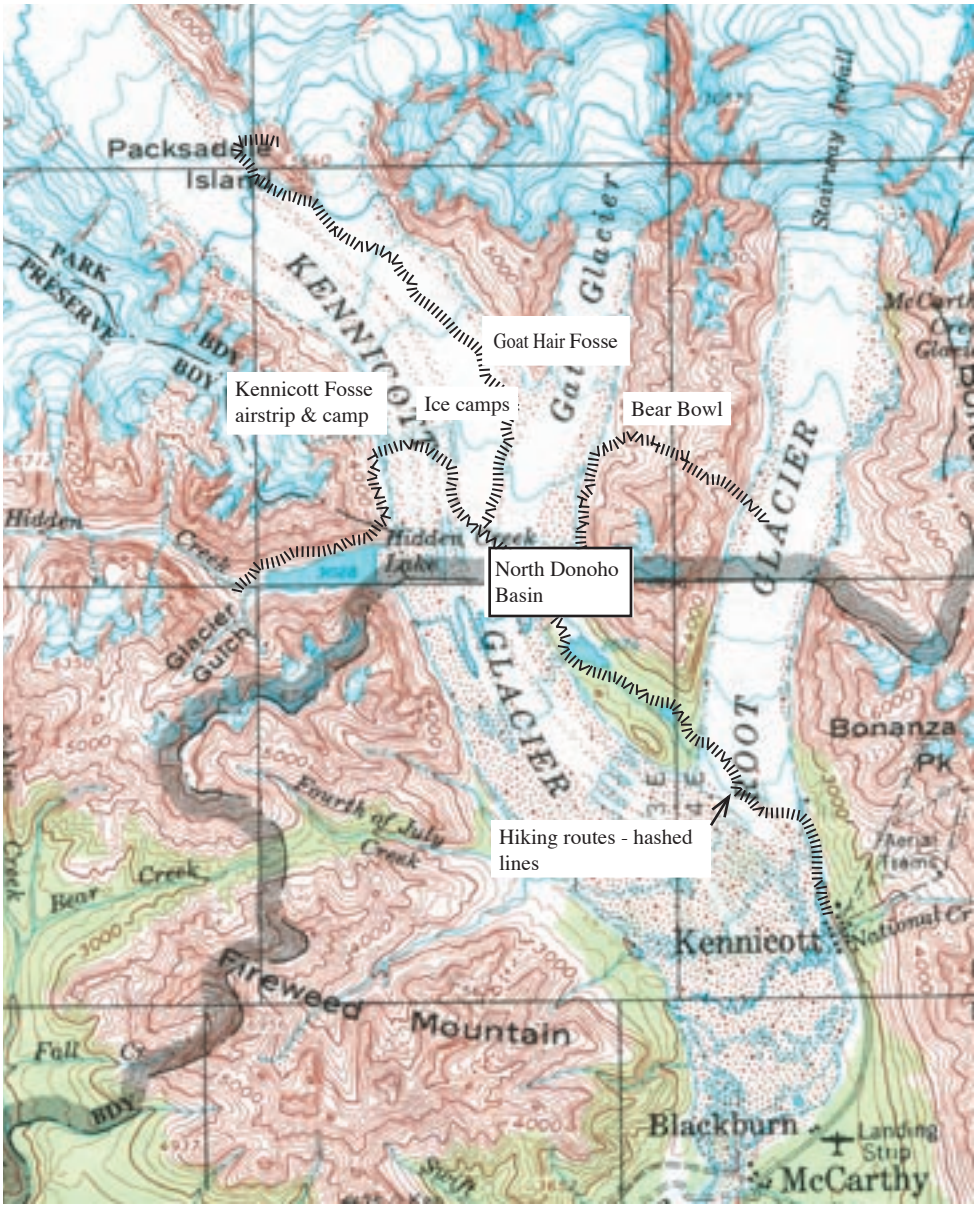


North Donoho Basin in Context

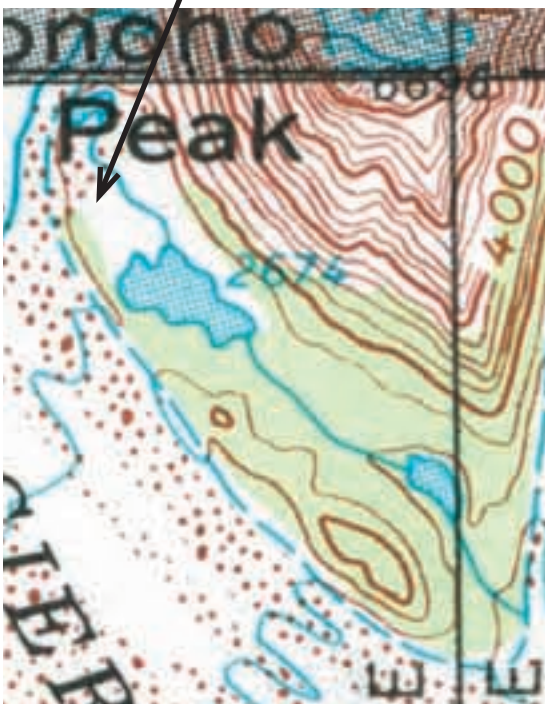


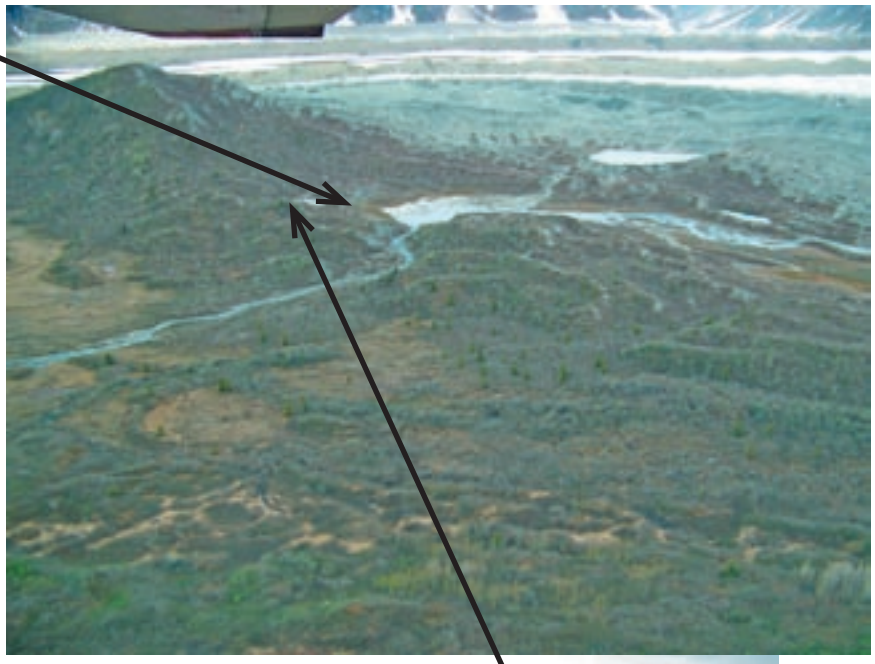
North Donoho is at the center of backpacking routes in the upper Kennicott Valley. One day's walk from Kennecott town, it provides dry-land camping on minimally vegetated, newly-deglaciated surfaces less harsh than ice camps and less sensitive to physical impact than sensitive meadows such as Bear Bowl.

Ice climbing, some of the best alpine flower displays in the Wrangells, and diverse natural history features including spectacular ice formations, complex Holocene moraines, extensive bear digs, and wetland and forest environments, are all within day-hiking distance of a North Donoho camp.



Existing Camping Area



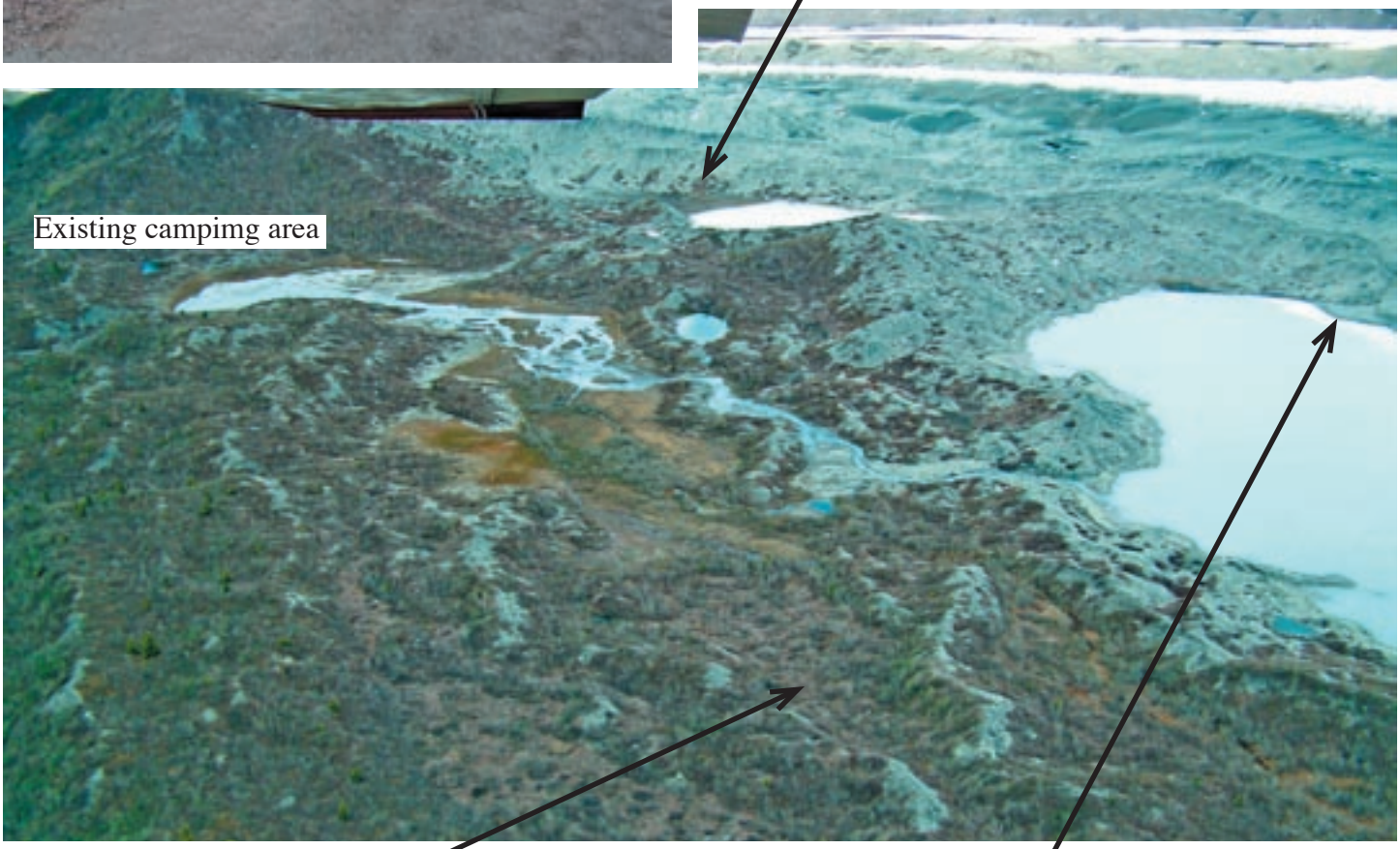


NPS installed bear lockers

Impacted *Dryas* at existing camping

Alternative camping areas

Possible new group camp - on un-vegetated surface, near organic soil for latrines, visually isolated from existing camping area

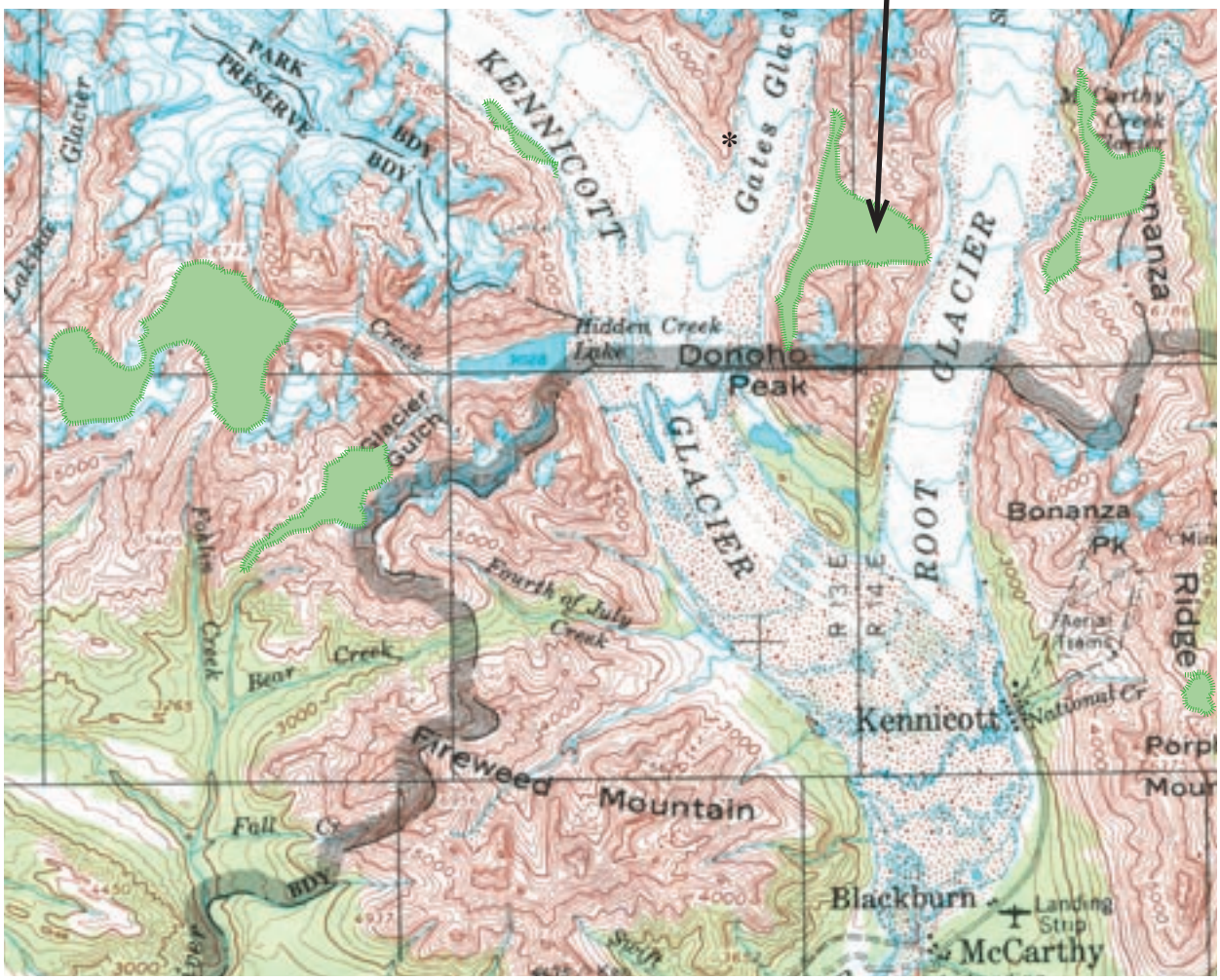


Possible general area of additional isolated small campsites, not evaluated for this study

Possible new group camp on lake delta, if sanitation requirements can be met

Alpine meadows potentially impacted by camping and hiking

Bear Bowl



Approximate locations of alpine meadow vulnerable to camping and hiking impact by larger groups. Goat-Hair Foss (*) is also sensitive, though not primarily meadow.