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Alternative Heliport Assessment for the City and Borough of Juneau

Summary

For a number of years, the concept of using alternate heliport sites as a means of reducing the impact of flightseeing noise in Juneau has been discussed. Following last year's analysis of flightseeing noise in Juneau by Michael Baker Jr. Inc., Baker was again hired by the City and Borough of Juneau (CBJ) to evaluate and recommend alternate heliport sites.

From the start of this study we have believed that unless alternate heliports could offer dramatic reductions in flightseeing noise, they were not worth pursuing. A proposed solution that reduces noise for 1,000 people, but does so by inflicting an increased noise level on 600 others, would not be a solution at all. The recommendations in this study have the potential to reduce or eliminate flightseeing noise impacts for most residents of the borough.

Working with the CBJ, we developed a set of screening criteria that focused on safety, noise, and impact on neighborhoods for the evaluation of potential alternative heliport sites. The criteria are included in Section 1.1.

Representatives of Baker and BridgeNet International, a Baker subcontractor that specializes in sound evaluation, presented these criteria at a public meeting at Centennial Hall on May 24th, 2001. We explained the criteria and the public asked questions and made suggestions. Following the meeting, the criteria were revised to incorporate suggestions made by the public and CBJ staff. The revised criteria were posted on the CBJ web site.

The U.S. Forest Service regulates both the number and location of helicopter landings on Juneau Icefield glaciers. We worked with the Forest Service to use this information as part of its destination-based analysis of potential sites. The vast majority of flightseeing customers are from the cruise ships in the Juneau harbor. Their flightseeing destinations are primarily on the Mendenhall Glacier to the north and on the Norris Glacier to the south.

Because the glacier helicopter landing sites and flightseeing routes tend to divide into north and south groupings, it was apparent early in the study that the goal of relieving the maximum number of homes from flightseeing noise was best served by

two sites, one to the north and the other to the south (See Figure 1.1 – USFS Map – Proposed Action Flight Routes and Icefield Landing Sites). Analysis throughout the study reinforced this conclusion.

We used the screening criteria to winnow the sites through a series of screening levels. Part of the evaluation of each site that made it past the Level 1 Exclusion Criteria (they all did) and the Level 2 screening, was to compare the number of households that would be affected by noise from flightseeing helicopters going to and from their permitted landing sites from each of the potential sites. A table showing the summary site evaluations of all sites is found in Section 1.1.3.

To quantify this comparison, three thousand foot and six thousand foot corridors were drawn along the potential flight routes (as a point of reference, 5,280 feet equal 1 mile). The number of residences within each of these corridors was then counted and compared. These corridors do not contain all the residences that would hear helicopter noise from the flight routes and are not noise contours.

The flightseeing noise level along any given route is affected by a host of factors. Sound travels farther across water, rock, or ice; it is affected by the humidity, wind, the height and density of cloud layers and topography to name just a few. With an understanding of this variability, the noise levels at the edges of the 3,000-foot corridor (1,500 feet from the flight route) are roughly estimated to average about 65 dBA (the level which starts to interfere with conversation). Noise levels at the edge of the 6,000-foot corridor, are roughly estimated to average approximately 55 dBA (the level where aircraft are clearly audible).

Last summer's noise study found that most residential areas of Juneau, away from major roads, have daytime L90 noise levels (the noise level that is exceeded 90% of the time) in the low 40s dBA. In a very quiet environment, distant helicopter noise down into the 30 dBA level is audible, but quieter than the ticking of a bedroom clock. The purpose of the noise corridors was to provide a reliable, apples to apples, comparison between the sites.

In evaluating the impact of flight routes, we also considered on a case-by-case basis, the frequency the route would be used. Noise from five helicopters a day has a far different impact on residents than noise from fifty helicopters a day even if there is no difference in the maximum noise. If residences are impacted by floatplane flightseeing noise as well as helicopter flightseeing noise the impact on residences is greater than the sum of the two parts.

Some sites offer the potential of good weather routes that would be heard by few if any residences. If, however, helicopters flying low ceiling routes from these sites would impact an unacceptable number of homes, the sites were not advanced through the screening process. **The analysis of all of the noise corridors is based on the presumption that while charter helicopter flights would continue to originate from the airport, all helicopter flightseeing would move to the alternate heliports.** A scenario that simply added flights at the alternate heliports without an equivalent reduction from the existing bases would not result in an overall reduction of flightseeing noise.

Please look at the maps with this summary. They show existing flightseeing routes and the proposed routes for the two recommended sites. The four candidates to make it through the Level 4 screening are: 1 -Montana Creek, 2 -Mendenhall Glacier Visitor's Area, 3 -Sheep Creek (Upper and lower being considered jointly as one candidate), and 4 -Dupont. For each site, we looked at noise (including impacts on trails), air safety, physical description (including environmental issues), infrastructure, ownership, and access.

Computer sound modeling, further in-depth analysis, and actual sound monitoring of helicopters making test runs at these sites were then used to evaluate each of the potential sites and result in the recommendation of two final sites. **The two recommended sites are Montana Creek (north) and Dupont (south).**

Currently there are 11,804 icefield landings permitted to the companies (Temsco, Coastal, and North Star Trekking) that fly out of the Juneau Airport and 7,235 icefield landings permitted for ERA Helicopters, flying out of their North Douglas base. There are 2,260 homes in the 6,000-foot noise corridors of the various flightseeing routes out of the airport and 3,777 homes in the 6,000-foot noise corridors for flightseeing tours out of the ERA base (Please see summary maps).

Moving northbound helicopter flightseeing operations to Montana Creek and southbound flights to Dupont would reduce the number of homes within the 6,000-foot noise corridors of associated flight routes from 6,037 to 0.

As indicated on the previous page, this does not mean that helicopter noise would not be audible at residences outside the noise corridors. All of those homes where helicopter noise would be audible, however, are currently within the noise corridors of existing flight lines and it is expected that noise levels for these residences would

be reduced.

For the Montana Creek site, it is expected that flights would be audible for the three residences on Montana Creek Road and for some of the homes in the subdivisions near the Mendenhall Campground. The frequency of flights would increase for these homes, but the loudness of flightseeing noise would decrease.

For the Dupont site, there are 10 cabins (at Lucky Me and Marmion) which are currently in the noise footprint of the ERA flights and where the noise would still be clearly audible. For these cabins, the loudness would decrease, but the frequency of flights would increase. The Dupont site offers the potential added advantage of basing floatplane flightseeing flights there as well.

This study focuses on reducing the noise impacts of flightseeing. During the course of the study, and our discussions with the FAA, it became apparent that moving flightseeing operations to the Dupont and Montana Creek sites could also “clean up” Juneau air space by gaining greater separation between flightseeing traffic and jet and general aviation traffic.

In horrible hindsight, after September 11th, it appears that moving the flightseeing bases could also benefit air safety in another way. We probably all agree that “. . . it could never happen here.” The potential consequences, however, of a simple mechanical failure, a pilot having a stroke or heart attack, or a deranged passenger wrestling for the controls of a flightseeing aircraft would be significantly less if the aircraft is not flying over populated areas or taxiing in between cruise ships. The same separation of Dupont or Montana Creek flight paths from populated areas that cause the reduction in noise would also provide additional protection in the unlikely event of an air disaster.

Appendices

In addition to the body of this report, there is additional information in five appendices:

Appendix A is a compilation of the noise contours for the Dupont and Montana Creek sites.

Appendix B is a brief analysis of noise reduction that would result if the helicopter flightseeing companies switched their fleets to Eurocopter 130 or similar helicopters, and flightseeing floatplane operators retrofitted their planes with

turbine engines. In both cases, some reduction in noise impacts could be achieved, but not as much as would be realized by moving base operations.

Appendix C presents additional material on vessels that that could be used to transport passengers to the Dupont site.

Appendix D is a brief analysis of the impacts of moving the base of operations for flightseeing floatplanes from the Juneau Harbor to the Juneau Airport Floatplane Pond or to the Dupont site. Moving all floatplane operations to the Juneau Airport pond would cause a substantial net increase in the number of homes affected by floatplane noise, but moving flightseeing floatplanes to the Dupont site could offer economies of scale in developing the site and transporting passengers and could virtually eliminate floatplane flightseeing noise from the developed portions of Juneau.

Appendix E is a glossary.



SUMMARY MAPS – Existing Helicopter Flightseeing Routes



Proposed Helicopter Flightseeing Routes from Montana Creek and Dupont



1.0 Methodology

1.1 Criteria

Listed below are the screening criteria for the evaluation of potential alternative heliports. The criteria focus on safety, noise, and impact on neighborhoods. A number of comments were received after the May 24th public meeting on criteria and were incorporated into the revised criteria listed below. At the end of this section is a summary table that shows how each site ranks against the main criteria categories.

Not all criteria were weighed equally, but if a site received an unacceptable rating in any category, that precluded it from advancing to Level 4.

1.1.1 Exclusion Criteria

The first evaluation of all sites was against the exclusion criteria. If a proposed site would not be safe, was not large enough, or the landowner was unwilling to have the site considered, it would have been discarded and not be rated in comparison to other sites. All sites considered passed the evaluation against the following exclusion criteria.

- Safety
 - Airspace and Air Traffic
 - Clear approach and takeoff surfaces free of obstructions (trees, power lines, terrain) during approaches and departures.
 - No air traffic conflicts with existing flight routes that cannot be managed through company dispatch or FAA Air Traffic Control.
- Landside Access
 - Allows timely access by equipment for aircraft rescue and fire fighting, or has sufficient area for on-site firefighting and rescue facilities.
- Land Size and Availability
 - Area Size
 - Level area is large enough to support aircraft landings and parking, terminal/office, bus/auto parking, hangars, fuel storage and fire/rescue equipment if provided on site.
 - Land Availability
- The landowner (CBJ, USFS, private owner, etc.) is willing to consider sale, lease, or trade to the CBJ for use as a heliport.

1.1.2 – Rating Criteria

After the sites had passed the Exclusion Criteria, the next step was to rate each site against the following criteria:

- Noise -
 - Number of overflights above different noise levels
 - Time Above noise levels
 - Daily DNL and modified DNL
 - Use three levels of analysis
 - Overall number of homes exposed to the various criteria
 - Number of homes that would experience increased or decreased noise levels
 - Representative receptor analysis in various neighborhoods and areas to show how the noise may change.
 - Analyze increases and decreases of noise impacts on trails and recreation areas from flights or ground transportation
- Work with CBJ Community Development Department to analyze land ownership and future residential growth patterns.
- Traffic and Ground Impacts
 - Changes in traffic impacts caused by changes in the pattern of ground transportation
 - Increases and decreases in the number of homes exposed to noise from ground transportation (buses, employee vehicles, fuel trucks, etc.)
 - Increases or decreases in the number of homes exposed to noises from ground operations (amplified announcements, maintenance work, etc.)
 - Impacts on sewer, water, or other CBJ infrastructure
- Flight criteria (*once an site has passed the safety exclusion criteria, these criteria rate functionality of the site*)
 - Rate sites for potential weather constraints.
 - Based on available meteorological information, rate sites and associated flightseeing routes for potential weather problems (fog, low ceilings, turbulence) and amount of time the sites would be usable compared to existing sites and each other.
 - Evaluate sites for local wind conditions that may affect flight safety and operations.
 - Evaluate sites according to the criteria in FAA 150/5390-2A “Heliport Design,” to ensure that the sites recommended are consistent with the standards. These standards include but are not limited to:
 - Do the sites contain sufficient area to function (parking, terminal area, apron area, maintenance hangars, fuel storage, etc.)?
 - How much site preparation is required to obtain a level site (remove surface irregularities)?
 - Do the sites have sufficient space and number of approach/takeoff

paths?

- Do the sites have sufficient space for protection zones?
- Do sites have space for optional lighting and visual approach aids?
- Analyze the issues in preparing FAA Form 7480-1 Notice of Landing Area Proposal and potential impacts to Navigable Airspace at appropriate sites.
- Coordinate with FAA to ensure that the sites do not conflict with navigable airspace, this means:
 - Do the sites have potential hazards to navigation?
 - Are marking and lighting recommendations needed as a result of potential hazards?
 - Assess sites for obstructions (FAR Part 77 compliance).
 - FAR Part 77 “Objects Affecting Navigable Airspace” describes the imaginary safety surfaces over and approaching the facility. These surfaces extend from the ground into the approach/departure paths for the safety of the helicopter operators and individuals on the ground. The purpose of FAR Part 77 is to prevent siting a heliport near any building, tower, power lines, or natural terrain or vegetation that may interfere with the safe operation of helicopters.
- Economics
 - Evaluate sites in comparison to existing sites and each other in the following areas:
 - Ground transportation time and expense
 - Increase or decrease of flight times
- Site acquisition and development costs
- Environmental considerations
 - Each site was also given a quick screening and evaluated for relative potential of physical impacts of site development to cause environmental problems. Sites that emerged from the Level 3 screening were further analyzed to avoid potential NEPA fatal flaws.

1.1.3 Summary Site Rating Table

This table lists each of the potential sites and rates them as Very Good, Good, Fair, Poor, or Unacceptable in different categories. Each rating is a summary of a number of component factors in that area. In evaluating the sites, noise was the most important factor considered, but a number of sites that rated “Very Good” in the noise category were screened out because they were unacceptable in other areas.

Please See Site Rating Table
(under separate download)

1.2 Companies and Flight Lines

The U.S. Forest Service regulates both the number and location of helicopter landings on Juneau Icefield glaciers. Baker worked with the Forest Service to use this information as part of our destination-based analysis of potential sites. The vast majority of flightseeing customers are from the cruise ships in the Juneau harbor. Their flightseeing destinations are primarily on the Mendenhall Glacier to the north and on the Norris Glacier to the south.

The Forest Service Land Use Designation of these two glaciers is Semi-remote Recreation. In its Draft Environmental Impact Statement on Helicopter Landing Tours of the Juneau Icefields 2002 –2006 (DEIS), the Forest Service identifies the Mendenhall and Norris glaciers as “high volume” zones, with use capped at 20,000 service days each, where a service day is defined as a day or part of a day on NFS lands for which an outfitter or guide provides goods or services, including transportation, to a client. The remaining zones, Herbert, Gilkey, Lemon and Taku, were “low volume” zones at 3,000 service days each.

Existing operators Temsco, North Star Trekking, and Coastal Helicopters currently operate from bases on Juneau Airport leased from the airport. ERA currently operates from the Douglas Heliport, a base it owns between North Douglas Highway and the Gastineau Channel, just northeast of the Bonnie Brae subdivision, and roughly across the channel from DIPAC, the *Juneau Empire*, and Bartlett Memorial Hospital.

The Forest Service’s DEIS describes the routes of the helicopter flightseeing companies that use the glaciers as follows:

TEMSCO Helicopters, Inc.

TEMSCO is currently permitted to operate on the Mendenhall, Herbert, Taku, Norris, Lemon, and Gilkey glaciers, as well as various locations in the backcountry zone, and is authorized a maximum of 8,800 landings. TEMSCO also has two assigned sites on Mendenhall Glacier for a temporary, portable shelter with a port-a-potty. Most of TEMSCO’s landing tours and associated activities occur on the Mendenhall Glacier.

In 1999 and 2000, TEMSCO, in partnership with Alaska Icefield Expeditions, offered the Icefield Flightseeing and Mushing Tour which

included one landing on the Mendenhall/ Herbert glacier saddle. Passengers departed the aircraft for a 1-hour, guided, dogsled mushing experience. The tour consisted of one to three helicopters flying together with approximately 1 hour between tours. Helicopters use a west departure to Auke Mountain to the Mendenhall Glacier or up the west side of the Mendenhall Valley over the Back Loop Road. The Heintzleman Ridge and Lemon Creek routes may be used when and if there are no opposing traffic conflicts.

TEMSCO currently offers icefield flightseeing tours combined with one or two glacier landings, as well as guided hiking and dogsled mushing tours. Glacier guides commute daily to the assigned sites to guide

tour passengers dropped off for their glacier activity.

TEMSCO also offers a Pilot's Choice Tour that, weather permitting, flies from TEMSCO's heliport west



to the ferry terminal then north to the icefield. After landing on two different glaciers, helicopters return along the same route or return through the Lemon Creek area or Taku Inlet, and up Gastineau Channel (see Figure 1-2). The Pilot's Choice Tour consists of one or two helicopters flying together with approximately 1.5 hours between tours for up to eight tours per day. Some of these tours also depart to the east, flying along Douglas Island, and following the same routes as ERA up Sheep Creek or around Point Bishop. The return route for TEMSCO is via Lemon Creek Glacier or from the west.

TEMSCO also offers the Mendenhall Glacier Tour, which flies from its heliport to the Mendenhall Glacier. This tour generally consists of five helicopters in a group flying every 25 minutes. The preferred

route, weather permitting, is up Heintzleman Ridge and back. Other flight routes used during low cloud ceiling conditions are either up the west side of the Mendenhall Valley, over the Back Loop Road, or over Auke Bay and up the eastern edge of Auke Mountain to Mendenhall Glacier. Of these two latter routes, the route up the eastern edge of Auke Mountain is TEMSCO's preferred route because they believe it creates less noise and visual impact to the residents of Mendenhall Valley. If weather permits, this route is flown first, with the Mendenhall Valley route as the last choice.

TEMSCO's Guide's Choice Extended Glacier Tour includes one glacier landing on the Juneau Icefield. Passengers are outfitted with hiking equipment and spend 2 hours exploring glacial features. This tour consists of one or two helicopters flying together, with approximately 2 hours between each tour. Helicopters use a west departure to Auke Mountain to the Mendenhall Glacier, or up the west side of the Mendenhall Valley, over the Back Loop Road. The Heintzleman Ridge and Lemon Creek routes may be used when and if there are no opposing traffic conflicts. All tour flights generally follow routes identified in the LOA, as discussed in Chapter 1 under the heading Laws, Statutes, and Ordinances.

Coastal Helicopters, Inc.

Coastal is currently permitted to operate on the Gilkey, Herbert, Lemon Creek, Norris, and Taku glaciers, as well as various locations in the backcountry zone. Coastal is authorized a maximum of 1,217 landings. Most of Coastal's landing tours and associated activities occur on Herbert Glacier, and involve walking on and experiencing the glacier environment, photography, and weddings.

Coastal's standard tour is the Icefield Excursion Tour, usually consisting of a single helicopter, but occasionally it flies a group of two helicopters. The tour is about 1 hour long, with one-fourth of the time spent on a glacier. Coastal also offers an Adventure Tour, which departs the airport to the west or north toward Gilkey Glacier and backcountry areas. This tour is approximately 1.5 hours long with one glacier landing. All tour flights generally follow routes as identified in the LOA with the FAA.

ERA Helicopters, Inc.

ERA is currently permitted to operate on the Norris, Taku, Lemon Creek, and Gilkey glaciers, as well as various locations in the backcountry zone. ERA is authorized a maximum of 7,235 landings. Most of ERA's landing tours and associated activities occur on the Norris Glacier.

ERA has one site assigned on Norris Glacier where it is authorized to occupy up to 3 acres and place temporary facilities for dogsled mushing activities. These facilities consist



of eight to ten temporary housing facilities for the guides, as well as approximately 180 sled dog houses and other structures designed to blend in with the glacier environment. The dogs and guides live at the assigned site for the duration of the tourist season.

Many of ERA's tours leave its heliport on the west side of Gastineau Channel, fly up Sheep Creek to Norris Glacier, and return via Salmon Creek. Flights generally follow routes identified in the LOA with the FAA. ERA typically leaves every 30 minutes with two tours consisting of four helicopters in each tour. Other tours, predominantly the dogsled tours, leave in groups of three from a heliport site at the Juneau International Airport near the Wings of Alaska cargo area. All tour flights generally follow routes identified in the LOA with the FAA.

North Star Trekking, LLC

North Star is currently permitted to operate on the Mendenhall, Lemon Creek, Taku, Norris, and Gilkey glaciers, as well as various locations in the backcountry zone. North Star is authorized a maximum of 1,787

landings. Most of North Star's landing tours and associated activities occur on the Mendenhall Glacier, but the other sites are regularly used when weather, snow, and ice conditions allow.

North Star offers four different flightseeing and glacier landing tour packages. The Glacier Discovery Tour involves one glacier landing and is approximately 2 hours long. The Glacier Trek Tour involves one glacier landing combined with a glacier trek that is 2, 4, or 6 hours long. North Star sets up a floorless expedition tent on the glacier surface for gearing up clients with glacier trekking gear. This tent is set up and taken down on a daily basis. The Icefield Explorer Tour involves two glacier landings and is approximately 2.5 hours long. The Overnight Glacier Adventure trek includes time to be outfitted with glacier gear and a flight to and from the glacier trek beginning and ending locations. The multi-day trekking activities take place primarily on the west side of the Mendenhall Glacier or on the Nugget Glacier, with a single camp and loop routes in the vicinity of the camp. Other multi-day trekking tours are conducted between the Lemon Glacier and lower South Branch of the Mendenhall Glacier. Participants set up and occupy temporary camps that they move with them as part of the trekking experience.

The primary flight routes originate from the Juneau International Airport. Arrivals and departures from the Juneau International Airport are conducted under an LOA with the FAA, but may deviate from this at the direction of the air traffic controller because of weather or conflicting traffic. Likewise, routes to, from, and over the glaciers/icefield vary due to weather and traffic conditions.

Flights to the Mendenhall Glacier, west end of the Juneau Icefield, and the Gilkey, Battle, and Thiel glaciers generally depart to the west on a Mendenhall departure, or a west departure, according to the LOA with the FAA. Mendenhall departures fly over the green belt area of the valley to the Rifle Range and either onto the Mendenhall Glacier or up Montana Creek to reach the Herbert Glacier and icefield. West departures fly over Auke Bay to the ferry terminal, then turn north along Spaulding Meadows for either Mendenhall Glacier or Montana Creek, proceeding to the Herbert Glacier and the icefield. Occasionally routes to the west continue further up the coastal area, as far as Berners

Bay, to access or return from the west end due to weather.

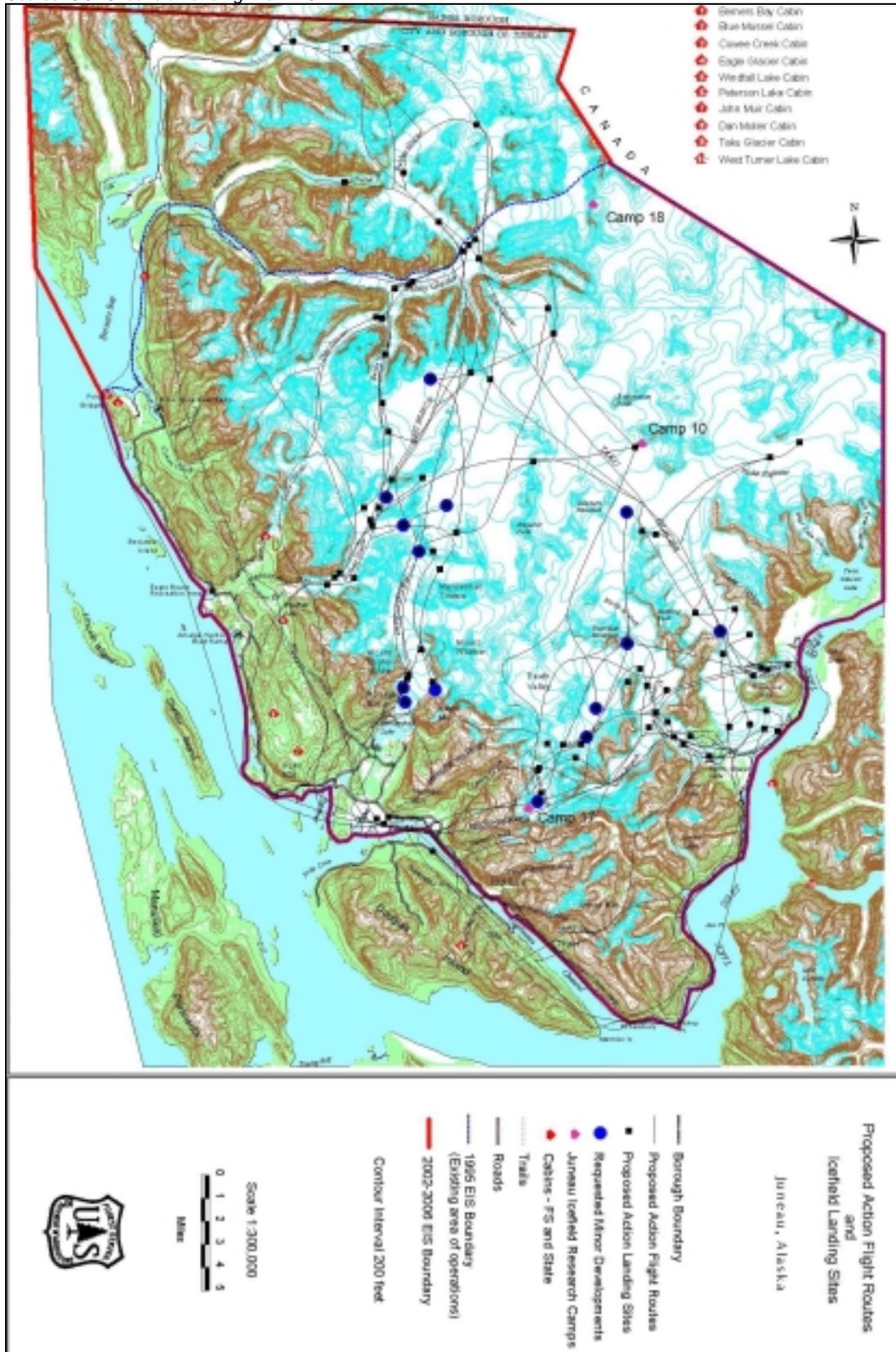
Flights to the Lemon, Norris, and Taku glaciers generally depart to the east, climb up the Blackerby Ridge side of Lemon Creek, and proceed to the sites at the east end of the Juneau Icefield. When weather conditions do not allow use of this route, the flight path proceeds east along the Douglas side of Gastineau Channel and either through Sheep Creek or around Point Bishop and up Taku Inlet. When weather allows, flights to the east end may depart or return via the Mendenhall Glacier or Spaulding Meadows route. Likewise, the west end trips may use the east route for either the departure or arrival.

Because the glacier helicopter landing sites and flightseeing routes tend to divide into north and south groupings, it seemed apparent very early in the study that the goal of relieving the maximum number of homes from flightseeing noise was best served by two sites (Please see Figure 1.1 – USFS Map – Proposed Action Flight Routes and Icefield Landing Sites). Analysis throughout the study reinforced this conclusion.

Northern flightseeing sites are reached primarily by flying routes that connect up the Mendenhall glacier or the Herbert glacier. Southern flightseeing sites are primarily reached by flying down the ridgeline of Douglas Island and over the mountains in back of Sheep Creek Valley in good weather, or down the channel and up Taku Inlet when the ceiling is lower.

Figure 1.1 – Proposed Action Flight Routes and Icefield Landing Sites

Source: USFS Icefield Landing Draft EIS



Analysis throughout the study reinforced this conclusion. Some commenters felt the Forest Service should be persuaded to change the locations of Icefield landing sites. The Forest Service's ability to do this however is limited by the Land Use Designations (LUD) of the Icefield and the accompanying restrictions. (Please see Table 1.1 – Maximum Recreation and Tourism Development Generally Allowed by LUD and Figure 1.2 – USFS Map of Land Use Designations (LUDS) and Requested Icefield Landing Sites)

Table 1-1
Maximum Recreation and Tourism Development Generally Allowed by LUD

Source: USFS Icefield Landing Draft EIS

LUD	Number of overnight guests	Number of users per day	Number of landings per site per day
Remote Recreation	10	24	10
Semi-Remote Recreation	24/150 ²	50/300 ²	10/100 ²
LUD II	24	50	10

¹ The actual numbers authorized could be larger or smaller depending on site-specific analysis.

² The first number is for most areas within the LUD and the second is for enclaves of recreation and tourism developments. Source: Forest Plan, 1995 (page 4-40). See also Appendix B of this document.

Figure 1.2 – Land Use Designations (LUDS) and Requested Icefield Landing Sites

Source: USFS Icefield Landing Draft EIS

