

NARRATIVE REPORT
MONITORING ANALYSIS FOR 2005 SEASON
Chugach Powder Guides
Glacier and Seward Ranger Districts, Chugach National Forest
Compiled by Teresa Paquet and Carl Madson, 10/19/2005

I. MONITORING RESULTS FOR CPG'S 2005 SEASON

Introduction: The Environmental Impact Statement and Record of Decision for Commercially Guided Helicopter Skiing on the Kenai Peninsula (September 2004) identified monitoring in three distinct areas. These areas included; Global Positioning System (GPS) recording of helicopter flight paths and permit compliance with the no-fly zones; wildlife monitoring; and social and human use monitoring. This report provides a summary of the monitoring activities and results for the 2005 operating season. The procedures for submitting the GPS data and the evaluation process (Appendix A) are also included in this report.

A. Monitoring Helicopter Flight Paths

The Forest Service (FS) worked collaboratively with Chugach Powder Guides (CPG) on the GPS monitoring procedure for the 2005 season. After a month of operations it was determined that the GPS monitoring protocol needed to be clarified. On March 18, 2005 a letter was sent to CPG providing an explanation of changes in the data collection and evaluation process.

1. Narratives provided by CPG for February 17 through March 17, 2005

The following narratives were provided by CPG and describe the results of the GPS monitoring. On those dates when incursions occurred, the narrative provides a description of the situation.

2/17/05 Aircraft 7CH made three incursions into the southeastern edge of Unit # 3 parallel to the boundary line. This incursion was necessary to avoid flying within 1,500 of a sighted goat located on a ridge to the east of the eastern edge of Unit #3 approximately 2,000 feet. Under the circumstances it appeared the most appropriate flight path to lift the three parties on this run out of this area was to go down the middle of the glacier, splitting the difference between the goat to the east and the habitat to the west.

2/19/05 Aircraft 8CH flying under Teton Gravity Research's permit. Possible incursion of approximately 300 feet parallel to the northeast boundary of Unit # 32. Duration was approximately 20 seconds. Possible cause was misinterpretation of exact location of the boundary since flight path is parallel to boundary.

2/24/05 Aircraft 8CH flying under Teton Gravity Research permit. Pilot flying alone with no guide on long ferry between filming locations. Incursion through eastern edge and center of Unit #13. Flight noted from ground observer in the Grandview area to pass through the saddle between Bench Peak and Peak 5005, although flight log shows it to the east of that location. Pilot was turned around as to which valley to return to pick up passengers and couldn't look at the no-fly maps while he was flying. Duration was approximately 1 minute. Clear event of pilot location error.

2/24/05 Aircraft 7CH clipped the extreme southern edge of Unit # 4 while flying alone on a

return trip between Hendrix and Dendrite. Flight was approximately 400 feet into the zone. There is some possibility this flight was more than 1,500 AGL since its half way between the landings of 5,500 feet and 2,000 feet respectively. Possible cause was related to spatial orientation of pilot flying alone and not able to check no-fly maps while flying. Reiterated need to fly straight above the creek bottom in this location. Duration was 15 seconds.

2/26/05 Aircraft 7CH passed through southeast corner of Unit #3 approximately 50 feet inside boundary. Altitude was probably sufficient to put it outside the 1500 foot distance. Duration was 10 seconds.

2/27/05 Both Aircraft 8CH and 7CH clipped the eastern corner of Unit #8 while traveling between Girdwood and Placer-Skookum. This flight path is commonly taken to avoid helicopter noise to community of Girdwood. Time in no-fly zone was 10 seconds. There was a cloud bank hanging on the eastern edge of the Kern Creek valley that day forcing both aircraft to clip the eastern corner of the zone for safety reasons. Also on the same day, 7CH flew a short safety orbit into the far western end of Unit #10 in order to verify there was no cornice and wind direction prior to landing on the top of Comet Peak just on the outside of this unit. First landing of the year at this location requires verification that there is no cornice development prior to landing. Duration was approximately 20 seconds.

3/1/05 Aircraft 7CH aborted a landing due to fog development on approach to WC-2, necessitating a short turn approximately 200 feet into the southwest corner of Unit #22

3/4/05 Aircraft 7CH clipped the eastern edge of Unit #8 again due to clouds on the eastern edge of the zone. This corner of Unit #8 shows a pattern of incursions due to it's location on the flight path between Girdwood and Placer when practicing noise abatement by not flying over Girdwood. The natural flight path is right through a low saddle and the eastern corner of this unit. If any clouds are in basin just to the east of the unit, it forces the flight to either divert through the edge of this unit, or to backtrack 15 minutes and go back through Girdwood which raises the community impacts somewhat. Both pilots have been specifically briefed on this location.

3/14/05 7-CH PDA GPS seemed to be functioning fine, but the file does not appear to contain data. Not sure what happened here. If you can extract data from it, please forward to us.

3/14/05 Aircraft 7CH had three incursions through the eastern portion of Unit #8. Fog was developing during the day in the Girdwood valley. At the end of the ski day the upper end of Winner Creek where skiing was occurring was relatively free of fog, but the exit route down-valley to Girdwood was closed out. Fog was also pushing up-valley in Kern Creek. All three groups were flown out of the field via the low saddle near Unit #8, then out into the Turnagain Arm valley in order to find holes big enough in the fog to get underneath it and return to base.

3/15/05 Aircraft 8CH used a high pickup zone on the western end of unit #12 to pick up a group. This was necessitated by encountering a water saturated snowpack at the lower elevations and concern over the exit route from an avalanche perspective between the upper pickup zone used and the standard pickup zone considerably downhill, which is out of the no-fly zone.

3/16/05 Guide picked up uncharged battery and unit did no function. (yellow Trimble).

3/16/05 Data from 8-CH PDA GPS unit does not appear to be complete. Guides stated that they kept getting a "not collecting data" error, but that the antenna appeared to be plugged in

correctly. It is my suspicion that the PDA interface plug may have been knocked and become seated crooked.

3/17/05 7-CH Trimble CPS battery either lost connection due to a lead wire coming loose (we have re-soldered the connection) or for some other reason that I can't figure out, but there is not a bit of data on this thing.

3/17/05 Aircraft 8CH flew a perfect no-fly pattern through Grandview, Moose Creek and Ascension with no incursions. We then shut the GPS off and flew into State land east of Seward for the next three days. Incursions shown in Deadman polygon were above 1500 AGL.

2. Narratives provided by CPG for March 18 through April 17, 2005 and FS response

Beginning March 18 the Forest Service provided more timely review of CPG's narratives describing their GPS monitoring results. FS review results are listed below.

3/18/05 Data from Aircraft 7CH shows straight lines over no-fly zones that are obvious data gap problems. It appears that the hot lead on the battery had some wiggle to it and the GPS was just connecting points between data gaps with a straight line. We believe that these are not incursions at all. Guides performed four landings on the very edge of polygon #14 thinking that the approach loop was outside of the polygon. It appears that this approach was within the polygon on a two dimensional map, but the incursion should be verified in a three dimensional format. We believe that the two dimensional translation is often off in this type of circumstance.

Response: CPG narrative correct with clarification. GPS unit had trouble picking up satellite coverage which led to a 'straight line' error across NFZ #22 which did not really happen. Incursions shown in NFZ #14 lasted approx. 537 seconds; maximum incursion into the NFZ was approx. 345m. All points were less than 1500ft AGL. The FS technical expert had a discussion with CPG regarding how the 1,500 ft. buffers around goat habitat were created. The buffer was created two dimensionally and this raises some concerns about applying that 1,500 ft. separation in the 3-D real world. A specific example discussed involved steep terrain that had a 1,500 ft. vertical drop with goat habitat at the top. This area would not only exclude the "drop" but by buffering in 2-D it would unnecessarily extend approximately 1,500 ft. out from the base of the drop, which is how the no-fly zones were created and the data analyzed for the flight lines.

3/19/05 7CH had a brief clip of polygon 40 for about 6 seconds, 100 feet or so within the corner of the polygon while in transit to a ski zone. The guide believed that the creek bed is not a goat zone and did not anticipate that the no-fly would actually extend into the creek bed itself. This may be another case of three dimensional translation errors. The creek bed must be followed to avoid polygon 13 and to avoid coming too close to the wall next to 13 in gusty conditions.

Response: CPG narrative clarification. CPG Narrative states "7CH had a brief clip of polygon 40 for about 6 seconds, 100 feet or so within the corner of the polygon while in transit to a ski zone. The guide believed that the creek bed (Bench Creek) is not a goat zone and did not anticipate that the no-fly would actually extend into the creek bed itself." CPG flew along Bench Creek three times that day and twice they did not enter the NFZ. On the flight that entered into the NFZ there is large amount of missing data before and after the incursion (1 point) most likely due to poor GPS coverage. The single point is approx. 115m into NFZ #40. Due to likelihood of poor GPS coverage leading to the before mentioned missing data, I would recommend that this point be disregarded because of its uncertain

accuracy.

CPG narrative missing. There was a single point approx. 55m within NFZ #14. This point appears to be a GPS multipath error and I would recommend it be disregarded.

3/20/05 7CH had 3 landing incursions into the Grandview 47.5 polygon. These landings were believed to be legal, as they have been traditional landing zones for the last eight years and are not goat habitat. The guides have been instructed that these historic landings can no longer be used and that this area is goat habitat because the computer model says so. These units are regularly used for the ski train. The loss of these landing zones precludes use of the entire Grandview zone.

Response: CPG narrative correct. The CPG narrative accounts for the incursions shown on the map. Incursions show in NFZ #15 lasted approx. 385 seconds, maximum incursion into the NFZ was approx. 365m. All points were less than 1500ft AGL.

3/22/05 Forest Service note: The Trimble GeoExplorer 2 unit contained data but it indicated that the helicopter did not leave the ground at the Girdwood airport.

3/23/05 – 3/25/05 Trimble GPS has recorded data but we seem to have lost the ability to communicate with the device. The data appears to be there, but we can't get it off. Carl is unable to get the files off of the unit as well. I have re-installed and upgraded the software and it still won't work. I will try to install the software on another computer and determine if there is a serial port problem on this computer. If this doesn't work, we may have to send the GPS unit to Garmin and try to have them recover the data. In short, there is no telling when this data will be recovered, but it appears to be intact. This could also be a problem with the cable or the communications port on the device.

Response: Trimble GeoExplorer 2. CPG narrative correct. The GPS unit appears to be collecting data and CPG has been running the unit during these days. There is most likely a hardware problem with the GPS unit that is keeping that data from being downloaded. I went to the CPG office on 3/25/05, confirmed that the unit had indeed been collecting data and attempted to download the data with no success. Chris and I discussed his options for recovering the data as listed in the narrative. This included sending the unit back to Trimble for service.

3/24/05 8-CH PDA GPS output file does not have any data in it. It appears that the guide tried to use a (/) in the date of the file name rather than a (-) and the file extension was erased as well. I think the unit was collecting data, but didn't know how or where to save the information.

Response: 3/24/05 8-CH PDA. CPG narrative correct. There is no data in the 3-24-05.shp file. Using a slash instead of a dash (the previous method) would confuse the operating system of the PDA. CPG has submitted their operating directions for the PDA that is given to their employees. The directions are comprehensive but to ensure that this problem doesn't occur again I would recommend that CPG change step # 10 "Change the date to today's date" to reflect proper file naming conventions. At my next meeting with CPG I will offer them my assistance in locating any data that may have been recorded.

3/25/05 8-CH PDA out put file is only 1kb. Once again this file does not appear to have any data in it. I don't know what the problem is here. As far as I can tell, everything was done correctly. Perhaps the Forest Service GIS guru can extract something from this file. Guides indicate that they followed the attached instruction sheet but there is nothing in this file. We are quite frustrated at this point.

Response: 8-CH PDA, CPG narrative correct with clarification. The PDA collected data during the day's flight but when attempting to export the data to the USFS Coordinate system an error was generated and none of the data showed up in the new file. On 3/25/05 at the CPG office I pulled all the points out of the corrupted shape file and save them to a new file (3-25-05b). I then exported this data to the correct coordinate system without any further complications. I will instruct CPG how to do this so they can resolve any similar future problems.

3/29/05 This file actually wrote to the 3-27-05 file. We have no idea why it did this, as we followed the instructions. The data is there however, and the FS should have no problem dealing with it. The file labeled 3-29-05 is only 1 kb and seems to contain no data.

3/29/05 7CH had one incursion on Peak 61. We were doing a cornice orbit to assure client safety for a proper landing.

Response: CPG narrative correct. CPG just barely went into NFZ #8 at a GPS distanced of approx 7m for approx. 22 seconds. Due to the accuracy of the GPS system it is not certain that they actually did cross into the NFZ. All the flights were under 1500ft AGL.

3/30/05 This file is only one kilobyte and seems to contain no data. Once again, instructions were followed precisely. The PDA unit is showing a strange screen flickering and seems as if the screen is being activated every few seconds. It's possible that the vibration of the helicopter is taking its toll on this brand new piece of equipment.

3/31/05 Once again the device was started and operated correctly, but seems to have collected no data for this day. After flying on 4-1-05, the 3-31-05 file shows the data from 4-1-05. The instructions for renaming the date on the file have been followed exactly. We have no idea why the same instructions followed by the same person every day are successful one day and not the next.

4/1/05 7CH had a couple of incursions and an interesting day in the field. We started our day skiing on East Bench run. After lifting of the base we noticed that two skiers had entered the basin. I decided that we should leave the basin and let the plane skiers have the drainage to themselves. We kept a good distance from them (much more then required) and flew to Grandview. We landed a site below where we had previously had incursions and took a landing that was far more difficult and hazardous, that was thought to be out of the goat zone. It was not. We had three landings in the polygon. This polygon does not make sense. It is projected way out onto the glacier beyond the ridge and cornice. We have used this landing for 8 years and it is now considered forbidden?

The other incursions took place on the Deadman Glacier run. We put four groups on the peak I instructed the pilot to fly down the middle of the glacier and around the knob at the tunnel section house and approach me from that direction. The pick-up is in the forest and alders and we could not ski safely any further. We were picked up at the 900 foot elevation. Both the middle of the glacier and pick-up were in the goat zone. This needs to be looked at by the biologist. I understand that goats do not live on ice (no food) and not in low elevation forests (no escape from hairy animals with teeth). This are needs to be evaluated for some changes. We have used this run every year of our operation.

Response: CPG narrative correct. The incursion into NFZ #15 (Grandview) lasted approx 282 seconds and went approx. 310m into the NFZ polygon. The incursion into NFZ #12 (Deadman glacier run) lasted approx 712 seconds and went approx. 240m into the NFZ

polygon. An amended NFZ was submitted to Aaron Poe for review to address their concerns with this NFZ.

4/2/05 The Rolfies landing in Winner Creek was used in the past this season and we did not show an incursion. This time we landed it and it showed us in by 100 feet or so. We approached it from the east and did no orbits on the south. We had another set of landings in WC-4 that is a very important landing in a saddle that has been moved out of our permit boundaries. I think that this may be a mistake in the mapping lines of our boundaries. Again, this is a highly used landing with frequent historical use.

Response: CPG narrative correct. The GPS shows an incursion into NFZ #8 (Rolfies), that lasted approx. 247 seconds and went approx. 90m into the NFZ polygon.

4/3/05 - 4/8/05 Forest Service note: No GPS data collected, GPS unit not functioning

4/7/05 It appears that either the unit did not function properly or the guide activated it improperly as no file was recorded this day. The person who normally pulls this data and is in charge of the GPS (Chris Owens) was incapacitated with a back injury.

4/9/05 The Winner Creek incursion was due to the need to inspect the cornice development and the safety for landing. The Glacier Creek landing was a pick up on the middle glacier. We were forced to make this landing because of avalanche conditions on the slope below. This is an area we have asked to have modified for this very reason. It is a gentle slope on the high end of the run, then it pitches over to the steeps for the lower half. If we proceeded, we would have had the guests in a risky situation.

Response: CPG narrative was provided but no GPS data was on hard drive.

4/10/05 It appears that either the unit did not function properly or the guide activated it improperly as no file was recorded this day. The person who normally pulls this data and is in charge of the GPS (Chris Owens) was incapacitated with a back injury.

4/11/05 As the return trip to our hangar is not shown on the GPS map, it appears that the unit may have lost signal or had some other malfunction.

4/12/05 The unit appears to have lost signal or had another malfunction. The screen on the unit still appears to be randomly self activating.

Response: 4/10/05 - 4/12/05 CPG narratives correct. No GPS data collected; GPS unit not functioning.

4/13/05 This was the first operational day that we have flown in East Twenty Mile with the GPS. It is also the 3rd time we have utilized the terrain in our company history. The areas that we skied were all brand new runs and we were seeing this terrain for the first time. Our display screen was working intermittently because of glitches we have not been able to pinpoint with Carl's help or our GPS expert. In the northern most zone we had a few incursions of a 100 feet or so on the ridge tops. This would likely be ok in a 3d format. One line incursion was a pilot descent in the wrong area. It may be over 1500 AGL? The southern no-fly zone had one incursion. Our PDA was not working at the time. By the looks of the maps we thought the landing was well within the legal limits. With a little more time in the area, this can be avoided in the future.

Response: CPG narrative clarified with one additional missing incursion.

1). *"In the northern most zone, we had a few incursions of a 100 feet or so on the ridge tops."* The above referenced points in NFZ #9 were on average approx. 45 meters into the NFZ and were less than 1500 ft. AGL.

2). *"One line incursion was a pilot descent in the wrong area."* The above mentioned pilot descent went into NFZ #9 for approx. 20 seconds at an average distance of approx. 185 meters. Both points recorded were less than 1500ft AGL.

3). *"The southern no-fly zone had one incursion. Our PDA was not working at the time. By the looks of the maps we thought the landing was well within the legal limits. With a little more time in the area, this can be avoided in the future."* Data shows that incursion lasted for less than 143 seconds to an average distance of approx. 270m in NFZ #24.

4). MISSING INCURSION: There was an incursion into NFZ #22 for less than 20 seconds at a maximum distance of approximately 120 meters. Both points recorded were less than 1500ft AGL.

4/14/05 FS note: No GPS data collected, GPS unit not functioning.

4/15/05 FS note: No CPG narrative provided; no incursions.

4/16/05 Similar to the 4/13 day, we were flying in the north twenty mile area for the first time with the GPS. There were a couple of incursions on the edges. Most were decent routes with the pilot in the machine. The run that is named "Turbo" has the saddle landing in a no fly. This is another historic run that should not have the no-fly in the landing. We would request a modification of this spot to allow the landing. This is an important run to feed us into the east zone. There are no other runs in the area that would work for this reason. The East zone had a much cleaner flight line then the 13th showed. We attribute this to the ability to review the data and refine the flight paths for our future trips into this area.

Response: CPG narrative correct. Data showed that three separate incursions into NFZ #7 occurred and all were less than 1500ft AGL. The first area was a group on the west side that had two incursions into the same area. The first lasted approx. 131 seconds and the second approx. 726 seconds. The average approx. incursion was 30 meters. The second area was on the east side and was a fly through that lasted approx. 20 seconds and went into the NFZ approx. 190 meters.

4/17/05 It appears that the GPS collected some data, but that it is completely inaccurate. The file shows just a few scattered points outside of the area that we operated.

Response: Data file just show points collected around the Girdwood airport.

3. Compliance

The requirement for CPG to track their flights using a GPS data logger system is a permit stipulation. The intent of the stipulation is to use the collected data throughout the season to jointly monitor operational activities associated with CPG's permit compliance with the no-fly zones. The narratives identify several situations when technical issues associated with the GPS units produced inadequate information or no information at all. Overall the process was successful in that it provided immediate feedback on flight paths and landings which allows CPG to know what they are doing right and/or how they can improve the next operational day.

During the 2005 operating season CPG flew a total 40 days out of 77 available. Of the 40 days they flew, CPG either used or attempted to use a GPS data logger for 33 days. From March 19 thru April 20 (last day of CPG's permitted season) CPG flew 22 out of 34 days

available within this time frame. They collected or attempted to collect data on 21 days and during 13 of those days the unit or process was not functioning or the accuracy was questionable.

Incursions occurred on 6 days due to location error: zone 14 on 3/18, zone 15 on 3/20, zones 12 & 15 on 4/1, zone 8 on 4/2, zones 9, 22, & 24 on 4/13, and zone 7 on 4/16.

The FS recognizes that some of the incursions occurred in unfamiliar terrain; however we also expect that overall incursions into no fly zones can be minimized further. It is expected that CPG's compliance will improve with increased exposure and experience to use area terrain and flight paths. To ensure timely evaluation of gathered data, clarification of the process was defined in the March 18th letter prior to the FS starting the analysis process. CPG attempted to collect data (sometimes successfully and sometimes not), from the start of operations in February. CPG submitted narratives for the entire season. Throughout the season, CPG was diligent in coordinating with the FS GIS specialist, to ensure quality of the collected data.

B. Wildlife Monitoring Items

1. Goats and No-fly zones. Goat presence and absence data will be modeled to provide probability of occurrence of goats. The biologists have completed initial analyses but in order to complete some validation they are incorporating data from an ADF&G radio telemetry study conducted in the area east of Moose Pass, in the 1980s. Final results are expected in December 2005 based on contracted arrangements with Statistical consultant, Western Ecosystems Inc.
2. Distribution Brown Bear Denning Habitat. Two validated models are to be finalized by fall 2005.
3. Population Distribution Wolverine Movement Study. Field surveys are planned for 2005/2006 and preliminary results describing winter movement patterns are expected fall 2006.

C. Social and Human Use Monitoring Items

Spatial Distribution of Winter Recreation and Human Use Activities.

1. Monitoring survey of winter recreation and human use activities across eastern Kenai Peninsula and Upper Turnagain.

Results: The biologists have completed a second year of surveys last winter with results due out by December 2006 (estimated).

2. Noise and Visual Impact.
 - a.) The Seward District was to complete noise and visual surveys within the Moose Pass community, when CPG is operating in the Mount Ascension and East Moose Creek units at least 50% of the time.

Results: CPG gave GRD and SRD advance notice of their operations in the Mount Ascension and East Moose Creek units. CPG operated for one day, March 16, in East Moose Creek with a total of six runs. CPG attempted to operate in Mount Ascension on March 17 and landed several times, but found no suitable areas to ski due to snow conditions and unsuitable terrain. As a result, the staging area at Mile 12.4 was plowed, but never used. Due to the limited utilization of the East Moose Creek unit and no use in Mount Ascension, the Seward District was unable to implement the noise and visual

monitoring in the Moose Pass community for the 2005 season. CPG also operated in the Seattle Creek exploratory unit for one day, March 26, with a total of six runs.

- b.) The Forest Service is to document all public comments related to noise and visual impacts in affected communities.

Results: Two comments were received and are documented in the performance evaluation. A Girdwood resident called regarding flight paths in and out of Girdwood and was pleased that CPG was using the Glacier Creek route. The second comment was from a man who flew into Bench Peak area to back country ski with a friend and encountered CPG operating in the area.

- 3. Community Attitudes, Beliefs and Perceptions of Change. Alaska Pacific University monitoring study. Information will be used to assist in making decisions on Ptarmigan and Snow River and decisions related to priority versus temporary use.

Results: The contract with APU to conduct the monitoring study was extended through October 31, 2005. The results should be available in November and will be used to aid the decision process for renewal of authorizing CPG's use in the exploratory units. In addition, the results will be shared and discussed in a community meeting format with the FS, Moose Pass residents and other interested individuals in attendance.

II. PROCEDURES FOR SUBMITTING GPS DATA

- A. On March 18, 2005 the FS sent a letter to CPG which outlined procedures for submitting the GPS data for monitoring purposes. The procedures address FS monitoring needs and CPG's concerns of protecting proprietary business information. The following describes the resulting outcome and current status of each procedure:

- 1 On a weekly basis, CPG will submit maps which contain helicopter flight lines, no-fly zones and date of flight. These maps will not contain temporal information other than date of activity. These maps will be submitted to the Forest Service in Girdwood on Mondays during the operating season. These maps will remain the property of CPG and will be returned after review.

Results: CPG successfully carried-out this procedure as they were diligent in their efforts to submit the requested maps to the district office on a weekly basis.

- 2 CPG will also provide written documentation for any incursions into no-fly zones, including the reason for the incursion, such as weather events, operational safety, etc. This documentation will be part of the public record.

Results: CPG also successfully met this procedure. On a weekly basis, CPG submitted their narratives to the district office.

- 3 Concurrently, CPG will also submit the raw data on a computer hard drive. The FS will review the data to confirm that all incursions into no-fly zones have been documented.

Results: CPG was successful at submitting the hard drive to the district office and Carl Madson for his review. The FS did identify one incursion that was not mentioned in CPG's narrative. However, it did not appear to be intentionally omitted, rather just overlooked.

- 4 The FS will also prepare a narrative report documenting our monitoring analysis. This narrative report will be part of the public record. Our narrative report will describe and/or verify the following items.
 - a.) Verification that incursions into no fly zones have been submitted.
 - b.) Verification that operations have occurred within approved use areas.
 - c.) Summarize the time spent within an approved use area.
 - d.) Document the number, (percentage of flights) and timing of incursions into no-fly zones, along with documented reasons for such.

Results: On four separate occasions, the FS technical expert reviewed the data on the hard drive and verified incursions into no fly zones a) and verified that CPG was operating in their permitted use area b). In addition he responded to CPG's narratives either confirming or clarifying the submitted information. A computer program (script) was created to analyze the time spent within each permitted area c) and the number and timing of each incursion d). To illustrate the results, three summary tables were created. The first two, Summary of MIN (minutes) and Summary of INT (intrusion) are further summarized in Table 1. Due to the cumbersome nature of the data in the third summary table, Count of INT, the results are not shown here but can be found in the project file.

The reasons for each incursion are identified by CPG in their narrative. In several situations, the FS technical expert clarified some of the incursions as being related to GPS unit error.

Table 2 displays the incursions showing the dates of each incursion and the number of minutes within the permit area boundaries sorted by no fly zones. CPG’s narrative identified two incursions on April 9, but because there was no GPS data found on the hard drive, the incursions could not be verified and are not represented in Table 2. Note that “0” in the table equals zero to 30 seconds.

Table 2

<i>DATE</i>	<i>NO FLY ZONES & TIME SPENT IN EACH (MINUTES ROUNDED)</i>								
	7	8	9	12	14	15	22	24	40
3/18/05					9				
3/20/05						6			
4/01/05				12		4			
4/02/05		2							
4/13/05			1				0	2	
4/16/05	5								

- By Wednesday of the same week, the Forest Service will return the weekly data and maps, and will jointly discuss any operational modifications &/or actions to be taken to address incursions into no-fly zones.

Results: The FS technical expert met with CPG weekly at their office to discuss operational problems and how to fix them, and clarification of data collected. In addition the FS technician was available daily for questions and technical advice.

Appendix A

Process for Monitoring Flight Paths As designed by Forest Service GIS Specialist, Carl Madson

Flight line data submitted by CPG was processed by an automated system involving a series of scripts written in Perl and AML. The Batch processing utility in Trimble GPS Pathfinder office was also utilized to automate the differential correction and exporting of the data collected on the Trimble GeoExplorer II. Table 1 outlines how the flight line data was processed:

Table 1

Trimble GeoExplorer II	PDA – collected in ArcPad
Differentially corrected	No correction
Exported to NAD27, UTM zone 6	Already in right projection when delivered from CPG
Point data processed through the following layers to identify the District Name, Permit Area and No Fly Zones of where the points were located	
Date and times corrected from UTC to local time	
Data is combined into one file comma delimited file and sorted based on the source of the data (Geo2/PDA), date and time.	
Time intervals between each point is then calculated and added to spreadsheet.	

This information is then loaded into excel and analyzed for time in No Fly Zones, Permit Areas and Ranger Districts. Data is then verified visually against GIS data submitted. All data remained on the hard drive except for hardcopies of the text summaries that the excel spreadsheet produced. Any hardcopy maps printed to verify data were shredded or returned with the unit to CPG.