

**System: FHP Aerial Photography - Aircraft**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation					Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No	Additional Local Mitigation	
Avionics (for radios see "Technology" tab)	Unplanned avionics failures (overheating, faulty wiring, etc.)	Occasional	Marginal	Medium	Have portable radio/handheld as back up, users prepared to use alternate frequencies (guard), land and repair or use alternate aircraft	Remote	Marginal	Medium			
	Loss of emergency locator ability (analog ELT systems will be discontinued)	Remote	Marginal	Medium	Switch to 406 MHz digital ELT systems before February 1, 2009	Improbable	Negligible	Low			
Configuration	Window configuration - poor visibility of hazards in certain models	Occasional	Marginal	Medium	Consider aircraft with better visibility	Occasional	Negligible	Low			
	If non-pressurized aircraft operating at high altitude, encumbrance caused by canulas/mask/hose	Occasional	Negligible	Low	Use pressurized aircraft	Remote	Negligible	Low			
	Insufficient work space, inability to use seatbelts during photo mission	Remote	Critical	Medium	None	Remote	Critical	Medium			
	Open camera port in belly - cold, fatigue	Occasional	Marginal	Medium	Wear warm clothes, fly fewer hours to avoid fatigue or use aircraft with sealed port (such as King Air)	Remote	Negligible	Low			
	Open camera port in belly - loosing items	Occasional	Marginal	Medium	Secure items, keep from port or use aircraft with sealed port (such as King Air)	Remote	Marginal	Medium			
Terrorist or malicious activity	Theft or damage to aircraft or gear & equipment (remote , unsecured overnight parking, risk to aircraft, personnel ... theft or damage to aircraft and equipment... threat to public safety.)	Remote	Catastrophic	Serious	Adhere to Project Aviation Safety and Security Plans; remove valuable equipment if overnight parking, use prop lock and fuel lock	Remote	Critical	Medium			
Performance Standards - mountainous terrain	High density altitude operations	Remote	Catastrophic	Serious	Project Aviation Safety Plan and contract to address minimum requirements, reference Airman's Information Manual (AIM) for mountainous terrain.	Improbable	Critical	Medium			
	Insufficient Horsepower	Occasional	Catastrophic	High	Project Aviation safety plan & contract to address minimum requirements, reference local unit Aviation Plan if operating out of area	Remote	Critical	Medium			
	Insufficient payload capabilities - camera type mismatch to platform, overnight gear	Probable	Critical	High	Match machine to task, perform weight and balance calculation, reduce load	Improbable	Critical	Medium			
Contract Aircraft	Many contract aircraft not configured for equipment or experienced with mission type (if turn-key, very expensive)	Probable	Critical	High	Conduct thorough market analysis and solicitation, request performance history, require Part 135	Occasional	Marginal	Medium			
	Aging aircraft	Probable	Marginal	Serious	Consider aircraft health monitoring program to include strain gauge, oil analysis, special inspection program	Occasional	Marginal	Medium			

**System: FHP Aerial Photography - Aircraft (cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
WCF (fleet) Aircraft	Identifiable as agency aircraft may encourage vandalism	Remote	Catastrophic	Serious	Utilize secure overnight parking if available	Remote	Catastrophic	Serious			
	Most agency pilots have tendency to lack experience with mission type, not dedicated to photography work	Probable	Marginal	Serious	Establish mentoring program for photo pilots, performance plan addresses support to other aviation functions (e.g., fire & photo)	Occasional	Marginal	Medium			
	Very few photo-capable aircraft in agency fleet, increases likelihood of contracting minimally skilled pilots/poor performing aircraft through contracting	Probable	Marginal	Serious	Conduct thorough market research and consider best value for contracting if no agency available	Occasional	Marginal	Medium			
	Aging aircraft	Probable	Marginal	Serious	Consider aircraft health monitoring program to include strain gauge, oil analysis, special inspection program (FHTET King Air '74, SPO Beavers '59-'64, DFO C206 newer)	Occasional	Marginal	Medium			
Fuel	Bad fuel	Occasional	Critical	Serious	Ensure fuel is tested for type and quality prior to fueling	Remote	Critical	Medium			
	Starvation	Occasional	Catastrophic	High	Monitor quantity pumped during fueling, monitor flight time and distance to services	Remote	Critical	Medium			
Availability	Lack of back up aircraft in event preferred aircraft unavailable (scrambling to find suitable substitute or settling for less than optimum)	Remote	Negligible	Low	R8 has two configured King Airs for back up	Remote	Negligible	Low			
	Minimal availability of photo platforms leading to maximizing flight hours with those aircraft/pilots that are available	Remote	Negligible	Low	Adhere to flight duty limitations	Remote	Negligible	Low			
	Sharing aviation assets (non-local pilot unfamiliar with area, photographer unfamiliar with pilot and aircraft)	Remote	Negligible	Low	R8 has two configured King Airs for back up	Remote	Negligible	Low			
	Not sharing aviation assets (overworking a single asset)	Remote	Negligible	Low	Utilize other aircraft equipped with camera hole (however, others are prioritized for fire... fire season and photo season overlap)	Remote	Negligible	Low			

**System: FHP Aerial Photography - Environmental**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation					Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No	Additional Local Mitigation	
Weather	Working in less-than-optimum conditions in order to take advantage of preferred sun angles	Occasional	Critical	Serious	Preflight briefing to include unacceptable conditions for safe photography	Remote	Critical	Medium			
	Lack of visibility - smoke, haze	Probable	Catastrophic	High	Maintain VFR, establish good communication w/air attack, remain outside of FTA/TFR w/out permission, practice see & avoid	Remote	Catastrophic	Serious			
	High winds	Frequent	Critical	High	Abort mission until more favorable wind conditions	Remote	Marginal	Medium			
	IFR conditions take off/landing, ferry	Probable	Negligible	Medium	Stay on ground or use twin engine/IFR qualified	Remote	Catastrophic	Serious			
	Sudden changes in weather, unexpected extreme conditions	Remote	Negligible	Low	Preflight weather briefing, maintain VFR	Remote	Negligible	Low			
	Lack of visibility - fog	Probable	Critical	High	Maintain VFR, continuously monitor conditions, have contingency plans for alternate airports/survey areas, consider utilizing twin engine aircraft in project areas w/strong likelihood of fog during take-off/landings.	Remote	Catastrophic	Serious			
	Lack of visibility during IFR take off/landing (OK for twin engine only)	Remote	Catastrophic	Serious	Pilot maintain IFR currency, abort mission until conditions improve.	Remote	Critical	Medium			
	Marginal VFR (having to avoid scud runners)	Remote	Catastrophic	Serious	Preflight weather briefing, maintain VFR, see and avoid scud runners	Remote	Negligible	Low			
Topography Hi Alt	Turbulence	Frequent	Critical	High	Obtain weather briefings, move to alternate location or abort mission until more favorable weather.	Remote	Critical	Medium			
	Terrain - operating in box canyons (rare, photo mission altitude fixed high above terrain)	Remote	Critical	Medium	Maintain awareness of altitude above terrain, fly ridges rather than drainage bottoms	Remote	Critical	Medium			
	High Altitude - density altitude	Frequent	Critical	High	Obtain weather briefings, review aircraft performance charts and data or abort mission until more favorable weather.	Remote	Critical	Medium			
	High Altitude above 18 thousand	Frequent	Marginal	Serious	Mission planning, IFR clearance, working with IFR traffic	Frequent	Marginal	Serious			
	Large scale photography/closer to terrain	Frequent	Critical	High	Change lens or camera	Remote	Critical	Medium			

**System: FHP Aerial Photography - Environmental (cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
<b>Minimal Topography/Low Alt</b>	Increased probability of encountering aerial hazards in areas with minimal topography	Probable	Catastrophic	High	Address in safety briefing, consider TCAS, practice see and avoid	Occasional	Catastrophic	High			
<b>Remote areas</b>	lack of communications	Probable	Catastrophic	High	Utilize AFF, know and use local repeaters (guard in emergency), possibly carry satellite phone	Remote	Catastrophic	Serious			
	Search and Rescue - delayed response within critical period	Probable	Catastrophic	High	Utilize AFF, carry aircraft and personal survival gear, handheld radio/know frequencies, satellite phone	Occasional	Critical	Serious			
	Fuel availability	Occasional	Marginal	Medium	Ensure mission planning includes fuel resources (call ahead), considers ferry distance/time, monitor flight time & distance to fuel location during flight	Remote	Marginal	Medium			
	Oxygen availability to aircraft (if using non pressurized aircraft)	Occasional	Marginal	Medium	Ensure mission planning includes oxygen resources (call ahead) & ferry distance/time, monitor flight time & distance to location or if not available, spend less time at high elevations	Remote	Marginal	Medium			
<b>Urgent Photography</b> (Pest Signature, Fall Colors, Fire/Other Damage)	Forcing timing of flights to meet photo needs rather than safety	Probable	Catastrophic	High	Utilize additional assets to complete survey or prioritize high interest areas & complete first, it's okay not to finish	Remote	Marginal	Medium			
<b>Water</b>	Amphibious aircraft landing on water with gear down	Occasional	Catastrophic	High	Use pilot check list, confirm gear up... (typically not using amphibious aircraft for photo missions)	Improbable	Catastrophic	Medium			
	Amphibious aircraft landing on land with gear up	Occasional	Critical	Serious	Use pilot checklist, confirm gear down... (typically not using amphibious aircraft for photo missions)	Improbable	Catastrophic	Medium			
	Poor depth perception to surface of water during landing	Occasional	Critical	Serious	Be aware during hazy conditions or dead-calm, more difficult to see water surface; Use experienced pilots, scan for water surface irregularities (wind, wake, fish, etc)	Remote	Marginal	Medium			
	Ill-equipped with survival gear and beyond glide distance to shore	Occasional	Catastrophic	High	Carry survival/mustang suits cold water, PFDs	Remote	Critical	Medium			
	Difficulty exiting aircraft after ditching or crashing in water	Probable	Catastrophic	High	Attending water ditching course, consider adding area-specific currency requirement in task book (alternatively, other companies and universities offer)	Remote	Critical	Medium			

**System: FHP Aerial Photography - Environmental (cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation					Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No	Additional Local Mitigation	
Water	Other watercraft & recreational users	Occasional	Catastrophic	High	Pilot/crew increase SA (watch for fishermen, swimmers, jet skis, canoes, etc. speed boats can become a hazard quickly...), no radio communication with these hazards; make reconnaissance pass prior to landing and search for watercraft/other users	Remote	Catastrophic	Serious			
	Turbidity - subsurface obstructions obscured	Probable	Catastrophic	High	Utilize pilots experienced with local waters; acquire local knowledge if operating away from familiar areas, check with dispatch; emergency landing only in unfamiliar waters	Remote	Catastrophic	Serious			
	River current	Occasional	Critical	Serious	Landing typically into wind and may be up or down stream, dock upstream	Occasional	Marginal	Medium			
	Floating debris	Probable	Catastrophic	High	Be aware not all floating debris may be visible on surface; Increase situational awareness... make reconnaissance pass prior to landing, all flight crew search for hazards	Occasional	Marginal	Medium			
Airspace	Working within active MTR, MOA, warning areas	Probable	Catastrophic	High	Call ATC/military agency (possibly flight service station, less reliable) to determine "hot" or not, see and avoid, request deconfliction through dispatch	Remote	Catastrophic	Serious			
	Working in proximity to or within FTA/TFR	Probable	Catastrophic	High	Maintain VFR, establish good communication w/air attack, remain outside of FTA/TFR w/out permission, practice see & avoid	Remote	Catastrophic	Serious			
	Working within restricted (military, presidential, nuclear, etc.)	Remote	Catastrophic	Serious	Check TFRs daily, know intercept procedures, Call ATC/military agency to gain permission, determine if any other activity	Remote	Catastrophic	Serious			
	Grid & altitude is fixed and within high traffic or controlled airspace	Occasional	Catastrophic	High	Comm. w/ATC... pilot & photographer to be extra vigilant in scanning for other aircraft & hazards while flying in a fixed patten (maintain SA, pilot to avoid inordinate focus on following GPS/photographer on operating camera)	Remote	Catastrophic	Serious			
	All B, C, D Class	Frequent	Catastrophic	High	Mission planning, requesting prior permission from controlling tower & conducting mission during minimal traffic times	Remote	Catastrophic	Serious			
	Risk of mid-air IFR altitudes (>18,000')	Occasional	Catastrophic	Serious	Mission planning, IFR flight plan, comm. w/ATC	Remote	Catastrophic	Serious			

**System: FHP Aerial Photography - Environmental (cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
<b>Airstrip Availability, Condition and Services</b>	No alternative or suitable landing location (surface condition, environmental limitations)	Remote	Critical	Medium	pre-mission planning to maintain options, call ahead to check on runway condition, check NOTAM	Occasional	Negligible	Low			
	No fuel source	Occasional	Negligible	Low	Call ahead to check availability of fuel	Remote	Negligible	Low			
	One-way landing - wind, terrain	Probable	Catastrophic	High	pre-mission planning for terrain/fix approach, plan for alternative airports	Remote	Catastrophic	Serious			
	One-way departure - wind, terrain	Probable	Catastrophic	High	pre-mission planning for terrain/fix departure, stay on the ground & wait for favorable conditions	Improbable	Catastrophic	Medium			
	No windsock	Occasional	Critical	Serious	Observe ground/water conditions (tree lean, dust, water ripples, etc.)	Remote	Critical	Medium			
	Prevailing wind may not be favorable to landing/departure	Probable	Critical	High	Know prevailing wind pre-mission, use alternate airport	Occasional	Critical	Serious			
<b>Animal activity</b>	Areas of high bird activity (flyways, nesting areas, etc.)	Occasional	Critical	Serious	Some areas are marked on sectional charts, local knowledge of flyways - incorporate in pre-mission planning; see and avoid	Remote	Critical	Medium			
	Survival in hostile wildlife habitat	Remote	Catastrophic	Serious	Stay with the plane, carry appropriate survival equipment for survey area/time of year (pepper spray, fire arm & mitigate carrying such items)	Improbable	Catastrophic	Medium			
	Potential for serious injury/aircraft damage from wildlife on runway (common at remote and county airports)	Occasional	Critical	Serious	Contact ground to clear runway, communicate any observed activity to pilot	Remote	Marginal	Medium			

**System: FHP Aerial Photography - Personnel**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Post Mitigation Value	
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		Additional Local Mitigation
Pilot	Minimal local experience	Occasional	Critical	Serious	Manager to brief pilot on project and area to be photographed, frequencies, hazards, refueling sites, etc.	Remote	Critical	Medium			
	Lack Jurisdictional/boundary awareness	Occasional	Negligible	Low	pre-mission planning/briefing, utilize digital mapping system information, load backgrounds on portable GPS	Remote	Negligible	Low			
	Unfamiliar with mission type - carded for reconnaissance/photo but no FHP mission-specific flight review	Frequent	Critical	High	Conduct mission-specific flight review/training and utilize FHP flight review checklist as required (applicable to agency-contracted pilots)	Remote	Critical	Medium			
	Unaware of hypoxia effects in event of loss of cabin pressure (whether nonpressurized or pressurized aircraft)	Probable	Critical	High	Recommend hyperbaric chamber training for pilots and crew members/flight managers if program includes high altitude photography	Remote	Critical	Medium			
	Minimal flight hours or experience with mission type (varies annually)	Probable	Critical	High	Thorough preflight briefing to new pilots, utilize FHP flight review checklist as required	Occasional	Critical	Serious			
	Inordinate attention to photo mission rather than flying	Occasional	Critical	Serious	Thorough preflight briefing to new pilots, observer/flight manager let pilot know if becoming a problem	Remote	Critical	Medium			
	Pilots may not have dedication, skills to perform mission or may be "pushed" into uncomfortable situations	Probable	Critical	High	CRM, discuss comfort level and environmental conditions, adjust flight profile accordingly	Remote	Critical	Medium			
	No preflight mission briefing from flight manager (photo area, profile, objectives, aerial hazards)	Occasional	Critical	Serious	Pilot request thorough briefing, manager provides	Remote	Marginal	Medium			
	lack of awareness leading to fuel starvation	Occasional	Critical	Serious	Proper preflight planning, monitor consumption, CRM to include crew observe flight time and fuel gauge; consider fuel totalizer for monitoring consumption & reset when fueling	Remote	Critical	Medium			
	Has not checked for current NOTAM	Remote	Catastrophic	Serious	Proper preflight planning to include checking NOTAMs, CRM to include crew.	Remote	Negligible	Low			

**System: FHP Aerial Photography - Personnel (cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
Pilot	Incomplete preflight/post flight inspection	Occasional	Critical	Serious	Take the time necessary to evaluate aircraft thoroughly, CRM to include crew in inspection & feel comfortable reporting anomalies	Remote	Marginal	Medium			
	Self-medicated (could range from a simple cold to serious health issue)	Occasional	Critical	Serious	All crew to crosscheck how each other is doing, ask if medicated, know FAA regulations pertaining to prescription & over-the-counter medication	Remote	Critical	Medium			
	Check list not utilized	Remote	Critical	Medium	Utilize appropriate check lists, CRM to encourage crew ask for check list.	Remote	Negligible	Low			
	Accepting unreasonable risk (e.g., fixed photo transect and proximity to rising terrain)	Remote	Catastrophic	Serious	Conduct project-specific risk assessment, job hazard analysis and incorporate into pre-mission briefing	Remote	Critical	Medium			
	Incapacitated	Remote	Catastrophic	Serious	Crew/Manager attend pinch hitter	Remote	Critical	Medium			
	Under the influence or hung over	Remote	Catastrophic	High	CRM to include awareness of regulations for 8 hours no alcohol, BA < .04 - crew to cancel mission if in question	Improbable	Catastrophic	Medium			
	Fatigue, complacency	Probable	Catastrophic	High	10 hours off duty, limit flight day to 8 hrs or less depending on conditions (usually not prudent to push for full 8-hour flight days)	Remote	Critical	Medium			
	Shortage of qualified, skilled pilots	Probable	Marginal	Serious	Implement mentoring program	Remote	Marginal	Medium			
Gear up landing	Remote	Critical	Medium	Pilot training including simulation training twice a year and aircraft check ride, utilize checklist & CRM	Remote	Critical	Medium				

**System: FHP Aerial Photography - Personnel (cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
Photographer (or flight manager)	Minimal experience with aircraft	Occasional	Catastrophic	High	Obtain pilot safety briefing, don't board or egress w/engine(s) running	Remote	Marginal	Medium			
	Minimal experience with mission type	Probable	Marginal	Serious	Utilize Fixed-wing Flight Manager Special-Use Task Books (sections relevant to aerial photography)	Remote	Negligible	Low			
	Fatigue, complacency	Probable	Marginal	Serious	Consider flying less than 8 hour/ day, CRM	Remote	Marginal	Medium			
	Self-medicated (colds to serious health issue)	Occasional	Critical	Medium	All crew to crosscheck how each other is doing, ask if medicated, know FAA regulations pertaining to prescription & over-the-counter medication	Remote	Marginal	Medium			
	Not ensuring pilot checklist used	Occasional	Critical	Medium	Practice CRM, assure checks complete	Remote	Marginal	Medium			
	Accepting unreasonable risk in general (refers to individual's character and state of mind)	Occasional	Critical	Serious	Participate in project-specific risk assessment, job hazard analysis and incorporate into permission briefing	Remote	Negligible	Low			
	Lack of mentoring	Remote	Marginal	Medium	Use experienced photographers, keep them current; train new people that have interest	Remote	Negligible	Low			
	Not obtaining safety briefing	Probable	Negligible	Medium	Photographer/Flight Manager refer to 5 steps to safe flight & request safety briefing from pilot	Remote	Negligible	Low			
	Not using CRM	Remote	Catastrophic	High	Involve pilot or crew (as appropriate) during project-specific risk assessment, job hazard analysis and incorporate into permission briefing	Remote	Marginal	Medium			
	Pressure employees to complete project	Remote	Catastrophic	Serious	Photographer/Flight Manager refer to "5 steps to safe flight" card & request safety briefing from pilot	Remote	Negligible	Low			
Lack of qualified photographer/flight manager	Occasional	Catastrophic	High	Cancel mission until rectified	Improbable	Negligible	Low				

**System: FHP Aerial Photography - Personnel (cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
Supervisor/ Program Manager	Fatigue, complacency	Probable	Marginal	Serious	Communicate w/FWFMSU, consider requiring employees to fly less than 8-hrs/day, practice CRM to include all aviation personnel	Remote	Marginal	Medium			
	Accepting/promoting unreasonable risk	Probable	Marginal	Serious	Supervise and set tone "aviation program first" - participate in programmatic and project-specific risk assessments, do job hazard analysis and ensure incorporated into permission briefing; FWFMSU communicate with supervisor, FHP supervisors to attend required aviation safety training	Remote	Marginal	Medium			
	Lack of project level knowledge & involvement	Occasional	Critical	Serious	Supervisor briefed during mission planning	Remote	Marginal	Medium			
	Not ensuring subordinates adequately trained on aviation safety/mission tasks	Probable	Critical	High	Supervisor monitor employees training requirements, have training identified on individual training plan (assures subordinates stay current as Flight Manager or other positions as appropriate in FHP IAT Matrix)	Remote	Marginal	Medium			
	Not completing required Supervisor training	Probable	Marginal	Serious	Complete appropriate modules per FHP IAT Matrix and stay current	Remote	Marginal	Medium			
	ABS issues - contributing to long duty day & vendors/pilots not being paid (contract aviation services only)	Remote	Marginal	Medium	Supervisor, program manager/UAO to remain alert for flight managers having trouble using ABS and/or vendors not getting paid; if occurring, potential to affect daily operations and safety... Respond to needs for additional ABS training (contact CO, other FHP COR's or F&AM staff for assistance)	Remote	Negligible	Low			
	Personality conflicts up/down leading to stress and poor communication	Remote	Marginal	Medium	Brief/debrief, CRM, maintain positive attitude, promote honest/open communication	Remote	Negligible	Low			
	General lack of mission understanding (within flight crew, also includes aviation support functions)	Frequent	Critical	High	Ensure agency personnel complete appropriate level of training/task books for position, recommend for states. Have regional program managers interact w/FAO, RAO, RASM, dispatchers, State Foresters, etc to increase understanding of photo operations and awareness	Remote	Marginal	Medium			

**System: FHP Aerial Photography - Personnel (cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
Dispatch	Uninformed or misinformed of Flight Plan	Occasional	Marginal	Medium	FHP UAO disseminate PASP and annual schedule to dispatch centers and FAOs as early as possible; FWFMSU to submit Flight Plan, call dispatch in each area prior to mission, ensure good communication in all areas to be flown	Occasional	Negligible	Low			
	Limited FM capability in photo projects due to distance to centers	Occasional	Critical	Serious	Have and utilize a plan for using phone and AFF systems.	Remote	Marginal	Medium			
	Work load, fatigue, or complacency resulting in missed flight following	Remote	Catastrophic	Serious	FWFMSU coordinate with dispatch centers, consider moving flight following services or project to alternate area if dispatch workload too high	Remote	Marginal	Medium			
	Inconsistent flight following procedures	Probable	Critical	High	FHP UAO clearly identify radio/AFF procedures in PASP, communicate to dispatch, FWFMSU call dispatch daily	Remote	Negligible	Low			
	Frequency congestion	Frequent	Critical	High	Consider utilizing local repeater frequencies to ease congestion, provide alternative frequencies; augment radio use with AFF; or, file FAA flight plan	Remote	Marginal	Medium			
	Inoperability of National Flight Following	Probable	Critical	High	Have and utilize forest net frequencies, submit safecom for outages or areas that should have NFF coverage	Occasional	Critical	Serious			
	Lack of staffing on weekends or outside of flight hours	Occasional	Negligible	Low	Use alternate methods of flight following, request additional staffing, adjust flight hours to accommodate dispatch hours	Remote	Negligible	Low			
	Jurisdictional/boundary awareness and inability to maintain flight following	Occasional	Critical	Serious	Ensure positive radio communication and successful hand-off to neighboring dispatch, close out flight following with previous dispatch area.	Remote	Negligible	Low			
	Frequency guides unavailable or not current	Occasional	Critical	Serious	GACC's to publish current frequency guides on the internet & have links to neighboring GACC frequency guides	Remote	Negligible	Low			
	Not filing flight plan or initiating flight following/closing flight plan	Occasional	Catastrophic	High	FWFMSU or pilot shall initiate and close flight following w/dispatch for each leg of flight.	Remote	Marginal	Medium			
Poor communication between local dispatch, GACC, NICC regarding flight plan	Occasional	Critical	Serious	When utilizing dispatch flight following, FWFMSU to assure mission specifics are communicated; communicate not only with unit through which order is placed but with local centers where project is planned, USFS and other agencies as needed - assure appropriate distribution of flight plan; FAA flight following required at a minimum	Remote	Marginal	Medium				

**System: FHP Aerial Photography - Personnel (cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
Dispatch	Unable to adequately communicate aerial hazards	Occasional	Catastrophic	High	Review hazard maps prior to flight (more of a factor for lower altitude photography, King Air frequently operates out of range from aerial hazards)	Remote	Critical	Medium			
	Minimally qualified/new dispatchers	Occasional	Critical	Serious	Develop mentoring program for growing centers or for areas where turn over is anticipated (be proactive, provide OJT to potential recruits)	Remote	Marginal	Medium			
Maintenance Inspector	Insufficient number of inspectors	Occasional	Critical	Serious	Managers to assure enough inspectors to fulfill area needs; hire additional and/or share inspectors across regional boundaries	Remote	Marginal	Medium			
	Not current on AD's	Remote	Catastrophic	Serious	Use FAA website for new AD's, get subscription (CD is available with 28-day updates)	Remote	Marginal	Medium			
	Fatigue, complacency	Remote	Catastrophic	Serious	Utilize other region's/agency inspectors to help workload, provide second set of eyes	Remote	Marginal	Medium			
	Accepting & transferring unreasonable risk to aviation users	Remote	Critical	Medium	UAO's to participate in inspections for the purposes of 1) gaining knowledge about inspections and 2) for raising general awareness to new issues/ideas on aircraft health	Improbable	Marginal	Medium			
Contracting	CO/COR turnover and/or lack of experience	Frequent	Critical	High	Aviation CO developmental positions, mentoring programs, UAOs coordinate with Cos to assure best value	Remote	Marginal	Medium			
	Very short timeframe from advertising to award of aircraft contracts (affects operating season, potentially limits pool of most desirable/most qualified bidders)	Frequent	Critical	High	Determine budget, funds available, and start preparing contracts as early as possible	Remote	Marginal	Medium			
	Stress in planning and completing missions while coordinating product delivery to customers (added complexity due to contracted services - film acquisition, processing, delivery)	Frequent	Critical	High	Aviation CO developmental positions, mentoring programs, aviation specific training, create contract template, FHP UAO's participate in contract development	Remote	Marginal	Medium			

System: FHP Aerial Photography - Technology (Hardware/Software)											
Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
Oversight & Coordination in General	Lack of mission understanding among some RAOs/RASMs, FAOs, other aviation functions	Remote	Critical	Medium	FHP to be proactive, educate and interact with other aviation staff during annual meetings (national and regional)	Improbable	Negligible	Low			
	Lack of knowledge, use or misuse of SAFECOM system	Occasional	Critical	Serious	Encourage FHP personnel to use system, provide constructive quarterly summaries to field	Improbable	Marginal	Medium			
	Lack of mission understanding among aviation users	Frequent	Critical	High	Ensure agency personnel complete appropriate level of training/task books for position, recommend for states. Have regional program managers interact w/FAO, RAO, RASM, dispatchers, State Foresters, etc to increase awareness.	Remote	Marginal	Medium			
	Aviation Management Plan, PASP not current or non existent (required for agency)	Remote	Catastrophic	Serious	FHP UAOs and Safety Manager (as appropriate) to assure plans are completed and distributed within project areas	Improbable	Negligible	Low			
ABS (if contract aircraft)	Difficulty inputting flight time for payment processing through ABS can cause frustration and long duty days	Occasional	Critical	Serious	Utilize ABS Helpdesk; acquire additional ABS training if necessary; report software problems to be addressed in future ABS versions	Occasional	Negligible	Low			
	Disgruntled pilots/vendors due to process or not being paid (rippling effect on attitudes through operation)	Probable	Critical	High	FWFMSU work with Pilot and/or CO as necessary to assure prompt payment for services	Occasional	Marginal	Medium			
AFF	False sense of security (not a method for air traffic control)	Occasional	Critical	Serious	Better communication between pilot and dispatch centers, train dispatchers and flight crew on proper use & limitations of AFF, dispatch must time and monitor display at required intervals	Remote	Negligible	Low			
	Flight manager trusting AFF absolutely with minimal voice communication	Occasional	Critical	Serious	Maintain positive radio communication, safety plan & flight plan include protocol for flight following (reference MOB Guide, chapter 20)	Remote	Marginal	Medium			
	Signal interruption due to antenna conflicts with other aircraft antenna	Remote	Critical	Medium	Install and inspect per manufactures recommendation (maintain separation from other antenna)	Remote	Negligible	Low			
	Portable units not secured, could become projectile in event of emergency landing	Remote	Catastrophic	Serious	securely mount portable components in tail section or strap down to floor	Remote	Negligible	Low			

**System: FHP Aerial Photography - Technology (Hardware/Software - cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
Radios	No frequency or repeater available in project area	Occasional	Catastrophic	High	Test frequencies and set up portable repeaters if necessary; communication plan requires backup communication by cell phone or satellite phone if necessary; in federal plans/suggest requiring in state plans	Remote	Catastrophic	Serious			
	No communications (in general) air-to-ground, with other aircraft or dispatch centers	Remote	Marginal	Medium	FAA requires ability to communicate with general aviation aircraft; contracts include necessary radio specifications; communications plan lists frequencies	Remote	Marginal	Medium			
	Inaccessible radios/controls, difficult to operate	Improbable	Marginal	Low	Break from flight pattern to access radio and make adjustments	Improbable	Negligible	Low			
	P-25 Digital, Analog & Narrow Banding compatibility issues	Probable	Marginal	Serious	Identify issues prior to contract and operation, radio check prior to project implementation - address in communication plan; provide time and training on new equipment	Occasional	Marginal	Medium			
	Portable radios - not secure, controls easily bumped	Remote	Marginal	Medium	Secure and properly place portables so as not to interfere with aircraft operations, use keypad/control locks	Occasional	Marginal	Medium			
	Panel mounted radios - bump controls	Improbable	Marginal	Medium	Use keypad/control locks	Improbable	Negligible	Low			
	Flight crew unfamiliar with components	Probable	Marginal	Serious	Preflight to include familiarization & programming radios	Remote	Marginal	Medium			
	Frequency congestion	Occasional	Catastrophic	High	Alternate frequency planning	Remote	Marginal	Medium			
	Faulty wiring leading to intermittent operations	Remote	Marginal	Medium	Have portable radio/handheld, users prepared to use alternate frequencies (guard), land and repair or replace aircraft	Remote	Marginal	Medium			
Inoperability of National Flight Following	Occasional	Negligible	Low	Identify and rectify NFF system failures (computer, satellite and aircraft equipment)	Remote	Negligible	Low				

**System: FHP Aerial Photography - Technology (Hardware/Software - cont.)**

Sub-systems	Hazards	Pre Mitigation			Mitigation	Post Mitigation				Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome	Mitigation Achieved? Yes or No		
Aircraft GPS	Not having latest software or map updates	Occasional	Critical	Serious	Contract to include GPS specifications and requirement for updates	Occasional	Marginal	Medium			
	Waypoint input errors	Remote	Marginal	Medium	Train pilots on GPS operation, double check waypoints prior to mission	Remote	Negligible	Low			
	Hand-held units not secured, could become projectile in event of emergency landing	Probable	Marginal	Serious	securely mount portable components in tail section or strap down to floor	Remote	Negligible	Low			
TCAS	If not using TCAS: potential for midair collision	Remote	Catastrophic	High	Use TCAS, continue practice of "see and avoid", apply CRM	Improbable	Catastrophic	Medium			
	If using TCAS: false sense of security that all other aircraft have functioning transponders	Occasional	Catastrophic	High	Recognize that all other aircraft may not have functioning transponders, continue practice of "see and avoid", apply CRM	Remote	Catastrophic	Serious			
	If using TCAS: Signal interference, antenna positioned too close to other antennas	Occasional	Catastrophic	High	Follow manufacturer's installation requirements	Remote	Catastrophic	Serious			
Camera & Associated Equipment	Loose Items	Occasional	Critical	Serious	properly secure loose equipment, brief on hazards	Occasional	Marginal	Medium			
	Electronic failures & diagnosis cause confusion, mission interruption, deviation from flight plan	Occasional	Marginal	Medium	Make equipment checks before flight in the lab and on the ground	Remote	Marginal	Medium			