

Aerial Survey Working Group Report
January 21-22, 2015 **Fort Collins, CO**

The 2015 Aerial Survey Working Group (ASWG) meeting was hosted in the Rocky Mountain Region. The group thanks Unit Aviation Officer Brian Howell for his help in determining cost-effective location and Regional Aviation Safety Manager Kent Hamilton for attending and providing the 2014 USFS Aviation Mishap Review. This report is the responsibility of Jeff Mai, Forest Health Protection (FHP) National Aviation Safety Manager (NASM).

In attendance were:

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| 1. Aleksandar Dozic | Washington Department of Natural Resources |
| 2. Amanda Grady | FHP, Southwestern Region |
| 3. Ben Smith | FHP, Pacific Northwest Region |
| 4. Bill Ciesla | Forest Health Management International |
| 5. Bill Frament | FHP, Northeastern Area, DFO |
| 6. Brian Howell | FHP, Rocky Mountain Region |
| 7. *Charlie Schrader | RSAC, Red Castle Resources |
| 8. *Christopher Hayes | FHP, Northern Region |
| 9. Crystal Tischler | FHP, Southwestern Region |
| 10. Dan Ryerson | FHP, Southwestern Region |
| 11. Dan West | Colorado State Forest Service |
| 12. Danny Norlander | Oregon Department of Forestry |
| 13. Don Ewing | FHP, FHTET, WO |
| 14. Drew McMahan | FHTET, Cherokee Nation Technologies |
| 15. Frank Krist | FHP, FHTET, WO |
| 16. Frank Sapio | FHP, FHTET, WO |
| 17. Gentry Carlson | Minnesota Department of Natural Resources |
| 18. James Yaussi | FHTET, Cherokee Nation Technologies |
| 19. JD Mullen | FHTET, Cherokee Nation Technologies |
| 20. Jeanine Paschke | FHTET, Cherokee Nation Technologies |
| 21. Jeff Mai | FHP, FHTET, WO |
| 22. Jennifer Ross | FHP, Rocky Mountain Region |
| 23. Jim Ellenwood | FHP, FHTET, WO |
| 24. Jim Schriever | Mason Bruce & Girard |
| 25. John Withrow | FHTET, Cherokee Nation Technologies |
| 26. Justin Backsen | FHP, Rocky Mountain Region |
| 27. Justin Hof | FHP, Rocky Mountain Region |
| 28. Kathleen Matthews | FHP, Northern and Intermountain Regions |
| 29. Kent Hamilton | FAM, Rocky Mountain Region |
| 30. Kerry Halligan | Mason Bruce & Girard |
| 31. Les Koch | Wyoming State Forestry Division |
| 32. Marc Roberts | FHP, Northeastern Area, SPFO |

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| 33. Mark McFall | Arapaho & Roosevelt National Forest, SO |
| 34. *Mark Zwiefler | FHP, FHTET, WO |
| 35. Marc Finco | RSAC, Red Castle Resources |
| 36. Michael Conly | FHTET, Cherokee Nation Technologies |
| 37. Nathan Edberg | FHTET, Cherokee Nation Technologies |
| 38. Robert Chastain | RSAC, Red Castle Resources |
| 39. Roger Mech | Michigan Department of Natural Resources |
| 40. Roy Mask | FHP, Rocky Mountain Region |
| 41. Rusty Rhea | FHP, Southern Region |
| 42. Scott Sontag | FHP, Northern Region |
| 43. Sherry Ramos | FHTET, Cherokee Nation Technologies |
| 44. Tom Heutte | FHP, Alaska Region |
| 45. Tom Zegler | New Mexico State Forestry |
| 46. Vern Thomas | FHTET, Cherokee Nation Technologies |
| 47. Zachary Heath | FHP, Pacific Southwest Region |

*attending virtually via LiveMeeting and conference call, several others dialed in but did not identify.

The ASWG Six Key Issues for 2015

1. Flight Hours, Automated Flight Following (AFF) and Digital Aerial Sketch Mapping (DASM)

Approximately 4,204.6 flight hours were reported by FHP and state cooperators conducting aerial survey and remote sensing in 2014. The total hours break down as follows: 50% FHP, 42% State and 8% cooperatively flown (both FHP and State on board). AFF was utilized 64% of the total survey flight time, a 2% decrease from last year. AFF is used on all FHP missions. Several cooperators in the Northeastern Area and Region 8 are not realizing the full benefit of this added safety measure. DASM systems were used 89% of the total survey flight time, a 3% decrease from what was reported last year. Development of the new Digital Mobile Sketch Mapping (DMSM) system continues with prebeta and beta testing planned for 2015 (see Issue 5).

In addition to aerial survey, FHP and States cooperated to fly 989.1 hours aerial application. Total flight hours, all operations = 5193.7. Black Hills aerial photography, a cooperative project between SD and the BHNF, is not included; HI aerial detection survey is not included. Neither of these projects were FHP-funded but we did receive forest health data from them.

FHP and cooperators had no accidents, incidents or incidents with potential in 2014; we have had no aerial application accidents for the last 11 years or aerial survey accidents for the last four years. Using flight hours reported during the last decade, the calculated 10-year average accident rate is 3.61 accidents per 100,000 hours flown for all FHP and cooperator operations; this compares to Fire and Aviation Management's (FAM) 2014 Safety Summary 10-year average accident rate of 3.32 accidents per 100,000 hours flown for all USFS and cooperator operations. Additional National and Regional/Area statistical information is available at www.fs.fed.us/foresthealth/aviation/safety/safety-statistics.shtml. Implementation of Safety Management Systems (SMS) components including

Promotion, Policy, Assurance and Risk Management are essential to further accident rate reduction. Our goal is to strive for zero accidents.

2. Promotion

A primary function of the ASWG, as well as the Aerial Application Safety Council (AASC), is safety promotion throughout all FHP and cooperater aviation operations. Revised charters out of both groups have been through multiple internal reviews before and after being provided to the FHP Director. To date the charters remain unsigned. Critical to the success and safety of our cooperative operations and FHP mission is the continued acknowledgement and persistence of these groups; promotion is a core function but their activities are aligned with and responsible for advancement of every SMS component and invaluable to technology development, quality and safety assurance efforts www.fs.fed.us/foresthealth/aviation/aviationprogram.shtml.

Training systems and curriculum continue to evolve. Advanced aviation training through Treasure Valley Community College (TVCC) has been attended by a number of FHP personnel, additional scholarships and opportunities are provided to the field with the expectation of more of the same in the future. FHP-sponsored training in 2014 included: Aerial Application Safety and Management (AASM) for spray program managers in Nashville, IN; Aerial Survey Aviation Safety and Management (AS2M) was provided in 2015 in Lakewood, CO; all first and second-level FHP supervisors attended one of a series of training sessions offered to meet leadership needs (new staff in 2015 will be prioritized for A-314 prior to flight season). Based on removal of certain courses and new Interagency Aviation Training (IAT) curriculum, the IAT Guide was updated and provided to the field. The new IAT website has become more complex and powerful; numerous issues continue to be addressed and changes made fairly regularly. The IAT Steering Committee continues to improve accessibility and training curriculum across the board, including advocating A-312 Water Ditching and Survival in policy revision. FHP plans on providing AS2M in the east or northeast in 2016 and AASM or variations of that as webinar and live classroom east and west in 2016. For training updates see www.fs.fed.us/foresthealth/aviation/training.shtml.

Aerial survey pilot Gracie Moore received the Safe Flying Award in 2014 for 3000 hours of accident-free flying in Region 2. We thank Gracie and Region 2 for their support and guidance to the overall program, high quality standards and safety performance we can all be proud of. The fifth recipient of the National FHP Aviation Safety Award is Don Eggen, Forest Health Manager, Pennsylvania Department of Conservation and Natural Resources. Don has been a leader in affecting positive change in forest health monitoring, management and aviation safety for over three decades. He was a principal advocate in establishing the AASC, is regularly engaged with Forest Health Monitoring (FHM) and the ASWG and he frequently orchestrates key meetings and training for state and federal personnel involved with spray and survey operations. We thank Don for his positive attitude and advocacy, influencing operational procedures and increased safety for state and federal forest health professionals locally and nationally www.fs.fed.us/foresthealth/aviation/news.shtml.

3. Policy

The National Aviation Safety Council (NASC) and FHP are engaged on policy and guide rewrites. FSM 5700 and FSH 5609.16 were circulated for review by the policy rewrite team April 2015. This is a significant undertaking that is in process with implications to numerous guide revisions (AIG, CRP, SMS, IHOG, PTS for rotor and fixed-wing, etc.). A few proposed manual and handbook-related policy revisions of importance pertain to aircraft performance, planning documentation and processes,

use of unmanned aircraft and FHP aviation positions in policy. Critical to FHP's management and safety success are our positions in policy. Attempts were made by FAM to retitle the FHP NASM position in policy which is not within the purview of FAM; subsequently, the position has been removed from draft as has the WO Director of FHP. Further, UAO responsibilities have not been adopted as recommended. The future of FHP's aviation program, organization and ability to implement SMS are inextricably linked to the policy review on going presently. WO staff have been formally briefed by the FHP NASM on multiple occasions as to our history and the importance of these positions in policy for program management and further advancing our SMS. Final draft FSM and FSH will be routed for review to staff directors (LEI, Engineering, FHP, Union, etc.) with plans to complete by March 2016. All are encouraged to participate and forward any comments or issues to the FHP NASM. For current policy and procedures see www.fs.fed.us/foresthealth/aviation/safety/safety-policy.shtml.

4. Risk Management

Risk assessments for all FHP aviation program areas are periodically and cooperatively updated based on operational feedback, task groups, safety and quality assurance. Both the AASC and ASWG have been engaged on updates which were made prior to flight season, distributed and posted www.fs.fed.us/foresthealth/aviation/safety/safety-riskmgmt.shtml. The remote sensing risk assessment is due for revision and subject matter experts need to be scheduled for the update.

Tools and technology continue to advance as options within a comprehensive survey strategy to augment conventional ADS, improve efficiency and reduce flight time. A plan to implement Operational Remote Sensing (ORS) has evolved and will need additional feedback/support from the aerial survey community, including aerial quality assurance of ORS data. The Spatial Tool for Aviation Risk (STAR) is also available on-line highlighting areas of relatively higher aviation risk and has been used to help prioritize ORS opportunities and build requirements for the multi-mission aircraft replacement effort. The Digital Mobile Sketch Mapping (DMSM) system is designed to improve efficiencies and accommodate safety data also reducing risk. Unmanned Aircraft System (UAS) utility for detection/monitoring and other resource applications remains to be proven but FHP supports investigation (Special Technology and Development Proposals for 2015 in R6 and R10, first Agency contract planned for 2016 in R3). Over recent years FHP has worked to define core survey areas and methods of survey, improve production rates, and strategically incorporate new tools and technology for increased safety and information utility. Risk management is a perpetual, ongoing effort and work continues along all these fronts in coordination with ASWG, AASC, UASAG, IATS and NASC.

5. Assurance

Program reviews, field visits, technical assistance all provide opportunities for quality and safety assurance and the frequency of both formal and informal assurance efforts needs to increase. R1 FHP voiced local concerns around contracting during AS2M 2015, followed by contacts with Regional FAM. Early flight season SAFECOM was submitted that inspired a constructive field review addressing the issues for R1 (continue to monitor). The Agency Aviation Strategic Plan calls for 2015 FHP Program Review which was not scheduled, expect that to be rescheduled soon. AASC Safety Assurance Reviews have been successfully implemented for state and federal spray programs, tentative plans are for the next review in PA. All units are encouraged to implement assurance oversight through all phases of project planning, implementation and post-project.

Accident investigation procedures and safety communication needs improvement. The NASC has been involved in the Accident Investigation Guide rewrite and attempting to determine where the new Coordinated Response Protocol (CRP), a separate effort, fits within the overall investigative process. Aviation Safety and Office of Learning personnel were simultaneously involved with an accident investigation and are now working to improve procedures around that experience. Nine SAFECOMs filed in 2014 were briefed; four in R4, two in R8 and one in NA, R10 and R5. The number of SAFECOMs filed by FHP and cooperators could be higher and all units are encouraged to include examples and history during preseason workshops, follow up with the FHP NASM during season, and include outbrief during after action reviews. FS requirements are to report any incident that affects, or could affect, operational safety using FS-5700-14 as stated in our contracts, plans and policy. Periodic queries are made by the FHP NASM, discussed with involved parties and summarized to the field to increase awareness for accident prevention. For more information see www.fs.fed.us/foresthealth/aviation/qualityassurance.shtml.

6. Digital Mobile Sketch Mapping (DMSM)

Reference the 2014 Report for DMSM development and Survey Requirements Team (SRT) activities regarding strategic improvements to survey coverage and classes, reporting timelines, and requirements gathering for DMSM. Preliminary tablet options were tested during 2014 with a hardware preference presented and accepted during the 2015 meeting. The ASWG agreed to support testing phases in 2015 that include analysis of prebeta software, feedback to development and followed by operational beta testing. The group is to provide the FHP NASM with small and large test areas for base map preparation at FHTET; tablets are to be distributed to the field prior to August/September operational test flights.

The project continues to track for 2016 implementation. Issues gathered during prebeta will be prioritized and addressed in subsequent operational beta version(s) to the degree they can be accommodated given fiscal limitations and strategic needs. Operational test results will similarly be incorporated in Beta 3 with delivery expected during Fall 2015. Focus thus far has been on aviation hardware and software, including enhancements to support ground checking and quality assurance. DMSM ground survey software will support quality assurance of ADS but the initial requirements are to accommodate a broader array of robust ground survey needs among FHP and cooperators. Workflow around use of standardized codes, editing and viewing draft data, compatibility of aerial, ground, and other data streams in the overall strategy continues to be addressed in terms of standards and workflow.

The overall project goals and design are sound. A few critical points remain to be formalized but overall strategy is good with both ground and aerial functionality expected in 2016 survey season. Accommodating the additional workload among FHP and partners to support this project will be challenging, requiring additional planning, coordination and oversight by all; change management and risk management are hand-in-hand and the extra effort is greatly appreciated.

Additional Information

- A. Though field units are significantly challenged with the need to upgrade obsolete hardware, defer replacing DASM notebook computers. FHTET plans to procure enough DMSM tablets to accommodate aerial and ground needs. If field units must purchase hardware, consult

FHTET and consider the Android platform of choice (Samsung Galaxy Pro 12.2”, 10” and 8”).

- B.** The national multi-mission aircraft replacement effort stalled due to other FAM priorities but is expected to be revived later in the year. R6 and R2 have entered Interagency Agreements with USFWS for use of their Quest Kodiak turbine aircraft. These agreements are consistent with needs demonstrated through risk assessment and mission profile definitions completed by FHP and the USFS Aviation Strategic Plan.
- C.** Aircraft availability, staffing, advancing technology and the use of high performance aircraft remain high priority. It is recommended that leadership address aircraft, DMSM, ORS and UAS in outyear budget planning to accommodate technological and safety improvements considering the suite of tools presented for a more comprehensive and increasingly safe survey strategy.
- D.** The Northeastern Area, Durham Field Office partnered with NASA to deploy and test the G-LiHT sensor gathering forest health information over the Merrimack. The project collected LiDAR, VNIR and thermal image data in 2014. Additional remote sensing flights are planned for 2015. Feedback to the ASWG and FHTET regarding the results of this work is necessary for our overall strategy and to inform B and C (above).
- E.** The ASWG reviewed extensive local and national utility and importance of quality IDS data, significant detections supporting management actions, derived products and other practical data applications. Two examples of this utility include *A Practical Strategy for Managing Forest Adaptation to Climate Change: a Case Study of Aspen and Spruce in Southwestern Colorado* (webinar by Jim Worrall) and the *2015 Report on Forest Sustainability* (Indicator 3.15 lead Jeff Mai, webinar and report). Applications, survey data, and risk modeling were reviewed; available through FHP Mapping & Reporting Portal foresthealth.fs.usda.gov/portal IDS placemat www.fs.fed.us/foresthealth/technology/adsm.shtml. Several other examples of utility and on-the-ground management actions for top forest health issues were discussed during the meeting and are available in the notes.
- F.** Pre/post-season workshops and reviews are vital to improving safety and quality. Calibration flights coupled with ground checks are recommended annually. Notify Jeff Mai if you plan any pre or postseason workshops and training www.fs.fed.us/foresthealth/aviation/training.shtml#workshops.
- G.** FHP and Forest Management, under the guidance of the UASAG, are coordinating with R3 and FAM to implement first UAS contract in 2016. STDP UAS projects submitted by R6 and R10 (both under state operational control); units must report back to the ASWG and FHP NASM with results of those projects.
- H.** The FHP NASM followed up on ASWG concerns after the meeting regarding aircraft needs and pilot standardization; met with Standards and Airworthiness staff regarding aircraft needs, UAS contract coordination, and provided check ride criteria for consideration when revising Practical Test Standards (PTS completed for rotor in 2014/planned for fixed wing in 2015).
- I.** There is a continuing need for qualified IAT Instructors to assist with a variety of FAM, FHP and externally-sponsored training. This is a great opportunity for state and federal employee

development and sharing resource aviation expertise; personnel are encouraged to take advantage and assist with training events currently being planned for aerial application and aerial survey programs.

- J.** The ASWG recommends pinch-hitter training for flight managers on a two-year cycle and currency for all aviation positions, including Fixed Wing Flight Manager-Special Use, per the FHP Matrix www.fs.fed.us/foresthealth/aviation/resources/docs/FHP_IAT_Matrix_2014.pdf; Position Task Books for Fixed-Wing Flight Manager Special-Use and Helicopter Manager – Resource are available at www.fs.fed.us/foresthealth/aviation/training.shtml. On-line, classroom and webinar training is available through www.iat.gov. FHP’s training and workshop announcements have been requested and will be posted on FHP Aviation News www.fs.fed.us/foresthealth/aviation/news.shtml.
- K.** Assistance across Region/Area boundaries is encouraged for employee development, teamwork and achieving FHP mission goals. Contact individual UAOs for more information and to request or share aircraft and personnel.
- L.** The 2016 ASWG meeting will be held January 20th – 21st hosted in Region 8.

Meeting notes are available and questions will be answered upon request - End of Report.