Forest Service UASAG Update
Background and Current Activities

Brad Quayle
Forest Service UAS Advisory Group (UASAG)

NIROPS Closeout Meeting
November 2, 2016
Presentation Overview

• UAS Governance
• Guidance/Reference Information
• Recent/Planned Missions
• Information Needs Assessment Survey
UAS Executive Steering Committee (UASESC)

- Regional executive leadership, Deputy Areas and Directorates

- Initial Taskings:
  - Advise Chief and ELT on UAS issues
  - Make broad UAS policy recommendations
  - Develop additional policy on the operation and use of UAS on NFS lands
  - Coordinate efforts with State and Federal partners

- Meetings/Coordination
  - Monthly conference calls
  - Quarterly face to face meetings

UNMANNED AIRCRAFT SYSTEMS EXECUTIVE STEERING COMMITTEE (UASESC) CHARTER
August 2015

The UASES was formed by the Chief to help integrate Unmanned Aircraft Systems (UAS) as a way to utilize the best available science, technology and information to accomplish our mission of “Caring for the land and serving the people”. UAS have the potential to augment the Agency’s capacity to gather information to support several national resource management programs. The Forest Service needs to be visionary in UAS policy, operations and management to fully utilize this rapidly advancing technology.

Roles & Responsibilities
- Collectively, serve as advisors to the Chief and the Executive Leadership Team (ELT) on UAS matters
- Make broad policy recommendations on the integration of UAS within Forest Service operations
- Develop clear UAS policy and direction to govern commercial operations on national forest system lands
- Develop clear UAS policy and direction to govern recreational use of UAS on national forest system lands
- Collaborate with our state and federal partners to develop alignment of UAS policy, operations and management as much as possible
- Utilize the agency UAS Advisory Group. The UAS Advisory Group is the interdisciplinary group of technical subject matter experts chartered by Fire & Aviation Management to provide strategic planning, risk assessment and operational implementation.
- Provide oversight as the point of contact for all agency specific UAS working groups, advisory committees, coordination groups or focus areas, as well as inter-agency groups and committees with USFS member representation.

Membership
The UASES is composed of Regional Executive Leadership, Deputy Area and Directorate with strong UAS mission, policy or acquisition interests.

Executive Steering Committee Membership
- Associate Deputy Chief - National Forest System
- Associate Deputy Chief - Research & Development
- Regional Leadership - Deputy Regional Forester
- Director - Fire and Aviation Management (Chair)
- Director - Law Enforcement & Investigations
- Director - Engineering, Technical and Geospatial Services
- Director - Chief Information Office
- Director - Recreation, Heritage & Volunteer Resources
- Director - Forest Wealth Innovation
- Director - Communication

The director of Fire & Aviation Management is established as the UASES Chair by the Chief.
UAS Advisory Group (UASAG)

- Interdisciplinary group
  - 14 discipline/application areas
- Subject matter expert (SME) groups provide scalable support
- Coordinates with UASESC
  - Provide relevant technical/SME support
- Meetings/Coordination
  - Bi-weekly conference calls
  - Annual face to face meetings
## UASAG Discipline/Application Areas

<table>
<thead>
<tr>
<th>Representation / Responsibility</th>
<th>Name of Primary Representative</th>
<th>Organization of Primary Representative</th>
<th>Name of Alternate Representative</th>
<th>Organization of Alternate Representative</th>
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</thead>
<tbody>
<tr>
<td>Co-Chair</td>
<td>Jami Anzalone</td>
<td>S&amp;P/F&amp;AM/R3</td>
<td>N/A</td>
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<tr>
<td>Co-Chair</td>
<td>Brad Quayle</td>
<td>NFS/ENG/VO/GTAC</td>
<td>N/A</td>
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<tr>
<td>Aviation Policy</td>
<td>Dan Zimmerman</td>
<td>S&amp;P/F&amp;AM/NA</td>
<td>Kris Damsgaard</td>
<td>S&amp;P/F&amp;AM/R3</td>
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<td></td>
<td>Jim McMahill</td>
<td>S&amp;P/F&amp;AM/R2</td>
<td>Kris Damsgaard</td>
<td>S&amp;P/F&amp;AM/R3</td>
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<tr>
<td>Airworthiness &amp; Pilot Inspection</td>
<td>Gil Elmy</td>
<td>S&amp;P/F&amp;AM/VO</td>
<td>Cory Noordermeer</td>
<td>S&amp;P/F&amp;AM/VO</td>
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<tr>
<td></td>
<td>Kent Hamilton</td>
<td>Safety System Enterprise Team</td>
<td>Jim Morrison</td>
<td>Safety System Enterprise Team</td>
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<td>Jim Keyes</td>
<td>S&amp;P/F&amp;AM/R8</td>
<td>Jim Morrison</td>
<td>Safety System Enterprise Team</td>
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<tr>
<td>CIO</td>
<td>Randall Stone</td>
<td>BO/CIO/EBSS</td>
<td>Shawn Hudson</td>
<td>BO/CIO/EBSS</td>
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<tr>
<td>Communications/Public Affairs</td>
<td>Jennifer Jones</td>
<td>S&amp;P/F&amp;AM/VO</td>
<td>Christine Cozakos</td>
<td>S&amp;P/F&amp;AM/VO</td>
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<td>Kaari Carpenter</td>
<td>S&amp;P/F&amp;AM/VO</td>
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<tr>
<td>Engineering / T&amp;D</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
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<tr>
<td>Fire Information Technology</td>
<td>Cole Belongie</td>
<td>S&amp;P/F&amp;AM/VO</td>
<td>Sean Triplett</td>
<td>S&amp;P/F&amp;AM/VO</td>
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<tr>
<td>Forest Health Protection</td>
<td>Jeff Mai</td>
<td>S&amp;P/FHP/VO (National Aerial Survey and Aviation Safety Manager)</td>
<td>Frank Sapio</td>
<td>S&amp;P/FHP/VO (FHTET Director)</td>
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<tr>
<td>Lands, Forest &amp; Resource Management</td>
<td>Matt Oberle</td>
<td>NFS/FM/VO</td>
<td>Monty Maldonado</td>
<td>NFS/FM/VO</td>
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<td>Law Enforcement &amp; Investigations</td>
<td>Michael Mascarenas</td>
<td>LEI/R3/Cibola NF</td>
<td>TBD</td>
<td>TBD</td>
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<tr>
<td>Remote Sensing/Geospatial</td>
<td>Everett Hinkley</td>
<td>NFS/ENG/VO/GMO</td>
<td>Brad Quayle</td>
<td>NFS/ENG/VO/GTAC</td>
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<tr>
<td>Research and Development</td>
<td>Bob McGaughey</td>
<td>R&amp;D/PNW Lab</td>
<td>Scott Goodrick</td>
<td>R&amp;D/SRS</td>
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<tr>
<td>USDA OCIO</td>
<td>Ted Payne</td>
<td>OCIO Geospatial Program Mgr</td>
<td>N/A</td>
<td>N/A</td>
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<td>Wilderness and Recreation</td>
<td>Crystal Merica</td>
<td>NFS/RHVR/VO (Rec Mgmt)</td>
<td>TBD</td>
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UASAG Chartered Objectives

- Develop interim agency protocols
  - UAS missions; External agency coordination
- Review and recommend changes to aviation policy
  - Acquisition and operational use of UAS
- Evaluate UAS systems and associated technologies
  - Assess range of possibilities, limitations and costs
  - Guide strategic planning, program development and agency direction
- Prepare guidance documentation for UAS implementation
  - Communications plans, strategic plan, risk assessments, website content
FAA sUAS Policy (Part 107)

• Released August 29, 2016
• Allows for routine use of sUAS in the NAS
• Requirements
  • UAS must be under 55 lbs; speed < 100mph
  • Activities limited to daylight, visual line of sight operations
  • Adherence to height restrictions (<500 ft) and other operational limits, operator certifications, aircraft registrations and markings, etc.
  • See https://www.faa.gov/uas for additional requirements and details
• Additional requirements need to be considered for UAS operations on NFS lands
UAS Operations on NFS Lands

- Operations require compliance with all laws and policies implemented by the WH, FAA, USDA and FS
- Applicable protocols/policies depends on who you are
  - Recreation/hobbyist use
  - Commercial use
  - Forest Service use
  - External cooperator use (state and other federal agencies)
UAS Operations on NFS Lands

• UAS are considered the same as manned aircraft (FSM 5713.7)
  - Acquisition
  - Carding of pilots/aircraft
  - Inspections
  - Maintenance
  - Avionics
  - Training
  - Operations
  - Certificate of Authorization (COA)

• Public aircraft operations (PAO) apply, including a COA
  - ~60 business days for approval
  - Emergency COAs possible for disaster response, SAR and other needs
  - FS/FAA MOAs pending
    - Blanket Class G airspace access
    - BVLOS operations in TFRs

• Agency requirements to utilize UAS (FS NASMP 5.28)
  - Coordinate with Forest Service Washington Office and Regional Aviation Officers (RAO)
    - Project submission and approvals
    - External agency cooperator UAS use
  - Completion and approval of project planning documentation (Ops plan, PASP).
National UAS Operations Desk Guide

- Provides consistency across the agency and adaptability to unique regional issues
- Incorporates relevant guidance from FAA sUAS Rule (Part 107), etc.

Key elements
- FS policy references and procedural information for UAS use on NFS Lands
  - Recreational use
  - Forest Service use
  - Commercial use
  - Cooperator use
- Aid aviation managers and line officers in assessing and processing requests/scenarios for the use of UAS
- Regulations and prohibitions regarding UAS use in wilderness areas
- Addressing UAS intrusions on wildfires
- Available late CY2016
- To be provided on FS UAS website and updated as needed
UAS Project Proposal Form

- Tool to initiate communication and project planning with RAOs
  - Platform needs assessment
  - Mission/project area information
  - Sensor/data collection requirements
  - Approval signatures by line officer/station director
- Reviewed and approved at April 2016 RAO Council
- Available from FS UAS intranet site and desk guide

U.S. Forest Service Unmanned Aircraft System (UAS) Project Proposal

This form documents essential information to be considered for review and approval of planned UAS missions conducted and/or contracted by the Forest Service. Note: A completed project aviation safety plan (PASP) and risk assessment are required to accompany this form.

Administrative Information

<table>
<thead>
<tr>
<th>Requestor Name:</th>
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<tbody>
<tr>
<td>Title:</td>
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<tr>
<td>District/Forest/Region or Research Station:</td>
</tr>
<tr>
<td>Email:</td>
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<tr>
<td>Phone number(s):</td>
</tr>
<tr>
<td>Forest Aviation Officer Name:</td>
</tr>
<tr>
<td>Forest Supervisor Name or Research Station Director Name:</td>
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<tr>
<td>Regional Aviation Officer Name:</td>
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Initial Mission Information

<table>
<thead>
<tr>
<th>Will the mission be flown within 5 nautical miles of an airport?</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Will the mission be flown over an urban or relatively dense populated area?</td>
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<tr>
<td>Will a manned aircraft be flown at the same time as the UAS as part of this mission?</td>
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<tr>
<td>Will the mission be flown beyond the line of sight (BVLOS) of the UAS operator?</td>
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<td>Does the UAS weigh more than 55 lbs.?</td>
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If the answer to any of the above is "yes", then a manned aircraft will be required to conduct this mission. Please coordinate with your Regional Aviation Officer.

Project Area Information

Note: Other relevant technical information regarding the project and mission will be documented in the PASP.

Project Location: (i.e., Horse Creek drainage, Jackson District, Smoky National Forest)

Identify Military Training Routes (MTRs) and Military Operational Areas (MOAs) within 5 miles of the project area (include route numbers).
 DOI/FS UAS Mission Support Agreement

• IAA with DOI OAS and BLM signed in August 2016
  • Continuation of recent DOI/FS UAS collaboration
  • Leverage DOI UAS operators, platforms and technologies
  • Available through FY17
• Support collaborative UAS missions of mutual interest
  • BAER support
  • Reforestation planning/monitoring
  • Vegetation condition/resource mapping
  • Infrastructure assessment
• Additional missions & schedule in development

Falcon Fixed Wing
Falcon Hover
3DR Solo
2016 Forest Service UAS Missions

1. North Fire Support / Cibola NF (June)
2. Eurasian Milfoil Mapping / Fishlake NF (September)
3. FHP/FM Aerial Survey / Apache-Sitgreaves NF (September)
4. Blackjack/Bluebird Mine Aerial Survey / Umatilla NF (October)
5. Champion Mine Aerial Survey / Umpqua NF (October, postponed)
6. Pioneer Post-Fire Aerial Survey (October, postponed)
FHP/FM Aerial Survey

- Initiated by UASAG in February 2015
  - 200 acre project area on A/S NF
- Objective
  - High resolution, multispectral imagery collection
    - Detect pest/pathogen impacts
    - Estimate forest biomass parameters
- Contracted mission
  - Develop and document protocols for contracted UAS services
- Contract awarded in September 2016
  - Ryka UAS Services
FHP/FM Aerial Survey

- Platform: Matrix Turbo Ace Quadcopter
- Sensor: MicaSense Red Edge
  - 5 band 2” imagery collected for 80% of 200 acre project area
- Mission affected by
  - Weather
  - Variable observation conditions
  - Platform incident
- Several lessons learned for future missions
FHP/FM Aerial Survey Products

CIR frame

RGB encoded point cloud

CIR Mosaic
Abandoned Surface Mine Aerial Survey

- Initiated by R6 and UASAG in August 2016
  - 3 mines and 1 repository area on Umatilla and Umpqua NFs
  - ~130 total acres

- Objectives
  - High resolution RGB imagery collection
    - Engineering/geotechnical needs
    - Environmental monitoring

- Mission conducted through DOI/FS IAA
  - Develop and document protocols for external cooperator UAS services
Abandoned Surface Mine Aerial Survey

• Platform: 3DR Solo Quadcopter
• Sensor: Ricoh GR II
• Mission completed October 19, 2016
  • ~2” imagery collected for 3 target sites on Umatilla NF (~90 acres)
  • Mission on Umpqua NF postponed due to weather (41 acres)
Abandoned Surface Mine Aerial Survey Imagery
FS UAS Information Needs Assessment

Forestry Service

Agency intent for UAS Missions and requirements

Forest Service Unmanned Aircraft Systems (UAS) Information Needs Assessment

Background

The purpose of this Information Needs Assessment (INA) survey is to receive input in order to create a Business Case that will determine if unmanned aircraft systems (UAS) are feasible for supporting natural resource management and if this tool would be an asset to your program of work. The INA survey is divided into two parts:

• Part 1 (required) captures information regarding Forest Service intent for UAS and should take 5 minutes to complete.

• Part 2 (optional) requests input on potential Forest Service UAS mission types and their associated technical requirements and should take approximately 10-15 minutes to complete for each specified mission.

Without this INA, it will be much more difficult to move forward in either adopting or denying the technology. Information gleaned from this INA will be available at a later date and compiled in the report which will be available on the FS UAS website.

If you have any questions, please contact either Dan Zimmerman (610) 557-4147 / dzimmerman@fs.fed.us or Brad Quayle (801) 975-3737 / bquayle@fs.fed.us. Thank you for your interest and for providing your input.

https://www.surveymonkey.com/r/FS_UAS_INA
FS UAS Information Needs Assessment

After the survey...

• Conduct an RFI with the sUAS vendor community
  • Types, sizes and capabilities of available sUAS platforms
  • Sensor systems and associated technologies

• INA/RFI results will:
  • Support development of ABC by Aviation staff
  • Guide platform acquisition decisions by the Agency
  • Support CIO IT infrastructure and data management strategies for UAS data/product storage and dissemination
Thanks!

http://fsweb.wo.fs.fed.us/fire/fam/aviation/uas (FS intranet)
http://www.fs.fed.us/science-technology/fire/unmanned-aircraft-systems (Public)

Jami Anzalone, Forest Service UAS Program Manager
jamianzalone@fs.fed.us
505-346-3844

Brad Quayle, Forest Service UASAG Co-chair
bquayle@fs.fed.us
801-975-3737

Forest Service UAS Advisory Group (UASAG)