



United States Department of Agriculture

# Forest Service UASAG Update

## Background and Current Activities

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Brad Quayle

Forest Service UAS Advisory Group (UASAG)

NIROPS Closeout Meeting

November 2, 2016



Forest Service

United States Department of Agriculture, Forest Service

# 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 (UAS-ESC)

### CHARTER

August 2015

The UAS-ESC 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 USFS policy and direction to govern commercial operations on National Forest System lands.
- Develop clear USFS 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 interagency groups and committees with USFS member representation.

#### **Membership**

The UAS-ESC is composed of Regional Executive leadership, Deputy Area and Directorate with strong UAS mission, policy or acquisition interests.

#### Executive Steering Committee Membership

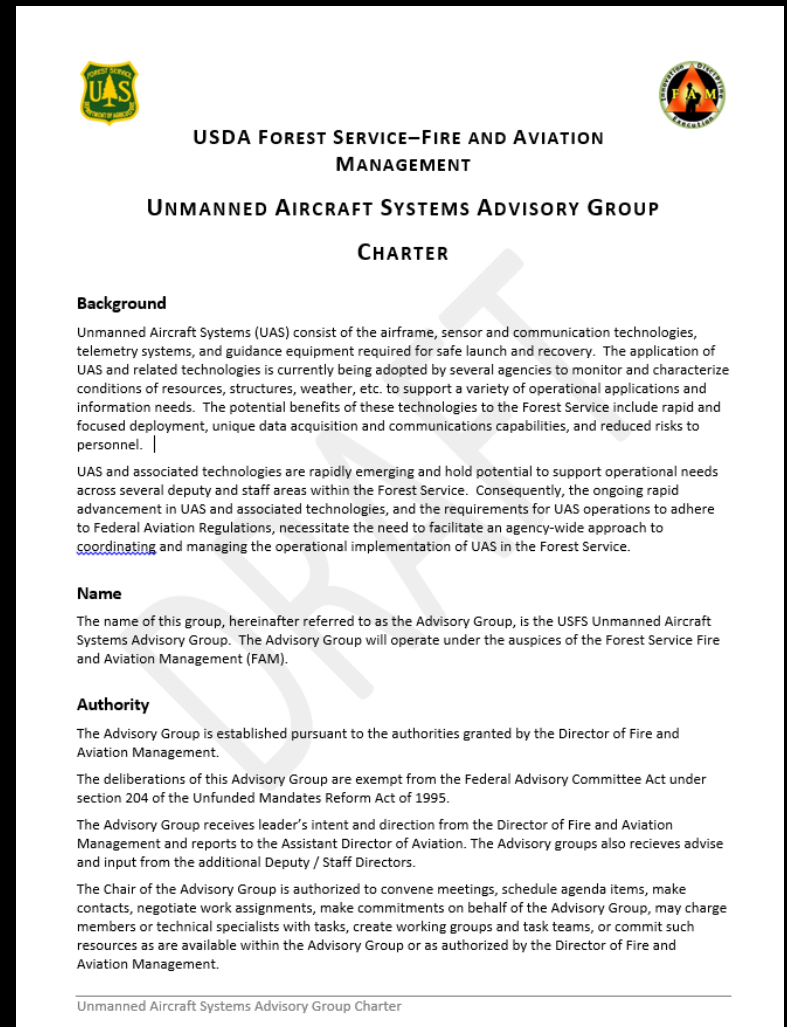
- Associate Deputy Chief- National Forest System
- Associate Deputy Chief- Research & Development
- Regional Leadership- Deputy Regional Forester
- Director- Fire and Aviation Management (Chair)
- Director- Law Enforcement & Investigations
- Director- Engineering, Technical and Geospatial services
- Director- Chief Information Office
- Director- Recreation, Heritage & Volunteer Resources
- Director- Forest Health Protection
- Director- Communication

The Director of Fire & Aviation Management is established as the UAS-ESC 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

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



# 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)





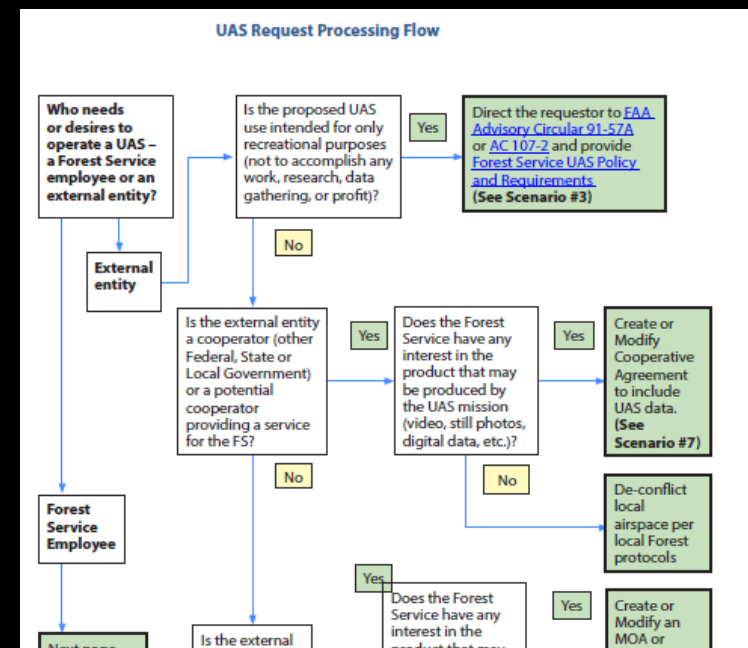
# UAS Operations on NFS Lands

- 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
  - Data/records management plan
  - 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**

Requestor Name:	
Title:	
District/Forest/Region or Research Station:	
Email:	
Phone number(s):	
Forest Aviation Officer Name:	
Forest Supervisor Name or Research Station Director Name:	
Regional Aviation Officer Name:	

### **Initial Mission Information**

	Yes	No
Will the mission be flown within 5 nautical miles of an airport?		
Will the mission be flown over an urban or relatively dense populated area?		
Will a manned aircraft be flown at the same time as the UAS as part of this mission?		
Will the mission be flown beyond the line of sight (BVLOS) of the UAS operator?		
Does the UAS weigh more than 55 lbs.?		

*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)

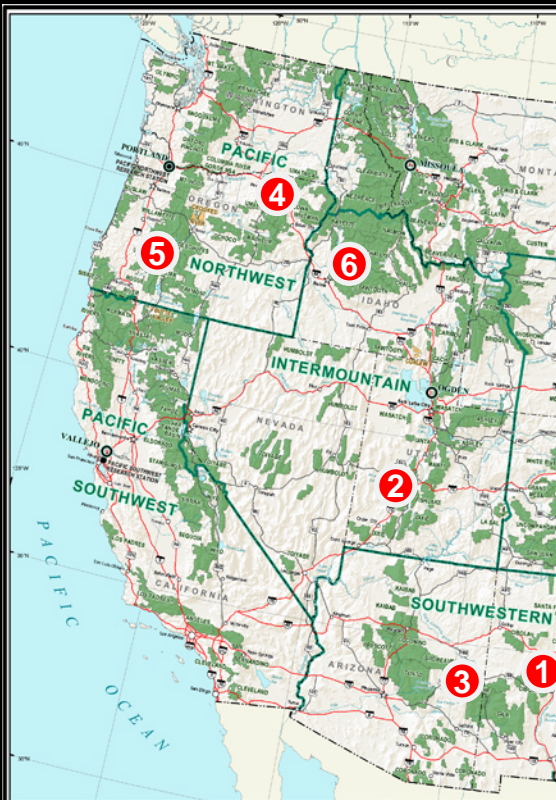
2. Eurasian Milfoil Mapping / Fishlake NF (September)

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)

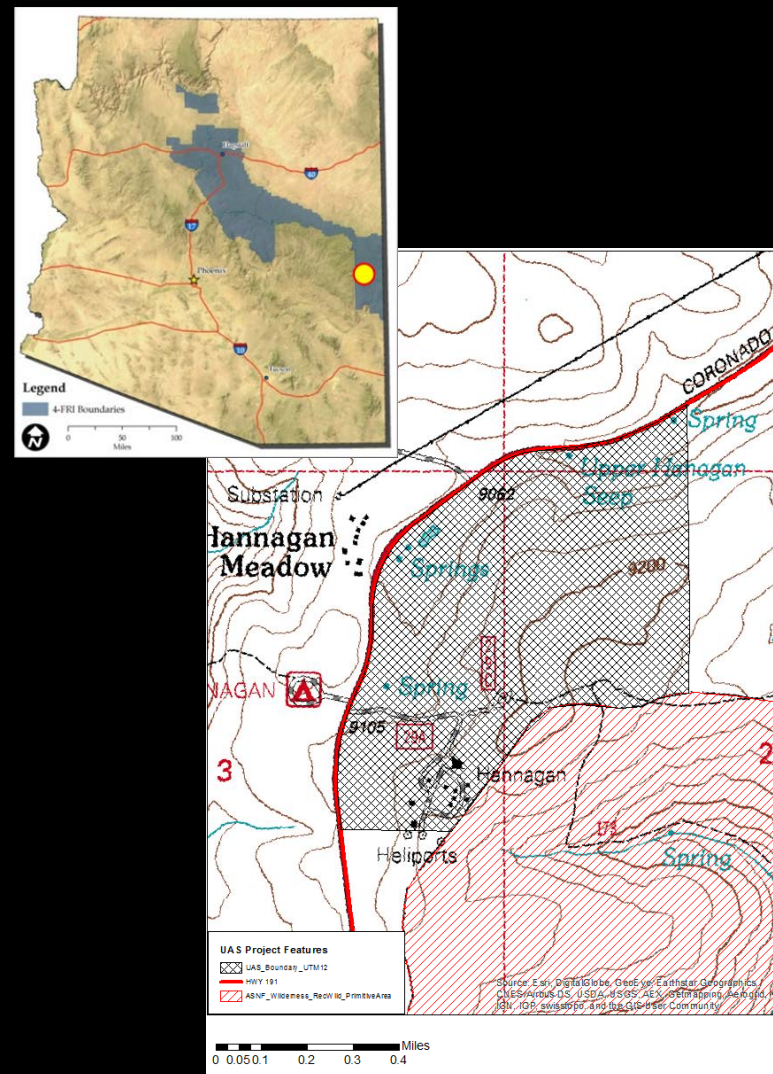
6. Pioneer Post-Fire Aerial Survey (October, postponed)





# 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
- Mission completed in September 13-15, 2016
  - 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

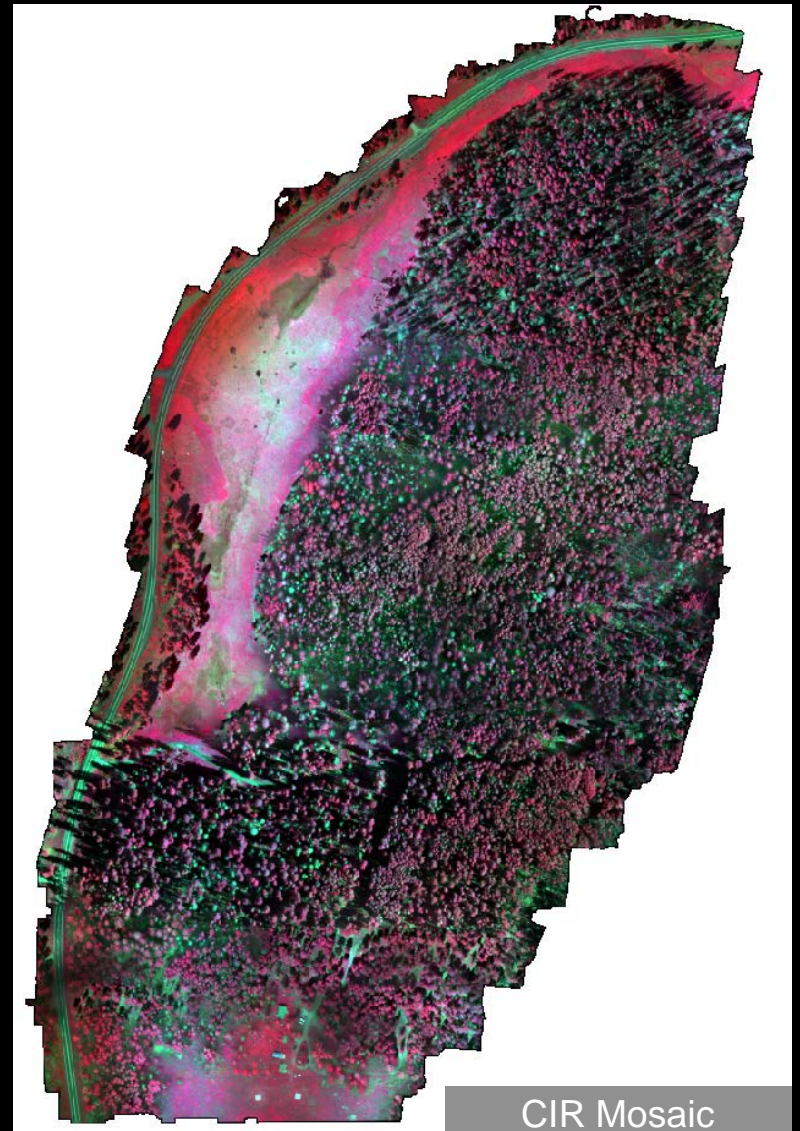




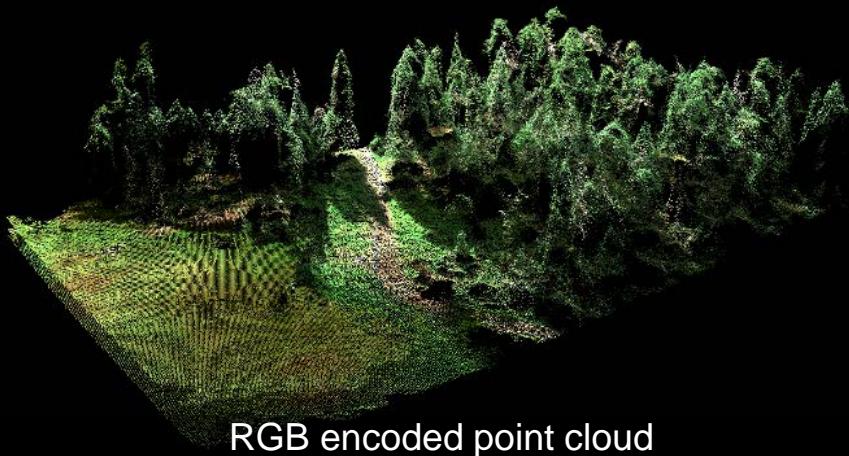
# FHP/FM Aerial Survey Products



CIR frame



CIR Mosaic



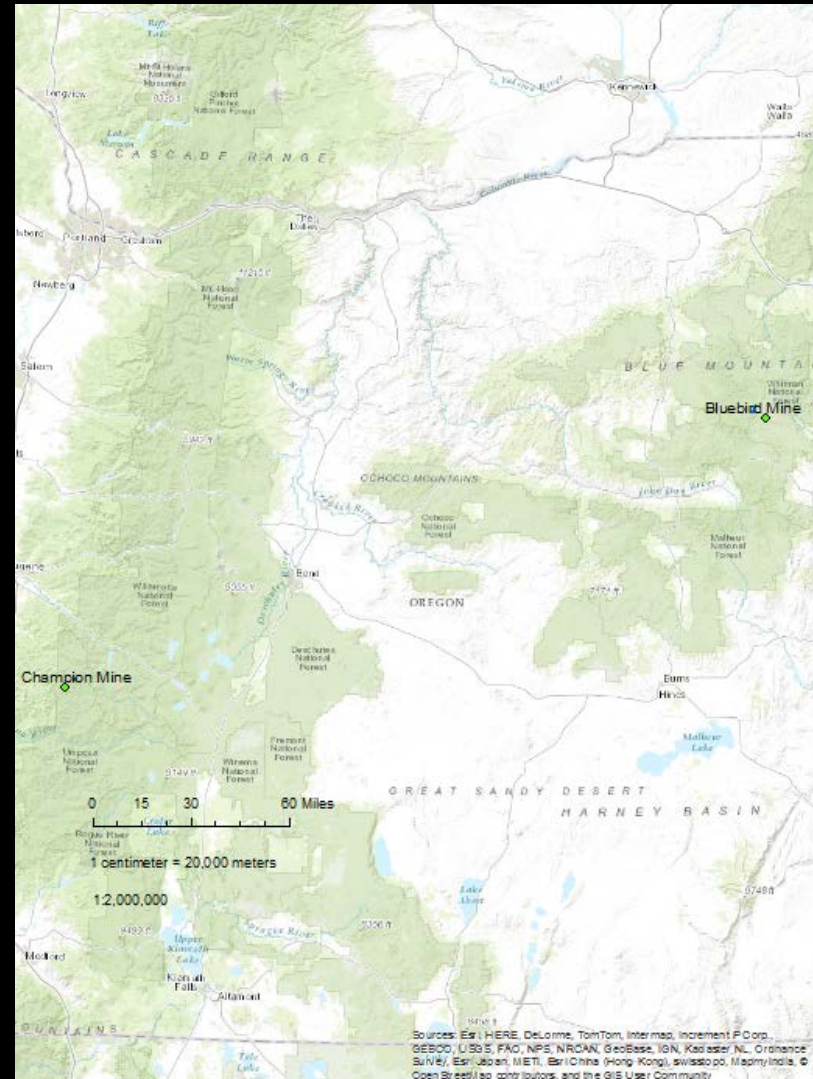
RGB encoded point cloud





# 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



RGB frame



# FS UAS Information Needs Assessment



**Available until  
December 9,  
2016**

## **Forest Service Unmanned Aircraft Systems (UAS) Information Needs Assessment**

### *Background*

The purpose of this Information Needs Assessment (INA) survey is to receive your 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 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](mailto:dzimmerman@fs.fed.us) or Brad Quayle (801) 975-3737 / [bquayle@fs.fed.us](mailto:bquayle@fs.fed.us). Thank you for your interest and for providing your input.

Next

[https://www.surveymonkey.com/r/FS\\_UAS\\_INA](https://www.surveymonkey.com/r/FS_UAS_INA)

**Agency intent  
for UAS**

**Missions and  
requirements**



# 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





United States Department of Agriculture

# 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)

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*Forest Service UAS Advisory Group (UASAG)*



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