

*BLM Utah  
Unmanned Aircraft Systems  
Supplement*



V1  
2020

# BLM Utah Unmanned Aircraft Systems Supplement

## BLM Utah Unmanned Aircraft Systems Supplement

This document is a supplement to the [2020 BLM Utah State Aviation Plan](#) and is incorporated by reference as policy for BLM Utah. It will be updated yearly along with the [BLM Utah State Aviation Plan](#). Suggested changes to the document can be sent at any time to the [BLM Utah State Aviation Manager](#).

This document has been designed as an easy to read reference guide for unmanned aircraft systems users in the Bureau of Land Management Utah who have the need to operate UAS for the purposes of currency, training, and other low complexity projects.

References are incorporated to include policy from other documents (i.e., [OPM-11](#), [National Aviation Plan](#), etc.). Most of the references are hyperlinked to provide ease of access to the original document.

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## **BLM Utah Unmanned Aircraft Systems (UAS) Supplement**

### **Purpose**

The purpose of this document is to enhance the safety of BLM Utah UAS remote pilots and to set up operational procedures that improve the efficiency of project planning, approval, and field operations while ensuring compliance with DOI, BLM, and Federal Aviation Administration (FAA) policy.

### **Objective**

The objectives of this supplement are to provide direction for BLM Utah employees regarding the UAS program and activities. This supplement will serve as the Project Aviation Safety Plan (PASP) in combination with the BLM Utah UAS Mission Plan for routine low complexity UAS operations conducted under [14 CFR Part 107](#). A web based version of the BLM Utah UAS Mission Plan can be utilized in combination with this supplement for flights defined in this document.

UAS operations covered by this supplement are limited to:

- Pilot Currency and Proficiency.
- Pilot Training.
- Low complexity, single day; single location projects flight.
- Fire Investigation/Cause Determination Documentation.
- Fire Intelligence/Mapping.
- Prescribed Fire Intelligence/Mapping.

This supplement is similar to BLM Fire and Aviation base operating plans (i.e. Helitack, Air Tanker Base) that allow those functions to conduct identified routine field operations without the formal PASP development and approval process. However, in place of the PASP a BLM Utah UAS Mission Plan must be completed. (See pg. 4)





## **UAS Organization**

### **Management Positions**

**State Director** - The State Director (SD) has overall responsibility for the aviation program, which is delegated to the State Fire Management Officer (SFMO).

**State Aviation Manager** - The State Aviation Manager (SAM) serves as the focal point for the aviation program and provides technical and management expertise regarding the use of aviation resources (including UAS).

**District Manager** - The District Manager (DM) has overall responsibility for aviation activities conducted within the district. Aviation management and operational authorities and responsibilities may be delegated to the District FMO, Unit Aviation Manager (UAM) and Dispatch Center Manager.

**Unit Aviation Manager** - The District UAM serves as the focal point for the district aviation program.

### **Aviation Position Definitions**

**Remote Pilot in Command (PIC)** - A person who holds a remote pilot certificate with a UAS rating and has the final authority and responsibility for the operation and safety of a UAS operation.

**Visual Observer (VO)** - A person acting as a flight crewmember who assists the UAS remote PIC to see and avoid other air traffic or objects aloft or on the ground.



## **UAS Operations**

As a bureau, we are often challenged with working in high-risk and dynamic environments that are not always predictable. It is the responsibility of each employee, cooperator, and contractor to conduct aviation operations that have been properly planned and approved by management. It is important to utilize the correct equipment and properly trained and qualified personnel to minimize risk.

Personnel involved in any UAS operation will adhere to FAA, DOI, and bureau aviation policy. The BLM State Aviation Manager must be notified prior to all planned UAS flights. The State Aviation Manager will review all PASPs and/or BLM Utah UAS Mission Plans prior to commencing operations. The SAM will notify local UAM's when a UAS flight is being conducted within their districts; Line officers shall be informed of UAS activities within their area of responsibility by the local UAM.

## **Emergency Exception to Policy**

Federal employees who are involved in an event in which there clearly exists an imminent threat to human life, and there is insufficient time to utilize approved methods, may deviate from policy to the extent necessary to preserve life. The following provisions and follow-up actions apply:

Personnel involved are expected to use good judgment.

Personnel involved in the decision making associated with deviating from policy must weigh the risks verses benefit.

Any deviations shall be documented on a [SAFECOM](#).

## **Flight Following**

Aircraft will remain within visual (eyesight) range of the pilot or observer at all times. Pilots and Observers will maintain communications with each other during flight operations.

## **Communications**

Corresponding dispatch centers will be notified before flight operations commence, and again when flight operations cease. Appropriate radio frequencies must always be monitored during UAS operations to ensure that UAS users can be contacted by dispatch, other aircraft, etc.

## **Visual Observer**

A visual observer may be utilized to supplement situational awareness and maintain visual line of sight (VLOS). A visual observer may NOT be used to extend the range of the PIC.

## **Search and Rescue (SAR) Flights**

The use of BLM aircraft and aviation personnel for SAR operations are not considered normally planned BLM operations. SAR is typically the responsibility of the Sheriff's Office. BLM does not budget for SAR operations. However, each situation and request is different and will be authorized based on the specific details and need for each event. It is important to obtain approval at the appropriate level prior to using BLM UAS for SAR operations. Federal employees who are involved in an event in which there clearly exists an imminent threat to human life, and there is insufficient time to utilize approved methods, may deviate from policy to the extent necessary to preserve life. (Ref. NAP 5.6 and 350 DM 1.3.B)

**Wildland Fire Flights**

Guidance for DOI Remote Pilots and DOI UAS used in support of wildland fire management comes from the BLM National Aviation Office and the [NWCG Standards for Fire Unmanned Aircraft Systems Operations](#). Protocols have been established to promote safe and effective use of agency UAS on interagency wildland fire incidents.

**Operational Requirements**

Remote pilots shall be certified by the FAA in accordance with 14 CFR Part 107.

Remote pilots will be trained and certified in accordance with interagency policy.

The Advanced UAS Workshop is required to operate UAS in support of wildland fire management.

Remote pilots must possess a Red Card for fire line operations.

Interagency certification cards are required to be in the possession of remote pilots while on an incident.

UAS aircraft will be certified in accordance with interagency policy. FAA registration cards are required to be with the aircraft while on an incident.

UAS Remote Pilots will:

Obtain approval from the agency administrator or designee and the incident commander or designee prior to conducting incident assignments/missions.

Obtain the appropriate level of airspace authorization prior to conducting incident missions (Part 107, ECOA, etc.).

Confirm airspace deconfliction with dispatch or the TFR controlling authority (when applicable) prior to conducting incident missions.

Coordinate and receive clearance for mission flights with aerial supervisors when they are on scene (ATGS, ASM, HLCO, LEAD) prior to conducting incident missions.

Coordinate mission flights with participating aircraft when aerial supervision is not on scene.

Make a blind call on the assigned air to ground frequency when no aircraft are reported to be on scene.

Respond to blind radio calls from incoming aircraft when the UAS is the only aircraft on scene.

Give way to all manned aircraft.

Have the capability of setting an altimeter and meeting operational altitude requirements.

Monitor assigned AM/FM frequencies.

Ensure that landowner notifications are attempted prior to flights over private land.

Coordinate missions and attend briefings with multiple incident management team (IMT) positions (ATGS, AOB, etc.) depending on complexity.

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### **Call Signs**

UAS Remote Pilots will follow established incident communications protocols and will make radio calls with the following information:

Unmanned Aircraft.

Configuration (fixed or rotor-wing).

Type.

Incident placeholder (x of # UAS assigned to incident).

Example: Unmanned R42 (Rotor Wing, Type 4, 2nd UAS assigned to incident).

See NWCG Standards for Fire Unmanned Aircraft Systems Operations.

### **Resource Flights**

Resource project flights can be conducted under the provisions of this supplement if:

UAS operations conducted under 14 CFR Part 107 and;

BLM Utah UAS Mission Plan has been completed and;

Proper notifications have been made and;

Proper authorization has been given.

### **Training and Currency Flights**

For all training, proficiency, and currency flights conducted under this supplement. UAS Pilots will:

Adhere to all policies established by 14 CFR Part 107.

Complete a BLM Utah UAS Mission Plan form.

Make all required notifications before flight operations commence.

Notify dispatch before flight operations commence and when they cease.

### **Cooperator Flights**

All UAS operated under DOI operational control, including cooperator/affiliate aircraft, must have a current OAS-36U DOI UAS Data Card or letter of authorization issued by OAS.

Cooperator/Affiliate Missions (DOI Operational Control): Requests for approval of Cooperator/Affiliate UAS flights under the operational control of DOI should follow the process outlined in 351 DM 4. UAS Cooperator Approval Letters will be issued by the OAS UAS Division Chief.

Any other federal agency operating UAS within BLM jurisdiction will coordinate with the Line Officer and UAM prior to project commencement/UAS flight.

### **End Product Contracts**

End Product Contracts are not aircraft flight service contracts. They are used to acquire a product for the Department (i.e., per-acre, per-unit or per-area, or per head basis). The intent of this type of procurement is for the contractor to supply all personnel and equipment in order to provide a "service"

or “end-result.” Many contractors utilize aircraft (including UAS) to meet the performance objectives of End Product contracts for activities such as: animal capture, seeding, spraying, survey, photography, etc. Since these are not flight services contracts, the AQD does not perform any acquisition service. End Product contracts are administered by the bureau procurement units.

These contracts must be conducted in accordance with OPM-35. OPM-35 aids in determining whether an operation is being conducted as either “end-product” or “flight service” and supplements existing DOI policy regarding End Product contracts found in 353 DM 1.2A (3). If the provisions of 353 DM 1.2A (3) and OPM-35 are met, the aircraft will be operated as a civil aircraft and the aviation management principles normally required for aircraft under DOI operational control do not apply.

For further guidance on End Product Contracts, see NAP section 3.9

### **Commercial Flights**

These operations are permitted with the following authorizations:

The operator has a current FAA Part 107 certificate.

The operator obtains a land use permit approved by the Line Officer.

### **Media/Recreational Flights**

People operating UAS for hobby/recreational or media purposes do not need permission from the FAA or BLM to fly on public lands as long as they comply with [FAA policy](#) and don't interfere with official government business or emergency operations such as wildfire management. Additional state/local office guidance may apply.

## **UAS Safety**

The BLM Aviation Safety program is modeled after the aviation industry and FAA Safety Management Systems (SMS). Each BLM employee and contractor involved with aviation has the responsibility to plan missions thoroughly, conduct missions with a conservative attitude, and respect for the aircraft and environment in which the missions operate. Both employees and contractors have the responsibility to speak up when unsafe operations are observed.

### **Aviation Life Support Equipment (ALSE)**

All personnel engaged in aviation activities must wear appropriate Personal Protective Equipment (PPE), depending on the mission. The ALSE Handbook is policy and must be followed unless a waiver is authorized. All waivers will be in writing, specific, and signed by authorized authority.

### **Personal Protective Equipment (PPE)**

UAS crew members will utilize PPE required by their crew position.

### **Project Aviation Safety Planning**

All UAS flights require project planning prior to implementation. The level of planning and approval depends on complexity, scale of the project, and level of associated risk.

### **Project Aviation Safety Plan (PASP)**

A PASP is required prior to all UAS flights. The size and detail of the PASP should be proportionate with the complexity of the project. For templates and guidance on completing a PASP, contact the SAM, UAS coordinator, or UAM on the district that the flight will occur. The following components must be included in the plan:

- Project name and objectives.
- Justification.
- Project date.
- Location.
- Projected cost of aviation resources.
- Aircraft.
- Pilot.
- Flight manager, aircrew, passengers, participants.
- Communication Plan, Flight following, and emergency search and rescue plan.
- Aerial Hazard Analysis (w/ attached map).
- Protective clothing and equipment.
- Weight and Balance / Load Calculations.
- Risk assessment utilizing appropriate format.
- Unit Aviation Managers review/signature.
- Supervisory approval signature (at appropriate level).

For more information on PASP development please see the [Utah BLM State Aviation Plan](#).

### **BLM Utah UAS Mission Plan**

The Utah BLM UAS Mission Plan is distributed to the field as an Excel document. Please contact the State Aviation Manager or your Unit Aviation Manager for a current version. All complex or multiple location (more than one location reported to Dispatch) projects require completing a PASP for approval.

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Low complexity UAS projects conducted under 14 CFR Part 107 may utilize the BLM Utah UAS Mission Plan in place of a formal PASP when used in conjunction with this supplement. The Mission Plan will document the necessary components of an aviation safety plan. The BLM Utah UAS Mission Plan form is equivalent to form [9400-1a Aircraft Flight Request/Schedule](#) and provides the same functions. The UAS Mission plan may be used on its own for the following missions:

- Pilot Currency or Proficiency.
- Pilot Training.
- Low Complexity Project Flight.
- Fire Investigation/Cause Determination.
- Fire Intelligence/Mapping.
- Law Enforcement (Low Complexity /Unplanned Mission).
- Prescribed Fire Intelligence/Mapping.
- Project Associated with a Project Aviation Safety Plan (PASP).

The UAS Mission Plan should be completed by the UAS Pilot or Crew Leader and forwarded to the UAM for distribution to Dispatch and State Aviation Manager.

### **UAS Mission Plan Conjunction with a Blanket PASP**

A BLM Utah UAS Mission Plan will be used in conjunction with a PASP for projects that occur periodically over a season or fiscal year. In this situation a PASP is prepared to cover all similar flights in a given time period. The BLM Utah UAS Mission Plan form will be required for each subsequent flight associated with that one time PASP. When using the form in conjunction with a PASP, approval decisions should be made at the lowest appropriate level and no additional signatures are required.

### **UAS Mission Go/No Go Checklist**

UAS Pilots or Crew Leaders will complete a hardcopy version of the UAS Mission Go/No Go Checklist prior to starting operations. The Checklist will be distributed as an Excel document. Please contact the State Aviation Manager or your Unit Aviation Manager for a current version.

### **DOI UAS Operations in the National Airspace System (NAS)**

DOI has the authority to conduct operations in the NAS under the requirements of [OPM-11](#) and 14 CFR Part 107. When operating UAS under the provisions of this supplement, flights outside of 14 CFR Part 107 rules are not authorized; with the exception of Beyond Visual Line of Sight (BVLOS) flights when conducted under an emergency COA (EOA) and within a Temporary Flight Restriction (TFR).

Under the terms of the FAA/DOI MOA regarding Beyond Visual Line of Sight operations of UAS in support of emergency assistance within an active TFR.

### **Airspace Planning**

Flights must be conducted in Class G airspace as defined by 14 CFR Part 107 (unless operating within a TFR).

Flights conducted under 14 CFR Part 107 do not require a NOTAM.



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Beyond Visual Line of Sight (BVLOS) must be conducted with an FAA Part 107 Waiver or under the terms of the DOI/FAA MOA for flights within a TFR.

Flights within a TFR must be conducted under the direction of the official in charge of the on-scene emergency response activity.

Flights will be planned to avoid sustained/repeated overflight of heavily trafficked roads or highways but may briefly cross active roads as necessary.

B4UFLY application (or equivalent) will be utilized to check airspace, nearby airports, NOTAMs, etc. for possible conflicts.

Dispatch will be notified before every flight so appropriate deconfliction can be made if necessary.



## **UAS Training**

Aviation training is essential to ensure that BLM maintains a safe and efficient aviation operation in pursuit of the bureaus mission. Aviation users, supervisors, and managers need to make certain that they and their employees are knowledgeable of the inherent hazards of aviation operations and have been provided the necessary skills and training to be successful conducting aviation operations.

### **Interagency Aviation Training (IAT)**

The Office of Aviation Services (OAS) is responsible for all DOI aviation training. Training is conducted and managed through the use of a web based online system (<https://www.iat.gov>). All aviation users and their supervisors should have an account on this system. Required training for employees is based on aviation roles and is as follows:

#### **Line Managers**

Knowledge required includes familiarization with the DOI aviation management program, policies, and related requirements and responsibilities. Line managers must complete the M-3 Aviation Management for Supervisors or complete the M-2 Aviation Management Line Managers Briefing course every 3 years.

#### **Supervisor**

DOI personnel that supervise employees who use aircraft to accomplish bureau programs must complete aviation training. It is the responsibility of the supervisor to ensure that employees who use aircraft are doing so in a safe and appropriate manner. Supervisors must attend the following training and maintain currency per DOI Policy (OPM-04):

M-3 Aviation Management for Supervisors (every 3 years).

A-200 Mishap Review (every 3 years).

#### **Aircrew Member**

Employee working in and around aircraft and is essential to ensuring the safety and successful outcome of the mission. Aircrew members must complete the following training and maintain currency per DOI Policy (OPM-04):

A-100 Basic Aviation Safety (every 3 years).

A-200 Mishap Review (every 3 years).

#### **DOI Remote Pilot**

A person who holds a remote pilot certificate with a sUAS rating and has the final authority and responsibility for the operation and safety of a sUAS operation.

Qualification for this position requires:

Must possess a current FAA remote pilot certificate.

Must possess a DOI remote pilot certificate.

Must meet training requirements for Aircrew Member as outlined in OPM-04.

Individuals holding a current qualification under IQCS are also qualified to perform equivalent non-fire aviation positions under IAT guidelines (See next section).

### **Additional Aviation Training**

Fire and Aviation training is conducted under the authority of the National Wildfire Coordination Group (NWCG) and is tracked in the Incident Qualification and Certification System (IQCS). Many aviation qualifications under this system are recognized as equivalent training and qualification to DOI IAT requirements. For a complete list of equivalent qualifications and training, you can reference those in the Interagency Aviation Training Guide under the position and training crosswalk matrixes.

The UAS Mapping Workshop will provide instruction and practical experience to mission plan, launch and data capture with UAS, and process data for delivery. This workshop is for resource (non-incident) oriented personnel.

The S-373, UAS Incident Operations course meets the performance needs of the UAS Remote Pilot (UASP), UAS Manager (UASM), UAS Module Leader (UASL), and UAS Data Specialist (UASD). The course combines lectures, facilitated discussions, individual/group exercises, and simulations. This course has a tracked curriculum. UASP, UASL and UASM combine into one track that focuses on incident flight operations, communication, and coordination. The UASD track focuses on data product development and delivery.

### **Currency and Refresher Training**

#### **Currency Requirements**

Remote pilots must demonstrate three takeoffs (launch) and landings (recovery) with the UAS they are approved to operate within the preceding 90 days. If currency is lost prior to a mission, the Remote Pilot must regain currency by:

Performing the flight maneuvers and emergency procedures for the specific make and model, either in the simulator or during a proficiency flight or conduct their mission flight under the observation of a current UAS pilot.

Remote pilots are required to fly each of the aircraft for which they are carded at least once every 12 months. Remote Pilots failing to meet this requirement shall fly under the supervision of a carded and current Remote Pilot and perform the flight maneuvers and emergency procedures for that aircraft.

#### **DOI UAS Refresher Training**

DOI Remote Pilots must complete UAS refresher training (A-452R) or approved equivalent every 24 months following the issuance of their OAS-30U. Current DOI Remote pilots participating in either A-450 or A-452R, as a student or instructor, will receive credit for refresher training. This training can be completed 30 days in advance or 30 days after the date of expiration on the OAS-30U. Remote Pilots operating the low complexity UAS will be able to complete this requirement via distance learning opportunities. Pilots operating more complex aircraft may be required to attend a refresher in person.

## **UAS Procurement and Flight Use Reporting**

### **UAS Procurement**

All purchases of commercially available systems by DOI personnel shall be routed through OAS and the Interior Business Center, Acquisitions Services Directorate (IBC-AQD). Specifications for UAS used by DOI will be developed collaboratively between the bureaus and OAS. Acquisition activities including requests for information, quotation, or proposal will be coordinated through the National Aviation Manager (NAM).

UAS purchase requests (OAS-13U) are routed to the UAS Program Manager via the SAMs. State leadership should be notified of UAS purchases. The Program Manager will consolidate all requests and forward them to the OAS fleet manager.

All IT Hardware and Software purchases for the purpose of supporting UAS operations must be coordinated with the Utah State Office IT, and approved prior to purchase.

### **Flight Use Reporting**

#### **Fleet Aircraft**

Record UAS flight time using the OAS-2U form. Remote Pilots shall submit an OAS-2U daily or when geographic location of flight changes.

A Remote Pilot in Command (PIC) must be designated for each flight and recorded on the form OAS-2U.

DOI Remote Pilots must record malfunctions, damage or repairs to UAS, or component replacement on the OAS-2U form. Repair of damage beyond normal wear shall be coordinated with the DOI UAS Fleet Manager.

Remote Pilots will ensure their equipment has been inspected within the timeframe (annually) specified on the aircraft data card (OAS-36U). The annual inspection form can be found [here](#).

#### **Flight Service Contracts**

Flight use reporting will follow the reporting process outlined in the contract.



**References and Exhibits**

**Policy References and Other Information:**

[Federal Aviation Administration AA Advisory Circular 107-2 Small Unmanned Aircraft Systems](#)

[Departmental Manual, Parts 350-354](#)

[DOI Operational Procedures Memorandum \(OPM\) – 11 DOI Use of Unmanned Aircraft Systems](#)

[DOI Operational Procedures Memorandum \(OPM\) – 4 Aviation User Training Program OPM-4](#)

[DOI UAS Agreements \(COA/MOA/MOU\)](#)

[NWCG Standards for Fire Unmanned Aircraft Systems Operations](#)

[OAS-2U UAS Flight Recording Form](#)

[BLM National Aviation Plan](#)

*BLM National UAS Operations Plan: TBD*

[BLM Utah State Aviation Plan](#)

**Useful Websites:**

[DOI UAS Program Website](#)

[BLM UAS Program Website](#)

[Interagency Fire UAS Website](#)





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Utah BLM Strategic UAS Risk Assessment

		Assessment and Mitigation of:		Unmanned Aircraft Systems (UAS)							
UAS		Flight Operations									
		Pre Mitigation			Post Mitigation						
Sub-system	Hazards	Likelihood	Severity	Outcome	Mitigation	Likelihood	Severity	Outcome	Mitigation Achieved?	Additional Local Mitigation	Post Mitigation Value
In Flight Emergencies	UAS mechanical failure resulting in loss of power or control	Occasional	Catastrophic	High	Follow emergency procedures in the aircraft flight manual. Addressing the failure with changes to equipment or procedures. Do not overfly people unless essential to the mission	Improbable	Catastrophic	Medium			
	Bird strike resulting in UAS uncontrollability	Remote	Critical	Medium	Follow emergency procedures in the aircraft flight manual. Discuss bird avoidance techniques with operators.	Improbable	Marginal	Medium			

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	Loss of link between ground control station and UAV	Occasional	Marginal	Medium	Ensure that you have set the lost link procedures correctly according to the aircraft flight manual.	Remote	Negligible	Low	Check NOTAMs for possible GPS jamming in area of operation.	Low
	Non-participating aircraft enters flight operations area	Remote	Critical	Medium	Ensure NOTAMS have been filed. Be vigilant of scanning operations airspace. Proactive see and avoid. Utilize a VHF radio.	Occasional	Critical	Medium		
<b>Flight &amp; Duty</b>	Crew exceeds flight and duty limitations	Remote	Marginal	Medium	Understand flight and duty limitations before starting the operational period. Suspend flight and duty of crew if policy will be violated. Manage crew to optimize duty by briefing optimum data gathering hours and days.	Improbable	Marginal	Medium		
<b>Airspace</b>	Mix of agency manned and unmanned aircraft in the same airspace resulting in a midair collision	Occasional	Catastrophic	High	UAS Operations will be made known to all participating aircraft. Follow established aircraft separation procedures. Ensure positive communication between all aircraft.	Improbable	Catastrophic	Medium		
	UAS flight plan and aircraft flight parameters are programmed incorrectly	Occasional	Critical	Serious	Follow aircraft flight manual, double check flight plans before launch.	Remote	Marginal	Medium		

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Incorrect altitude flown while operating in the FTA	Remote	Catastrophic	Serious	Ensure UAS operator has thorough knowledge of FTA policy. Follow established aircraft separation procedures.	Improbable	Catastrophic	Medium			
Incorrect altimeter setting	Remote	Catastrophic	Serious	Ensure correct altimeter setting is established through communication with aerial supervisor.	Improbable	Catastrophic	Medium			
UAS Pilot has loses situational awareness	Occasional	Catastrophic	High	Only approved pilots will be used to fly UAS. Adhere to established work/rest guidelines. Land as soon as practical. Use the return to launch function if needed. Stay in contact with incident aircraft and personnel.	Improbable	Catastrophic	Medium			
Operators lose visual contact with UAS (if required)	Probable	Catastrophic	High	Use observers to maintain visual contract with aircraft. Move Ground Control Station (GCS) closer to area of interest.	Improbable	Catastrophic	Medium			
Stationary aerial hazards (wires, trees, towers, vegetation, rock outcroppings)	Probable	Critical	High	Utilize local aerial hazard map for reference. Perform site survey prior to flying. Utilize personnel familiar with the geographic area to share knowledge of known hazards.	Remote	Critical	Medium			
Low level flight profile- below 500', Special Use, animal herding	Frequent	Catastrophic	High	Thorough PASP completed to include risk assessment/performance planning is completed and signed at the appropriate level. Ensure load calculations are completed. Minimize exposure time. Ensure that the appropriate PPE/ALSE is used and that the flight is limited to essential flight crew members. Ensure aircraft and pilot are carded for the mission. Conduct high level recon prior to working below 500' AGL.	Occasional	Critical	Serious			

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UAS sharing same flight path/route with other participating aircraft from same departure and arrival points.	Probable	Critical	High	Ensure separation of aircraft by establishing routes and patterns for all participant aircraft. Separate by establishing horizontal and vertical flight paths. Schedule flight times, routes and altitudes to avoid conflict during heavy use periods. Include CRM Training.	Improbable	Catastrophic	Medium			
Multiple initial attack incidents in same area cause confusion.	Occasional	Catastrophic	High	Follow established protocols for use of UAS on fires. Maintain visual line of sight of UAS. Consider landing UAS immediately if an aircraft enters the area.	Improbable	Catastrophic	Medium			
Flight is planned in Special Use Airspace, Military Training Route, etc.	Occasional	Critical	Serious	Contact Dispatch and initiate deconfliction procedures for flight.	Remote	Critical	Medium			
Flights over non-participating personnel	Remote	Critical	Medium	Avoid flights over non-participating personnel unless authorized or necessary for emergency response.	Improbable	Critical	Medium			
Mistaken identification of UAS when multiple UAS operations are occurring simultaneously	Remote	Critical	Medium	Have UAS painted with high visibility paint scheme and identifiable markings. Install conspicuity lighting if applicable per UAS flight manual. Communication between UAS pilots must be established. Follow established aircraft separation procedures.	Improbable	Critical	Medium			

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<b>Environmental</b>	Poor visibility due to smoke/inversion	Occasional	Critical	Serious	Ensure line of sight operations comply with established visibility regulations. Ensure beyond visual line of sight operations comply with established policy. Follow established aircraft separations procedures. Wait for visibility to improve before flight.	Remote	Critical	Medium			
	High density altitude (DA), decreased performance	Probable	Marginal	Serious	Ensure aircraft performance is reviewed as a part of preflight planning. Monitor DA throughout the day. Fly within aircraft performance capabilities.	Occasional	Marginal	Medium			
	Strong winds, thunderstorms, change in weather	Probable	Critical	High	As part of preflight planning and Operational Risk Management (ORM) check and monitor weather, be cognizant of time of day and diurnal wind patterns. Operate within aircraft capabilities and manufacturers recommendations. Move mission to alternate environment or defer until conditions improve.	Remote	Critical	Medium			
	Lost or destroyed aircraft over water operations	Remote	Critical	Medium	Avoid overflying large bodies of water unless necessary for the mission.	Remote	Marginal	Medium			

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UAS Training											
		Pre Mitigation			Post Mitigation						
Sub-system	Hazards	Likelihood	Severity	Outcome	Mitigation	Likelihood	Severity	Outcome	Mitigation Achieved?	Additional Local Mitigation	Post Mitigation Value
Training	Training compromised for time and/or money constraints	Occasional	Critical	Serious	Management approval in advance identifying training as part of the program. Operations does not take place without qualified personnel. Provide adequate resources to ensure qualified personnel to meet mission.	Occasional	Marginal	Medium			
	Basic Training program does not include adequate mission experience for agency operations	Probable	Critical	High	Follow policy requirements for training qualification and currency.	Remote	Critical	Medium			

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	UAS not properly assembled due to inadequate training	Occasional	Critical	Serious	Ensure personnel are trained to manufacturer's procedures.	Occasional	Marginal	Medium			
	UAS improperly maintained due to lack of training	Occasional	Critical	Serious	Incorporate appropriate maintenance procedures into approved training.	Remote	Critical	Medium			
	Unqualified personnel operating UAS	Remote	Critical	Medium	All personnel operating UAS will be qualified in accordance with policy.	Improbable	Critical	Medium			
	Not conducting post maintenance flight checks	Occasional	Critical	Serious	Require post maintenance test flights in contract and fleet policy. Include as part of student training curriculum.	Remote	Critical	Medium			
<b>UAS Aircraft</b>											
		<b>Pre Mitigation</b>				<b>Post Mitigation</b>					
<b>Sub-system</b>	<b>Hazards</b>	<b>Likelihood</b>	<b>Severity</b>	<b>Outcome</b>	<b>Mitigation</b>	<b>Likelihood</b>	<b>Severity</b>	<b>Outcome</b>	<b>Mitigation Achieved?</b>	<b>Additional Local Mitigation</b>	<b>Post Mitigation Value</b>

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<b>Payload</b>	Mounted/installed equipment negatively effects UAS performance	Occasional	Critical	Serious	Only use approved aircraft and payload configurations.	Improbable	Critical	Medium			
	Aircraft out of Weight & balance	Occasional	Critical	Serious	Follow the weight and balance procedures outlined in the aircraft flight manual.	Remote	Critical	Medium			



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UAS Flight Ops - Spectrum, Communication, Avionics											
		Pre Mitigation			Post Mitigation						
Sub-system	Hazards	Likelihood	Severity	Outcome	Mitigation	Likelihood	Severity	Outcome	Mitigation Achieved?	Additional Local Mitigation	Post Mitigation Value
UAS C2	Loss of link due to terrain	Remote	Critical	Medium	Ensure UAS has auto-return or auto-land capability. Ensure PIC has an unobstructed area with good visibility of UAS operations area. Restrict UAS operations to pre-planned UAS flight area. Post observer with radio. Train for loss of link procedure.	Improbable	Critical	Medium			
	Loss of link due to hardware failure	Occasional	Critical	Serious	Follow UAS manufacturer's operation and maintenance procedures. Preflight UAS.	Improbable	Critical	Medium			
	Loss of link due to distance between UAS and control transmitter	Occasional	Critical	Serious	Preflight/preplan mission operating area to maintain adequate UAS link margin. Review transmitter range limitations. Ensure optimal antenna locations on the ground stations.	Improbable	Critical	Medium			

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	Loss of link due to software failure	Remote	Critical	Serious	Load all software updates that the manufacturer issues and test UAS before flight. Maintain a current log of all software updates for the UAS.	Improbable	Critical	Medium			
Equipment Power	Non-COTS payload interferes with UAS (e.g. a repeater)	Occasional	Critical	Serious	Use only approved and flight tested aircraft and payloads.	Improbable	Critical	Medium			
	Manned aircraft cannot electronically detect UAS	Frequent	Catastrophic	High	Require large UAS to have a transponder. Have a visual observer constantly monitor operating area when no other known aircraft are in the UAS operation area. Contract language states a mode C transponder must be installed.	Improbable	Critical	Medium			

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UAS		Maintenance									
		Pre Mitigation							Post Mitigation		
Sub-system	Hazards	Likelihood	Severity	Outcome	Mitigation	Likelihood	Severity	Outcome	Mitigation Achieved?	Additional Local Mitigation	Post Mitigation Value
Aging Aircraft Inspection Compliance Major repair or alteration	No recommended TBO for any UAS components	Occasional	Critical	Serious	Follow manufacturer's recommendations and create a tracking system to document failures.	Remote	Critical	Medium			
	Inspections not complied with at proper intervals	Occasional	Critical	Serious	Follow flight manual recommendations for inspection and maintenance. Ensure aircraft is current agency approved card.	Remote	Critical	Medium			
	Lack of policy for what constitutes a major repair or alteration on a UAS	Occasional	Critical	Serious	Follow contract requirement or policy for reporting damage and/or repairs. Develop a list of what constitutes a major repair for filed operators.	Remote	Critical	Medium			
<b>Final Assessment Value:</b>					<b>Prepared By:</b>					<b>Date:</b>	
Medium					Cameron Dingman					03/06/2020	
<b>Operation Approved by:</b>					<b>Title:</b>					<b>Date</b>	



**BLM Utah UAS Mission Plan**

1. Submitter's Email Address:
2. Project Name:
3. Crew Leader Name:
4. Crew Leader Phone Number:
5. Pilot Name(s):
6. Visual Observer Name(s):
7. Flight Date:
8. Flight Type (Circle one):
  - a. Pilot Currency or Proficiency
  - b. Pilot Training
  - c. Low Complexity Project Flight (single day in a single location)
  - d. Fire Investigation/Cause Determination
  - e. Fire Intelligence/Mapping
  - f. Law Enforcement (Low Complexity /Unplanned Mission)
  - g. Prescribed Fire Intelligence/Mapping
  - h. Project Associated with a Project Aviation Safety Plan (PASP)
9. Associated PASP Name:
10. Project Location (Circle one):
  - a. Moab Field Office
  - b. Monticello Field Office
  - c. Cedar City Field Office
  - d. Richfield Field Office
  - e. St. George Field Office
  - f. Vernal Field Office
  - g. Price Field Office
  - h. Grand Staircase Escalante National Monument
  - i. Kanab Field Office
  - j. Fillmore Field Office
  - k. Salt Lake Field Office
11. Descriptive Location of the Project:
12. Latitude (DD MM.MM):
13. Longitude (DD MM.MM):
14. Is the project located in class G Airspace:
  - a. Yes
  - b. No (B, C, D, and E require ATC permission)
15. Have Hazards been Identified and Mitigated:
  - a. Yes
  - b. No
16. Unit Aviation Manager (Circle One):
  - a. Canyon Country District: Clark Maughan (435) 259-2191

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- b. Color Country District Glenn Dietz (435) 865-4621
  - c. Green River District: Chris Deets (435) 781-4444
  - d. Paria River District (435) 865-4621
  - e. West Desert District: Jason Keefe (801) 977-4282)
17. Dispatch Center (Circle One):
- a. Color Country Interagency Fire Center (435) 865-4600
  - b. Moab Interagency Fire Center (435) 259-1850
  - c. Northern Utah Interagency Fire Center (801) 495-7600
  - d. Richfield Interagency Fire center (435) 896-8404
  - e. Uintah Basin Interagency Fire Center (435) 789-7021
18. UAS Make and Model:
19. UAS Call Sign:
20. Are Pilot and UAS Carded:
21. Notifications/Approvals completed?
- a. Yes
  - b. No
22. I will complete a hard copy version of the Go/No Go Checklist in the field prior to flight.
- a. Yes

**UAS Mission Go/No Go Checklist**

DO NOT FLY UNTIL YOU HAVE ANSWERED YES TO ALL QUESTIONS.

1. Is this flight Necessary and the safest method to complete the mission?
  - a. Yes
  - b. No
2. Is your PASP or UAS Supplement approved?
  - a. Yes
  - b. No
3. Has dispatch been notified and flight following established?
  - a. Yes
  - b. No
4. Has a communication plan been established and verified?
  - a. Yes
  - b. No
5. Are the pilot and aircraft carded and approved?
  - a. Yes
  - b. No
6. Does the aircraft have the capability to perform the mission based on expected conditions? (Altitude, temperature, wind, etc.)
  - a. Yes
  - b. No
7. Have aerial hazards been identified and briefed?
  - a. Yes
  - b. No
8. Have you checked for Temporary Flight Restrictions at project site?
  - a. Yes
  - b. No
9. Have aviation Sectional Charts been reviewed and airspace deconflicted if needed?
  - a. Yes
  - b. No
10. Has land status been verified?
  - a. Yes
  - b. No
11. Are landing areas adequate for the mission?
  - a. Yes
  - b. No
12. Have roles and responsibilities been identified and made known to all participants?
  - a. Yes
  - b. No
13. Are all personnel qualified for the mission?
  - a. Yes

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- b. No
- 14. Do all personnel have required PPE?
  - a. Yes
  - b. No
- 15. Have all personnel been briefed on emergency procedures?
  - a. Yes
  - b. No
- 16. Have all personnel been briefed on the mission?
  - a. Yes
  - b. No

UAS Crew Leader Signature: