



Parks & Open Space

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PARKS & OPEN SPACE ADVISORY COMMITTEE MEETING

Time/Date of Meeting: 6:30 p.m., Thursday, Feb. 24, 2022

Location: Virtual Meeting

TO:	Parks & Open Space Advisory Committee
FROM/PRESENTER:	Kristi VanDenBosch, Barry Shook, Erik Hinkley
AGENDA ITEM:	Revised Policy for Unmanned Aircraft Systems (UAS)
ACTION REQUESTED:	Recommendation to the BOCC

Introduction

The Boulder County Parks & Open Space (BCPOS) UAS Policy was approved by the BOCC in April 2016. This was relatively early on in the days of UAS usage by the public on Parks & Open Space land, and prior to the creation of the internal BCPOS UAS Program. With all of the changes to public UAS use over the last six years and the new internal BCPOS program, it is time to update the UAS policy. To help inform POSAC and the public, this memo includes background information on the BCPOS UAS program. The recommended minor changes to the policy include shortening the review and approval timeframe for mission requests as well as moving the final approval responsibility from the department Director to the Resource Planning Manager.

BCPOS UAS Program Background

Summary

The BCPOS UAS program ran as a pilot project from 2019-2020. In 2021, the program was approved by the BCPOS Management Team to move into official operation. In 2021, fifteen missions were flown, for purposes including topographic surveys for trailhead construction, Calwood fire reconnaissance, evaluation of trail alignments, and evaluation of riparian corridors to assess tree removal. BCPOS staff fully monitored all of these internal UAS operations and no visitor or wildlife conflicts occurred. Four permits for external flights were issued in 2021, the purposes included floodplain survey, search and rescue training, geologic survey, and recording the release of an endangered species. No visitor or wildlife conflicts were reported.

Program Review

UAS systems can be used to support a variety of natural resource management activities, including ecological mapping, crops and soil analysis, land cover classification, vegetation and wildlife monitoring, forest health assessment, wildfire suppression, change detection, recreational impacts, and search and rescue. UAS can often collect this data easily, in a timely manner, and at a fraction of the cost of traditional remote sensing applications such as satellite imagery and fixed-wing aerial photography.

During this initial period of the UAS program, staff has determined that assessing the return on investment of the UAS program can be accomplished in many ways, including financial cost savings (measured in both capital outlay and staff time saved), advancement in management capability, human safety and reduction in natural resource impact, including

wildlife. Some of the initial data collected via the UAS was at Heil for forestry, Rabbit Mountain and Heil for weeds, and Brewbaker and Reach 3 Phase 1 for plant ecology; these missions were primarily for research purposes and long-term monitoring. Staff discovered that the value isn't primarily in the cost saved, but in the quality of the data that's collected. Data from an aerial perspective offers benefits and opportunities that cannot be obtained from ground collected data. It also provides a time savings over ground collection, monitoring, or observation.

Collecting topographic data via UAS has proven to have very positive return on investment. A post construction flight of the Heil Corral trailhead was conducted to evaluate the accuracy of topographic information collected with a UAS compared to a traditional ground survey. Based on the results, a UAS is a good method to collect topographic data for grading and drainage designs. The cost of collecting topographic data for the Corral Trailhead using traditional survey methods was estimated to be \$5000. The internal cost of the UAS flights and processing was \$585.

Other data collection and monitoring flights were conducted at the Western-Mobile property to support the Lake 4 project. These flights collected pre- and post-construction photos and videos. The data will be used for presentations and long-term monitoring of the project. The costs of the flights were \$156/hour for staff versus \$200/hour contracted. In this particular instance, the primary benefit was in the quick turnaround to create this video, in order to keep a complex contracting process moving in a timely manner during COVID pandemic restrictions that limited in-person, on-site meetings.

The department has determined that UAS are appropriate for scientific and agricultural research and monitoring, as well as emergency purposes. In order to ensure that UAS use on BCPOS lands does not cause negative impacts to natural resources and visitor enjoyment, UAS missions are reviewed and only permitted if its impact is judged, by BCPOS staff, to have an overall benefit for resource management and/or is within the department's mission.

Mission Review

In order to minimize potential negative impacts, BCPOS administers and manages UAS operations with a team of interdisciplinary staff that review the proposed use on county open space and, after considering the benefits and impacts of the activity, then make a recommendation to the Resource Planning Division manager.

The UAS team worked with the wildlife staff to create Best Management Practices (BMPs) for drone program operation to reduce impact on wildlife, particularly raptors. A number of those BMPs were already incorporated into the flight protocols, so there was a minimal amount of adjustment required. In addition, wildlife staff are present on missions when possible, particularly when there is greater concern for potential wildlife and drone conflict. As a result of these practices, no adverse wildlife interactions have occurred on any mission to date.

Policy Discussion

The Boulder County Comprehensive Plan provides the overarching vision and guiding policies for managing county open space lands. Policy OS 3.03 states

Boulder County monitors and evaluates uses and resources on open space to inform management decisions and seeks to be innovative in its approaches to on-the-ground

management of open space resources utilizing knowledge of current conditions, latest science, and best technologies and practices.

BCPOS is committed to conserving natural, cultural, and agricultural resources and providing public uses that reflect sound resource management and community values—a commitment which is reflected in the department’s mission statement. Additionally, BCPOS strives to use the best methods and techniques available, including technological advancements, when performing land management activities. The department’s experience has shown that UAS aid and improve the understanding and management of natural resources.

Revisions

Staff is recommending four primary revisions to the existing policy. First, the new document includes specific details pertinent to the new internal UAS Program that did not exist in 2016. Second, the new policy reduces the permit application review period from a maximum of 30 days to 10 business days. Over the last six years, a 30-day review period has proven too long to enable effective UAS utilization, both for internal and external missions. Third, as a general best practices effort, all newly written county policies separate the policies from the procedures—so the procedures have been moved to a separate document. This means that procedures can be nimble and adjust to changing conditions as necessary, without going through a public approval process. Finally, changing the final permit review approval authority from the BCPOS Director to the Resource Planning Manager distributes accountability for missions to more appropriate department staff.

Discussion

This policy will continue to be periodically reviewed and revised, as at this time, in response to new scientific developments, new farming and land management tools and techniques, environmental changes, and the evolution of community goals for this publicly owned land. Additionally, future policy reviews will be prompted by changes in UAS technology and regulations. The revised policy will improve the process which allows the department to approve UAS missions that help understand, manage, and monitor county open space properties and resources. Procedural changes are already improving the program and the policy revisions will address several other issues. This UAS policy will not offer or suggest any changes to the department’s current rules and regulations with regard to recreational and personal (or “hobby”) use of UAS or drones. These uses would remain prohibited.

POSAC Action Requested

Recommendation to the Boulder County Commissioners for approval of the Revised UAS Policy, as described above and as further described by staff at the POSAC meeting.

Suggested motion language: I move approval of the Revised UAS Policy as staff has described.

Attachments

1. Proposed BCPOS UAS Policy



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Unmanned Aircraft Systems Policy to use UAS on Boulder County Open Space

I. Policy Summary

The purpose of this policy is to provide direction for the safe use and regulation of Unmanned Aircraft Systems (UAS) on Boulder County’s open space properties. It guides Boulder County Parks and Open Space (BCPOS) to allow and permit this use for specific purposes, while protecting resources and visitor experiences. This policy requires that all UAS operations are performed in a manner that mitigates risks to safety, security, and privacy, ensures compliance with all Federal Aviation Administration (FAA) rules and regulations and applicable laws. It also describes a framework for managing this use in an appropriate manner. Use of UAS on open space will only be allowed for activities that contribute to the understanding, management of, and protection of BCPOS properties and its’ resources. This includes uses such as natural resource monitoring and research, resource management activities, agricultural operations, education and outreach, project bidding, and managing cultural resources. Persons seeking to operate an UAS on any BCPOS property must receive written approval in advance in accordance with this Policy. The operation of UAS for all other unpermitted uses (including recreational or hobby uses) will remain prohibited on BCPOS properties.

This Policy shall be periodically reviewed and revised, as needed, in response to scientific and technological developments, new agricultural methods and techniques, new regulatory or legal guidance, environmental changes, and the evolution of community goals for county open space.

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III. Policy Statement

This policy establishes an approval process and procedures to ensure safe and responsible operation of UAS on BCPOS properties in the U.S. national airspace system. Adherence to this policy ensures compliance with applicable laws, enhances safety, and preserves the security and privacy of the community. This policy applies to any person or BCPOS staff seeking to operate an UAS on BCPOS properties.

BCPOS recognizes that UAS offer great potential as tools for research and other educational functions as well as providing opportunities across a diverse array of users and industries.

In addition, BCPOS must take into consideration public safety, privacy, and civil rights issues when allowing use of UAS on BCPOS properties.

Persons wanting to operate an UAS on BCPOS lands must comply with the following:

1. Apply for and receive approval in advance from BCPOS to operate an UAS on BCPOS properties (please see the UAS Permit Procedures Document for how to apply for a permit).
2. Operate in compliance with all applicable laws, regulations and rulings.
3. Operate in a manner that ensures public safety, right to privacy, and civil rights.
4. Operate in compliance with the provisions provided in this Policy. Some exemptions to the provisions in this Policy may be made on a case-by-case basis after review and approval by the BCPOS Director.

IV. Background

Originally developed for military purposes, UAS has seen rapid growth and advancements since 2010. Today UAS are found in a wide range of applications including monitoring climate change, monitoring natural resources, surveying, search and rescue, wildland fires, delivering goods, and recreation. Due to this rapid changing technology and the many beneficial uses, BCPOS created a policy January 2016 to manage the commercial and research aspects that private and public sector UAS could provide. Recreational use of UAS is not allowed on BCPOS open space properties.

Since adoption of the policy in April 2016, BCPOS has issued many permits for UAS operations on open space lands. Those uses included pollinator monitoring, geological surveys, weed monitoring and flood recovery projects.

Recognizing the beneficial use of UAS, in 2019 BCPOS created an UAS program for monitoring open space properties and the resources on those properties. Projects include flood and wildland fire recovery monitoring, forest monitoring, weed monitoring, topographic surveys and videos for project bidding.

V. Goals, Compliance and Responsibilities

The goals of this policy are to ensure that all UAS activities are conducted in a manner that ensures the protection and safety of park visitors, staff, natural and cultural resources, open space property, and the environment; provides for privacy; outlines acceptable uses of UAS; and ensure compliance with all applicable laws and regulations. Achieving these goals are the responsibility of BCPOS staff and the public that operates an UAS on Boulder County open space lands.

1. Safety

UAS use must not jeopardize the health, safety, and welfare of either county open space visitors or resources.

- A. UAS operators on BCPOS properties must comply with this policy, the department's Rules and Regulations, the department's UAS regulations, and all local, state, and federal laws, including Federal Aviation Administration (FAA) regulations.
- B. UAS operators must immediately cease operation on county open space when requested to do so by BCPOS Park Rangers, BCPOS staff assigned as the liaison to the flight operations or the Boulder County Sheriff's Office.
- C. UAS operators assume all the risks associated with use on county open space and must meet Boulder County insurance requirements. Operators of UAS on county lands will be financially responsible for damage or injuries to persons, structures, vehicles and resources caused by negligent actions.

2. Acceptable Uses

UAS operations will only be approved for activities that contribute to the understanding or management of BCPOS properties or resources. This includes scientific uses such as:

- A. Natural resource monitoring and research, resource management activities, agricultural operations, and cultural resources. In addition, proposed public UAS operations will be evaluated to determine their need, value, efficiency, and cost-benefit in the acquisition of aerial information.
- B. Emergency operations of UAS authorized by the BCPOS Director and/or the Boulder County Sheriff are considered an acceptable use. Emergency operations include search and rescue, wildland fire, and law enforcement
- C. For the Boulder County Fairgrounds specifically, UAS use can be permitted for other uses in facility lease contracts but only after the BCPOS interdisciplinary team has reviewed the proposed use and determines it will not have significant resource or visitor impacts.

3. Protection of Resources and Recreation

Since the protection of cultural and natural resources and providing recreational opportunities are components of the primary mission of BCPOS, the Department will only approve and permit UAS operations which do not diminish these values or their enjoyment by the visiting public.

- A. An interdisciplinary team of BCPOS staff will review each UAS request to assess the proposed operation's impacts to natural resources and visitor use.
- B. Following the review and evaluation by the BCPOS interdisciplinary team and the department's management staff, only those UAS operations which have no unacceptable impacts to sensitive sites, cultural and environmental resources, popular locations and trails, and visitor use will be approved and permitted. Decisions will be based on current research and will continuously incorporate new research.
- C. BCPOS approval and permission for UAS operation only applies to Boulder County Open Space. BCPOS cannot permit or authorize use on adjacent private

property or other public lands.

- D. UAS operations are allowed on fee-owned lands and may be allowed on properties with conservation easements with approval of the landowners.
- E. BCPOS will designate a staff person to be a liaison to the UAS operator. The department's liaison will make periodic field inspections of the permitted UAS operations and as needed, provide direction and guidance. The liaison will also act as the Department's contact for public and staff inquiries.
- F. UAS operators must immediately cease operation on county open space when any authorized member of BCPOS informs the UAS operator that its use is posing a threat to a natural resource.

4. Privacy, Data Collection, Civil Rights Protection, and Program Monitoring

Privacy Protections and Data Collection: considering the advancements in UAS technologies and diverse potential uses, it is essential that BCPOS take steps to implement an UAS policy that addresses privacy protections, procedures, and standards to ensure compliance with all privacy laws.

- A. All UAS collected data shall be made available to BCPOS upon request within 5 working days of the completion of the UAS flight permit date.
- B. BCPOS and approved public users shall only use UAS collected information to the extent that such collection or use is consistent with and relevant to an approved purpose and privacy laws.
- C. UAS-collected information will not be disseminated outside of BCPOS unless it is required by law or fulfills an authorized purpose and complies with both this policy and the approved UAS operations.
- D. Data collected by or on behalf of BCPOS or the public using UAS that may contain personally identifiable information shall not be retained longer than reasonably necessary to fulfill a purpose.
- E. An UAS should not be used to monitor or record activities where there is a reasonable expectation of privacy.
- F. No UAS flights should occur over private property without landowner approval.
- G. On the day of UAS operations and prior to conducting flights, provide onsite signs to notify the public of the general timeframe and area that they may anticipate a UAS collecting identifiable data.

Civil Right and Civil Liberties Protections: to protect civil rights and civil liberties, BCPOS shall:

- A. Adhere to Boulder County policies regarding the collection, use, retention, or dissemination of data in any manner that would violate the First Amendment or in any manner that would discriminate against persons based upon their ethnicity, race, gender, national origin, religion, sexual orientation, or gender identity, in violation of law.
- B. Ensure that UAS activities are performed in a manner consistent with the applicable laws.
- C. When complaints are received, contact the County Attorney's Office to investigate and address privacy, civil rights, and civil liberties complaints.

Program Monitoring: BCPOS will document public feedback about approved UAS operations and monitor impacts on county open space and its resources, such as visitor experiences and wildlife responses to UAS operations. This information will be saved and used to monitor the program and continually assess UAS impacts and benefits.

VI. Definitions

Boulder County Parks and Open Space (BCPOS): a county department responsible for management of county open space lands.

Certificate of Waiver or Authorization (COA): an authorization issued by the Air Traffic Organization to an operator for a specific unmanned aircraft activity.

Federal Aviation Administration (FAA): the national aviation authority of the United States. An agency of the United States Department of Transportation, it has authority to regulate and oversee all aspects of American civil aviation.

Recreational Use: use of a UAS for non-business purposes as a hobby or as part of a non-commercial community-based organization.

Unmanned Aircraft System (UAS): an unmanned aircraft and associated elements, including communication links and the components that control the unmanned aircraft, which are required for the pilot to operate safely and efficiently in the airspace.

VII. Revision History

Date	Revision	Revision Type	Comments
12/20/2015	1.0	Major	Policy Created
02/28/2016			Approved by POSAC
04/12/2016			Approved by BOCC
01/30/2022	2.0	Major	Updated