

Bonanza Flat Conservation Easement Intention and Use Report

Summary

The current condition of Bonanza Flat is a mix of heavily used and man-made impoundments; backcountry; and relatively untouched remote land, which holds several conservation values and purposes. On balance Utah Open Lands has determined that the best protection of these conservation values would be to facilitate management that does not result in a net increase in human activity. In achieving the goals of the Park City Municipal bond and the campaign that raised funds for the purchase of Bonanza Flat, the conservation easement will outline prohibited and permitted uses. The Conservation Easement will also outline uses or future management actions to be done in accordance with an adaptive stewardship management plan.

Conservation Easement Intentions and Purpose

Natural Systems

The property possesses unique, natural habitat in accordance with Tres. Reg. 1.170-14(d)3) protecting habitat for several priority wildlife species.

Watershed

The property is a source of water quality protection and a partial headwaters for the Provo River Drainage emanate from the elevation and therefore snowpack storage that the flat provides as well as the wet meadows, perennial, intermittent and ephemeral streams that appear as snow begins to melt. The Bonanza Flat property contains two lakes and a portion of an additional lake.

Habitat

It contains habitat appropriate for several priority wildlife species for conservation in Utah. The protection of high priority habitat as identified by the Utah Division of Wildlife Resources, exists on the property as abundant riparian and wetland habitat as the Property encompasses streams wetlands and ponds. As well as a significant Aspen forest which is considered a high priority habitat for Utah. Of significance this Property as a known nesting site for great horned owls and the flammulated Owl which is considered a species of greatest concern for the west. The property serves as year round habitat for Moose. Songbirds, raptors, and many mammals exist on the property as well.

Scenic

The property possesses scenic, aesthetic and open space in accordance with IRC 1,170-14(d)(4)) through the protection of views of the Property which can be seen from several vantage points including Guardsman Pass on S.R., Empire Pass on S.R.

Recreation and Education

The property possesses general public educational and recreational values in

accordance with IRC 1.170-14(d)(2))

Outdoor Classroom

The property contains numerous areas for scientific and cultural investigation. Currently the area is part of a Utah State University study on Moose. Along wetlands and stream corridors there are unique opportunities to study aquatic species, understand hydric soil complexes and the plants supported by this unique value. Mining shafts provide a window into Park City's past and areas close to the Jones shaft could provide historic value.

Recreational Experience

The property provides unique topography and attributes that lend itself to destination hikes such as to Blood's Lake, trail connections with adjacent established trails and better managed recreational use of the property through improved trail design.

The Property is adjacent and in close proximity to several permanently protected open spaces.

Bond Language

Park City Voters authorized "a \$25,000,000. Bond to acquire, improve and forever preserve open space, park and recreational land located in Bonanza Flat." With the further intention that "in order to protect the conservation values thereof, to remove existing unneeded man-made improvements and to make limited improvements for public access parking and use."

The stated Conservation Values to be protected would be as follows: The watershed and water quality, natural, scenic, aesthetic, heritage, public recreation, education use and access and wildlife habitat values of open land.

Proposed Uses

An overarching value identified by the stakeholders, the public and the resource inventory data is the watershed value of the property. To ensure the protection of this value, water features on the property should be considered in all trail, trailhead and use decisions. All recreational uses have an impact on the property and have the potential to threaten watershed values. Utah Open Lands has determined that uses on the property will fundamentally be guided by choice. Not all types of recreation can be accommodated, nor can degrees of use reach levels that cause damage to water features or water quality. The most obvious watershed threat is waste. This takes the form of dog and human waste as well as trash and debris dumped or left on the property. Any recreational use has the potential to increase threats which is why Utah Open Lands has suggested that restroom facilities and trailheads are necessary to provide management for this potential threat. At this time Utah Open Lands suggestions include monitoring dog waste removal by users, no camping unless by a backcountry permit system that requires waste containment by user and trail decommissioning. Additionally, Utah Open Lands does not recommend motorized

recreational use for winter or summer on Bonanza Flat. The use this winter was substantial as detailed in the Resource Inventory and the property simply cannot accommodate the intensity and undefined snowmobile use that occurred this winter. This is a choice, this is not to say that snowmobiles have a greater impact on the watershed, rather not all recreational uses can be accommodated on balance with each other and in concert with other conservation values such as watershed, wildlife and scenic values, a fundamental choice is needed regarding which recreational uses, which conservation values are to be prioritized to ensure that there is not a net increase of use. Utah Open Lands does recommend snowmobile access on identified travel corridors as this area is used to access permitted recreational snowmobiling areas in Pine Canyon and Snake Creek Canyon. Similarly winter Nordic use should not include dogs

All stakeholders have identified that the Guardsman Pass parking area as beyond capacity, creating safety and welfare concerns that are unsustainable. A significant action suggested by the data and stakeholder involvement to date is the elimination of parking at Guardsman Pass. To accomplish this needed management parking will have to be moved to a safer location and enforcement will be needed. PCMC will need to work with Wasatch County and UDOT on the management of roadways with particular emphasis on seasonal access and appropriate public safety considerations. The popular destination of Bloods Lake will require a major trail route to effectively deal with soil erosion, dog and human waste entering the watershed.

Outdoor Classroom—The property contains numerous areas for scientific and cultural investigation. There is the potential to include Bonanza Flat in environmental curricula for various schools.

Recreational Trail System—The property provides unique topography and attributes that lend itself to destination hikes such as to Blood's Lake. Area trail connections also provide potential for recreational corridors through the property as well as loops that provide vistas and accessibility due to relatively even topography.

Recreational Experiences—Hiking only trails, unique interpretive and natural history points of interest are found throughout the property. The eventual trail system can include directional trail design to minimize impacts. Mountain biking connections to Wasatch Crest Trail as well as the WOW trail make sense to accommodate mountain bike use that is already occurring but will need a different defined location for trailhead parking A directional loop that takes advantage of unique destination moments in the front and backcountry zones for mountain biking would facilitate additional recreational experience while separating uses.

Non motorized recreation—With abundant adjacent motorized use in Snake creek Canyon and Pine Canyon motorized access on designated travel corridors is the only motorized use of the property suggested at this time. There is little to no motorized use in the spring to summer use and current study of this season's winter

use demonstrates that any use—wildlife viewing, snowshoeing, backcountry skiing, Nordic skiing cannot be accommodated under the current use patterns for motorized recreational use. Transportation corridors for motorized recreation enabling access to adjacent permitted and concession recreational use and groomed trails is feasible. (see Inventory report)

To aid in management, Utah Open Lands has identified Conservation zones. The proposed conservation zones will guide both types and degrees of recreational engagement with the land to optimize recreational experience, monitor and support a reasonable carrying capacity for the land, lessen wildlife and watershed impacts and to create a sustainable trail use system.

Within each zone a greater refinement regarding sensitive habitat, slope, view shed and watershed considerations will need detailed analysis as improvements, restoration, trail decommissioning and trail rerouting, or changes to existing conditions are executed on the property.

These zones are approximate. They are developed with a fundamental goal of watershed protection, as water flows downhill, and based on current conditions.

- Primitive (red)—Areas with a greater concentration of conservation values and limited or no manmade disturbances.
 - Possible Recreation: Limited to primitive hiking or snowshoe only trails. Limit use on dogs.
- Backcountry (orange)—Areas with multiple conservation values with manmade disturbances and potential restoration as well as multiple use potential.
 - Possible Recreation: Passive (non-motorized) multi-recreational trails (hiking, biking, equestrian, xc skiing and snowshoeing) Limited trail improvements and amenities, such as picnic tables, backcountry yurts or camping areas, signage.
- Frontcountry (green)—Areas with more intense use due to focused points of access, manmade disturbances for management and recreational purposes.
 - Possible Recreation: Trailheads and trails, Passive recreational amenities, including restrooms, structures for emergency or maintenance/management.

Prohibited Uses on Bonanza Flat

Although not a complete list, below are several prohibitions discussed with the Jurisdictional Stakeholders and Technical Resource Committee.

1. Motorized Use: Property owned and controlled by PCMC will be posted prohibiting motorized uses (summer and winter)
 - Motorized vehicles including but not limited to jeeps and trucks, utility vehicles, motorcycles, all-terrain vehicles, snowmobiles and ‘timber sleds’. E-bikes are also prohibited.

- The exception to this would be associated with emergency response/ services and/or authorized management and maintenance of the property.
2. Hunting: Property owned and controlled by PCMC will be posted ‘No Hunting’ without the authority of the landowner.
- The exception to this prohibition would be to utilize hunting as a management tool for diseased or problematic animals as identified by Utah Open Lands.
3. Overhead Transportation Infrastructure
- This would include ski lifts, gondola or trams and the related infrastructure.

Provisions of Note

Issues associated with drafting the Bonanza Flat conservation easement and management plan necessitate determining a course of action regarding how to deal with enforcing the eventual restrictions associated with the protection of Bonanza Flat for the benefit of the public. Achieving a sustainable trail system, protecting the conservation values associated with the property, and furthering the public mandate established by the bond that purchased the property will require defining within the conservation easement flexibility to deal with potential future opportunities as well as defined protocols to ensure the conservation easement adequately protects the public trust. Utah Open Lands recommends:

- A one-time subdivision provision in the Conservation Easement language that allows for discussions regarding agreements that encumber the property or agreements made with jurisdictional funding partners. The conservation easement will remain in full force and effect over the entire property regardless of future agreements with respect to transfers.
- A provision for minimal expansion of infrastructure associated with current leases or property lines. Parameters regarding the expansion of infrastructure (water lines, buildings, trail connections) associated with existing leases will require public benefits in excess of benefit accruing to lessee from expanded infrastructure and will be codified in the conservation easement to ensure the public is made whole.
- Allow for proven encumbrances currently existing on the property
- Provisions necessary to accommodate public safety and jurisdictional agencies regarding uses and established rules and regulations already in place, and ensure compliance.

Utah Open Lands

Technical Resource Advisor Meeting Report

17 November 2017 / Park City, UT

Subject: Bonanza Flat Open Space Planning

Author: Ben Marolf, Utah Open Lands

ATTENDEES

- Park City Staff: Heinrich Deters
- Utah Open Lands: Mike Auger
- Mountain Trails Foundation: Charlie Sturgis
- Park City Staff: Logan Jones
- Citizens Open Space Advisory Committee: Jim Doiley
- Utah Open Lands: Ben Marolf
- Utah Open Lands: Wendy Fisher
- Wasatch Backcountry Alliance: George Vargyas
- Wasatch Backcountry Alliance: Chris Adams
- Summit Land Conservancy: Kate Sattelmeier
- Trails Utah: Senta Byer
- Mountain Trails Foundation: Rick Fournier
- Park City Staff: Devin Boyle
- Park City Staff: Spencer Lace
- Remote attendance: Save our Canyons: Alex Schmidt
- Public in attendance: Paul

REPORT

SUMMARY

1. Utah Open Lands and Park City Municipal are following up on a November 9th City Council and public presentation of the Bonanza Flat Resource Inventory Report draft.
2. Discussion of degree of use, permitted use, and restricted use on the land.

ACRONYMS

- PCMC: Park City Municipal Corporation
- UOL: Utah Open Lands
- BF: Bonanza Flat

CURRENT STATUS

Park City City Council has approved a planning framework associated with the Bonanza Flat Conservation Area. The process allows for the coordination and input of a jurisdictional stakeholder group, a technical resource group and the general public. It stipulates the importance of recognizing the property's natural resources, from which discussions associated with use and management of the property may be balanced. Each factor will ultimately result

in the drafting and adoption of a conservation easement and adaptive management plan, to be held by Utah Open Lands.

BACKGROUND

- June 15, 2017: Park City Municipal Corporation acquired 1350 acres of open space located in Wasatch County. Furthermore, on the same date, City Council selected Utah Open Lands as the land trust to hold the conservation easement.
- July 13, 2017: Park City City Council approved a planning framework and timeline, which included coordination and input of a jurisdictional stakeholder group, a technical resource group and the general public.
- August 11th, 2017: Staff hosted a Jurisdictional Stakeholder meeting. On August 25th, staff hosted a Technical Resource Advisor meeting. On September 20th, Utah Open Lands and Park City staff participated in Park City’s broader Fall Project Open House to collect public comment on the Bonanza Flat planning process.
- November 9th, 2017: Utah Open Lands presented their draft resource inventory report to City Council and the public. City council approves:
 - Extending the Resource Inventory through March 2018, so as to collect data specific to the winter season.
 - Identifying and staking Bonanza Flat property boundaries adjacent to Pine Canyon and Guardsman Pass seasonal roads.
 - Monitoring winter motorized usage.
 - Directing staff to meet with the Jurisdictional Stakeholder Group and Technical Resource Committee to confirm the Conservation Values, based on the Resource Inventory and initiate discussions associated with permitted and prohibited uses to be identified within the Conservation Easement.

ANALYSIS

Bonanza Flat Draft Resource Inventory Report Recap

The Resource Inventory Report was created by UOL for the purpose of gaining a holistic, well-rounded view of the property as a whole. It will be used in the drafting and adoption of a conservation easement, baseline documentation report and adaptive stewardship management plan, which UOL will hold. Stewardship Director Mike Auger of UOL presented some of the key species and vegetative areas that BF contains. Current health of the property and its species is, to current knowledge, very good. A goal of the adaptive management plan and

conservation easement will be to maintain the excellent natural condition of the property, while keeping it responsibly accessible for public use. Jurisdictional Stakeholders were brought in for this meeting in order to aid and contribute to a discussion on how the property might best be managed through permitted and degree of use. While stakeholder opinions and information will be taken into account when creating the adaptive management plan, no plan will be implemented until after a full study of use can be done over the winter, and ‘status quo’ public use will be maintained on Bonanza Flat until that point.

General Commentary from Technical Resource Advisors

Chris Adams, from Wasatch Backcountry Alliance, opened discussion with the agreed upon concept that there should be an identification of areas on BF that are sensitive from a watershed standpoint. Post identification of these areas, use and area management should recognize and follow the watershed needs first and foremost. He also brought up the concept of separating recreationalists by trails, i.e. including a trail for biking, a trail for hiking, an equestrian trail, etc. All advisors agreed on the parking at Guardsman pass as a recognized hazard that should be changed. Suggestions of a drop off area and a shuttle service were generally agreed upon by all advisors. The concept that perhaps BF is at user-capacity was brought up, countered by the concept that BF isn’t at user-capacity, rather that the areas of access and use are restricted such that users have nowhere else to go.

Commentary on Permitted, Restricted, and Prohibited Uses from Technical Resource Advisors

Early discussion on best practices in the realm of use restrictions focused heavily on minimizing impact and minimizing risk. Advisors agreed that:

- a) Uses should be restricted in order to prioritize land values.
- b) Zones are plausible solutions to balancing uses and values.
- c) Access corridors should be potentially be made available.

Included in early discussion of potentially prohibited uses were: motorized vehicle use, mountain biking, equestrian use, dogs, hunting, backpacking, camping, target shooting, and swimming. Jim Doiley of COSAC presented the agreed upon concept that any use posing a fire hazard should be a prohibited use. If camping is going to happen, it should be car accessible, and there should ideally be restroom facilities available. If allowed, high-impact uses (mountain biking and snowmobiling as examples) should be restricted to specific areas to minimize interaction with low-impact uses such as skiing and hiking. Crafting a compatible area where multiple uses can share space will be a challenge, and advisors were keen on the concept of “zones.” Chris Adams of WBA brought up a potential “zone” of use meant for access. If snowmobiling and biking are going to happen on BF, then they might only be able use BF to access abutting properties where they wish to participate in their respective activities. With the added publicity of BF’s fundraising and purchase, there will continue to be more and more users of the space, and more and more impact.

Discussion turned to Guardsman Pass parking for the latter minutes of the meeting, and all were in favor of:

- a) Closing current Guardsman Pass parking access.
- b) Allowing for 15-minute shuttle / drop-offs

- c) Creating an alternate parking space or providing alternate access

Closing thoughts on permitted and restricted use focused on centralizing management of BF, creating a system that allows for active and engaged monitoring and enforcement of the area, and maintaining the natural beauty of BF while providing public access.

Utah Open Lands Jurisdictional Stakeholder Meeting Report

17 November 2017 / Park City, UT

Subject: Bonanza Flat Open Space Planning

Author: Ben Marolf, Utah Open Lands

ATTENDEES

- Summit County: Councilman Doug Clyde
- Park City: Mayor-elect Andy Beerman
- Metropolitan Water District of Salt Lake City and Sandy: General Counsel Scott Martin
- Salt Lake Public Utilities: Patrick Nelson
- Snyderville Basin Special Recreation District: Bob Radke
- Utah Open Lands: Ben Marolf
- Utah Open Lands: Wendy Fisher
- Park City Staff: Heinrich Deters
- Utah Open Lands: Mike Auger
- Park City Staff: Logan Jones
- Wasatch Mountain State Parks: Tracy See
- Excused: Wasatch County, US Forest Service, Midway City
- Public in attendance: Rick Johnson

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group, a technical resource group and the general public. It stipulates the importance of recognizing the property's natural resources, from which discussions associated with use and management of the property may be balanced. Each factor will ultimately result in the drafting and adoption of a conservation easement and adaptive management plan, to be held by Utah Open Lands.

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property, while keeping it responsibly accessible for public use. Jurisdictional Stakeholders were brought in for this meeting in order to aid and contribute to a discussion on how the property might best be managed through permitted and degree of use.

General Commentary from Jurisdictional Stakeholders

An overarching concern amongst all stakeholders was the issue of parking at Guardsman Pass Road. There is a real and clear safety threat posed by noted and consistent congestion. BF has limited points of access, but high levels of use. Because of this, the access points are high-use, high-traffic zones. All were in favor of restricting the Guardsman access to shuttle / drop-off access only and creating alternative parking zones that would more efficiently hold and distribute visitors to BF. The idea of incorporating UDOT and UTA in this project was brought up by Patrick Nelson, who referenced recent work in Little Cottonwood Canyon as a positive model for the access issues at BF.

Commentary on Permitted, Restricted, and Prohibited Uses from Jurisdictional Stakeholders

Discussion on permitted, restricted, and prohibited use on BF led to a few conclusions:

- a) The watershed should be prioritized as a means of creating restrictions.
- b) Zones may aid in creating “areas” of permitted use for high-impact recreation.
- c) There is a need for balancing values and uses.

The discussion only came to concrete general permissions for the low-impact uses of hiking, snowshoeing, and skiing, while all other discussed uses were recognized to be, one way or another, in conflict either with other uses, or with land values. Mountain biking and dog-walking were suggested as uses that be restricted to certain corridors. i.e. Dog-walking may be restricted to areas where fecal waste left behind would be of a lesser impact to highly-sensitive watershed zones like ponds and wetlands. i.e Mountain biking may be restricted to single-track, downhill and uphill trails in an area where hiking doesn't occur. High impact, motorized uses, such as snowmobiling and OHV use were discussed in depth, and while summertime OHV use was unanimously agreed as a fully prohibited use, snowmobiling brought greater complications. Access to homes and adjacent property via UDOT roads will be there in perpetuity, but unfettered use and highpointing practices were a contentious issue. Abandoned machinery and sound-pollution are two, noted and known issues of snowmobiling that were discussed as problematic. In order to determine the effects of snowmobiling on the property, Stewardship Assistant Ben Marolf of UOL will be spending significant time on-site monitoring the property throughout the winter. In closing discussion, target shooting was unanimously agreed to be a prohibited use, and an agreement on methodological management and scientifically based approach to the values was supported.

Bonanza Flat Conservation Area

Winter Resource Inventory Summary

Author: Utah Open Lands

March 6, 2018

Summary:

On November 9th, 2017, Utah Open Lands (UOL) presented the initial draft Resource Inventory to the Park City City Council and to the public. In response to a decision at this meeting to

continue the resource inventory, data collection has occurred throughout the winter to gauge winter-specific activity. UOL has made a concerted effort to visit Bonanza Flat at least weekly throughout winter to track human and wildlife use, spending over 50 hours on the property as of the middle of February. This data collected during visits to Bonanza Flat is being used to create both a more robust resource inventory and compare use through all seasons. Information obtained will be incorporated into a comprehensive baseline documentation report that will be used in tandem with the creation of a conservation easement (to be held by UOL), and an adaptive stewardship management plan for the property. UOL has so far documented and collected extensive information on human and wildlife use, selected summaries and descriptions of which are included in this report. As of mid-February, 2018, snowmobile use has been steadily rising, while wildlife sightings have been fairly consistent in overall species count, but qualitatively decreasing in noted species density.

Snowmobile Use:

Snowmobile use on Bonanza Flat was documented as the most substantial wintertime human use on the property. While there are gates in place to restrict rubber tire access to Bonanza Flat from all directions, individuals obtain gate keys which then provide access. Centrally located for snowmobilers from all over the Wasatch Front and the Wasatch Back, there is parking of trailers and motor vehicles along the roadways at Bonanza Flat. As of February, 2018, snowmobile tracks cover over 75% (see “Map 1”) of some of the flatter, more open areas (see “Photo 1”). In some locations, there is effectively no untracked snow by snowmobiles after a single weekend of use.

Photo 1: Wet Meadow area with over 90% Snowmobile Track Cover



Snowmobiling is the only use that has been observed in consistent quantity and density on all property visits by UOL. Each visit has yielded more snowmobiles left on site than the last, and documented usage has increased in tandem. This increase has been tied to an increase in snowfall and base snowpack during the season. As of our most recent visit (2/9/18), snowmobile use is at its to-date height. Snowmobile use increase and correlative trends suggest snowmobile use will only grow as more snowfall continues to accumulate. While there is certainly snowmobile use strictly as a means of access (particularly towards adjacent land), there is clear snowmobile use that is entirely recreational. The “travel” use occurs in select areas, directly linking from the center of Bonanza, where many vehicles park along Guardsman Pass Road and Pine Canyon Road. High travel areas spread multi-directionally from the center of Bonanza towards adjacent, privately and publicly owned properties, with most of the travel areas running along Guardsman and Pine Canyon Roads, and also towards adjacent private properties to the southeast of Bonanza Flat. Recreational use encompasses a vast majority of the property in an undefined and unregulated manner. UOL visits have documented snowmobiles running up and down hillsides, on and off of right of ways from the southeastern corner of the property near adjacent properties

through the northwestern areas near Guardsman pass, down to the Bloods Lake, and spread throughout numerous parts of the property. While most use is assumed to be individual riders on snowmobiles, strictly riding, there is also documented use of snowmobiles pulling skiers and snowboarders around using a rope. A low estimation model ((average snowmobiles recorded / weeks recorded) x weeks) of use predicts that there has been over 1800 cumulative days of recorded individual snowmobile use (1 day of use = 1 snowmobile using property within a 24-hour period) on Bonanza Flat from the beginning of UOL winter monitoring on November 29, 2017. This brings us to an average of over 26 snowmobiles using Bonanza each day.

Photo 2: Snowmobiles and other vehicles parked on Bonanza Flat, off of right-of-way.

On top of snowmobile use on the property, snowmobile storage has exceeded 260 documented weeks of “individual snowmobile” storage (1 week = 1 snowmobile left on Bonanza for one week’s time). There have been over 56 individual snowmobiles noted on site. Additionally, there are a number of undocumented snowmobiles that are being stored in the 11 snowmobile trailers that have been left on this property since the beginning of the season. 13 cars, trucks, and buses have sat parked on site for multiple weeks, with dozens of daily access vehicles using the area



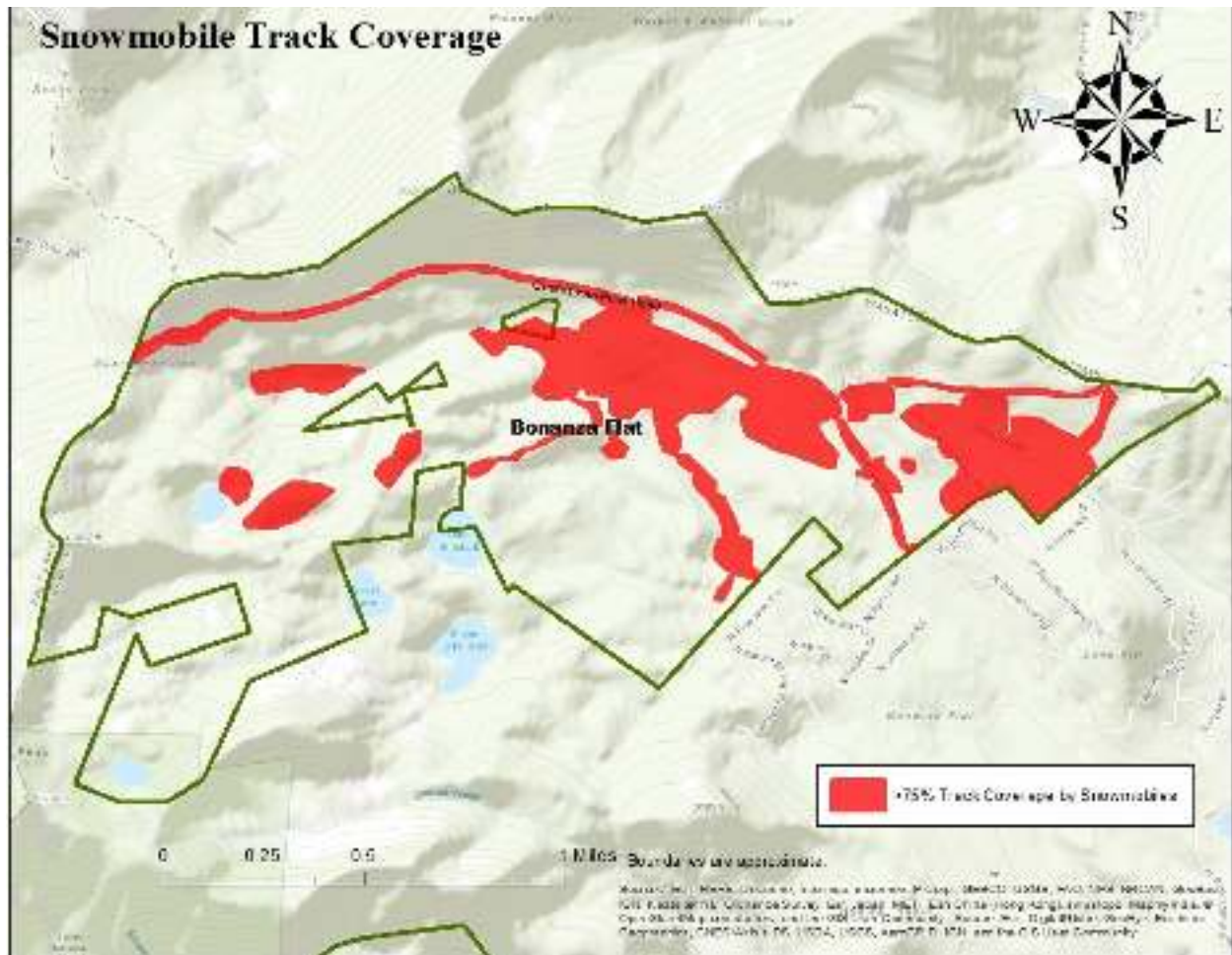
for staging and parking. Access to these snowmobiles by vehicle has meant snow moving tractors and snow-cats also remain stored on/adjacent to Bonanza Flat, many of which block the

gate and road towards Guardsman Pass. Use of snow-cats and tractors has occurred both on and off of roadways. This described on-site storage and parking has occurred near the center of the property at the intersection of Pine Canyon Drive and Guardsman Pass Road (See “Photo 2”). At this location, destruction of landowner property, tallying in the hundreds of dollars for repair, demonstrates a lack of respect by users for the landowner, as cables, chains, and locks have been routinely cut. Furthermore, 2018 data collection has documented a newly abandoned snowmobile that does not appear to either be in working condition, nor with any sign of owner reclamation (See “Photo 3”).

Photo 3: Abandoned Snowmobile



MAP 1:



Additional Information on Wintertime Human Use:

Motorized use on Bonanza Flat has not been primarily snowmobile use. There is documented vehicular use, OHV use, and dirt bike use. There is vehicle use of closed roads to access adjacent land.

In terms of non-motorized recreational use, signs of use have been minimal. Nordic skiing and snowshoeing signs have only been seen on 20% of monitoring visits, and signs of these uses have been limited to one line of tracks, rather than an extensive web of trails.

Wintertime Wildlife Use:

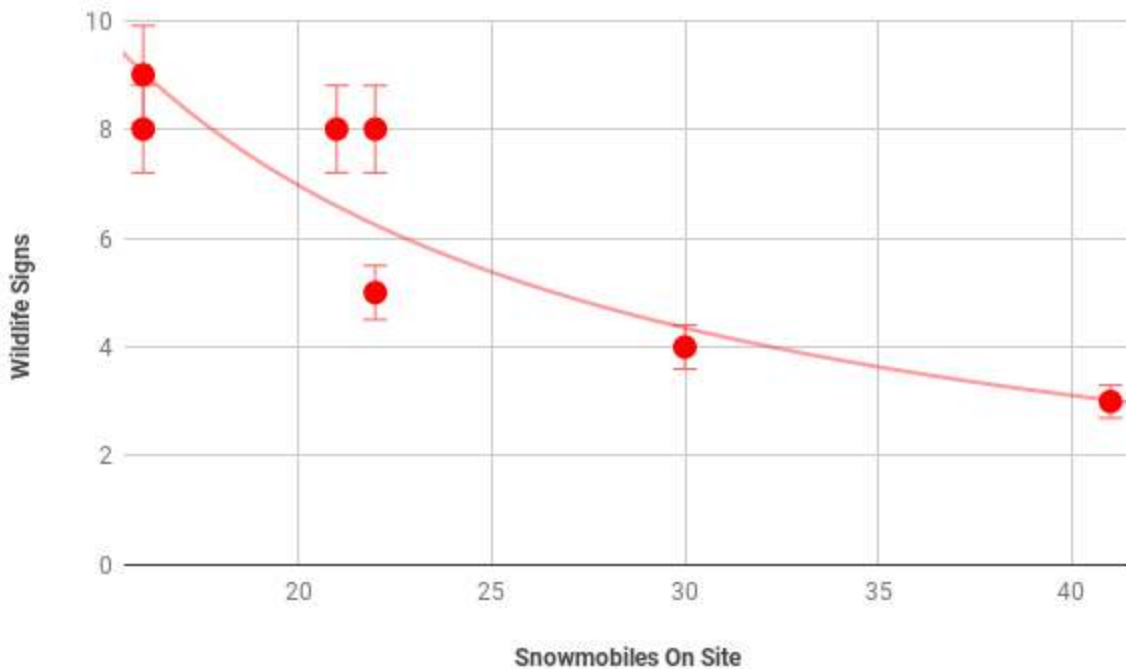
There have been, at the least, signs of 11 different species of wildlife spotted on Bonanza Flat at this point. To date, most visits have yielded signs of moose (*Alces alces shiras*), elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), and coyote (*Canis latrans*). The consistent sign of these species is encouraging, but there has been a qualitative decrease in the quantity of sign sightings. i.e., while earlier visits yielded ample sign of moose, later visits have noted sporadic and less dense sign of some species, particularly cervidae. Again, this is tied directly to an increase in snowmobile use on the property. Species noted in earlier drafts of the Bonanza Flat resource inventory should not be disregarded from management planning if they are not spotted during the winter data collection. For example, the pika (*Ochotona princeps*), a unique species, will likely not be seen at all, as their winter habits remain underneath the snowpack.

Analysis:

Going into the collection of data for the resource inventory, UOL had to hypothesize correlation between human use and wildlife use in order to create a model for study. We hypothesized that as snowmobile use increased, wildlife use of Bonanza would decrease. At this point in our data collection, UOL data shows that there is a strong statistically significant connection between an increase in snowmobile use and a decrease in wildlife sighting and signs (See “Graph 1”).

Collected wildlife data has declined as snowmobile use has increased. When plugged into a Pearson Correlation model, the value of “r” ($r = \frac{\sum((X - M_y)(Y - M_x))}{\sqrt{((SS_x)(SS_y))}}$) is -0.8818. This is a strong negative correlation, which means that high snowmobile use (x-value) correlates with lower wildlife sightings (y-value), and vice versa. The value of r^2 , the coefficient of determination, is 0.7776, and the p-value is 0.008791. The result is significant at $p < 0.05$, and as such, we must reject the null hypothesis that there is no correlation between human and wildlife use, and accept correlation.

GRAPH 1: Correlation graph between wildlife sign and snowmobile sign



In addition, past studies lead us to further confirm connection between snowmobile use and wildlife health. Points of habitat and wildlife concern from snowmobiling include: destruction of vegetation (photo documented), area avoidance in wildlife populations such as mule deer (Freddy et al. 1986 [LINK](#)), moose (Colescott & Gillingham 1998 [LINK](#)), and elk, and elevated stress levels in both cervidae and canine populations (Creel et al. 2002 [LINK](#)). Snowmobiling can displace ungulates to poor habitats, which may raise their energy expenditure and lower individual survivorship, causing population declines (Harris et al. 2014 [LINK](#)). Concentrations of ammonium, nitrate, sulfate, benzene, and toluene in snow have been positively correlated with snowmobile use (Ingersoll 1998 [LINK](#)), and should be noted as potential hazards to riparian and watershed health.

Overall, Utah Open Lands is not arguing that snowmobiles have a greater individual impact on wildlife than other recreational uses. Quieter and cleaner machines have mitigated some of the

historic impact from snowmobiles as technology has improved. However, the documented use of snowmobiles on Bonanza Flat was not confined to any specific pattern, except along paved roadways. Studies of recreational use on properties that UOL stewards where recreational use is confined to designated trails has demonstrated that “predictable” human use is less impactful, and easier to manage. Given the unpredictable patterns of use, and the overall volume of individual users, snowmobiling does have an impact on Bonanza Flat’s conservation values that should be taken into some consideration.