Centennial Mountain Range Grizzly Bear / Whitebark Pine Monitoring Project Summer-Fall 2011 Field Season Report January 2012



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### ABSTRACT

The ASC/NRDC Centennial Mountain Range Grizzly Bear/Whitebark Pine Survey utilized trained citizen-scientist volunteers to record the presence/absence of grizzly bear signs on the northern slope of Montana's Centennial Mountain Range in Montana with a focus on areas adjacent to high levels of whitebark pine mortality. Through transect surveys, hair/DNA collections, and visual observations we attempted to determine the presence/absence of grizzly bear (Ursus arctos horribilis) signs along the entire stretch of the 42 mile range. Clear signs of grizzly bears were found in several drainages throughout the range, which is apparently being used by multiple bears.

The project trained 43 volunteers in traditional, non-invasive carnivore survey techniques and DNA collection methods. We collected 48 hair samples from the range and after careful scrutiny ultimately sent four samples to the lab for further DNA verification (results pending). We recorded 8 bear tracks, 10 bear scats, 2 rub trees (without hair), 2 bear digs, and recorded a sighting of one grizzly bear. Photos taken by the Red Rock Lakes NWR from a nearby cow carcass have also confirmed the presence of at least one grizzly bear in the Odell Creek area. Throughout the field season we successfully surveyed 190.2 km of distance in 20 transects covering a longitudinal range of 70 km east to west.

# **PROJECT SUMMARY**

This project was a joint effort between Adventurers and Scientists for Conservation and the Rocky Mountain Office of the Natural Resources Defense Council, with outside funding received from Patagonia and the Dillon Field Office of the Bureau of Land Management. The project was designed to survey the entire Centennial Mountain Range between Red Rocks Pass and I-15 with aims at finding definitive evidence of grizzly bear presence (Images 1,2). Viable evidence included tracks, DNA hair samples, DNA from scats, or the sighting of a grizzly bear. Throughout the range participants walked trails, fencelines, roads, the Continental Divide, and other areas determined to be likely travel zones for bears.<sup>1</sup>



Image 1 (Left). View of Centennial Range from West. Blue lines indicate transects surveyed. Green Indicates Bear Sign



Image 2. View of Centennial Range from East, Blue Lines indicate transects surveyed, Green marks indicate bear sign

# PROJECT DESIGN

After an extensive recruiting process including posters, internet outreach, tabling at farmer's markets, email campaigns, and word-of-mouth, participants took part in up to three tracker training weekend sessions.

In each of the three weekends, participants met in Bozeman, Montana on Friday evening and caravanned to field study sites, often arriving after dark. The study area was divided into three main sections: (west, central, and east), each of which was surveyed on one of three tracking weekends (Aug 19-21, Sept 9-11, Oct 7-8 respectively). Saturday mornings consisted of a brief training session and project summary including GPS training, data recording, bear safety, basic vegetation identification, basic track identification, training in Leave No Trace ethics, and an overview of the project's methods, purpose and potential.

Participants were then broken into small groups consisting of at least one guide experienced in tracking techniques. Guides then further explained how to distinguish between signs of bear species and other species, likely places to find signs of bear activity, and other non-invasive methods for tracking bears such as identification of tracks, rub-trees, hairs, and scats. Through active hands-on participation in non-invasive survey techniques participants quickly became versed in basic identification and collection protocols.

Groups were then further divided into groups of 2-5 people and were asked to complete pre-determined transect routes while searching for signs of bear activity. Transect ranged from 2 - 24km and were completed on Saturday and Sunday of each weekend. Each group included at least one member with more advanced wilderness skills.

#### METHOD

#### **Location Selection**

After examining allotment maps provided by the BLM-Dillion field office and several field visits, we were able to map out fencelines throughout the northern slope of the Centennial Mountain Range. Fencelines were of primary interest as they provide the highest potential for collection of hair samples.

Fencelines were followed by 2-5 people who were asked to search for the presence of hairs caught in the barbs of the fence or when wooden posts were present that had been deposited on wooden posts by a bear rubbing against that post.

After all fencelines which were not located on private property in the range had been surveyed, routes were selected based the on presence of clear trail or other likely bear travel routes,<sup>1</sup> including dirt tracks, dirt roads, or game trails. Private property was avoided in most cases. Special permission was attained to travel on the Taft property near Jones Creek and portions of this land were surveyed.

### Hair Samples

Hair samples encountered by project participants were examined in the field for color, texture, and length to determine if the sample was potentially from a bear species. Hairs that showed potential to belong to a bear species or that were unknown were collected in small paper envelopes. In any case where there was question about a sample, volunteers were asked to collect the sample for later examination. Volunteers were instructed to use caution to avoid handling the follicle ends of hair samples and to avoid samples covered in tree sap. For each collection, the sample number, the elevation, UTM location, general area geography, local vegetation species, and information about where the sample was found was recorded (Table 1, Figure.1). The name, UTM location and elevation were also marked by handheld Garmin e-trex GPS units.

### **Rubs and Claw Marks**

Volunteers were shown examples of rub trees during training and instructed to look at prominent trees or trees that appeared to have been rubbed while walking along trails or other bear movement zones. Potential rubs were examined for the presence of hairs, and were recorded as hairs and not as rub trees if they were present. Trees were marked as rub trees only if definitive signs of bear were present. In cases where marks were clearly from black bear (claw marks climbing the tree) trees were not recorded. Habitat type, tree type, UTM location, and elevation were recorded for clear rub and claw trees. If a group of rub trees was present, as was the case in several locations, one representative tree was recorded.

#### Prints

In all cases that bear paw prints were found, they were visually examined to determine the position of the 5<sup>th</sup> toe, space between the toes, and size<sup>2</sup> to distinguish between black and grizzly species.

All prints were measured for length and width and photographed with a scale reference as well as marked on GPS for UTM location and elevation.

#### Scats

Basic instruction was given in distinguishing between obvious characteristics of scats left by bear vs. non-bear species.<sup>3</sup> No instruction was given to differentiate between grizzly bear and black bear scats as diet and size

can be unreliable in distinguishing between species. When present, bear scats were collected and UTM location, habitat type, and elevation were recorded.

#### **Observer Reliability**

Volunteers were asked to collect samples liberally, and told that any doubt in species should lead to a collection. Project consultant Steve Gehman and project leader Gregg Treinish examined all samples collected to further eliminate non-grizzly hair samples. While there were a considerable number of non-bear samples collected, we have no reason to believe that any extra collection opportunities were missed by volunteers other than what would be expected by a researcher of any skill level.

### RESULTS

On three weekends (Aug 19-21, Sept 9-11, Oct 7-9) 43 volunteers and 10 staff surveyed 190.2 km on 20 different tracking transects (Figure 1ab). We estimate the total volunteer hours at 720 hours. In total 48 samples were collected and four have been sent to the lab for further analysis (Table 1, Figure 2). We found clear signs of many animal species in the range including wolf, red fox, bobcat, coyote, black bear, elk, deer, and grizzly bear. We identified two sets of bobcat tracks, one set of wolf tracks, and one red fox track. The range in general was characterized by spruce, fir, and lodgepole pine in the eastern part of the range which gave way to more sagebrush and lodgepole dominated

forests on the western side of the range. Stands of whitebark pine were found along the continental divide and above the Price/Peet area (Figure 3).



Fig. 1b Track transects completed during summer 2011 field season.



Figure 2. Hair Samples Collected overlaid on MT Landownership map. Red indicates samples that were sent to the lab for further analysis

8.20.11	Hair	414321	4931715	2367 Livestock	Sage		
8.20.11	Hair	414478	4931676	2463 Livestock	Sage		
8.20.11	Hair	415128	4932053	2029 Bear	Sage	2	
8.21.11	Hair	410560	4939056	2029 Livestock		Livestock	
8.21.11	Hair	410559	4939123	2025 Livestock		Likely cow	
8.21.11	Hair	410543	4939610	2026 Livestock			
8.21.11	Hair	409860	4943901	2031 Non- Bear			
8.21.11	Hair	410118	4938892	2030 Livestock	Sage		
8.21.11	Hair	410223	4938912	2024 Non- Bear	Sage		
8.21.11	Hair	406411	4939453	2079 Non- Bear	Sage		
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	:	110107	1007000		>		
0.21.11	nall	104014	4000177		after		
9.11.11	Half	400402	4939477	2030 NON- Bear			
8.21.11	Hair	410784	4936412	2127 Non- Bear	Sage		
10.8.11	Hair	458446	4937935	2212 Bear	LPP S/F		
10.8.11	Hair	458600	4937437	7382 Bear	LPP S/F		ASC002
10.8.11	Hair	455275	4937205	7293 Bear	LPP S/F		
8.21.11	Hair	436804	4937842	2049	S/F		
10.8.11	Hair	436807	4937836	2067 Likely Cow	S/F	2	
9.11.11	Hair	420583	4937950	2066			
					S/F Aspen		
9.11.11		40000	4907000	2000 LIKELY COW	INIEGUOW	2	
9.10.11	Hair	437208	4937034	20065 Bear (Black)			
9 10 11	Hair	437259	4936790	6863 Bear		Rlond Hair	ASC001
8 20.11	Hair	411596	4935187	2166			
8.20.11	Hair	411982	4935127	2184			
						Price Peet. Non-	
8.20.11	Hair	409068	4935329	2271 non-bear	Sage	bear. Sage	
10.11.11	Hair	408899	4935280	2344 Likely Cow	S/F		
10.11.11	Hair	408233	4935053	7690 Canid	S/F		
8.21.11	Hair	420277	4934175	Bear		Silver Tlpping	ASC003
10.8.11	Hair	458450	4937677	Bear	LPP		ASC004
9.11.11	Hair	424275	4939034	2039 Livestock	grassland		
9.11.11	Hair	424306	4943006	6627 Livestock	grassland		
9.11.11	Hair	424301	4941719	2032 Livestock	grassland		
9.11.11	Hair	424307	4939703	2034 Livestock	grassland		
9.11.11	Hair	424308	4939599	2038 Livestock	grassland	likely cow	
9.11.11	Hair	424311	4939220	2038 Livestock	grassland		
9.11.11	Hair	424312	4939156	2036 Livestock	grassland		
9.11.11	Hair	424313	4939105	2026 Livestock	grassland		
9.11.11	Hair	424320	4940027	2027 Livestock	grassland		
9.11.11	Hair	424322	4940004	2024 Livestock	grassland		
9.11.11	Hair	424323	4940070	2034 Livestock	grassland		
9.11.11	Hair	424325	4939852	2018 Livestock	grassland	likely cow	
9.11.11	Hair	424337	4943895	2016 Livestock	grassland		
10.10.11		436810	4937853	2016	S/F		
10.10.11		437263	4936785	2120	S/F		
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ited Yellow I	Indicates San	nple Was Se	nt To Lab F	or Further Analysis.			
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Figure 3. Whitebark Pine Stands found. All stands were experiencing high levels of mortality, however the trees marked indicate that there were cones present on the trees found.

Bear signs (either black or grizzly) were found as far west as Whiskey Gulch. Definitive signs of grizzly bears were found in the Red Rocks Pass area, Hellroaring Creek, and Odell Creek, including a sighting of a grizzly bear at the mouth of Odell Creek. Throughout the eastern portion of the range bear signs were far more frequent than further west of Odell Creek. Nineteendistinct signs of bears recorded from Odell Creek to the east, and only eight were observed to the west of Odell Creek (Figure 4).



Figure 4. Bear Signs Found in Centennial Mountain Range during 2011 field season. Red Flags indicate hair samples sent to lab. Green Squares indicate scats found. Green circles indicate tracks founds

Grizzly tracks were found in Hellroaring Creek on one occasion (Images 3ab) and in Odell Creek on multiple occasions (Images 5ab). A grizzly cub track

was found in the Hellroaring Creek area alongside larger adult grizzly tracks (Image 4).



Image 3a. Grizzly prints in-Hellroaring



Image 3b. Multiple Grizzly Prints- Hellroaring



Image 4. Grizzly cub and Adult side by side -Hellroaring Creek 10/7/11



Image 5a. Grizzly Track in Mud-Odell

Image 5b. Grizzly Track in Dirt -Upper Odell

Two rub trees were located on the eastern part of the range near Red Rocks Pass that did not have hair on them.

Two fresh bear digs were found in the Hellroaring Creek drainage with nearby tracks.

## DISCUSSION

### **Observer Reliability**

While there have been questions raised about the validity of data collected during citizen-science research and field identification of indirect evidence of wildlife species<sup>3</sup>, observers were trained to err on the side of caution and collect all suspected samples. While it is reasonable to assume that an experienced researcher could better differentiate tracks, scats, or hairs in the field, in our case, all questionable signs were recorded and treated as if they were from the species in question. In addition, samples that show potential to be from a grizzly bear will be analyzed by an independent lab minimizing any reasonable doubt that sampling error could have occurred. By using the resources of a large number of observers, we were able to thoroughly cover the survey area, often

with multiple sets of eyes on the same fencelines, rub trees, and trails. All samples collected were independently examined by a consultant with more than 30 years of grizzly tracking experience, as well as project leader Gregg Treinish, thereby ensuring that all samples collected were viewed by someone with a proper experience level. All tracks that were viewed in the field were viewed by experienced "guides", and therefore can be assumed to be accurate identifications as well. Furthermore, tracks were photographed and measured allowing for further confirmation should any doubt arise.

# BLM Use of Data

This study was partially commissioned by the BLM- Dillon field office. They will be using the data

"As there is continued pressure for grizzly bears to move out of the Primary Conservation Area (PCA) for the Yellowstone sub-population it is imperative that land management agencies become informed regarding the presence of grizzly bears and the suitability of grizzly bear habitat on their jurisdictional lands. To date this information is lacking on BLM lands adjacent to the PCA in southwest Montana. Of primary interest to me is any information regarding grizzly bear presence and habitat suitability in the Centennial Mountains of Southwest Montana. Any information on grizzly bear use of BLM managed public lands is important to be able to take appropriate management actions to protect and provide secure habitat for grizzly bears on these lands. In addition, the BLM Dillon Field Office will utilize this information in considering management decisions regarding livestock grazing, forest health treatments including timber harvest, oil and gas leasing, recreation management, road construction and/or improvement, travel management including seasonal road closures, and wildlife habitat management. I would be very interested in obtaining any information related to grizzly bears an the suitability of grizzly bear habitat on BLM managed public lands in southwest Montana. I would also be interested in this type of information on adjacent US Forest Service lands in the Snowcrest and Gravelly mountain ranges of Southwest Montana."

# - Tim Bozorth, Field Manager BLM Dillon Field Office

### Challenges

The lack of up-to-date information about the conditions of fencelines often made travel where fences were downed or no longer present very difficult. Volunteers were forced to bushwhack, and in many cases where fences were downed, there were no trees or other structures to serve as rubs, thus making tracking animals through the area difficult. We have recorded better data on the fences in the area and with more intimate knowledge of the area should be able to minimize this problem in the future.

Timing of the routes was also difficult to manage due to differential hiking speeds, tracking intensity, and variable presence of wildlife signs. A large amount of flexibility was necessary in route finding and arrival back in camp within the allotted timeframe. The nature of working with large numbers of people means that logistical challenges will often come into play. On longer hikes or more difficult routes, having a "guide" with groups was essential to ensure safety and proper survey techniques .

Radio contact throughout the large distance was a challenge, which led to unnecessary worry and, in some cases, unnecessary effort on the part of volunteers. Higher end radio equipment should be used in the future to eliminate this problem.

While we initially set out to complete whitebark pine analysis of the range in addition to our bear surveys, we found access and time to be limiting factors in these surveys. We were able to conduct some sampling in whitebark pine areas

and findings are reported by Wally McFarlane in *Pilot Study: Gauging the impact* whitebark pine mortality is having on the occurrence of Clark's nutcracker, red squirrel, black bear and grizzly bear.

#### Citizen-Science

The use of citizen-scientists has allowed us to survey a significant portion of the range in minimal time and with minimal cost. Obtaining data from this vast of an area would have been nearly impossible without the effort of the volunteers. Additionally, volunteers have participated in the survey of this area and have expressed that they now feel connected to the area on a much deeper level. Engaging members of the public as citizen-scientists presented a unique opportunity to inform them about grizzly bear conservation in the Centennial range could not have been achieved as quickly and with as much depth as was accomplished without direct hands-on involvement. The value of using citizenscientists is found as much on an intangible level as it is in the time and money saved.

Including team leaders was essential for training individuals about what they were looking for. Paid guides who led groups offered an opportunity for citizen-scientists to ask questions and learn survey methods more quickly.

### **Recommendations for Next Field Season**

It would be useful to gather information from the US Forest Service lands found on the southern slope of the Centennial Range. It is highly likely that

grizzlies are moving through this area at least at an equal rate to the northern slope of the range.

The BLM-Dillon has indicated that there is a desire to repeat these studies in the Gravelly/ Snowcrest Range, located to the north of the Centennial Mountain Range. Like the Centennials, the Gravelly/Snowcrest represent a key area for wildlife movement.

Using more trained guides for future tracking sessions could be helpful in increasing reliability and coverage.

It will be helpful in future years to simplify the naming system for the collection of samples using H for "hairs", BT for "bear tracks", BS for "bear scat", RT for "rub tree", and BD for "bear dig". This will make data analysis far easier and ensure that no information is lost when converting multiple naming systems to a singular system. Encouraging participants to use data sheets rather than simply using notebooks could also be helpful in ensuring the completeness of the data collected.

#### Acknowledgements

Special thanks to: Whitney Leonard, Steve Gehman, Jamie Walton, Wally McFarlane, Louisa Wilcox, Bill West, Hans Cole, Patagonia, the Red Rocks Lakes National Wildlife Refuge, Bob Taft, Kyle Cutting, Tim Bozorth, All project participants.

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# 3. Appendices Data Sheets

Please send data to:						
Adventurers and Scientists for Conservation					URERS	A.SC.
Gregg Treinish					(EN)	IN3
621 N Bozeman Ave					ADV	2T2I
Bozeman, MT. 59715					101	HON
grizzly@adventureandscience.org					CONS	ERVN do
Grizzly Survey	Answers/Options	-	2	ω	4	5
First Name						
Last Name						
Contact Phone						
Email contact						
Date Grizzly Sign obs. (mm/dd/yy)						
Time Grizzly Sign obs.						
UTM Easting (X cood.) 6 digits						
UTM Northing (Y cood.) 7 digits						
What type of sign did you see? Scat Hair Track Bear Dig						
What was the hahitat type?	Whitehark Pine					
	Lodaepole Pine Forest					
	Spruce/Fir Forest					
	Meadow Edge					
	Sage Brush Semi Desert					
	Desert					
How mature was the forest?	Old Growth					
	Mature Trees					
	Mostly Saplings					
Where did you find the sign?	Fence					
	Tree					
	Ground					
	Other					