



The Ecological Society of America's SEEDS Program



**ESA SEEDS Field Trip Report
Rocky Mountain Biological Laboratory
June 7-13, 2009**

Field Trip Overview

The 2009 SEEDS Spring Field Trip took place from June 7-13 at the [Rocky Mountain Biological Laboratory \(RMBL\)](#) in Crested Butte, Colorado, about 200 miles southwest of Denver. The location of this field trip is about 9,500 feet above sea level. This field trip provided a unique opportunity for 18 students to learn from, and hopefully contribute to, scientific research programs taking place at the research station.

For nearly 80 years, leading scientists and students from around the country arrive at RMBL's remote field station high in the Rocky Mountains to work side-by-side studying the still-wild ecosystems of the rugged, yet fragile land. Few places are as well understood, or documented. Research at the Rocky Mountain Biological Laboratory is contributing scientific knowledge that is vital to understanding our rapidly changing world.

The Rocky Mountain Biological Laboratory's mission is to advance the deep scientific understanding of nature that promotes informed stewardship of the Earth. The Lab accomplishes this by providing scientists and students access to diverse natural habitats, infrastructure for high-quality research and education, and a dynamic, collaborative, internationally recognized scientific community. Scientists build on an unusually broad base of knowledge about the ecology of high-altitude habitats, accumulated over decades of research. The combination of a deeply understood place, tools for further investigation, and outstanding people makes the RMBL an ideal training ground for the next generation of leaders in education and research in the field sciences.



During the field trip, students toured RMBL and met with many faculty, staff and graduate students. Students not only learned of the research being conducted at RMBL, but will had the opportunity to conduct group investigations and present their results. In addition, student visited the town of Crested Butte; enjoyed hikes in the area; participated in a career panel and a writing workshop; and learned about the important cultural history of the area. A career panel discussion gave students some ideas of the diverse career paths in ecology. [Opportunities for undergraduate students at RMBL](#) was presented, including [Research Experience for Undergraduates \(REU\)](#) opportunities.

Students were given field notebooks and asked to keep journals. In addition to individual notes, rotating groups of 3-4 students were responsible for writing about each day's events, which was then edited and compiled to create this report. This report reflects the voices of the students who attended the field trip.

A full list of the field trip participants is in Appendix A. The field trip itinerary can be found in Appendix B and a list of the host professionals in Appendix C. Additional information given to students during the field trip can be found in Appendix D. Evaluations are found in Appendix E.

Day One: Sunday June 7th, 2009

Day one of the SEEDS/ESA field trip to the Rocky Mountain Biological Lab (RMBL) in Gothic, Colorado. We have had an eventful travel day all round with several people (including Teresa) missing their connecting flights in Denver. About three quarters of the group arrived in the afternoon along with some REU students from various universities after a harrowing flight on the small aircraft from Denver to Gunnison. The flight was definitely turbulent and scary!

Once on the ground, we were met by Sarah Bonton, Development Director for RMBL, who saved the day with her efficiency and especially her wonderful self. After a quick stop for sandwiches and a few necessities we headed to Gothic with the minivan following the RMBL van with all of the luggage tied on top and covered by a tarp for rain and snow. Almost immediately the tarp tried to liberate itself from the luggage and the van and after several pit stops to re-tie everything we finally shoved all of the luggage and gear on top of people in the two vehicles and made our way to Gothic.

We were greeted by Dave Larson and Ian Billick and the kitchen crew who had kindly put out snacks for us! After a brief but much needed circle introduction everyone pitched in and helped to get the gear to cabins and everyone settled in.

At 6:00 pm we gathered for a delicious dinner and a chance to talk to others at RMBL followed by some time to explore.

It is cold and snowed today although it did not stick on the ground. Tomorrow it is forecast for more snow which will be beautiful. How often do you get to see snow in June? And honestly, who needs to see snow in June?



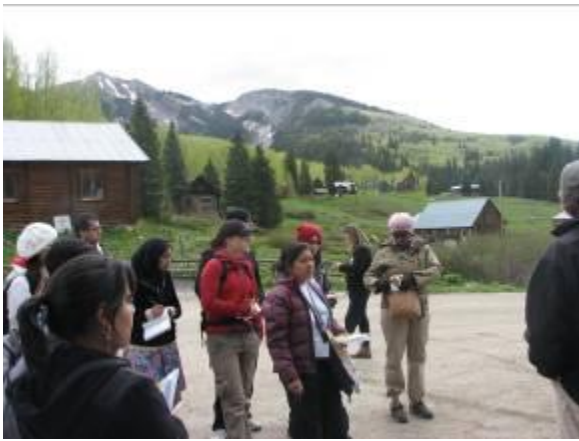
We are hoping that Teresa and others will make it in tonight and that we will have at least a brief orientation as a group. After that it is guaranteed that everyone will fall into bed (sleeping bags) for a sound night's sleep after the long travel day. Tomorrow we will tour Gothic itself, learn the history of RMBL and meet with graduate students and researchers before planning SEEDS research projects.

Teresa and students arrived about 10:00 pm. Tired and hungry. Our SEEDS RMBL orientation was re-scheduled for Monday morning. Eddie, our last delayed passenger arrived mid-morning Monday!

Day Two: Monday June 8th, 2009

Group: Kellen Marshall-Gillespie, Lluvia Alcazar, Ingrid Cepero, and Season Falkler-Rodriguez

The SEEDS Rocky Mountain Field trip began with several unexpected obstacles including rough plane rides and delayed flights. Because of this, many students were forced to arrive after sunset to a very dark and cold Rocky Mountain Biological Lab (RMBL). Nevertheless, they were still welcomed warmly by their fellow SEEDS students as they were introduced to their rustic living quarters. The lack of heat in the cabins resulted in a chilly night for everyone with temperatures reaching close to 37F. Luckily, everyone survived and was able to make it down in time for a traditional breakfast of eggs, bacon, bagels, and English muffins at 7:00 AM. Most students huddled together for warmth with hot tea in hand as they continued conversations from the night before and talked about their late-night adventures to the outhouse. After breakfast, everyone gathered outside to discuss the activities of the day and enjoy the views of the mountains, still dappled with snow and golden aspens.



After a much deserved nutritious breakfast, the SEEDS group became acquainted with what would be their home for the next week with a tour given by RMBL Director Ian Billick. Part of the tour included a brief history of Gothic and how RMBL began its mission. Ian answered questions regarding the life in Crested Butte, precautions to take while out on a hike and questions participants may have about the logistics and overall organization of the field experience. Ian pointed out various native plants as well as invasive plants that are a part of Crested Butte and the surrounding areas. After an informative session with Ian, we broke out for a small break and continued to meet at the Dining Hall for a scrumptious lunch.

After coming back from a lunch break, half of SEEDS students got to experience such a personal connection with a researcher's research through RMBL's marmot man, Dan. Dan began his introduction about his research with Marmot as if watching a soap opera but in wild life. Dan began with three main topics about marmots: friendship, sex, and death. Marmots have become such a passion to Dan that he has even adopted names for them such as Martha and Buttons. After hearing Dan's research on marmots, SEEDS students could feel his strong passion for them and many felt inspired to find their own self passion and care for it just as much as Dan cares for his marmots. Within the breakout groups SEEDS students had a chance to discover the interests of David Inouye who has been studying the flowering patterns and presence of wildflowers at RMBL for over 30 years. His passion and dedication to long term field studies allowed for students to speak to him about his perspective on climate change, hydrology and pollinators at the field station. Not only was it exciting to find out about the various interests of one particular scientist but he also shared his love of science through communicating the significance of field studies at RMBL.



Evening sessions after dinner allowed for the students to speak with scientists David Inouye and Johannes Foufopoulos about research at a field station and working at a field station with all of the unknown and uncontrollable variables. Also a graduate panel discussion with current doctoral students, Jamie Winternitz, Zach German, and Anne Marie Pannetta let SEEDS students know about graduate school and the aspects of applying, finding a mentor, and determining a project. In all the evening ended with a group hug and a bonfire.

Day Three: Tuesday June 9th, 2009

Group: Andrea Marrugo, Erica Fernández, Cindy Li, and Anam Mian

It is Tuesday morning and we wake up to a beautiful day in the mountains. Around the cabin there is a mixture of emotions. We are all excited, hungry, and tired but ready for the day to come. We hiked to breakfast where we enjoyed a warm cooked meal and a variety of conversations with people of many diverse backgrounds. After breakfast, we were divided into two groups according to our interests in research. Half of the group went with John Harte to learn about his climate change project and the other half went with Johannes Foufopoulos to learn about the different vectors of malaria found in sparrows.

Those who left with John Harte took a ten minute hike up a ridge, which is where he decided to conduct his research. When we arrived he showed us ten plots that he had made when he started his research about twenty years prior to our visit. Five of the plots were experimental and the other five were control. Here he told us the details of his project which began before many of us were born. In his experiment he decided to question how climate would affect ecosystems, biodiversity, extinctions and the extreme change of an ecosystem. He decided to test this by applying 25 watts heating pads on five of the plots to see the effects of the warmer temperature on the reproductive system of flowers. He recorded the time of flowering and the amounts of organic carbon in the soil. These results would then allow him to see how the warming climate will affect the reproduction of plants and how that change in reproduction will affect the climate.



John Harte then went on to teach us some terminology and important theories when studying the effects of climate change. He also gave us advice on how to choose the means and place of where to conduct our own research.

The second group who came with Johannes Foufopoulos took a five minute car drive up the mountains to learn about his research on sparrows. When we arrived two of his graduate students talked to us about how to set up the traps in order to catch the sparrows. When we arrived they had already caught the sparrows they needed for that day. Dr. Foufopoulos then talked to us about the effects of disease on ecology. Later he showed us how they drew blood from the sparrows and what kind of lab work they do with the vials of blood. He talked about the DNA testing he does on the blood and the types of vectors that are found in the blood.

From Anam Mian: On Tuesday morning my group and I went with Dr. Johannes Foufopoulos to observe, and learn the wide crowned sparrow disease. The White-crowned Sparrow is a distinctive bird with bold black and white stripes on its head. It has a clear, gray breast and belly, long tail, and wings distinctly marked with two white wing-bars. Each morning Dr. Johannes's grad students catch the birds draw blood from them to take it back to the lab to examine for any kind of disease. I learned that the sparrows with the wide crown carry very good genetic material, but they don't help raise the young one, which is very interesting. In birds the song should communicate 'honest' information about the condition of the singer. It turns out that in white-crowned sparrows this is exactly what happens. The female can tell the genetic condition of the birds by the way they sing. I also learned that the wide crowned sparrows



live in Mexico, come in Colorado during spring to mark their territories, and then females arrive later to mate and lay eggs. I am very thankful to SEEDS for giving me the chance to explore and learn about the different plants and animals.

After we were all done learning about their research projects, we headed over to the diner to enjoy lunch. Then we had a discussion led by Ian Billick about creating our own short-term research project which we had to present at the end of the week. Here he told us about all the factors that go into designing a research project. After our discussion we had dinner and returned to the classroom to learn about the great Research Experience for Undergraduates which is held in summer at RMBL.

To end the day we held a bon fire at our cabin which was the best way to relax and enjoy a great time after such a long and activities filled Fay.



Day Four: Wednesday June 10th, 2009

Group: Edward Realzola, Geldar Matungwa, Juan Ortega Sánchez, and Dana Page

The day started off with another phenomenal breakfast. Grey clouds drifted above Gothic and the air was crisp and fresh. After breakfast the group divided into two separate subgroups. Group A decided to go for an extensive hike to Judd Falls while group B got on two vans to visit Crested Butte.

Judd Falls Hike:

A tall and rustic looking man was leaning against a table in the back of the cafeteria, this man was George Aldridge. George was going to be leading our hike up Copper Creek. We slowly began our ascent towards Judd Falls. As we got higher above the town of Gothic, George explained the brief mining history of the town. Gothic was originally owned by the Ute Indian tribe and the chief of the tribe gave settlers the right to mine and hunt in the area. Slowly,



but surely these miners took over the town looking for silver. The mining times of Gothic were short lived and in 1928 it became a biological research laboratory. As we approached Judd Falls you could hear the water roar. We stopped briefly to observe its power and continued up the mountain into the Copper Creek valley. George talked a lot about the geology of the area and stopped to point out important plants and features. As the trail became less steep, the views and serenity became overwhelming. The mountain peaks towered in the skies as snow clouds danced around them. Bird calls rang from every direction and snow began to tickle our cheeks. We approached an enormous mound of rocks, called a talus and scurried across them precariously. We ended our walk

with a journal reflection in a secluded meadow sprinkled with emerging wild flowers. George bound into the trees and returned with a delicious treat, glacier lilies. Glacier lilies are delicate yellow edible flowers that grow abundantly in early spring. We all cautiously ate our beautiful snack and then continued down the mountain for a well deserved hamburger lunch.

Crested Butte Visit:

One of the SEEDS students cried because the group was being divided. Other trippers were almost crying out of joy because they would use their cell phones for the first time in the week. Happy faces and smiles were everywhere as the students could finally communicate with their parents and closest friends. Crested Butte, the nearest town from the station was twenty minutes away from RMBL. On our way, the majestic mountains elevated in front of our eyes. Everyone was so excited watching those peaks that no one thought of or mentioned turning on the radio. All the stores were closed when we arrived to town, including the heritage museum, the prime reason of our visit. Students separated again to walk the main road and its perpendicular streets. The first open store was a coffee shop at the end of the main street. Others brought ceramics, stickers, postcards, and a variety of cool items for their fellows. When the museum opened a nice guide named, Glo Cunningham received us with great pleasure. It was full of strange artifacts, bicycles, photos, old skies, models and much information. Students gathered around the big town model while Cunningham recounted the town's history



from coal mining until the present. Trippers finished the town visit with a rainy walk before returning to the station. All students ran directly to the dining room when they got back from town.

After lunch, we were given an excellent talk by Mary Price, the author of the upcoming book, "Ecology of Place". The topic of the book was long term research stations and particularly what makes them successful. As a reference, RMBL has on average, a modest 40 ongoing projects and 240 people. However, RMBL has had a huge impact on our understanding of mountain systems. After interviewing scientists who have worked at RMBL, Mary discovered several recurring themes and elements of success. The first element of success is that research stations attract



many scientists with diverse ideas and perspectives. These scientist are in good spirits and enthusiastic about being at the station and often speak with each other about their projects. These interactions often lead to exciting insights and often produce compelling manuscripts. The second element of success is the long term nature of the projects. Longer projects are more likely to produce unexpected results that may have otherwise been missed. Mary encouraged us to consider these elements when conducting our own research projects this week and in the future.

After the discussion with Mary Price, we met in our 3 mini-research groups to collect data. Group 1 was looking at how the speed of river water affects the abundance of larvae in

the East river and the Copper Creek. The group collected samples from an area with fast moving water and slow moving water. Group 2 looked at ant abundance in relation to slope and rock size, while Group 3 looked at the invertebrate abundance in relation to human disturbance along a trail.

Dinner was at 6pm after which, we all gathered for a keynote address by Ron. The audience at this address was composed of the SEEDS students, the RMBL alumni, and the REU students who were conducting several research projects at the site. Ron gave a talk on the "Perfection and Nature of Life: The journey from Primordial soup to Graham H. Pyke." This talk was particularly interesting because it was not entirely about science or ecology but tried to show the strife for perfection from the creation of man, to his religion, evolution, and research. In summary, a question was asked as to whether there is a move towards perfection or imperfection with regards to the different religions of the world, and in research. In research, four different constraints to optimization were identified: design constrains, information constrains, social constrains, and feedback constrains. The night ended with the triumphant struggle to create a bonfire by the Ore House. Some students sat by the fire and worried that two students were lost in the woods. However, these students were not lost, but were watching Twilight Zone episodes in the Rudy Lounge.



Day Five: Thursday June 11th, 2009

Group: Nadine Sur, Manaswi Sangraula, Relena Ribbons, and Nadia Rivera

After breakfast, the SEEDS students met with their respective groups to work on their research projects. The morning was spent either in the field finishing collecting data, or in the laboratory processing and analyzing data.



Some of the groups that worked outside faced rain and snow, which just made the project a little more interesting. One of the groups worked on a project concerning the effects of water velocity on the abundance of larval organisms in Copper Creek and East River. They separated larvae and counted them in the laboratory and then began processing our results. Another examined the abundance of ants in the rocky meadows of Gothic, CO. The third group researched the effects of human disturbance on insect communities. After a delicious lunch, the students returned to the Barclay computer lab to continue the research projects and apply the finishing touches for the presentations tomorrow.

After spending the grueling hours in the field, the groups could finally look at what each of the data meant. Our group in particular spent a significant amount of time entering data from wet data sheets and attempting to discern the field notes we had hastened to scribble down during the morning's snowfall. After data entry, we contemplated what statistical tests we should try to use for our data, given the goals of our project and the range of data we had collected. We got a lot of help from resident RMBL scientists during this endeavor.

The rest of the afternoon was spent differently by each of the research groups. While most concluded and touched up their presentation, others dispersed and engaged in various activities. Dinner time came, and as usual, SEEDS and the other groups RMBL gathered for dinner and mingling afterwards. After dinner, SEEDS staff suggested that we all come together in one of the cabins to spend time with each other. To break the ice, we began with a game, Never Have I Ever, which gave us another opportunity to get to know each other a little more. As the night progressed, we entered a discussion regarding each person's experience thus far at RMBL. Being that most SEEDS students are very passionate concerning what they do, there were instances where teary eyed faces surged in response to the inspirational stories told about the impact SEEDS had on them, not just during this trip, but in their overall lives. As we spoke about diversity in the sciences, some students mentioned the importance of having people who look like you and thus people you can identify with, as role models, and as professors in the sciences.



Nonetheless, all of us agreed that there is always something to learn and admire from the mostly white male researchers that we met at RMBL. But, highlighted was the importance of having diverse faculty, and researchers in the sciences, who would inspire and motivate underrepresented groups to overcome educational, racial and cultural barriers to pursue a career in ecology and the sciences in general. In essence, the different opinions, backgrounds and potential that filled the room represents the heart and beauty of SEEDS, a program where one is challenged intellectually and emotionally by the science and scientists. Most importantly and as occurred this night, SEEDS also is a program where one learns, grows and develops an admiration from each of the unique individuals that compose SEEDS. On a lively note, the cold, cloudy and rainy night ended with each of us departing to our cabins or mingling with fellow SEEDS students.



Day Six: Friday June 12th, 2009

Group: Harris Ferrell Williams, Abdul Hameed Siddiqui, and Courtney Lynn Williams

Overall this is the last day of the SEEDS field trip at the Rocky Mountain Biological Laboratory. It was an exciting and informative experience. We started the day with breakfast, then we went to the Barclay classroom to practice our research presentations.



At 10:30 all three groups presented their research to one another. We also learned more about how ecologists take the time to progress their research. After the presentations the SEEDS students took a trip to the town of Crested Butte. There, the SEEDS students walked around, shopped at the stores and enjoyed the weather. When the students arrived back we enjoyed a delicious lunch of chili dogs and tater tots. Directly after lunch all the students went on a hike to Crested Butte Water Falls.

The dinner bell rang at 6:00 and all the students gathered at the dining hall to enjoy the last supper at RMBL. We enjoyed Mahi Mahi which was prepared by Denny and the rest of the RMBL kitchen staff. We presented appreciation cards to the entire RMBL staff that had been signed by all of the SEEDS participants. After taking group photos we were left to enjoy the rest of our time at the RMBL. This was an outstanding experience that we participated in. Everyone made new friends that will hopefully stay in contact. Also the interaction with the ecologists encouraged many of us to continue our studies and pursue careers in Ecology.



Acknowledgements

The success and continued growth of the SEEDS program is due to the support of many organizations, foundations, corporations, and individuals. We would like to acknowledge and extend our sincere thanks to the following for their contributions to the SEEDS Field Trip to Rocky Mountain Biological Laboratory:

- **The Rocky Mountain Biological Laboratory Site** for their hosting our SEEDS group.

- **All field trip volunteers at Rocky Mountain Biological Lab** who donated their time and expertise to help make this field trip an unforgettable success.

- **The RMBL Dining Services** for providing our meals.

- **All field trip participants:** the students, faculty, and staff who each contributed his/her own special part to the whole. Thank you!

Appendix A

List of Participants

Students

Lluvia Alcazar – Columbia University
Ingrid Cepero – Miami Dade College
Season Falkler-Rodriguez – Occidental College
Cindy Li – New College of Florida
Andrea Marrugo – Miami Dade College
Kellen Marshall-Gillespie – Chicago State University
Geldar Matungwa – Florida A&M University
Anam Mian – Rust College
Juan Ortega Sánchez – University of Puerto Rico, Río Piedras
Dana Page – University of California, Santa Cruz
Edward Realzola – Sam Houston State University
Relena Ribbons – Wellesley College
Nadia Rivera – Occidental College
Manaswi Sangraula – George Washington University
Abdul Siddiqui – Rust College
Nadine Sur – Simmons College
Courtney Williams – Alabama A&M University
Harris Williams – Livingstone College

Faculty Advisors

Cindy Wilber – Stanford University

SEEDS Staff

Teresa Mourad – Director of Education and Diversity Programs, Ecological Society of America

Appendix B

Field Trip Itinerary

Sunday June 7: Arrival

SEEDS students and staff arrive from Gunnison Airport, via vehicles and/or van.
6:00 pm Dinner in Dining Hall
9:00pm SEEDS Introduction

Monday June 8: Introduction to RMBL in Gothic

7:00 am Breakfast in Dining Hall – bring outdoor gear (raincoat, boots, etc)
8:00-9:15 am General introduction of people and the week's schedule – Dining Hall

- RMBL Operations Manager
- SEEDS Staff, Instructors, participant introductions
- Journal writing (led by SEEDS)

9:30-11:30 am Walking Tour of Gothic: History, Ecology, Rocky Mountain ecosystem (RMBL Director)
12:00 pm Lunch in Dining Hall
2:00-4:00 Marmot Observations (Dan Blumstein)
Ongoing Research Projects (David Inouye)
4:00-6:00pm Down time, exploration of area...
6:00 pm Dinner in Dining Hall
7:30 – 9:00 pm **Career Panel** – Barclay Classroom – 4 to 6

- RMBL scientists, graduate students, SEEDS faculty, etc. Discussion of career paths, in rotating small groups.

Tuesday June 9

7:00 am Breakfast in Dining Hall

Group A (11 students max.)

8:00- Van departs for **Field Trip:**
10:30am White Crown Sparrows and
Disease-
Johannes Foufopoulos
Discuss research projects ?

Group B

8:30 -10:30 **Walking tour:**
am Rebecca Irwin- Community Ecology and
Invasive
Plants
Discuss research projects ?

12:00 pm Lunch in Dining Hall
1:30-3:30pm Defining a Research Project (in groups)
4:00-6:00pm Down time
6:00 pm Dinner in Dining Hall
7:00 – 8:00pm **Discussion of local site opportunities, REU Program** (Ian Billick)

Wednesday June 10

7:00 am Breakfast

Group A (11 students max.)

8:00- Van departs for **Field Trip:**
11:30am Walking tour of Crested Butte
Visit Heritage Museum
Writing, reflection

Group B

8:30 -11:30 **Walking tour:**
am Hike to Judd Falls, Copper Creek Trail
Journal writing
Reflection

12:00 pm Lunch in Dining Hall

- 1:30-3:00 pm Discussion of “Ecology of Place” in Rocky Mountains (Mary Price) - Barclay Classroom, and outside
- 3:00-6:00 pm Data collection by research groups (SEEDS Staff, Jennifer Reithel, other RMBL staff)
- 6:00 pm Dinner in Dining Hall
- 7:00 – 9:00pm **Seminar – Keynote Address, Dining Hall** (Graham Pyke)

Thursday June 11

- 7:00 am Breakfast in Dining Hall
- 8:30-11:30 am Data collection by research group (SEEDS Staff, RMBL staff)
- 12:00 pm Lunch in Dining Hall
- 1:30-5:00pm Data analysis and preparation of presentations
- 6:00 pm Dinner in Dining Hall
- 7:00-9:00 pm Journal writing, processing (SEEDS Staff)

Friday June 12

- 7:00 am Breakfast in Dining Hall
- 8:30-10:00 am Grad Student research presentations with opportunity for informal discussion (RMBL grad students)
- 10:30-11:30am SEEDS Group presentations (SEEDS Staff, RMBL staff)
- 12:00 pm Lunch in Dining Hall
- 1:30-5:00pm Hike or drive to Crested Butte or reflection/down time
- 6:00 pm Dinner with RMBL Faculty and Scientists – special dinner
- 7:00-10:00 pm Journal writing, closing, and social time (SEEDS Staff)

Saturday June 13: Departure

- 6:45 am 1st Shuttle departs for airport (for 9:38am departures)
- 7:00 am Breakfast (for later departures)
- 10:00 am 2nd Shuttle departs for airport (for 1:10pm departures)

Appendix C

**List of Participants from Host Site
Rocky Mountain Biological Laboratory
PO Box 519
Crested Butte, CO 81224**

Ian Billick
Director
director@rmbll.org

Dave Larson
Operations Manager
admin@rmbll.org

Jennie Reithel
Science Director
sd@rmbll.org

George Aldridge, Scientist
Dan Blumstein, Scientist
David Inouye, Scientist
Johannes Foufopoulos, Scientist
Mary Price, Author
Graham Pyke, Scientist
John Harte – Scientist
Glo Cunningham – Museum curator

Appendix D - Map of RMBL

