Introduction to the
University of Wyoming’s Rogers Research Site
NORTH LARAMIE MOUNTAINS, WYOMING
By Stephen E. Williams and Robert W. Waggener
This is Bulletin 1 in an ongoing series focusing on research, teaching, extension, and other activities at the University of Wyoming’s Rogers Research Site (RRS) in the Laramie Mountains, north Albany County, Wyoming. The approximate 320-acre site was bequeathed to UW in 2002 by Colonel William Catesby Rogers.

Colonel Rogers spent much of his retirement time at the mountainous, remote property, which he called the Triple R Ranch. UW renamed the property “Rogers Research Site” in memory of Colonel Rogers, who passed away in 2003 at age 96.

The February 16, 2002, amended living trust of Colonel Rogers states that:

saw ranch be used for the public benefit as a center for studies, a retreat for conducting meetings, conducting conferences, or conducting research in connection with the improvement of wildlife and forestry, or to hold as a natural wooded area in its original state with specific instructions that no part of it be subdivided or sold for residential or private business purposes but held as an entire tract. Said restriction is to continue in perpetuity. If violated, said property shall revert to the ownership of the U.S. Forest Service.

Overseeing management of RRS is the Wyoming Agricultural Experiment Station (WAES), UW College of Agriculture and Natural Resources. RRS is placed administratively under one of the WAES research and extension centers, the James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC) near Lingle, Wyoming.

Copyright © by the University of Wyoming. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright appears on all such copies. For other uses, please contact the Wyoming Agricultural Experiment Station at aes@uwyo.edu, or University of Wyoming, WAES, Dept. 3354, 1000 E. University Ave., Laramie, WY 82071-2000.

SUGGESTED REFERENCE


ON THE COVER

RRS and surrounding lands in the Laramie Mountains were dominated by ponderosa pine (Pinus ponderosa) prior to the 2012 Arapaho Fire. The lightning-caused wildfire burned nearly 100,000 acres, consuming the majority of ponderosa on RRS and surrounding lands in the area of Laramie Peak. Both before and following the fire, University of Wyoming faculty, staff, and students initiated a number of research projects at RRS relating to soils and vegetation. This photo shows summer intern James Harkin preparing to plant a ponderosa pine seedling in July 2015 as part of a post-fire restoration study. A number of native grass and forb species established after the fire, including the four species in the foreground: harebells (aka bluebells, Campanula rotundifolia, purple flowers); blanketflower (Gaillardia aristata, yellow/red flowers); common yarrow (Achillea millefolium, white flowers); and sagewort (aka white sagebrush, Artemisia ludoviciana, the silvery plants). Noxious weeds also spread, including cheatgrass (Bromus tectorum), the reddish-brown grass in the lower right, and Canada thistle (Cirsium arvense), the plants in the background with purple seed heads. (Photo by Mattia Herget; cover design by Tanya Engel)

RESEARCH & EXTENSION CENTERS

LARAMIE R&E CENTER (LREC)
Douglas Zalesky, director
University of Wyoming
1174 Snowy Range Road
Laramie, WY 82070
email: lrec@uwyo.edu
phone: (307) 766-3665
www.uwyo.edu/uwexpstn/centers/laramie

POWELL R&E CENTER (PREC)
Bret Hess, interim director
747 Road 9
Powell, WY 82435-9135
email: uwprec@uwyo.edu
phone: (307) 754-2223
www.uwyo.edu/uwexpstn/centers/powell
Seed Certification: (307) 754-9815 or (800) 923-0080; mdmoore@uwyo.edu
Seed Lab: (307) 754-4750; seed-lab@uwyo.edu

SHERIDAN R&E CENTER (ShREC)
Brian Mealor, director
3401 Coffeen Ave.
Sheridan, WY 82801
email: shrec@uwyo.edu
phone: (307) 673-2856
www.uwyo.edu/uwexpstn/centers/sheridan

DISCLAIMER

Mention of a proprietary product does not constitute a guarantee or warranty of the product by the Wyoming Agricultural Experiment Station (WAES) or the authors and does not imply its approval to the exclusion of other products that may also be suitable.

Persons seeking admission, employment, or access to programs of the University of Wyoming shall be considered without regard to race, color, religion, sex, national origin, disability, age, political belief, veteran status, sexual orientation, and marital or familial status.

Persons with disabilities who require alternative means for communication or program information (Braille, large print, audiotape, etc.) should contact the state WAES office on the University of Wyoming campus in Laramie, Wyoming, or a local WAES Research and Extension Center in Laramie, Lingle, Powell, or Sheridan, Wyoming. To file a complaint, write to the UW Employment Practices/Affirmative Action Office, University of Wyoming, Department 3434, 1000 E. University Ave., Laramie, WY 82071-2000.

Be aware that due to the dynamic nature of the World Wide Web, internet sources may be difficult to find—addresses change, and pages can disappear over time. If you find problems with any of the listed websites in this publication, please contact WAES at (307) 766-3667 or aes@uwyo.edu.

Issued in furtherance of State Agricultural Experiment Station work of the 1887 Hatch Act, as amended through public law 107–293, November 13, 2002, in cooperation with the U.S. Department of Agriculture. Bret Hess, director, Wyoming Agricultural Experiment Station, University of Wyoming, Laramie, Wyoming 82071.
CONTENTS

About the authors ................................................................. 1

Standing on The Colonel’s shoulders ........................................ 2

Tribute: The attention that Robert ‘Bob’ Means gave to natural resources was as enormous as his compassion for people ................................................ 4

Chapter 1: Colonel William Catesby Rogers .......................... 5

 Acknowledgments ................................................................. 15

Chapter 2: An introduction to the University of Wyoming’s Rogers Research Site, including site characteristics and initial planning .............................. 18

 Acknowledgments ................................................................. 46

 References cited ................................................................. 48

Appendices

 Appendix A. Colonel William Catesby Rogers, 1906–2003 .................. 50

 Appendix B. Colonel Rogers’ trust benefits a variety of programs and research at UW, including studies relating to forestry and wildlife. ............................. 51

 Appendix C. Ponderosa pine (Pinus ponderosa) plant guide. .................. 53

 Appendix D. Quaking aspen (Populus tremuloides) plant guide. ......... 57

 Appendix E. Antelope bitterbrush (Purshia tridentata) plant guide ........ 61

A note of thanks ................................................................. 65

A personal statement from Steve Williams .............................. 67
ABOUT THE AUTHORS

STEPHEN E. WILLIAMS

University of Wyoming Professor Emeritus Steve Williams, of Laramie, Wyoming, has been involved in a variety of research projects at the Rogers Research Site (RRS), both before and after the Arapahoe Fire. The lightning-caused wildfire burned nearly 100,000 acres of the Laramie Mountains in 2012, including RRS lands. Though the fire consumed much vegetation in the area around Laramie Peak, it gave Williams and other faculty and staff members, along with undergraduate and graduate students, the opportunity to conduct both pre- and post-fire studies, including ecosystem comparisons manifest mostly in physical, chemical, and biological properties of soils.

Working with graduate students, he has been involved in additional research since the fire, including soil amendment and microbial community recovery after fire, as well as the restoration of ponderosa pine and grasses post-fire. Results from those studies will be presented in upcoming RRS bulletins. During his trips to RRS, Williams took and compiled numerous photographs. Many are included in this bulletin, and additional before- and after-fire photos will appear in future bulletins.

While at UW, a career that spanned from 1976 to 2013, Williams served in various capacities including assistant, associate, and full professor of soil science, head of the then Department of Plant, Soil, and Insect Sciences, dean of the UW Graduate School, director of the Wyoming Reclamation and Restoration Center, and professor of soil biology and biochemistry. During this period, he was on more than 140 graduate committees, and he authored or co-authored approximately 50 peer-reviewed publications and has several hundred other forms of publication and professional presentations. His work includes efforts in Wyoming and the U.S., but also from Australia, Northern China, Mongolia, and, most recently, New Zealand. He was involved heavily in a project that evaluated the ecological consequences of the 1988 Yellowstone fires.

Williams earned a B.S. in biology at New Mexico State University (1970), an M.S. in agronomy from NMSU (1972), and a Ph.D. in soil science from North Carolina State University (1977).

ROBERT W. WAGGENER

Robert Waggener of Laramie, Wyoming, is a part-time editor for the Wyoming Agricultural Experiment Station (WAES). In addition to his work on the Rogers Research Site bulletins, he co-edits the annual WAES Field Days Bulletin. Waggener is also part-time copy editor for Rocky Mountain Geology journal, published by the UW Department of Geology and Geophysics.

Waggener focuses his freelance editing, writing, and photography work on agriculture and natural resources in Wyoming and the West. Among his other clients are Penton’s Western Farmer-Stockman magazine, DTN/The Progressive Farmer magazine, and Farm Journal Media.

He worked at The Sheridan Press and Buffalo Bulletin newspapers in northern Wyoming prior to becoming an editor, writer, and photographer for the UW College of Agriculture and Natural Resources/UW Extension in 2004. He then served as editor-in-chief at the Wyoming State Geological Survey before launching his full-time freelance career in 2010.

Waggener earned a B.S. in journalism from the University of Wyoming in 1983, where he also studied sociology and wildlife management. During college, he worked as a biological aide at the Kooskia National Fish Hatchery near Kooskia, Idaho; interned at the Green River Star newspaper in Green River, Wyoming; labored in FMC’s coal-fired power plant near Green River; and co-taught two summer photography classes at UW. These broad experiences encouraged him to follow a career path that would allow him to blend writing, editing, and photography with his interests in agriculture, natural resources, wildlife, and the great outdoors.
“We make a living by what we get. We make a life by what we give.”

Those words by Sir Winston Leonard Spencer-Churchill certainly hold true for a World War II veteran named Colonel William Catesby Rogers, who silently accumulated much wealth during his lifetime, and then shared that wealth with many—whether small sums to help pay for the education of young people or very large gifts to benefit cancer research, fine arts, and the tireless efforts of groups trying to end intolerance. Colonel Rogers certainly made a life by what he gave, and we are equally certain that he would be proud watching undergraduate and graduate students, along with their faculty mentors, conducting research on a small tract of Wyoming land that he called home after retiring from the U.S. Army following a distinguished career.

Colonel William C. Rogers put a gift of land into your hands—your challenge is to receive it, use it beneficially, and one day faithfully hand it to the next generation.

STANDING ON THE COLONEL’S SHOULDERS

By Stephen E. Williams and Robert W. Waggener

It has now been approximately 15 years since the Triple R Ranch in north Albany County’s Laramie Mountains was bequeathed to the University of Wyoming by Colonel William Catesby Rogers. UW and many others owe “The Colonel”—as he was known by many—a debt of gratitude for his generosity and foresight in providing this gift. Colonel Rogers died in 2003, at age 96, but a year earlier he provided instructions in his will for how the gift was to be used. Those instructions are broad enough to accommodate a diversity of uses, but specific enough to secure the approximate 320 acres as a unit to address natural resource management issues on the property and surrounding lands near the prominent Laramie Peak, an area known for its rich variety of wildlife and vegetative species.

The Triple R Ranch has since officially become known as the Rogers Research Site (RRS) in honor of The Colonel. RRS has great potential as a research, teaching, and extension site, notably in the areas of forestry and wildlife resources, per the wishes of Colonel Rogers. The legal will provides a broad set of recommendations for use of the property, and it is our hope that future managers and users, including student, faculty, and staff researchers and those involved in extension and other activities, keep in mind the guidelines established by the remarkable Colonel William C. Rogers.

During his later years he worked quietly and mostly anonymously as a benefactor of many programs and efforts at UW. Only now, years after his passing, are we realizing the impact of this man. And his impact is having a very positive influence on others, including UW students who have and are conducting a variety of research at the remote, mountainous site—from vegetation mapping using high spatial resolution photography to post-fire ponderosa pine regeneration studies to soil microbial recovery after a high-severity forest fire. Their work, which has been in collaboration with UW faculty and staff members, has truly inspired us, and we hope it inspires others to carry on the wishes of Colonel Rogers, who wanted his beloved land to become a center for studies and a place to conduct research for the improvement of wildlife and forestry resources.

“Bill,” as he was known by some, also willed money to UW for the establishment of the Colonel William C. Rogers University of Wyoming Excellence Fund, with the purpose to support a variety of programs at UW and across Wyoming, including those that benefit our state’s wildlife and forests.

But beyond The Colonel’s work—and the work that we do as individuals or teams of individuals—there is a social construct and unwritten contract that we, as members of the group identified taxonomically as Homo sapiens, must attend. ‘Tis more than curiosity that drives this attendance, although the love and excitement of acquiring new insights and knowledge are close to the heart of these endeavors. With this in mind, there is no summary of our social contract more salient or succinct than the words of Albert Einstein:

Bear in mind that the wonderful things you learn in your schools are the work of many generations, produced by enthusiastic effort and infinite labor in every country of the world. All this is put into your hands as your inheritance in order that you may receive it, honor it, add to it, and one day faithfully hand it to your children. Thus, do we mortals achieve immortality in the permanent things which we create in common.

We would expect that Colonel William Catesby Rogers—the man we now know as The Colonel—would whole-heartedly agree with Mr. Albert Einstein and Sir Winston Churchill. The Colonel made a life by what he gave, and may we honor that gift for generations to come.
As research, teaching, and other activities were progressing at the Rogers Research Site (RRS), we learned of the sudden passing of Robert “Bob” Means, who died at his Cheyenne, Wyoming, home on May 26, 2015. He was 61.

Bob was an active participant with the 2011 Wyoming Forestry Best Management Practices Audit Team, which audited several forested sites across Wyoming in an effort to help landowners and managers—both public and private—better manage natural resources on those sites, including forest, wildlife, and water. Among the properties that Bob and his fellow team members toured that year was RRS. Their work at RRS and the subsequent recommendations they made, which are reflected in this bulletin and will be thoroughly discussed in an upcoming bulletin, are helping to pave the way for future management decisions at the remote Laramie Mountains’ site that was donated to the University of Wyoming by Colonel William C. Rogers.

Bob Means, like many of the people who have been associated with RRS research, extension, and teaching, devoted much of his life to bettering our state and country’s natural resources. He worked many jobs with public land management agencies, most recently the U.S. Bureau of Land Management in Cheyenne, where he managed the agency’s state forestry program. He was chair of the Society of American Foresters and a member of the Whitebark Pine Ecosystem Foundation.

“Bob’s attention to natural resources was as enormous as his compassion for people from all walks of life,” states his obituary. “His hobbies overlapped with his work, sanding wood rounds, and counting tree rings on his weekends.”

We extend our thoughts to Bob’s family—wife Maria, daughter Marcela, son Taylor, and brother Rick—as well as his friends, colleagues, and the university students and interns that he mentored. His dedication, talents, compassion, and service are missed.

---

1 The full obituary for Robert “Bob” Means, 1953–2015, is on the Schrader, Aragon & Jacoby Funeral Home website at www.schradercares.com. We thank the funeral home and employee Mary Pino for kindly sharing the obituary and photo of Bob.
Most stories begin at the beginning. But when telling the story of Colonel William Catesby Rogers, it seems only fitting to begin at the end. That day came in spring 2003, when employees of the Neptune Society of Northern California piloted a small craft into the Pacific Ocean, where they quietly disposed of the ashes of Colonel William C. Rogers. No military detail. No three-gun salute. No Taps. No marble headstone amidst weeping redbud trees and manicured green grass. Just a simple, discreet, direct cremation into the cold, deep waters of the Pacific.

That might seem rather unfitting for someone like William C. Rogers. Here’s a decorated colonel who served his country with distinction in the U.S. Army (Fig. 1), a man who was respected and loved across the globe by friends and strangers alike, and a stock investor worth millions of dollars who paid the guys at Neptune exactly $1,275 to carry out their assigned duty as cheaply and efficiently as possible.

As The Colonel’s ashes slowly sank into the Pacific that spring day, a young woman from Wyoming named Colleen Hogan learned that she had been willed $10,000 for her advanced education. And a New York woman received word of a $15,000 gift to improve her job skills. And a letter would arrive at the small library in West Point, Nebraska, informing the trustees that $10,000 was on its way for “fundamental and/or classic volumes.”

There were many others, too, among them the Memorial Sloan Kettering Cancer Center in New York ($500,000), the Association of Handicapped Artists in Broadway, New York ($25,000), and the Southern Poverty Law Center Endowment Fund in Montgomery, Alabama ($500,000).

Many people who knew Colonel Rogers had no idea he was a multi-millionaire until after he died at age 96. And that held true for friends who sat around a crackling campfire on The Colonel’s isolated property in southeast Wyoming’s Laramie Mountains, enjoying a cold beer and salted peanuts with the man they grew fond of in so many ways (Fig. 2). He was a simple man, but at the same time remarkably complex.

People who knew him used words like eccentric, opinionated, powerful, stern, nice, scary, ornery, caring, and kind. Eclectic,
Figure 2. Colleen Hogan and many other guests enjoyed sitting around the campfire with The Colonel. On the log just to the right of Colonel Rogers is a can of beer, a jar of salted peanuts, and a salt shaker. “He really liked salty peanuts with his beer,” says Colleen, who, with her mother, Levida Hileman, spent a portion of each summer from 1977 to about 2000 visiting The Colonel in the Laramie Mountains. Colleen was 17 or 18 when this photo was taken (circa 1987). (Photo courtesy University of Wyoming American Heritage Center, William C. Rogers Papers)

Figure 3. This hand-drawn map shows the general outline of the Rogers’ property (dark blue, right center) and surrounding lands in the Laramie Mountains of northeast Albany County. The year the map was created is unknown. It may have been drawn by Colonel Rogers himself since it is in the William C. Rogers Papers at the University of Wyoming’s American Heritage Center, but that is also unknown. (Map courtesy University of Wyoming American Heritage Center, William C. Rogers Papers)


Yes, militaristic on one hand, hippy-ish on the other. During his career in the U.S. Army, Colonel Rogers toed the military line. But once retired, “Bill” loved to hang out with hippies, and mountain folks, and film festival goers … and well-read scholars, and monks, and missionaries … and Tarahumara Indians living in cliff overhangs … and Zapotec weavers … and liberals bathing nude on isolated beaches in Mexico … and conservatives raising corn in Nebraska or running cattle on high-mountain pastures near his 320-acre chunk of Wyoming real estate that he called the “Triple R Ranch” (Fig. 3).

Individuals and organizations and institutions from all walks of life would discover that their friend Bill—The Colonel—was sending them a gift of appreciation. One of them was the University of Wyoming, which learned before his death that it would be receiving millions of dollars to support the arts, social justice, campus beautification, forestry, and wildlife. And UW would also learn that The Colonel was bequeathing his beloved land to the institution so faculty, staff, students, and others could conduct research on ponderosa pine, quaking aspen, antelope bitterbrush, dwarf mountain ragwort, northern saw-whet owls, Preble’s meadow jumping mice, bitterbrush, dwarf mountain ragwort, northern eared mule deer, and equally long-eared bats, and equally long-eared mule deer. And that’s what this bulletin is all about. It’s our way of introducing readers to the Rogers Research Site, north Laramie Mountains, Wyoming, and its potential for research, teaching, and extension. We’ll cover those latter three things in the coming chapter and Bulletins 2 and 3, but in Chapter 1 we want to tell you about the man named William C. Rogers, for it was his gift of land and money that is helping to pave the way for budding scientists to study the very things that attracted him to Wyoming’s rugged Laramie Mountains following his distinguished—but undoubtedly traumatic—career in the military, which took him, among other places, to the Western Front of the European Theatre during World War II.

Born in Newport News, Virginia, in October 1906, William Catesby Rogers was named after Catesby ap Roger Jones (1821–1877), the U.S. Navy officer who commanded the first Confederate ironclad warship, the CSS Virginia, formerly the U.S.S. steam frigate Merrimac. “Our family is directly related to Catesby Jones,” says Sarah Stark Serra of Williamsburg, Virginia, a niece of Colonel Rogers.

When she was growing up, Sarah called her uncle “Uncle Catesby,” which, unbeknownst to her at the time, was a fitting name for someone destined for the military. “I hate to admit this, but when I was a little girl I was very scared of him. He was a very stern man,” she recalls. But Sarah and other members of her family would really never get to know the real Colonel whom many others would meet down the long road that he traveled, because, for whatever reason, when he left for the military he left his family behind.

‘He lost contact with his entire family by his choice. I don’t know why,” Sarah says. “My brother doesn’t know why. In fact, his wives and nephews know very little about him. We rarely saw him, and he remains quite a mystery to our family. He did occasionally visit his parents in Newport News, but I don’t know where he was living at the time. He had five brothers and sisters and outlived all of them except my mother, who passed away in 2005.”

The last time Sarah saw Uncle Catesby was in 1969, when he returned to Newport News to attend the funeral of his mother. “He was cleaning the gutters of his parents’ home. I guess he was cleaning the gutters because he wanted to help in some way and wanted to keep busy,” she speculates.
By then, a lot had happened in the life of Uncle Catesby, things his family knew virtually nothing about. William Catesby Rogers entered the Virginia Military Institute (VMI) in 1923, at age 16. Rogers, who served as managing editor of the Cadet newspaper and was a member of the VMI Dramatic Club, graduated with the Class of 1927 after earning a bachelor’s degree in liberal arts. He was called to active duty in 1942 and assigned to the rail branch in the office of the Chief of Engineers. He served as commanding officer of a railway shop battalion in the Persian Gulf War. He served as commanding officer of the rail branch in the office of the Chief of Engineers.

Rogers was in Berlin during the hectic days immediately following the armistice, and it was during this period that he acquired a document signed by Adolph Hitler ordering the German people to cooperate with police. Rogers would later donate the order to the War Memorial Museum of Virginia, which stated in a news release that it is one of the very few authenticated Hitler signatures the museum has in its archives.

People who got to know Bill while visiting around a Wyoming campfire decades later say that they learned little about his military career, even when asking questions. Perhaps The Colonel, like many others who returned home from the war, had buried horrific experiences deep within. “He didn’t openly talk about his military service with us and I believe that had to do with us being women, but I’m not sure,” recalls Colleen Hogan, who, as a girl growing up in Casper, Wyoming, would spend part of each summer on The Colonel’s property in the Laramie Mountains with her mother, Levida Hileman. “One day I did ask him about World War II. He didn’t tell me a lot, but he did say that he started out in Africa and that the war was horrible. When Hitler surrendered and the American troops made it into Nazi Germany, his troops were the first to go into the Auschwitz concentration camp. I vividly remember one of the things The Colonel told me. ‘I will never forget the smell. I will never forget the smell of rotting corpses.’”

Maybe the Laramie Mountains helped Colonel William C. Rogers cope with the wartime memories. “There were the fresh scents of late-afternoon summer showers. There were grand ponderosa pines that smelled like vanilla when he peeled the bark back. There were antelope bitterbrush shrubs with fragrant dainty yellow flowers. There were composting layers of quaking aspen leaves on the ground that emitted their distinct earthy smells following early autumn rains. And there were hissing-popping-snapping campfires that gave off musky, mesmerizing wisps of bluish white smoke, smoke that rose to a big Wyoming sky packed full of twinkling stars. In 1955, Rogers, who by that time had been promoted to colonel, received the Ulchi Distinguished Military Service Medal in Seoul, Korea, for his service as chief of the Korean Civil Assistance Command’s transportation branch (Fig. 4). The award, later renamed the Korean Order of Military Merit, Ulchi Class, is the second highest decoration bestowed by the Republic of Korea for military merit. Rogers, who proudly accepted the honor, became a well-traveled man during World War II, serving not only in Korea, but Europe, Africa, and Iran, overseeing such missions as keeping railroad supply lines open to Russia. In 1962, he honorably left one life behind and started another. His travels continued, but this time his destinations were by choice, not by orders from the U.S. Army. Among the lures were the sandy beaches and tree-covered mountains of Mexico.

“He loved Mexico, and he spent a lot of time down there with a woman he adored,” says UW Professor Emerita Rebecca Hilliker, who developed a friendship with The Colonel late in his life. “He and this woman, a cultural researcher, took medical supplies to rural people, to Indians. He loved Mexican culture. He loved the indigenous people. And they really wanted to know more about that whole indigenous culture.”

The Colonel spent extensive time researching the Tarahumara Indians of northern Mexico, the Union Pacific Railroad, Calamity Jane, and windmills, and his fascination with adventure, travel, and history would eventually take him to the western U.S., where he fell in love with a remote piece of the Laramie Mountains. “He was a very reclusive person. The Colonel spent extensive time researching the Tarahumara Indians of northern Mexico, the Union Pacific Railroad, Calamity Jane, and windmills, and his fascination with adventure, travel, and history would eventually take him to the western U.S., where he fell in love with a remote piece of the Laramie Mountains. “He was a very reclusive person.”
man. That’s why we think he bought that isolated piece of land in Wyoming,” speculates The Colonel’s niece, Sarah Stark Serra.

As he embraced retirement, Bill would spend winters in Mexico bathing nude on the beaches and researching indigenous people in the mountains, early spring and late fall laboring on a farm in Nebraska, and summers on his Triple R Ranch in north Albany County, Wyoming, where he chopped wood for the fire and collected cow patties to make compost for his strawberry patch. Though he was reclusive, he loved being around people from all walks, and would run ads in Mother Earth News welcoming strangers to his little place in the hills. That’s how Levida Hileman, a school teacher in Casper, Wyoming, would learn about the man that she and daughter Colleen would grow to admire, respect, and, become forever close friends.

“The ad said there were teepee spaces, cabins, and a sheep wagon for rent in the Wyoming mountains. So I answered that ad. I was a single mother at the time, and it sounded like a neat way to get my kids outdoors,” Levida recalls of that early spring day in 1977. “Within weeks, she and one of her five children, Colleen, along with a friend loaded a car and headed to the ponderosa-covered mountains, where they were greeted by a tall, slender, physically fit man sporting thick white hair and rugged, hand-me-down clothes.

I was 7 years old the first time we went up there,” Colleen says. “We spent the night in a homemade sauna, and that next morning we got dumped on by snow. There were about 8 inches of heavy spring snow and it was still snowing, so we figured we better get out of there (Fig. 5). We were in a hatchback Datsun, so Bill toweled us to the county road. When we got there, he unhooked the car and said, ‘See you later.’”

Colleen starts laughing, before adding: “Bill said ‘See you later’ in a good way. That was his way of saying, ‘I enjoyed seeing you, and you are welcome back.’ It wasn’t a ‘get-off-my-property’ type of thing. It was a good goodbye. Mother had already talked to him about renting his sheep wagon for the summer.”

She thought that maybe Bill admired independent people. I remember Mother saying, ‘Yes, I guess we are on our own. But I want to come back. I feel welcome here.’ “Bill indeed admired independent people, but he also truly made them feel welcome, whether a California hippie on a long, soul-searching road trip, a scholar wanting to talk about the Tarahumara Indians, or a neighboring landowner hired to prune trees. ‘The Colonel moved in as a stranger, but made himself pretty well welcome,’ says Duane Walker, a lifelong Laramie Mountains resident who logged, ranched, chased smoke as a firefighter with the U.S. Forest Service, and, along with his wife, Sharon ‘Tiny’ Walker, helped neighbors, including Colonel Rogers, with whatever they needed help with.”

He was real easy to work for. I would explain what I could do, and he would approve it,” Duane says. “And then when I got finished, I would ask him: ‘Is that what you wanted? Did I get your problem solved?’ ‘Yes, please come back and do some more.’” And when I did do more work for him, he paid me twice as much for doing that work as anybody else around here would have done. He must have thought that I did a pretty dang good job for him.”

Another man who helped Colonel Rogers was Bryan Anderson, who, at the time, was an extension forester for UW Cooperative Extension Service. “Bryan and others would walk public and private lands, including the small parcel owned by The Colonel, marking trees infested with mountain pine beetle and discussing ways to better manage forest resources. ‘One fall day a fellow forester and I were in the area marking when we ran into Tiny Walker. She said we were welcome to stop by Hubbard’s Mountain Cupboard (the locally famous restaurant, bar, and dance hall) and have supper with everyone,’ Bryan says.

‘Tiny told us that The Colonel had bought a couple of turkeys in town, and they were cooking them up at Hubbard’s Cupboard and having a community potluck. After a long, hard day in the field, we enjoyed a wonderful meal and some great conversation with Colonel Rogers and his friends. That is one of the memories of The Colonel that still warms my heart.’ “Those who got to know Bill during his time in the Laramie Mountains spoke of his generosity, whether buying turkeys for a potluck or paying a little extra for a job well done, but following his death in 2003 they were shocked to learn that he was worth many millions. He inherited some money, earned a good salary in the military, lived an incredibly frugal life, and actively traded stocks. ‘He would go out to the county road and wait for the mailman at 1 p.m. every Monday, Wednesday, and Friday to get his Wall Street Journal. He really enjoyed investing. He was a stock market person, and that’s why he got the paper,’ says Brock Hileman, who began spending time at the Triple R Ranch in the early 1980s after developing a relationship with Levida, whom he would soon marry. Brock, like many others, would quickly grow fond of The Colonel (Fig. 7). “We learned later that he had a lot of money, $6 million, $8 million, or $10 million, something like that, but he never spent much of it. He lived in a tiny shack on the property and would get his clothes from The Salvation Army. Sometimes his shirts wouldn’t have buttons, but that didn’t matter to The Colonel. He would even buy secondhand underwear.”

The secondhand underwear story would bring both laughter and tears from Levida and Colleen. “The day they learned he wore hand-me-down briefs, which added one more notch to The Colonel’s growing list of eccentricities, was the same day that they knew something was seriously wrong with their dear friend.”

“One day The Colonel had a severe bleeding attack. I don’t remember the year, but it happened in October,” Levida says. “Colleen and I went up to the mountains for the weekend and found out he was in a hospital in Cheyenne. He was very special to us so we immediately went down there to see him. He had a bleeding ulcer and had all kinds of tubes
He did not want me to go anywhere for those clothes except The Salvation Army. I kind of rebelled when it came to buying him used underwear so I went to a store and bought him some new underwear," Levida recalls like it was yesterday. “You could tell that when he saw the package of new underwear, that was not the right thing to do. He wasn’t happy that I bought him new underwear.”

But that’s one of the reasons people like Colleen Hogan, Levida and Brook Hillman, Duane and Tiny Walker, Bryan Anderson, and Rebecca Hilliker like The Colonel. It was his quirks and his peculiarities and his complexities and the way he lived his life that made the colonel The Colonel. “Bill was such a unique individual, and my life is much better for having known him. He always gave me a different perspective at looking at life,” Colleen says. “He was very, very special to me and a lot of other people. He taught me the importance of making the most with what you have in life. We had no idea that he was worth millions when looking at how he lived. He was happy enjoying the simple things in life. He could have had a huge, elaborate home built up there in the mountains—a home with running water. But he chose to live in this little one-room cabin (Fig. 8) and carry water from a spring up the hill. He kept that bucket by the wood stove and would go out every day and get water. He enjoyed a simple life, and he enjoyed people.”

The last time Colleen and her mother, Levida, saw The Colonel was in 1999, maybe 2000. By then, the tall, slender, physically fit man they had met more than two decades earlier was riddled with arthritis and had become obsessed with getting older. One could tell he was hurting when he walked. That was in pain everywhere. The Colonel, a man who served his country with dignity and pride, a man who helped Indians in Mexico, a man who assisted farmers in Nebraska, a man who lent a hand to neighboring ranchers and loggers and cabin owners in the Laramie Mountains, and a man who welcomed strangers to his little piece of heaven in the mountains—a home with running water. He enjoyed the simple things in life. He could have had a huge, elaborate home built up there in the mountains—a home with running water. But he chose to live in this little one-room cabin (Fig. 8) and carry water from a spring up the hill. He kept that bucket by the wood stove and would go out every day and get water. He enjoyed a simple life, and he enjoyed people.”

The Colonel still corresponded with people such as “Colonel William C. Rogers,” “Uncle Catesby Rogers,” “Uncle Duane,” and others, which, for The Colonel, was not an easy thing to do. Not at all!

There’s another pause in the conversation. This time a longer pause.

Levida then says that she must tell the story of Colonel Rogers and the hand-me-down underwear because that story, like many other individual sending an ambulance down to that small town across the border. “Him sending that ambulance down to Mexico helps explain who Colonel Rogers was,” says Professor Hilliker. “Have you heard of any other individual sending an ambulance down to Mexico to help a community in need? That tells you something about Colonel Rogers.”

As people around the United States and Mexico and Japan were learning that they were in the living trust of Colonel William Catesby Rogers, his ashes were slowly sinking in the cold, blue waters somewhere off the coast of Northern California. The man known as “Colonel William C. Rogers,” “Uncle Catesby Rogers,” was buried at sea. His ashes were scattered in the ocean near the Triple R Ranch, campfire gatherings with strangers to his little piece of heaven in the mountains—a home with running water. He enjoyed the simple things in life. He could have had a huge, elaborate home built up there in the mountains—a home with running water. But he chose to live in this little one-room cabin (Fig. 8) and carry water from a spring up the hill. He kept that bucket by the wood stove and would go out every day and get water. He enjoyed a simple life, and he enjoyed people.”

The relatively frail man had become a hero to many of the people he had developed lasting friendships with. The Colonel had learned through his correspondence that they grew so fond of and cared for during stays on his property (Fig. 9). Others received gifts, too, like a poor community in Mexico. The Colonel had learned through his correspondence that the community was in desperate need of an ambulance, so he instructed his caretaker in California to buy an ambulance and drive it to that small town across the border. “Him sending that ambulance down to Mexico helps explain who Colonel Rogers was,” says Professor Hilliker. “Have you heard of any other individual sending an ambulance down to Mexico to help a community in need? That tells you something about Colonel Rogers.”

As people around the United States and Mexico and Japan were learning that they were in the living trust of Colonel William Catesby Rogers, his ashes were slowly sinking in the cold, blue waters somewhere off the coast of Northern California. The man known as “Colonel William C. Rogers,” “Uncle Catesby Rogers,” was buried at sea. His ashes were scattered in the ocean near the Triple R Ranch, campfire gatherings with strangers to his little piece of heaven in the mountains—a home with running water. He enjoyed the simple things in life. He could have had a huge, elaborate home built up there in the mountains—a home with running water. But he chose to live in this little one-room cabin (Fig. 8) and carry water from a spring up the hill. He kept that bucket by the wood stove and would go out every day and get water. He enjoyed a simple life, and he enjoyed people.”

The Colonel still corresponded with people such as “Colonel William C. Rogers,” “Uncle Catesby Rogers,” “Uncle Duane,” and others, which, for The Colonel, was not an easy thing to do. Not at all!

There’s another pause in the conversation. This time a longer pause.

Levida then says that she must tell the story of Colonel Rogers and the hand-me-down underwear because that story, like many other
Mountains. This photo was taken in 1995. At the time, the Colonel was 89 years old. (Photo courtesy Colleen Hogan)

The Colonel would have been a friend to many, including my grandmother, Levida, and my mother, Colleen, who were close friends with Colonel Rogers during his time on his beloved land in the Laramie Mountains. This photo was taken in 1995. The Colonel would have been 89 years old at the time. (Photo courtesy Colleen Hogan)

Figure 10. Colonel William C. Rogers spent much time hanging out with friends and strangers, doing manual labor, relaxing, reading, writing, and researching (everything from windmills and the Union Pacific Railroad to Calamity Jane and the Tarahumara Indians) on his beloved land in the Laramie Mountains. This photo was taken in 1995. At the time, the Colonel would have been 89 years old. (Photo courtesy Colleen Hogan)

Acknowledgments

Many thanks go to those who are making these Rogers Research Site (RRS) bulletins possible, including the Wyoming Agricultural Experiment Station (WAES); Brett Hess, director of WAES and associate dean in the UW College of Agriculture and Natural Resources; and John Tanaka, associate director of WAES and director of the James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle, Wyoming. I appreciate Brett and John’s votes of confidence to help see these bulletins through to completion so that you can learn about The Colonel, his land that was donated to UW, and the research, extension, and teaching taking place on the site by UW students, faculty, staff, and others.

A strong Wyoming handshake is extended to Steve Williams, the lead author of this and upcoming bulletins; he has been a key player for many years when it comes to research activities at RRS. Steve is now retired after an outstanding career at UW, and taking over RRS oversight are Assistant Professor Linda T. A. van Diepen and Assistant Professor/ Rangeland Extension Specialist John Derek Scasta in the UW College of Agriculture and Natural Resources. Many thanks go to Tanya Engel, graphic designer, and Tana Stith, manager. UW Extension Communications and Technology, for their assistance. Tanya Engel oversaw the graphic design of this and upcoming RRS bulletins, and she worked patiently and professionally with us as we worked through the process of creating a scientific looking, yet visually appealing template for the RRS bulletin series. We are confident that Colonel Rogers would be happy with both the content and the look, but, more importantly, that many people, including UW students, faculty, and staff, are involved in research and other activities on the land that he donated to UW.

Thanks go to those who reviewed all or portions of this bulletin: Linda T. A. van Diepen, Derek Scasta, Ryan Amundson, statewide habitat biologist for the Wyoming Game and Fish Department, Bryan Anderson, district forester with the Wyoming State Forestry Division, Sarah Stark Serra, Colleen Hogan, and Levida Hileman. The mother-daughter pair, Levida and Colleen, became very close friends with Colonel Rogers during summer trips to his land—trips that spanned more than two decades. Bryan Anderson and Ryan Amundson both served on the RRS Management Committee, which met in 2010 and 2011 to formulate short- and long-term objectives for the site. The work of the RRS Management Committee, which was directed by Steve Williams, is summarized in this bulletin and will be detailed in an upcoming RRS bulletin.

I am indebted to those who personally knew Colonel William C. Rogers and kindly agreed to be interviewed for this bulletin. They include Colleen Hogan, now of Wheatland, Wyoming; Levida and Brock Hileman, who retired in Truth or Consequences, New Mexico, but who recently moved back to Wyoming; UW Professor Emerita Rebecca Hilliker, who retired on the High Plains between Cheyenne and Laramie; Sarah Stark Serra, of Williamsburg, Virginia; Duane Walker, who lives in the Laramie Mountains; and Bryan Anderson, of Casper. A “click of the shutter” is extended to Colleen Hogan, who provided photos that she and her mother, Levida, took during their trips to The Colonel’s Triple R Ranch from 1977 through about 2000. Some of those photos (including Fig. 11, next page) appear in this bulletin, and others will be proudly showcased in the introductions of upcoming RRS bulletins.

Mary Laura Khady, archives and records management specialist at the Preston Library, Virginia Military Institute, Lexington, Virginia, provided a great deal of material about The Colonel’s military career in addition to the two military photos appearing in this
chapter. The campfire photo (Fig. 2), the hand-drawn map of the Rogers’ property and surrounding lands in the Laramie Mountains (Fig. 3), as well as additional information about The Colonel himself, came from the William C. Rogers Papers at the UW American Heritage Center. Another collection at the AHC, the Virginia Scully Papers, added additional insight into this man’s life. (If you’re not familiar with the AHC, it’s that big cone-shaped building across the street from the UW athletic facilities. Known as the “Cone on the Range,” the AHC is UW’s repository of manuscripts, rare books, and university archives.)

Though Jim Clyde, of Wheatland, Wyoming, didn’t meet Colonel Rogers personally, he was hired by The Colonel to perform prescribed thinning on his property. During this time, Jim became familiar with both The Colonel and his land while working with others at the site. After UW received the property following the death of Colonel Rogers, Jim was hired to perform additional prescribed thinning as part of both forest management and research projects at RRS. Those involved in these studies, including lead author Steve Williams, speak highly of Jim and the work he performed.

I thank Greg Dyekman for sharing information relating to Colonel Rogers. Greg, a Cheyenne attorney and UW Foundation emeritus board member, became involved on behalf of the UW Foundation in matters relating to the settling of The Colonel’s estate. Toby Marlatt, UW Foundation vice president for marketing and communications, and Tamara Linse, UW Foundation editor, provided additional information about Colonel Rogers.

I offer much thanks and gratitude to my wife, Leslie, who has offered guidance as this and upcoming RRS bulletins have progressed. Leslie has voluntarily proofread copy, shared ideas, and listened to countless stories about a man whom I’ve never met, but whom I have grown to respect and know so well. I am confident that Leslie feels the same way about Colonel William C. Rogers, as does lead author Steve Williams, and, I would imagine, many others who read this and upcoming bulletins. If you missed the “Standing on the Colonel’s Shoulders” column near the beginning of this bulletin that Steve and I co-authored, we encourage you to flip a few pages south to learn why William Rogers, Albert Einstein, and Winston Churchill share something in common. Many others contributed to the development of this and upcoming bulletins in the RRS series, and additional acknowledgments are presented in the upcoming chapter, an acknowledgments section at the back of this bulletin, and the upcoming publications.

Like the people who were fortunate enough to personally meet Colonel William Catesby Rogers, I have gained a deep admiration for the man they called “The Colonel” or, simply, “Bill.” For it was this strong, eccentric, unique, remarkably complex man who lived such a simple life so that in the end he could help so many.
CHAPTER 2

AN INTRODUCTION TO THE UNIVERSITY OF WYOMING’S ROGERS RESEARCH SITE, INCLUDING SITE CHARACTERISTICS AND INITIAL PLANNING

By Stephen E. Williams1-2 and Robert W. Waggener3

INTRODUCTION

The Triple R Ranch in southeast Wyoming was bequeathed to the University of Wyoming in the amended will of Colonel William C. Rogers in 2002. The property passed to the UW College of Agriculture and Natural Resources by 2005, and at the time it was covered with dense and sparse stands of ponderosa pine (Pinus ponderosa) in various age classes (Fig. 1; Appendix C). The property—which officially became known as the Rogers Research Site (RRS)—is now a component of the research and extension program of the University of Wyoming.

Figure 1. Ponderosa pine (Pinus ponderosa) dominated RRS lands and surrounding areas in the Laramie Mountains prior to the 2012 Arapaho Fire. This photo was taken in June 2007. (Photo by Steve Williams)

KEY WORDS
Colonel William C. Rogers, forestry research, Laramie Mountains, planning, ponderosa pine (Pinus ponderosa), post-fire restoration, Rogers Research Site, University of Wyoming, wildlife research, Wyoming Agricultural Experiment Station

1 For specific questions about this report (along with general questions about RRS research, information about access, driving directions to RRS, etc.) please contact the James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC) at sarec@uwyo.edu; 307-837-2000; or 2753 State Highway 157, Lingle, WY 82223-8543.

2 Professor emeritus, University of Wyoming Department of Ecosystem Science and Management, Laramie, Wyoming. Specialties include soil biology and biochemistry, disturbed land reclamation, and restoration.

3 Laramie, Wyoming-based freelance editor, writer, and photographer covering agriculture and natural resources in Wyoming and the West. He is a part-time editor for the Wyoming Agricultural Experiment Station.
centers operated through the college and the Wyoming Agricultural Experiment Station (WAES). Management of RRS is through administrators at the James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC) located near Lingle, Wyoming (SAREC is one of four R&E centers in the state under WAES). The approximate 320-acre (~129.5-hectare) RRS is on the eastern flank of the Laramie Mountains 25 miles (40 kilometers) northwest of Wheatland, Wyoming, and ~five mi (eight km) southeast of the prominent Laramie Peak, the highest point in the range at 10,272 feet (3,131 meters) (Figs. 2–5).

Elevations of the Laramie Mountains are highly variable, ranging from ~4,200 to more than 10,000 ft (1,280–3,000 m). The RRS has an average elevation of 7,000 ft (2,100 m), although elevations range from about 6,700 to 7,300 ft (2,000–2,200 m). At the time the land was given to UW, it was mostly forested with ponderosa pine (Pinus ponderosa [Figs. 1 and 4; Appendix C]) with a few groves of quaking aspen (Populus tremuloides [Fig. 6; Appendix D]). In 2012, a lightning-caused wildfire swept through nearly 100,000 acres of the Laramie Mountains, including RRS and surrounding lands, killing most of the ponderosa pine (Cover; Figs. 4 and 7–8).

The Laramie Mountains provide habitat for hundreds of plant and wildlife species, which helped draw Colonel Rogers to the area. Rogers, in turn, directed UW to use his land, in part, for research relating to wildlife and forestry. Since the 2012 Arapaho Fire, the major focus of efforts by UW, WAES, and the College of Agriculture and Natural Resources has been to develop RRS as a post-fire forestry- and wildlife-focused research site. The parcel that constitutes the site was renamed by UW from the Triple R Ranch to the Rogers Research Site (RRS) in honor of Colonel William Catesby Rogers. It administratively has been assigned to SAREC and thus falls under the duties of the SAREC director, a position at this writing held by John Tanaka, WAES associate director. The SAREC director reports to the WAES director, who doubles as an associate dean for the College of Agriculture and Natural Resources, a position held by Bret Hess. The WAES director, in turn, answers to the College of Agriculture and Natural Resources dean, a post held by Frank Galey, one of seven academic deans in UW colleges who answer to the UW Office of Academic Affairs and UW Office of the President.

Prior to July 2012—when the Arapaho Fire burned across RRS lands—most of the efforts at the site were centered on describing the land, and making its features and opportunities known to the UW academic community, to the State of Wyoming, to federal agencies, and to the general public. During this time a planning effort was initiated (this is covered below and in upcoming RRS bulletins).

In August 2011, a forestry audit team visited RRS (Figs. 9–10). The audit was requested by this bulletin’s lead author and was directed by the Wyoming State Forestry Division. Other members of the team included representatives from the University of Wyoming, Wyoming Game and Fish Department (WGF&D), Wyoming Department of Environmental Quality (WDEQ), Colorado State Forest Service, U.S. Forest Service (USFS), U.S. Bureau of Land Management (BLM), Black Hills Forest Resource Association, and Devils Tower Forest Products. The audit addressed mostly best management practices (BMPs), which were evaluated within the context of: (1) overall planning including soil- and water-resource monitoring and evaluation, sanitary guidelines for construction of temporary camps used by researchers, students, etc., oil and hazardous substance spill contingency, and riparian area protection; (2) permanent and temporary roads, including planning, design, construction, drainage, maintenance, stream crossings and bank protection, tree harvesting/slash treatments, and revegetation; (3) the use of pesticides, herbicides, fertilizers, and other chemicals; and (4) fire management including protection of soil and water from prescribed fires as well as emergency rehabilitation of watersheds impacted by wildfires (Wyoming Forestry Best Management Practices Audit Team, 2012).
Since the audit was conducted, the major focus of RRS has shifted to post-fire research, including ponderosa pine restoration, largely because of the wildfire (Figs. 11A–B). This and upcoming bulletins will provide background information for RRS including natural history, recent human history, an overview of research projects that have either been completed or are in progress, and the status of surrounding lands. Upcoming bulletins will also address current needs at RRS and the potential for further research, extension (outreach), and teaching activities.

CHARACTERISTICS OF THE ROGERS RESEARCH SITE AND SURROUNDING AREA

GEOGRAPHY

RRS and surrounding lands are in the northern reaches of the Laramie Mountains, which extend southerly for ~140 mi (225 km) from Casper Mountain in central Wyoming to northeastern Colorado (Blackstone, 1996). The majority of the range is in Wyoming, where it covers about 3,900 square mi (10,100 square km) (Packer, 2000). This is the famous—and perhaps equally infamous—range between Cheyenne and Laramie, Wyoming, that some four to five million travelers drive over annually as they head either west or east on Interstate 80. At an elevation of 8,640 ft (2,633 m), the “Summit,” as it is known locally, is the highest point on the transcontinental interstate (Wyoming Department of Transportation, 2016) as well as the Transcontinental Railroad. Here at the summit is the Lincoln monument, which memorializes the president and his administration that instituted the construction of the railroad in the 1870s.

The Laramie Mountains have served as not only a singular landmark, but also an impediment for 150 or more years to travelers mostly headed west. People on the Oregon Trail in the mid-1800s had their first view of the Rocky Mountains, including the Laramie Mountains and particularly Laramie Peak; however, the Oregon Trail skirted north around the rugged mountains to avoid the terrain in those days impassible and today sometimes nearly so. Scouts searching for a route across the southern Wyoming range...
north of the Wyoming-Colorado border in extreme southeast Albany County (U.S. Forest Service, 1994; U.S. Forest Service, 1998; Google Chrome, 2014). The northernmost peak in the range, Casper Mountain, which overlooks the city of Casper, Wyoming, has an elevation of 8,130 ft (2,478 m).

The Laramie Mountains northwest of Laramie Peak are interspersed with deep canyons, such as Deer Creek, Box Elder, La Prele, LaBonte, and Horseshoe canyons. Deep canyons are also present south of Laramie Peak. The deepest in the area is the Sybille Canyon between Laramie and Wheatland, Wyoming.

Though the I-80 Summit, which is ~70 mi (113 km) due south of RRS, boasts an impressive elevation, a number of peaks in the range are higher, including the aforementioned Laramie Peak located near RRS. Among other named peaks in the range are Warbonnet Peak (9,414 ft/2,869 m); North (8,306 ft/2,532 m), Middle (8,502 ft/2,591 m), and South (8,725 ft/2,659 m) Sawtooth mountains; Eagle Peak (9,167 ft/2,794 ft); Bear Head Mountain (8,380 ft/2,554 m); Collins Peak (7,915 ft/2,412 m); Red Mountain (6,589 ft/2,008 m); Baldy Mountain (8,607 ft/2,623 m); Sherman Hill (8,492 ft/2,588 m); Pilot Hill (8,859 ft/2,700 m); and Mount Mound (7,891 ft/2,405 m), the latter of which is just

Wyoming along the east side of the Medicine Bow Mountains, and then through the city of Laramie (Fig. 2). The Little Laramie River, which originates in Wyoming’s Medicine Bow Mountains west of Laramie, meets the Laramie River in the Laramie Plains north of the city. The combined river then continues north through the plains and through the Laramie Mountains, eventually meeting the North Laramie River near Wheatland, Wyoming (Fig. 2). The main rivers and streams passing through the Laramie Mountains are tributaries to the North Platte River, which skirts the northern end of the range near Casper before heading in a southeasterly direction toward the Wyoming-Nebraska state line. The extreme southern reach of the Laramie Mountains drains into the South Platte River, which skirts the northern end of the range near Casper before heading in a southeasterly direction toward the Wyoming-Nebraska state line. The extreme southern reach of the Laramie Mountains drains into the South Platte River, which skirts the northern end of the range near Casper before heading in a southeasterly direction toward the Wyoming-Nebraska state line.
core of the mountains. The range was uplifted along Laramide-age reverse faults, which occur along its eastern flank (Blackstone, 1996).

SOILS
Soils of the range are mostly embryonic (recently formed soils exhibiting only early stages of formation), low-nutrient status, shallow, and erodible. They are generally low in pH and salt content. Along water courses, soils are generally much deeper with higher organic matter, and they often have buried horizons. Erosion events can alter these soils periodically during periods of high rainfall—especially post-fire (Reckner, 1998; this study). In flat regions, soils are more developed and have an organic matter content in surface horizons that is characteristic of grasslands. Where precipitation is low, soils exhibit flooding usually only the early stages of weathering persist. Often the vegetation cover here is sagebrush (Artemisia tridentata), and the soils are generally alkaline (high pH). Calcium salts dominate, while sodium salts are also present. Sagebrush dominates, while sodium salts are also present.

Soil Orders of the Laramie Mountains and RRS
Of the 12 orders of soil taxonomy, five orders are found in the Laramie Mountains: Alfisols, Aridisols, Entisols, Inceptisols, and Mollisols (Young and Singleton, 1977; Packer, 2000). Descriptions of these five orders follow: (1) Alfisols are in semiarid to moist areas; they formed primarily under forest or mixed vegetative cover and are productive for most vegetation; (2) Aridisols are soils located in arid climates; they are too dry for the growth of mesophytic plants; (3) Entisols have little, if any, horizon development, and form in such locations as dunes, steep slopes, and flood plains; (4) Inceptisols are the beginning of horizon development; they occur in a wide variety of climates, from semiarid to humid; and (5) Mollisols have a dark-colored surface horizon relatively high in organic matter; they characteristically formed under grasslands (U.S. Department of Agriculture, Natural Resources Conservation Service, 2017).

Soils at RRS are Entisols, Inceptisols, and Mollisols (L. Munn, personal communication, 2017). On forested slopes, the soils are moderately developed Inceptisols and shallow Entisols because of the low inherent fertility, low water-holding capacity due to coarse texture, and erosive nature of the soils. They developed from granitic substrates. Soils found under quaking aspen and herbaceous vegetation along springs and other wet areas are Mollisols and Inceptisols. These soils are deeper, are finer textured, and contain more organic matter than the soils on the forested slopes (L. Munn, personal communication, 2017). Detailed information about soils at RRS, including pre- and post-fire soil comparisons, will be presented in an upcoming RRS bulletin.

CLIMATE
The climate in the Laramie Mountains is semiarid with snowfall during at least half of the year. The growing season (temperatures above 32°F [0°C]) is 100 days or less. Annual precipitation varies from around 12 inches (30 centimeters) in the foothills to as much as 40 in (100 cm) in the mountainous band that stretches from Laramie Peak to Casper Mountain. The balance of the Laramie Mountains lies between these extremes, with probably 16–20 in (41–51 cm) being the most common (Reider et al., 1990).

The number of weather stations in the Laramie Mountains has always been few, and most are now discontinued. One station near Esterbrook (elevation 6,251 ft/1,905 m) operated from 1954 to 1957 and recorded only precipitation. Despite the short time of operation, the station demonstrated the variability of precipitation from year to year (as well as across the same months, although that data are not shown here). From the four-year period, Esterbrook averaged 21.5 in (55 cm) of melted precipitation and 159 in (403 cm) of snow, although variations from these means were as high as 25% (National Oceanic and Atmospheric Administration, 2014a).

The most complete weather records in the vicinity were kept by the Double Four Ranch (elevation 6,119 ft/1,865 m), about four miles (6.5 km) southwest of RRS. Weather data were recorded at the ranch for 50 years, from 1955 to 2005, after which the station was discontinued. Those records show an annual average precipitation of 15.4 in (39.2 cm) and a mean annual temperature of 47.5°F (8.4°C) (National Oceanic and Atmospheric Administration, 2014b; Tables 1 and 2).

The weather at RRS is probably somewhat colder and wetter than at the lower-elevation Double Four Ranch. To establish better weather records for RRS, a weather station with remote access was installed in 2013 (discussed below and in upcoming RRS bulletins).

BIOTA—VEGETATION
A variety of habitat types are found in the Laramie Mountains. They include (1) cottonwood floodplains; (2) foothill grasslands (cool- and warm-season species); (3) foothill shrub lands, e.g., antelope bitterbrush (Purshia tridentata) (Fig. 12; Appendix E), juniper stands (Juniperus species), mountain mahogany (Cercocarpus montanus), and sagebrush-steppe (Artemisia tridentata and other species); (4) mountain meadows, which include a variety of grass and shrub species, among them sagebrush; (5) stands of quaking aspen (Fig. 6; Appendix D) and willow (Salix spp.); (6) ponderosa pine forests; (7) mixed pine, spruce, and fir woodlands; and (8) boulder outcrops and rocky peaks (Packer, 2000; T. Byer, personal communication, 2017; M. Hicks, personal communication, 2017). Found throughout the range, from the lowest to highest elevations, are numerous species of forbs (see below). Water system habitats include a wide variety of riparian areas, wetlands, springs, creeks, rivers, ponds, lakes, and reservoirs.

When Colonel Rogers donated his land to UW, the major habitat type in the site was ponderosa pine forest (Figs. 1 and 4; Appendix C). But there were other macro-vegetative components including quaking aspen (Fig. 6), willow, and a small number of alder (Alnus spp.). The understory was occupied by various rosaceous and chamaephyte shrubs,
Figure 12. Antelope bitterbrush (Purshia tridentata) is an important shrub species for many wildlife species in the Laramie Mountains. It is an essential dietary component of mule deer and bighorn sheep, particularly in fall, winter, and spring. It also provides browse for elk, pronghorn antelope, and domestic livestock, and it’s an important shrub—food or cover—for a host of small animals and birds (R. Amundson, personal communication, 2016). This photo, taken in July 2015, shows antelope bitterbrush re-sprouting following a low-intensity prescribed fire in the Laramie Mountains. Following the 2012 Arapaho Fire, however, there was very little regrowth of bitterbrush from original plants at RRS and surrounding lands because of the intensity of the fire. Instead, regeneration is from the native seedbank. (Photo by Ryan Amundson, WGFD)

Figure 13. Quaking aspen quickly regenerated after the 2012 Arapaho Fire. This photo was taken in 2013. (Photo by S. Williams)
actively regenerating within a couple of years (Fig. 13). In the immediate years following the fire and through 2016, dominant vegetation included grasses, among them bluebunch wheatgrass (Elymus spicatus), forbs, and shrubs (Figs. 14–15), which is typical of post-fire vegetation in this region. Among the many forbs that reestablished include blanketflower (Gaillardia aristata [Fig. 16]), cutleaf daisy (Erigeron compositus), dwarf mountain ragwort (Senecio fremontii), beardtongue (Penstemon spp.), spreading dogbane (Apocynum androsaemifolium), New Jersey tea (Ceanothus velutinus), common yarrow (Achillea millefolium), harebells (Campanula rotundifolia), and sagewort (Artemisia ludoviciana).

Graminoids on RRS include rough bentgrass (aka winter bent) (Agrostis scabra; identified by J. Daniel Rodgers8 and John Derek Scasta9 [personal communication, 2015]). This species is common in mountains and has proliferated at RRS since the 2012 fire. Another grass that has spread rapidly since the 2012 fire is the highly invasive downy brome (Fig. 17, reddish-purple plants in middle), commonly referred to as cheatgrass (Bromus tectorum). Canada thistle (Cirsium arvense) is another invasive plant that was present at RRS prior to the 2012 fire, but in low numbers. There are areas within RRS, however, where this plant has established in dense patches since the fire (Fig. 17, green plants in foreground/some of which have purple heads, and Fig. 18). Future research projects and management efforts at RRS should include weeds (discussed below).

Detailed pre-fire vegetation categories at RRS are presented in an upcoming RRS bulletin titled Vegetation mapping of Rogers Research Sites, north Laramie Mountains, Wyoming, using high spatial resolution photography and heads-up digitizing.

**BIOTA—NON-PATHOGENIC (BENEFICIAL) FUNGI**

A category of non-pathogenic fungi has been recorded at RRS—macrofungi. These were observed abundantly prior to the 2012 fire and included a number of organisms that likely formed mycorrhizal associations with trees, especially ponderosa pine. These mycorrhizal fungi enhance tree growth and reproduction; in fact, many trees cannot survive to maturity without these fungal associations (Bellgard and Williams, 2011).

Mycorrhizal associations aid the host trees in nutrient uptake, provide growth hormones, and antibiotics that protect the trees actively regenerating within a couple of years (Fig. 13). In the immediate years following the fire and through 2016, dominant vegetation included grasses, among them bluebunch wheatgrass (Elymus spicatus), forbs, and shrubs (Figs. 14–15), which is typical of post-fire vegetation in this region. Among the many forbs that reestablished include blanketflower (Gaillardia aristata [Fig. 16]), cutleaf daisy (Erigeron compositus), dwarf mountain ragwort (Senecio fremontii), beardtongue (Penstemon spp.), spreading dogbane (Apocynum androsaemifolium), New Jersey tea (Ceanothus velutinus), common yarrow (Achillea millefolium), harebells (Campanula rotundifolia), and sagewort (Artemisia ludoviciana).

Graminoids on RRS include rough bentgrass (aka winter bent) (Agrostis scabra; identified by J. Daniel Rodgers8 and John Derek Scasta9 [personal communication, 2015]). This species is common in mountains and has proliferated at RRS since the 2012 fire. Another grass that has spread rapidly since the 2012 fire is the highly invasive downy brome (Fig. 17, reddish-purple plants in middle), commonly referred to as cheatgrass (Bromus tectorum). Canada thistle (Cirsium arvense) is another invasive plant that was present at RRS prior to the 2012 fire, but in low numbers. There are areas within RRS, however, where this plant has established in dense patches since the fire (Fig. 17, green plants in foreground/some of which have purple heads, and Fig. 18). Future research projects and management efforts at RRS should include weeds (discussed below).

Detailed pre-fire vegetation categories at RRS are presented in an upcoming RRS bulletin titled Vegetation mapping of Rogers Research Sites, north Laramie Mountains, Wyoming, using high spatial resolution photography and heads-up digitizing.

**BIOTA—NON-PATHOGENIC (BENEFICIAL) FUNGI**

A category of non-pathogenic fungi has been recorded at RRS—macrofungi. These were observed abundantly prior to the 2012 fire and included a number of organisms that likely formed mycorrhizal associations with trees, especially ponderosa pine. These mycorrhizal fungi enhance tree growth and reproduction; in fact, many trees cannot survive to maturity without these fungal associations (Bellgard and Williams, 2011). The mycorrhizal associations aid the host trees in nutrient uptake, provide growth hormones, and antibiotics that protect the trees actively regenerating within a couple of years (Fig. 13). In the immediate years following the fire and through 2016, dominant vegetation included grasses, among them bluebunch wheatgrass (Elymus spicatus), forbs, and shrubs (Figs. 14–15), which is typical of post-fire vegetation in this region. Among the many forbs that reestablished include blanketflower (Gaillardia aristata [Fig. 16]), cutleaf daisy (Erigeron compositus), dwarf mountain ragwort (Senecio fremontii), beardtongue (Penstemon spp.), spreading dogbane (Apocynum androsaemifolium), New Jersey tea (Ceanothus velutinus), common yarrow (Achillea millefolium), harebells (Campanula rotundifolia), and sagewort (Artemisia ludoviciana).

Graminoids on RRS include rough bentgrass (aka winter bent) (Agrostis scabra; identified by J. Daniel Rodgers8 and John Derek Scasta9 [personal communication, 2015]). This species is common in mountains and has proliferated at RRS since the 2012 fire. Another grass that has spread rapidly since the 2012 fire is the highly invasive downy brome (Fig. 17, reddish-purple plants in middle), commonly referred to as cheatgrass (Bromus tectorum). Canada thistle (Cirsium arvense) is another invasive plant that was present at RRS prior to the 2012 fire, but in low numbers. There are areas within RRS, however, where this plant has established in dense patches since the fire (Fig. 17, green plants in foreground/some of which have purple heads, and Fig. 18). Future research projects and management efforts at RRS should include weeds (discussed below).

Detailed pre-fire vegetation categories at RRS are presented in an upcoming RRS bulletin titled Vegetation mapping of Rogers Research Sites, north Laramie Mountains, Wyoming, using high spatial resolution photography and heads-up digitizing.

**BIOTA—NON-PATHOGENIC (BENEFICIAL) FUNGI**

A category of non-pathogenic fungi has been recorded at RRS—macrofungi. These were observed abundantly prior to the 2012 fire and included a number of organisms that likely formed mycorrhizal associations with trees, especially ponderosa pine. These mycorrhizal fungi enhance tree growth and reproduction; in fact, many trees cannot survive to maturity without these fungal associations (Bellgard and Williams, 2011). The mycorrhizal associations aid the host trees in nutrient uptake, provide growth hormones, and antibiotics that protect the trees actively regenerating within a couple of years (Fig. 13). In the immediate years following the fire and through 2016, dominant vegetation included grasses, among them bluebunch wheatgrass (Elymus spicatus), forbs, and shrubs (Figs. 14–15), which is typical of post-fire vegetation in this region. Among the many forbs that reestablished include blanketflower (Gaillardia aristata [Fig. 16]), cutleaf daisy (Erigeron compositus), dwarf mountain ragwort (Senecio fremontii), beardtongue (Penstemon spp.), spreading dogbane (Apocynum androsaemifolium), New Jersey tea (Ceanothus velutinus), common yarrow (Achillea millefolium), harebells (Campanula rotundifolia), and sagewort (Artemisia ludoviciana).

Graminoids on RRS include rough bentgrass (aka winter bent) (Agrostis scabra; identified by J. Daniel Rodgers8 and John Derek Scasta9 [personal communication, 2015]). This species is common in mountains and has proliferated at RRS since the 2012 fire. Another grass that has spread rapidly since the 2012 fire is the highly invasive downy brome (Fig. 17, reddish-purple plants in middle), commonly referred to as cheatgrass (Bromus tectorum). Canada thistle (Cirsium arvense) is another invasive plant that was present at RRS prior to the 2012 fire, but in low numbers. There are areas within RRS, however, where this plant has established in dense patches since the fire (Fig. 17, green plants in foreground/some of which have purple heads, and Fig. 18). Future research projects and management efforts at RRS should include weeds (discussed below).

Detailed pre-fire vegetation categories at RRS are presented in an upcoming RRS bulletin titled Vegetation mapping of Rogers Research Sites, north Laramie Mountains, Wyoming, using high spatial resolution photography and heads-up digitizing.

**BIOTA—NON-PATHOGENIC (BENEFICIAL) FUNGI**

A category of non-pathogenic fungi has been recorded at RRS—macrofungi. These were observed abundantly prior to the 2012 fire and included a number of organisms that likely formed mycorrhizal associations with trees, especially ponderosa pine. These mycorrhizal fungi enhance tree growth and reproduction; in fact, many trees cannot survive to maturity without these fungal associations (Bellgard and Williams, 2011). The mycorrhizal associations aid the host trees in nutrient uptake, provide growth hormones, and antibiotics that protect the trees actively regenerating within a couple of years (Fig. 13). In the immediate years following the fire and through 2016, dominant vegetation included grasses, among them bluebunch wheatgrass (Elymus spicatus), forbs, and shrubs (Figs. 14–15), which is typical of post-fire vegetation in this region. Among the many forbs that reestablished include blanketflower (Gaillardia aristata [Fig. 16]), cutleaf daisy (Erigeron compositus), dwarf mountain ragwort (Senecio fremontii), beardtongue (Penstemon spp.), spreading dogbane (Apocynum androsaemifolium), New Jersey tea (Ceanothus velutinus), common yarrow (Achillea millefolium), harebells (Campanula rotundifolia), and sagewort (Artemisia ludoviciana).

Graminoids on RRS include rough bentgrass (aka winter bent) (Agrostis scabra;
Figure 16. Blanketflower (Gaillardia aristata Pursh) was among the many forbs that reestablished after the 2012 Arapaho Fire. This photo was taken July 23, 2015, just over three years after the wildfire swept through RRS. (Photo by M. Curran)

Figure 17. Highly invasive weeds—including cheatgrass (the reddish-purple plants in the center) and Canada thistle (the green plants in the foreground and background)—quickly spread in some areas after the 2012 Arapaho Fire. This photo was taken in 2014. (Photo by S. Williams)

Figure 18. Canada thistle was present in low numbers at RRS before the 2012 wildfire, but several large patches began establishing following the fire. This photo was taken in 2014. (Photos by S. Williams)

Figure 19. Among the macro-fungi observed are the king bolete (Boletus edulis) (Fig. 19), slippery jack (Suillus luteus), stubby-stalk (Suillus brevipes), and aspen scaber stalk (Lecinum aurantiacum), as well as several hedgehog mushrooms (Hydnum spp.). Other genera observed include the brittlegills (Russula spp.), shaggy mane (Coprinus spp., including C. commatus), field mushrooms (Agaricus spp.), occasionally fly agaric, also known as fly amanita (Amanita muscaria), among others (personal observations by S. Williams, 2005–2015).

BIOTA—ANIMALS

Wyoming is well-known for its wildlife, with more than 600 species of birds, mammals, amphibians, and reptiles (Orabona et al., 2016). Though we are not aware of a specific species list for the Laramie Mountains, the range is home to a rich array of resident and migratory wildlife—along with an equally rich array of resident and migratory insects and a variety of fish species. Collectively, they depend on a great diversity of plants and habitats. Packer (2000) conducted an extensive floristic study of the Laramie Mountains between 1997 and 1998 and identified 929 taxa (1,061 when including historical collections) inhabiting floodplains, grasslands, shrub lands, riparian areas, forests, boulder outcrops, and rocky summits.

The diversity of both animal and plant species across the Laramie Mountains is largely due to (1) wide ranging climatic variation, including mean annual precipitation from rain and snowmelt (~5–40 in [13–100 mm]).
mountain cottontails, *Sylvilagus nuttallii*, mice, including deer mice (*Peromyscus maniculatus*), and coyotes (*Canis latrans*) (Kearns, 2005; personal observations by S. Williams, 2005–2015; Orabona et al., 2016; R. Amundson, personal communication, 2017; T. Byer, personal communication, 2017; M. Hicks, personal communication, 2017).

A northern saw-whet owl (*Aegolius acadicus*) was photographed in an aspen grove in the northern portion of RRS in 2013 (Fig. 22). This owl, although listed as occurring in Wyoming, is uncommon in the state. The northern saw-whet along with other raptors in Wyoming are listed as “species of concern” by the U.S. Fish and Wildlife Service (Wyoming Ecological Services Office, 2016). Turkey vultures (*Cathartes aura*) have been seen in the air over RRS and seem to have nested on the high point near the southern end of the site. Golden eagles (*Aquila chrysaetos*), bald eagles (*Haliaeetus leucocephalus*), and other raptors have been seen in the area, as well as a diversity of smaller birds including songbirds, among them the mountain bluebird (*Sialia currucoides*), western tanager (*Piranga ludovica*), and common nighthawk (*Chordeiles minor*; personal observations by L. Hileman and S. Williams).

Among the reptiles and amphibians that have been observed at RRS and nearby lands is the prairie rattlesnake (*Crotalus viridis*), and common garter snake (*Thamnophis sirtalis*), western toad (*Anaxyrus baxteri*), and the mountain bluebird (*Sialia currucoides*). In addition, prairie rattlesnake (*Crotalus viridis*) is a resident, but more information is needed. USFS currently has only one confirmed sighting, and it was on the western side of the USFS Douglas Ranger District (T. Byer, personal communication, 2017).

**Threatened Species Inhabit Area**

The Preble’s meadow jumping mouse (*Zapus hudsonius preblei*)—listed as “threatened” under the federal Endangered Species Act—is known to inhabit lands around RRS, including the Cottonwood Park and Albany Peak areas (Fig. 22). The most recent detection in this area was in 2014 by the WGFD statewide nongame mammal biologist, Nichole Bjornlie (T. Byer, personal communication, 2017). In 2015, WGFD detected Preble’s along Friend Creek, about seven miles west of RRS (N. Bjornlie, personal communication, 2017). Another threatened species, the northern long-eared bat (*Myotis septentrionalis*), may also occur within the Laramie Mountains as a resident, but more information is needed. USFS currently has only one confirmed sighting, and it was on the western side of the USFS Douglas Ranger District (T. Byer, personal communication, 2017).

**LAND STATUS**

The Laramie Mountains cover approximately 2,5 million ac (1 million ha) in southeast Wyoming, which equates to ~3,900 square mi (10,100 square km). The land status is relatively heterogeneous when compared to most other mountainous areas

---

10 Ryan Amundson is statewide habitat biologist for the Wyoming Game and Fish Department.
in the state where land status tends to be homogeneous. Unlike some of those ranges, the Laramie Mountains are a patchwork of federal, state, and private lands. The lands in private ownership—mostly working cattle and recreation ranches—comprise approximately 70% of the range, or roughly 1,792,000 ac (725,000 ha). However, the single largest landowner in the range, which mirrors the state of Wyoming as a whole, is the federal government. The U.S. Department of Agriculture’s USFS manages approximately 237,000 ac (96,000 ha) in the Laramie Mountains north of the Wyoming-Colorado border. Of this, nearly 180,000 ac (73,000 ha) are in the northern parts (under Douglas Ranger District jurisdiction), while about 57,000 ac (23,000 ha) are in the southern stretches (Pole Mountain Unit of the Laramie Ranger District). All of these USFS lands are in the Medicine Bow-Routt National Forests and are comprehensively administered out of the supervisor’s office in Laramie and the Douglas Ranger District office in Douglas, Wyoming.

BLM and the Wyoming Office of State Lands and Investments each oversee approximately 235,000 ac (95,100 ha) of federal and state lands, respectively, in the Laramie Mountains of Wyoming. Each of these totals is nearly the same amount of land managed by USFS.

Characteristically, ownership types are often mixed over fairly small areas within the Laramie Mountains. These mountains accommodate 108 townships, of which not a single one has contiguous land ownership across all of the 36 square miles (93 square km) that constitute a township. Many townships have state, BLM, and USFS lands mixed with privately owned parcels, and those private lands may have four or five separate owners. There are some large private holdings (e.g., the Double Four Ranch and Warren Livestock holdings), while numerous landowners own smaller tracts of private land. Many of these are used as summer and vacation homes largely because of the recreational activities that the forest affords.

RRS is, for all practical purposes, embedded in lands that are mostly managed by USFS. Within a 5-mi (8-km) radius of RRS, there are roughly 3,842 ac (1,555 ha) of state land and 27,528 ac (11,340 ha) of private land. The remainder, about 19,212 ac (7,775 ha), is USFS land concentrated in the vicinity of RRS (Fig. 24).

HISTORY AND PLANNING AT ROGERS RESEARCH SITE

HISTORY
In September 1984, Colonel William C. Rogers and the University of Wyoming signed an agreement that the Triple R Ranch, owned by The Colonel, as he was known by friends, would transfer to the university. This transfer was made clearer in a trust amendment dated February 16, 2002, in which Rogers indicated that all of his interest in the Triple R Ranch would be transferred to UW at the time of his death, stating...

Prior to the termination of the Trust, I direct that my Successor Trustee convey any interest I retain at my death in Triple R Ranch in the amount of 320 acres located in Township 26 North, Range 71 West, of Albany County, Wyoming, to the University of Wyoming with the requirement that said ranch be used for the public benefit as a center for studies, a retreat for conducting meetings, conducting conferences, or conducting research in connection with the improvement of wildlife and forestry, or to hold as a natural wooded area in its original state with specific instructions that no part of it be subdivided or sold for residential or private business purposes but held as an entire tract. Said restriction is to continue in perpetuity. If violated, said property shall revert to

Figure 23. The Preble’s meadow jumping mouse—listed as “threatened” under the federal Endangered Species Act—is known to inhabit lands in the immediate vicinity of RRS, including the Cottonwood Park and Albany Peak areas. This particular Preble’s was captured in 2015 along Friend Creek, about seven miles west of RRS. Once data was recorded, the male mouse was released unharmed back to the wild. (Photo by Nichole Bjornlie, WGFD)

Figure 24. Land status of RRS and lands within the vicinity. The tannish-colored area in the upper center is RRS property. The blue areas surrounding RRS are USFS lands, while the brown areas to the south and southwest are State of Wyoming trust lands. Other colors represent private lands. (Map courtesy J. Decker/UW Real Estate Operations)
the ownership of the U.S. Forest Service (Rogers, 2002).

Additionally, Colonel Rogers made a large gift to UW to create the Colonel William C. Rogers University of Wyoming Excellence Fund (Rogers, 2002; Appendix B). Funds from this program could tie directly into research, education, outreach, and other activities at and related to RRS. Among the areas that the fund is to support are: (1) forestry programs at UW that help to reforest cleared areas and maintain the health of these forested areas; and (2) wildlife management programs at UW that benefit wildlife in the state.

PLANNING

The Triple R Ranch, now known as the Rogers Research Site (RRS), has been under control of UW for more than a decade. During the last 10 years, WAES and the UW College of Agriculture and Natural Resources have been organizing the property as a forestry and wildlife research station. Part of this decision hinged on opinions of those attending an open house at the Rogers property in 2005 (Fig. 25). Nearly 70 people attended the field day (Kearns, 2005), and 50 visitors filled out a survey that identified forestry research as the primary desired activity at RRS (this will be covered in detail in an upcoming RRS bulletin). The same group also identified wildlife and wildlife habitat as a principle area of focus as well as student education. Other suggested areas of focus that were identified by at least 50% of the survey participants were water and watershed research, weed control and research, and adult outdoor education.

Another field day took place in 2009; this event attracted participants from a variety of UW departments, the Laramie Peak Fire Zone, WGFD, among others (Fig. 26). Input from this event and other meetings at RRS were compiled by the authors, and these suggestions were incorporated into early planning documents (these will be covered in detail in upcoming RRS bulletins).

Rogers Research Site Management Committee

The Rogers Research Site Management Committee was created and charged May 14, 2010, by WAES Director Bret Hess. The committee submitted its final report in early 2011 (this report, along with updates, will be detailed in an upcoming bulletin). The following are summaries of charges made to the committee by Director Hess:

1. Provide input and recommendations on management practices planned to be implemented in the very near future. These include aspen treatments and land acquisition.
2. Develop a management plan (short-term and long-range) for the property, including a protocol for planning and implementing management practices. These include fire management and coordination with the Medicine Bow-Routt National Forests, Wyoming Office of State Lands and Investments, and other federal, state, and local entities.
3. Provide recommendations on how to encourage research, teaching, and outreach at the site.
4. Develop a protocol for how requests to utilize the property should be handled.
5. Provide recommendations for (1) the committee’s role into the future; (2) future committee members’ limits to time in office; (3) selection of committee representatives; and (4) whatever else may be pertinent to the committee’s purview.

There are two clear mandates that must be accommodated at RRS, just as they must be accommodated at any research center managed by UW. The first is that management of RRS should be accomplished such that natural features of the site and activities therein do not pose a risk to users of the facility nor represent risks to landowners in the immediate area (this being said, there is always risk). The intent here is to remove as much risk as possible so as to minimize risk. Second, research, teaching, and outreach activities conducted at RRS should be consistent with the mission of UW as a whole, the College of Agriculture and Natural Resources, WAES, SAREC, UW Extension, and the needs of the citizens of Wyoming and beyond.

Forest Fires Complicate Land Management

There is considerable concern regarding forest fires throughout the western United States. Numerous private and public structures have been—or have the potential to be—threatened by fire because they are embedded in, or are adjacent to, forest lands, an area known as the wildland-urban interface.

Although the mixture of land-ownership and land-use types in the Laramie Mountains makes comprehensive land management problematic, this mixture also provides an opportunity to manage complex ecosystems that are currently under a diversity of management strategies and philosophies, some of which are conflicting. This has been exacerbated by the long-held federal policy to extinguish nearly all forest fires. This policy has led to forests that are overstocked with flammable fuels, and many are decadent and diseased. Land management, including the potential for prescribed fire, becomes even more difficult in places like RRS and surrounding lands because of the increased rural growth in these lands, which has resulted in construction of cabins (Fig. 27), summer and year-round homes, and some
O’Brien, longtime caretaker, burned down during the 2012 Arapaho Fire. Colonel Rogers had a name for all of his cabins—this one was called the “Ever House” (L. Hileman, personal communication, 2017). Jim O’Brien, longtime caretaker of the property when it was owned by Colonel Rogers, lived in this cabin until it was destroyed by the fire. (Photo by Kelly Greenwald)

privately owned camps including a church-sponsored camp near RRS, Camp Grace. This problematic admixture of land ownerships and ecosystem types was tested during the 2012 Arapaho Fire. The lightning-caused wildfire burned ~98,000 ac (39,659 ha) of the Laramie Mountains before being contained in late August. Fire does not respect or recognize political boundaries. The 2012 fire consumed virtually all vegetation at RRS, destroyed rustic cabins (Fig. 28) and several outbuildings, and burned several vehicles (more photos will be presented in upcoming RRS bulletins). A small storage shed was spared, and, miraculously, so was The Colonel’s old sheep wagon, which, by then, had been moved to nearby property that was granted ownership of Colonel Rogers’ property, Colleen and Levida moved the sheep wagon to nearby property that they rent in the Laramie Mountains. The wagon miraculously survived the 2012 Arapaho Fire.

most of the structures at Camp Grace burned including cabins and an auditorium. The problems associated with managing forests partially inhabited by multiple land users is a national problem. At RRS and surrounding areas these problems are magnified because of the fire-prone nature of the vegetation as well as the fire dependency of some of the plant species present. Such policies as “let it burn” versus “no burn,” timber management versus wilderness management, wildlife management versus livestock management, etc. (see Christensen et al., 1989, for an example of some of these conundrums) have the potential to be addressed at least in part at RRS. More saliently, however, is that fire control on RRS will be a function of fire control on surrounding, mostly USFS, lands. Fire control must be part of short-term as well as long-term planning. Fire and fire control could, and likely should, be a theme in research, teaching, and outreach at RRS. This became abundantly clear during 2012 when the Arapaho Fire burned through RRS on July 2 and 3. Most of the trees (and tree species) at RRS burned in this conflagration, which covered 95% of the property. Lightning started the fire on June 27, and it wasn’t contained until late August. This was one of the largest wildfire fires in the region that year, and at its peak about 1,050 firefighters and support crews were assigned to the event (InciWeb, 2012). There were fire mitigations and fencing activities on RRS prior to the July 2012 fire. Activities also included removal of unsafe buildings and clean-up of materials left by former human visitors, including old tires, spent barbed wire, cans, glass, etc. The Arapaho Fire burned several rustic cabins and outbuildings at RRS and significantly damaged most of the fence posts, while ensuing rains washed out cattle guards and roads, and dumped a considerable amount of silt into the small reservoir on the property.

Activities, Research Take Place at RRS Post-Fire

Some of the original charges addressed by the Rogers Research Site Management Committee were abated by the 2012 fire; however, several efforts are ongoing. Although the fence was destroyed during the fire, new fencing is complete, but in need of repair because of damage caused by falling dead trees and large animals, most likely elk. Electrical service to RRS was completely restored after the fire. A forest pathogen inventory was conducted in fall 2014; this included brief surveys for fungal-like pathogens. Soil and vegetation studies have and are taking place. But some proposals have stalled, including monitoring of and improvements to aspen stands. Though meetings have taken place in the past with stakeholders as well as officials with the Medicine Bow-Routt National Forests and Wyoming State Forestry Division, such communications need to be continued. It is our recommendation that talks resume and that both short- and long-term management plans be developed and carried out. (NOTE: co-author R. Waggener interviewed or corresponded by email with more than 50 people to gather information for this and upcoming RRS bulletins. Among them were residents of the Laramie Peak area; employees with the USFS, WGF, Wyoming State Forestry Division, and Wyoming Office of State Lands and Investments; the warden of the Laramie Peak Fire Zone; current and former UW faculty and staff members; former UW undergraduate and graduate students who conducted research at the site; and people who personally knew Colonel Rogers. But these discussions and correspondence were strictly informal and held well after management plans had been instituted. Consequently, they are not part of the various RRS management plans; however, they do provide key updates to the research focuses, management activities, short- and long-term objectives at RRS, etc., that are identified in the plans, which will be

Figure 27. Steve Paisley, UW Extension beef cattle specialist, left, and John Kitten, assistant professor in the UW Department of Agricultural and Applied Economics, visit during the 2009 field day at RRS. In the background is one of the rustic cabins that would burn down during the 2012 Arapaho Fire. (Photo by S. Williams)

Figure 28. Pictured are remains of the rustic cabin shown in Figure 27. The cabin and many other structures in the Laramie Mountains burned during the 2012 wildfire. This photo was taken a year after the fire. (Photo by S. Williams)
discussed in detail in upcoming RRS bulletins. Additionally, the persons contacted and the information they shared provide important platforms for future collaboration and decision-making.

A weather station with remote accessibility was constructed at RRS in 2013 by a former faculty member of the UW Department of Plant Sciences, Assistant Professor Axel Garcia y Garcia, and his graduate student (Fig. 29). The station, however, was heavily damaged by mice (Fig. 30), and it is our hope that repairs are made in 2017 to bring the station back online. This planned effort is being led by Assistant Professor Vivek Sharma in the UW Department of Plant Sciences (more details about the station will be presented in an upcoming bulletin; V. Sharma, personal communication, 2017). In addition to repairing wires and electronic equipment, steps should also be taken to prevent mice and other like creatures from entering the box. It is our recommendation, too, that the UW College of Agriculture and Natural Resources, WAES, and SAREC work with the National Weather Service (NWS) to make this weather station an official cooperative weather station. This could happen through the NWS Cooperative Observer Program.

To better track trends in weather, it is our recommendation that the long-term weather records from existing (e.g., Syfile) and discontinued (e.g., Double Four Ranch, Estebrook) weather stations be comprehensively summarized in an upcoming RRS bulletin to provide future researchers and other users easy access to this information.

A soils map for RRS needs to be completed, and UW Professor Emeritus Larry Munn has agreed to complete this project for a chapter in an upcoming bulletin (L. Munn, personal communication, 2017). The RRS Management Committee also stressed that a marketing plan for the site, including potential to users, also needs to be done. The development of this and upcoming RRS bulletins in conjunction with news releases to promote the bulletins and field days at RRS are major steps in showcasing this facility to the public in general and to potential users at UW and other like institutions. A field day is being planned at RRS for either 2017 (late summer or fall) or 2018 (J. Tanaka, personal communication, 2017).

RRS Ad Hoc Committee

Helping to guide early decision-making in addition to on-site management at RRS was not only the Rogers Research Site Management Committee (discussed above and detailed in an upcoming bulletin), but a committee that met in response to the Arapaho Fire. This committee became informally known as the Rogers Research Site Ad Hoc Committee, and its recommendations for post-fire management and research will also be detailed in an upcoming bulletin.

It is clear that RRS has and can provide an opportunity for pre- and post-fire teaching, research, and outreach. Several UW undergraduate classes have visited RRS both before and after the Arapaho Fire (Fig. 31), and several monitoring and research activities are progressing (Cover; Figs. 6, 11A–B, 15, 29, 32–35). In addition to research summarized in this bulletin, other studies relating to vegetation and soils will be detailed in upcoming bulletins.

**Wildfire Changes Research Opportunities at RRS**

As comes in many walks of life, fortune and serendipity play a large part in the success (and failure) of *Homo sapiens*. That has certainly held true at RRS, where the 2012 Arapaho Fire burned stands of ponderosa pine and aspen and also obliterated some of the early research. But the wildfire also provided tremendous opportunities to study pre- and post-fire changes in soils and vegetation since much research had, fortuitously, already taken place.

In 2006, Mathew Seymour, then an undergraduate student at UW, mapped vegetation at RRS using high spatial resolution photography. The work by Seymour and his co-authors, which will be detailed in an upcoming bulletin, provides pre-fire baseline vegetation data that could prove to be invaluable for future research at RRS and surrounding lands.

And shortly before the Arapaho Fire, a monitoring effort on RRS was initiated. Eight 50-m × 50-m plots (164-ft by 164-ft) were established at random locations around RRS on principle vegetation and soil types (the fire swept across the Laramie Mountains and RRS before a planned ninth plot had been established). Figure 15 shows a member of the Wyoming Conservation Corps stringing the boundaries of a plot. Vegetation on all eight plots was photographed and informally mapped. Soil samples were taken during the winter 2013–2014, mice gained access through an opening in the bottom of the weather station, causing extensive damage. The station needs to be repaired and returned to functionality, and steps need to be taken to avoid future damage by mice and other animals (work on the station was planned for summer 2017). (Photo by S. Williams)
from the center point of each plot to help determine chemical, physical, and biological characteristics of the site; soil horizons were identified as well. These samplings and analyses were finished by mid-June 2012. On July 2 and 3, the wildfire swept across RRS. During the ensuing weeks, soils were resampled at the same eight locations, permanent sites were photographed again, and vegetation mapping initiated (although this was largely an exercise in mapping ash and blackened ponderosa pine trunks (Fig. 8). Although these data sets, both pre- and post-fire, are not unique, they are still the kind of comparative data sets that are hard to come by. They have provided the basis, at least in part, for further experimentation. As discussed in more detail in an upcoming bulletin, the reestablishment of nitrogen-fixing plants at RRS post-fire would be an appropriate project currently and in the future.

**Weeds Take Hold Post-Fire**

Because cheatgrass, Canada thistle, and other noxious weeds are now common in the area, weed and weed control will most likely continue to be an issue at RRS and adjacent lands. A more complete weed survey is recommended at RRS and, if possible, other lands in the area; it is our recommendation that UW collaborate with neighboring landowners, both private and public, as well as the weed and pest control districts from Albany and Platte counties to develop and carry out a management plan to control weeds in the area. During the 2017 growing season, UW master’s degree student Stephanie Winters, working under the direction of Assistant Professor Linda T. A. van Diepen, plans to study the invasive weeds to help determine if earlier erosion control treatments with grass, for example, reduce the occurrence of weeds (L. van Diepen, personal communication, 2017). Opportunities for future research and management are detailed in an upcoming bulletin.

Cheatgrass is on the State of Wyoming, Albany County, and Platte County lists of designated noxious weeds (Wyoming Weed and Pest Council, 2015a, 2015b), while Canada thistle is on the state list (Wyoming Weed and Pest Council, 2015a). These designations mean that these two weeds and the others on the lists “are considered detrimental, destructive, injurious, or poisonous, either by virtue of their direct effect or as carriers of diseases or parasites that exist within the state (Wyoming Weed and Pest Council, 2015a).” Such a listing provides statewide mandate and legal authority to regulate and manage the weeds so listed.

Looking to the Future

Much groundwork has been laid at RRS in terms of planning, on-site management, and scientific studies. Now, it is our hope that UW leaders, faculty and staff members, and students continue to collaborate with others on research projects, outreach activities, outdoor classroom teaching at the mountainous site and neighboring public and private lands, and indoor classroom teaching relating to RRS research. And this should all be done in accordance with the will of Colonel William C. Rogers, who loved sharing his land, and all it offered, with friends and visitors. Per his wishes, the land is now to be used as a center for studies, as a place to hold meetings and retreats, and as a site to conduct research that will improve wildlife and forestry resources not only on this property, but across the Laramie Mountains, Wyoming, and hopefully beyond.
Figure 35 Matt King, left, and Emily Bean, right, University of Wyoming master’s degree students in soil science, along with UW assistant professors Linda T. A. van Diepen and John Derek Scasta, pose for a picture before surveying ponderosa pine restoration plots at the Rogers Research Site on September 30, 2016. (Photo by Elizabeth Traver)
REFERENCES CITED


Packer, B. A., 2000, A floristic study of the Laramie Range, Wyoming [Master’s thesis]: Laramie, Wyoming, University of Wyoming, v + 105 p. (The print version is available in the University of Wyoming Coe Library, UW theses and dissertations, stacks level 1, Bot 2000 .P127. The print version is also available through Interlibrary Loan. The electronic version is available through ProQuest Dissertations & Theses [access is limited to UW-affiliated patrons].)


Rogers, W. C., 2002, Amended living trust of Williams C. Rogers, 18 p.


U.S. Forest Service, 1998, Map of the southern portion of the Medicine Bow National Forest: Laramie Ranger District and Brush Creek/Hayden Ranger District, scale 1:24,000, 2 sheets.


Editor's note: The following obituary appeared in the fall 2003 issue of the Alumni Review, published by the Virginia Military Institute (VMI), Lexington, Virginia. William Catesby Rogers graduated with VMI’s Class of 1927 (his official date of graduation was January 11, 1928). His obituary was provided by Mary Laura Khudy, archives and records management specialist at VMI’s Preston Library. Sarah Stark Serra, a niece of Colonel Rogers, provided additional information about survivors.

WILLIAM C. ROGERS ‘27

William Catesby Rogers ’27 of Carmel, California, died on April 30, 2003. He was 96. Rogers matriculated from Newport News, Virginia, and attended VMI for three and one-half years. He held a bachelor of arts degree in liberal arts from VMI, where he was managing editor of the Cadet newspaper and a member of the Dramatic Club during his first class year.

A veteran of World War II, he was called to active duty in 1942 and assigned to the rail branch in the office of the Chief of Engineers, the Corps of Engineers. He later served in the headquarters of Gen. Carl Gray, who at the time was director general of the Military Railway Service. He served overseas during the war as commanding officer of a railway shop battalion in the Persian Gulf Command. In 1951 he was assigned as chief of the Rail Operations Branch, the Transportation Research and Development Station, at the Army’s Transportation Center, Fort Eustis, Virginia.

In 1955, Rogers, who by that time had been promoted to colonel, received the Ulchi Distinguished Military Service Medal in Seoul, Korea, for his service as chief of the Korean Civil Assistance Command’s transportation branch.

Among his survivors are a sister, Anne Rogers Stark1 of Newport News, Virginia; two nieces, Sarah Stark Serra and Anne Burrell Williams; and two nephews, John Walker Carter Stark and Ernest Rogers Williams.2 Ernest Williams is collecting material for a biography of Rogers and would like to hear from anyone who knew of or worked with Rogers. Williams may be reached at 52 St. Leonards Road, Bexhill-on-Sea, East Sussex TN40 1JB, Great Britain.

APPENDIX B. COLONEL ROGERS’ TRUST BENEFITS A VARIETY OF PROGRAMS AND RESEARCH AT UW, INCLUDING STUDIES RELATING TO FORESTRY AND WILDLIFE.

Editor’s note: The Colonel William C. Rogers University of Wyoming Excellence Fund was established in fiscal year 2010 by the Colonel William C. Rogers Trust. The purpose of the fund is to stimulate creative and innovative activities at UW. The following article—titled “Who is anonymous”—appeared in the fall 2009 UWYO magazine.

By Tamara Linse
Editor, University of Wyoming Foundation

He was not a professional day trader and was untrained in the world of stocks and bonds, but every day he would go to his local library and read the Wall Street Journal.1 He followed the work of investor Warren Buffett, and at one time his fortune grew to $130 million.

For the past 20 years, this individual gave part of what he made to the University of Wyoming, and only a handful of people knew his identity. The many students and faculty who benefited from his almost $4 million in gifts knew him only as “anonymous.” Anonymous turns out to be the extremely private and charismatic Colonel William C. Rogers, who died in Carmel, California, in 2003, at age 96.

“The Colonel wanted to create something that would be lasting for humanity and for the university, two things that he loved. He was a very unique character,” says Chuck Graves,2 his friend and lawyer for almost 30 years.

In 2009, his estate will provide an estimated $1.2 million to programs at UW, but his generosity has benefited UW since 1991. That’s when Colonel Rogers gave UW

---

1 Anne Rogers Stark, 82, died on December 4, 2005, in Newport News, Virginia.
2 Ernest Rogers Williams, of Great Britain, died at age 72.

Figure 1. Colonel William C. Rogers (Ret.) at the throttle of a high horsepower, high speed Union Pacific freight locomotive in Cheyenne, Wyoming, testing and preparing for a full tonnage run west, August 1965. (Photo courtesy William C. Rogers Papers, American Heritage Center, University of Wyoming)

1 We have since learned that Colonel Rogers had the Wall Street Journal delivered to his mailbox in the Laramie Mountains.
2 Attorney Charles E. (Chuck) Graves, of Sheridan, Wyoming, passed away on August 22, 2011. He was 80.
$109,000 for the Half Price Revolving Trust, a loan fund to help students.
In 1997, he contributed $87,000 to establish the Gladys Crane Mountain Plains Film Festival. In 1998, he donated $1.6 million for the Crane Studio, a 4,000-square-foot, state-of-the-art rehearsal hall and studio theater in the UW Fine Arts Building. In 2001, he supported the Matthew Shepard Symposium on Social Justice with $1 million, which was matched with $1 million from the state.

“Colonel Rogers is the most significant donor the UW Department of Theatre and Dance has ever had,” says Dr. Rebecca Hilliker, department head.

Adds Graves: “The Colonel was a brilliant man who thought with the right approach and enough money he could bring UW into the league with the finest liberal arts schools in the country.”

Rogers was born in 1906 in Newport News, Virginia, and earned a degree in mechanical engineering from Virginia Military Institute. During World War II, he served in Iran with the American Transportation Corps to help keep railroad supply lines open to Russia. He also served in Europe and Korea until 1962.

With his varied interests, Rogers was an intellectual who read and researched voraciously. That was his connection to UW—he spent time doing research in the archives of the American Heritage Center.

He researched and published work on Calamity Jane, the Union Pacific Railroad (Fig. 1), Mexico, windmills, and the Tarahumara Indians of northern Mexico.

His interest in UW soon broadened to include film, dance, social justice, forestry, wildlife, and campus beautification. Rogers also believed in tolerance, and he was deeply affected by what happened to Matthew Shepard.

“For someone who came from a straight-laced Virginia family, he was very moderate. He was very liberal,” says Graves.

---

3 Professor Emerita Rebecca Hilliker retired from the UW Department of Theatre and Dance in 2014. She and her husband, Rich Nelson, live between Laramie and Cheyenne, Wyoming.

4 Colonel Rogers bequeathed approximately 320 acres (129.5 hectares) in southeastern Wyoming’s Laramie Mountains to UW for the purpose of conducting research in connection with the improvement of forestry and wildlife resources and for a place to conduct meetings and conferences. Additionally, funds from the Colonel Rogers trust are to support a variety of programs at UW and in the state, including forestry programs that help maintain the health of forested areas and wildlife programs that benefit Wyoming’s wildlife.

5 Matthew Shepard, an openly gay student at UW, was beaten and left to die in the outskirts of Laramie, Wyoming, in October 1998.
PONDEROSA PINE

*Pinus ponderosa* P. & C. Lawson

Plant Symbol = PIPO

Contributed by: USDA NRCS National Plants Data Center

Alternate Names

Uses
*Erosion control:* Ponderosa pine is a rapid growing tree with the ability to firmly anchor into most soil types. For this reason, it is suitable for use as a windbreak species. It can also be used with other natives to provide cover and erosion control on rehabilitated sites.

*Ethnobotanic:* Native Americans used various parts of ponderosa pine for medicinal, building and household, food, and ceremonial purposes. Needles were used as dermatological and gynecological aids. They were also used to reduce coughs and fevers. The pitch was used as an ointment for sores and scabby skin, backaches, rheumatism, earaches, inflamed eyes, and as a sleeping agent for infants.

The boughs of the plant were used in sweat lodges for muscular pain, as decoctions for internal hemorrhaging, and as infusions for pediatric treatments.

The roots of ponderosa pine were used to make blue dye and needles were used as insulation for underground storage pits. The wood was used extensively for fence posts, boards for general construction, and to fabricate snowshoes. Single logs were used to make dugout canoes. Bark was used to cover houses.

Most parts of the plant were used for food, including the pitch, seeds, cones, bark, buds, and cambium. The pollen and needles were used in healing ceremonies.

*Ornamental value:* Ponderosa pine has a lush green color and pleasant odor that makes it popular for ornamental plantings. It has been planted, sometimes out of its natural range, because of its aesthetic qualities. Ponderosa pine is used as borders of forested highways, but is not planted within the right-of-way. The large stature of the tree limits its use to open spaces.

*Wildlife:* Red-winged blackbirds, chickadees, mourning doves, finches, evening grosbeak, jays, Clark's nutcracker, nuthatches, rufous-sided towhee, turkeys, chipmunks and squirrels consume the seeds of ponderosa pine. Blue and spruce grouse use ponderosa pine needles for nesting material. Mice, porcupines, and other rodents use the bark for nesting material. The trees are also important to various birds for cover, roosting and nesting sites.

*Wood production:* Ponderosa pine is one of the most important timber species in the western United States. The annual production of ponderosa pine is ranked third behind Douglas fir and hem-fir. Approximately 1.3 billion board feet of ponderosa pine lumber is produced annually out of Oregon, the largest supplier in the United States. It is popularly used for the construction of buildings.

Description
*General:* Pine Family (Pinaceae). Ponderosa pine is a large tree that lives 300 to 600 years and reaches heights of 30 to 50 m tall and 0.6 to 1.3 m in diameter. The oldest trees can exceed 70 m in height and 2 m in diameter. The bottom one-half of the
straight trunk is typically without branches. The crown of ponderosa pine is conical to round-shaped. The bark is characteristically orange-brown with a scaly plate-like appearance. Twigs are stout, up to 2 cm thick, orange-brown, and rough. Needles are 12 to 28 cm long, thin, pointed with toothed edges, occur in bundles of three, and give a tufted appearance to the twig. Buds are up to 2 cm long, 1 cm wide, red-brown with white-fringed scale margins. Male cones are orange or yellow and are located in small clusters near the tips of the branches. The female cone is oval, woody, 8 to 15 cm long, with a small prickle at the tip of each scale. Flowering occurs from April to June of the first year, and cones mature and shed winged seeds in August and September of the second year.

**Distribution:** Ponderosa pine is distributed from southern British Columbia through Washington, Oregon, and California, and east to the western portions of Texas, Oklahoma, Nebraska, North Dakota, and South Dakota. For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site (http://plants.usda.gov).

**Habitat:** Ponderosa pine trees occur as pure stands or in mixed conifer forests in the mountains. It is an important component of the interior Ponderosa Pine, Pacific Ponderosa Pine-Douglas fir, and Pacific Ponderosa Pine forest cover types.

In the northwest, it is typically associated with Rocky Mountain Douglas fir, lodgepole pine, grand fir, and western larch. In California it is associated with California white fir, incense cedar, Jeffrey pine, sugar pine, coast Douglas fir, California black oak, and western juniper. In the Rocky Mountains and Utah, it is associated with Rocky Mountain Douglas fir, blue spruce, lodgepole pine, limber pine, and quaking aspen. In the Black Hills, it is associated with quaking aspen, white spruce, and paper birch. In Arizona and New Mexico, it is associated with white fir, Rocky Mountain Douglas fir, blue spruce, quaking aspen, gambel oak, and southwestern white pine at higher elevations and Rocky Mountain juniper, aligator juniper, and Utah juniper at lower elevations (Oliver & Riker 1990).

**Shrubs and grasses typically associated with ponderosa pine within its range include camasroot, sagebrush, oak, snowberry, bluestem, fescue, and polargrass.**

**Adaptation**

The USDA hardiness zones for ponderosa pine range from 3 to 7. It grows on a variety of soils from shallow to deep, and from gravelly sands to sandy clay loam. It is found growing on bare rock with its roots in the cracks and crevices. It has a low tolerance to alkalinity, preferring soils with a pH of 6.0 to 7.0. It grows best in zones with 30 to 60 cm average annual precipitation on well-drained soils. Once established it also survives hot and dry conditions, exhibiting medium to good drought tolerance. Fifty percent shade reduces the growth rate significantly. It withstands very cold winters.

Ponderosa pine is a climax species at the lower elevations of the coniferous forest and a mid-successional species at higher elevations where more competitive conifers are capable of growing. It generally grows at elevations between sea level and 3,000 m. The populations at higher elevations usually occur within the southern part of its range (Oliver & Riker 1990).

**Establishment**

Site preparation is needed to control competition, which compromises seedling survival and growth. Seeds are sown in late March to early April. The seed is sown for an initial density of 237 seedlings/m² (22 seedlings/ft²). Transplant stock should be one or two years old, with less than 2 prior transplantings, and 15 to 30 cm in height. Space the plants 1 to 3 m apart depending on the site.

Initial seedling survival is reduced under moisture stress. Older seedlings can tolerate limited moisture. Competition from other vegetation should be controlled for the first three to six years until the trees become well established.

**Management**

Ponderosa pine can be over-irrigated in poorly drained soils, or drown out on high water table sites. It responds well to thinning, which should be done as stands become older to develop larger crowns resulting in heavier seed crops for wildlife. More forage for deer and elk become available from associated plants by opening the canopy. The use of repellents or other control measures may be necessary to prevent overuse of the trees by rodents.

Ponderosa pine is resistant to fire due to its thick bark. Low intensity surface fires control competitive species like scrub oak and shade-tolerant conifers. Ponderosa pine seedlings can also survive low intensity burns.

**Pests and Potential Problems**

Approximately 200 insect species affect ponderosa pine from its cone stage to maturity. Pine cone beetles cause tree death by transmitting blue stain fungus to the tree. Their larvae also consume the phloem of the host branch, creating stem cankers that leave the wood weak and unsuitable for use as lumber. This weakens the tree and leaves it susceptible to fungal infections and insect attacks. Root diseases, rusts, trunk decays, and needle and twig blights also cause significant damage.

**Seeds and Plant Production**

Ponderosa pine is propagated by seed. Cones are ready for collection in October and November when they turn reddish brown. Mature seed is firm and brown in color. Cones should be dried on canvas tarp in a well-ventilated area immediately after they have been collected. The seeds will drop from the cones as they dry.

Several germination methods for ponderosa pine have been utilized, each with their own variations. In general, seeds undergo an inhibition treatment before stratification. Seeds are placed in mesh bags and soaked in cold running water for 48 hours. One variation is to soak the seeds in a 40% bleach solution for 10 minutes with hand agitation prior to placing them under running water. The mesh bags are placed in plastic bags and stored at 1°C for 2 to 8 weeks. They should be checked daily for mold.

Seeds are sown into containers and covered with media. The media should be kept moist throughout germination. Germination will occur at an average greenhouse temperature of 20°C. Alter species greenhouse temperatures of 21-25°C during the day and 16-18°C at night are an appropriate environment for germinating seeds. Germination will occur in approximately 15 days.

Seeds are thinned and watered daily throughout the establishment phase. They should not be moved outdoors until after the last frost of the year.

Seeds can be dried to between 5 and 8% moisture and placed in airtight plastic bags, then stored for long periods of time in freezers set at -15°C.

**Cultivars, Improved and Selected Materials (and area of origin)**

Contact your local Natural Resources Conservation Service (formerly Soil Conservation Service) office for more information. Look in the phone book under “United States Government.” The Natural Resources Conservation Service will be listed under the subsection “Department of Agriculture.”

**References**


APPENDIX D. QUAKING ASPEN (PUPULUS TREMULOIDES) PLANT GUIDE.

QUAKING ASPEN
Populus tremuloides Michx.
Plant Symbol = POTR5

Contributed by: USDA NRCS National Plant Data Center & the Biota of North America Program

Plant Guide

Conservation: Quaking aspen is valued for its white bark and brilliant fall color, especially when clustered. The species has been widely used in landscaping but is best in sites away from structures that might be damaged by the aggressive roots. The trees provide good visual screening and noise abatement.

Aspen stands are good firebreaks, often dropping crown fires in conifer stands to the ground when they reach aspens and even sometimes extinguishing the fire because of the small amount of flammable accumulation. They allow more ground water recharge than do conifer forests and they also play a significant role in protecting against soil erosion. They have been used in restoration of riparian habitats.

Wildlife: Young quaking aspen provide food and habitat for a variety of wildlife: black bear, deer, beaver, porcupine, elk, moose, ruffed grouse and many smaller birds and animals, including small mammals such as mice, voles, shrews, chipmunks, and rabbits. Bark, buds, new sprouts, twigs from the tops of fallen or logged trees, and fallen leaves all are wildlife foods.

Ethnobotanic: Native Americans used Populus bark (including aspen) as a food source. They cut the inner bark into strips, dried and ground it into meal to be mixed with other starches for bread or mush. Cankins were eaten raw, and the cambium was eaten raw or in a soup.

Status
Please consult the PLANTS Web site and your State Department of Natural Resources for this plant’s current status, such as, state noxious status and wetland indicator values.

Description
General: Willow Family (Salicaceae): This is a native tree 5-30 m high, typically less than 15 m, with a rounded crown; lateral roots may extend over 30 meters and vertical sinker roots from the laterals may extend downward for nearly 3 m; bark is typically smooth, greenish-white to gray-white, often thin and peeling, becoming thicker and furrowed with age, especially toward the base. Leaves are simple, deciduous, broadly ovate to nearly round, 4-6 cm long, with small, rounded teeth on the margins, on a

Alternate Names
Trembling aspen, golden aspen, mountain aspen, trembling poplar, white poplar, popple, aspen

Uses
Industry: Quaking aspen is an important fiber source, especially for pulp, flake-board, and other composite products. The wood is light and soft with little shrinkage (see Wheeler 2000) and is used for pallets, boxes, veneer, and plywood. Higher grades are used for other solid wood products, such as paneling, furniture components, and flooring. The wood characteristics make it useful inmiscellaneous products, including excelsior, animal bedding, matchsticks, toys, beehives, tongue depressors, spoons, and ice cream sticks. It makes good playground structures because the surface does not splinter, although the wood warps and is susceptible to decay.

Plant Materials <http://plant-materials.nrcs.usda.gov/>
National Plant Data Center <http://npdc.usda.gov>
slender, flattened petiole, dark green and shiny above, pale green below, turning bright yellow, yellow-orange, gold, or reddish after the first frosts. The male (staminate) and female (pistillate) flowers are on separate trees (the species dioecious – or ‘polygamodioecious,’ because bisexual flowers may be produced at low frequencies on staminate and pistillate trees), each type of flower borne in pendent catkins. The fruits are narrowly ovoid to flask-shaped capsules 5-7 mm long, splitting to release the seeds; seeds ca.2 mm long, each with a tuft of long, white, silky hairs, easily blown by the wind. The common name is in reference to the shaking of the leaves in light wind.

Variation within the species: Considerable genetic and morphological variation exists over the range of quaking aspen. A number of species and varieties have been described but none are currently recognized. Entire stands are often produced as a single clone from root sprouts – this sometimes easily observable on a single mountainside in different timing in leaf appearance or in different hues and timing of fall coloration. Distinctive large tripped rides are sometimes found.

Quaking aspen hybrids naturally with bigtooth aspen (Populus grandidentata), narrowleaf cottonwood (P. angustifolia), curly poplar (P. canescens), balsam poplar (P. balsamifera), eastern cottonwood (P. deltoides), and white poplar (Populus alba, a naturalized European species), and hybrids with black cottonwood (P. trichocarpa) occur rarely in Alaska. Quaking aspen, European aspen (P. tremula), and three Asian species are closely related and sometimes classed together as a single, circumglobal superspecies (see Peterson and Peterson 1992).

Distribution

Quaking aspen is the most widely distributed tree species in North America. It is native to all the provinces of Canada and the U.S., except the Northwest Territories and Nunavut, Alaska, and northernmost parts of the Yukon Territory and the Northwest Territories. In the contiguous U.S., it is found in all 48 states, except Hawaii, the District of Columbia, and Puerto Rico. Quaking aspen is also widely grown in temperate zones of the world, including Europe, Asia, and South America. It is the dominant species in the boreal forest region of North America, extending southward into the eastern deciduous forest region, where it is found in a wide variety of habitats, from mountains to lowlands, from coastal areas to inland valleys. It is commonly found in moist, well-drained soils, but it can also be found in dry, sandy soils, and in all types of soil except saline soils. Quaking aspen is often found in disturbed sites, such as clearings, fencerows, and roadsides.

Adaptation

Quaking aspen occurs in a wide variety of habitats (including soil type and moisture conditions) and at a great range of elevation, matching its extensive geographic range. It characteristically forms pure stands or mixed stands with bigtooth aspen, but it occurs with scrub oaks and sedgebrush at lower elevations and as a prostrate form above timberline and exists as a dominant species in many communities at mid elevations. It is a shade-intolerant, disturbed site species and is quickly replaced in succession by more tolerant species. Some trees are self-pruning, dropping numerous small twigs with excess fall foliage and returning nutrients to the soil. Leaves decay relatively rapidly, and a characteristic “aspen soil,” with a higher pH than on conifer-dominated soils, develops on sites that have supported aspen for a number of generations.

Flowering occurs March–April (East) or May–June (West), before the leaves appear and flowering in May–June (~July), often before the leaves are fully expanded. Temperatures above 12°C for about 6 days apparently trigger flowering. Female trees generally flower and leaf out before male trees.

Establishment

Quaking aspen commonly establishes from seed in Alaska, northern Canada, and eastern North America. Seedling establishment is less common in the West but occurs there in moist sites such as kettles and other topographic depressions, seeps, springs, lake margins, and burn-out riparian zones. Drought stress kills seedlings, as does standing water.

Young trees first flower at 2-3 years but production of large seed crops begins at about 10-20 years; maximum seed production occurs at 50-70 years. Heavy seed crops are produced at 4-5-year intervals. Seeds are wind-dispersed for distances of 500 meters to several kilometers.

Germination generally begins nearly immediately after moisture is received and can occur across a broad temperature range, with optimal germination at 15-25°C. Surface placement or a very shallow depth of burial on exposed mineral soil (such as burned or scarified sites) apparently provide the best environment for germination. Continuous moisture is required.

Sexual reproduction and clones

Reproduction of quaking aspen is primarily by root sprouts, and extensive clones of root-interconnected trees are characteristic of the species. Most root sprouts develop on 10-50 meters of the parent stem, although some are produced at 30 meters or more. They develop from roots within 2-10 centimeters of the surface. Growth in primordia and buds is suppressed by apical dominance but resumes after stems are top-killed by fire, harvest or wind-breakage, or after defoliation and many thousands of sprouts per acre may be produced. Removal of the apical meristem portion in late May or early June after maximum auxin production (the chemical agent of apical dominance) results in fewer suckers than top-removal during the dormant season. Sprouts produced in a closed stand usually die unless in a canopy gap. Saplings may begin producing root sprouts at 1 year of age.

Stands of quaking aspen consist of a single clone or represent a mosaic of different clones. Even in small areas, wide variation in genetic traits exists between clones – differences may be seen in leaf shape and size, bark colour and texture, branching habit, resistance to disease and insect attack, sexual expression, growth rate, and phenology. The most conspicuous differences may be in the timing of spring leaf flush and in autumn leaf coloration.

The staminate-pistillate ratio of clones is 1:1 in most localities, but in the eastern US staminate trees may outnumber pistillate trees by 3:1. Some clones alternate between staminate and pistillate forms in different years or produce combinations of perfect, staminate, and pistillate flowers.

Individual trees of quaking aspen are short-lived (maximum age in the Great Lakes states is 50-60 years, up to 150 years in the West). Stands may be even-aged (after a single top-kill event) or only broadly even-aged (from sprouting of a gradually deteriorating stand). The clones are much older: many in the Rocky Mountain and Great Basin regions are at least 8000 years old, persisting since the last glacial retreat. A male clone in the Wasatch Mountains of Utah occupies 17.2 acres (69.3 ha) and has more than 47,000 stems – this clone is estimated to be 1 million years old and may be the world’s most extensive known clone. Clones east of the Rocky Mountains usually cover no more than a few acres.

Management

The thin, soft bark of quaking aspen makes it susceptible to many diseases and insect infestations as well as mechanical and fire damage. Fires may kill trees or cause basal scars that serve as entry points for wood-rotting fungi, which are common in older stands. The wood decays easily. Fires may also kill surface roots that could reduce sucker regeneration.

The poplar borer beetle, one of the most common wood borers of aspen, weakens trees by boring galleries in the trunk near the lower portion of the crown. Outbreaks of forest tent caterpillar may last 4-5 years and result in serious defoliation – cold weather in the spring shortly after the eggs hatch and above-average fall temperatures in June and July decline in riparian populations by killing eggs and larvae. Overgrazing by livestock or big-game animals inhibits development and spreads, limiting sucker formation. Heavy grazing of young sucker stands by cattle for three years in a row may destroy them.

Quaking aspen can be propagated by seed, following cold stratification. Germination of fresh seed may be 80-95%, but viability lasts only 2-4 weeks under favorable natural conditions (low temperature and humidity). Seeds dried for 3 days and stored at cool temperatures may retain good viability for up to a year.

The species roots poorly from woody stem cuttings, but newly initiated (softwood) shoots can usually be induced to root by dipping in IBA (indolebutyric acid) or other commercially available rooting powders. A more preferred method uses root sprouts. Collect dormant lateral roots in early spring – plant root cuttings 1-2 in diameter and 3-5 centimeters long in vermiculite and place in the greenhouse for 6 weeks. Excise the young sucker shoots and root in perlite/vermiculite (2-3 weeks, using IBA), misting frequently. Transplant the developing plants to peat/vermiculite mix and grow at 15-25°C. Or, the root cuttings may be planted directly into the perlite mix, with the top of the cutting just below the media surface.

Cultivars, Improved and Selected Materials (and area of origin)

Contact your local Natural Resources Conservation Service (formerly Soil Conservation Service) office for more information. Look in the phone book under “United States Government.” The Natural Resources Conservation Service will be listed under the subheading “Department of Agriculture.”

References

Antelope bitterbrush (PURSHA TRIDENTATA) PLANT GUIDE.

Antelope Bitterbrush

**PURSHA TRIDENTATA (Pursh) DC.**

**Plant Symbol = PUTR2**

Contributed by: USDA NRCS California State Office and Lockeford Plant Materials Center, California Upper Colorado Environmental Plant Center, Colorado

Alternate Names

Antelopebrush, backbrush, quinisnerbrush, bitterbrush, antelope-brush, quinine brush, deer-brush, black sage

Uses

Antelope bitterbrush is one of the most important palatable native shrubs in the western United States. It provides high quality, important spring and winter browse for domestic livestock, antelope, deer, and elk. Its seed is an important source of food for small animals and the plant provides cover for small animals and birds. It is considered medium quality coverage for sage-groove. The shrub is also used for reclamation and erosion control of mined areas and has the potential for use as a living snow fence, roadside beautification, and xeriscape plantings.

Historic Native American Uses: Western Indian groups used leaf poultice or wash for ulcers, rashes, insect bites, chickenpox, and measles. Leaf tea was used as a general tonic and for colds, pneumonia, liver disease, to expel worms, and as an emetic and laxative for stomach ache and constipation. Twigs, leaves, and berries were used as a laxative. Root teas were used for coughs, lung and bronchial infections, fever, and to facilitate delivery of placenta.

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Description

General: Antelope bitterbrush is a slow growing shrub that is moderate to very deep rooted with wide ecotypic variations. It is normally 2 to 6 feet in height and up to 8 feet in width with wedge shaped, three lobed leaves (some are persistent in winter). Leaves can vary in color from grey green to bright green. Some plants have branches near the soil that layer (branches that touch the soil develop roots) providing additional rooting for the plant. Flowering occurs in late spring to early summer. The spindle-shaped seed shatters easily at maturity. Flowers are small, varying from white to yellow, and produced profusely along each leader. The seeds are large for the species—15,500 per pound. They are about one-fourth inch long and obovate. Seeds, stems, and leaves are nontoxic. Individual bitterbrush plants exhibit considerable variation for growth form. Bitterbrush’s growth forms vary from a uniform, erect growth habit to more decumbent, layering forms. Users are encouraged to consider the various forms of bitterbrush in choosing a strain best suited to their needs.

Distribution: Antelope bitterbrush is an important native browse shrub in the intermountain western United States. It occurs from New Mexico north to Colorado, Wyoming, Montana, and British Columbia, west to Idaho, and Washington, south to Oregon, California, and Nevada. For current distribution, please consult the Plant Profile page for Plant Materials (http://plant-materials.nrcs.usda.gov/).

**APPENDIX E. ANTELOPE BITTERBRUSH (PURSHA TRIDENTATA) PLANT GUIDE.**
this species on the PLANTS Web site.

Habitat: Antelope bitterbrush occurs most often as part of a mixed shrub community, but occasionally is found in nearly pure stands. It is associated with a variety of underfoot grasses and forbs. It can also be an understory plant in association with taller growing trees.

Adaptation
Antelope bitterbrush is adapted to a wide range of soils with 8 to 34 inches of annual precipitation. It is normally found at elevations of 4000 to 8500 feet, but has been noted at 11,000 feet in California. The shrub has good tolerance to drought and cold.

In California, bitterbrush is associated with big sagebrush (Artemisia tridentata) and rabbitbrush (Chrysothamnus sp.). It occurs naturally on dry lake beds, alluvial fans or terraces, and low foothills. It occurs in soils that are deep, gravelly, loamy coarse sands derived from granite, with pH ranging from 6.0 to 7.0. Tests have shown that bitterbrush has high potential for use on deep, coarse, well-drained, neutral to slightly acidic soils in areas that have 12-24 inches of annual precipitation.

Establishment
Natural establishment of antelope bitterbrush occurs in years with good seed production when rodents cache seed and do not use all of the caches. Moisture is necessary the first few years of seedling growth for establishment. Late fall or winter seeding is recommended and competition can be a problem for establishment. Seeds should be drilled about 1 inch deep at a rate of 1/2 to 2 (3) pounds per acre. Rates are doubled if broadcasting and seeds do need to be covered. In California, pretreatment with hydrogen peroxide is required to break dormancy for spring establishment. Seeds should be browsed for good forage production and vigor. However, no more than 50 to 60 percent of current annual growth should be removed. The literature indicates that bitterbrush is not a fire resistant shrub, but is fire dependent and light to moderate fires may enhance stands.

Pests and Potential Problems
Many species of insects and mites inhabit antelope bitterbrush, several of these are beneficial. It should be noted that bitterbrush is insect pollinated. Insects that cause problems include defoliators such as mountain mahogany looper and western tussock moth. Some of the noted seed insects are bitterbrush seed midge, Say’s stinkbug, dark bitterbrush leaf tier, and flower thrips. Large numbers of seedlings and small plants have been destroyed by cutworms and false wireworms. Diseases associated with bitterbrush include rust, root rot, stem wilt, and root-stem canker. Seedlings have been damaged by damping off (a disease caused by fungi). A beneficial organism associated with antelope bitterbrush is the nitrogen-fixing endophyte Frankia purshiae.

Environmental Concerns
There are no known environmental concerns associated with antelope bitterbrush.

Seeds and Plant Production
In Colorado, seed may not be produced in wildland stands for 8 to 20 years depending on existing conditions. Browning should be reduced to 30 percent or less to obtain good seed production. Seed may not be produced from mature plants when stressed from drought or late freezes. Seed can be collected by hand by shaking branches and allowing the seed to fall in hand held collectors. Seeds vary in size from 15,000 to 33,000 per pound and germination normally ranges from 95 to 97 percent. A cold moist stratification period of up to six weeks may be required to obtain good germination. Tublings can be grown in a greenhouse for planting in a period of six months to one year.

In California, mature seed must be harvested within 3 to 10 days of ripening because it shatters quickly after reaching maturity. Seed may be harvested into canvas hoppers or aluminum seed collection trays positioned under the shrubs prior to seed fall. Seed collection and orchard maintenance are simplified by the upright growth form. A 3.6 to 3.6 to 4.9 m (12 x 12 x 16 ft) spacing is recommended for antelope bitterbrush seed orchards. Plants in wildland stands reach full seed production in 8 to 20 years. With appropriate cultural practices, this period may be reduced to about 5 years for seed orchards. Nine-year old shrubs grown at 2.4 m (8 ft) spacings without irrigation or other cultural treatments at the Boise Shrub Garden, produced 118 g (0.26 lbs) of seed per shrub or 199 kg (437 lbs/acre).

Seed is easily cleaned to a purity of 95 percent using a two-screen fanning mill and a barley dehinder. Shriveled black seed is nonviable and should be separated from the chaff. Seeds of bitterbrush are relatively large, averaging 34,507 seeds/kg (15,685 seeds/lb) for cleaned seed, with germination averaging about 84 percent. Seeds of bitterbrush remain viable for 15 years or more in open storage.

On rangeland sites antelope bitterbrush is normally seeded in late fall or winter to permit field stratification of the seed. Pretreatment with hydrogen peroxide is required to break dormancy for spring seeding. Seedlings are susceptible to late frosts. Plants develop very slowly and must be protected from competition during the first two seasons. Recommended seeding rates are 1.2 to 3.3 kg/ha (1 to 3 lbs/acre). Bitterbrush may be established on critical sites by transplanting.

Cultivars, Improved, and Selected Materials (and area of origin)
' Lassen' is a cultivar of antelope bitterbrush released in 1984 by USDA Forest Service, Shrub Sciences Laboratory, Provo, Utah. It was released in 1990 by the USDA Forest Service, Shrub Sciences Laboratory, Provo, Utah, and the Utah Division of Wildlife Resources, Ephraim. Its origin is north of Fountain, Utah.

Fountain Green germplasm is a source identified in 1990 by the USDA Forest Service, Shrub Sciences Laboratory, Provo, Utah, and the Utah Division of Wildlife Resources, Ephraim, Utah. Its origin is north of Fountain, Utah.

Maybell germplasm was released in 1997 as a selected class release by Upper Colorado Environmental Plant Center. Five other agencies participated in the release. Maybell’s origin is Moffat County in northwest Colorado, near the town of Maybell.

References


Shaw, Nancy and Stephen B. Monsen. No date. Notice of release of 'Lassen' antelope bitterbrush. USDA NRCS.


USDA NRCS. September 1986. 'Lassen Antelope Bitterbrush' broccoli. Davis, California


Release information for 'Lassen' and Maybell Select Class.

Prepared By
Dyer, Dave, USDA NRCS Plant Materials Center, Lockeford, CA and Reina O’Beck, California State Office, Davis, CA and Gary L. Noller, Ph.D., Plant Materials Consultant, Upper Colorado Environmental Plant Center, Meeker, Colorado
Species Coordinator
Dyer, Dave, USDA NRCS Plant Materials Center, Lockeford, CA.

Edited: 070814 jsp

For more information about this and other plants, please contact your local NRCS field office or Conservation District, and visit the PLANTS Web site <http://plants.usda.gov> or the Plant Materials Program Web site <http://Plant-Materials.nrcs.usda.gov>

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Read about Civil Rights at the Natural Resources Conservation Service.
A NOTE OF THANKS

RRS has great potential as a research, teaching, and extension site, and we owe a great deal of appreciation to The Colonel and many others.

By Stephen E. Williams

We owe a great deal of gratitude to Colonel William C. Rogers for donating his land in the Laramie Mountains to the University of Wyoming for research, teaching, and extension. In turn, we owe a great deal of gratitude to the many people who have been instrumental in early development of the Triple R Ranch into what has been renamed the Rogers Research Site (RRS) in memory of The Colonel.

Stephen Horn and Frank Galey, the former and current deans of the UW College of Agriculture and Natural Resources, have provided incentive to develop RRS during their respective administrative times. The former associate deans and directors of the Wyoming Agricultural Experiment Station (WAES), Jim Jacobs and Stephen Miller, and the current associate dean/director, Bret Hess, have also provided direction and resources to continue this development under their respective administrative tenures. During the last seven years especially, Bret Hess, with strong approval and support from Frank Galey and others, has provided resources to bring the development of RRS to function as a research, outreach, and teaching location.

Administratively RRS has been placed under the direction of one of the four WAES research and extension (R&E) centers, the James C. Hageman Sustainable Agriculture R&E Center (SAREC) near Lingle, Wyoming. Jim Freeburn was the director of SAREC during the early development of RRS. He had a strong hand in the planning effort and has directed many resources toward RRS. There has been a continuation of that effort under the new SAREC director, John Tanaka.

Prior to 2017 a host of people worked on research at RRS or had a strong influence in planning, implementation, or sample analysis. As apparent elsewhere in this bulletin, two ad hoc planning committees, attendees of field days and an open house, and members of a team that conducted an on-site forestry audit have paved the way for current and future research, extension, and teaching at RRS, in addition to on-site management.

Claire Wilkin, a former UW graduate student (co-advised by this author and Professor Michael Urynowicz [UW Civil and Architectural Engineering]), was at the center of much of this early work, and results from her studies focusing on soils will be presented in an upcoming paper in the RRS bulletin series. In her thesis Claire thanked Caley Gasch, Leann Naughton, and Rachana Giri Paudel for their help in sample analysis. Claire also made a point to particularly thank Kelli Belden for her expertise in soil analysis and her always sage advice. During the time that Claire was conducting her thesis work, several persons were instrumental in helping with various field operations. These include Christine Sednek, Dave Rider, Michael Curran, and Jesse Hahm (Claire’s husband). David Legg, statistician in the Department of Ecosystem Science and Management, helped with the statistical design. Brian Mealor, faculty member in the Department of Plant Sciences who now directs the Sheridan R&E Center, helped to lay out the study conceptually.

Mollie Herget worked on RRS projects during 2015, when much on-site activity occurred. She was crew boss during much of the tree cutting operations, and she oversaw all of the erosion control seeding treatments, seeding of ponderosa pine, and plantings of ponderosa pine seedlings. Her work under less than ideal weather conditions and under changing personnel situations was nothing short of heroic. Prior to her paid work at RRS, Mollie completed a master’s degree at UW under the guidance of Kristina Hufford, a faculty member in the Department of Ecosystem Science and Management. Mollie’s
research focused on the implications of seed origin for ecological restoration success. Herget, like Wilkin, will co-author an upcoming paper in the RRS bulletin series. Others have had a strong presence at RRS. One of Hufford’s former students, Patrick McIlvania, conducted line-transect surveys of vegetation both before and after the 2012 Arapaho Fire, which burned nearly 100,000 acres in the Laramie Mountains, including the RRS property. Larry Munn, professor emeritus in the same department, conducted important soil survey work at RRS prior to retiring. And Stan Bellgard, a plant pathologist from Landcare Inc. in New Zealand, helped with soil sampling in 2012 and worked closely with the lead author of this bulletin in 2014 in conducting a pathogen survey. We anticipate that results from all of these studies will also be presented in upcoming bulletins.

Contributing to the research efforts, especially layout of plots and planting of ponderosa pine, were Noah Snider, James Harkin, and Tunisia Hurissio, who provided technical assistance both in the field and greenhouse. Bret Hess generously granted access to his personal all-terrain vehicles for use at the field site. Brian Meador and his lab crew—Will Rose, Julia Workman, Tevyn Baldwin, and BJ Bender—volunteered hours of their time to establish and plant study plots at RRS. From the Wyoming State Forestry Division, Travis Pardue donated help, time, and equipment to assist in seeding plant species at RRS. Mick Mickelson proved to be the finest of neighbors in times of need at the rustic cabin he called home. During the time that UW has had the property, he has been a helpful resource for historical, management, and ecological information and perspective. His input has been greatly appreciated.

Future researchers studying vegetation and related topics at RRS and surrounding lands will be grateful for the work of Mathew Seymour, who, as an undergraduate student at UW in 2006, conducted a vegetation mapping project at RRS using high spatial resolution photography. His study became particularly relevant just six years later when the lightning-caused Arapaho wildfire burned the majority of vegetation at RRS. Thus, as Mat and his co-authors state, future work could examine if vegetation is transitioning back to pre-fire states or trending to new ecological states. Assisting Seymour in his paper, which is complete and will be published shortly after the release of this bulletin, was Ken Direse and Robert Waggener. Thanks are extended to Bret Hess for hiring Robert to assist with the RRS bulletin series. Robert has provided editing, writing, research, collaboration, and project management, which is bringing these peer-reviewed bulletins to completion. Part of his effort has involved pulling together vital material from more than 100 sources, including personal interviews and written materials, both published and unpublished. He has also assembled hundreds of photographs and reached out to potential reviewers. A note of thanks goes to those who accepted his invitation and then took the time to read the papers and offer constructive comments. A big thank you goes to UW Extension graphic designer Tanya Engel and the many others who have assisted with these bulletins.

A PERSONAL STATEMENT FROM STEVE WILLIAMS

This and upcoming RRS bulletins that I co-authored with Claire Wilkin, Mollie Herget, and Robert Waggener are part of my post-retirement efforts at RRS. These have been done after the close of the contract (ending in spring 2016) that I had with UW, the College of Agriculture and Natural Resources, and the Wyoming Agricultural Experiment Station. I have been involved with RRS and its evolution for nearly 15 years. In fact, it began soon after I stepped down as dean of the UW Graduate School in 2003, and it continued through my stint as director of the Wyoming Reclamation and Restoration Center until my retirement in 2013. Since that time and until spring 2016, I continued to work as a contractor on research and other activities related to RRS (Fig. 1). Now there are two relatively new faculty members in the Department of Ecosystem Science and Management taking over that role—Linda T. A. van Diepen (soil microbiologist) and Derek Scatts (Extension rangeland specialist).

RRS has great potential as a research, teaching, and extension site, and I am happy to have had a minor part in early activities at the site. I am now equally happy to pass the torch to Linda and Derek. The legal will of Colonel Rogers provides a set of guidelines for the use of the former Triple R Ranch, now known as the Rogers Research Site. It is my hope that as Linda, Derek, and others use RRS and surrounding lands to advance research, extension, and teaching, that they keep in mind the guidelines established by the remarkable Colonel William C. Rogers.
A rainbow is cast over the Rogers Research Site during an afternoon thunderstorm on July 15, 2015, when University of Wyoming researchers were working on a post-fire ponderosa pine regeneration study. (Photo by Mollie Herget)