

# RUBY HABITAT FOUNDATION

ANNUAL REPORT 2012

"Landowners and resource managers are inherently bound to a high level of resource accountability. We are bound by law to protect the environment and prevent resource degradation, but we have a higher obligation to be good stewards of our natural resources, sharing them today and preserving them for future generations. The decisions we make and the actions we take affect our own environment as well as that of the wildlife, our neighbors and future generations."

Charles Craig Woodson, Founder, 1933-2011

RUBY HABITAT  
foundation

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10 Years of Innovative, Insightful,  
and Responsible Resource Management.



The following was written by Charles Gaines, world renowned angler, author, & naturalist. It is taken from a book entitled *Astream, American Writers on Fly Fishing* published by Skyhorse Publishing Inc. It is included here with their permission.

*The river I hope runs through it for me on the other side will look something like the two-and-a-half-mile stretch of the Ruby near Alder, Montana, that belonged to my friends Craig and Martha Woodson: dainty and purling, its banks a manicured comeliness of cottonwoods, its amber water dimpled with brown trout rises. And those browns are some of the feistiest and most agreeable anywhere: beautifully colored, acrobatic, quick-to-take fish that are found exactly where they are supposed to be, in the river’s textbook runs, seams, and pools.*

*The Ruby is a river to make you feel like Izaak Walton -- a wet-wading and bank-fishing river that invites long, meditative breaks for reverie, a pipe, good conversation. It is also a river that can toss out epiphanies like flowers from a basket.*

*My young friends Ethan and Jason have their first day of trout fishing just under their belts. Yesterday they floated a hot stretch of the Madison, lobbing nymphs under indicators into runs beside the boat and letting them float there until their guide told them to strike. They caught lots of fish that way and decided they were naturals at the trout fishing game. Today we are on the Woodson’s Ruby – a different kettle of fish. I walk the banks with them, looking for rises, then they take turns blowing the fish. They can’t reach it or line it, they drag over it, they hook willows and each other. But the Ruby is, as ever, open-hearted and generous, and maybe even a little smitten with my boys.*



## Reflections on the Ruby . . .

The last ten years at Ruby Habitat Foundation has truly flown by. I remember wondering what exactly Craig had in mind as he finalized the agreement with Montana Land Reliance and organized a board to oversee the newly formed foundation. I was impressed with the generosity I was seeing and was intrigued by the urgency that Craig had to make sure everything was in order. As I grew to know Craig better I realized that he was planning for the future but he expected to get started working immediately. Fortunately we had Craig with us for about nine more years and his vision has inspired each of us associated with the Ruby Habitat Foundation. Without Craig and Martha Woodson’s generosity, none of the things in this annual report would have been possible.

In the last ten years Ruby Habitat Foundation’s message of stewardship and resource accountability has really taken shape. We are having more opportunities each year to demonstrate and educate about the importance of preserving our natural resources while emphasizing viability of agricultural operations. We are continuing with new projects to find ways to diversify habitat for wildlife and agriculture production. The Woodson Ranch is a beautiful setting to show off a variety of approaches to conservation for the small acreages and the larger working ranches. In education it is important to have the information available and to be able to show the results “on the ground” leaves a lasting impression.

As we look forward, the message of good resource management has to be of the highest priority. Without examples of good management practices we can have the best of intentions but little progress is made. At Ruby Habitat Foundation we will continue to have a clear voice of conservation and stewardship as we face the many challenges of protecting and using our natural resources. I want to thank our many supporters and encourage you to schedule a visit to view Woodson Ranch. It is always a rewarding experience.

Neil Barnosky  
Chairman, Ruby Habitat Foundation



## Ruby Habitat Foundation 2012 Financials

Foundation Operations:		
	Income	\$120,437
	Expenses	\$89,878
	<b>Net Income</b>	<b>\$30,559</b>
General Fund Cash & Investments:		\$79,398
(Pays the day-to-day expenses that finance the operation of the foundation.)		
Rural Heritage & Open Lands Fund:		\$183,493
(Designed to provide funding for outreach and land conservation efforts.		
General fund surpluses and designated gifts create the balance of this account.)		
Hill Education & Outreach Endowment:		\$27,424
(Income from this endowment finances conservation education and outreach to landowners and the general public. These funds come from designated gifts.)		
Visitor Center Building:		\$41,173
<b>Foundation Operations Assets as of 12-31-12</b>		<b>\$331,488</b>
<b>Woodson Ranch &amp; Endowment:</b>		
	Income	\$561,883
	Expenses	\$240,615
	<b>Net Income</b>	<b>\$321,268</b>
Fixed Assets		
	Equipment	\$50,123
	Improvements	\$654,629
	Land	\$7,312,500 <sup>1</sup>
	Woodson Ranch Endowment	\$5,073,946 <sup>2</sup>
<b>Ranch &amp; Endowment Assets as of 12-31-12</b>		<b>\$13,091,198</b>

<sup>1</sup>Restricted land donation subject to life estate

<sup>2</sup>The income from Woodson Ranch Endowment is used for the operation and maintenance of the Ranch, to ensure its protection and continued viability.

<b>Ruby Habitat Foundation Combined Total:</b>	
<b>Net Income 2012</b>	<b>\$351,827</b>
<b>Total Assets as of 12-31-12</b>	<b>\$13,422,686</b>

RHF is a 509(a)(3) tax-exempt support organization to the Montana Land Reliance, a 501(c)(3) corporation. Our Tax identification number is 45-0487621. Each entity is audited annually and independently. Audit copies are available upon request.

“I could see immediately that the ranch was well managed for both the conservation of wildlife as well as agriculture which makes it a true gem and one that no doubt is the envy of many. I had several experiences that day that I will remember for a long time, thirty turkeys feeding in the shade of the cottonwoods, a bull and cow moose in the willows watching me as I walked past, a buck mink running on a bank above the river’s edge and a beaver swimming across the river before it dove underwater to its bank den. Thank you for this privilege.”

Bob Sager, Butte, MT

“The ranch is way past special.”

John Splittorf, Paso Robles, CA

“It is a privilege and an honor to support the Foundation and the Foundation initiatives that in turn support the local community. Congratulations on your continued and sustained success over the past ten years.”

Mike Pearce, Lafayette, CA & Sheridan, MT



## Mission Statement

The Ruby Habitat Foundation is dedicated to preserving and enhancing the natural resources and the social and economic makeup of the Ruby Valley and southwest Montana by, among other things:

- Supporting agriculture in the community and the diversification of agricultural operations to ensure the long-term viability of working ranches;
- Working with landowners, educational institutions, foundations and other entities to protect and enhance open space and wildlife habitat;
- Encouraging education and training to broaden the understanding of resource management issues and responsible management of private lands;
- Promoting the concept of resource accountability and developing examples of minimal impact resource management for agricultural and recreational uses while protecting the environment.



Ruby Habitat Foundation  
Board of Directors

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**Founder**  
**Craig Woodson 1934-2011**  
Sheridan, Montana

## Twenty Years Later, a Tenth Anniversary

Unbelievably, it has been twenty years since I first met Craig Woodson at the local NRCS office in Sheridan in the fall of 1992. He had just purchased a ranch in our small community not far from my own family ranch. I had no way of knowing at the time that I was about to embark on a life changing adventure of renovation, conservation, education and perspective. Over the next few years Craig became, to say the least, passionate about his ranch in the Ruby Valley. Throughout the remainder of his life, he poured his heart and soul into the enhancement of the property that everyone respectfully knows as the Woodson Ranch. Those of you who have had the opportunity to visit the ranch know full well the result of his efforts. The property is an incomparable jewel of diversity in uses and habitats. Agricultural, wildlife and recreational opportunities are shared by family, neighbors, friends and community.



Over the years, I became fully aware that Craig was driven, by among other things, an uncompromising conservation ethic and a love for the Ruby Valley. In spite of my prior ten year relationship with him, I was unprepared for the level of foresight and generosity he displayed in creating the Ruby Habitat Foundation in the fall of 2002. Ten years later I am even more amazed.

It is difficult to express in words the extent of my respect and enthusiasm for what has developed and my anticipation for what is yet to come. The creation of the Foundation and Craig's generosity assure that the Woodson Ranch and the far reaching implications of the projects we have undertaken will remain intact for generations to come. The property is an unparalleled showcase of possibilities for land owners large and small. Educational, recreational, agricultural, wildlife and residential uses coexist on the ranch in sustainable fashion. The ongoing projects detailed in this annual report are a testament to Craig Woodson and the Foundation's commitment to demonstrating what time, effort, creativity and an open mind can achieve.

Craig's wisdom in originally seeking out an alliance with a highly respected conservation organization cannot be overstated. The Foundation's association with the Montana Land Reliance has proven to be invaluable. Their encouragement and advice have contributed to the Foundation's success in no small measure. All of us at the Ruby Habitat Foundation are grateful to the Directors, the Board and the staff of the Montana Land Reliance for their support and assistance over these first ten years.

I hope you will take time to thoroughly review this 10th Anniversary Annual Report. Revisit with us the highlights of the past year and consider our progress toward accomplishing our purposes. Once again, the talented Dr. Samuel Corl III has volunteered his creativity in assembling this outstanding summation of our past. I appreciate his dedication and commitment.

The past year brought with it changes on the Board of Directors. Founding chairman, George Swan, and founding director, Roy O'Connor, have retired. We will miss their wisdom and insight and appreciate their years of dedication. We welcome aboard two new directors, George Olsen and Lois Delgar-DeMars. On behalf of the Board of Directors I extend our heartfelt appreciation for the support of our many friends over these past ten years. We believe we are making a difference but there is much yet to achieve in our effort to preserve and enhance conservation values of this great area.

I hope you will choose to continue to partner with RHF as we strive to maintain the integrity of our western landscape and heritage.

Les Gilman  
Executive Director  
Ruby Habitat Foundation

A very short ten years ago Craig & Martha Woodson took an idea and a vision for the Ruby Valley and formed the Ruby Habitat Foundation (RHF). The Montana Land Reliance (MLR), with guidance and encouragement from Craig and Martha, formed a partnership with the RHF to shepherd their vision into the future. For eight years Craig remained a force challenging all of us to provide ideas that would work not only on the Woodson Ranch but also in the local community. Projects from soil health to low input cattle grazing, have been completed or are ongoing. We here at MLR are excited to see what will come over the next ten years to cement Craig's and Martha's vision of the future.

Rock Ringling  
Managing Director  
Montana Land Reliance





# Bee Pastures and Other Pollinator Projects



Due to numerous factors, all pollinators, not just bees, are experiencing severe population declines across the United States. Pollinator species play a vital role in the production and the reproduction of many plants. The Ruby Habitat Foundation joins the many governmental and nongovernmental organizations that are advocating the establishment of pollinator friendly plant communities to aid in habitat creation for pollinating species. A plant that is considered pollinator friendly is a plant that requires an organism (pollinator) to transport pollen between different individual plants to successfully reproduce.

During the past year, the Ruby Habitat Foundation continued to expand its ongoing advocacy of pollinator projects. We expanded our outreach on the subject and joined forces with the local school district to create pollinator habitats as the Foundation's newest pollinator project.

In the classroom, the kindergarten class learned about pollination and the

important role that pollinators play in the environment. They also learned about the different kinds of bees that are native to Montana and where some of those species prefer to nest. After a brief education about the different kinds of bee nests, the kindergarten students were joined by the high school senior Advanced Biology class to construct and paint the bee habitats. The habitats were constructed out of wood and clay to target the nesting areas of several different native species with hopes of finding numerous guests residing in those habitats during the summer.

Once the bee condos were constructed, and spring arrived, the students from both classes participated in a field trip to the Foundation property to help set up the pollinator habitats on the ranch. While on the ranch they prepared and planted a “bee pasture” behind the visitor center into a diverse mixture of native and nonnative plant species designed to provide habitat for the pollinators. Once the work was done, an informative stroll along the visitor center nature trail was conducted to learn more about the vital role that pollinators play.



The Ruby Habitat Foundation, in cooperation with the local school district, is teaching by example in showing how it is possible to have a successful agriculture enterprise while maintaining pristine natural resources and enhancing specific habitats to allow for niche animals such as pollinators to flourish.

More information about pollinators can be found at [www.pollinator.org](http://www.pollinator.org)



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Laurilyn & Greg Wysocki  
Alan Zimmerman

## Organizations

Ansun Graphics, Inc.  
Barton Family Foundation  
Bessemer Trust  
Big Hole Lodge  
The Braewold Fund  
Brown Contracting, Heating & Plumbing  
Burke Family Foundation  
Channel Ship & Marine Services, LLC  
Charlevoix County Community Foundation  
The Community Found for the National Capital Region  
Crane Meadow Lodge  
Craig Fellin Outfitters

The Donnelley Foundation  
Elise R. Donohue Charitable Trust  
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Fidelity Charitable Gift Fund  
First American Title  
Four Rivers Fishing Company  
Friends of the Curry Center  
Frost Financial Management  
Gottelman Philanthropic Fund  
Gilman IH Cattle Company  
Hamilton Ranch  
HAP Foundation  
Headwaters Realty, LLC  
Hells Canyon Creek, LLC  
Iacopi, Lenz & Company  
J.D.L. Construction  
Jewish Community Endowment Fund  
Kenneth & Cherrie Garrett Foundation  
Kenworthy Electric, Inc.  
Kingfisher Consulting, Inc.  
Luther King Capital Management  
McGuire Family Foundation  
Millsap Enterprises, Inc.  
The Minneapolis Foundation  
Morse Land Company  
Montana Land Reliance  
National TB Controllers Association  
Network for Good  
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Ranch Management, Inc.  
Ranch Resources, LLC  
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Rockpoint, LLC  
Ruby Springs Lodge  
Ruby Valley Lodge, LLC  
SaltChuk Resources, Inc.  
Schwab Fund for Charitable Giving  
Seligman Cash Management Fund  
Shaun Jeszenka Outfitting  
Shannon, Gracey, Ratliff & Miller, LLP  
Silicon Valley Community Foundation  
Silver Spring Ranch  
SRI Ranch Holding  
Steven Strauch Living Trust  
Sweetgrass Rods, LLC  
Tarlow, Stonecipher & Steele  
Taylor Family Fund  
Thomas U. Warren, Inc.  
Timber Creek Ranch  
Trout and Salmon Foundation  
Upper Canyon Outfitters  
Vanderpool Family Fund  
Waterborne Productions

## In Memoriam 2012

Chester Anglen  
Dick Lower  
Donny McCluskey  
Pat Mumme  
Scott Waldie  
C. Craig Woodson



*These very kind and generous people and organizations expressed their commitment to and their support of the mission of the Ruby Habitat Foundation with contributions during our first 10 years:*

Hew Chu Tu & Arthur Frank Ackerman  
Constance Achterberg  
Leslie Adams  
Harry Albrecht  
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Nancy & Chester Anglen  
Mary & Arthur Apkarian  
Susan & John Bachelder  
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Marge A. Meinke

## Ruby Valley Students Get Out for Annual River Resources Day

LAURIN – Almost 100 third, fourth and fifth grade students from Sheridan and Twin Bridges gathered at the Ruby Habitat Foundation's Woodson Ranch for the eighth annual Kids River Resource Day, where children are invited onto local ranch properties to learn about various conservation issues.



Fourth grade students from Sheridan look on as district conservationist Trisha Cracroft (right) demonstrates how erosion works using the Rolling Rivers display on Thursday at the Ruby Habitat Foundation's Woodson Ranch during Kids River Resource Day. Photo by Ben Coulter.

While some students were more excited to get out of the classroom than others, especially under a smoky haze from regional wildfires, all the kids enjoyed the opportunity to learn about something they never knew existed in their own backyard. Nearly a dozen different presenters spoke on topics ranging from fish and aquatic invasive species to bats, bears and cattle. Students also learned about recreational ethics, invertebrates and different types of pollinators and even how riverbanks are affected by sediment and erosion.

Ruby Habitat Foundation executive director Les Gilman explained that one of the organizations' purposes is to provide opportunities for educational outreach in natural resource management issues, to give kids the chance to get dirty and learn about their environment for themselves.

“So they can have a little better appreciation of the diversity of the natural world around them,” Gilman said. “We believe it's vital to provide every educational opportunity we can, and we're happy to host this here today just because so many of the young people don't have the opportunity to actually get on the ground and experience firsthand: hands in the water, feet on the ground experiencing wildlife around them.

Many students were captivated by the presentation on bears given by Rebecca Skeldon of the Beaverhead Deerlodge National Forest that emphasized safety and proper food storage. “In the Ruby Valley there are a lot of grizzly bears and black bears,” she said. “It's good to let them know that bears aren't going to eat them.”

Others gave Montana Department of Fish, Wildlife and Parks aquatic education coordinator Dave Hagengruber a run for his money at the Fish Jeopardy station, deftly answering questions about the many waterways and fish species in the state. While Hagengruber tried to stump students by asking about specific identification marks on fish and destinations of certain watersheds, many of them answered like seasoned anglers.

Twin Bridges fifth grader Cody Olsen said his favorite part of the Kids River Resource Day was learning about fish, quickly adding that he considers himself an old pro when it comes to working the water around Montana. “I liked the paddlefish,” he said.

The Ruby Habitat Foundation was founded by Craig Woodson in 2002, in the hopes of preserving a delicate wetlands habitat for the future. Woodson willed his 1,100-acre property to the foundation before his death in January 2011.

“He had the idea that at his death, there would be the means to carry on the work he had started,” Gilman said of Woodson. “He realized that he wouldn't be able to own it and run it forever, but he wanted to figure our a way to perpetuate the things that he had started so he very wisely and generously created this foundation.”

For Gilman, the best part of the Kids River Resource Day was the level of excitement and enthusiasm displayed by the kids across the board.

“It demonstrates that there is a desire to learn this information, but also there is a need to present it because they're not getting it otherwise if we cant get them out here,” he said.



3rd, 4th and 5th grade students from Sheridan and Twin Bridges rush to the next presentation during Kids River Resource Day at the Ruby Habitat Foundation's Woodson Ranch in Laurin on Thursday. Photo by Ben Coulter



# Soil Health Project 2013 Update

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## Why So Much Interest in Soil Health?

Across the nation, Soil Health is being discussed more and more at agricultural producer meetings, USDA offices, the halls of Congress, and local diners. Much of the conversation is focused on improving soil structure and biological activity to address environmental concerns and improve crop production.

Soil Health is not a new idea. For centuries people have recognized that productive soils are alive and thriving with life. Whether or not they knew the names of the bacteria and fungus doing all the work did not matter.

They saw firsthand that crop residue, manure, and plant diversity were good for production. While excessive tillage, erosion,

depletion of soil nutrients, and crop monocultures could lead to a host of problems.

As we have “progressed” in agriculture, some of these stewardship fundamentals have been set by the wayside as chemicals and other tools have been developed to deal with poor fertility, compaction, insects, weeds and drought. We keep inventing expensive band-aids, but often fail to address the underlying problems.

The Soil Health movement aims to incorporate basic soil health fundamentals back into modern agriculture. By recognizing the importance of soil biology we can address underlying problems and build soils for long term success.



*Healthy Soil Provides Countless Environmental Benefits While Allowing for Sustained Crop Yields.*

We sometimes hear “these concepts don’t apply here.” However, that is simply untrue! The importance of Soil Health applies everywhere, including the Ruby Valley. The trick is to learn how we can use progressive tools and techniques to meet our local objectives, while continually building soil.

## Did You Know?



A Handful of Healthy Soil Contains over 6 Billion Living Organisms



Bacteria in Legume Roots Can Fix Free Nitrogen From the Atmosphere



Proper Livestock Grazing Stimulates Production Both Above and Below-ground

## Soil Health Basics

- Keep the Soil Surface Covered
- Reduce Disturbance
- Encourage Diversity
- Keep Living Roots in Soil for as Long as Possible
- Incorporate Proper Livestock Grazing



## 2007 – Intensive Grazing Project

“The Goals and Objectives of the project are to:

- Showcase different species for irrigated pasture
- Monitor protein and energy through the growing season for different species by using fecal analysis
- Monitor re-growth potential for different species
- Monitor production for different species
- Showcase intensive grazing on irrigated pastures
- Meet producer’s cattle production goal of 2.5 lbs/day
- Showcase intensive grazing on irrigated pastures”

## 2008 – Cows Eating Weeds

“As part of the Foundation’s effort to be proactive and innovative in the application of management practices, we volunteered to participate in a trial weed control method brought to Madison County by the NRCS, Madison Valley Ranchlands Weed Committee, and the Ruby Valley Conservation District. The group solicited the expertise of Kathy Voth from Livestock for Landscapes who had developed a protocol for teaching cattle to eat weeds.”



## 2009 – Guests from Mongolia

“On a brisk spring day in April, the world became slightly smaller and the reach of the Ruby Habitat Foundation expanded greatly. On that day, a delegation of Buddhist High Lamas and some environmental educators from Mongolia kicked off a 17 day tour of the United States by visiting the Foundation’s home, the Woodson Ranch in the Ruby Valley.”

## 2010 – Pollinator Project

“The NRCS supports the use of native species in many conservation practices that involve seeding or transplanting. Selecting pollinator-friendly native species for these practices can provide added conservation benefits. These practices include:

- Channel bank vegetation
- Critical area planting
- Early successional habitat development/management
- Field borders
- Filter strips
- Herbaceous wind barriers
- Range planting
- Riparian herbaceous cover”

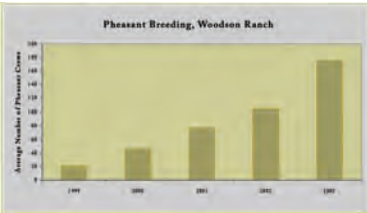


## 2011 – Transition

“On January 27, 2011 we lost our founder and dear friend, Craig Woodson. With his passing, his vision for the Ruby Habitat Foundation, which began to take shape in 2002, has reached a monumental milestone... Craig inspired and motivated the Foundation to aggressively pursue our mission and accomplish our goals... In his memory, we will continue to raise the awareness of a conservation ethic and demonstrate specific conservation practices that have application in our area.”



# Our First Nine Years in Review



## 2003 – Pheasant Habitat/Population Trends Monitoring

“Small annual grain food plots were planted to supply a steady and high value winter food source. Additionally, areas of low cover were farmed up and planted with a much more favorable mix of grasses and flowers that would provide excellent cover for nesting and rearing of broods. Surveys for pheasants in the spring show a steady increase in breeding activity on the ranch...”

## 2004 – Nature Trail Established

“In the spring of 2004, following an outing to the ranch to GPS a location, the 4th Grade class from the elementary school along with the High School Agriculture classes, came to the ranch to begin construction of a nature trail.”



## 2005 - Wetland and Riparian Area Management and Restoration

“It has been said that the highest value of our riparian areas is in the cool clean water that comes from them. In addition to the forage that grows in the riparian and wetland areas, and the wildlife that thrive there, these areas serve as filters and storage sponges for the water that flows through them. Healthy, functioning riparian areas provide a wealth of resource value that is difficult to quantify.”

## 2006 – Two Dear Friends Honored and the Visitor Center Created

“In the development stage is a small interpretive center in an historic log barn located at the trail head. Memorial gifts given in honor of two dear friends of the foundation, Bud Kanouse and Scott Waldie, will be used to renovate the building. It will become the Waldie/Kanouse Visitor Center.”



**Scott Waldie**  
October 14, 1946 - May 25, 2006



**M. C. “Bud” Kanouse**  
October 7, 1936 - October 9, 2003



# Soil Health Project Overview

Since 2011, the Ruby Habitat Foundation has been working with the Natural Resources Conservation Service on a 5-year Soil Health trial to evaluate the effectiveness of no-till seeding and cover crop cocktails in Southwest Montana.

Nationwide, these technologies are being touted as important tools for improving soil health. No-till seeding reduces disturbance to biological systems, maintains soil structure and preserves surface residue.

Cover crops can be used for many things including reducing compaction, smothering weeds, fixing atmospheric nitrogen, attracting wildlife and pollinators and on and on.

However, these tools are unproven in our area, and many landowners have questions about their effectiveness and economic feasibility in local agricultural systems.

Therefore, the Ruby Habitat Foundation has set aside 45

acres to experiment with these technologies over a 5 year period. In addition the study will evaluate the benefits of commercial fertilizer in each treatment.

This project will allow us to measure crop yields and track changes in soil fertility while comparing production costs between traditional, no-till and cover crop farming systems.



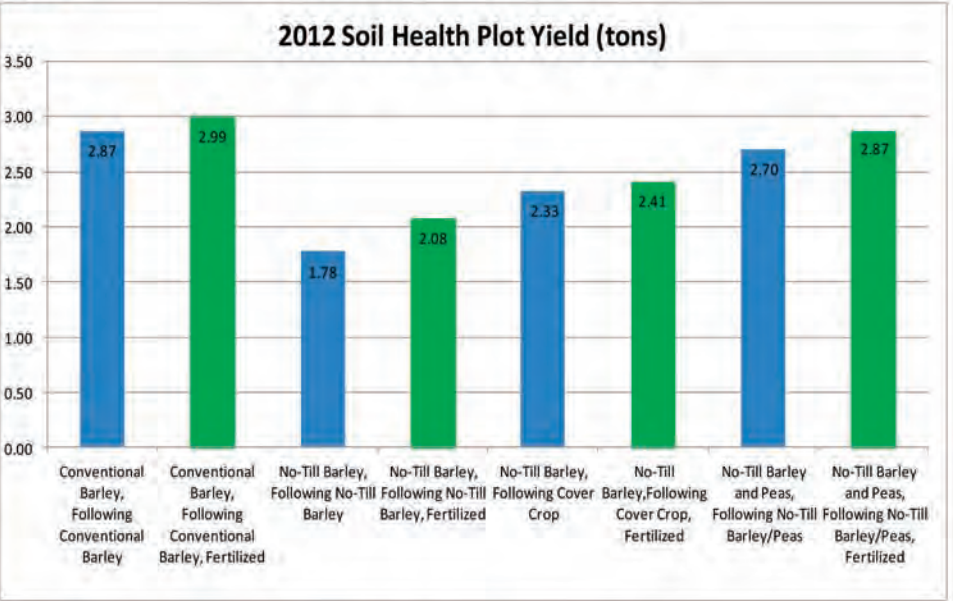
## 2012 Production Results

This chart illustrates differences in production among treatments in 2012.

Yields were the highest in conventionally tilled systems. However, the inclusion of forage peas in the no-till plots increased yields considerably, almost matching the conventional system.

The no-till plots that were in a cover crop in 2011 had greater production than plots that were in hay barley in 2011. This suggests a cover crop can provide important nutrients for the following crop.

It was surprising to see how little yield was gained by applying conventional fertilizer.



*The Ruby Habitat Foundation's 12' Truax No-Till Drill hard at work planting Hay Barley into an old grass stand on the Woodson Ranch*

## How Does No-Till Work?

Traditionally farmers and ranchers have relied on a variety of tillage implements to terminate crops, incorporate residue and manure into the soil, fight weeds, and break up compaction. Conventional tillage tools include moldboard plows, chisel plows, disks, harrows, culti-packers and more.

These tools have their place, and may still be needed in certain situations. However, intensive tillage destroys soil structure and

biological systems that are critical for cycling nutrients, storing water, preventing erosion and a host of other important services.

No-till farming relies on chemical control of existing crops and weeds. Sharp metal disks on the no-till drill then create small slits through surface residue and the soil where the seed is then planted. Benefits are great due to reduced disturbance and lower labor and fuel costs.



The Numbers

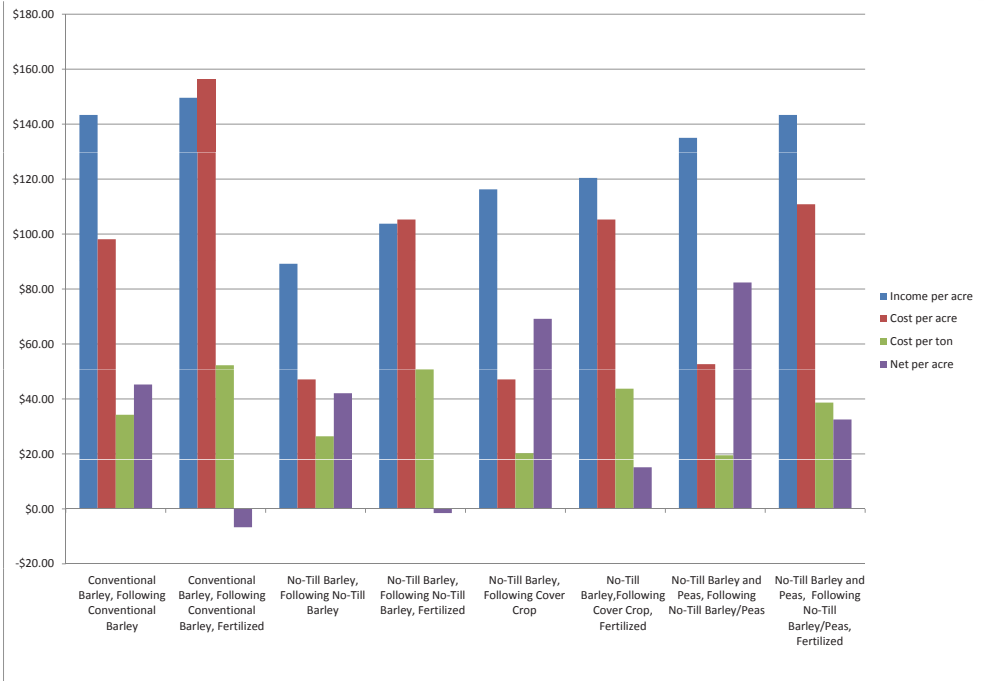
While the utility of no-till farming for reducing disturbance and erosion is well documented, local producers are hesitant to convert to this technology due to perceptions of equipment costs and lost productivity.

Our yield data (page 2) indicates that production can indeed be lower in no-till situations, at least for the first couple years. Literature related to this phenomena suggests that yields can be lower when converting to no-till because nitrogen is initially “locked up” in bacteria that are eating the old residue. Oftentimes this can be offset with additional fertilizer in early years, until the biological system catches up.

Despite slightly lower production, the economic data from 2012 demonstrates that net profits from no-till can match or even exceed those of conventional farming.

Greater net per yield is due to lower input costs associated with no-till

2012 Production Cost and Income Per Acre



systems. No-till requires fewer passes with heavy tillage equipment which reduces both labor, equipment, and fuel costs.

The chart shows that highest profits in 2012 were realized in plots with no-till barley following a cover crop, and no-till barley and peas.

The chart also demonstrates that commercial fertilizer does not always pay for itself.

Net profit was lower in every treatment when fertilizer was applied, and money was lost when fertilizer was used in the conventional and no-till barley systems.



What is a Cover Crop “Cocktail”?



Cattle from Peas Ranches dine on a mixture of Radishes, Turnips, Oats, Sunflowers, Millet and Peas at the Woodson Ranch. Forage production exceeded 2 AUMs per acre, making this cover crop cocktail a viable option for building soil while providing a nutritious late summer or fall forage for livestock.

Cover crop “cocktails” are becoming a very popular tool for improving soils and reducing expensive inputs.

Diverse mixes of annual crops can fix nitrogen, increase organic matter, reduce compaction, make deep nutrients available to subsequent crops, stimulate nutrient cycling, smother weeds, and increase soil biological activity.

Just about any annual crop can be included in one of these cocktails. However, it is important to match the species mix with your local growing conditions and land man-

agement objectives. For example, if fixing nitrogen for your next crop is your goal, include more legumes. If you want to increase organic matter and residual cover than consider high carbon species like corn, sorghum or other grasses. Radishes can be used to break up compaction, and turnips can scavenge nutrients from deep in the soil for subsequent crops.

Cover crops can make excellent late season forage. However, always make sure the “cocktail” does not contain any potentially toxic species for your class of livestock.

Soil Health Project Monitoring

In addition to crop production, this project will track a variety of physical, chemical and biological soil parameters to monitor changes in soil quality on the study plots. Standard soil samples will be submitted annually to quantify nutrient status and changes in organic matter. In 2011 a baseline Soil Food Web Analysis was completed to document the number and type of critters present in the soil prior to treatment. This test will be repeated at the end of the trial to see if anything has changed. In 2013 the NRCS will also assist in conducting an Active Carbon Assessment of each plot to evaluate biological activity.



2012 Selected Soil Test Results

	%Organic Matter	Nitrogen (lbs/ac)
Tilled Barley	4.1	28
No-Till Barley/Peas	4.8	54
No-Till Barley	4.2	30
Baseline Grass	5.0	28
Cover Crop	5.2	50

Baseline Soil Food Web Analysis Results

Active Bacteria-	Above Range
Total Bacteria-	Above Range
Active Fungi-	Below Range
Total Fungi-	Above Range
Flagellates-	Low
Amoebae-	Low
Ciliates-	Low
Nematodes-	Low

Outreach



Local ranchers came out to see the cover crop and no-till plots first hand at the 2012 field tour. Here they are standing in the cover crop cocktail looking at a patch of healthy sorghum/sudangrass, which is not typically grown in this part of the state.

For the past two summers the Ruby Habitat Foundation has worked with the Ruby Valley Conservation District and the Sheridan NRCS field staff to host a tour of the Soil Health project site. This field day provides an excellent opportunity for local land managers to hear what is going on out here and see the results first hand.

Walking through the field, listening to the buzz of pollinators, picking turnips, and digging in the soil is really the best way to understand this effort.

Please join us again in 2013 to see what is happening in the field!