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Montana Conservation Districts

2000 Project Posters

A collection of natural resource conservation efforts by Montana's conservation districts

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Conservation districts 2000 project posters

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Liberty County Conservation District
Lower Musselshell Conservation District
Meagher County Conservation District
Missoula County Conservation District
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Phillips Conservation District
Pondera County Conservation District
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*Celebrating Fifty
Years of Service to
Beaverhead County*

*Chairman Art Christensen (left) and
Vice-Chairman Emmett Blomquist (right)
have served the Beaverhead Conservation
District since its inception in 1950.*



*Supervisors - Beaverhead
Soil Conservation
District 1950*

Beaverhead Conservation District



Spring development



*Inset photo, above right:
Harold and Margie Peterson
curves spring development*

**THE BIG HOLE
WATERSHED PROJECT**

Keeping rare fluvial, arctic grazing off the endangered species list was a common goal for many agencies, private individuals, and landowners who worked together to establish off-river alternative watering facilities in the upper Big Hole basin. The project successfully developed 13 stockwater wells and two springs, decreasing the need to divert water for stock. Water is pumped from the wells into the river during low water and drought conditions on the Big Hole River. The aquatic environment is enhanced by maintaining instream flows, thus providing sufficient habitat and suitable water temperatures for the river's trout and graveling fisheries. "This is the most positive project we've done in a long time," said Chairman Art Christensen.

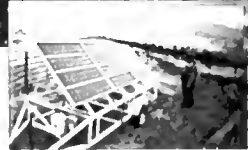
Large capacity stockwater tank



Foot of the stockwater well program



Bottom of the stockwater well program



Top of the stockwater well program

CHALLENGE OF CHANGE— A Field Day on the Sun River

The Cascade County Conservation District Board of Supervisors worked with the Lewis and Clark Conservation District, the Teton County Conservation District, and the Sun River Watershed Group to host a tour of the Sun River Watershed Project



One hundred and twenty-eight people attended the Sun River Watershed Project Tour. Shirley Cameron, the state coordinator for the U.S. Natural Resources Conservation Service (NRCS), opened the tour with her comments. Plaques were presented to Greenfield Irrigation District and 18 Shaw Irrigation District in recognition of their dedication and commitment to efforts in the watershed.



Cascade County Conservation District's Tom Leimaster and U.S. Natural Resources Conservation Service State Coordinator Shirley Cameron work together to strengthen the partnership.



Landscape plan at Leesville.



Tour participants cross Elk Creek for a view of the Scherer project.



Planting the bank stabilisation project on the main stem of the Sun River—100 feet of riparian work.

This workshop tour was the result of cooperation, coordination, commitment, and hard work on the part of a great many individuals, agencies, and organizations. Landowners cooperated and we had the help of Warren Kellogg, Tom Paul, Allen McNeal, Sue McNeal, and the Sun River Watershed Coordinator, Alan Rohls.

Cascade County Conservation District

Three buses followed by private vehicles proceeded on the tour. The first stop was at Thompson's Sand and Gravel, situated on the main stem of the Sun River. The group toured a large bank stabilization project that used cottonwood rootwads keyed into the bank. The tour group proceeded to the banks of Muddy Creek. Once a mainly muddy area, Muddy Creek supports a fishery in Cascade County.



Muddy Creek project. 500 barbs and 15 drops installed. Erosion has been reduced by approximately 75 percent. Vegetation is coming back and the fishery has been restored.

The next stop was in Teton County Conservation District at Marc Lee's bank project. Christmas trees were bound together as bank reinforcement. Chris Dalberg of Teton County Conservation District addressed the group during a luncheon hosted by parents of Eager Eagles 4-H Exchange Club at the Fairfield Community Hall.



Sun River Watershed Coordinator Alan Rohls explains the Sun River watershed project.

The group proceeded to Fred Scherer's ranch near Augusta, in Lewis and Clark County. Elk Creek is also known as the South Fork of the Sun River. The riparian recovery project involves a section of Elk Creek adjacent to a hay field. It had been completed only a few months before the tour. The constructed area, with willows sprigged into the banks, should allow the riparian area to recover. Funding for this project was provided by grants in kind contributions from three conservation districts, and an in-kind support from the U.S. Forest Service, the Montana Department of Fish, Wildlife and Parks, and the U.S. Natural Resources Conservation Service.

PROJECT LOCATION

The Sun River Watershed is located in west-central Montana and covers 2,200 square miles (1,408,000 acres), as follows:

- 356 square miles (228,096 acres) northwestern Cascade County
- 1,089 square miles (696,960 acres) in eastern Lewis and Clark County
- 755 square miles (482,944 acres) in southern Teton County (approximate figures only)

The project includes:

- U.S. Forest Service wilderness
- rangeland
- critical wildlife winter habitat
- irrigated cropland
- several small communities

PROJECT OBJECTIVES

The project objectives of local groups are as follows:

- maintain and/or improve a viable agricultural economy
- control noxious weed infestations in the Sun River Watershed
- reduce the sediment loads into the Sun and Missouri Rivers
- improve the overall water quality of the Sun River
- improve the flows in the Sun River
- improve the fisheries of the Sun River
- ensure effective subdivision planning



Sun River flows in its 360 miles willow-lined riparian corridor, contributing its water to various uses until it mingles with the Missouri River. The Missouri River originates near the historic city of Great Falls. As it makes this 1,000-mile journey, it communities of Glasgow, Shovelton, Sun River, Vaughn, and Sun Prairie Village.

Rocky Mountain Frontiers on the Sun River

TOPOGRAPHY AND GEOLOGY

The Sun River is a major tributary of the Missouri River located in north-central Montana. The basin is about 110 miles long and 30 miles wide. It drains 2,200 square miles of the east slope of the Rocky Mountains. Elevations range from 9,000 feet to 3,300 feet.



Cascade County Conservation District supervisors were all on hand to host landowners and super-sites from other conservation districts.



The watershed tour provided an arena for serious discussion about stream improvements and total maximum daily loads (TMDLs).

STAKEHOLDER REPRESENTATION

Teamwork is the driving force behind the success of this project. A partnership coordinates the needs of the project. Key decisions and direction are formulated during quarterly group meetings. Day-to-day operations are led by three conservation districts, calling special work group meetings. Operations are integrated by the watershed coordinators at their respective board meetings. A consensus process is used to reach an agreement with all partners.

The respective irrigation and conservation districts work cooperatively on behalf of the major land users who are agricultural. Numerous conservation groups and many businesses contribute funds, time, and skills to the project. More than 20 local, state, and federal government agencies actively participate, providing guidance and suggestions. All participants have a voice. Work groups encourage teamwork and provide general direction for cooperative efforts toward achieving the objectives of this plan. Actions from these groups are voluntary.



Irrigation flow meter



Irrigation sarge valve



Irrigation watering facility



IRRIGATION EFFICIENCY

The district is involved with local workgroup activities with the Buffalo Rapids Irrigation District. The workgroup's goals and objectives are to increase water management efficiency to 50 percent on the project area. Irrigation water management and installation of buried pipe, gated pipe, are being used on the project to meet these goals.

Custer County

Conservation District

WINTER GRAZING SEMINAR

The Custer County Conservation District co-hosted the 2000 Winter Grazing Seminar with Prairie County Conservation District.

A record number of participants came from three states and Canada to take in this year's seminar. Topics for this year's seminar ranged from increasing profitability to grazing alternative crops and raising buffalo.



The primary goal of the Custer County Conservation District is to improve range management in Custer County.

The Custer County Conservation District sponsors a variety of opportunities to improve range management in Custer County, including:

- Rangeland Improvement Loans
- USDA cost-share programs to assist landowners with rangeland management and range improvements

CONSERVATION KIDS' DAY

One hundred and ten Custer County rural school students and 10 Prairie County sixth graders attended this year's Conservation Kids' Day. Stations for the event ranged from soils and local archaeology to identifying aquatic insects and fish. A barbecue lunch was provided, sponsored by both conservation districts and the Seedex Seed Company. The event concluded with a Cavalry/Civil War presentation.







Photo 1. A stream bank is being prepared for revegetation. The stream is in the background. Photo 2. A stream bank is being prepared for revegetation. The stream is in the background.

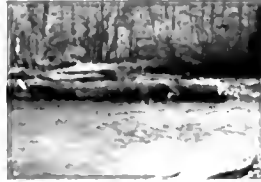


Photo 3. A stream bank is being prepared for revegetation. The stream is in the background. Photo 4. A stream bank is being prepared for revegetation. The stream is in the background.

SWIFT CREEK REHABILITATION

Flathead Conservation District administers Montana's Natural Streambed and Land Preservation Act (the "310" law) on 600 perennial (year round) streams within Flathead County. The projects range from small culverts to major renovations. An example of a recent rehabilitation was that undertaken by four landowners along the mouth of Swift Creek, within the jurisdiction of the 310 law.

Seventy-two streams contribute to Swift Creek as it winds its way from the divide to Whitefish Lake in northwestern Montana, creating a raging stream during spring runoff. The lower portion of the creek just upstream of the lake was severely eroding. Many bank stabilization projects had been tried there unsuccessfully over the years. The accelerated bank erosion threatened homes and a county road.

Watershed Consulting of Whitefish designed the "soft fix" rehabilitation for the landowners, utilizing tree rootwads, downed trees, rock placements, and heavy revegetation. This approach was an alternative to the standard rocking of the stream. These photos show the ongoing success of the project one year later.



Photo 5. A stream bank is being prepared for revegetation. The stream is in the background. Photo 6. A stream bank is being prepared for revegetation. The stream is in the background.



Photo 7. A stream bank is being prepared for revegetation. The stream is in the background. Photo 8. A stream bank is being prepared for revegetation. The stream is in the background.



Approximate water sets the diversion, typically built as a wing dam. Access flows go around the upstream end of the diversion rather than overtopping the blocks.



CONCRETE BLOCK IRRIGATION DIVERSIONS



ADVANTAGES

- Installation and removal and fast and easy.
- Local farm equipment can be used to install the diversion.
- The concrete blocks last for many years.
- Long-term maintenance of the diversion site is reduced.
- Safety hazards and interference to recreational floaters are minimized.
- Fish passage is allowed around the structure.
- If the stream moves, the blocks can be moved to a new position.

DISADVANTAGES

- An area on the streambank adjacent to the diversion is required to store the blocks.
- Block diversion is designed to be removed in the fall after the irrigation season.



Tom Hughes, from the Montana Department of Natural Resources and Conservation, developed a new irrigation diversion system using portable concrete blocks. The diversions were designed to provide an environmentally friendly alternative to the traditional diversion methods of constructing permanent dams with large rocks and constructing temporary dams with river gravel. Concrete blocks are relatively inexpensive and durable, and they can be rapidly placed in the streambed.

A 223 grant was acquired in 1997 by Gallatin Conservation District to provide assistance to construct two steel forms capable of building a wide variety of concrete block sizes. The 223 grant was also used to install the first block diversion on the Nichols-Burrell Ditch in Logan. Fifteen blocks were placed with an excavator. Each 2-foot by 6-foot block weighs approximately 2,000 pounds.



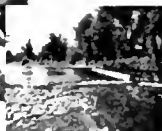
Baker Ditch



Baker Ditch



Roadarmel Ditch



Mammoth Ditch

The Gallatin Conservation District applied for a second grant in 2000 to place three additional structures in the Gallatin valley: on Baker Ditch, Roadarmel Ditch, and at Mammoth Ditch Company on the Gallatin River. The latter required 18 blocks for diversion of the water into the head of the irrigation ditch.

Figure 1. The 1997 diversion structure on the Nichols-Burrell Ditch. The blocks were placed in the streambed after the stream has been flushed of gravel and debris through the diversion site.

Mammoth Ditch



Governor's Range Tour, July 8, 1999 Little Dry Creek at 1 Half's



July 8, 1999



July 8, 1999

Standing over pin facing South Big Dry Creek above Jordan (at Cottonwoods)



July 8, 1999

STREAM MONITORING PROJECT

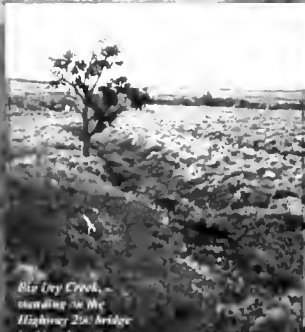
Garfield County

Conservation District 406-557-2232



July 28, 1997

Steven's Fork of Big Dry Creek, standing on the county road bridge at mid-channel looking downstream

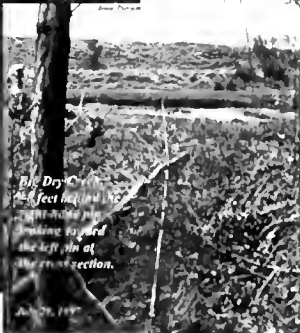


Big Dry Creek, standing on the Highway 261 bridge looking downstream.

July 28, 1997



July 28, 1997



Big Dry Creek, 20 feet higher than 1997-2000 pin, looking toward the left pin at the cross section.

July 28, 1997

In 1997 Garfield County Conservation District began a stream monitoring project on the streams in the county that had been listed as impaired. Big Dry Creek and Little Dry Creek were the first streams targeted. Warren Kellogg and Bob Bukantis assisted with assessments and implementation of the monitoring plan.

Different sites were targeted along each stream. At each site, photo points were established, and a cross section of the creek bank was surveyed. Electrical conductivity, salinity, water temperature, and flow were measured. Grab samples taken at each site were tested for nutrients, nitrates, phosphorus, common ions, and suspended solids. Algae and bug samples were also gathered and tested.

With assessments complete, monitoring sites were established along Big Dry Creek and Little Dry Creek. Monthly monitoring began late in the summer of 1997. Monitoring continued on a monthly basis, except during freezing, through spring 2000, at which time bimonthly monitoring commenced. Once every three years, photos will be taken at established sites on both creeks. A cross section for each will be completed in addition to the tests listed above.

Initial assessments will be completed and new monitoring sites are scheduled for establishment on Calf Creek and on the South Fork of Lodge Pole Creek during the summer of 2000. Streams will be monitored monthly for the duration of funding or until sufficient data are collected.

RESULTS AND CONTINUED ACTIVITY

After the initial assessment, Little Dry Creek was removed from the impaired stream list. Big Dry Creek, Calf Creek, and the South Fork of Lodge Pole Creek are still listed as impaired. Efforts continue to secure data to assist in the removal of these creeks from the impaired stream list.



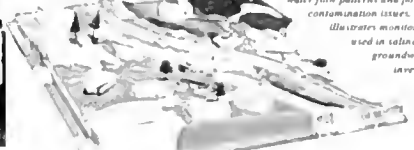
Four colonies: Hillside and Rimro, & Colonies of Toole County, Sage Creek Colony of Liberty County, and Glendale Colony of Glacier County attended Science Day 1999.

HUTTERITE COLONY SCIENCE DAY

Students learned soil types and textures, soil moisture, water quality issues, planting plans, and monitoring salt hazard/nitrate levels. Students sampled and measured electrical conductivity and nitrate levels in groundwater.



Joe Don Stein, MSU, explained the planting process for the medium to high salt-tolerant Shubhone beardless wildrye and Garrison creeping fescue plugs from Montana State Nursery.



"b arm game" a portable ground-water flow model, was used to demonstrate water flow patterns and potential contamination issues. The game illustrates monitoring wells used in saline groundwater investigation.

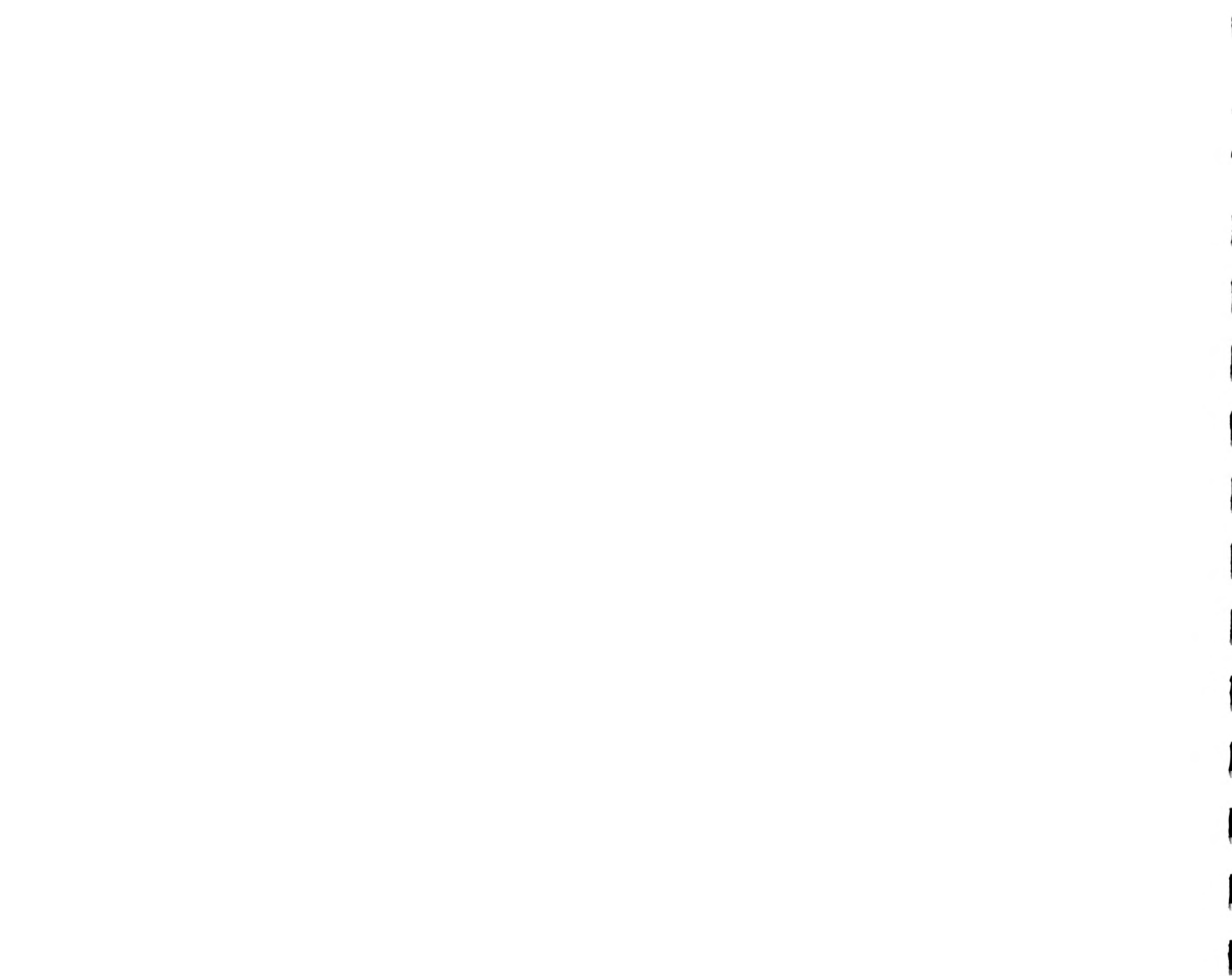


Robert Legare tells how the monitoring well was drilled and how samples are withdrawn and analyzed.

The long-term goal of Science Day is to promote natural resources conservation by building a trust level with natural resource personnel and familiarity with programs, groups, and agencies. This trust level will also encourage colony residents to support actions by Colony Farm Bosses to continue natural resources protection.

Hutterite Colony classroom resources are limited, and one or two teachers instruct multiple grades. The Science Day project facilitated incorporating agricultural issues relative to colony situations into the science natural resources education.

Education grants were obtained by Glacier and Liberty Conservation Districts to co-sponsor a Science Day with the Montana Salinity Control Association (MSCA).



Jon Siddoway, U.S. Natural Resources Conservation Service, explains setting up a range monitoring plot.



MONTANA RANGELAND MONITORING

Range monitoring is becoming a condition of many grazing permits and leases on both public and private land, regardless of ownership. Past inconsistencies in monitoring methods and terms used among various governmental agencies have been a frustration faced by range livestock producers. Two workshops were created to promote uniformity and consistency in (1) methods used to measure the effects of livestock grazing on rangeland, and (2) evaluation of range condition. The workshops were offered by Glacier County Conservation District to 90 ranchers in June and October of 1999.



Rancher livestock producers identify grasses.



Each one-day workshop was sponsored by Blackfoot, Glacier County, and Pondera County Conservation Districts. Montana State University Extension Range Specialist Jeff Mosley, Glacier Extension Agent Darren Crawford, and Blackfoot Extension Agent Verna Billedeau led the discussions. The U.S. Natural Resources Conservation Service assisted individuals in identifying plants, setting up monitoring plots, and keeping records.



PHOTOS: (far left) George E. Anderson/PhotoDisc

PHOTOS: (left center) Darren Crawford and Jeff Mosley present information to producers and assist with checking (far left, right center and far right) vegetation on a riparian area at John Shepard's.

Shell the wheat



Grind the flour



OODLES OF NOODLES

FROM THE FIELD TO THE TABLE

The Oodles of Noodles Program begins with stations set up for teaching various yet simple tasks taking students, parents, and teachers from grain in the field to pasta on the table

Station One

A head of wheat is taken apart and examined, showing how the wheat berries grow. The parts of the wheat kernel are explained, with information added about nutrition and production of grain.

Station Two

The wheat berries are ground into flour, using a home flour grinder. The texture of the flour can be felt by rubbing it between the fingers

Station Three

The dough is mixed, following a simple, basic noodle recipe. Chocolate milk mix is added to make the taste of the noodles more appealing to fourth graders.

Station Four

Students roll the dough through pasta machines to make noodles. The students can then taste or take home what they have produced

Each student has hands-on activity at each station experiencing the development of a product from the field to the table.



Glacier County Conservation District teams with Women in Farm Economics to present a program to fourth grade students as part of the observation of National Agriculture Week.

Many students are unfamiliar with grain products that are specifically grown for pasta. The process of grinding grain for flour and the fun of mixing dough and rolling noodles are shared through this program with teachers, parents, and pupils.

Fourth graders roll out the dough and make noodles using a pasta machine.



Chocolate milk was added to the pasta dough to enhance the flavor for demonstration purposes.



**SPRING CROPS
TOUR 1999**

Glacier County

Conservation District

Greg Ruskamp, with a handful of plants, explains spring variety plots.



Mark Nitz in the brown shirt, tells his experiences with hard white wheat production.



CONSERVATION TILLAGE

A crops tour of new grain variety plots is hosted each year by Glacier County Conservation District. Chemical applications are checked, and spring grain and fertilizer tests are inspected.



Hard white spring wheat had varying results with chemical applications. *Discover*, a chemical presently being used in Canada, is labeled for release in the U.S. in February 2000. There is a wider window of application, especially on the wild oats and Persian darnel, making it easier to receive a high proportion of overall control.

General Mills elevator had two new hollow-stem varieties of hard white spring wheat nearby. Comparisons showed definite differences in growth. Yield on the hard white averages 10 bushels higher than hard red spring wheat with a premium payment.

Utopia durum wheat — a black-bearded variety — provided an eye-catching color comparison with a neighboring field of Rambo. Utopia is a new variety release owned by General Mills.

The Western Triangle Experiment Station's spring grain and fertilizer test plots on no-till or chemical-fallowed farming areas were visited, and the new malt barley varieties were noted. Fertilizer application results were checked on barley seeded to summer-fallowed ground. Local producers grow many solid-stem grain varieties that are sawfly-resistant since sawfly is prevalent in this area.

Rust rot has a tendency to show up in dry years, when the plants are under stress due to lack of moisture and aren't healthy enough to resist the rot.



Spring grains at Bruce Bradley's 1999



Barley plots at Bradley's 1999



Black bearded durum General Mills, Utopia new variety at Ted Nitz's



Roger C. Nitz, General Mills, tells of characteristics and proposed improvements in the hard white spring wheats.

Governor Marc Racicot presented the Sage Creek Watershed Alliance with the 2000 Watershed Stewardship Award. The award is supported by both Hill County (HCCD) and Liberty County (LCCD) Conservation Districts.

The alliance, through HCCD and LCCD, was honored for the following achievements:

- diverse, local involvement
- effective collaboration
- community outreach and education
- comprehensive approach to watershed health

2000 Watershed Stewardship Award

Hill County

Conservation District



Sage Creek Watershed Alliance Chairman, Tom Jenks, receiving the award from Governor Marc Racicot.



Governor Marc Racicot and Mary Ellen Wolfe, chair of the Montana Watershed Coordination Council.



Montana State Capitol Building - Helena, Montana

The Sage Creek Watershed Alliance has proven itself to be an effective force through a person-to-person approach in its efforts to address water quality/quantity concerns—primarily, the reclamation of saline seeps and the evaluation of the surface water and groundwater interaction.

The Montana Watershed Coordination Council established the award to recognize innovative, locally led approaches to restoring and enhancing Montana's watersheds.



The delegation representing the Sage Creek Alliance (from the left): Joe Waldner, farm manager of Sage Creek Colony; Tom Jenks, alliance chair; Mike Wrenland, chair, Hill County Conservation District; all board members of the alliance: Mary Ellen Wolfe, Pam Gumbel, administrator, HCCD; Marlene Olson, administrator, LCCD; Governor Marc Racicot; John Wertz, vice president; David Heffer, president; and Paul Waldner, secretary/treasurer, Sage Creek Colony officers.



CANYON CREEK RESTORATION PROJECT

This project was successfully completed after carefully evaluating and surveying the area, designing a good restoration plan, coordinating with a great number of partners to secure materials and funding, and hiring a competent contractor



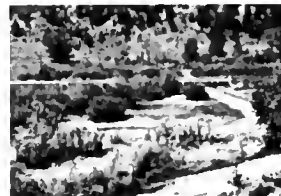
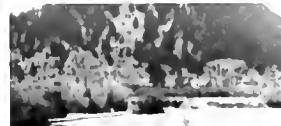
Before construction



Before construction—note the split channel and how it widens the total area under the bridge.



After construction—note that the willow has been removed and placed on the side of the channel. Note also how the channel is no longer endangering the bridge



Braided channel below the bridge

The problem—The Canyon Creek system has endured a variety of unhealthy activities over the past 100 or more years. Historical hydraulic mining, stream manipulation, historical use of the riparian area by livestock, and building of the highway bridge have all combined to result in large volumes of bedload material coming down the stream, loss of portions of the riparian community, and restriction of the floodplain. The deposition was sufficient to have severely restricted the conveyance area of the county bridge. Immediately below the bridge, the deposition had completely filled the historical channels, resulting in an extremely braided channel configuration. This system was not healthy, and the fisheries habitat was poor.

The solution—The Grady Ranch, along with various other federal, state, county, and local agencies, developed a stream and riparian restoration plan that included modifications within the stream corridor to improve function and riparian and fisheries habitat. The improvements included changes in grazing management of the stream corridor, along with channel adjustments under the bridge to improve conveyance. *Or, more specifically:*

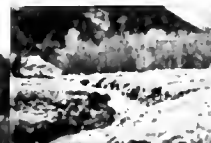
- *The channel above the bridge needed to be narrowed and stabilized with vegetation.*
- *The channel approaching and under the bridge would need to be centered, with side spans acting as the primary floodplain.*
- *Below the bridge, a new channel would have to be excavated.*
- *Channel stability and the riparian plant community would have to be re-established.*
- *The entire project area would have to be excluded from livestock grazing for three years to allow the vegetation to become established.*

Cooperators—

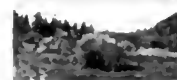
Grady Ranch Company
Lewis and Clark Conservation District
Lewis and Clark County—Road and Bridge
Montana Department of Fish, Wildlife and Parks—
Future Fisheries Improvement Program
US Fish and Wildlife Service—
Partners For Fish and Wildlife Program
Natural Resources Conservation Service



(Old braided channel that was filled in



After construction at high water



After high water



Showcasing the work that the Sun River Watershed Group has spearheaded in the past five years, the tour participants made four stops in the three conservation districts

The Lewis and Clark Conservation District stop was at landowner Fred Scherrer's property. Fred and his wife, Phyllis, have participated in a large section of work completed on their property since 1996. Lewis and Clark Conservation District, the US Fish and Wildlife Service; the Montana Department of Fish, Wildlife and Parks; and other agencies cooperated with the landowners to accomplish stream restoration efforts on Elk Creek. The most recent work was finished less than a year ago.

This restoration project started the way many do, with the landowner, Fred Scherrer, approaching Lewis and Clark Conservation District for a 310 permit to repair an eroding streambank in the late fall of 1994. After the proposed project site was reviewed, it was determined that, in addition to the eroding streambank, there were contributing problems upstream with an irrigation diversion system. Additional inventory in 1995 indicated that a solution to the erosion problems would be to install a diversion control structure as well as re-establish a proper meander pattern in this stream reach.

Restoration projects can be quite expensive. Consequently, during the summer and fall of 1995, partnerships were formed with entities interested in assisting financially and/or technically with this worthwhile project. In addition to Fred and Phyllis Scherrer and Lewis and Clark Conservation District, these partners included the US Fish and Wildlife Service; Montana Department of Fish, Wildlife and Parks; Last Chance Audubon Society; Missouri River Flyfishers; and the U.S. Natural Resources Conservation Service.

The initial construction phase of the project started in the late fall of 1995 and was completed in the spring of 1996. Approximately 1,000 feet of streambank was restored during this phase of the project. A fish-friendly irrigation diversion was constructed using local rock and a screw-gate water control structure to eliminate the need for annual damming of the river. Re-vegetation was accomplished using local sod transplants along the streambanks and seeding a native grass mix in other disturbed areas.



SUN RIVER WATERSHED TOUR

On April 21, 2000, Lewis and Clark Conservation District co-hosted a watershed tour, along with Teton County Conservation District, Cascade County Conservation District, and the Sun River Watershed Group.



Additional impaired reaches of the river were identified with ongoing evaluation and monitoring of the site. Construction to rehabilitate an additional 2,100 feet of stream was just completed during the fall of 1999. Local material was used to reshape and realign the stream channel into a more stable pattern and profile, which will equate to a healthier stream system.



Fencing to enable better control of grazing animals has also been installed.

Over one mile of Elk Creek has now been enhanced as it flows through the Scherrer property, which will directly benefit adjacent landowners, fisheries, and local wildlife.

Lewis and Clark Conservation District, Cascade County Conservation District, Teton Conservation District, and the Sun River Watershed Group



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2000 Watershed Stewardship Award

Liberty County

Conservation District



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Governor Marc Raelicot and Marc Ellen Wolfe, chair of the Montana Watershed Coordination Council.



Montana State Capitol Building - Helena, Montana

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Lower Musselshell Conservation District covers a wide range of activities—ranging from studying the tiniest macroinvertebrate in Careless Creek to using the latest water conservation technology available.

Lower Musselshell

Conservation District 406-23-2111



ANNUAL OUTDOOR CLASSROOM

At the Annual Outdoor Classroom on Careless Creek, students participated in their own area of interest, ranging from catching fish by electricity to catching bugs by net.

WEATHER STATION

Lower Musselshell Conservation District recently co-sponsored the installation of a weather station that

- *calculates evapotranspiration rates for crops grown in the area*
- *calculates crop water-use information related to stages of crop growth.*

Producers attended district-sponsored workshops to learn how to use this tool to make informed management decisions, irrigate efficiently, and protect natural resources.



Fort Logan Ridge hydrant located along Highway 160, northwest part of the county



Checkerboard hydrant located on Highway 1, heading toward Billings



Ranch Creek hydrant located along Highway 89 to Great Falls, northern part of the county



DRY HYDRANT FIRE PROTECTION PROJECT



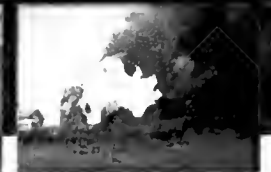
Bair County hydrant at the Bair Museum near Martinsdale



Meagher County Conservation District and the U.S. Natural Resources Conservation Service cooperated with the White Sulphur Springs Volunteer and Meagher County Rural Fire Departments to install 13 dry hydrants around the county. A grant, administered by Beartooth Resources Conservation and Development, cost shared the installation, up to \$500 each applicant.

Meagher County has already benefited from the use of the new hydrants for fire protection.

Dry hydrants provide a dependable, 365-days-per-year source of water to assist with fire control efforts.

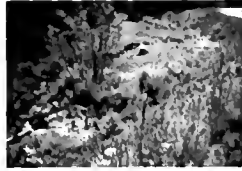


Fire protection in Meagher County is greatly enhanced by the new dry hydrants.



Knapweed Nelly Program

This successful program teaches children (K-3rd grade) about noxious weeds and how they can help prevent their spread. Children participate in a discussion on knapweed, watch a video, and do activity sheets related to the topic. This program was taught to 24 classrooms, approximately 175 students and 24 teachers.



Cost share participant and daughters, Susan Tallor.

Riparian Forest Buffers

Missoula County Conservation District is actively working with landowners around the county on installation of riparian forest buffers for streambank stabilization, fisheries, and wildlife habitat improvement. We have had good success with installation of native willow cuttings gathered on-site. This stream corridor was fenced and sprigged with Drummond willow cuttings.



Missoula County Conservation District



Pilot District Cost-Share Program A Great Success

Missoula County Conservation District received 42 applications for its new cost share program, and 19 projects were partially or fully funded. Applications came from all over Missoula County. The conservation district hopes to continue this program for a five year period. The pilot district cost share program included the following practices: bridge replacement, fisheries enhancements, diversions, irrigation water conveyances, riparian forest buffers, stream stabilization, wetland restoration, filter strip grassed waterways, vegetative plantings, windbreaks, forest site preparation, forest stand improvements, spring developments, weed control, fencing, native plant restoration and improvement, wildlife habitat improvement, and tree shrub planting.

310 PERMITS



Missoula County Conservation District has developed a new brochure to help educate landowners and 310 applicants on the s10 law and permitting process.



Hi, everyone!
I'm Knapweed Nelly, and I am spotted knapweed.
Here's how I spread, and here's how you can help to stop the spread of weeds.

Tissoula County Conservation District 406-251-4826

Knapweed Ned and Nelly Program

Knapweed Ned and Nelly is a program for K-3rd Grade that teaches children about noxious weeds and how they can help prevent their spread. Children participate in a discussion on knapweed, watch a video, and do activity sheets related to the topic. This program was taught to 24 classrooms approximately 475 students and 24 teachers.

The attention span of children varies, and materials are developed to address each age group. The program consists of an information discussion with students and a knapweed plant to illustrate plant growth habits. Students learn where knapweed comes from, how it got here, how it spreads, and ways to help prevent its spread.

Students learn why area residents don't want knapweed on their property.

- Knapweed Nelly puppets and a presenter in a knapweed costume get the program started.
- Activities are geared for specific age groups.
- A video from the Wyoming Weed and Pest Council is shown, with activities following that reinforce the messages.
- At the end of the program, each student receives a coloring book with information about further resources for parents.



Children are questioned about their knowledge of weeds throughout the program. An important part of the teaching is a display of different types of insects that feed on knapweed seeds and roots. The students watch a video entitled *A Kid's Journey to Understanding Weeds*. The video is sponsored by the Wyoming Weed and Pest Council. The video includes fourth graders telling other children about diffuse knapweed and musk thistle and how they can help be "Weed Warriors." A short question-and-answer session asking "What did you learn?" follows the video. Activities reinforce the program message. The program ends with distribution of a coloring book entitled *Ned and Nellie Present the Knapweed Coloring Book*. Additional resources for parents are listed in the coloring book.





Park



Conservation District

**GOVERNOR'S
UPPER
YELLOWSTONE
RIVER
TASK FORCE**

Governor Marc Racicot created the Upper Yellowstone River Task Force in November 1997 to address problems arising from the extreme floods of 1996 and 1997.



PURPOSES:

- Provide a forum for the discussion of issues that affect the upper Yellowstone River basin.
- Bring together landowners, sportsmen and sportswomen, and community leaders.
- Ensure that future projects affecting the river are planned and conducted in a manner that will preserve the integrity, beauty, values, and function of the upper Yellowstone River for Montanans now and in the future.

OVERALL GOAL:

- Develop a set of publicly supported river corridor management recommendations that address potential adverse cumulative effects of river channel modification and floodplain development on the human community and the riparian ecosystem.

Upper Yellowstone River Study Area: Gardiner to Springdale, Montana, 2,930 square-mile basin.



**OFF-STREAM STOCKWATER
AND HABITAT/RIPARIAN
PROTECTION PROJECT**

Installed three frost-free tanks in the upland area in order to provide another source of water for approximately 600 cows that had been drinking from Daisy Dean Creek.



Installed tank



Degraded riparian area (north side of the county road)



Degraded riparian area (south side of the county road)

**UPPER SHIELDS RIVER
WATERSHED ASSOCIATION**

Park Conservation District 406-222-2899



Before

**HOYEM BROTHERS
BANK STABILIZATION PROJECT**

Stabilized 191 feet of the Shields River using harbs and rootwads.

The Upper Shields River Watershed Association is a collection of land owners and citizens of the community who share the vision that ranching, as a way of life, can and must be preserved. This group has been drawn together for the purpose of protecting and improving the land, water, and the resources of the land since these represent the very foundation of ranching.

The association works collaboratively with federal, state, and local government agencies on projects intended to protect and improve watershed health throughout the upper Shields River area. The Association has been active since November 1997.

The size of the upper Shields watershed is 543 square miles and 347,520 acres.



After summer with vegetation growth



After winter



*Irrigators from Blaine
gather around an irrigation
workshop to learn the art of
regulating soils from U.S.
Natural Resources
Conservation Service
and Scientist Rick Bands.*



*Phillips Conservation District
Field Technician Erik Banks
is standing in front of an
AgriMet weather station.*

IRRIGATION WATER MANAGEMENT PROGRAM



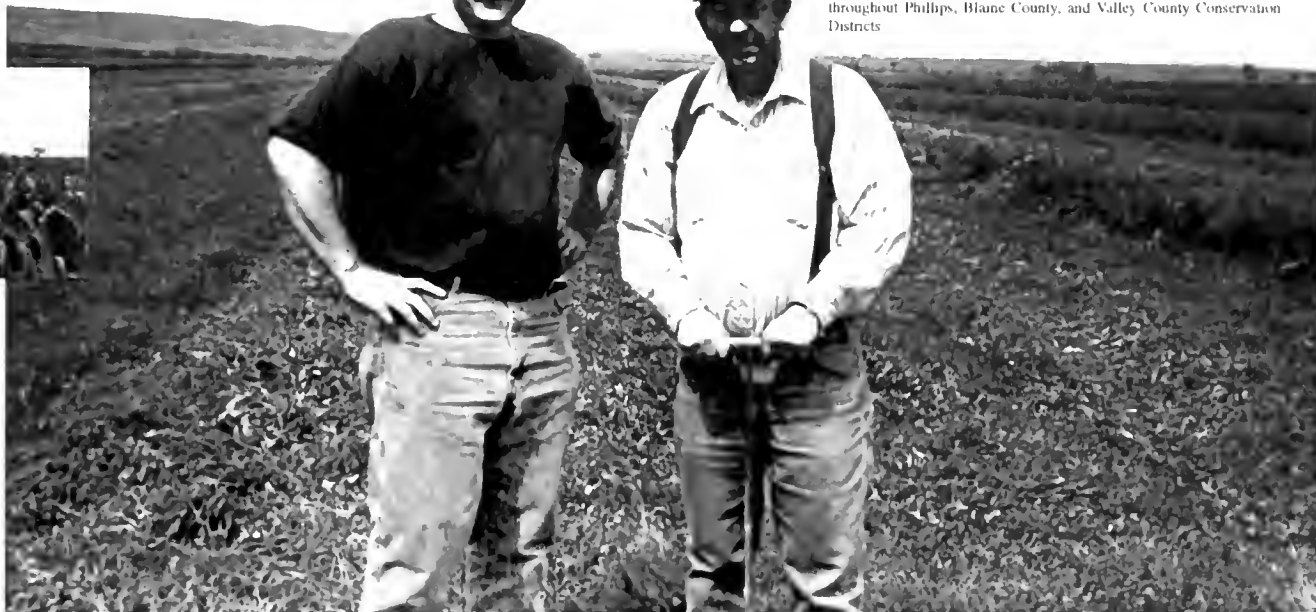
*Phillips Conservation District Field
Technician Deb Fankatz (left) works
with Agr Metter from Turner, Montana.
They are testing moisture using the
feel-and-squeeze method utilizing
a Paul Brix Probe.*



*U.S. producer Craig Barnham (left)
uses week's crop water reports and
soil information to schedule irrigation
in his corn fields.*

**Irrigation scheduling
using AgriMet ET
data can provide
significant savings in
water, pumping costs, and
fertilizer, herbicide, and
pesticide applications.**

**Everyone benefits from
reduced soil erosion and
protection of surface water
and groundwater quality.**



The U.S. Bureau of Reclamation, in cooperation with other federal, state, and local sponsors, has developed an agricultural weather information system called "AgriMet" to promote energy and water conservation. AgriMet is a contraction of the words *Agriculture* and *Meteorology*. It is a network of automated weather stations that collect and telemeter site-specific weather data. AgriMet's primary purpose is modeling ET (evapotranspiration—the amount of water used/emitted by a crop).

The educational focus of the AgriMet Irrigation Water Management (IWM) Program is to provide irrigators with information about a management tool for developing IWM plans. Benefits from practicing IWM are directly related to applying the right amount of water according to crop state, weather, and soil water-holding capacity. The program is available to cover approximately 120,000 acres of irrigated ground in the Milk River basin, throughout Phillips, Blaine County, and Valley County Conservation Districts.



Dick Meier, a Conrad Junior High teacher, brought his archeology collection. Students learned how an arrowhead is made.



Bill Hill of the Department of Fish Wildlife and Parks brought pictures of fish for students to identify.



Rick Bandy and Bev Walker, NRCS, taught kids about soil. The different types of soil are sand, silt, and clay. A mixture of these make up soil. Bandy showed how to determine soil texture by wetting a sample of soil and making a ribbon. Each student took a sample of soil and added water to check the soil's smoothness and graininess.



Rick Bandy, NRCS, showed students different soil textures.

4th GRADE OUTDOOR CLASSROOM

Over 125 students from Pondera County attended the 4th Grade Outdoor Classroom. Six 20-minute stations were set up near the creek to teach the children about soils, plants, animals, and fish.



Lanny Walker, NRCS, explained the differences between forbs, grasses, and shrubs. Stephanie Rittman, Pondera County Extension Agent, talked with students about annuals and perennials. Annuals run their course and die out, while perennials die back in the fall and then store their energy in their roots for the coming spring. At the end of the session, students could identify the difference between annuals and perennials, and between forbs, grasses, and shrubs.



Gary Olson, DFWP biologist, explained the differences between horns and antlers. Horns are made from bone, just like a person's fingernails, and they do not fall off each year. Antlers, on the other hand, fall off and regrow each year. Of all the antlered animals, only males have antlers. Horned animals can be male or female and keep their horns for life.

Phyllis Philipps of the U.S. Natural Resources Conservation Service and her mother, Josephine Caputo, visiting from California, taught students about ecosystems and illustrated how each one of us is part of that system. Students participated in charades including frogs, deer, and insects while forming a web of yarn woven from student to student. As portions of the web were cut away, students learned how ecosystems are destroyed as portions of the interconnected web are weakened.

At the archeology station, Dick Meier, a Conrad Junior High teacher, shared his collection of Indian artifacts. Dick demonstrated how Indians made arrowheads by taking a basalt rock and breaking off pieces with a chunk of deer antler until it was razor sharp. Differently sized arrowheads had different uses, and differently shaped rocks were used for different purposes, like the thumbnail rock for cleaning animal hides.

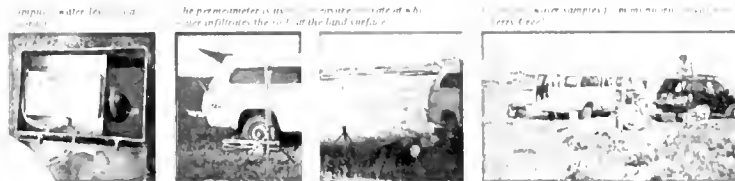
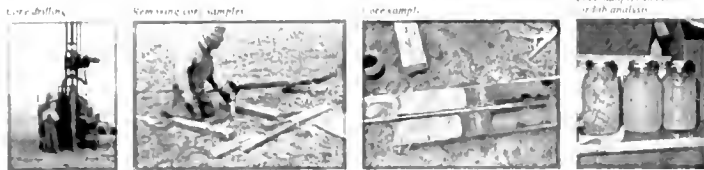
Bill Hill of the Montana Department of Fish, Wildlife and Parks (DFWP) gave the students a book with pictures of different fish and asked them to identify plastic fish. Students compared color, fins, and spots and looked up where the fish are found. Students learned that fish are predators if they eat other fish.

Students ended the day with a scavenger hunt applying their new knowledge. Students collected litter and illustrated being good land stewards. Lilac trees and a treat bag were handed out. Pondera County Conservation District thanks the participating schools, teachers, and chaperones, NRCS, DFWP, MSU Extension Service, Dick Meier, Fred Walker, Lanny Walker, and Connie Hanson for organizing the classroom and John and Leanne Haynes for use of their land and the access gate.

We had a great turnout. See you all next year!

Ruffalo and bighorn sheep make good examples. Other animals find nutrients and vitamins in the antlers that are shed each year. Antlers do not give an accurate indication of an animal's age. Age is determined by examining the animal's teeth and its growth rings.

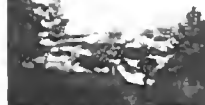




ESTIMATING RECHARGE TO GROUNDWATER IN EASTERN MONTANA—CHERRY CREEK DRAINAGE



Terry Badlands, a scenic view across the Yellowstone River valley.

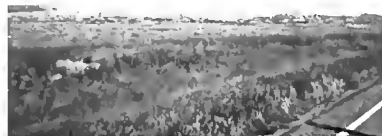


Terry Badlands in one Tertiary Fort Union Formation looking north.

Prairie County Conservation District and James Rose of the Montana Bureau of Mines and Geology entered into a joint study for determining infiltration recharge contributions to the groundwater of the upper Fort Union Formation in eastern Montana. Results from the Cherry Creek study site near Terry can be applied to groundwater in a large segment of eastern Montana. The primary purpose of this study is to provide information to help the public and private sectors make decisions on how to manage, protect, and develop the area's groundwater resources.

This information will be useful in answering questions, such as

- If I drill a new well, how deep will I have to go? Will the water be suitable for drinking?
- Is there any chance of using groundwater as a new public water supply?
- What are the current water levels in deep wells?
- Is an aquifer's recharge-zone water quality changing?
- Is land use affecting water quality in shallow aquifers?
- Are shallow wells failing due to drought?
- Is uncontrolled use of groundwater causing water levels to decline?



Lab. Member of the Fort Union Formation with a few thin coal beds.

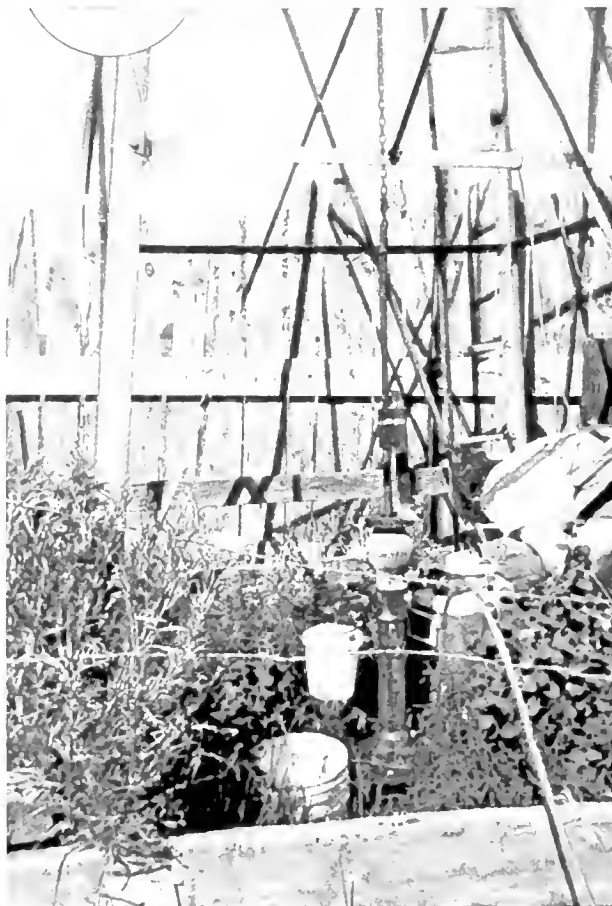


Landscape of the low in Cherry Creek drainage.

METHOD OF STUDY Core samples were collected at four sites in the Cherry Creek drainage. The cores were collected using an auger drill and continuous core sampler in 2-foot intervals to 40 feet (about the level of the water table). The samples were broken into 1-foot intervals, stored in jars, and transported to the Montana Bureau of Mines and Geology lab in Butte. At the lab a portion of the sample was mixed with dechlorinated water and stirred for eight hours to inactivate any chlorine in the soil into the water. The water was decanted into flasks. Silver nitrate was added into the dechlorinated water until potassium chromate was formed, causing a color change to yellow. The amount of silver nitrate required was used to determine the amount of chloride present in the sample. The amount of chloride present was used to estimate the amount of water from precipitation that has infiltrated through the vadose zone to the water table.

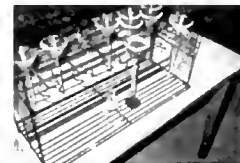
PERMEAMETER A permeameter was used to measure the rate of water infiltration through the land surface and the upper few centimeters of soil. A tube at the base of the permeameter is placed on the ground surface or a few centimeters below the surface. The upper tube is filled with water. As water in the upper tube drains through the lower tube and into the ground, the rate of drainage is recorded at 1-minute intervals. The results are graphed and the rate of water infiltration can be calculated from the data.

DATA RECORDER The data recorder records the water level in the monitor well every hour, year round. The data are downloaded and stored in the Montana Bureau of Mines and Geology database.



Collecting water samples from a pump pack and water table.

All photos are courtesy of James Rose.



Filtering water draining sample through filter paper.



Lab setup showing flask of dechlorinated water and shaker table for mixing water and core samples.



Water samples ready for analysis.



Water samples in flasks showing color change indicating amount of chloride and silver nitrate present.

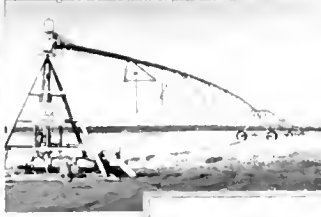
Encouraging proper natural resource conservation in order to preserve the productivity of the land for future generations



Shelterbelt with mesh on farmstead stream bank stabilization—June 1994



Stream bank stabilization—June 1994



Irrigation point on wheat



Montana Department of Natural Resources and Conservation Range Loan Stockwater pipeline

Richland County Conservation District purchased a Lawson aerator this past year. The aerator was purchased with local funds and 223 grant funds to aid producers in rejuvenating rangeland and pastureland. We also plan to use it in Conservation Reserve Program maintenance. A local landowner used it to re-seed pastureland with more productive grass without disturbing the seedbed. Neighboring counties have used the aerator, and we are anxiously awaiting reports on results of the demonstrations. Results need to be tracked on a season-by-season basis.



Tree crew planting trees—2004



Aerator—June 1994



Site specific planted spruce—2004—mesh—2004

Richland County lies in the eastern part of Montana, with a land area of about 1,321,600 acres. Forty percent of the county is cropland and pasture, and 54 percent is rangeland. The principal crops are wheat, sugar beets, hay, barley, oats, and corn for silage. Beef cattle and small grain production are the main enterprises. The Yellowstone and Missouri Rivers support the irrigated acres in the county.

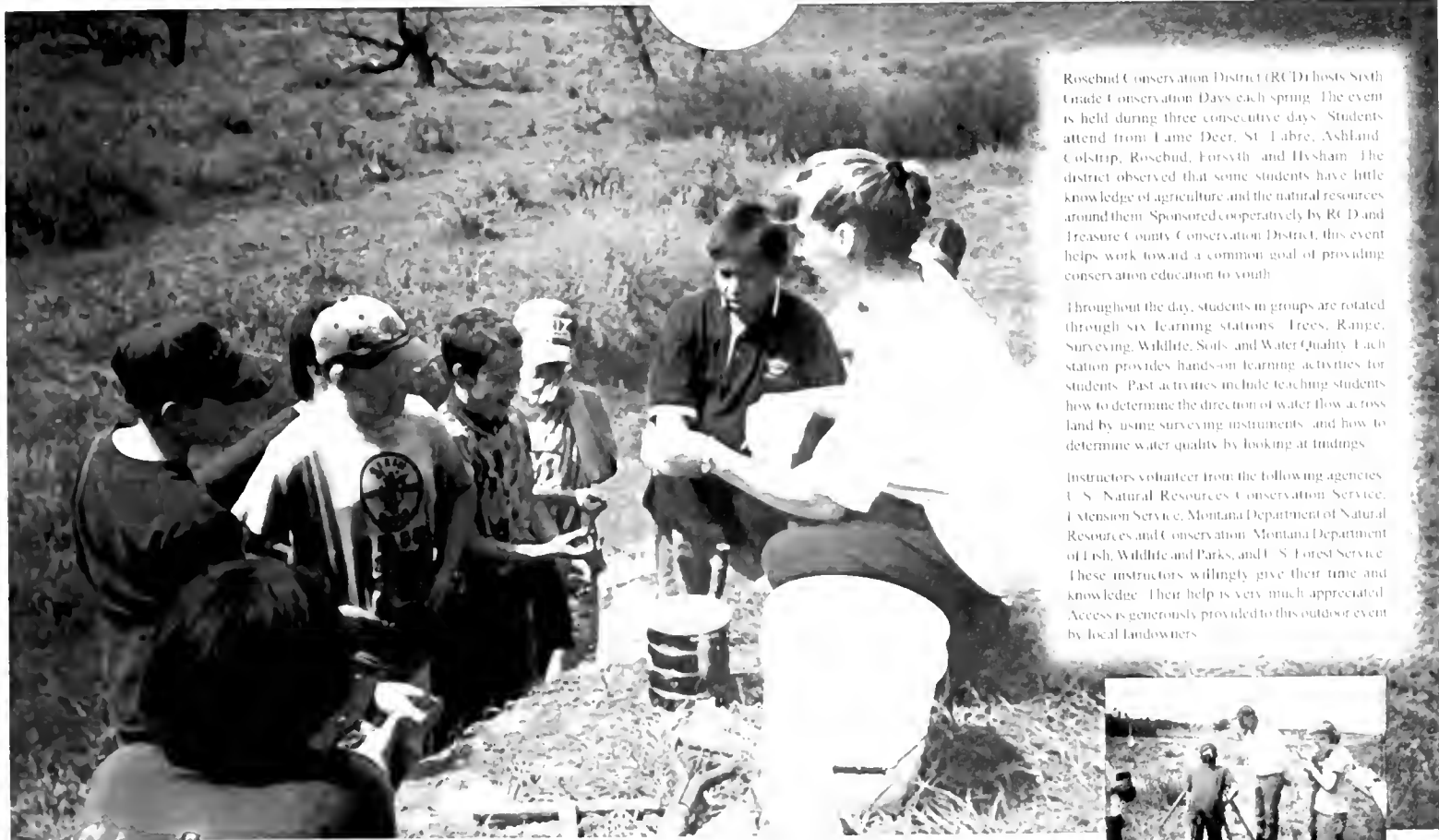
Thirty producers work actively with the Montana Department of Fish, Wildlife and Parks to promote upland game bird habitat on 100,000 acres in the county. Planting trees that benefit wildlife is one of the ways to increase bird populations. Our tree crew has been very busy this season with over 50,000 trees planted and 40 miles of weed-barrier fabric laid. The use of mesh to control weeds is becoming a very common practice. We use a fabric that allows the moisture to permeate into the soil, but doesn't allow the weeds to grow.

The Richland County Conservation District Board of Supervisors has approved six 310 applications for the current year. These applications include pump site maintenance on the Missouri, major restoration work at the MDU plant on the Yellowstone, and stream bank stabilization on listed streams.

Richland County has the unique situation of having reserved water available to producers on both the Yellowstone and Missouri Rivers. Irrigated acres using reserved water on the Missouri have been steadily increasing in recent years.



SIXTH GRADE CONSERVATION DAYS ANNUAL SPRING EVENT



Rosebud Conservation District (RCD) hosts Sixth Grade Conservation Days each spring. The event is held during three consecutive days. Students attend from Lane Deer, St. Labre, Ashland, Colstrip, Rosebud, Forsyth and Hysam. The district observed that some students have little knowledge of agriculture and the natural resources around them. Sponsored cooperatively by RCD and Treasure County Conservation District, this event helps work toward a common goal of providing conservation education to youth.

Throughout the day, students in groups are rotated through six learning stations: Trees, Range, Surveying, Wildlife, Soils, and Water Quality. Each station provides hands-on learning activities for students. Past activities include teaching students how to determine the direction of water flow across land by using surveying instruments, and how to determine water quality by looking at findings.

Instructors volunteer from the following agencies: U.S. Natural Resources Conservation Service, Extension Service, Montana Department of Natural Resources and Conservation, Montana Department of Fish, Wildlife and Parks, and U.S. Forest Service. These instructors willingly give their time and knowledge. Their help is very much appreciated. Access is generously provided to this outdoor event by local landowners.



ESP/CHAMBERS SPRING CREEK PROJECT



ESP Chambers before



Winter 1999 - ESP Chambers construction

The restoration of ESP/Chambers Spring Creek included cleaning up a livestock pond and a small, spring-fed stream flowing into the Yellowstone River. The spring creek was reconstructed, vegetation was planted, and livestock were fenced off the spring creek. A grazing plan was implemented to protect riparian vegetation and habitat.



ESP Chambers stream before

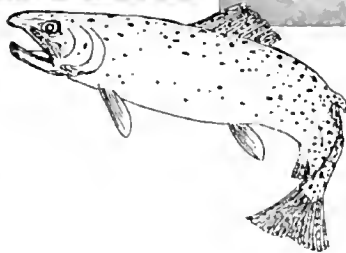
ESP Chambers stream after



ESP Chambers after

The ESP/Chambers Spring Creek Restoration Project is a cooperative effort between two landowners, the U.S. Natural Resources Conservation Service, U.S. Fish and Wildlife Service, and Montana Department of Fish, Wildlife and Parks

Sweet Grass County Conservation District sponsored the project, provided technical assistance, and served as funding administrator



The primary goal of the project is to increase the Yellowstone River cutthroat trout population by providing a safe spawning ground. Instream incubation has been implemented during two previous years with good results. Instream incubation will continue for two additional years.



Teton County Extension Agent Dan Clark welcomes students and creates some excitement for the day ahead



Students, teachers, and student FFA leaders pose for a "Goodbye and Thank You" picture!



Patty Johnston of the U.S. Forest Service explains different parts of the trees in a riparian area during her segment on plants.



Teton County

Conservation District



Fourth graders from around Teton County dig for dinosaur bones and learn grid mapping

FIRST ANNUAL CREEKS AND CRITTERS OUTDOOR CLASSROOM



Rick Bandy of NRCS teaches about different soil types in a riparian area Hands-on! Lots of muddys fun!



Bill Hill of the Montana Department of Fish, Wildlife and Parks holds kids' interest with lots of different types of fish that he caught right there in Spring Creek!

The First Annual Creeks and Critters Outdoor Classroom was held on May 18, 2000, along Spring Creek in the Choteau City Park. One hundred and thirty-five grade-school students from eight schools around the county came to spend the beautiful spring day learning about how riparian health affects soil, water, geology, wildlife, aquatic life, and plant life. Presenters used hands-on activities as children learned rudimentary ecological concepts.

Funding for the daylong program was through an HIB 223 mini-grant from the Montana Department of Natural Resources and Conservation through the Teton County Conservation District.

Others who presented and assisted include Lisa Flowers with Boone and Crockett, Patty Johnston with the U.S. Forest Service, Carl Ostberg and Rick Bandy of the Natural Resources Conservation Service (NRCS), Paul Belanger of The Nature Conservancy, Alan Rollo from the Teton River Watershed Group, Bill Hill and Quentin Kuajala of the Montana Department of Fish, Wildlife and Parks, Becca Hanna of the Old Trail Museum, and Dan Clark, Teton County Extension Agent.

Five FFA students from Fairfield High School and four FFA students from Choteau High School attended the outdoor classroom to assist with smoothly moving the groups between stations. Resource kits were given to the teachers at the end of the program. The kids were also given large trash bags and encouraged to pick up garbage along the creek as they passed from station to station.



Visitors built the chicken habitats and visited the horned lizard and the Russian tortoise.

The Ag Day Presentation is always a great success. Third and fourth grade students from Sunburst, along with home-schooled and Colony School students, spend a day studying natural resources and conservation. The same program is then presented to third graders at the Meadowlark School in Shelby. This year's theme was "Habitat," and the activities involved learning from Rod Duty, the game warden, how different animals live and how to respect them. Students built their own habitats with dirt, worms, and plant seeds. Students also made habitats from edible materials. Stations were set up for students to see the horned lizard (thorny toad), Russian tortoise, bugs in bottles, a baby lamb, and to go on a horse-drawn hay ride. The hands-on activities keep the kids interested, engaged, and learning.

LUNCH BOX SERIES

For the young at heart, a Lunch Box Series was presented again this year. In conjunction with the Toole County Extension Agency, we offered 1-hour presentations during the lunch hour for three days. The district provided meals, and each person was presented with a talk on the Conservation Reserve Program (CRP) with Misty Vermahn, U.S. Natural Resources Conservation Service, and Rob Hermance, U.S. Farm Service Agency; saline seep with Jane Halzer, Salinity Control, and leafy spurge competition with experimental grass plantings that were planted by Chris Onstad, the county's Extension Agent.

EDUCATION FOR ALL AGES

The Toole County Conservation District has identified education as a priority issue. In keeping with our goal to promote resource conservation education, the district sponsored several educational events that served young and old.



People enjoy the lunch box series.

The "nose pump project" was developed on the Olson Brothers Ranch, north of Twodot.



COWS MOOOOVE TO A NEW WATERING SYSTEM

Upper Musselshell Conservation District



NOSE PUMP PROJECT

The Upper Musselshell Conservation District funded an innovative livestock watering project during 2000 on the Olson Brothers Ranch. The brothers, Rick, John Clay, and Cy, had fenced out a small creek in their pasture and hauled 1,000 gallons of water each day throughout the summer for 45 head of cattle.



The nose pump project included installation of a watering system 200 feet from the creek. The nose pump is designed for cows to sip from their own water fountain.

The Olson brothers no longer haul 1,000 gallons per day. They haul 350 gallons of water every other day. The innovative nose pump watering system makes it possible to conserve both water and fuel costs.

The Pump. The Aquamat is a diaphragm pump with a pumping lever that is pushed by the nose of an animal. One pump is recommended for every 20 head of cattle. The elongated drinking bowl has a slight slope to the back, away from the animal. The pump lever must be operated until the water is drawn up into the bowl for the first setup. The water in the back of the drinking bowl acts as bait, attracting the animal to push the lever out of its way to reach the water. Each time the lever is pushed, a pump stroke brings more water into the bowl. The lever is released to make a back stroke when the animal pulls its head away. The back stroke action draws more water into the bowl as the lever returns to its initial position. Water always remains in the bowl, attracting the next animal. Animals quickly learn that pushing the lever three or four times fills the bowl with water. The pumps are connected to a water source through a one-inch suction hose and a spring loaded foot valve with a screen that meets fisheries requirements.

Saline seep production has been eliminated



Photo A

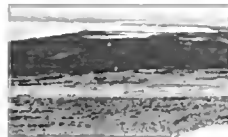


Photo B

Photo A - Saline reclamation project in progress. Alfalfa has been established in the recharge area and the saline area now supports salt tolerant vegetation. A monitoring well is used to measure the depth to ground water.

Photo B - Success of saline reclamation project.

Monitoring well in a saline seep - water high water table has eliminated seep growth



Yellowstone

Conservation Foundation



Alfalfa established in the recharge areas seeps from the saline area that now supports salt-tolerant vegetation and formlife was covered with a white salt crust.

Saline soil and water conditions can adversely impact agricultural practices, but they can be improved! Loss of productive cropland to saline conditions led Lee Lane and his family to work on remediation practices near Molt. Starting in 1990, the Lanes began working with Montana Salinity Control Association (MSCA) and Natural Resources Conservation Service (NRCS) to find out what was causing the expanding saline conditions and what could be done to slow the loss or reclaim the land.

MSCA completed a shallow groundwater investigation and developed a long-term reclamation plan. NRCS helped the Lanes with technical and financial assistance to implement the reclamation measures. Land-use changes have been gradually adopted by rotating large recharge areas, which cause the

saline discharge or seeps, to perennial forage from the crop-fallow system. The Plant Materials Center provided seed for a salt tolerant vegetation establishment trial.

In addition, the Lanes adopted a no-till intensive cropping system to improve soil conditions and reduce erosion. Concentrating hay production in one area creates a greater impact to the shallow groundwater system and makes the farm more efficient. The conditions have improved significantly and most of the saline land is now in forage production. More forage still needs to be planted, but eventually the recharge acres can be rotated back and forth from hay to grain. The saline areas will remain in perennial vegetation on a permanent basis.

Regional geology creates unique conditions in the Conanche, Lake, and Hartstone basins. In addition to the saline cropland, some animal health problems are related to the forages produced in this region and the degraded water quality. Local producers are learning to analyze their forages (both hay and pasture) and water sources and then adapt feed rations to compensate for both toxic and deficient levels of trace minerals.

A large crowd attended the field tour held May 23, 2000, to view Lane Properties' successful reclamation project. Resource and animal health specialists summarized the regional geology, reclamation plan development, salt-tolerant vegetation and establishment measures, animal health issues, and U.S. Department of Agriculture programs. Saline seeps can be brought back into crop and forage production when addressed correctly.



Mark Vigneri, Plant Materials Center, explaining salt-tolerant vegetation.



Dr. John Peterson, Montana University animal scientist, discussing the saline seep reclamation process.

Field Tour of Lane Properties



Lee Lane, landowner, describing the reclamation project.



Dr. John Peterson, Montana University animal scientist, discussing the saline seep reclamation process.

Example of water table in the recharge area.



SALINE SEEP RECLAMATION PROJECT

