



New Mexico  
Environment Department

# Clearing the Waters

## Newsletter of the Watershed Protection Division New Mexico Environment Department

of the Surface Water Quality Bureau

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### STUDY SHOWS WATER QUALITY AS A MAIN CONCERN AMONG SOUTHERN NEW MEXICO COUNTIES

by Renee Kincanon

The Surface Water Quality Bureau (SWQB) Silver City field office recently participated in a survey of the Moving Communities Toward Environmental Health Assessments Project (the Project). The goal of this project is to involve communities in the process of prioritizing and developing solutions to environmental health issues affecting southern New Mexico. The Project is being sponsored by the New Mexico Border Health Office through a contract with the New Mexico State University Southern Area Health Education Center/Border Health Education Training Center.

State and local government representatives and community members from six southern New Mexico counties were contacted during spring and summer 2001 to provide input on the environmental health issues affecting their communities. The counties that were targeted were Dona Ana, Grant, Hidalgo, Luna, Otero, and Sierra. For those counties water quality was the most frequent environmental health concern cited, except for Otero County which cited water quantity. The majority of all participants felt that something could be done to better protect community members from adverse environmental health factors. Increased education and awareness was cited most frequently as a way to improve environmental health.

The survey was Phase One of a two phase project. Phase Two is the implementation of the Protocol for Assessing Community Excellence in Environmental Health (PACE-EH), a framework for conducting a Community Driven Environmental Health Assessment (the Assessment). Luna and Dona Ana Counties were chosen as pilot sites for the Phase Two implementation. The selection of the pilot sites was based on community readiness to undertake the Assessment. Criteria included knowledge and attitudes about environmental health issues, extent of current collaborative efforts within each community, interest and ability to participate in the Assessment, key resource availability, and pre-existent environmental health issues.

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## SWQB HELPS IMPLEMENT FIRST RMUs ON NAVAJO LAND

by Delbert Trujillo

The Navajo Nation recently put into practice the first Range Management Units (RMU) on their land with a ClearWater Act Section 319(h) project. In 1997, the Window Rock Field Office of the The Natural Resources Conservation Service (NRCS) developed a proposal on behalf of the Navajo Resources Conservation and Development (RC&D) Council to implement the Naschitti Nonpoint Source Range project. The project was recently implemented and RMUs became part of Navajo Nation management activities.

The goal of the proposed project was to reduce nonpoint source erosion into the headwaters of CoyoteWash and to reduce siltation and salinity discharges into the Chaco River. In order to achieve the goal, five RMUs were constructed. RMUs are parcels of land sectioned off by a fence to allow grazing only on certain parcels in different time spans. Currently, the five RMUs are being used to maintain cattle within the units to eliminate open range grazing. Before the Naschitti project, the land was open range, severely degrading vegetative conditions and contributing to soil erosion. In the future, the RMUs will be subdivided into smaller sections to implement complete rotational grazing.

The success of this project could be attributed to the cooperative spirit of the Navajo people. There were many different agencies involved, including Navajo RC&D Council, NRCS, and Surface Water Quality Bureau, that contributed to this project. Five Navajo families participated in the fencing of the RMUs as well. The land on the Navajo Nation is not privately owned, but owned by the Nation. The work that the five families contributed was donated to the Nation as a whole because they do not own the land where they graze their cattle.

The Navajo families initiated rotational grazing practices and discovered the advantage of resting grasses from constant livestock foraging at the same locations. This activity reduces erosion by maintaining root growth in the soil.

The Naschitti Project is the first of its kind on the Navajo Nation and hopefully will not be the last. This project has opened the door for more participation from within the Nation for outside help and has helped the all those involved appreciate the importance of cooperative management.

## PERFECT TIMING AND COLLABORATION: WATERSHED RESTORATION ON RAINBOW RANCH

by Julie Arvidson and Abe Franklin

The timing of the Rainbow Ranch project was perfect, according to Rainbow Ranch owner Sarah iSunnyi Hill. The Quivira Coalition was looking for an on-the-ground project for the demonstration portion of their 319(h) grant application. Hill was beginning the 319(h) grant application process on her own for a project to reduce erosion on the reach of the Dry Cimarron River that is on her property. She was referred to the Quivira Coalition to help her with the project. When she contacted them, both of their problems were solved. The Quivira Coalition could plug her project into their grant as a demonstration project and Hill could reduce erosion on her land through Quivira's efforts.

The project as currently planned includes restoration of at least 7000 feet of the Dry Cimarron River, education of participants in the restoration, development of a grazing plan for the Ranch, and monitoring of the results. The riparian restoration will utilize Bill Zeedyk's iinduced meandering techniques (see CTW Volume 6 Number 3), which use locally available materials to increase sinuosity, lower the width to depth ratio, and reduce erosion and entrenchment of stream channels. The work will be done by volunteers recruited by the Quivira Coalition, who will learn about riparian systems and how they function during several workshops. The grazing plan will complement the active restoration efforts by including consideration that a healthy riparian zone produces far more forage for cows than does an overgrazed riparian zone. Monitoring of channel geometry, upland and riparian vegetation, and bird populations before and after the project will be used to plan the riparian restoration, to develop the grazing plan, and to document the project's results.

This project will probably benefit Hill by providing more forage for her cows in the riparian zone in three ways: improving the geometry of the stream channel, controlling grazing, and stabilizing the stream banks. A narrower and deeper channel will likely increase the area of the floodplain. Some aggradation of the channel may also occur, which would result in a wider floodplain, as the arroyo walls are not completely vertical. The floodplain is the area that can produce far more forage than adjacent uplands. The grazing plan will probably provide for sufficient rest from grazing to allow this vegetation to grow. With more vegetation present to produce forage, more forage will be available for cows without depleting the resource. A more stable channel form, better coverage by riparian vegetation, and controlling access by cattle will provide still more forage by increasing the stability of the banks, so that vegetation will be less likely to wash away during floods.

This project not only has the potential of improving the profitability of the Rainbow Ranch, but may also increase the value of the property. The Surface Water Quality Bureau hopes that the public will also receive a  
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(*Rainbow Ranch continued from page 2*) return on the project, with improved water quality and many associated values of riparian areas. And Hill isn't just riding high on government subsidy. She plans to match the Section 319(h) grant by covering a large part of the expenses of the riparian restoration and monitoring, and by paying for the grazing plan. Most importantly she plans to follow up the project by implementing the grazing plan.

One of the most essential individuals involved in the 319(h) grant process is the landowner. Without landowners' support, watershed restoration and protection projects cannot happen on private land. Therefore, it is important to understand what landowners think of watershed restoration. *Clearing the Waters* recently conducted an interview with Hill to get her view of the restoration project planned for her property.

CTW: Can you tell us about the history of the Rainbow Ranch?

Hill: The history of the ranch is a varied one. Part of it was homesteaded by the Honey family. There were three brothers that combined their original holdings for the land along the river and to the south on the mesa. There have been many owners over the years and more land acquired. The Honey family used the land in much the same manner as we do. They put in the extensive ditch irrigation system that runs the length of the property and used it to irrigate the bottom lands along the river for grass (vega) hay production. We still rely on those same ditches for all our irrigation out of the river. Subsequent owners have used the land for hay production, cattle, some sheep (for a brief period) and horses.

We purchased the property in 1970 and the acreage purchased was 4500 acres. We have since sold all but 640 acres of the land, keeping only the portion that runs along the Dry Cimarron River. It is very narrow but long. About 3/4 of a mile wide in places and 2 1/2 miles long. When this place was purchased by my family it was bought as a memorial to my brother who had just been killed, and to be a place for his widow and infant if they should ever need a place to be. They lived here for the following three years (the ranch bears the name of his daughter, Rainbow).

This land has, periodically, over the course of our ownership, produced a profit, but it has never been a primary goal, nor a necessity. That situation is now changing. Since I do not have outside sources of income, it is imperative that sustainable profitability becomes the major goal. In order to do this, we must address sustainability first and foremost, otherwise profit will be fleeting if it arrives at all.

CTW: How did you become involved with the 319(h) grant process?

Hill: We had been in the process of an (after the fact) [permit] approval for a dam that had been constructed in the river by my father. When the approval was denied because of concerns about the effects on water quality, rather than fight the decision, I agreed; but wanted to do more than just the dam removal. I had been learning quite a lot about watersheds and riparian areas throughout the process, and thought that we should be addressing more than just the removal of the dam. I wanted to look at the bigger picture of how the condition of the whole ranch and surrounding area affected the health of the river. Over the years I had been becoming alarmed at the condition of the river and the amount of erosion but did not know what to do about it. [The project officer in SWQB that worked with me on the dam] knew of the 319 grant and gave me paperwork to fill out. I was VERY lost, not ever having applied for a grant before, and the deadline for proposals was only a few weeks away. I was told to get in touch with the Quivira Coalition because they might be of some help. Quivira Coalition was applying for the same 319 grant for educational purposes and needed an in the ground project to go with the proposal. The timing just happened to be perfect.

CTW: The Quivira Coalition applies what they call a "New Ranch" philosophy to the demonstration projects that they perform. Their web page suggests that this is ranchers and environmentalists working together to create ecologically-friendly ranch management that strengthens the local economy. This could also be considered holistic ranch management. Were there any of these types of practices on the Ranch in the past?

Hill: To my knowledge, there has never been any holistic ranch management practices in use here by us or anyone else as a management philosophy. The homesteaders made the best use of the land, in the most holistic manner, because of their diversified livestock and other crops. They had two apple orchards, several other fruit trees, grape vines, gardens, and barnyard animals for food. They constructed earth ponds to gather the spring water and raise fish, and developed other springs for human use in the houses and root cellars. One of my goals is to re-establish most of that earlier diversification.

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(Rainbow Ranch continued from page 3)

CTW: When did you first hear about the iNew Ranch philosophy and what does it mean to you as a rancher?

Hill: I had been hearing about the iNew Ranch philosophy for some time from friends and neighbors. A good friend, Tim Harkness, has been involved with the iholistic ranch management program for quite a few years and had encouraged me to attend one of their workshops. I did finally I attended Kirk Gadziais [a contractor with Quivira Coalition] class in Albuquerque this past fall. I have also attended classes by Joel Salatin in Virginia two summers ago. I had already been interested and somewhat involved with the sustainable agriculture movement before I returned to the ranch in 1998. So these were not entirely new concepts to me. I have also learned that these various organizations are all familiar with each others work and do a lot of projects together, so involvement with one necessarily expands to more. Since meeting with Courtney White and the others at the Quivira Coalition, I have learned much more about the iNew Ranch philosophy and am very encouraged by the work that is being done. It is difficult to verbalize all the ramifications of iwhat the philosophy means to me as a rancher. In a nutshell: what appeals to me most is the regression back from the iissues to the idea of icommon ground. If you back up enough, I believe that the goals of all are the same, e. to restore and sustain the land that supports us all either directly or indirectly. (One of my favorite sayings is: iLive lightly on this earth.) The second thing I like, is the emphasis on flexibility; of processes, of methods, of myriad means to meet the icommon goals. The concept of cooperation rather than confrontation, education and information rather than fear, ignorance and tradition, change rather than the status quo, and study and observation rather than judgment and condemnation, is one that I can get behind and champion. It means that this ranch and this rancher are very willing and excited to be in the evolutionary process of the iNew Ranch.

CTW: What are your expectations of the demonstration project the Quivira Coalition will be doing on the Ranch? What type of improvements do you hope they will make?

Hill: I am very excited to get to work on the river project. I have great expectations. I expect that the work will have numerous benefits for not just this ranch, but the community as a whole. We had already decided to take on this restoration work before I was introduced to the Quivira Coalition, the grant monies, or the experts and experience available through them. The involvement of the Quivira Coalition is a huge added bonus, not only for the above mentioned reasons, but also because of the educational aspect. It will mean a lot of exposure that we would not otherwise have had, to the local community, the environmental community, and the general public. I hope that with positive results, it will be a bridge for others in the ranching profession to cross over to these new concepts of cooperation. I intend to use this as a springboard to involvement with even more environmentalists. I hope that this project will help to take some of the fear and loathing out of that label. I know that it will improve the value of the land, both aesthetically and financially. I expect that this will be the beginning of a very long term and beneficial relationship for all involved.

Readers may get involved by contacting the Quivira Coalition or watching the pages of *Clearing the Waters* for announcements of upcoming workshops on the Rainbow Ranch. *Clearing the Waters* will also provide updates on this project as it progresses.

(Study continued from page 1)

In the Final Report, Jagan Butler, who is coordinating the Project, discusses what steps will be taken in the follow-up to the survey ([http://www.NMSU.Edu/~bho/bho/eh/cda/Preassess\\_frontend\\_web/](http://www.NMSU.Edu/~bho/bho/eh/cda/Preassess_frontend_web/)). In the steps, Butler indicated that community collaborators will outline the PACE-EH and determine how to proceed. He also mentions the importance of each community tailoring the PACE-EH to meet their own needs. At the end of the project the community collaborators will develop an action plan that addresses community concerns around environmental health issues identified and prioritized through the PACE-EH process. It is hoped that the pilot projects in Luna and Dona Ana Counties will serve as a model for other New Mexico border counties.

The SWQB remains highly involved in projects within southern New Mexico counties and looks forward to additional participation in this program. For additional information regarding the Moving Communities Toward Environmental Health Assessments Project please contact Jagan Butler at: Jagan Butler, Assessment Services Coordinator, Department of Health Science, MSC AHC, NMSU, P.O. Box 30001, Las Cruces, NM 88003-8001 (505-646-3259).

## RECEIVE A FREE WATERSHED CALENDAR!

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## Star Thistle in the Cliff/Gila Valley

by Renee Kincanon

A weed can be defined as any plant that interferes with the management objectives for a particular site or watershed, with invasive weeds not being native to a particular locale. Some species have been known to spread at rates of 200 acres per hour on federal lands in the western United States. The rate is not known on private lands.

New Mexico State University (NMSU) currently classifies invasive weeds as Class A, B, and C. Class A invasive weeds are non-native to a particular ecosystem and have limited distribution. Species that are threatening to invade are placed in this class. Management measures include prevention and elimination of infestations. Some examples of Class A include camelthorn, purple and yellow star thistle, Dalmatian toadflax, and Dye's woad. Class B weeds are those that are not native to the ecosystem and are presently limited to a particular area of the state. Management measures rely on containment, and prevention of new infestations. Examples of Class B weeds are the Russian knapweed, African rue, Malta star thistle, and musk thistle. Class C weeds are not native, yet are widespread throughout the state. Long-term management is needed and suppression is encouraged. Examples of Class C are field bindweed, jointed goat grass, and bull thistle.

The Surface Water Quality Bureau recently attended meetings focused on planning for a noxious weed control program in the Gila River valley. To date, NMSU extension service's Ron Lamb reports that heavy concentrations of star thistle in New Mexico have only spread as far east as the Cliff/Gila valley. Yellow star thistle is an annual, germinating in the fall or spring. Spreading of the seeds can occur from wind distribution and tracking by people, equipment, and animals, with viability being many years. The weed is a serious problem in California and Idaho; it has also been found in Grant, Catron, Eddy, Lea, San Miguel, and San Juan Counties here in New Mexico. Specific area concentrations of star thistle vary by year, depending on germination success, width of spread, and watershed management techniques in place. This plant is the main culprit for chewing disease in horses.



Yellow Star Thistle  
(Source: Weeds of the West, 1996)

The main concern in our sub-watersheds is the effects of larger populations of these noxious weeds. It has been demonstrated (Gerlach, 1988 and Sheley and Petroff, 1999) that weed problems affect vegetative diversity, increase soil erosion and stream sedimentation, and dramatically reduce wildlife habitat. As evident in the Total Maximum Daily Load program, stream changes can occur quickly, and once a stream has become degraded it is very difficult to reverse the trend.

In the long-standing battle against noxious weeds, there are a great number of techniques described in the literature that range from being effective to having no-effect. Insects have been described as being the primary biological control tool being used against noxious weeds. However, it may take a few years for the insect population to multiply to a sufficient level for effective weed control, and long term effects are not known. Grazing animals are being used successfully to help suppress weed growth and seed development in some areas around the United States.

Replanting of native, competitive plants in areas where noxious weeds have been controlled can help reduce re-establishment of weeds from residual seed, however, the slow growth of our native vegetation might make this a lengthy task. Grazing management is a valuable tool for controlling weed establishment and growth. However, overgrazing will favor prolific growth. Forest canopy management provides a balance of large tree and under-story plants to compete with noxious weeds for light, water, and nutrients. Fire has been used for disease and weed seed control for many years in the grass seed industry. Low environmental-impact chemicals are available that will target the weed with little or no effect to non-target organisms or water quality. Eradication techniques, regardless of the type chosen, need to have strong community support, and technical expertise to ensure success.

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## Pollutant Pointers: Focus on Phosphorus

by Maryann McGraw

(This is the first of a series of articles on specific surface water nonpoint source pollutants)

Phosphorus can be a significant surface water pollutant and is responsible in large part for severe algal blooms observed on many rivers, ponds, and lakes. The presence of some aquatic vegetation in surface waters is normal and provides habitat and food for aquatic organisms. However, high levels of phosphorus, along with nitrogen, can promote excessive growth of aquatic plants, especially excessive algal growth or nuisance algae. When you go down to the river and see it fully covered with green scum, that's nuisance algae.

**Besides being no fun for swimming and other recreational activities, what is the problem with nuisance algae?**

When you have excess aquatic plant life in the stream, several things may occur that affect the aquatic environment, primarily fish. During daylight hours, aquatic plant life photosynthesizes and produces oxygen. When there is excessive plant growth, the result can be super-saturation of the water with dissolved oxygen. Excessive dissolved oxygen can cause gas bubble disease in fish. Also, the photosynthetic process can raise the pH of water to levels that exceed water quality standards.

During the night, respiration by excessive aquatic plants and decomposition of organic matter use up dissolved oxygen, resulting in extremely low levels, which in turn suffocates fish.

Phosphorus itself does not have notable adverse human health effects. However, phosphorus levels greater than 1.0 milligram per liter (mg/L) may interfere with coagulation in water treatment plants. As a result, organic particles that harbor microorganisms may not be completely removed before distribution.



Kristin Martin-Dors handles nuisance algae

### WHAT YOU CAN DO TO REDUCE PHOSPHORUS AND NITROGEN WATER POLLUTION IN YOUR WATERSHED

1. Do not apply fertilizer to lawns, and avoid growing lawns or ground cover that are not sustainable without supplemental irrigation.
2. Pick up the poop. Take responsibility for properly disposing pet and hobby livestock waste. Keep pet fecal matter out of drainages to the river.
3. Use phosphorus-free detergents for cleaning.
4. Use a commercial car wash that treats its water, or wash your car using phosphorus-free detergents.
5. Have your septic system inspected annually to ensure that it is not discharging untreated or partially treated wastewater. Have your septic system pumped out regularly as well. This is especially important if you live close to the river.
6. Use nutrient management plans if you produce livestock and poultry.
7. Use proper management techniques when applying chemical fertilizers and manure for agricultural purposes.
8. For more information on nutrient management visit these websites:  
<http://cahpwww.vet.upenn.edu/nutrimgt/nutrimgt.html>  
<http://clay.agr.okstate.edu/animalwaste/>  
<http://www.ext.vt.edu/pubs/envirohort/426-613/426-613.html>

### How does phosphorus get to surface water in large enough quantities to cause pollution?

First, you do not need much to be too much. Some stream reaches in New Mexico have segment-specific stream standards that amount to limits not exceeding 0.1 mg/L total phosphorus. The US Environmental Protection Agency (EPA) water quality criteria states that phosphates should not exceed 0.05 mg/L if streams discharge into lakes or reservoirs, 0.025 mg/L within a lake or reservoir, and 0.1 mg/L in streams or flowing waters not discharging into lakes or reservoirs to control algal growth (USEPA, 1986). Surface waters that are maintained at 0.01 to 0.03 mg/L of total phosphorus tend to remain uncontaminated by algal blooms. *(continued on page 7)*

*(Phosphorus continued from page 6)*

Phosphorus can be found in the environment in the form of soluble phosphate ions that tend to bind to clay particles in the soil. When fertilizer or animal waste that contains phosphorus is applied to the land, the phosphorus rapidly becomes bound to soil particles. Without proper application, phosphorus can build up to very high, even toxic, levels in the soil.

**Since this phosphorus does not dissolve into the water and flow into surface water, how does it get there in high enough amounts to cause severe pollution problems?**

It gets there by soil erosion, a form of nonpoint source pollution. Soil particles that contain phosphorus are eroded into lakes and streams causing the phosphorus to build up to high enough levels to cause eutrophication and nuisance algae problems.

Phosphorus also comes from the use of products such as toothpaste, detergents, pharmaceuticals, and food-treating compounds. A normal adult excretes 1.3 - 1.5 grams of phosphorus per day. Sewage treatment plants may inadvertently discharge excessive phosphorus to a surface water body if their EPA discharge permit limits are not met.

**How does the State check for phosphorus in our surface waters?**

New Mexico surface water quality standards stipulate that plant nutrients (phosphorus and nitrogen) should not be present in concentrations that will produce undesirable aquatic life or result in a dominance of nuisance species in surface waters of the State. The New Mexico Environment Department, Surface Water Quality Bureau has adopted a nutrient assessment protocol that consists of three levels. Level I focuses on visual observations that usually provide enough information to determine if the water body is impaired by plant nutrients. Levels II and III assessments combine chemical and biological sampling and are used to confirm the conclusions reached in Level I.

U.S. Environmental Protection Agency. 1986. Ambient Water Quality Criteria for Bacteria - 1986. EPA 440/5-84-002. Washington, DC.

*(Star Thistle continued from page 5)*

Prevention is the best way to avoid having a problem in your watershed. Preventing infestation is far more economical than trying to control an established noxious weed problem. Most noxious weeds have entered the United States as crop seed contaminants. Planting Certified seed provides cheap insurance against weed introduction, and can aid in preventing weed introductions on range and forestlands. The New Mexico State Highway and Transportation Department reports that mowing, at the right stage of plant development, can prevent flowering and subsequent seed production of some species of noxious weeds. Cultivation by machine or even hand pulling can eradicate some other varieties.

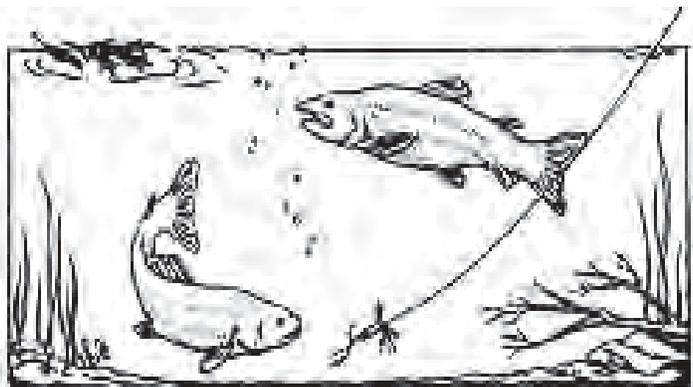
Control is a multi-step process, with no single method being effective. In October 2001, a meeting was held to create a Herbicide District comprised of local Cliff/Gila Valley residents. The October meeting also addressed education about and awareness of star thistle weeds, and discussed lessons learned for the control of the Cliff/Gila valley star thistle infestation. Awareness, as reported at the meeting, is generally the best first-step, before application of large-scale watershed restoration Best Management Practices. The Herbicide District is currently seeking funding to help determine the appropriate steps to eradicate the infestation. Follow-up meetings are announced in the Silver City Daily Press.

For watershed specific information in the Cliff/Gila Valley, and more detailed locations of the star thistle and other noxious weeds present here in New Mexico, contact New Mexico State University, Frannie Decker, (505-646-8005), fdecker@nmda-bubba.nmsu.edu.

Gerlach, J.A. Dyer, and K. Rice, 1998. iGrassland and Foothill Woodland Ecosystems of the Central Valley. Fremontia 26(4): 39-43.

Mullin, B.H., et. al., 2000. iInvasive Plant Species. Council For Agricultural Science and Technology. 13: February, 2000.

Sheley, R. L. and J. K. Petroff (Eds.), 1999. iBiology and Management of Noxious Rangeland Weeds. Oregon State University Press, Corvallis.



## FUTURE EVENTS

### March

11-13, A conference entitled "Watershed Management to Meet Emerging TMDL Environmental Regulations" will be held in Dallas, TX. For further information, contact Brenda West, ASAE, 2950 Miles Road, St. Joseph, TN 49085, 616-428-6327, west@asae.org

### April

5-11, A "Watershed Strategic Planning Social Change and Action" course will be held in Portland, OR. The course will cover multidisciplinary analysis of whole watersheds. Special focus will be given to plan implementation and reporting. For more information, contact Brigetta Olson by phone 503-725-5117, or email at Bolson@irn.pdx.

5-6, The New Mexico Watershed Coalition is holding their annual meeting and field trip at Rancho's Steakhouse in Socorro, NM. For more information and a registration form, contact Dick Smith, 3730 Spring River Road, Roswell, NM 88201.

### May

4, Ruidoso River Association is holding their 9th annual river clean-up from 8:00 AM to noon at the Schoolhouse Park. Free breakfast, lunch, refreshments and t-shirt are offered to all volunteers. Live music will be on hand and over 100 prizes will be awarded as well. For more information, call (505) 257-9494 or (505) 257-5030.

11-18, National River Cleanup Week. To register or get more information about organizing a river clean-up, contact National River Cleanup Week /America Outdoors, PO Box 10847, Knoxville, TN 37939, 865-558-3595, <http://www.americaoutdoors.org/nrcw>.

**NM Environment Department  
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