

CLEARING THE WATERS

A quarterly newsletter by the Surface Water Quality Bureau

Volume 21, No. 2

Summer 2016

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This newsletter is published quarterly by the New Mexico Environment Department's Surface Water Quality Bureau. Funding is provided by a Clean Water Act (CWA) §319(h) grant from the EPA.

Section 319 Projects

Four New Projects Underway in May 2016!

The Watershed Protection Section and cooperators started four new projects to be funded under Section 319 of the Clean Water Act. These projects were identified through two Requests for Proposals (RFPs).

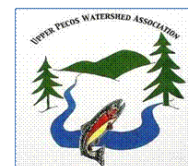
Here is a summary of each:

On-The-Ground Improvement Projects for the Upper Gallinas River and Porvenir Creek Phase II



The Hermit's Peak Watershed Alliance, local landowners, and partners will develop two grazing plans, develop at least two vegetation management plans, carry out at least 0.5 miles of riparian planting, install structures to improve stream geomorphology at four locations, implement three small sub-projects to arrest and heal upland erosion, pursue conservation planning, and conduct outreach.

Temperature Reduction and Riparian Habitat Restoration in Upper Cow Creek



The Upper Pecos Watershed Association (UPWA) will plant more than 2,000 tree poles and shrubs in two areas along a 1.8-mile reach of Cow Creek, install woody debris structures in the channel to facilitate the formation of pools, riffles, and bankside microsites, and restore dispersed campsite areas. UPWA will also coordinate other watershed restoration and protection activities.



Río Fernando de Taos Watershed-Based Plan

This project is now underway in the Taos area. Amigos Bravos is coordinating this effort to produce a watershed-based plan to reduce *E. coli* loading in the Río Fernando de Taos, in cooperation with local governments, the Carson National Forest, grazing permittees, Water Sentinels - Rios de Taos, and interested area residents.

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Rio Nutrias Watershed Based Plan Implementation Phase I

Aguas Norteñas, LLC will implement portions of the recently completed Rio Nutrias Watershed-Based Plan. The work will include streambank stabilization along 0.5 mile of the stream, three miles of cross fencing and riparian fencing, brush control and reseeding on 200 acres, erosion control in arroyos and gullies, replacing an undersized culvert with a bridge, and education and outreach.

For a complete list of current and recent Section 319 and River Stewardship projects, with links to detailed information, visit: www.env.nm.gov/swqb/wps/documents/NMED_319_and_RSP_Project_List.pdf.

The three on-the-ground projects described above implement portions of watershed-based plans. To review these plans, or learn more about watershed-based planning, visit www.env.nm.gov/swqb/wps/WBP.

Watershed Protection Section Staff Changes - Santa Fe

Watershed Protection Section welcomes *Alan Klatt*

The SWQB welcomes **Alan Klatt** as the newest member of the Surface Water Quality Bureau's Watershed Protection Section. Alan's office will be in Santa Fe, and he will work on watershed planning and riparian projects in the northern half of the state. He replaces **Mike Matush** who retired after many years of service with NRCS and NMED.

Alan was most recently a surface water hydrologist for the Wyoming Center for Environmental Hydrology and Geophysics and taught Soil Morphology, Wildland Watershed Management, and Wildland Hydrology at the University of Wyoming. His M.S. in Rangeland Ecology and Watershed Management included coursework in fluvial geomorphology, surface hydrology, water quality modeling, GIS, and other natural resources courses. His B.S. in Environmental Management and Protection from California Polytechnic University focused on watershed management and hydrology. As both an undergraduate and graduate student, he worked on stream restoration and monitoring projects similar to those he will encounter in his new position. Alan and his wife, Shannon, are looking forward to the four beautiful seasons we enjoy in New Mexico as opposed to the two they have in Wyoming: Winter and Fall.



Alan Klatt

Welcome Alan!

Mike was instrumental in maintaining the relationship between SWQB and several Soil and Water Conservation Districts around the state. He could always be counted on to spend a large part of his time and effort in the field collaborating on a variety of resource improvement projects.

We wish Mike well in his new endeavors.



Mike Matush

Cooperator Spotlight ~ Watershed Planning

Watershed Based Plans:

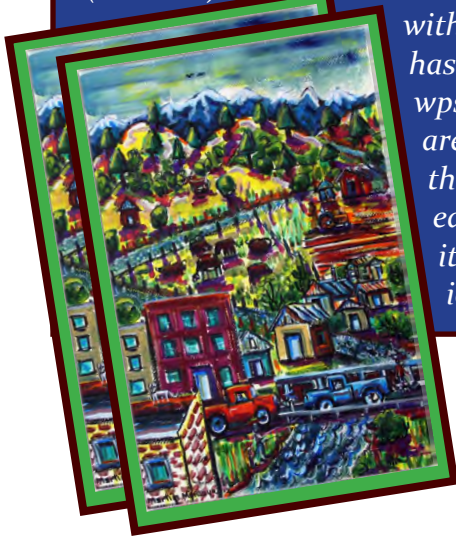
mobilizing organizations, engaging stakeholders, and driving work that makes a difference

By **Lea Knutson**, Executive Director, The Hermit's Peak Watershed Alliance



The primary purpose of this Clearing the Waters Newsletter is to “detail lessons learned of Section 319(h) projects”. Perhaps the most daunting 319(h) project of all is writing a Watershed Based Plan (W B P) .

The Hermit's Peak Watershed Alliance (HPWA, <http://hermitspeakwatersheds.org/>) with Lea Knutson, Executive Director, is one of only a few in New Mexico who has written a WBP that was accepted by EPA (<https://www.env.nm.gov/swqbwps/WBP/Accepted/UpperGallinasRiver/index.html>). In addition to that, they are finishing up a second WBP for the Mora River. And if that isn't enough, they've proposed to write a third WBP. Lea says, “You definitely learn things each time.” Lea has lived with that Gallinas WBP for four years. “I look back at it and chuckle”. Clearly, HPWA is an expert at developing WBPs in New Mexico. What follows is Lea's advice for making the most out of the WBP effort.



While the Hermit's Peak Watershed Alliance (HPWA) brings together many efforts, both scientific and social, to help drive holistic management and restoration of the land and water in the lower Mora Watershed, we contemplate how to make the most out of the Watershed Based Planning process. Watershed Based Plans are not just an exercise to get future funding; they stimulate the

synthesis of existing information, fill information gaps, connect stakeholders and better focus efforts in a very complex ecological and social setting – our watersheds.

Our genuine effort to capture the essence of ecological and social conditions that have resulted in degraded watersheds and impaired water quality and then develop meaningful strategies to repair degraded conditions, has been a growing experience for our now, six year old organization. We firmly believe (and have seen it happen) that the Watershed Based Planning process moves the trajectory of land and water management in a positive direction for our watersheds and communities.

Watersheds by their very nature are complex assemblages of the land, its topography, rocks, soil, plants, animals, people, processes and history. To first understand, then to help steer those complex systems toward a healthy and sustainable future is a challenge that Watershed Based Plans strive to meet. Melding ecological and societal needs to develop Watershed Based Plans that are both effective and doable is the challenge.

HPWA strives to capitalize on the planning processes to make the greatest gains on-the-ground for watersheds and communities and not just add them to the volumes of shelf dust collectors. Toward helping others navigate the challenge, we would like to share some thoughts and lessons learned as we too evolve more effective Watershed Based Plans for us, other organizations and watersheds.

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The Opportunities

- **Stimulate and support watershed organizations** - Watershed Based Plans offer watershed and other similar groups a sound starting place (with both knowledge and funding) for their work as “boots-on-the ground,” local watershed advocates and stewards. HPWA, with WBPs as the backbone, has grown into a viable and effective organization.
- **Go beyond 319** – 319 funds can serve as a catalyst to work on watershed-wide concerns beyond the specific impairment that is their impetus. While the needs and objectives of meeting water quality standards must first be met, a larger long-term vision of improving the overall health of the watershed and improving the community’s role in keeping it healthy is the opportunity. 319 funds can help stimulate other work and further a broad, watershed-wide vision while also building organizational capacity. This broad approach has enabled HPWA to access funds from diverse sources (e.g. economic development, educational, Brownfields, agricultural, rangeland management) with watershed health as the centerpiece.
- **A foundation in science and watershed ecology** – A solid planning effort should begin with a scientific assessment of watershed condition. Past studies should be collected but are likely to be minimal. While assessment should focus on the specific watershed characteristics that relate to applicable water quality impairments (like stream shade and water temperature), it should include overall watershed health indicators to enable a more holistic approach. These assessments provide a strong basis for planned remediation and baseline data to track improvements. Better assessment methods at the watershed level that look at overall watershed condition, function, and point to recovery potential and restoration priorities are needed.
- **An equal foundation in the community** - Sound science needs to be accompanied by an assessment of social conditions to determine the state of understanding, issues of concern and support for watershed improvements. This assessment will not only identify needed education efforts but also will enable developing strategies that are acceptable and practical.
- **Build personal relationships** – Rather than relying on a series of formal public meetings to solicit stakeholder input, building personal relationships with local residents and other stakeholders is imperative. While this effort is very time consuming, it is a key aspect of setting the stage for future work and shared land stewardship. Building personal relationships begins with learning about the perspectives, interests, and knowledge of each individual, then slowly and respectfully, pursuing more in-depth understanding and personal work with those individuals. Many new friendships have formed for us through the WBP process which has deepened our ability to work as caring partners and neighbors.
- **Build a lasting effort with focus on common ground** – Discovering a local common ground upon which to focus helps alleviate conflicts that can stop progress. Of course the common ground here is our mutual need for water and the critical role that land stewardship plays in providing that resource, but maybe there are more specific commonalities that need to be uncovered. By focusing on specific issues rather than a common goal, efforts can become too polarized and exclusionary to move forward in the long-run. Understandably a past watershed organization in the Gallinas that focused on water rights as the issue did not last very long. In the Gallinas Watershed we discovered a common ground of “love of the place” while in the Mora Watershed it was land resilience through drought; those commonalities connect rather than fragment people and efforts.
- **Do the work in-house with local people** – In order for the WBP process to be well grounded in the local community, it is preferable to do the assessment and planning with local resources and people as much as possible. Hiring outside consultants to develop a plan may be efficient but may not result in an approach that is locally em-

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-braced. If expertise is not available locally, consider training local people or staff to do the work to help build local capacity. At a minimum, local people should oversee the planning project and do the social aspects of the work. Local landowners are also much more likely to be receptive to a neighbor than a divorced professional or agency person from another area. HPWA has supported successful professional development of three local individuals and numerous interns with their work for us on WBPs.

- **Collaborative efforts really pay off** – While it takes time to build relationships and cooperate with others, the greater amount of work that can be accomplished makes it well worth the time invested.

The Challenges

- **Prioritizing projects** - Now that understanding of watershed restoration has improved, many landowners/managers are interested in doing restoration work. With more projects than are possible to do, prioritizing them has become more important. When willing landowners were few, projects occurred wherever there was someone willing to cooperate. Now there is a need to develop more rigorous and meaningful ways to prioritize projects. That approach needs to factor in those projects with the greatest potential for recovering watershed functions within the context of the entire watershed. HPWA hopes to build a new prioritization strategy in our next WBP.
- **Engaging the public** – Ideally we would like to have many landowners and stakeholders join field data collection efforts, actively participate in the planning process, and regularly attend meetings and events, but that is often not the reality. Busy schedules on the part of working people, challenges with finding and communicating with them and having a public that does not identify with our work, all hinder engagement. During the WBP effort, adequate resources and effort must be made available to pursue public engagement by a wide diversity of means.
- **Events** – Hosting events is one way of meeting and including the public but it is easy to invest a lot of time on events with mixed results (especially in small rural communities). Selecting the type of event that is most likely to engage people in a meaningful way is a continual challenge. Having an effective publicity approach is also a challenge and needs to be customized for each community. For instance, the most effective promotion approach in one of our watersheds is “word-of-mouth” and in another it is the internet. We have learned that many, smaller events located close to where people live and that are easily organized are more effective and doable than fewer large and consuming events. Large events also have less of an opportunity to meaningfully educate and engage people.
- **Volunteer recruitment** – In our rural community it can be very difficult and time consuming to find and organize volunteers to help with field work and events. While it is a worthwhile endeavor, ensuring that adequate staff are available to get WBP work done without a reliance on volunteers is important. Volunteer recruitment is an effort on its own and the WBP effort requires a degree of professional attention. So, if volunteers are relied upon through the planning process, adequate resources to recruit, train and organize volunteers must be anticipated. It may even require building the “culture of volunteerism” which is what we experience.

Finding the nexus between science and people is both the opportunity and the challenge of the Watershed Based Planning process and outcome. The planning approach must be broad in scope to allow opening doors for future work but also must be specific enough to address the intent of 319 funding; it is a balancing act that helps to yield a more effective plan.

Development of Watershed Based Plans are funded through the EPA Clean Water Act, Section 319(h) and are guided and administered by the Surface Water Quality Bureau of the NM Environment Department.

Thanks to Abraham Franklin, Neal Schaeffer and Chris Cudia for helping us along this road.

Microbial Source Tracking in the Four Corners: What it Takes

By Neal Schaeffer, SWQB Environmental Scientist, and friends

Surface waters generally have fecal bacteria, which wash off the landscape during storm events (or from aquatic creatures like ducks). This natural process is in part how the Fertile Crescent gave rise to both agriculture and civilization! But in high concentrations, fecal contamination can lead to human diseases, especially those that involve ingesting pathogens from feces -- the so-called “fecal-oral” diseases. Simple sanitation reduces the incidence of diseases like poliomyelitis and hepatitis (viruses), cholera and typhoid fever (bacteria), giardiasis and cryptosporidiosis (protozoans), and tapeworms (helminths). Note that analyses commonly rely on *Escherichia coli*, in part because feces contain a lot of *E. coli*. But *E. coli* typically has low pathogenicity; it is merely an indicator of feces and pathogens.

Controlling pollution requires identifying its sources. This usually means geographic sources, such as feedlots or septic tanks; and conventional sampling at many locations through time can identify these places. But we can also approach ecological sources: the warm-blooded animals associated with those fecal microbes. This testing involves genetic analysis. Besides suggesting control opportunities, human feces may be more pathogenic than non-human sources because each other animal is a vector for just a few human diseases.

Microbial Source Tracking (MST) is a relatively new water testing method that involves genetic analysis of fecal bacteria. The purpose of this article is to illustrate what it can take to generate a useful MST study.

As with any study, a quality assurance plan is necessary, especially to articulate what questions are to be addressed and how the data will answer them. MST studies are expensive, and unfortunately some have not provided much new information or other value. Before turning to MST, first try to find actionable sources using cheaper conventional enumerations. Even if these results are inconclusive, proper MST planning relies on these conventional data (“targeted” MST).

MST requires careful planning, and the team must include a scientist who is familiar with the “bleeding-edge” of this technology and how best to address the scientific questions. Recent work on the San Juan and Animas rivers near Farmington provides a good example. They found a large human fecal signature; and going public with such controversial findings required great certainty with sufficient controls, repeatability, and corroboration by other lines of evidence. Dr. Geoffrey Smith from New Mexico State University knew about confirming analyses using a second bacterial genetic marker as well as two viral markers; and I do not think anyone has challenged those findings. Dr. Smith also negotiated with the laboratory to go beyond presence-absence, to estimate the quantities of the pathogens. As described below, this proved essential to subsequent data interpretation.

MST also requires local expertise to keep up with this science (to incorporate local wisdom) and to collect valid samples. For the San Juan study, Melissa May of the San Juan Soil and Water Conservation District and Dave Tomko with the San Juan Watershed Group (SJWG) brought relevant education and work experience. They recognized needs for “crucial changes in study design that arguably are the only reason we got good results”:

- One study question was how much fecal pollution in New Mexico came from Colorado. Conventional data suggested little contamination from Colorado. But by adding an appropriate “background” station, based on understanding both science and local conditions, they discovered something “complicated and interesting”: human bacteria were constantly present even though the conventional *E. coli* counts often did not exceed water quality standards.

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- MST data can inappropriately color the findings. The existing MST technology identifies whether specific animals were sources of the feces, but the analysis tests only a short list of animals requested ahead of time. The SJWG made another smart change, from cow to ruminant markers. Although counter-intuitive (ruminants include cows plus many other animals), the cow feces genetic marker seemed to be insensitive. This change led to a finding that both ruminant and human sources were present in most samples, instead of only finding a human signature.
- The MST quantification mentioned above provided for basic statistical analysis of the results as well as comparison with conventional numerical data. The SJWG could not discern obvious patterns in the temporal distribution of some markers, and statistical analysis of presence-absence data proved difficult. But the semi-quantified MST results allowed “correlation” analyses, which highlighted the importance of human and ruminant markers. The SJWG strongly recommends that other groups include quantification of the suspected sources, even if that means taking fewer samples.



Julia Campus, OSM/VISTA volunteer, coordinates community volunteers before heading out for a day of river sampling.

This San Juan MST study took a lot of time and technical expertise; but the findings were profound, especially for watershed planning. Few people expected such a large human fecal signature, especially since virtually all human sources should be controlled through proper septage and sewerage treatments. One outcome from this work was a closer look at these regulated communities, especially “honey-dipper” septic waste haulers (there is concern that these liquid wastes are not always disposed of properly). Another outcome is greatly increased public awareness, especially as this story played through a series of community meetings and the local media.

But even after all this work, both the synoptic conventional sampling and the MST study, the SJWG still is not able to pinpoint many specific geographic sources to be controlled. This article is a warning that an “off-the shelf” approach to MST might become an expensive education in disappointment.

To learn more about this work;

visit the San Juan Soil and Water Conservation District at <http://www.sanjuanswcd.com/> and <http://www.sanjuanswcd.com/programs/watersheds-and-water-quality/> and San Juan Watershed Group at <https://www.facebook.com/SanJuanWatershedGroup>

Their Watershed Based Plan for the lower Animas River is in EPA review, and may be posted to <https://www.env.nm.gov/swqb/wps/WBP/Accepted/index.html> soon.



EVENTS & ANNOUNCEMENTS

June

June 17th-19th - Valles Caldera National Preserve. Join Los Amigos de Valles Caldera and Albuquerque Wildlife Federation for a weekend project and camping. The design of this restoration service project will enhance the water quality of Sulphur Creek, a major tributary to San Antonio Creek. For those not wanting to camp, day volunteers are welcome. More information can be found at <http://losamigosdevallescaldera.org/projects/> or <http://abq.nmwildlife.org/projects.html>

June 18th - Santa Fe. Santa Fe River Cleanup with the Sierra Club-Rio Grande Chapter. 9-11 am. Contact Kathleen Davis if attending, 505-795-3286, kdav40@gmail.com

June 25th - Questa - 10th Annual River & Land Cleanup with Amigos Bravos. 8:00am - 1:00pm. Contact Loe Maroline at 575-758-3874 or visit: <http://questa-nm.com/event/2638/>

July

July 1st - 4th - Quemado Lake. Join New Mexico Volunteers for the Outdoors at beautiful Quemado Lake to improve the Largo Canyon and Sawmill Canyon Trails. Work includes: defining trail tread, brushing and working to improve erosion and soil retention control. Contact Leader: Jim Scanlon, 505-385-0517, scanlon.jim@gmail.com to sign up.

July 13th - Santa Fe, La Fonda Santa Fe Hotel. *Hydrology and the Law Seminar*. Using the science for resolving water rights and supply issues. Law Seminars International. Visit: www.lawseminars.com or call 206-567-4490.

July 22nd-24th - Valles Caldera National Preserve. Join with Los Amigos de Valles Caldera and Albuquerque Wildlife Federation for a weekend wetland restoration project and camping. For those not wanting to camp, day volunteers are welcome. More information can be found at <http://losamigosdevallescaldera.org/projects/> or <http://abq.nmwildlife.org/projects.html>

August

August 5th-7th - Comanche Creek Volunteer Weekend. Restoration workshop with Quivira Coalition. Please see their website for upcoming details at: <http://www.quiviracoalition.org/>

August 19th-21st - Midnight Meadows; Carson National Forest near Questa, NM; Albuquerque Wildlife Federation volunteer restoration project. For additional details: Albuquerque Wildlife Federation - <http://abq.nmwildlife.org/projects.html>

Save the Date

October 5th-7th - 61st Annual New Mexico Water Conference. Western New Mexico University, Silver City, NM; New Mexico Water Resources Research Institute - *Where Does All the Water Go? History, Hydrology and Management of New Mexico's Scarce Waters*. For additional details: <http://nmwaterconference.wrri.nmsu.edu/>

If you have a related event that you would like distributed, please send an email to susan.ossim@state.nm.us