Western Montana Groundwater Mitigation Program for Sustainable Water Use and Environmental Flows

Student Proposers
Ian Bell, Master’s Candidate, 2016
UCSB Bren School of Environmental Science & Management
ian.douglas.bell@gmail.com, (714)392-6716

Karen Askeland, Master’s Candidate, 2016
UCSB Bren School of Environmental Science & Management
karen.askeland@gmail.com, (858)603-1906

Clients
Laura Ziemer, Senior Counsel and Water Policy Advisor, Trout Unlimited
LZiemer@tu.org, (406)522-7695

Eloise Kendy, Ph.D., Senior Freshwater Scientist, The Nature Conservancy
ekendy@tnc.org, (406)495-9910

Objectives
The objective of this project is to develop a groundwater mitigation bank for Montana’s Upper Missouri River watershed that acquires senior surface-water rights from willing sellers, moves the water rights through the change-of-use regulatory process to a mitigation purpose, and then sells the “credits” to new groundwater users. This mitigation bank will make water readily available for new groundwater pumping, while maintaining agricultural water uses, securing municipal supplies, and protecting instream flows. The specific objectives are to:

• Define the service area,
• Determine how to obtain, store, and transmit water for the bank,
• Design the institutional structure, and
• Develop an operational plan

This group project will complement other components of the mitigation bank being designed by stakeholders, including the City of Bozeman, Montana Department of Natural Resources and Conservation (DNRC), the Montana Building Industry Association, and potentially other consultants.

Significance
The proposed project can be leveraged to support the expansion of water markets across the Western United States and maintain in-stream flows, while meeting new and challenging water supply needs.

Nearly all Western states lack limits on groundwater withdrawals—particularly for small, individual wells—even when science shows that groundwater aquifers replenish stream flow. However, to protect the environment and existing water users, as of October 17, 2014, Montana now caps both permitted and multiple, small individual groundwater withdrawals and surface water withdrawals¹. A groundwater mitigation bank in Western Montana will streamline the permitting process under a cap on water diversions, benefiting all stakeholders. New groundwater users could avoid the arduous process of finding an existing senior water right and repurposing it as mitigation water. People seeking water (such as real estate developers or the City of Bozeman) could instead obtain mitigation water by simply purchasing credits directly from the mitigation bank. Most importantly, the mitigation bank will demonstrate that a cap on groundwater withdrawals can protect instream flows and senior water right users without impeding future development. Without the mitigation bank to act as an intermediary in the water permitting process, Montana runs the risk of losing its cap on water withdrawals to development pressure which would harm instream flows and senior agricultural rights.

The proposed project is one of six water transaction pilot projects being considered by the newly established Science for Nature and People (SNAP) Water Transactions Working Group convened by the clients along with
government, industry and other stakeholders (discussed in Client Letter of Support). The Working Group’s goal is to use multi-objective water transactions to enhance streamflow, increase water supply reliability and maintain rural economies.

Due to its integration with other pilot projects, the proposed project has the potential to shape groundwater policy in Montana and the greater Western United States in the face of increasing water demand and an uncertain supply due to drought and climate change. This is especially relevant in light of recent groundwater policy passed in California directing local governments to form groundwater sustainability agencies by 2017, which can adopt groundwater sustainability plans that may limit groundwater withdrawals.

**Background**
The proposed project is located in the Upper Missouri River watershed in West-Central Montana. The watershed includes the groundwater resources underlying the cities and towns of Bozeman, Belgrade, and Manhattan. The watershed has experienced rapid growth—in the two decades between 1990 and 2010, Gallatin County experienced greater than 70% growth. The proposed project will also share information and assist with and/or complement the Montana Building Industry Association’s efforts to develop a mitigation bank in the Helena Valley. Both mitigation banks will be located in the upper Missouri River basin (see map in Appendix A).

The rapid growth in the Upper Missouri River watershed has created high demand for water for residential use. New houses built in the rural areas of the watershed do not have any surface water rights or municipal water supplies, and instead drill wells to pump groundwater for domestic water consumption. Between 2000 and 2008, nearly 30,000 non-permitted exempt wells were drilled in Montana, many of which were located in the Upper Missouri Watershed. This is allowed via a “loophole” in the Montana Water Use Act that allows individual wells pumping 35 gallons per minute or less and do not exceed a volume of ten acre-feet per year to be exempt from the State water rights permitting process. Therefore, entire subdivisions have been plumbed under the groundwater loophole, all without any water permitting process.

However, pressure from senior agricultural water right holders led to a Montana district court ruling on October 17, 2014 stating that a “project or development” using one or more wells that together use more water than the 35 gallons per minute and 10 acre-feet per year exemption must go through water rights permitting. Because nearly all the watersheds of southwest Montana are closed to new water right appropriations, the only way new water for residential, commercial and industrial growth can now be obtained through the water permit process is to “off-set” the new use with mitigation water, or change an existing water right to the new use. Now that the exempt-well “loophole” is closed to multiple wells, new housing or other development projects across Montana need to secure water rights by obtaining mitigation water from an existing surface water right, or from a groundwater mitigation bank like this proposed group project. The State of Montana sorely needs to implement workable mitigation banks in high-growth places like Gallatin County to be able to comply with the requirements of the new water rights permit ruling; otherwise, legislative opponents are likely to defeat it, returning water use to its previous unsustainable condition.

**Available data**
- **Yakima River Basin, Washington Water Exchanges** - Upper Kittitas, Lower Kittitas, Central Yakima and Lower Yakima Basins (includes data [tracking mitigation bank performance](#) in the region)
- **Dungeness, Washington Water Exchange** - Washington Water Trust for mitigation and restoration information, including mitigation plans and guides
- **Walla Walla, Washington** groundwater well mitigation crediting programs
- **City of Santa Fe, New Mexico** water bank
- **Arizona Water Banking Authority**
- Montana Bureau of Mines and Geology [Gallatin Valley, Montana hydrogeologic study](#)
- Kendy and Bredehoeft, (2006) **Transient Effects of Groundwater Pumping and Surface-water-irrigation** - [Returns on Streamflow](#) (Gallatin Valley, Montana)
- United States [Census data](#) and [projected water demands](#)
- City of Bozeman [Integrated Water Resources Plan](#) (2013)
Possible approaches
The project will help design and implement a groundwater mitigation bank within the Upper Missouri River watershed in Montana. The proposed project will involve a tailored planning effort comprised of the following aspects:

- **Determine the pricing structure and tradable units for exchange.** This group project will perform an economic analysis of the cost of water rights acquisition for the mitigation bank, assess and estimate the operational costs of running the mitigation bank, and estimate the costs of setting up the mitigation bank in order to determine the price of a “mitigation credit,” and compare our approach with the pricing structure used by other mitigation banks.

- **Define the institutional structure and operation.** This group project will research and recommend avenues for “operationalizing” the mitigation bank once water rights are obtained for the bank, including the organizational structure for the bank (non-profit corporation, buyer-owned cooperative, incorporated into an existing state or local government entity or watershed group, etc.), how to interface with potential buyers of mitigation credits, how to track credit sales, how to monitor and report on mitigation water recharging the Gallatin River, and how to ensure the long-term viability of the mitigation bank.

- **Assess environmental benefits.** Analyze the ability to utilize “natural infrastructure” such as existing or restored wetlands, ephemeral streams, or existing irrigation canals to recharge the Gallatin Valley’s aquifer which will have positive impact on the connected surface stream flow. Local hydrologic data on return flow characteristics and data from other up-and-running environmental markets will be used to estimate the environmental gains to streams from the likely volume of senior surface water rights to be traded into the mitigation bank.

Deliverables
The goal of this project is to fully develop all the mechanisms and planning for a well-functioning groundwater mitigation bank in Montana’s Gallatin Valley. The specific deliverables for the group project will be a report to the clients documenting the recommendations on the pricing structure and institutional operation of the mitigation bank, and the assessment of environmental benefits, as described above.

In addition to the report detailing research and recommendations to the clients, the project may be presented as a pilot watershed case study in water markets design at the SNAP Water Transactions Working Group meeting at the National Center for Ecological Analysis and Synthesis in Santa Barbara in 2016.

Internships
There are two pending grant proposals to fund 1-2 three-month summer interns at the Trout Unlimited office in Bozeman, Montana. In the event that funding is not obtained, the internships would still be offered as unpaid.
Budget and justification
It is not anticipated that the proposed project would need any additional funding greater than the $1,300 contributed by the Bren School.

Client letter of support
See attached.

Appendices
Appendix A: Map of the Upper Missouri Watershed in West-Central Montana
Appendix B: Visual representation of exempt and permit water withdrawals
January 23, 2015

Group Project Committee
Bren School of Environmental Science & Management
University of California, Santa Barbara
Santa Barbara, CA 93106

RE: Letter of Support for the 2015-2016 Bren School Group Project Proposal

Dear Group Project Committee,

The Nature Conservancy (TNC) and Trout Unlimited (TU) support the Bren School Group Project proposal to design a groundwater mitigation bank for Montana. Unlimited access to groundwater, nearly universal across all Western states, is widely recognized as a major impediment to the development of water markets and a contributor to groundwater and streamflow depletion. Montana leads the West—and the world—by capping both groundwater and surface-water allocation to protect streamflow. However, the cap is new and untested, and is threatened by repeal if it can’t quickly be shown to be compatible with meeting new demands for water through water right exchanges or trades. By designing the state’s first groundwater mitigation bank, this project will demonstrate how a cap on new water allocations can benefit nature and people, including real-estate developers who need reliable water rights, rivers that need more instream flow, and agricultural communities that need water to grow crops. If successful, it will embolden other states to cap new water allocations, opening the doors to efficient water markets that protect streamflow and senior water users across the West.

TU is providing overall leadership and coordination of several project partners, including the Bren School students, The Nature Conservancy, City of Bozeman, Montana Department of Natural Resources and Conservation (DNRC), the Farmers’ Canal, the Association of Gallatin Agricultural Irrigators, the Montana Building Industry Association, and the Montana Bureau of Mines and Geology. Together, these project partners have been in discussion regarding the need for creating mitigation banks, especially in high-growth areas like the Gallatin River valley. The proposed project gains particular credibility because of the involvement and support of the DNRC, Montana’s water use agency, which recognizes the need and role for a mitigation bank.

This project is linked to three other project proposals:

(1) TNC submitted a proposal to Wells Fargo, which includes a request to fund ($5,000) a Bren Student intern to participate more deeply in the Montana groundwater mitigation bank design.
The intern would be based at the Trout Unlimited office in Bozeman, Montana. Wells Fargo will announce grant recipients in May or June 2015. TNC’s commitment to participate in the groundwater mitigation bank design project is contingent on receiving this grant. However, TU’s commitment to lead the mitigation bank design project is independent of Wells Fargo funding. Therefore, while approval of this proposal will enhance the mitigation bank design project, rejection will not preclude its moving forward.

TNC and the National Fish and Wildlife Foundation (NFWF) submitted, and received approval of, a Science for Nature and People (SNAP; a scientific collaboration among The Nature Conservancy, the Wildlife Conservation Society, and the National Center for Ecological Analysis and Synthesis (NCEAS)) proposal to lead a 2-year NCEAS Working Group on Water Transactions, beginning this spring. The Montana groundwater mitigation bank will be the foundation for one of 2-4 water transaction pilot programs with which the Working Group will collaborate to demonstrate the costs and benefits of innovative water transactions that restore depleted streamflow, secure urban water supplies, and maintain rural economic vitality concurrently. The SNAP project aims to expand the single-purpose mitigation bank into a broader, multi-purpose water exchange. The Working Group of 16 academics and practitioners will meet in Santa Barbara at least three times in the next year, and Bren School students working on this proposed Group Project would have the opportunity to present and participate in the working group meetings at the NCEAS’ downtown Santa Barbara offices. This collaboration will allow Bren students a unique opportunity for building valuable professional relationships. TNC (Eloise Kendy) commits to co-lead the SNAP project, and TU (Laura Ziemer) commits to do double-duty as a Working Group core team member and Montana pilot project manager. The Montana DNRC’s Water Division Administrator, Tim Davis, has also expressed his willingness to participate in the SNAP Working Group, representing the Montana mitigation bank pilot project.

TU will partner with the City of Bozeman to submit a proposal to Montana DNRC’s Renewable Resource Grants and Loans program, which will include a request to fund ($5,000) a Bren Student intern to participate more deeply in the Montana groundwater mitigation bank design. This grant would also fund a local consultant to conduct detailed, field-based analyses, in which the Bren intern would participate.

As clients for the Bren student Group Project, TNC and TU commit to providing the necessary advice and data. We will make ourselves available through phone calls and emails to the students as needed, and can commit to travel to Santa Barbara three times during the study period (in conjunction with SNAP Working Group meetings). We will help students access publicly available datasets, if needed; specific data needs will depend on the final scope of the project. We will also introduce the students to other project collaborators, including the City of Bozeman, Montana Department of Natural Resources and Conservation, and Montana Building Industry Association.

TU commits to host an intern in the Bozeman, Montana Trout Unlimited Western Water Project office. This office is staffed by four water attorneys who undertake a variety of project and policy-based initiatives in Montana and around the West to protect and restore flows in coldwater rivers and
streams. The development of the mitigation bank in Montana will be supervised by Laura Ziemer, based in the Bozeman TU office, who will provide mentoring in a professional capacity, including introductions to project collaborators, guidance on research directions, feedback on analytic work, and review of written work synthesizing the research and analysis. The Masters student intern will perform work that will develop professional skills, provide valuable professional experience and connections, and make important contributions to the mitigation banking project. As noted above, we are actively seeking two alternative sources of funding to support an intern. In the event that neither proposal is granted, a Bren student would still be welcome to serve on-site in Bozeman as an unpaid intern.

In addition to the above, TU commits to work with state and local officials as needed to implement the mitigation bank as soon as practicable upon its completion. TNC commits to leverage the results broadly across the Western US through journal article publication, technology transfer, and new project development.

We are excited to be part of this Group Project proposal and to have the potential opportunity to work with Bren’s bright, motivated students. Please don’t hesitate to contact us with any questions or concerns.

Sincerely,

Laura Ziemer, J.D. and M.S.

Eloise Kendy, Ph.D.

Trout Unlimited
321 East Main Street, Suite 411
Bozeman, Montana 59715
(406) 599-2606
lziemer@tu.org

The Nature Conservancy
415 Monroe Avenue
Helena, Montana 59601
(406) 495 9910
ekendy@tnc.org