

Henry's Fork Watershed Council Annual Field Tour
Hosted by Fremont-Madison Irrigation District (FMID)
and the Henry's Fork Foundation (HFF)
Tuesday, August 9, 2016

Participants gathered at 801 Main Street in Ashton to carpool to Cloud Seeding Site for the start of the field tour.

Introductions and Community Building

The field tour was organized and led by Dale Swensen (FMID) and Brandon Hoffner (HFF). A group of about 25 met at the old hospital parking lot in Ashton for brief introductions. Brandon explained that HFF is refurbishing the old hospital into a new office. He also announced that there will be a Drought Management Planning meeting immediately after the field tour at 4pm for those who might be interested. Rob Van Kirk (HFF) introduced Bryce Oldemeyer, a new Research Associate working for the Henry's Fork Foundation. Bryce has a fisheries biology background and joins the team as Christina Morrisett has moved on to graduate school.

Cloud Seeding Site – Derek Blestrud, Idaho Power

The group convened at one of Idaho Power's ground-based seeding sites near Hatchery Butte. Derek explained that most ground-based sites are on mountain tops to take advantage of so-called *orographic uplift*, which causes horizontally traveling air masses to be uplifted as they encounter mountain ranges. However, the Hatchery Butte site is located on the flat expanse of the Henry's Fork Caldera in Island Park. In this setting, so-called *synoptic-scale* (weather patterns over scales of hundreds of miles) forcing pushes air up onto the Caldera from lower elevations on the Snake River Plain, causing uplift. Snowflakes form on natural aerosols at around 15°F, but snowflakes can form on silver iodide particles introduced from cloud-seeding at 23°F, allowing more time for snowflake formation. Introduction of silver iodide particles also provides more nuclei in the cloud on which flakes can form.

At ground-based stations such as Hatchery Butte, silver iodide is dissolved in acetone, which is burned in a propane flame, releasing the silver iodide aerosols into the cloud. A satellite modem powered by a solar panel allows personnel in Boise to remotely operate the seeding. Last year, planes were added to the ground-based sites to allow more efficient delivery of silver iodide into clouds. In addition to the cloud-seeding planes and ground stations, Idaho Power maintains a network of ground-based meteorological stations and launches balloons with meteorological recording instruments to monitor the success of cloud-seeding operations.

Small-scale studies show that cloud-seeding can increase precipitation by around 13%, although site-specific effects depend on topography. Because precipitation from a cloud seeded on a given ridgetop falls 5-15 miles downwind, the optimal topography for cloud-seeding is a series of ridges 5-15 miles apart oriented perpendicular to the prevailing winds. This type of topography is present in the Payette watershed, where Idaho Power's cloud-seeding program has been

particularly effective. Although Idaho Power plans to establish 25 ground-based stations in the upper Snake Basin, spanning an area from the Centennial Range across Island Park to the Tetons and south to the Georgetown area, it is not clear that the topography of the upper Snake Basin will result in the high success of cloud-seeding in western Idaho. Models based on 50 years of meteorological data suggest that full implementation of the cloud-seeding program in the upper Snake River basin, including both ground stations and planes, will increase water supply by about 400,000 acre-feet. For comparison, the storage capacity of the upper Snake reservoir system is 4,000,000 acre-feet, and the total annual water supply in the upper Snake basin averages around 11,000,000 acre-feet. Derek emphasized that cloud-seeding is a water-management tool that is most effect in average years. Clouds are not seeded during very wet years because the additional water yield does not justify the cost of seeding. In dry years, there are few storms suitable for seeding, so the program has little effect in those years.

The most frequently asked questions about cloud seeding are related to environmental effects, including the fate of silver iodide and changes in downwind precipitation. Analysis of physical snow on the ground in study watersheds has revealed slight concentrations of silver iodide following seeding, on the order of 1 to 40 parts per trillion. However, silver iodide is inert, and no detectable concentrations of silver iodide have been recorded in aquatic macroinvertebrates or other components of aquatic ecosystems in the study watersheds in western Idaho. There is a misconception that cloud-seeding in one location removes moisture that would have fallen as precipitation at other locations downwind. However, the amount of water in a given storm is not fixed; as storms move across the continent, they continuously draw moisture from different sources. Precipitation induced by cloud-seeding removes around 1% of the moisture available in a given storm, which becomes even a smaller fraction downwind as new moisture is added. Studies have detected neutral to even slightly positive effects of cloud-seeding precipitation as many as 250 miles downwind.

St. Anthony Union Canal Recharge Project – Mike Rasmussen, Egin Bench Canals Inc.

Dale Swensen introduced Mike Rasmussen, Present of the North Fork Reservoir Company and Egin Bench Canal Inc., and Jeff Raybould, Vice-Chair of the Idaho Water Resource Board (IWRB) and Chairman of FMID. Discussions began on this project about one year ago, but thanks to support from IWRB, they were able to achieve a quick turnaround. Mike said they looked at a lot ways to get water to the desert, which is northwest of the river, and this was the only place in the area where water can run north—away from the river—rather than south and west back toward the river. So, the canal diverts water north from the St. Anthony Union Canal to the Egin Lakes recharge site, which floods about 200 acres near the St. Anthony sand dunes. The Raybould brothers and John Ramsey made this project possible.

The canal was built to handle 125 cfs, but the soil is dry and sandy, so they weren't sure what would happen. So far it has gone pretty well, and on the day of the tour they had 75 cfs running through the canal. They use rock rip-rap where sandy banks are eroding into the canal.

An audience member asked about the timing of recharge and whether it is unusual to conduct

recharge in the summer. Jeff Raybould replied that the water in the canal is storage water that was leased by groundwater districts, and FMID is recharging the water on behalf of the leasee. He elaborated further by saying that once leased for recharge, the water would be recharged somewhere in the upper Snake system, so greater benefit accrues to the Henry's Fork if water is recharged here than if it is recharged farther downstream in the system. Recharge will typically happen in the spring when natural flow is available to fill the IWRB's managed recharge rights, which are junior in priority to other rights. Recharge occurred during the summer of this year because some irrigation districts had extra storage water they could lease for managed recharge. In the future the ability to recharge here will be quite variable – ranging from 0 to 125 cfs, depending on natural flow priorities.

In general, there are two administratively different programs of managed recharge. One is the IWRB's program, which has a long-term goal of recharging 250,000 acre-feet per year at sites distributed across the upper Snake River basin. This program uses natural-flow rights belonging to the IWRB that are junior to all of the irrigation storage rights in the basin. Thus, recharge under this program will occur only when natural flow is available that would otherwise spill at Milner Dam and be lost from the basin. The other program is private, using either privately held natural-flow rights or storage leases. In water year 2016, for example, recharge under the IWRB's natural flow rights occurred only during the winter and only downstream of Minidoka Dam. However, some extra storage water was available for lease from Palisades Reservoir during the irrigation season, and that's the water that is being recharged now. As to the effect on the storage system, around 20,000 acre-feet of leased water is being recharged in the Henry's Fork watershed in 2016. At the same time, around 27,000 acre-feet of physical water stored in Henrys Lake and Island Park Reservoir belonged to American Falls on paper and needed to be delivered to American Falls anyway. Thus, the recharge diversion was simply offset by the water delivered to American Falls. The amount of storage leased for managed recharge this year was unprecedented and was prompted by the recent settlement between the Surface Water Coalition (an organization of irrigation entities in the Magic Valley) and the Idaho Groundwater Association. Under that settlement, groundwater users must cut pumping by about 240,000 acre-feet or mitigate continued pumping through recharge of an equal amount of water. Because leases are done on a year-to-year basis, and because storage users who lease water in a given year receive lowest priority for storage refill the following year, this year's high volume of leases for recharge will not necessarily be repeated in the future.

Someone asked about where the water recharged at Egin Lakes returns to the surface water system. Jeff deferred to Rob Van Kirk to answer this question. Rob replied that about 35% of the response to recharge at Egin Lakes is realized in the Henry's Fork upstream of the Rexburg gage, another third between Rexburg and Shelley, and the remainder between there and American Falls Dam. About two-thirds of the effect of the recharge is felt within 10 years, and 95% of the effect of the recharge is realized within 25 years. Someone else asked if recharge could be done during the winter rather than summer to reduce negative effects on fisheries and possibly even have positive effects, if storage could be delivered during the winter. Jeff replied that physical logistics are more difficult during the winter because of icing in canals. However, Mike had mentioned that historically, canals on Egin Bench had diverted a small amount of water all winter for stock water and to maintain a higher water table caused by recharge incidental to that diversion. As long as a snow bridge forms over the canals to prevent freezing of water flowing

underneath, it is possible to divert water during the winter. However, if canals were not already diverting water at the beginning of winter, there is no guarantee that mid-winter startup of recharge is possible once canals are full of snow. There are still logistical challenges on delivering the full amount to the recharge site during winter. Dale added that current rental pool rules do not allow diversion of leased water during the winter and that those rules would need to be changed to allow winter recharge. Another audience member asked about what consideration could be given to business supported by recreational fishing, which could be harmed by recharge during the summer but potentially helped by recharge during the winter. Jeff responded that if fishing interests were willing to contribute some financial resources to offset additional costs and to provide insurance in case winter conditions prohibited delivery of all water in particular lease, then perhaps the groundwater districts would be willing to lease water for winter recharge.

Sand Mountain Wilderness Study Area

During lunch, Dale Swensen distributed a handout prepared by the U.S. Bureau of Land Management that contained a brief history of the Sand Mountain Wilderness Study Area (WSA). The status of that WSA is relevant to managed recharge, as proposed expansion of recharge capacity at Egin Lakes will require amendment of the existing recharge right of way (ROW) agreement to allow additional acreage to be flooded. The handout is included at the end of this document.

St. Anthony Hydropower Project – Dirk Mace, Sorenson Engineering

Dirk Mace of Sorenson Engineering welcomed the group. He explained that the facility was built in 1915 and still uses some of the original equipment. In 2002, Rocky Mountain Power closed the facility due to turbine issues. Then, approximately two and a half years ago, Sorenson Engineering purchased the facility and refurbished it. It has been running well ever since.

Water for the power plant is diverted from the Henry's Fork into the Egin Canal. The plant has a capacity of 700 cfs, but the canal's irrigation right is only 430 cfs, so the power plant's flow is diverted out of the canal, through the plant, and back to the river upstream of where the Egin Canal's irrigation diversion is measured. There is a fish ladder near the diversion dam to improve fish passage, and an automatic trash rake started operating in November.

There are four turbines all connected to one shaft, and water flows through two of the turbines. The plant is producing approximately 600 kW right now, but the maximum production they've reached is 720 kW.

South Fork Teton Access Project – Dan Garren, IDFG

Dan Garren of the Idaho Department of Fish and Game (IDFG) explained that IDFG oversees 65 access sites in the Upper Snake Region and that the sites are established and maintained to put the public in touch with the public resource – the river. IDFG's interest in this site stems from the fact that the river is navigable, there is an existing boat ramp downstream, the reach supports a high-quality fishery and existing angler use, and the river reach is on private land, so there is the potential for future loss of access. These factors together made this site rise to the top as a

priority.

In February of 2016, the Henry's Fork Watershed Council conducted a WIRE process to evaluate the proposed South Fork Teton Access Project. There was mixed feedback as two of the three break out groups supported the project and one group could not come to a consensus. There were a number of good concerns raised, including the concern that trash would increase at the site, that land values would decrease, that there could be safety concerns in the area, and that the river might not be navigable all year round.

IDFG has looked into each of these concerns and Dan explained, regarding safety, there is some risk in floating a river, as there is with any outdoor activity. Regarding navigability, based on records of IDFG staff taking drift boats out on this section of river at varying flows, it's estimated that the river is navigable approximately 80% of the time. Dan also got in touch with County Assessors in Fremont, Jefferson, Madison, and Bonneville Counties and all said that they didn't think a boat ramp would decrease property values. County Assessors from two of those counties said they believe a boat ramp would increase property values. Regarding trash, the site is currently full of trash, but as an access site it would be maintained. BYU-I's outdoor recreation program has also expressed interest in an annual river clean up. A few concerned local citizens asked for the names and contact information for all of the county assessors IDFG spoke to as well as access to the data and numbers used to determine that the river is navigable about 80% of the time.

Going forward, IDFG must bring the project to a public hearing and gain a variance from Madison County to move forward with the project. That public hearing will likely be in October.

Community Building and Wrap-Up

Brandon Hoffner thanked everyone for attending the tour. He commented that there was a lot of good information shared. Rob Van Kirk commented that there were highly variable topics and Melissa Muradian (HFF) thanked the presenters for taking the time to share that information with us.

The tour wrapped up at approximately 3:15 pm.

Background of Sand Mountain WSA Designation

- In 1979, the BLM State Director published a final decision on the Initial Wilderness Inventory. This decision identified what units would be intensively inventoried for wilderness characteristics. The Sand Mountain Unit was not identified as an area to further study through the intensive inventory process.
- The Wilderness Society Appealed that decision to IBLA (Interior Board of Land Appeals) in August 1979, arguing that the Sand Mountain unit was not properly analyzed by BLM and that it should be intensively inventoried (see attached 1979 Wilderness Society Appeal of Initial Inventory Decision).
- IBLA directed BLM to do an intensive inventory of the Sand Mountain unit area.
- A citizen appealed BLM's decision to intensively inventory the Sand Mountain unit (IBLA (Case IBLA 80-882) on April 29, 1981). The private citizen's appeal was dismissed and the BLM continued with the intensive inventory of the Sand Mountain unit.
- A Federal Register Notice was published on June 3, 1981, requesting public input concerning designation of the Sand Mountain unit as a Wilderness Study Area.
- A BLM memorandum was released on August 24, 1981 which indicated all public comments were reviewed and the Sand Mountain unit should be identified as a Wilderness Study Area.
- BLM released the Intensive Wilderness Inventory Final Decision in October 1981. The Idaho Trail Machine Association appealed to IBLA (Case 82-548) the BLM decision to designate the Sand Mountain unit as a Wilderness Study Area. The BLM decision was upheld by IBLA (see attached IBLA 82-548).
- 1985: Medicine Lodge Resource Management Plan (RMP) provided direction to recommend the Sand Mountain WSA as "nonsuitable" for inclusion into the National Wilderness Preservation System. The RMP also established direction to manage the Sand Mountain WSA area as part of the Knile Mile Knoll Area of Critical Environmental Concern (ACEC) and the St Anthony Sand Dunes Special Recreation Area (SRMA) (as defined and designated in the RMP) if it were not carried through as a Wilderness Area.
- 1988: BLM followed up with a more in-depth analysis of the Sand Mountain WSA. NEPA analysis was completed for the Sand Mountain WSA (completing the Study Phase of the process). BLM's decision was that the Sand Mountain WSA was not suitable for inclusion as wilderness.
- 1991: The Idaho WSA suitability report was submitted to Congress (this completed the Reporting phase of the WSA process).
- On December 17, 2002, an Act (PUBLIC LAW 107-361) authorizing the Secretary of the Interior to convey certain public land within the Sand Mountain Wilderness Study Area in the State of Idaho to resolve an occupancy encroachment dating back to 1971. On March 18, 2003, the BLM patented 10.23 acres to Gene Williams resolving the trespass.

Sand Mountain

Existing Egin Bench Canals Recharge ROW Area
ID1-36709
Approximately 253.25 Acres

Proposed ROW Amendment
Recharge Expansion
approx. 160 acres

Proposed ROW Amendment
Recharge Expansion
approx. 60 acres

17 N R 38 E

T 07 N R 39 E

Road

BM 1869

FREMONT CO
MADISON CO
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