



Big Hole Watershed Committee

Monthly Meeting Minutes

August 18th, 2021 – 7:00 pm at the Divide Grange
Zoom option also provided

In Attendance

In-person: Pedro Marques, BHWC; Tana Nulph, BHWC; Ben LaPorte, BHWC; Randy Smith, Rancher/BHWC; Matt Norberg, DNRC; Jarrett Payne, MFWP; Liz Jones, Rancher/BHWC; Mark Kambich, Rancher/BHWC; Diana Morris, Rancher; Dave Stone, Sportsman; John Jackson, BVHD County Commission/Rancher/BHWC; Lance Trebesch, Resident; Paul Cleary, Resident; Sandy Cleary, Resident; Tom Bowler, Resident; Betty Bowler, Resident; Roy Morris, GGTU/BHWC; Clayton Marlow, MSU – Montana Agricultural Experiment Station; Lynne Marlow; Jacob Smith, Rancher; and Jim Hagenbarth, Rancher/BHWC.

Zoom: Max Hanson, University of Montana/BHWC Watershed Health Intern; Miranda Brenna; Yulia Misevich-Crofutt; Sierra Harris, TNC/BHWC; Robert Pal, Montana Technological University; Jaime Trivette; Sean Claffey, TNC/Southwest Montana Sagebrush Partnership; and Paul Hooper, USFS.

Meeting Minutes

BHWC monthly meetings are now held at the Divide Grange with a virtual Zoom option provided thanks to Southern Montana Telephone Company, who donated the internet service. Meeting minutes and recordings are available at <https://bhwc.org/monthly-meetings/> (scroll down for meeting minutes archive). Printed copies are available during in-person meetings. Contact BHWC at info@bhwc.org or 406-267-3421 to suggest additions or corrections (or mention them at the next meeting).

Reports

Streamflow/Snowpack Report as of August 18, 2021 – Matt Norberg, Montana Department of Natural Resources and Conservation

Big Hole River Stream Gages							
Station Number	Station name	Date/Time	Gage height, feet	Dis-charge, ft ³ /s	Long-term median flow 3/17	Temperature, water, deg C	
UPPER MISSOURI RIVER BASIN							
06024450	Big Hole River bl Big Lake Cr at Wisdom MT	08/17 09:45 MDT	1.74	3.56	27.0	13.2	
06024540	Big Hole River bl Mudd Cr nr Wisdom MT	08/17 10:30 MDT	2.51	63.9	99.0	--	
06025250	Big Hole River at Maiden Rock nr Divide MT	08/17 09:45 MDT	2.65	248	337	14.1	
06025500	Big Hole River near Melrose MT	08/17 10:15 MDT	1.14	193	361	14.9	
06026210	Big Hole River near Glen MT	08/17 10:30 MDT	2.00	148	260	16.2	
06026420	Big Hole R bl Hamilton Ditch nr Twin Bridges, MT	08/17 09:30 MDT	0.350	46.8	163	17.4	

- **Streamflows:** Streamflows across the basin are well below average. Fishing closures/restrictions have been in effect for most of the summer months. Hot and dry conditions throughout the late spring and summer months have not been kind to the Big Hole River and its tributaries this year.

- **Snowpack/Precipitation:** I think we are all aware how hot and dry it has been this spring and summer. Rivers and streams are low, pastures have dried up, the forest is burning all around us, but just how hot and dry has it been this year? According to Drought.gov, also known as NIDIS (National Integrated Drought Information System), Beaverhead county is experiencing the 7th driest year to date in 127 years and Silver Bow county is experiencing the 3rd driest year to date. The month of June was the 2nd driest to date for Beaverhead county and Silver Bow county was 3rd driest for June. July was a little better with Beaverhead county receiving 0.95" of precipitation and coming in at 48th driest July on record, while Silver Bow county was the 25th driest July on record. Couple these dry months with below average snowpack and ... well you get the picture, and we haven't even started talking about temperatures. On a more positive note, have had a few thunderstorms pass through in August and it is forecasted to be rainy for the next couple of days.

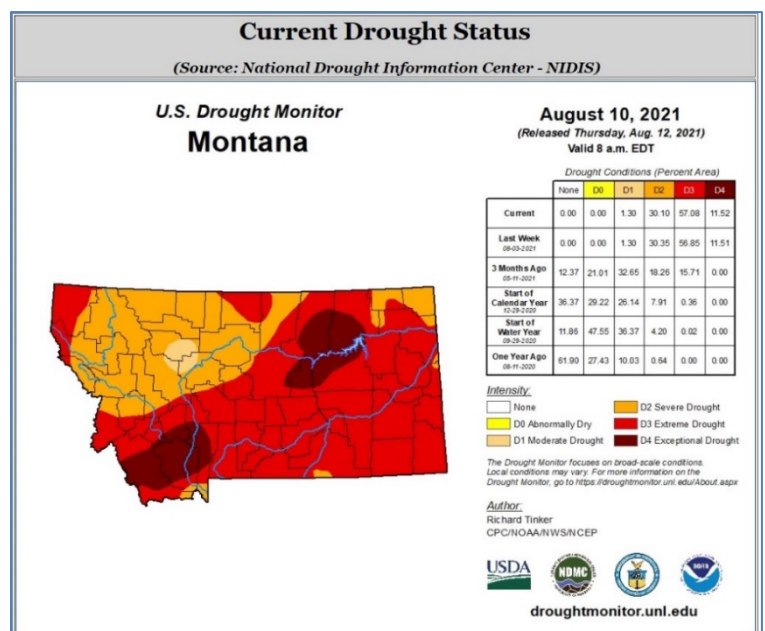
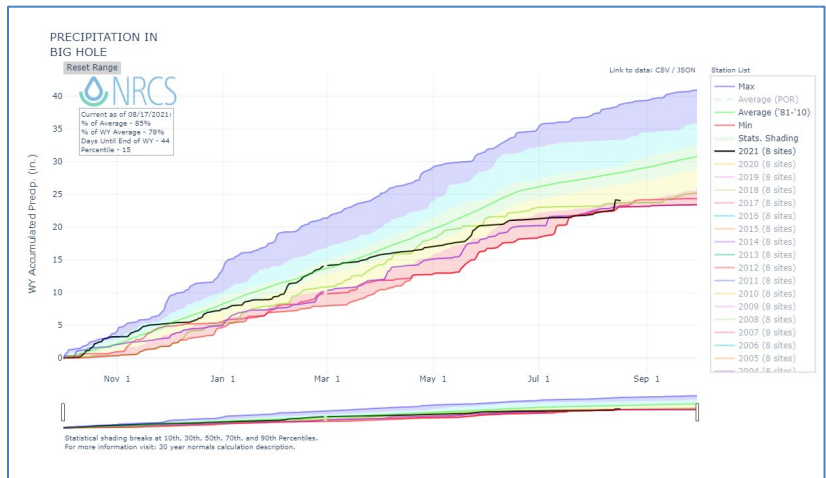
- Precipitation YTD in the Big Hole is below average at 85%. The thunderstorms from last week brought the total precipitation up to the 15th percentile for this time of year. Prior to this small increase the Big Hole was in record low territory. For reference, precipitation has been tracking with the 1987, 1988, and 1994 water years, with 1994 being the minimum on record.

- **Temperatures:** The average temperature for Beaverhead and Silver Bow counties in June were the warmest on record. Beaverhead county was 9.5°F warmer than the average and Silver Bow county was 8.6°F warmer than average for June. July temperatures were basically the same. Beaverhead and Silver Bow counties reported the 2nd warmest July on record. Beaverhead county was 6.2°F above average and Silver Bow county was 7.1°F above average.

- **Drought Status:** Southwest Montana, including most of the Big Hole, is classified as D4 status (Exceptional Drought).

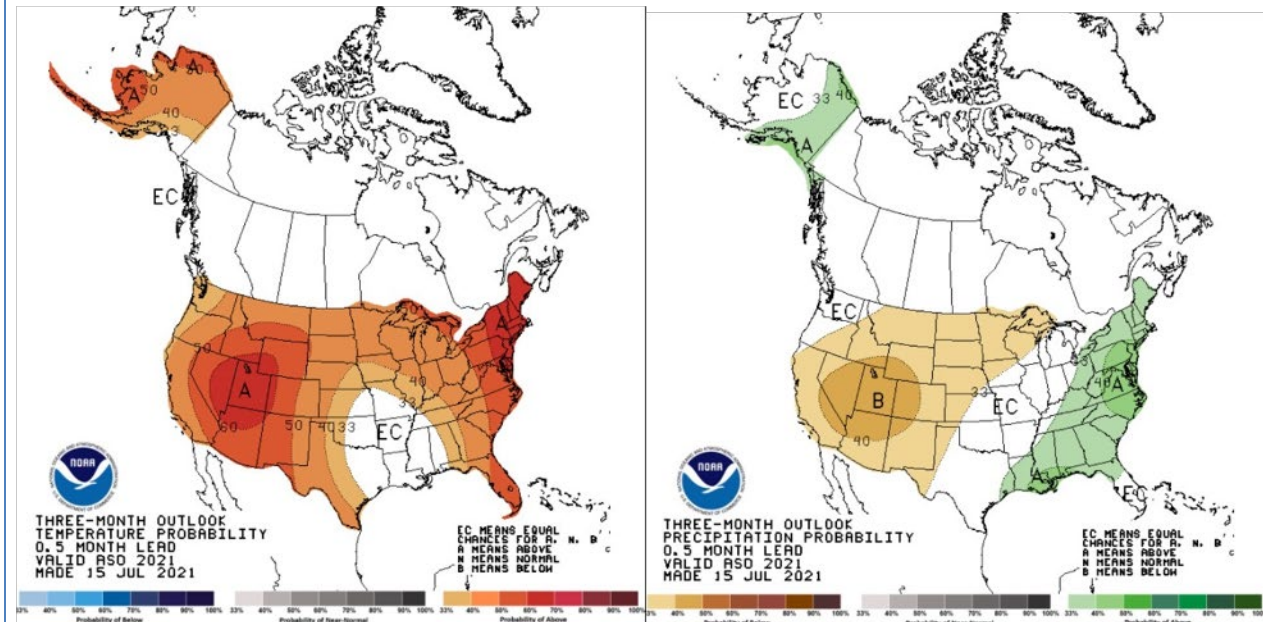
- **Forecast:** The forecast for Montana and specifically the Big Hole continue to predict above average temperatures and below average precipitation for the next 3 months. However, La Nina could make a return later in the fall, which MAY result in above average precipitation for Montana.

- **ENSO Alert System Status: La Niña Watch (from NOAA):** ENSO-neutral is favored for the remainder of summer (~60% chance in the July-



September season), with La Niña possibly emerging during the August-October season and lasting through the 2021-22 winter (~70% chance during November-January).

Three-Month Outlook



- **Discussion:**
 - When DNRC takes over those 4 sites in the Upper Big Hole, will they still show up on the USGS site?
 - No. DNRC took over the gages on July 1st and the USGS pages now link to the new DNRC pages.
 - Here is the link to the DNRC page: <https://gis.dnrc.mt.gov/apps/StAGE/>.
 - Note: The DNRC page takes a little getting used to, but it is actually fairly user friendly. The link above takes you to the map of all gages across Montana. You can then zoom into your watershed and click on the gage you're interested in, which will give you a summary of conditions for that gage. From there, you can click "gage report", which will take you to that gage's webpage. You can then bookmark the page to easily return and see data for that gage.

StAGE - Stream And Gage Explorer (Beta)						
Select a Location						
Station Details						
Sort By: Location Real Time = Seasonal = Discontinued =						
Station Code	Station Name	Basin	Last Measured	Last Discharge ft ³ /s	Last Stage ft.	Last Temp °C
41D 08000	Big Hole near Wise River, MT	Upper Missouri Basin	8/17/2021, 12:45 PM	87.98	2.31	16.10
41D 02000	Big Hole River ab Spring Cr nr Jackson, MT	Upper Missouri Basin	8/17/2021, 12:45 PM	9.94	1.30	No Data
41D 05000	Big Hole River at Miner Creek nr Jackson, MT	Upper Missouri Basin	8/17/2021, 12:45 PM	18.30	0.63	No Data
41D 01000	Big Hole River near Jackson, MT	Upper Missouri Basin	8/17/2021, 12:45 PM	10.98	0.80	No Data

- You can also view Realtime data for all Big Hole River stream gages by visiting our river conditions webpage at <https://bhwc.org/river-conditions>.

Director's Report –Pedro Marques, Executive Director

- THANK YOU: Ranchers, Outfitters, Agency Partners
- Get the message out: **Collaborative Conservation Works**
 - Montana Public Radio Shared State: pitch in progress
 - Stories for Action: in production
 - Letter to Editor
- Expanding Partnerships:
 - USFS: Elkhorn
 - BLM: East Pioneers
 - MFWP: Anaconda Uplands
 - High Divide Collaborative
 - Riverscape Restoration Network
- Restoration Planning: 13 sub-watersheds: Wise River first
- French Creek assessment and de-listing
- Big Hole River Conservation Fund:
 - 1st project ask met! Raised \$1,600 from 11 donors for Pennington Bridge phase I restoration project.
 - Text “BigHole” to 26989 to get connected with BHWc via text message and/or contribute to one of our current Conservation Fund projects!
- *Discussion:*
 - *Why don't we talk about off-stream storage anymore? We haven't talked about it since Harold Peterson worked with Miners Lakes. BHWc has been in existence for 26 years and we don't have even one off-stream storage site. Why can't we get a congressional delegation or work with some of the other watershed groups on something like this?*
 - *One brief response to that is that we tried – Randy went to Washington D.C. and tried to shake the money tree, but there just isn't \$40 Million available to build a dam at Pattengail (or wherever). We have already done the studies to find where the best places in the watershed would be. Maybe this is something we need to look into again.*
 - *Instead of agencies buying ground and taking it out of the tax structure, why don't they put some money toward off-stream storage? People better start waking up and smelling the roses and everybody better go back to their constituents and start talking.*
 - *We tried really hard to get storage on Twin Lakes and were fought every inch of the way over it. We had a hearing in Butte and there was concern about a camping spot being eliminated. Maybe we can try again with more success now.*
 - *There was an infrastructure bill that was just passed that may be able to provide some funding for off-stream storage. The BHWc Steering Committee talked about this issue in-depth at our recent meeting.*
 - *Maybe we can work with the Missouri Headwaters Partnership to get other watershed groups on board with potential natural water storage projects.*
 - *On another note, why are they filling in the rumble strips? Is it because of the noise?*
 - *No, it's because the rumble strips are tearing up the snow plow equipment in the winter.*



Steering Committee Report – Randy Smith, Chairman; Jim Hagenbarth, Vice-Chairman; Roy Morris, Secretary

- Steering Committee met recently. They are happy with the progress BHWc is making.

Wildlife Report – Tana Nulph, Associate Director

- Upper Big Hole Range Rider Program:
 - Wildlife/Livestock Monitoring Program
 - July 1 – September 30
 - 6 USFS grazing allotments, 7 producers
 - Monitoring for carnivore (wolf) activity, dead/injured livestock
 - Helps livestock producers and large carnivores share the landscape
 - Find & report carcasses FAST to secure reimbursement for losses to depredation
 - Keeps wolves moving
 - Informs producers of carnivore locations & activity
- 2021:
 - Funding
 - NRCS Conservation Innovation Grant
 - Livestock Loss Board?
 - Located 2 wolf dens, monitoring closely.
 - Several wolves tracked, photographed by game cameras.
 - Served as “eyes and ears” on grazing allotments – notified producers of open gates, livestock on wrong sides of fences, presence of wolves, etc.
 - Other observations:
 - Not seeing much sign of black bears, but it’s been challenging to find any sort of tracks with how dry it’s been, even for Chet.
 - Abundance of grasshoppers.
 - Deer/elk in hay fields early.



Restoration Report – Ben LaPorte, Program Manager

- Elkhorn Mine and Mill
 - Round 1 of water quality sampling complete
 - QAPP/SAP for soils characterization drafting
 - USFS getting excited about this work as BHWc keeps momentum moving on the project.
 - Discussion:
 - What did you find in the water coming out of the mine?
 - It’s contaminated with lead, copper, and zinc.
 - There are no fish there.



- French Creek Assessment and de-listing
- High Divide Collaborative – Aspen workshop
- Prepping for Fall projects:
 - Upper and Lower Big Hole Bank Stabilization Projects
 - Melrose Bank Planting
 - Upper Oregon Creek BDA installation
- Mesic restoration volunteer day – built 37 “Zeedyk” rock structures to hold back water in this ephemeral (seasonal) drainage. Thank you to Anaconda Sportsman’s Club and Skyline Sportsman’s Association for donating the rocks needed for the work and a HUGE thank you to Sean Claffey with TNC and Vanna Boccadori with MFWP for helping us coordinate this event!



New Business

- *Discussion:*
 - *Smelling smoke all summer, every summer is getting old. It goes back to these watershed groups that are popping up. The whole state was on fire this year and is going to be on fire until the snow flies. I would like to get our congressional delegates here and just talk with them to change the law where one single person can dispute a timber sale. There are 12 pending lawsuits right now, and the sad part about it is that nothing gets done. Once they’re hung up by lawsuits, they just hang out there for years – nothing happens. Between the 3 fires we’ve had in the Big Hole this year, we’re probably close to 80-90,000 acres. I would like to see if there’s some way to encourage our congressional delegation to take this thing by the horns and get the laws changed so we can do something about the timber. I can buy into climate change, but if the climate is changing, shouldn’t we change our management regarding the timber?*
 - *Timber sales on private lands are helping. The Christensen fire is burning AROUND where all the Kirkpatrick’s removed the timber up there. But we need timber management on Federal lands, too.*
 - *It’s the Law for the Act of Justice (check this name). It was created by congress and needs to be changed by congress. Litigative environmental groups are suing again and again to put millions of taxpayer dollars in the pockets of their CEOs and it’s WRONG.*

Meeting Topic: Conifer Management for Water Conservation

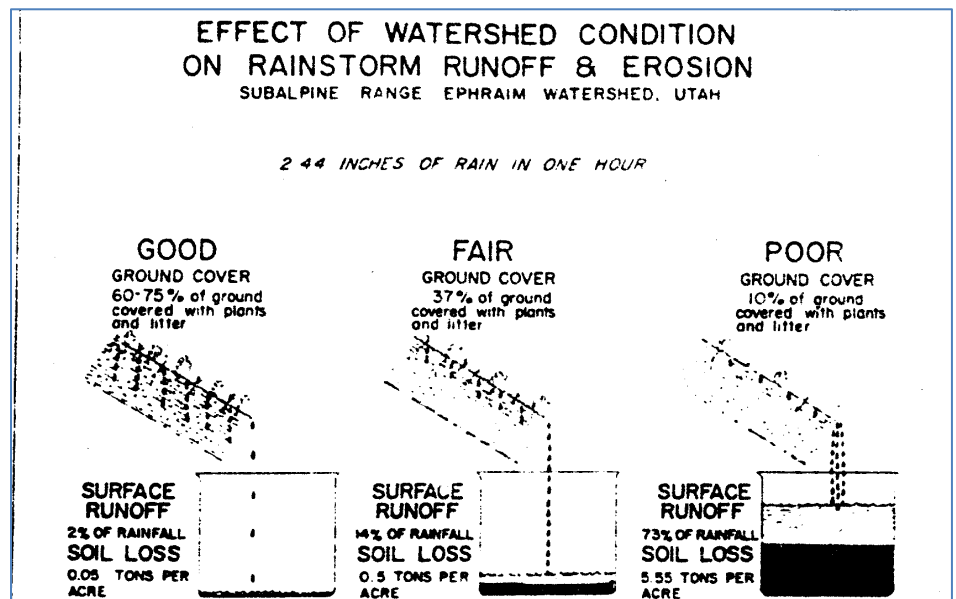
Presented by: Dr. Clayton Marlow, Animal and Range Sciences, Montana State University

Outline:

- Three main points:
 1. The relationship between upland ecological state streamflow and riparian function
 2. Ecological Status Disruptors
 3. Streamflow and riparian response to prescribed fire in the uplands
- Summary
 - Discussion throughout presentation

1. The relationship between upland ecological state streamflow and riparian function

- Balance of nature vs. dynamic equilibrium. (ecosystem moves back and forth between maximum and minimum).
- Historic view = stasis, nothing changes (but really, change is normal and necessary part of the system).
- Watershed Processes:
 - **Capture** precipitation
 - Vegetation and soils
 - **Store** captured water
 - Soils and Geomorphology
 - **Release** Stored Water
 - Riparian Function
- Sustainability of Riparian Areas
 - Interesting challenge
 - Surface-fed systems
 - “Properly functioning” meant to protect/enhance ecological stability of riparian systems.
 - Processes that set template are created by storage and release (flooding)
 - Exist in dynamic equilibrium
 - Spring-fed system
 - Flooding not a factor
- Change is the Reality
 - Flooding is THE driving force
 - Timing of run-off
 - Stage (volume), duration of runoff
 - Groundwater recharge maintains late season or base flow
 - Channel cross-section forms to handle flood Q (2-year flood)
 - Continuous flow critical to spring creeks
 - Largely groundwater recharge patterns
- Runoff and sediment inputs links to upland conditions – upland changes reflected in runoff and sediment loading. All of these factors affect storage, because they all affect infiltration:
 - Grazing
 - Fire
 - Drought
 - Sediment
- What keeps the Big Hole flowing is largely groundwater. And groundwater comes from the uplands.
- Vegetation cover and infiltration dictate runoff amount and rate
 - The more ground cover, the less sediment loss

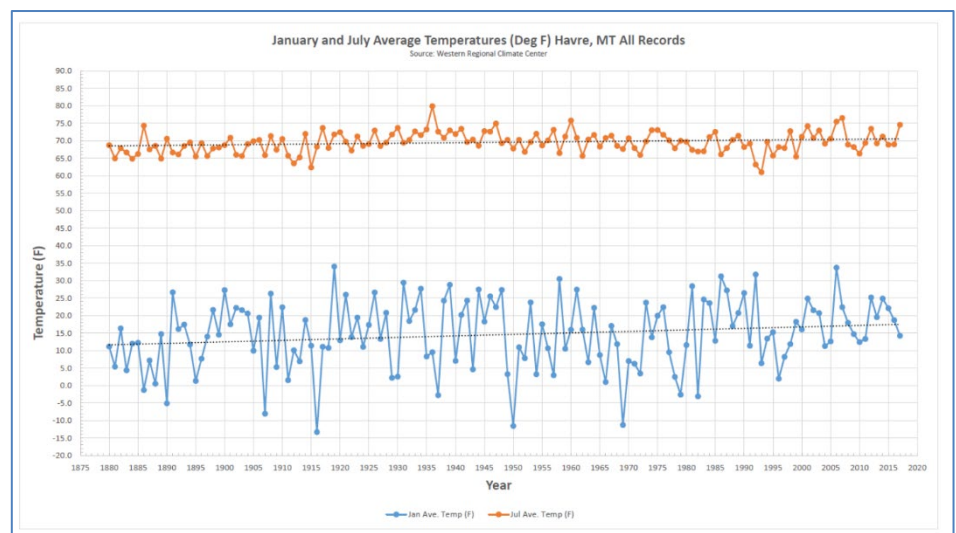
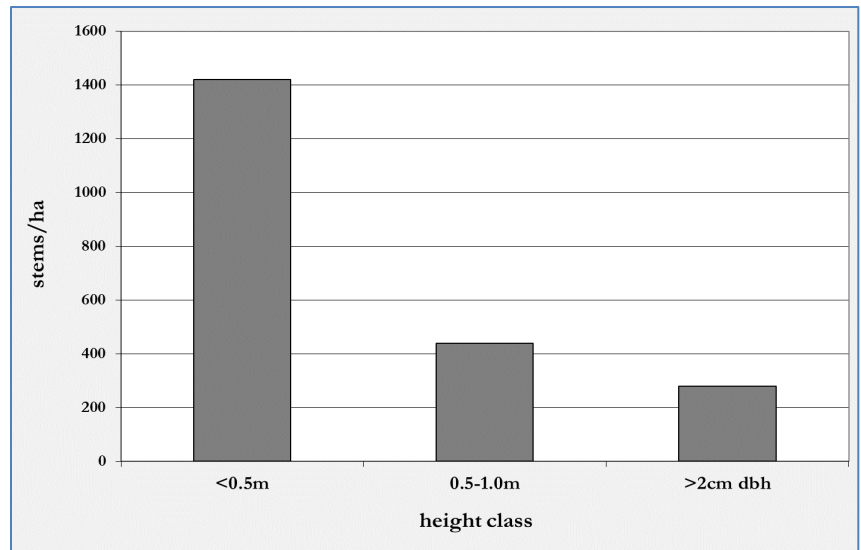


due to surface runoff.

- Difficult to establish new woody species in a “balanced system”?
 - By stopping sedimentation, we stop the deposition of sediment where it needs to go to create “nursery bars” for willows and woody plants to establish. This creates a vicious cycle where we then have to plant willows because they can’t establish on their own. But this is sometimes necessary when houses/property are present, preventing the river from cutting its own dynamic course.
- Springs and spring creeks aren’t immune from changes in uplands.
- Mean sulfate concentration in stock-water wells by type of precipitation year. (Aka when you don’t get enough precipitation, minerals are concentrated in wells affecting water quality).
- Through time, these interactions create an Ecological State.

2. Ecological State Disruptors:

- Infrequent, large scale catastrophic events that reset the ecological template
 - Examples:
Yellowstone Caldera,
Ancient Lake
Missoula
- Small scale but repeated disturbances that disrupt processes eventually moving ecosystem to different state (template remains unchanged)
- Climate change will exaggerate disruptions set in place by Smokey the Bear (fire suppression)
 - Listening to Smokey has disrupted the age class and structure of our conifers
 - Climate change will exaggerate degree of disruption.
 - Increased conifer density:
 - Warmer winters:
- Warmer winters = more soil and groundwater drawdown
 - Impact of trees on groundwater. Groundwater recharge shown near October is due to aspen dropping their leaves.
- Combined Impact:
 - As conifers continue to expand their range, the impact to both



surface and groundwater will intensify.

- Conifers have a double impact because they continue to transpire during the winter.
- Conifers will PSN/TRNP at 35 degrees F when soils unfrozen. (In Japan, it was found that pine trees still grow – albeit very slowly – at 29 degrees F.)
- Deciduous species stop groundwater drawdown at leaf drop.

3. Groundwater Response to Prescribed Fire

- Rx Fire and Water Response
 - Thinning is not a substitute for fire in terms of aspen regeneration.
 - Action threshold = treat > 18% of watershed area
- Discussion:
 - *You're looking at one year here right. Have you done this analysis for a number of years? Wondering how long increases in discharge due to prescribed fire last?*
 - *Not very long. Discovered that at 300-350 stems/acre, that is the action threshold. (If there's less than that, it's not worth it. You won't see additional groundwater recharge.)*
 - *Two camps in FWP. One believes in fire and trusts it; the other won't have anything to do with it.*
 - *Hopefully with everything we've learned over the past decades about the effectiveness of prescribed fire, attitudes toward it will start to change (those who are against it will reconsider).*
- Juniper removal increases spring flow
- Could smaller "evergreens" have similar impact? Sage grouse is basically an evergreen – does it have an impact on groundwater?
 - High elevation Mountain Big Sagebrush – when killed using spike pellets, increased groundwater about 3-4 feet down (not at the surface). So, when people treat sagebrush and see no change in the grasses, it's because the water is being stored in springs (groundwater).
 - Discussion: *This is species specific, correct?*
 - *Yes, not all sagebrush is equal in terms of response (to prescribed fire). This study site covered Mountain Big Sagebrush.*
 - *Sagebrush structure captures snow drifts, which may outweigh the benefits of increased groundwater from treating sagebrush.*
 - *Did you ever do a study with the skeletons of the sagebrush to see if they still hold back the snowpack while also recharging groundwater?*
 - *Yes, just the structure of the sagebrush holds back snow/increases groundwater – it doesn't have to be alive.*
 - *When you burn sagebrush, it grows back within a few years. So, does killing it with spikes work better than growing it?*
 - *This is sagebrush specific, but yes. For Mountain Big Sagebrush, spikes work better. For Wyoming sagebrush (what kind), it's best to leave it alone (don't burn or spike), because it is very fragile.*
 - *Fire is the natural way to manage sagebrush. You can also treat sagebrush with herbicide, which leaves the skeletons, for about \$20/acre.*

In Summary: Vegetation community (ecological state) in watershed affect riparian processes

- As conifer density in watershed increases

- *Elevated transpiration losses + canopy interception (12% of each event)*
- *Surface flows (Q) and groundwater recharge decline*
- *Riparian “footprint” narrows*
- Lower surface flow means less sediment delivered to channel
 - *Bank building?*
 - *Nursery bars?*
- Sustainability of riparian ecological services means ...
 - *Recovery of natural processes in uplands*
 - Reasonable surrogates (selective logging; targeted livestock grazing)
 - *Personal and public acceptance of a different view-scape*
 - Understanding of “over time” component of ecological stability
 - Stability doesn’t mean the landscape or components of it won’t change
- *Discussion:*
 - *If I understand what you said, we have 3 fairly large fires going on right now in the Big Hole. Does that mean that we can expect higher streamflows after this? What happens to the sediment?*
 - *Historically, the Big Hole was ~40% aspen. Now we have an overabundance of conifers. ... something about having more sediment?*
 - *As long as the sediment is flowing through the river system and not covering important spawning gravels, it will be ok. But it will be interesting to see how things play out after this fire season.*
 - *Beaver activity in the watershed (which we now have ~1/10th of the beaver activity now in our watershed and throughout much of the West) historically helped catch and spread out sediment.*
 - *Don’t conifers shade the understory to keep more snow on the ground?*
 - *They do, they also use a lot of groundwater and lose a lot of snow to evapotranspiration.*

Upcoming Meetings

- September 15, 2021: **BHWC Monthly Meeting. Topic: Wildlife and Sage Grouse Updates from MFWP & USFWS**
 - 7:00 pm at the Divide Grange/Zoom

Adjourn