Big Hole Watershed Committee

Monthly Meeting Minutes

February 15, 2023 – 6:00 pm at the Divide Grange

Zoom option also provided

In Attendance

In-person: Pedro Marques, BHWC; Tana Nulph, BHWC; Ben LaPorte, BHWC; Tom Bowler, Resident; John Reinhardt, Rancher/BHWC; Charlie Ivor, Elkhorn Ranch; Jim Hagenbarth, Rancher/BHWC; Paul Siddoway, Resident; Paul Cleary, Resident/BHWC; Sandy Cleary, Resident; Peter Frick, Rancher/BHWC; Chris Edgington, MTU; Dean Peterson, Rancher/BHWC; Pete Kamperschroer; Liz Jones, Rancher/BHWC; Steve Luebeck, Sportsman/BHWC; Kay Jensen, Resident; Diane Hutton, Resident/BHWC; John Jackson, Beaverhead County/BHWC; Jeff Dunn, WGM Group; and Michael Day, WGM Group.

Zoom: Matt Norberg, DNRC; "Baskin"; Brandy Janzen; Brian Wheeler, BHRF/BHWC; Eric Thorson, Sunrise Fly Shop/BHWC; Craig Fellin, Big Hole Lodge; "Jeff"; Matthew Lacey; "Mike"; Tom Parker; Amy Sacry; and Stephen Carpenado, DEQ.

Meeting Minutes

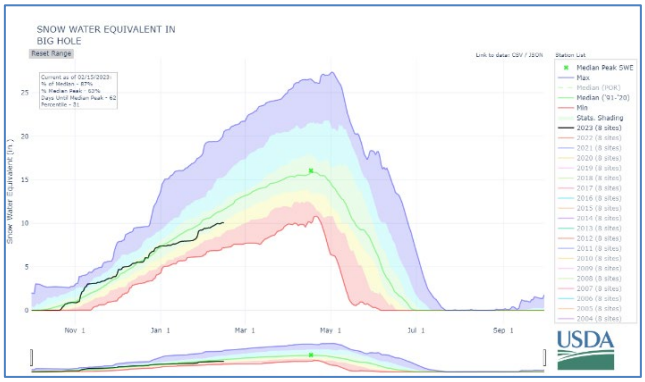
BHWC monthly meetings are held at the Divide Grange with a virtual (Zoom) option provided thanks to Southern Montana Telephone Company, who donated the internet service. Meeting minutes and recordings are available at https://bhwc.org/monthly-meetings/ (scroll down for meeting minutes archive). Printed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

Reports

Streamflow and Snowpack Report – Matt Norberg, Department of Natural Resources and Conservation

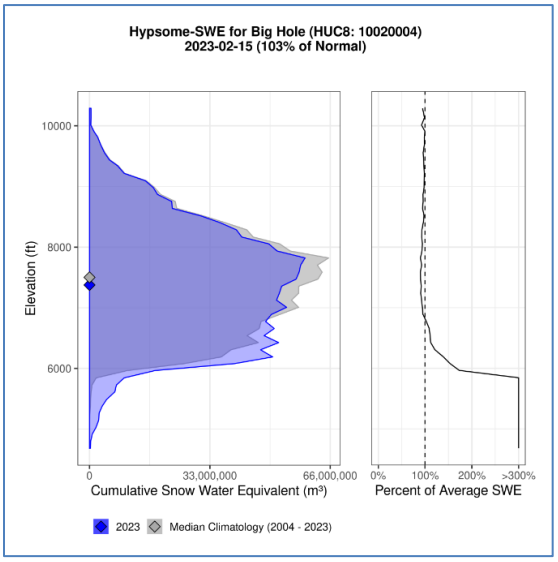
- *Snowpack:* Snowpack in the Big Hole is currently 87% of NRCS median values, however the modeled Hypsome-SWE value is 104% (2004-2023). The modeled snowpack for the basin indicates that the

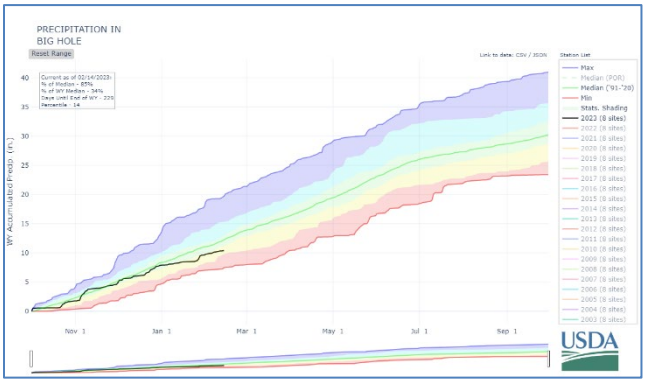
Station	Network	Elev. (ft.)	Obs	NRCS Median	% NRCS Median
Barker Lakes	SNOTEL	8,250	8.2	9.3	88%
Basin Creek	SNOTEL	7,180	6.3	5.2	121%
Bloody Dick	SNOTEL	7,600	7.5	9	83%
Calvert Creek	SNOTEL	6,430	6.2	6.4	97%
Darkhorse Lake	SNOTEL	8,945	19.1	21.6	88%
Moose Creek	SNOTEL	6,200	10.3	12.6	82%
Mule Creek	SNOTEL	8,300	8.9	10.7	83%
Saddle Mtn.	SNOTEL	7,940	14.2	17.2	83%
Slagamelt Lakes	SNOTEL	8,620	*16.3*		
Basin Index					88%



lower elevation snowpack is well above average, the mid-range snowpack is slightly below average, and the high elevation snowpack is at average. Below are the current SNOTEL observations as well as the % median for individual sites across the watershed.

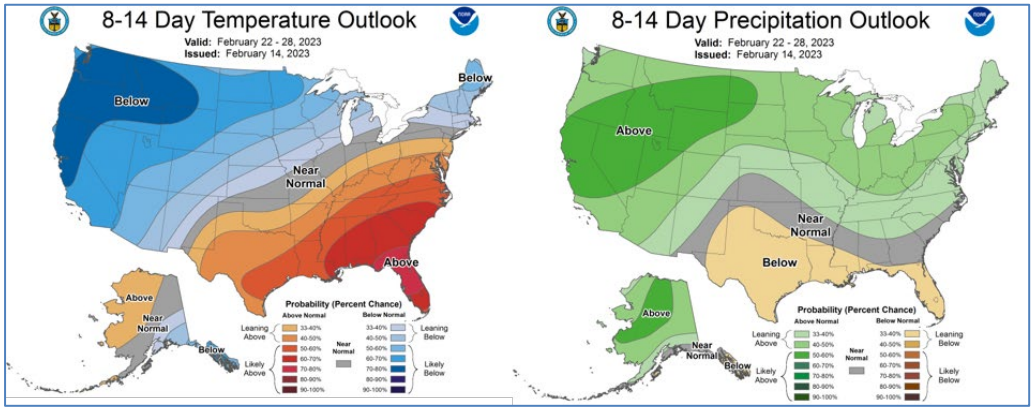
- *Precipitation:* Total precipitation in the Big Hole is currently below median values (85%).
- *Outlook:* The 8-14-day outlook predicts below average temperatures and above average precipitation.
- *Seasonal Outlook:* The three-month outlook (Feb/Mar/Apr) predicts below normal temperatures and above normal chances for average precipitation.
- *ENSO Alert System Status (from NOAA)*: La Niña Advisory
    - *Synopsis:* ENSO-neutral conditions are expected to begin within the next couple of months and persist through the Northern Hemisphere spring and early summer.

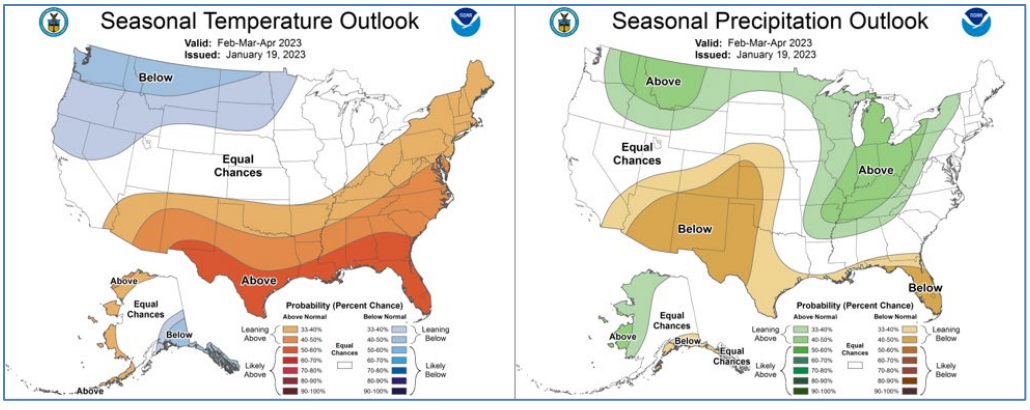




Director's Report – Pedro Marques, Executive Director

- Building capacity to match the demand
    - Conservation Fellow
    - Communications
    - Line of credit
    - BoR Irrigation $ (Wise River, Melrose, Pennington, Glen)
- Partnerships deepening
    - USFS partnerships: conifer, riparian, Elkhorn
    - BLM
    - FWP Mt. Haggin Uplands funding in FY '24-'26 budget request
    - GGTU; Trout and Salmon Foundation; High Stakes; Patagonia, Cinnabar; Family Foundations





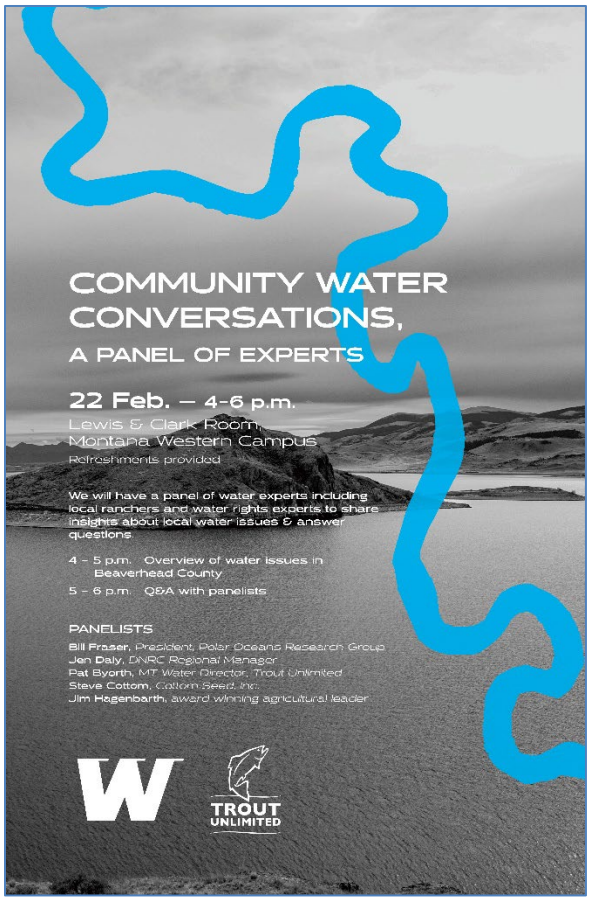
- Communications
    - Boise State/NASA monitoring
    - Water Conversations – UMW – Feb. 22nd
    - Roxy Film Screening – *Life in the Land: The Big Hole Valley*
    - Young Ranchers Farm Bureau
    - DEQ – Qualitative DO standards
    - Legislative updates: Stream gage funding, service organizations, HB 462

Steering Committee Report – Jim Hagenbarth, Vice-Chair; Steve Luebeck, Treasurer

- The steering committee is proud of the progress BHWC is making.

Communications and Wildlife Report – Tana Nulph, Associate Director

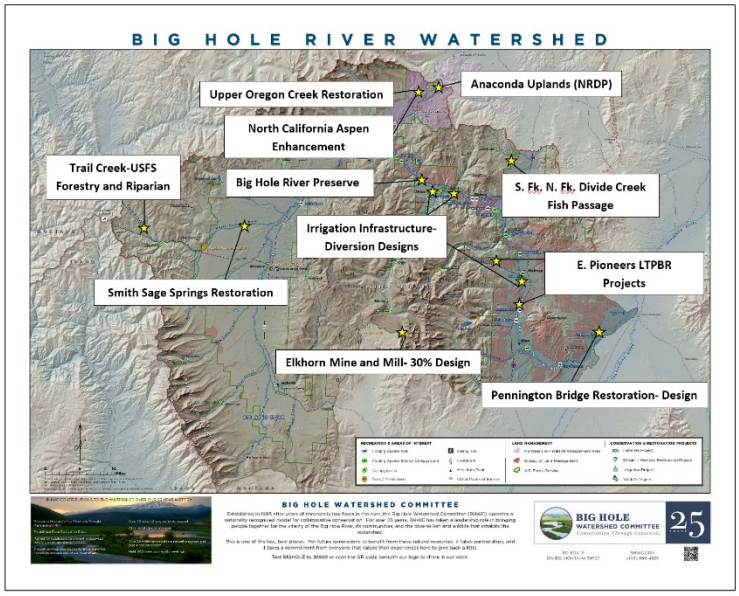
- 2023 Communications
    - Social media contractor
    - Spring newsletter – in development
    - 2023 monthly meetings
        - March – Public Lands Water Access Association
        - April – Weeds
        - May – Edaphix
        - June – Fishery Update
        - July – No meeting
        - August – Old Salt Coop.
    - Wildlife Speaker Series
        - Macroinvertebrates @ Melrose
            - June
- Finances & Fundraising
    - Grants
        - Recently secured
            - MWCC Capacity - $7,500
            - High Stakes Foundation - $10,000
            - Patagonia $10,000
        - Upcoming/pending:
            - RRGL – Planning, Irrigation
            - BoR
            - Cinnabar Foundation
            - Livestock Loss Board
            - Others?
    - Donations
        - 2021: $59,318
        - 2022: $86,029
        - 2023: $8,087 (so far)
- 2022 Drought Review
    - January 26th – Fairmont
    - Updates considered
        - Section 4 flow gage – Melrose vs. Glen



        - Section 5 triggers – increase each by 50 cfs
    - Communications – weekly drought update text messages
        - Sign up – text "Drought" to 26989 (or ask Tana to add you to the list)
    - 2023 DMP adoption by full committee – to take place at March 15th meeting
- 2023 Carcass Removal
    - Season: March 1 – May 30
    - Available to all Big Hole Valley ranches/residents
        - Pending dump truck availability – refuge truck currently snowed in
    - Wisdom compost site
        - Lease fee: $150
    - Contributions:
        - Tractor (John Jackson)
        - Wood chips (Tash T. Diamond Post & Pole)

Restoration Report – Ben LaPorte, Program Manager

- 2022 Restoration Program metrics
    - Stream miles reconnected: 2.2
    - Stream miles restored: 1.5
    - Uplands acres treated: 55
    - Studies/assessments: 2
- 2023 Restoration Program outlook
    - NRDP Anaconda Uplands
        - Operation and Maintenance
    - Upper Oregon Creek Restoration
        - Additions and maintenance to 2022 work
        - Monitoring
    - North California Aspen Enhancement
        - 39.5 acres of aspen enhancement
        - 18,700 ft of plugged/treated
    - South Fork/North Fork Divide Creek Fish Passage
        - 4 miles fully connected to the South Fork Reservoir
    - Smith Sage Springs Mesic Restoration
        - Restoration of large degraded mesic area
    - Irrigation Infrastructure-Diversion Designs
    - Pennington Bridge Restoration- 3 Project Designs
    - East Pioneers LTPBR/Conifer Encroachment Projects
        - Browns Gulch
    - Elkhorn Mine and Mill
        - 30% design



New Business

Break – 10 minutes

Meeting Topic:
Water Storage Opportunities in the Big Hole Watershed

Presented by: Pedro Marques, BHWC Executive Director
Mike Day and Jeff Dunn, WGM Group

Pedro Marques, BHWC Executive Director

Water Storage – not a new idea

- 1976: DNRC- *Preliminary Design Review of Potential Off-Stream Reservoir Sites in the Big Hole River Basin*
- 1978: DNRC- *Potential Off-Stream Reservoir Sites in the Big Hole River Basin*
- 1981: DNRC- *Water Storage in the Big Hole: A Recommendation (H.B. 824)*
- 1997: MBMG- *Ground-water/Surface-Water Interactions in the Upper Big Hole Basin*
- 2005: BHWC/BHRF- *Big Hole Water Storage Scoping Project and Water Management Review*:
    - *Reservoir Storage Alternatives*
    - *Water Management Alternatives*
- 2020: W.E.T. Inc- *Beaver Mimicry Impact on Surface Water and Groundwater Storage*

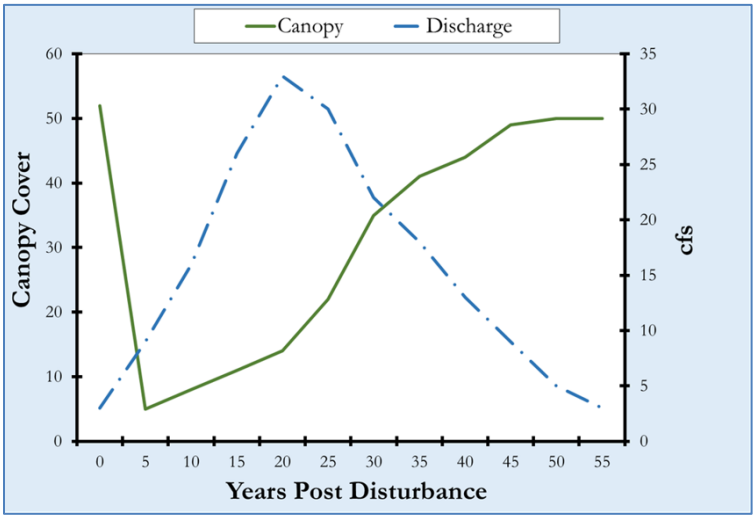
1980 DNRC, 2005 DTM Consulting

- 1979: Growing season: 68 days (upper river), 126 days (lower river)
- Big Hole basin yield is 1.7 million acre-feet (AF).
- 70% is evapotranspired by vegetation
- Wetland vegetation consumes more water than grasses
- Ditch loss (recharge) increases with gradient, varied from 3-8 cfs/mile
- Improving 1% of basin's yield = 17,000 AF
    - 189 cfs/month: July, August, September

Size	< 0.5m	0.5 to 1.5m	> 1.5m
Age (avg)	33	53	61
Gal/day/stem	6	18	26
Cu-ft/day	0.8	2.5	3.7
Stem Count	145/0.02ac	73/0.02ac	23/0.02ac
WU/0.02ac/d	870gal/d	1314gal/d	690gal/d
	116 cu-ft	183 cu-ft	96 cu-ft

Other Considerations

- Co-benefits/Impacts
    - Fisheries, Wildlife
    - Management, Maintenance Costs
    - Wildfire Risk +/-
    - Recreation
    - Water Quality
- Leakage
    - Impacts displaced to other area
- Downstream cooperation
    - How far can more water go?

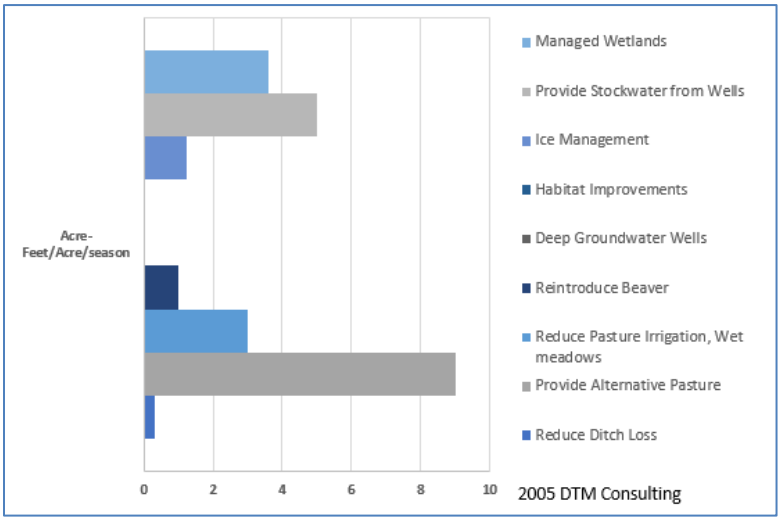


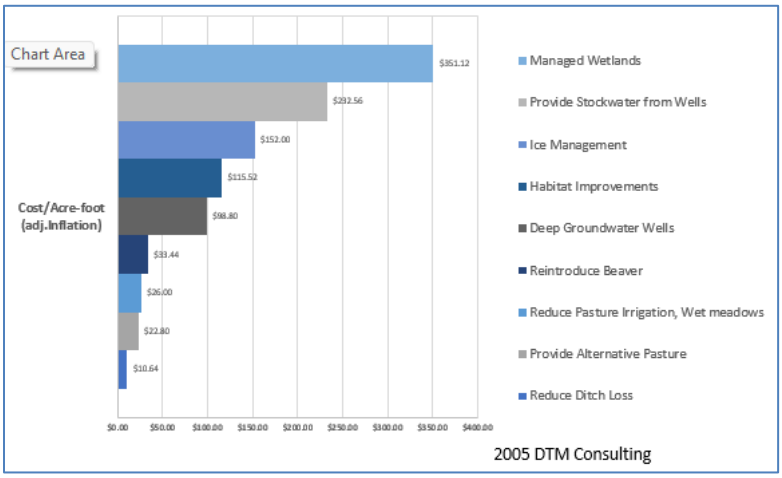
Natural Water Storage Options

- Low-tech, Process-Based Restoration
    - + 0.1 AF/acre
    - $200/dam
- Conifer Management for Water Conservation

- 9,150 cubic feet/day/acre
- 0.2 AF/day/acre
- 20 AF/day/100 acres
- Thinning 20% per 100 acres
  - 4 AF/100 acres or 2 cfs/day/100 acres
  - Minus new plant grow

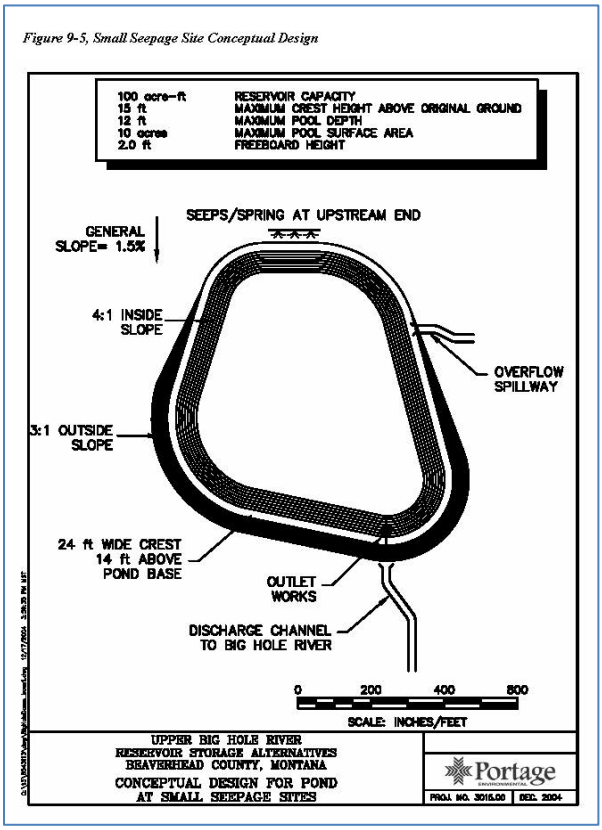
- Small Seepage Sites
  - Spring seep locations private ground
  - 10-acre sites
  - 15-ft embankment height
  - 100 AF storage = 0.6 CFS during July, August, September



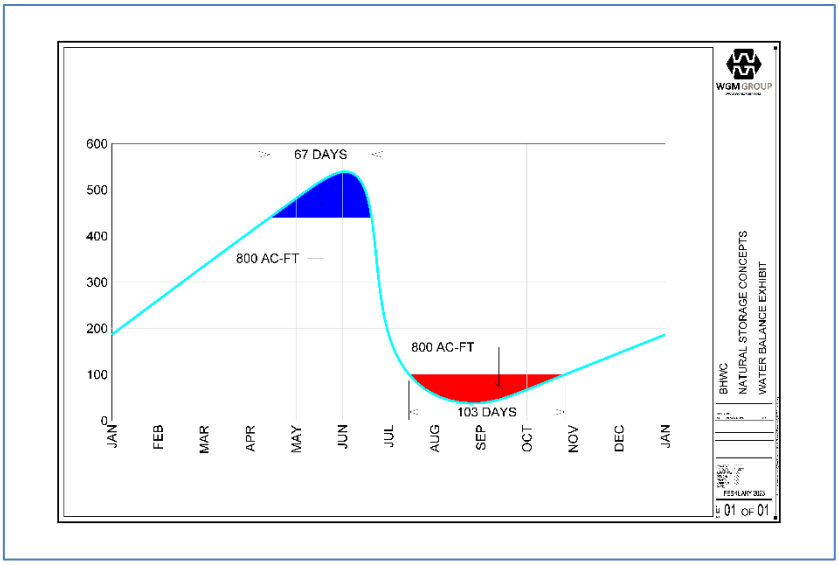


Hard Storage Options

- +10-70 AF/acre
- $ Millions/dam
- Other considerations
  - Co-benefits/Impacts
    - Fisheries, Wildlife
    - Management, Maintenance Costs
    - Wildfire Risk +/-
    - Recreation
    - Water quality
  - Leakage
    - Impacts displaced to other area
  - Downstream cooperation
    - How far can more water go?
- Pettingil (Pattengail)
  - 10,000 AF = 32 CFS during July, August, September
  - 73% of average shortages
  - 26% of shortage in driest years
  - Fisheries = Large Impact
  - Risk = Geotech Failure?
  - Dead Pool = warmer water
  - Drained dam = mud flat
- Controversy over dams in Wyoming
  - *Feds eye $20M for embattled dam as public demands answers*
  - *Plans for 264-foot dam above Little Snake River spur conflict*



Mike Day/Jeff Dunn – WGM Group



Hydrograph

- It all comes down to the hydrograph – conceptual hydrograph (left) helps us think about what we want to do.
    - During high flows in the spring, trying to capture that area under the hydrograph, which would give us a certain amount of volume (shown in blue).
    - Later in the year, when the flows get lower, basically it's a swap of those two areas.

Hard storage:

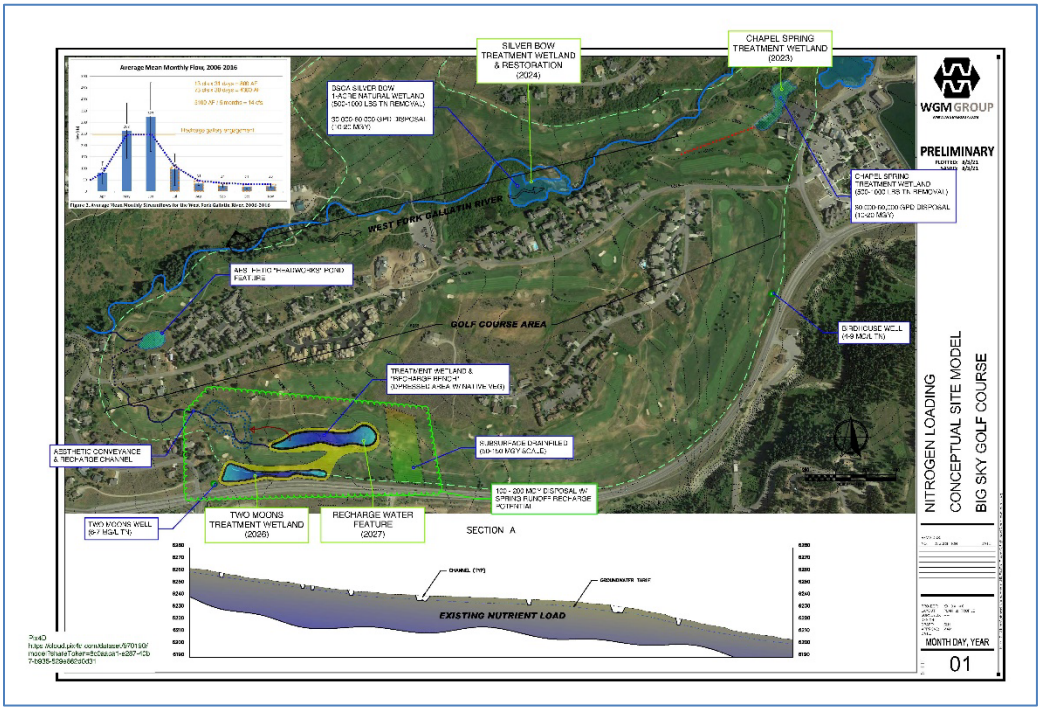
- WGM/BHWC put in for a DNRC RDGP planning grant to consider locations for hard storage but were not successful. People (and agencies) are not excited about hard storage for various reasons: expensive, requires a lot of maintenance, and there's a lot of risks associated.
- Interestingly, if you dig a 2-foot deep hole in the ground that's 200 acres, you'd have 400 AF for storage, and even if it's perched up on a plateau, that doesn't have to be permitted through Montana Dam and Safety. But if you build a 5-foot berm and that has a certain volume behind it and ran a breach analysis showing that if it was knocked out, it could endanger public infrastructure or someone's home, automatically that's considered a high hazard dam and would require permitting. It doesn't really matter what the height of it is so much as what could happen with all that water if it was released at once.
    - Working to show the natural resource benefits (besides augmenting water availability and temperature) of such a project to make future grant proposal more competitive.

- Out of Bozeman office, implementing treatment wetlands. Utilizing them for sewer treatment. If put in right location, they can be used not only for sewer effluent, but also for a return water solution if you have an impacted water body. You take that return water and run it through the treatment wetland before you return it to the water body and it removes

the nitrogen. So for that, we could go for DEQ-319 funding. Even though the wetlands eat up a lot of water, you're getting that natural resource benefit for wildlife.

  - Also have the potential to do mitigation banking for other work that we're doing on the Big Hole/tributaries.

- Concept, in general, is to find areas where we could make a 200-acre footprint, 2-feet deep and store that water in discrete locations through the whole watershed (but for right now, concentrating on the upper watershed).



  - Would do a lined system so you could put the water back into the water body when needed (minus evapotranspiration losses). May try a combination of a natural system similar to beaver dam analogs and see if we could quantify how that would work (some uncertainty there) and also do another site with a small, tilled layer of bentonite to prevent infiltration for a controlled, hard release later in the season.
  - In 2022, would have needed about 2,300 AF of water stored in order to maintain flows over 20 cfs at Wisdom bridge for that 150-day duration. Would have been pretty difficult and you'd need to do it at the right location to supplement those flows.
  - But for other years where flows dipped below 20 cfs – looking at 2016 as more an average – if we could have provided 5 cfs for 45 days, that would have addressed the concerns there and kept flows above 20 cfs at Wisdom Bridge. Required volume would be 446 AF AKA one of those 200-acre sites (or two 100-acre sites) for storage.

        - So, can we find a 200-acre site in the right location (or two 100-acres site) where irrigation return flows could go through there to be treated and go after potentially funding related to that along with other programs?
    - WHEN we can actually store water is dependent upon both water rights and when we can actually capture those peak flows.
        - Would include analysis to make sure we wouldn't be hurting the fishery and would be the geomorphologically prudent thing to do. These are natural systems and we want to keep that sediment balanced and keep it from going down the river.
            - On the water rights side with DNRC, if you store more than 50 AF, you can do that – even though it's a closed basin – if you use those high flows in the spring. That's what this concept is modeled after.

Upcoming Meetings

- March 15, 2023: **Public Land Water Access Association**
    - 7:00* pm at the Divide Grange/Zoom *(*Note the time change back from 6:00 to 7:00 pm.)*

Adjourn