Big Hole Watershed Committee

Monthly Meeting Minutes

February 21, 2024 – 6:00 pm at the Divide Grange

Zoom option also provided

In Attendance

In-person: Pedro Marques, BHWC; Tana Lynch, BHWC; Ben LaPorte, BHWC; Tom Bowler, Resident; Betty Bowler, Resident; John Reinhardt, Rancher/BHWC; Mary Sutherland, MBMG; Dean Peterson, Rancher/BHWC; Charles Ivor, Elkhorn Ranch; Jenna Dohman, MBMG; Diane Hutton, Resident/BHWC; Kaitlin Boren, DNRC; Roy Morris, GGTU/BHWC; Katelin Killoy, MFWP; Jim Keenan, BSB Water/BHWC; Jim Hagenbarth, Rancher/BHWC; Craig Fellin, Big Hole Lodge; Matt Cornette, Complete Fly Fisher; and Arica Crootof, UMW Environmental Sciences professor and her Sustaining Water Resources class (Andrew Panimb, Kendrick Wheeler, Carson Crary, Landon Russell, Shilow Rainey, Cory Kueffler, Caleb Sykes, AliBell Winn, Alyza Bond, Bird Hayes, Ian Smith, Kaleb Martin, Adam Scully, Keaghn McDaniel, Gus Wiggins, Tyler Fitte, Teresa Sage Baird, Savannah Draper, Emma Day, and Nadine French).

Zoom: Wade Fellin, Big Hole Lodge; Peter Frick, Rancher/BHWC; Lainey Rhinaman; Niah Brass, Big Sky Watershed Corps; Mike Mooney, BLM; Ford Smith, Regenerative Land Solutions; and Kim Giannone, UMW.

Meeting Minutes

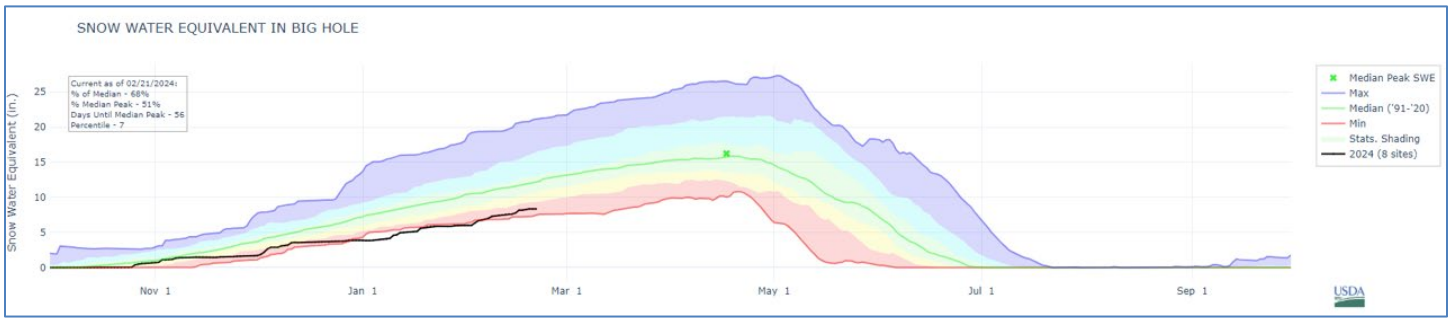
BHWC monthly meetings are held at the Divide Grange with a virtual (Zoom) option provided thanks to Southern Montana Telephone Company, who donated the internet service. Meeting minutes and recordings are available at https://bhwc.org/monthly-meetings/ (scroll down for meeting minutes archive). Printed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

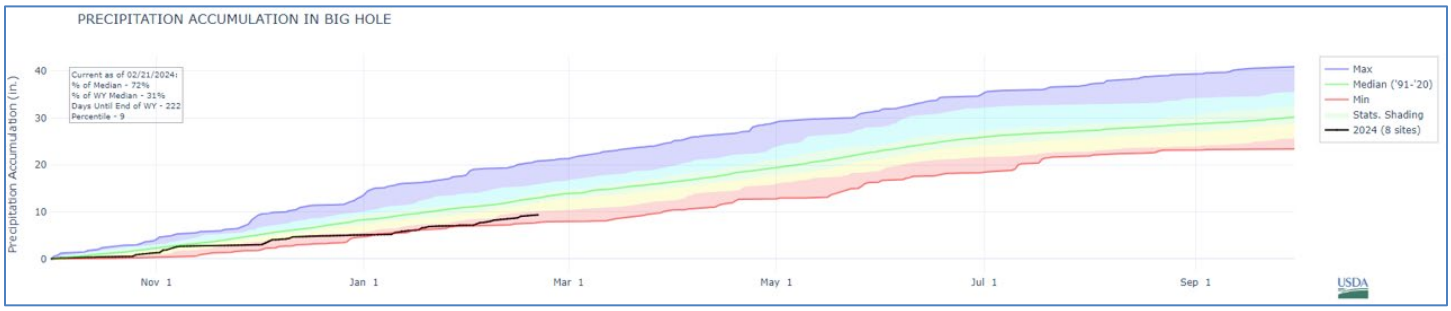
Reports

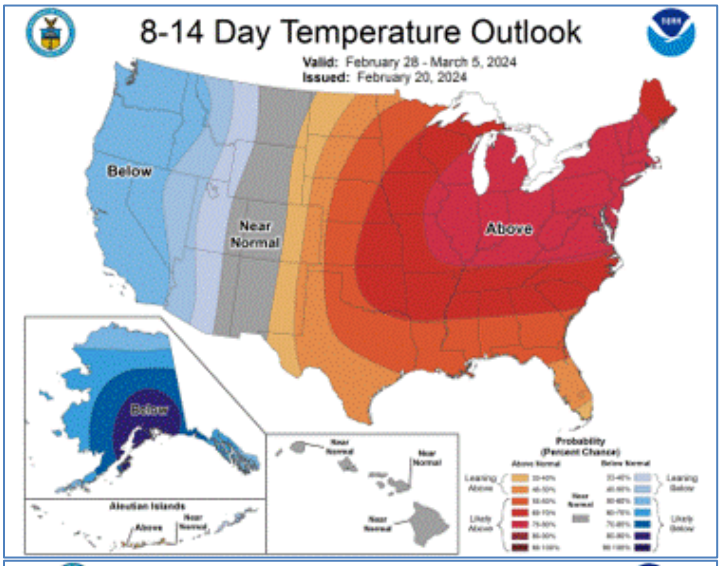
Streamflow and Snowpack Report – Kaitlin Boren, Department of Natural Resources and Conservation

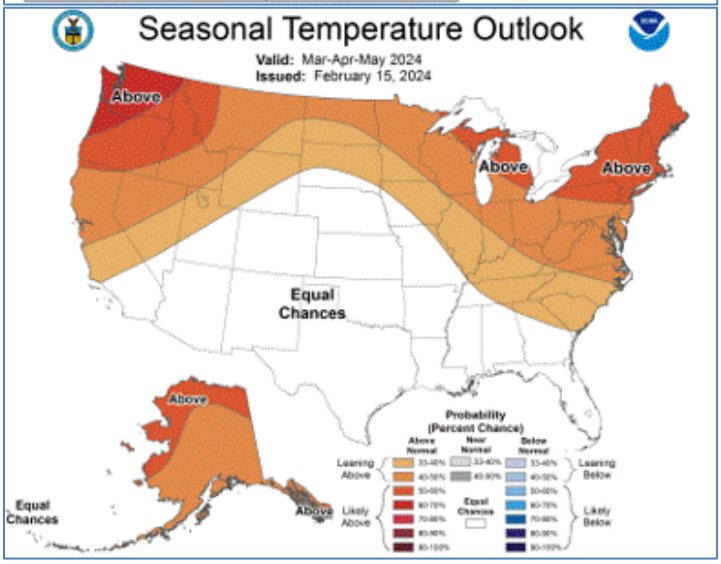
- *Streamflows:* All stream gages on the Big Hole River are either reporting ice conditions or are in seasonal status.
    - Stream And Gage Explorer (StAGE): https://gis.dnrc.mt.gov/apps/stage/
- *Snow Water Equivalent (SWE):* 69% of median
- *Precipitation:* Currently 72% of median
- *Outlook*: The 8-14 day outlook predicts slightly below normal temperatures and slightly above normal precipitation.
- *Seasonal Outlook*: The three-month outlook (Mar-Apr-May) predicts above normal temperatures and slightly below normal chances for average precipitation.
    - *ENSO Alert System Status (from NOAA)*: El Niño Advisory / La Niña Watch

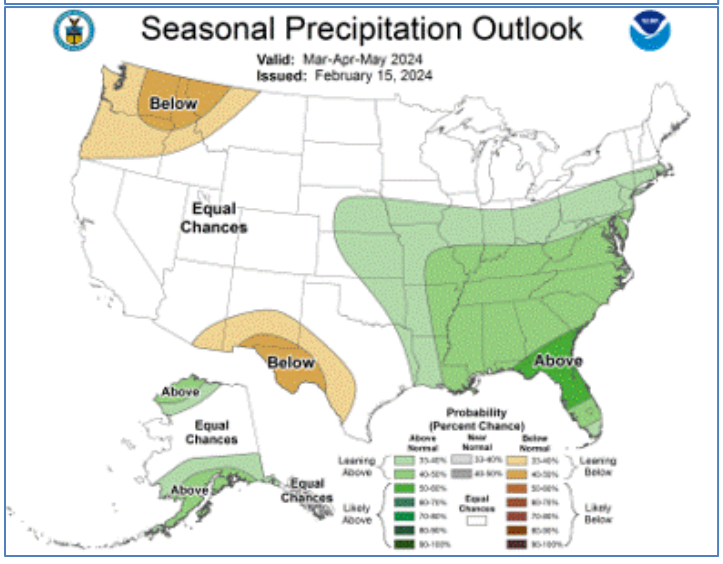
- *Synopsis:* A transition from El Niño to ENSO-neutral is likely by April-June 2024 (79% chance), with increasing odds of La Niña developing in June-August 2024 (55% chance).



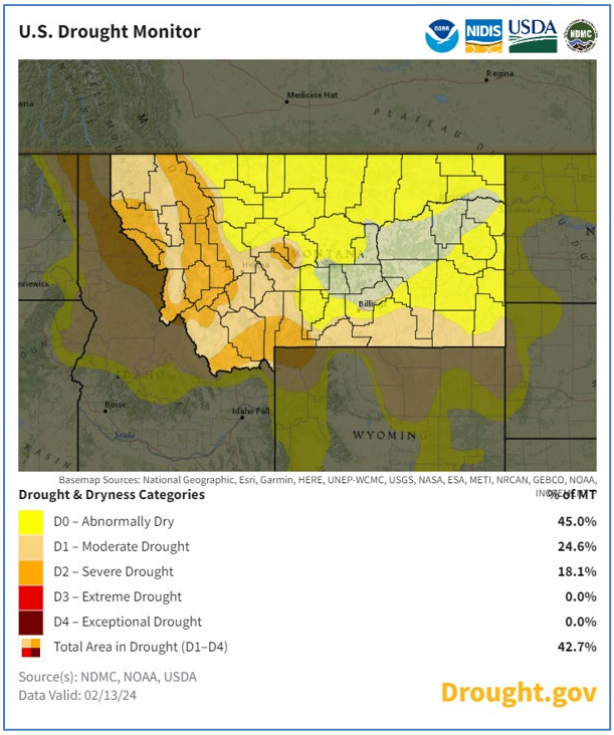








- *Drought Status:* The Big Hole watershed is currently in moderate-severe drought.



Director's Report – Pedro Marques, Executive Director

- Foundational Relationships- PRIVATE
    - Broad Reach Fund
    - High Stakes Foundation
    - Cinnabar Foundation
    - ABCw Ranch
    - Big Hole River Preserve
- Foundational Relationships- PUBLIC
    - USFS- Elkhorn remedy coming. Mine and Mill has been closed
    - USFS- Forestry and Riparian coming to East Pioneers
    - BLM- Conifer Encroachment expansion East Pioneers
    - FWP- Mt. Haggin. Intern coming to support O&M
- Board and Governance
    - Red Rock Lakes Proposal
    - USFS Commercial Use Days
    - Steering Committee changes

Steering Committee Report – Jim Hagenbarth, Chair; Dean Peterson, Vice-Chair; Steve Luebeck, Treasurer; and Roy Morris, Secretary

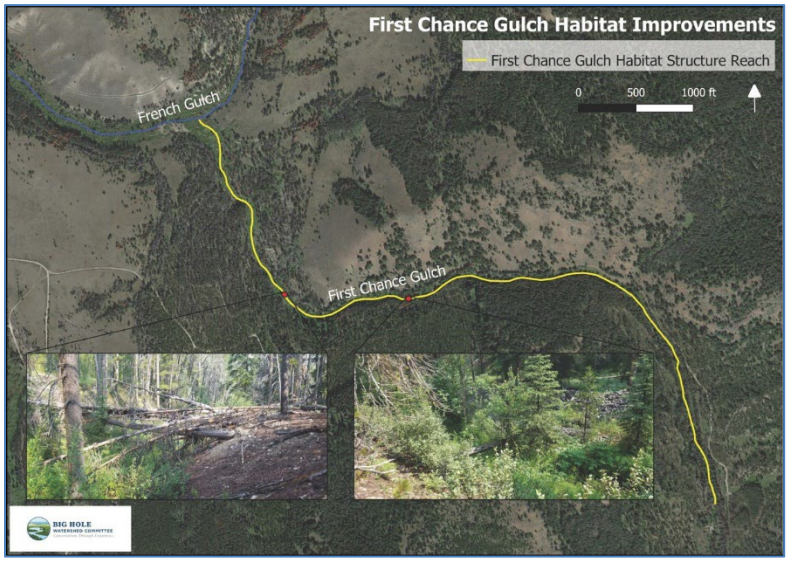
- Randy Smith, Chair of BHWC for nearly 30 years, stepped down in January. He will maintain his seat on the board but will no longer serve on the steering committee. Thank you for your many years of commitment, Randy!
    - Jim Hagenbarth, former Vice-Chair, has stepped up to fill the Chair position.
    - Board member and upper Big Hole rancher, Dean Peterson, has stepped into the Vice Chair position.
    - Steve Luebeck, Treasurer, and Roy Morris, Secretary, will maintain their positions on the Steering Committee.
- The Steering Committee has considered a proposal by E.D. Pedro Marques to allow Pedro to work remotely from Brazil for one year starting this fall. This is a once in a lifetime opportunity for Pedro to raise his kids for a period of time in his and his wife's native country. The steering commitee has approved the proposal and it is now being reviewed by the full board.

Communications and Wildlife Report – Tana Lynch, Associate Director

- 2024 Carcass Removal:
    - Livestock Loss Board: $21,000
    - Dump truck from Red Rocks – check
    - New staff member – Justin Cottingham
    - March-May, 2024 (or sooner)
    - John: 209-628-2225

    - Justin: 406-600-8295
- Wildlife Funding:
    - Landowner-Led Conflict Reduction Partnership (LLCRP)
        - Includes BHWC
        - Heart of the Rockies Initiative and Western Landowners Alliance
            - NRCS Regional Conservation Partnership Program (RCPP) grant – secured
                - *A partner-driven approach to conservation administered by the NRCS that funds solutions to natural resource challenges on agricultural lands*
                - $16.5 Million for "Stewarding the Working Wild" project
                - Montana, Oregon, and Colorado (including BHWC!)
    - NFWF America the Beautiful Challenge (AtBC) grant awarded, too!
        - BHWC will be subrecipient
- Available funding = opportunity for expansion! So, what do we need?
    - Fall carcass removal
    - Compost sit in the lower Big Hole (Glen area)
    - 2nd range rider
    - Other ideas?

Restoration Report – Ben LaPorte, Program Manager



- 2023 Restoration Program metrics:
    - Streams Worked on in the Big Hole (2023):
        - Upper Oregon Creek (Restoration)
        - Trapper Creek Tributary (Restoration)
        - Browns Gulch (Restoration and Conifer Encroachment)
        - Browns Gulch Tributary (Restoration) = .
        - Trail Creek (Conifer Encroachment)
        - Joseph Creek (Conifer Encroachment)
        - Smith Sage Springs (Restoration)
        - Mudd Creek (Beaver Conflict Mitigation)
        - Main stem slough (Beaver Conflict Mitigation)
        - Elkhorn Creek (Planning and Design)
        - Wise River (Irrigation Infrastructure Design)
        - Jerry Creek (Irrigation Infrastructure Design)
        - Main Stem Big Hole (Irrigation Infrastructure Design)
    - Streams Worked on in the Clark Fork w/NRDP (2023):
        - Cabbage Gulch (Restoration)
        - Joyner Gulch (Restoration)
        - Muddy Gulch (Restoration)
- 2024 Restoration Program Outlook:
    - NRDP Anaconda Uplands

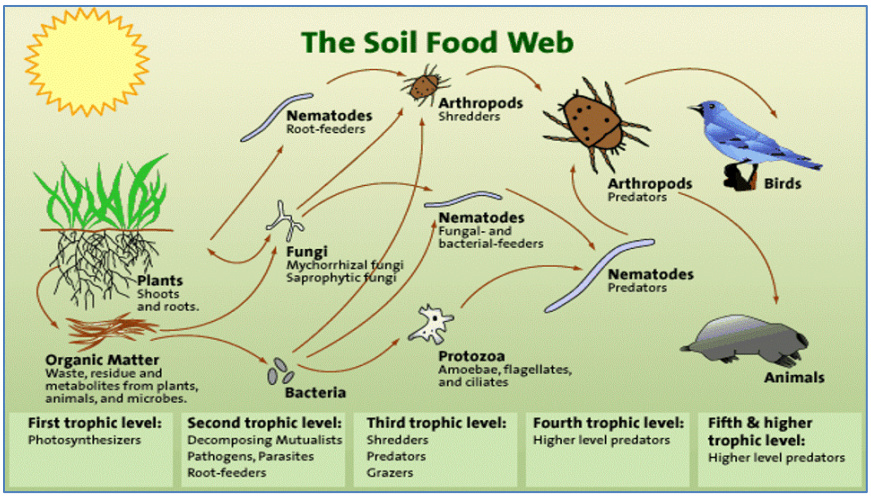
        - Operation and Maintenance
    - Pennington Bridge Restoration- 3 Project Designs
    - Elkhorn Mine and Mill
        - EE/CA and 30% design
    - First Chance Gulch Habitat Improvements
        - 50-80 simple log-step structures over 1.5 miles
    - Mount Haggin Culvert Removal and Replacement
        - 2 removals (Julius Gulch and Little California 1)
        - 2 replacements (Little California 2 and Sixmile Creek)
    - Trapper Creek-USFS Conifer Encroachment
        - 900 acres on USFS
        - Strong possibility that we will also facilitate BLM acres
    - East Pioneers LTPBR/Conifer Encroachment Projects
        - Large head cut work in Browns Gulch Tributary
        - Browns Gulch LTPBR maintenance
        - Trapper Creek Tributary Conifer Encroachment
- Other Happenings:
    - Smith Sage Springs film project and phase 2 (reconnect)
    - Grant writing and report season
- Projects in Development:
    - Irrigation Infrastructure Funding
        - Wise River
        - Jerry Creek
        - Melrose
    - Elkhorn Ranch
        - Johnson and Alder Reconnections
        - Mainstem streambank plantings
    - Upper Moose Creek LTPBR and potential beaver reintroductions
    - Trail Creek LTPBR
    - Smith Sage Springs Phase 2-Reconnect
    - Upper French Gulch Repair

New Business

Break – 10 minutes

Meeting Topic:
Reclamation, Cheat Grass, and Water Conservation: Managing for Biology

Presented by: Vern Smith, Regenerative Land Solutions



<u>What is soil?</u>

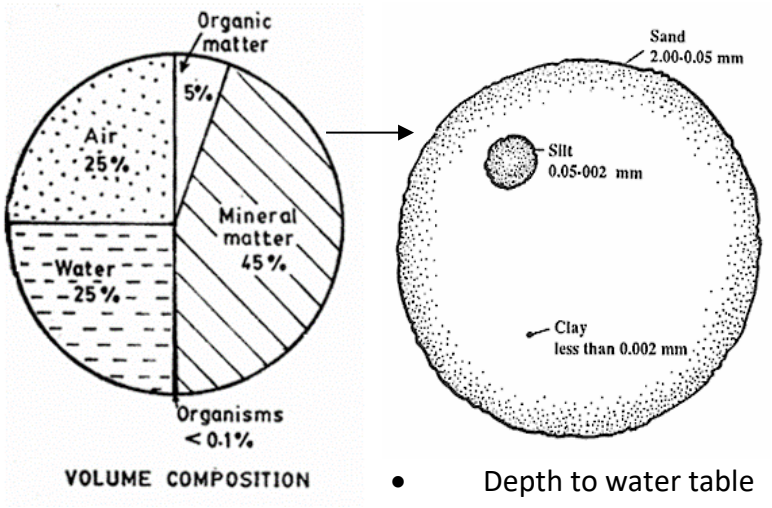
- Air
- Water
- Sand, silt, clay
- Organic matter

<u>Positive Ripple Effects of Good Soil</u>

- Nutrient dense crops
- Better water holding capacity
- Fertility and germination rates increase
- Less disease and insect pressure
- A system of diminishing inputs and great profitability
- Health industry - Healthier food for people
- Clean water
- Less weed pressure

<u>Soil Structure</u>

- Fungi plays a significant role in soil structure.
- Healthy soil has roughly 25% air and oxygen is often a missing component of many of our agricultural systems.
- Fungi is delicate and easily damaged and requires different foods than the bacterial community.
- A primary driving force in the soil is the F/B and the AF/TF



- Depth to water table

<u>Tom Miner Basin Side by Side</u>

- Comparison of soil microbial diversity in two fields at Vern Smith's.
- One field was treated with Earthfort Provide/Revive twice. First treatment was a significantly less than recommended amount of Revive in Fall of 2017 and second was of

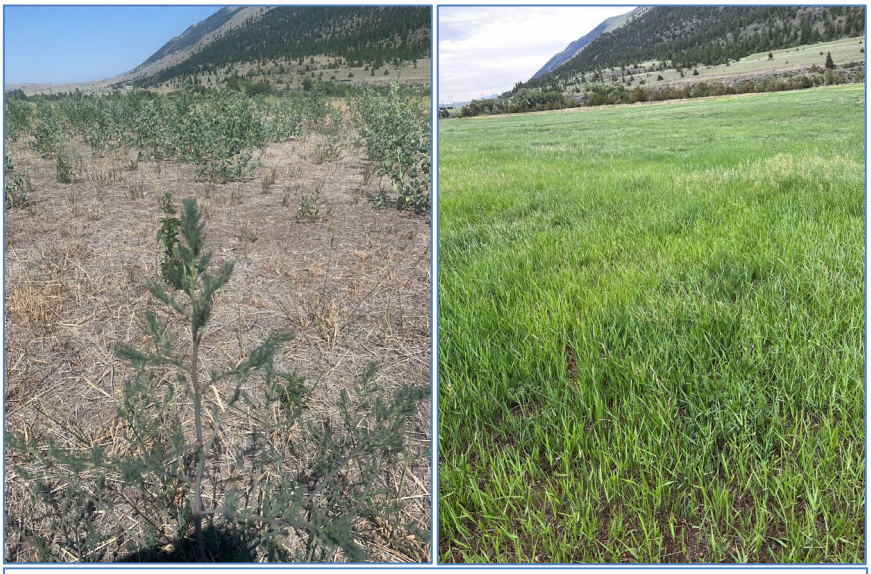
Assay Name	Result	Units	Desired Level	Commentary
Organism Biomass Data				
Dry Weight	0.89	N/A	0.45 to 0.85	Add organic matter to build soil structure, increase water holding capacity.
Active Fungi	27.21	µg/g	> 45.00	Fungal activity low, foods may be required. -
Total Fungi	970.64	µg/g	> 300.00	Good fungal biomass. - Fair fungal diversity. Hyphal Diameter: 1.5 to 6.5um
Hyphal Diameter	2.85	µm	> 2.50	Good balance of fungi. -
Active Bacteria	30.68	µg/g	> 45.00	Bacterial activity low, foods may be required.
Total Bacteria	758.93	µg/g	> 300.00	Good bacterial biomass. -
Actinobacteria	17.71	µg/g		
Organism Biomass Ratios				
TF:TB	1.28		1.00 to 2.00	Correctly balanced fungal and bacterial biomass for hay.
AF:TF	0.03		> 0.15	Low fungal activity relative to total biomass, foods may be required.
AB:TB	0.04		> 0.15	Low bacterial activity relative to total biomass, foods may be required.
AF:AB	0.89		1.00 to 2.00	Fungal dominated, becoming more bacterial
Protozoa (Protists)				
Flagellates	5,196.34	number/g	> 5,000.00	Nutrients are being cycled and made available to plants in good rates.
Amoebae	51,963.37	number/g	> 5,000.00	
Ciliates	31.59	number/g	< 572.00	
Nitrogen Cycling Potential	100-150	lbs/acre		Nitrogen levels dependent on plant needs. Estimated availability over a 3 month period
Nematodes				
Nematodes	2.32	number/g	> 10.00	Low numbers, but good diversity.
Bacterial	0.80	number/g	> 4.00	
Fungal	0.49	number/g	> 4.00	
Fungal/Root	0.92	number/g	< 1.00	
Predatory	0.00	number/g	> 2.00	
Root	0.12	number/g	< 1.00	

both Provide and Revive at a conservative amount in the spring of 2018. The other side of the field was untreated.

- This was an un-replicated side by side trial. At the time of the microbial sampling, these fields had had identical management for 20 years.
- Summary:
    - Alpha diversity was higher in the treated field
    - There was a higher abundance of the orders Rhizobiales, Bacillales, and Micrococcales in treatment.
    - The abundance of Acidobacteria and Acidimicrobiales was higher in the control.
    - The results suggest that the treated field had a greater abundance of potentially beneficial taxa while the control was higher in taxa associated with unhealthy, acidic soils.

Left: 4 years post-treatment- virtually no weeds; Right: untreated- cheatgrass, pigweed, crested and mustard.

- Church Pivot Trial
    - Idea behind study was to test a bio approach against a traditional approach side by side on a blank slate with new seeding to provide a more accurate picture than looking at bio approach on top of years of traditional management.
    - Study parameters:
        - Two treatments:
            - Biological Approach: Earthfort's Provide/Revive, Fish Hydrolysate, and G22 (a less salty and more biologically friendly fertilizer). Amounts based off of biological and chemistry testing.
            - Traditional Chemistry: Rocky Mountain Fertilizer's status quo fertility program. 30-30-10-10 blend (applied around 4/15/20)
        - Site: alfalfa mix in 40 acre pivot
        - Application: spring 2020
        - Costs: Biological Program was $7/ acre cheaper upfront. Predicted Biological Program costs will go down more as biology improves.

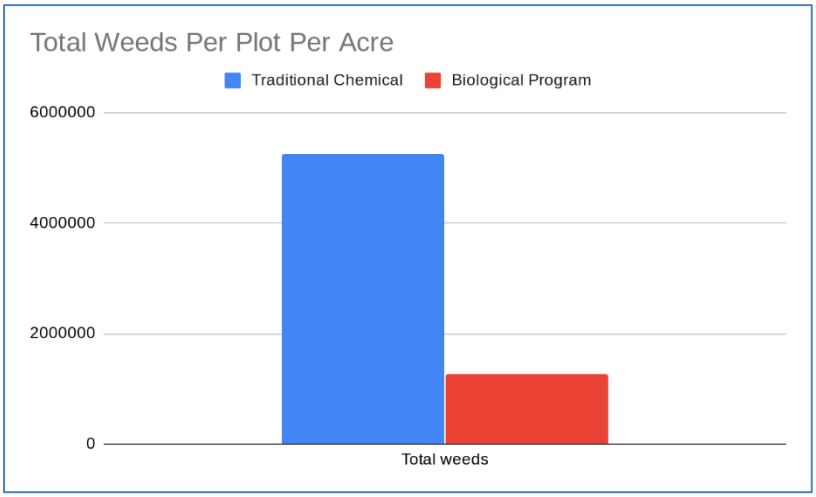


Tom Miner side-by-side comparison. Left: Treated with Earthfort Provide/Revive twice. Right: Untreated. Identical land management for 20 years prior to comparison.

- Mountain Sky Replicated MSU Experiment:
    - Two treatments

        - Provide/Revive
        - Spectrum/Nutrinate
        - Compost was nixed after initial fall 2018 application
    - Two sites
        - Pivot irrigated Alfalfa Field
        - Pivot irrigated pasture
        - Put on top of regular conventional fertility
    - Applications
        - Initial fall application of both treatments in 2018 at manufactures recommendations.
        - Spring and post cutting application 2019.
        - Spring application 2020

Church pivot trial. Left: Biological Approach; Right: Traditional chemistry- yellow mustard is significantly more pronounced.



- MSU DNA Sequencing:
    - Provide and Revive increased abundance of both the Rhizobiaceae family and the Azospirillaceas family.
    - Rhizobiaceae includes nitrogen fixing genera associated with legumes.
    - Azospirillaceas family includes free floating nitrogen fixing genera.
    - Repeated applications of chemical nitrogen can dissociate plants from naturally occurring nitrogen fixing soil biology, we think this might be why Provide is so helpful, as well as for adding diversity that we don't fully understand.
- For more information visit regenerativelandsolutions.com.

Upcoming Meetings

- March 20, 2024: **Arctic Grayling CCAA Update**
    - 7:00 PM at the Divide Grange Hall
- April 17, 2024: **Topic: TBD**
    - 7:00 PM at the Divide Grange Hall

Adjourn