Big Hole Watershed Committee

Monthly Meeting Minutes

May 20, 2026 – 7:00 pm at the Divide Grange

Zoom option also provided

In Attendance

In-person: Pedro Marques, BHWC; Tana Lynch, BHWC; Nolan Salix, BHWC; Luke Lutz, DNRC; Katelin Killoy, MFWP; Tom Bowler, Butte Resident; Betty Bowler, Butte Resident; Paul Siddoway, Sportsman; Jim Hagenbarth, Rancher/BHWC; JM Peck, Rancher/BHWC; Grayson Gee, Rainmaker; Dean Peterson, Rancher/BHWC; Diana Peterson, Rancher; Dave Duffy, Wise River resident; Dave Ashcraft, Rancher/BHWC; Jim Wierzba, Wise River resident; Jim Griffin, Butte resident; Kristina Kennedy, MFWP; John Cozby, Divide resident; Kelly Cozby, Divide resident; Diane Hutton, BHWC; Jim Olsen, MFWP; Jim Keenan, BSB Water/BHWC; Jon Peterson, Rancher/BHWC; John Jackson, Beaverhead County Commissioner/BHWC; Jim Wallace; Reuben Cochran; Howard Varner, Rancher/BHWC; Kay Jensen, Divide resident; Erik Kalsta, Rancher/BHWC; Mike Wilkinson, Wise River resident; and BHWC's summer watershed technician field crew: Madelyn Hanson; Noah Dowler; Cora Johnson; and Simon Shepherd.

Zoom: Charlie Broui; Steve Luebeck, Sportsman/BHWC; Marieke Jeffrey, BHWC summer intern; Marilynn Mehmke, MCC; Randy Smith, Rancher/BHWC; Roy Morris, GGTU/BHWC.

Meeting Minutes

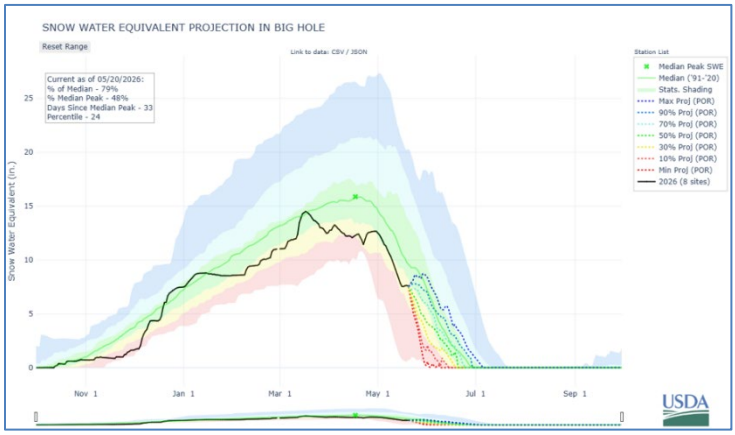
BHWC monthly meetings are held at the Divide Grange with a virtual (Zoom) option provided thanks to Southern Montana Telephone Company, who donated the internet service. Meeting minutes and recordings are available at https://bhwc.org/monthly-meetings/ (scroll down for meeting minutes archive). Printed 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.

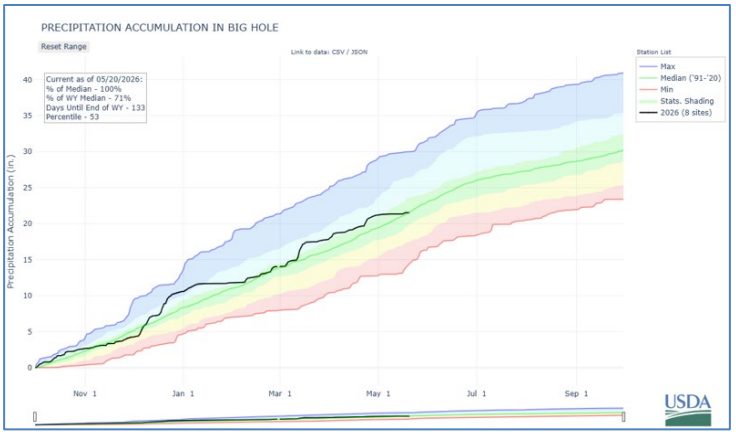
Reports

Streamflow and Snowpack Report – Luke Lutz, Montana Department of Natural Resources and Conservation

- *Streamflows:*
  - *Stream And Gage Explorer (StAGE):* https://gis.dnrc.mt.gov/apps/stage/
  - Section 1: Wisdom (06024450): 66 cfs
  - Section 2: Big Hole River near Wise River (41D 08000): 1,720 cfs
  - Section 3: Maiden Rock (06025250): 2,110 cfs
  - Section 4:
    - Melrose (06025500): 2,110 cfs
    - Glen (06026210): 2,110 cfs

- Section 5: Hamilton Ditch (06026420): 1,980 cfs
- *NWCC Snow Water Equivalent:*
  - Big Hole: 79% of median
  - Median peak date: 4-17
  - Current peak: 3-17
- *Precipitation:* 100% of median
- *Hypsome-SWE:* 71% of Normal
- *Climate Outlook (NOAA)*:
  - *Outlook*: The 8-14 day outlook slightly above normal temperatures and slightly above normal precipitation.
  - *Seasonal Outlook*: Above average temperature with slightly above average precipitation.
  - *ENSO Conditions*:
    - Drought conditions are forecast to worsen or develop for many areas in the West and south-central Plains, according to NOAA's Spring Outlook released today for April through June. Forecasters from also predict above-normal temperatures for the majority of the U.S.





- *U.S. Drought Monitor – Beaverhead County:* The Big Hole watershed is characterized as abnormally dry to moderate drought as of May 12, 2026.

Director's Report – Pedro Marques, Executive Director

- Thank you, Karly!
  - Job Opening for Comms Coordinator
- Governing Board Additions
  - Dr. Paul Siddoway- resident Melrose
  - Howard Varner- resident, Wisdom
  - Board reached consensus regarding adding these 2 additional board members. Their official terms will start in January 2027. Welcome, Howard and Paul, and thank you for joining us!
- Partnerships!!
  - USFS Partnership Agreement
  - BLM Butte Office Partner Agreement
  - Gage Funding: GGTU and FOAM to Split the Bill: $4,250
  - LOS- Cloud Seeding funding
  - Cinnabar Foundation- largest grant to date!
  - Thank you to the Rabke Foundation!

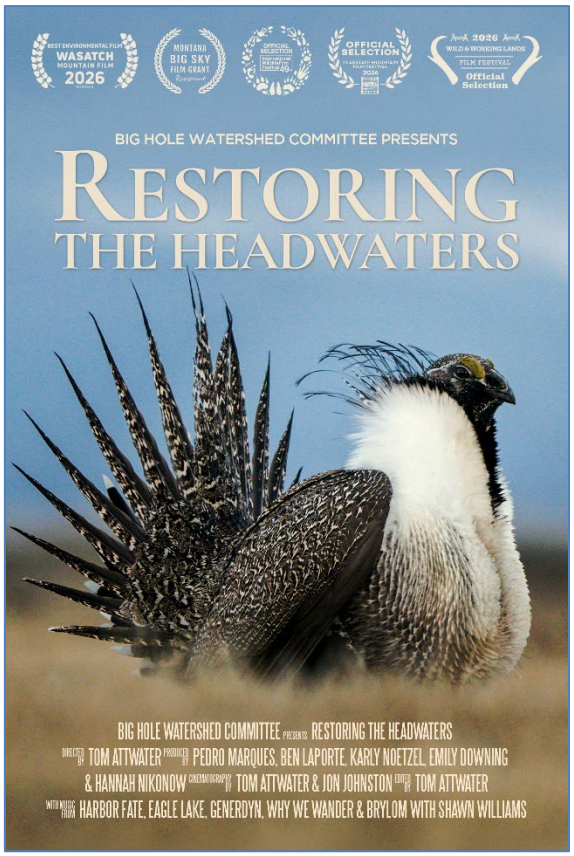
- Watershed Planning
    - TELL US WHERE TO WORK!

Steering Committee Report – Dean Peterson, Chair

- Had phone call, discussed the Partnership Agreement with the Forest Service and proposed cloud seeding pilot project.
- Dean interviewed with Montana Outdoor Magazine (Tom Dickson) regarding wolves & ranchers.

Communications and Wildlife Report – Tana Lynch, Associate Director

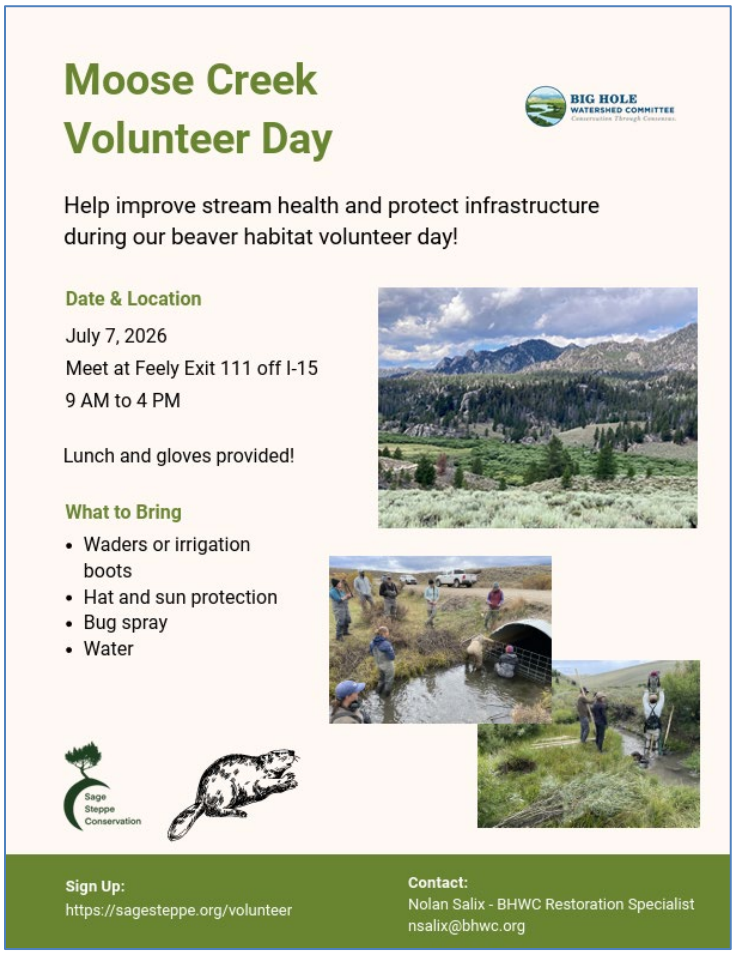
- Communications:
    - Shop to Support BHWC and get your own BHWC gear at bhwc.org/shop-to-support
    - We're Hiring!
        - Goodbye and good luck to Karly!
            - Got a job on an MSU film crew
        - Now hiring Communications Coordinator!
            - Open until filled
            - Job description and application instructions available at bhwc.org
            - Passionate about conservation and rural communities!
            - Local to Southwest Montana
            - Willing to help out in all aspects of our work, but particularly communications
    - Film screenings:
        - Restoring the Headwaters Film
            - Butte: March 26th at the Covellite Theatre
            - Dillon: April 9th at the Patagonia Outlet
    - Weekly drought updates:
        - Current streamflow
        - Temperature
        - River status by section
        - Long-term average flows
        - Text DROUGHT to 26989 & register
            - Also sent via email
            - Sign up at bhwc.org
- Wildlife:
    - Carcass Removal and Composting:
        - Now Operating
        - Eric Lewis, Conflict Reduction Coordinator
            - Based in Melrose
        - Carcass Pickup & Composting Services
        - Compost site located near Wisdom
        - Dump trailer rented from Western States Cat
        - Supporting wildlife and a working landscape
        - Recently featured in the Montana Standard!



        - 2026: picked up 31 carcasses (at time of meeting)
        - Contact Eric at:
            - 307-343-3803
            - or elewis@bhwc.org
    - Range Riding:
        - Monitors USFS grazing allotments in the Upper Big Hole to prevent conflicts between grizzly bears & wolves and livestock, identify injured & sick livestock, and locate carcasses to instigate investigations for potential reimbursement by the State.
            - Chet Robertson, Range Rider (Hired 2011)
            - Monitors 8 USFS allotments for 7 producers
            - July – September
        - Preparing for 2026 season
            - Starting June 1
            - 2 new allotments
        - Range Rider Workshop, Western Landowners Alliance
            - April 27 – May 1 in Grand Junction, CO

Restoration Report – Nolan Salix, Restoration Specialist

- Kamperschroer Springs- fish habitat project-Fundraising
    - $58,000 in hand, $303,00 targeted amount.
    - Requesting $100,000 from Future Fisheries Improvement Program (FWP)
- Smith Sage Springs Phase 2: Reconnect- Awaiting Start
- California Gulch- Currently developing
- Elkhorn Mine and Mill- Design/Monitoring
- Lazy S Ranch- active
    - Willow Trenches completed
    - Weed barrier semi-completed
    - Fencing June 15th
    - Planting fall 2026
- McCartney Mtn/Burma RD- We did not receive DEQ 319 funding for these 2 projects. We are looking for funds, developing test plot quantity metrics, and partnering with IND Hemp.
- East Pioneers LTPBR/Conifer Encroachment projects- active/contracting
    - Conifer Reduction:
        - Lost Creek
        - Trapper Creek
    - Stream Restoration:
        - Browns Tributary
        - UMW 4-23-26
        - Education + Action
- Upper Moose Creek LTPBR and potential beaver reintroductions- Planning + Permitting + Data collection



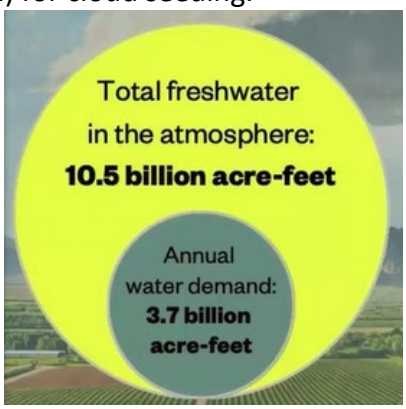
- Moose Creek Volunteer Day July 7th
  - Sign up at sagesteppe.org

New Business

- Measuring Water Conservation – Jon Peterson, BHWC seasonal Hydrology Technician
  - What Jon does:
    - Measures streamflow and discharge
    - Monitors springs, tributaries, and river conditions
    - Collects data using flow meters and field measurements
    - Helps track water availability and conditions over time
  - Why streamflow data matters:
    - Irrigation planning
    - Understanding low water conditions
    - Drought awareness
    - Fish habitat and river health
    - Long-term water management
  - Measurement sites:
    - Smith sage springs
    - ABW Ranch
    - Raffety Ranch
    - Pattengill Creek
    - Meadow Creek
    - Jerry Creek
    - Canyon Creek
    - Trapper Creek
    - Wise River
    - Deep Creek
    - Moose Creek
    - Hagenbarth Ranch
  - Jon is a resource for irrigators to use. He can:
    - Help measure flow in ditches, springs, or streams
    - Can explain how measurements are taken
    - Can help provide data for better understanding water use
    - Available to answer questions in the field
    - His goal is to help irrigators

  - Goals:
    - Healthy rivers support ranching and fisheries
    - Better data improves decision-making
    - Local collaboration matters
    - Shared responsibility for the watershed
  - Questions and Contact information:
    - Jon Peterson
      - jonhpeterson11@gmail.com
      - (406) 660-2306
- Cloud Seeding Pilot Project Proposal – Greyson Gee, Rainmaker
  - Rainmaker requested a Letter of Support from BHWC for pilot project in the Big Hole. BHWC agreed to write the letter.
    - The LOS is for a federal grant to fund the pilot project.

        - If funded, BHWC would be the prime "sponsor" of the project.
        - DNRC study showed the Big Hole is suitable (actually ideal) for cloud seeding.
        - Cost of proposed project: ~$800k per year
        - Taking lessons from neighbors in Idaho, who have been cloud seeding for years.



    - Rainmaker: scientists, hydrologists, etc.
        - Uses American designed and made drones.
    - The American West is running out of fresh water.
        - Nearly 100 million Americans are affected by wide-spread droughts.
        - The solution is in the sky – the atmosphere holds nearly 3 times more water than global annual water demand at any given moment.
    - How cloud seeding works:
        1. Seeding – Seeding particle are delivered into clouds.
        2. Nucleation – Ice crystals form on the seeding particles.
        3. Growth – The ice crystals grow by taking up surrounding water vapor and cloud droplets.
        4. Precipitation – Once the ice crystals grow large enough, they fall as snow.
    - Rainmaker's Operations – multiple converging technologies – AI/ML, drones, and radar – make cloud seeding more effective than ever before:
        1. Target – Numerical weather modeling & forecasting
        2. Seed – Weather resistant, high-altitude UAVs
        3. Validate – Advance radar sensing & validation
    - Validation results (in Oregon and Utah this winter season):
        - 82 unambiguous seeding signatures, or distinct radar patterns that prove seeding operations directly caused precipitation.
        - Radar and satellite-based quantitative precipitation estimation (QPE) was used to isolate seeding signatures and convert reflectivity values into surface liquid-equivalent precipitation.
            - Based on this analysis, Rainmakers 81 seeding signatures created over 130 million gallons (about 400 acre-feet) of unambiguous, validated precipitation in the form of snow and rain, equivalent to ~1,600 American households' annual water usage.
            - This likely represents only a small amount of the total precipitation created by Rainmaker over the course of the season so far.
    - The Big Hole Basin Pilot Project:
        - The NCAR feasibility study was designed to support the Big Hole Basin. It was commissioned by DNRC to assess cloud seeding potential for snowpack and streamflow augmentation in the Big Hole.
        - The Inflation Reduction Act of 2022 included $4 billion for grants and other funding for public entities to conduct specific drought mitigation activities
        - These funds are set to expire in September. BHWC has indicated interest in being the primary sponsor to receive a portion of these funds to implement the NCAR Big Hole feasibility study.
        - Cloud seeding in the Big Hole would increase winter snowpack in the Beaverhead, Anaconda, and Pioneer mountains, boosting April-June streamflow that supports

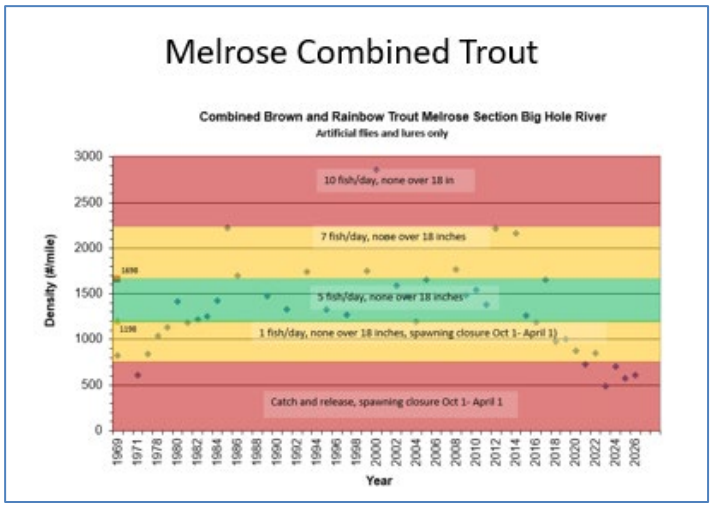
irrigated agriculture, the blue-ribbon trout fishery, and fluvial Arctic grayling habitat in-basin, and downstream water users throughout the Jefferson and Missouri systems – including hydropower, municipal supply, and senior water-right holders facing increasingly frequent drought and hoot owl restrictions.

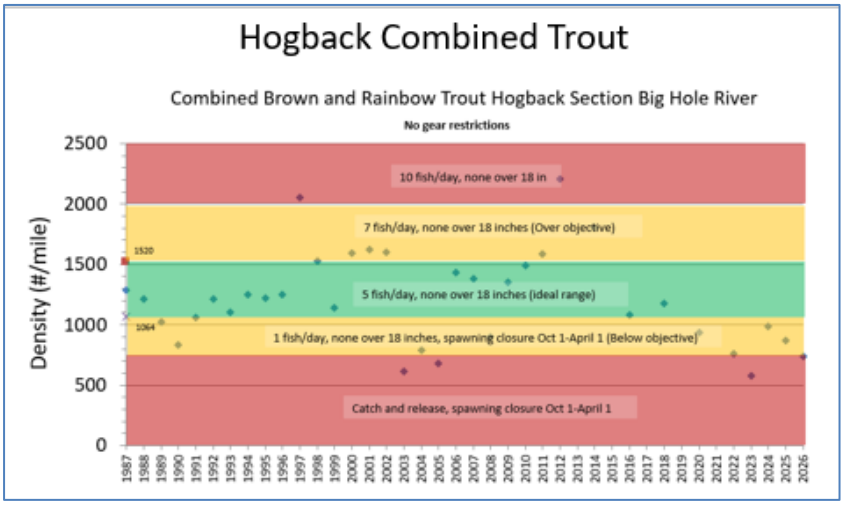
- Rainmaker climatology analysis indicates that a fully funded project could generate 22,063-33,095 acre-feet of additional water per year for the Big Hole Basin.

Break – 10 minutes

Meeting Topic:
Big Hole River Fishery Update

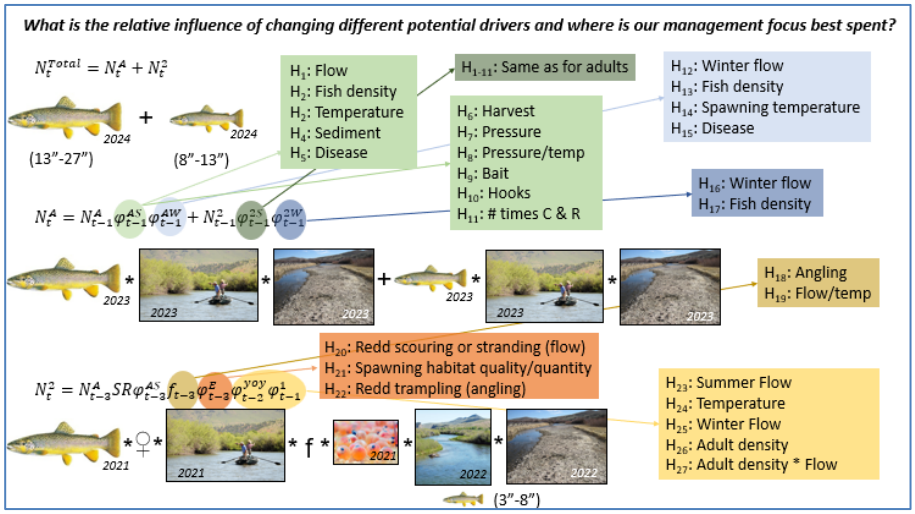
Presented by: Jim Olsen,
Big Hole River Fisheries Biologist – Montana Fish, Wildlife and Parks





<u>Southwest Montana Adaptive Trout Management Plan</u>

- Development of adaptive trout management in the Big Hole, Ruby and Beaverhead Rivers
- Matt Jaeger, Donovan Bell, Jim Olsen, Anthony Zenga, and Andrew Gilham
- Use Adaptive Management Plan to inform the best, most cost-effective actions to meet population objectives:



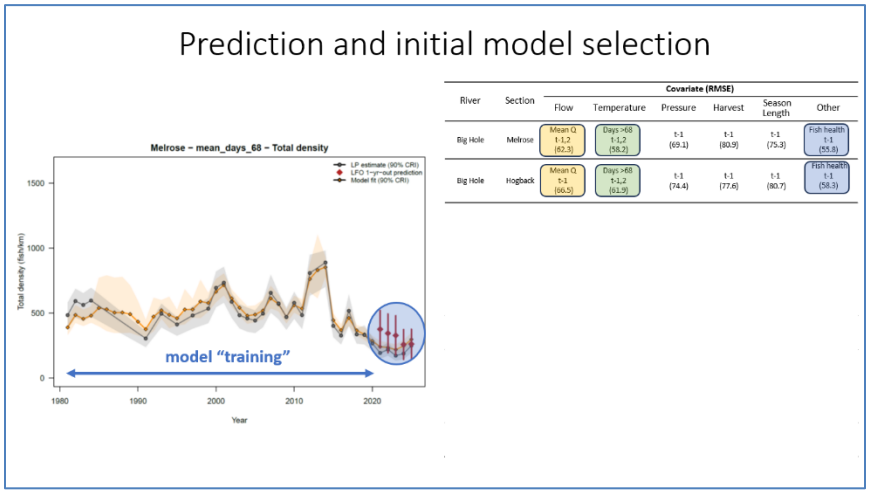
- Define management goals
- Use past and future data and strategic implementation in response to decision thresholds to inform what management actions will allow us to best meet goals.
- What is the relative influence of changing different potential drivers and where is our management focus best spent?

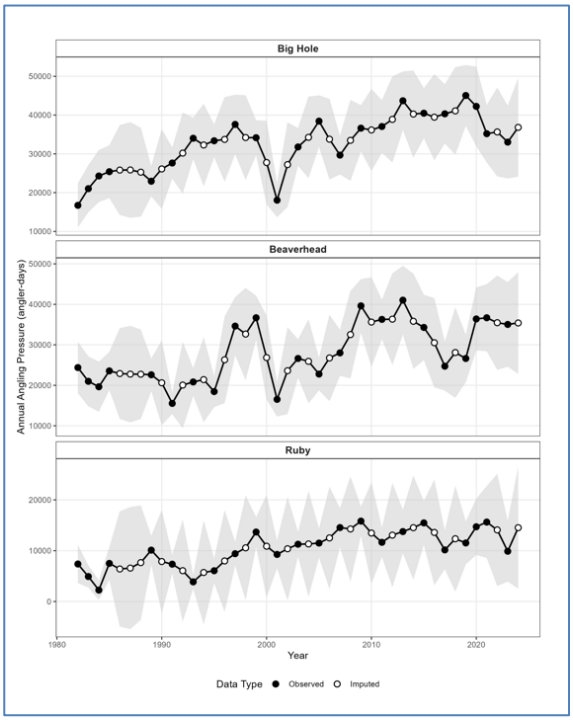
Model	Management Action	Implementation Cost
NA	No Action*	
Temperature	Johnson reconnection	320,000
	Alder reconnetction	240,000
	Moose reconnection	275,000
	Trapper reconnection	275,000
	Wise River reconnection	750,000
	Camp reconnection	275,000
	Rock reconnection	275,000
	All reconnections	2,410,000
Flow	Pattengill storage reservoir	70,000,000
	Warm Springs storage reservoir	90,000,000
	Flintlar Creek storage reservoir	55,000,000
	Water leasing	370,000
	Increase Efficiency of Diversion Infrastructure	2,200,000
	Shift Stock Water to Wells	200,000
	Hybrid Irrigation Practices	600,000
	Drought plan minimum 150 cfs	
	Drought plan minimum 175 cfs	
	Drought plan minimum 200 cfs	
	Cloud seeding	1,000,000
	Forest management	
Pressure	Reduce Threshold for Hoot Owl Triggers	
	Eliminate shoulder season commercial	
	Reduce non-resident Non-commercial Days by 10%	
	All reductions and spawning closure	
Season Length	Spawning Closures	
	Traditional Season	
	Max Protection	

Effect Size

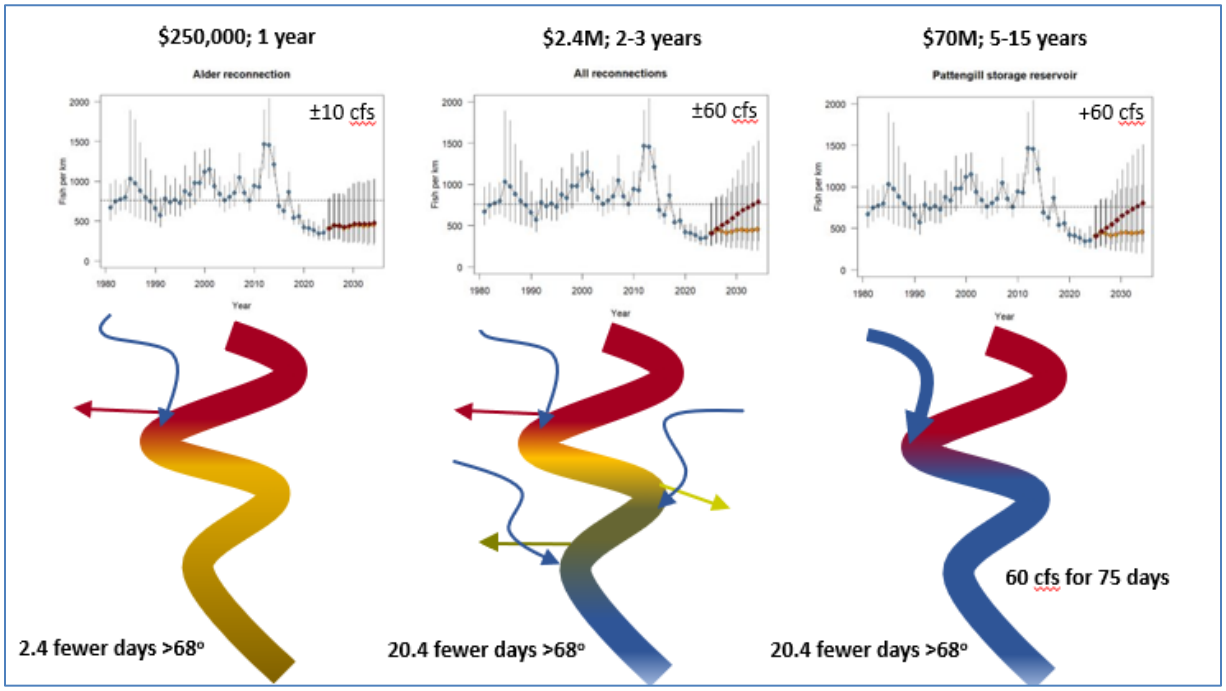
Population outcome

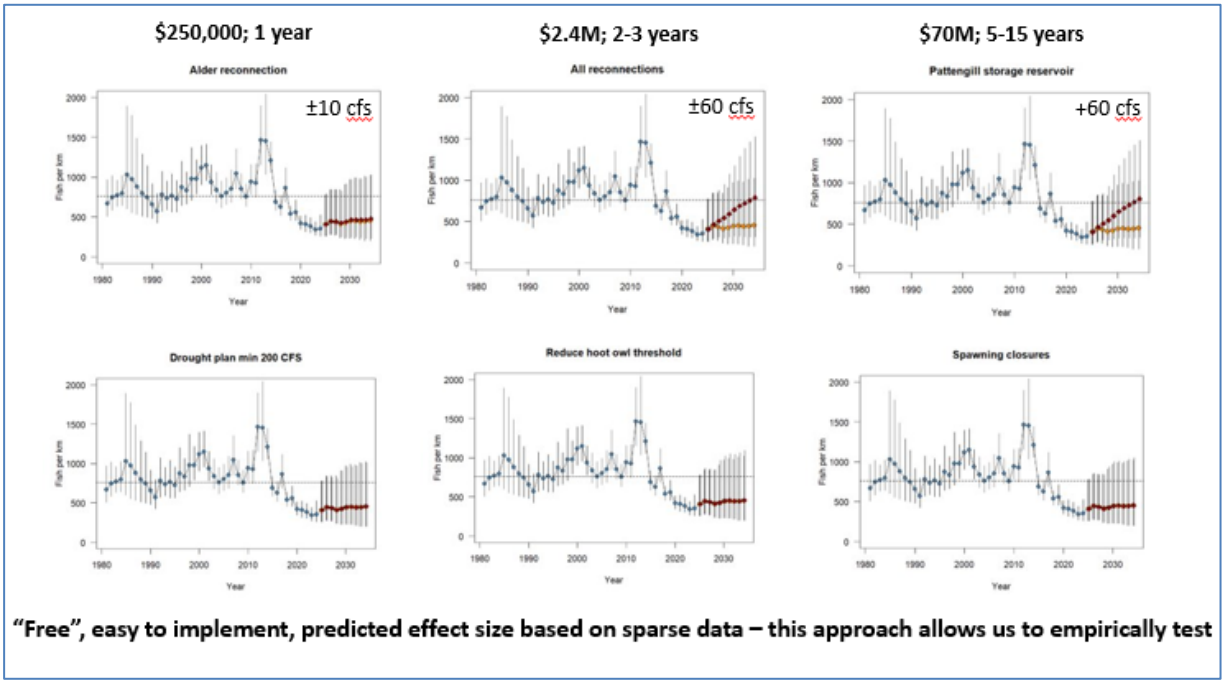
- Time series data and covariate preparation





- Fish abundance, stream temperature, flow, angling pressure, regulations, fish health symptoms
- Impute missing values
- Melrose – modeled with past 45 years
  - Fish abundance – 56 years
  - Discharge – 106 years
  - Stream temperature – 32 years
  - Angling pressure – 42 years, odd years
  - Angling regulations – 75 years
  - Fish health symptoms – 7 years "on"


$250,000; 1 year
Alder reconnection
±10 cfs
2.4 fewer days >68°
$2.4M; 2-3 years
All reconnections
±60 cfs
20.4 fewer days >68°
$70M; 5-15 years
Pattengill storage reservoir
+60 cfs
60 cfs for 75 days
20.4 fewer days >68°


$250,000; 1 year
Alder reconnection
±10 cfs
Drought plan min 200 CFS
$2.4M; 2-3 years
All reconnections
±60 cfs
Reduce hoot owl threshold
$70M; 5-15 years
Pattengill storage reservoir
+60 cfs
Spawning closures
"Free", easy to implement, predicted effect size based on sparse data – this approach allows us to empirically test

Big Hole - Melrose

Model	Management Action	mean_q	mean_days_68	pressure	harvest	season_l	disease	Implementation Cost
NA	No Action*							
Temperature	Johnson reconnection	0	-1.4	990	0	0	0	320,000
	Alder reconnetction	0	-2.4	1650	0	0	0	240,000
	Moose reconnection	0	-1.4	990	0	0	0	275,000
	Trapper reconnection	0	-2.4	1650	0	0	0	275,000
	Wise River reconnection	0	-5.2	3466	0	0	0	750,000
	Camp reconnection	0	-1.4	990	0	0	0	275,000
	Rock reconnection	0	-1.4	990	0	0	0	275,000
	All reconnections	0	-20.4	5116	0	0	0	2,410,000
Flow	Pattengill storagereservoir	60	-15.2		0	0	0	70,000,000
	Warm Springs storage reservoir	75	-18.6		0	0	0	90,000,000
	Pintlar Creek storage reservoir	40	-13.2		0	0	0	55,000,000
	Water leasing	2	-1		0	0	0	370,000
	Increase Efficiency of Diversion Infrastructure	3.3	-1.2		0	0	0	2,200,000
	Shift Stock Water to Wells	10	-2.2		0	0	0	200,000
	Hybrid Irrigation Practices	10	-2.2		0	0	0	500,000
	Drought plan minimum 150 cfs	0	0		0	0	0	
	Drought plan minimum 175 cfs	2.3	0		0	0	0	
	Drought plan minimum 200 cfs	7.7	0	3664	0	0	0	
	Cloud seeding	6.6	-1.6		0	0	0	1,000,000
	Forest management	13	-3.2		0	0	0	
Pressure	Reduce Threshold for Hoot Owl Triggers	0	0	-8334	0	0	0	
	Eliminate shoulder season commercial	0	0	-518	0	0	0	
	Reduce non-resident Non-commercial Days by 10%	0	0	-1008	0	0	0	
	All reductions and spawning closure	0	0	-13049	0	-69.2	0	
Season Length	Spawning Closures	0	0	-3189.00	0	-69.2	0	
	Traditional Season	0	0	-4304.00	0	-66.2	0	
	Max Protection	0	0	-36586.00	0	-261.2	0	

Annual value of Big Hole fishery expenditures are $23M

Big Hole – Hogback

Model	Management Action	mean_q	mean_days_68	pressure	harvest	season_l	disease	Implementation Cost
NA	No Action*							
Temperature	Johnson reconnection	0			0	0	0	320,000
	Alder reconnetction	0			0	0	0	240,000
	Moose reconnection	0			0	0	0	275,000
	Trapper reconnection	0			0	0	0	275,000
	Wise River reconnection	0			0	0	0	750,000
	Camp reconnection	0			0	0	0	275,000
	Rock reconnection	0			0	0	0	275,000
	Willow Creek irrigation return	0			0	0	0	240,000
	All reconnections	0			0	0	0	2,650,000
Flow	Pattengill storage reservoir	60			0	0	0	70,000,000
	Warm Springs storage reservoir	75			0	0	0	90,000,000
	Pintlar Creek storagereservoir	40			0	0	0	55,000,000
	Browns Lake storage reservoir	10			0	0	0	40,000,000
	Water leasing	2			0	0	0	370,000
	Increase Efficiency of Diversion Infrastructure	3.3			0	0	0	2,200,000
	Shift Stock Water to Wells	10			0	0	0	200,000
	Hybrid Irrigation Practices	10			0	0	0	
	Drought plan minimum 150 cfs	0			0	0	0	
	Drought plan minimum 175 cfs	2.3			0	0	0	
	Drought plan minimum 200 cfs	7.7			0	0	0	
	Cloud seeding	6.6			0	0	0	1,000,000
	Forest management	13			0	0	0	
Pressure	Reduce Threshold for Hoot Owl Triggers	0	0	-8334	0	0	0	
	Eliminate shoulder season commercial	0	0	-518	0	0	0	
	Reduce non-resident Non-commercial Days by 10%	0	0	-974	0	0	0	
	All reductions and spawning closure	0	0	-13015	0	-69.2	0	
Season Length	Spawning Closures	0	0	-3189.00	0	-69.2	0	
	Traditional Season	0	0	-4304.00	0	-66.2	0	
	Max Protection	0	0	-36586.00	0	-261.2	0	

Upcoming Meetings

- BHWC does not meet in July
- Wednesday, August 19, 2026: BHWC Monthly Meeting
    - 7:00 PM at the Divide Grange Hall/Zoom – Topic: *Restoring the Headwaters* film showing and a special update from our summer field technicians on their work monitoring high alpine meadows

Adjourn