

Yellowstone River Basin Water Plan

Appendix A. Section II. Introduction: Yellowstone Basin Planning Methodology

The 2015 Montana Water Supply Initiative (MWSI) is a public water planning process that promotes awareness and understanding of the dynamic nature of Montana's water supply and engages citizens in planning for our future water needs. For the Yellowstone River Basin, the MWSI occurred in three primary phases that occurred over a two-year period *Phase 1 (Issue Identification)*; *Phase 2 (Information Transfer)*; and *Phase 3 (Recommendation Development)*. Phase 1 included a messaging campaign that promoted public awareness of water issues and the planning process for the Yellowstone River Basin. Phase 1 also included establishment of the Yellowstone Basin Advisory Council (Yellowstone BAC). Phase 2 included a series of presentations during the fall of 2013 from subject matter experts on issues raised during Phase 1, while Phase 3 focused on the BAC's development of recommendations to address priority issues.

Phase 1 - Establishing the BAC, Public Scoping Process, and Issue Identification

Establishing the Yellowstone Basin Advisory Council. In January 2013, a contract was established with Montana State University-Billings to provide assistance with formation and coordination of the Yellowstone BAC activities for Phase 1 (Issue Identification). To establish the Yellowstone BAC, citizen involvement was solicited from a variety of water interests including agriculture, conservation, industry, municipal, recreation, and tribal. In the Yellowstone River Basin there are 15 conservation districts and 9 watershed groups. Each of these organizations was asked to supply a single nominee who is knowledgeable about water resource issues and interests within their district or watershed. Other key water interest organizations within the Yellowstone River Basin in Montana were asked to submit nominees. From this pool of potential members, DNRC selected a 20-member Yellowstone BAC that, to the extent possible, is geographically distributed and representative of water interests throughout the basin. Figure A-1 is a photo of the Yellowstone BAC.



Figure A-1: Photo of Yellowstone BAC on May 8, 2013

Back Row--Left to Right: Dan Rostad, Dave Mumford, Greg Lackman, Steve Pust, Cal Cumin, Bobbi Blankenship, Paul Gatzemaier, Jerry O’Hair, Nick Golder.

Front Row-Left to Right: Dan Lowe , Roger Muggli, Shanny Spang Gion, Mack Cole, Mike Penfold, John Pulasky, Dave Galt. (Photo by MSUB Research Team)

The Yellowstone BAC includes people with a broad array of water interests, ranging from irrigation, to petroleum production, to instream flows. Two entities requested alternates who could attend some of the designated meetings. In both cases the request was approved, thus Boris Krizek was named as an alternate for David Mumford (City of Billings Municipal Water Supply) and Nick Golder was named as an alternate for Brad Sauer (Northern Plains Resources Council). Mack Cole and John Moorhouse were elected as Chair and Vice Chair, respectively, at the March 18, 2013 meeting in Billings. In August, Kay Petermann was named as the new representative for the Wibaux conservation district (in place of Bobbi Blankenship who served the BAC from March through August).

Scoping Process/Issue Identification

Design of the Public Scoping Meetings. In general, the scoping meetings were designed to take two hours. At the regional locations, two sessions were scheduled: a morning session (10-noon) and an afternoon session (1-3). The sessions included:

- 20-minute Overview of Planning Process
- 20-minute Overview of Hydrologic Issues
- 20-minute Overview of Water Rights
- 45-minute Roundtable Discussion
- 20-minute Q Sort Survey

The Kick-off meeting on March 18 (see Table 2-A - Schedule of Yellowstone BAC Scoping Meetings) was designed to serve two primary functions: 1) as a convening event where the Yellowstone BAC members could meet for the first time and where they could select a Chair and Vice-Chair; 2) as a “preview” of how the regional scoping meetings would be run.

The elements explained below were all in place at the March 13 Kick-off meeting and the Yellowstone BAC members themselves experienced each design element in much the same manner as the public would at the regional meetings. Having gone through these elements themselves, the Yellowstone BAC officially approved each of the meeting elements as formats for the regional meetings.

Staff Support for the Yellowstone BAC. DNRC contracted with Montana State University – Billings, to coordinate and support the Yellowstone BAC in its scoping activities. MSUB under the leadership of Dr. Susan Gilbertz assembled a team of five professors, one graduate student and five undergraduate students. The team represented a concerted effort on the part of three institutions to support interdisciplinary/inter-institutional studies that encourage citizen-based natural resource management models. Faculty from Montana State University-Billings, Rocky Mountain College (of Billings), and Saint Louis University Center for Sustainability were involved.

In addition, a DNRC support team was created for the Yellowstone BAC. This team attended every regional meeting and each member of the team provided a brief overview of water issues in the basin. Jim Robinson explained that water planning, per se, had not occurred in the Yellowstone River Basin since 1976. He also explained the goals and mandates of the 2015 MWSI and the Yellowstone BAC. Chuck Dalby provided an overview of Yellowstone River Basin hydrologic information. Kim Overcast (with Kerri Strasheim) provided an overview of water rights. As summarized in Appendix B, each of the DNRC team members had key points to emphasize. After each briefing, time was allowed for questions from the BAC and the public.

Once the DNRC briefings were completed, over one hour of time at each session of the public scoping meetings was dedicated to gathering inputs from the attending public. Three types of opportunities were created in each session for the public: 1) roundtable discussions, 2) demographic surveys, and 3) Q Sort surveys (see Appendix D for details).

Regional Public Scoping Meetings. To provide a variety of regional opportunities for public input, four meetings were held in four different communities along the Yellowstone River. The meetings in Glendive, Big Timber and Forsyth included morning and afternoon sessions to expand opportunities for public comment at any single location. Also, as a means of accommodating people unable to attend a

daytime meeting, one evening session was conducted in Billings. The public meetings were all held in settings that were politically neutral and readily accessible (see Table 3).

DATE	LOCATION	VENUE
March 18*	Billings	MSU-Billings Downtown Campus
March 27	Glendive	Dawson College
April 12	Big Timber	Big Timber Public Library
April 24	Forsyth	Forsyth Public Library
May 7	Billings	MSU-Billings Downtown Campus
May 8**	Billings	MSU-Billings Downtown Campus
*Primarily an organizational meeting.		
**Primarily for review of public inputs and to begin prioritization of issues.		

Publicity for the meetings involved four primary avenues: 1) radio, 2) newspaper, 3) direct mail, and 4) personal solicitation. Some local outlets such as conservation districts and Farm Bureau newsletters offered free announcements, while others required advertising space to be purchased (see Table 4).

Newspaper	Run Dates					
Miles City Star	3/22	3/25	4/16			
Glendive Ranger Review	3/21	3/24				
Sidney Herald	3/24	3/27	4/17			
Billings Gazette	3/24	4/5	4/17	4/30	5/2	5/5
Bighorn County News			4/11	4/18		
Livingston Enterprise		4/3	4/10			
Carbon County News			4/18			
Big Timber Pioneer		4/4	4/11			
Forsyth Independent Press			4/11	4/18		
Powder River Examiner		4/11	4/18			
A Cheyenne Voice		4/12	4/19			

Numerous local radio stations were engaged as a primary means of announcing the meetings. The radio “spots” were primarily handled by one Yellowstone BAC member, John Pulasky. Local print media were also engaged as primary modes of announcing the public meetings. A third means of encouraging attendance at the regional meetings included sending meeting notices to all of the groups and organizations that received the original invitations to provide Yellowstone BAC nominations. Finally, the MSUB team placed approximately 200 telephone calls to citizens throughout the basin informing them of nearby meetings and encouraging their participation.

Scoping Results

The public scoping efforts were well received in each location. As shown in Table 5, nearly 150 public attendees participated in the meetings.

Table A-4 Public Attendance at Yellowstone BAC Meetings March-May 2013	
Meeting Site and Date	Number of Public Attendees
Billings, March 18	08
Glendive, March 27	24
Big Timber, April 12	43
Forsyth, April 24	32
Billings, May 7	30
Billings, May 8	11
TOTAL	148

Public Comment via Roundtable Discussions.

Each discussion resulted in a list of concerns and an audio-recording. These materials were reviewed in a five-step process. First, the listed concerns were transcribed into sets of notes organized by meeting and discussion table. Second, the audio –recordings were carefully reviewed by a research associate and explanatory details were added to the transcribed notes. Third, the various sets of notes were reorganized into question-by-question documents. Fourth, the content was organized into thematically arranged elements. Finally, the thematically arranged elements were distilled into a set of primary concerns which were edited for continuity, clarity and primacy as concerns.

As a result, the roundtable data revealed 28 primary concerns voiced by the public. These were not discrete concerns as there is certain overlap among them. They are summarized below in alphabetical order, not by order of importance:

Availability: Do we know how much water is available?

Beneficial Uses: Should we rethink what constitutes a “beneficial use?”

Current Allocations: To what extent are we appropriated or over-appropriated?

Drought Readiness: Are we ready to address water shortages?

Enforcement/Protecting Senior Rights: What can be done to better enforce our water right administrative system based on the Prior Appropriation Doctrine?

Exempt Wells/Groundwater Wells: Are wells impacting surface water availability in this basin?

Federal Reserved Rights: Can the BAC better address the failure of water supplies to support fish and wildlife (especially as defined by federal rights that protect the fisheries, endangered species and flow regimes)?

Fisheries and Wildlife: Can we determine how much water is truly needed to support wildlife and fisheries?

Future Allocations/Additional Rights: How many new users can be supported? Are "closures" of sub-basins eminent? Can we avoid over-allocating?

Gauges/Monitoring: Do we really know how much water is being drawn? Do we need a comprehensive system that links all monitors in the basin to one database or system of analysis? What would it take?

Hydrologic Models to Explore "Full Development": Can we find a way to think about how much water is really in the system, how much is being drawn off and what it would look like if all of the existing rights were fully developed? Do we know what will happen if all water right holders develop their full shares?

Hydrologic Models to Explore Variability: Can we anticipate what it will mean to experience extremely variable episodes of available snowpack or rainfall?

Incentives and Support for New Technologies and Conservation Practices: Should we seek governmental support to encourage water use technologies that maximize efficiencies? Should we reward conservation?

Industrial Uses of Water: Do we know how much water industry is using? How do we ensure the needs of industrial users? How much water does fracking (hydraulic oil well fracturing) really use?

Irrigation Technologies and Growth: Do we know the circumstances when flood irrigation is preferable to sprinkler irrigation?

Instream Flows: What are the instream flow requirements? Can we devise management plans that work to serve all needs?

Invasive Species: To what extent are invasive species, such as salt cedar and Russian olive, reducing our available water? Can we reduce the problem?

Montana as Priority: Have we done all we can to get our share from Wyoming? Have we done all we can to keep water in Montana? To what extent are we beholden to barge traffic on the Missouri or Mississippi? Are we prepared to fully protect our water rights from parties located outside the state?

Municipal Uses, Urban Development and Population Growth: To what extent might significant growth in municipal draws impact availability?

Planning for Water Demands: Can the BAC better match water supplies to demands, especially where shortages currently occur? Can the BAC look further down the road than 20 years? Can we revisit the planning process every few years instead of every few decades? How should future planning be financed?

Recreational Uses: Do we know how to value recreational uses? If recreational demands increase, how will that impact other user groups? Will river access issues be addressed by this plan? Are recreational uses fully developed?

Stock Water Ponds and Tanks/Fishing Ponds: How much water is retained? How much is lost to evaporation? Should these practices be addressed? Might more creeks be dammed to store water?

Tribal (Reserved) Rights: To what extent are tribal rights already developed? What is the impact if tribal rights are fully developed?

"Use it or Lose it" Principle: Is this the best model for encouraging water conservation? Should this be modified? Are ditch companies intentionally wasting water as insurance against "losing it?"

Water Market Transfers: Should Montana stop allocating and start a new transfer system? Is water already in a "loose" market system that needs to be watched over more carefully? What are other states doing in terms of water markets?

Water Quality: To what extent is quality a concern within issues of availability? Do we monitor quality in a satisfactory manner? Can we better address non-point source pollution, especially agricultural run-off? Do we understand "natural pollutants" in the Montana water system?

Water Reservations: Is it possible to honor all of the Yellowstone Water Reservations and not impact existing senior users? What if they are fully developed? How can we maintain instream flow reservations?

Water Storage: What are the options for storing more water? How will projects be paid for? Can smaller projects help individuals and the state? Are off-stream reservoirs a viable option?

Preliminary Ranking of Issues

At the May 8th Wrap-up Meeting, the Yellowstone BAC members were provided a list of issues that had been brought forward by the public and were given approximately two weeks to make their rankings and to return them to Gilbertz who would separately calculate overall rankings for the BAC voting members and for the BAC Ex-Officio members. See the final Yellowstone BAC scoping report for the methodology.

Table A-5 documents the calculated rankings for the Yellowstone BAC. Issues for which no ranking was offered by any member of the BAC have been left off the list. In the third column, the list also indicates the number of respondents that ranked each issue as #1 (most important).

Table A-5 Yellowstone BAC Issue Rankings

CONCERN	# with this as #1 Rank	# who ranked this as 1-7
Availability	10	13
Drought Readiness	1	11
Enforcement/Protecting Senior Rights	1	7
Water Quality	1	7
Instream Flows	0	6
Shifting Practices: Irrigation Technologies	0	6
Future Allocations/Additional Rights	0	5
Incentives and Support for New Technologies and Conservation	0	5
Storage Capacities	0	5
Reservations (Protected MT Rights)	0	4
Current Allocations	1	4
Planning	0	4
Beneficial Uses	1	3
Montana as Priority	1	3
Gauges/Monitoring	0	4
Municipal Needs, Urban Dev & Pop	0	3
Shifting Practices: Water to Industry	0	4
Water Market Transfers	1	3
Hydrologic Model –Variability	0	2
Hydrologic Model—Full Development	0	3
Recreational Uses	0	2
Exempt Wells/Groundwater Wells	0	2
Fisheries and Wildlife	0	1
Invasive Species	0	2
Stock Ponds and Tanks/Fishing Ponds	0	1
Use It or Lose It Principle	0	1
Hydraulic Fracturing (Fracking)	0	1
Tribal (Reserved) Rights	0	1

Public Input—Written Comments. MSUB faculty (Gilbertz) served as the primary contact during the scoping process. All written comments, including those gathered at meetings, via email or by postal delivery, were directed to her office. A complete record of all written comments is found in Appendix G of the Scoping Report.

Phase 2 - Information Transfer

The Yellowstone BAC met twice in Billings, on November 14-15 and December 13, 2013, to complete the work of Phase 2. The technical analyses phase was designed to provide the BAC members with the most current science and information on the topics of importance identified by the Phase 1 scoping. This was accomplished by inviting technical experts on the various issues to make presentations to the BAC and be available for follow-up questions and discussion. The presentation topics covered during this phase were initially identified by DNRC staff based on the results of Phase 1 and then approved by the BAC members.

The BAC members heard presentations from state and federal experts, legal and non-profit interests, and an experienced on-the-groundwater commissioner (Table A-6). Taken together, the presentations provided everything from a scientific background to practical advice on what is working on the ground now, and thoughts on enhancing water management in the future. The overarching topics addressed were; water administration, reallocation tools, and drought management; climate science and water information tools; water quality and beneficial use; reservoir operations, tribal compacts, and the hydrological effects of present-day water development; instream flow programs; groundwater-surface water nexus; and the executive and legislative process for recommendations.

Table A-6 Yellowstone Basin Advisory Council Technical Presentations

Date	Speaker	Topic
11/14/2013	Peter Marchi, Chief Water Commissioner	Musselshell Water Distribution Project
11/14/2013	Mike Roberts, Hydrologist Montana DNRC, Water Resources	Water Management and Candidate Conservation Agreements—Bighole Basin
11/14/2013	Jennifer Schoonen, Blackfoot Challenge Water Steward	Blackfoot Drought Response Plan
11/14/2013	Patrick Byorth, Attorney, Trout Unlimited	Instream Flow Leasing and Forbearance Agreements
11/14/2013	Chuck Dalby, Hydrologist Montana DNRC, Water Resources	Introduction to Climate Science and Policy Development in Other States
11/14/2013	Greg Pederson, Climate Scientist U.S. Geological Survey	Yellowstone River Basin Climate: Past, Present and Future
11/14/2013	Troy Blandford, Water Information System Manager, Montana State Library	Montana's Water Information System
11/14/2013	Peter McCarthy, Hydrologist U.S. Geological Survey	StreamStats-an Internet Accessible Hydrological Statistics Application for Hydrologists, Engineers, and Water Right and Water Quality Specialists
11/14/2013	Rusty Merritt, President Geospatial Solutions, Inc.	Water Information Systems for Irrigation District Operations
11/15/2013	Jill Frankforter, Hydrologist U.S. Geological Service	Water Quality in the Yellowstone, A Basin-wide Perspective
11/15/2013	Mark Ockey, Water Quality Specialist, Montana DNRC	TMDLs and Beneficial Use Criteria in the Yellowstone
11/15/2013	Jim Bauder, Soil Scientist and Professor Emeritus MSU-Bozeman and Broadus, MT	Water Quality, Soils, and Beneficial Use in the Tongue and Powder River Basins
11/15/2013	Lenny Duberstein, Chief Planner U.S. Bureau of Reclamation Montana Area Office	Water Planning for Federal Reservoir Operations in the Bighorn Basin
11/15/2013	Clayton Jordan, Engineer, U.S. Bureau of Reclamation Montana Area Office	Bighorn Reservoir Operations
11/15/2013	Doug Ollerman, Engineer, U.S. Bureau of Reclamation Great Plains Regional Office	Status of the Crow Water Compact
11/15/2013	Chris Murray, Hydrologist, U.S. Bureau of Reclamation Great Plains Regional Office	Missouri River Depletions Model
11/15/2013	Kathy Chase, Hydrologist, U.S. Geological Survey	Streamflow Statistics for Unregulated and Regulated Conditions for the Yellowstone River
12/13/2013	Tim Davis, Division Administrator Montana DNRC Water Resources Division	Executive and Legislative Process for Recommendations
12/13/2013	John LaFave, Montana Bureau of Mines and Geology	Aquifers, Wells, and Groundwater Use
12/13/2013	Tim Bryggman, Economist Montana DNRC Water Resources	Economics of Water Resources
12/13/2013	Andy Brummond, Fishery Biologist Montana Fish, Wildlife, and Parks	Instream Flow in the Yellowstone River Basin

The BAC did not develop any formal input during Phase 2. There was brief discussion following the presentations and during selection of the issues to advance for recommendations. The BAC discussed among other topics:

the importance of information from monitoring,
the difficulty of placing a monetary value on the water resource,
the amount and use of water for hydraulic fracturing for petroleum extraction,
water quality and the relationship between water quality and quantity,
the roles of the various agencies in water management (DNRC, DEQ, etc.),
the tools available for instream flow protection, their uses, and some of their limitations,
the impacts of climate change on water availability,
the benefits of local watershed groups,
the water information that is currently available to the public,
the operations of Yellowtail Dam in the Bighorn watershed,
what to expect with the Crow Compact settlement,
the relatively minor impact of groundwater withdrawals (for all uses) compared to surface water uses on water availability,
the artificial aquifer situations created by human activity, and
the need for communication on water management between Montana and Wyoming (especially in the Tongue watershed.)

During Phase 2 the Yellowstone BAC members heard from experts on a wide range of water-related topics and were given opportunity to request clarification and additional information on any of the topics. BAC members, while not necessarily experts in all aspects of water science themselves, appeared comfortable with their level of understanding related to the task of developing recommendations. They also appeared comfortable relying on DNRC staff and ex-officio agency experts for answers to questions that arise during discussion of specific issues. Ex-officio members with expertise in subjects under discussion related to the recommendations will likely be present during those discussions and able to answer questions as they surface.

The BAC's input and feedback was gathered at the series of meetings held during Phase 2 and between meetings by working closely with the Chair and Vice Chair of the BAC. During the three days of meetings, presentations were made and questions and discussion followed.



Figure A-3 Patrick Byorth, attorney for Trout Unlimited, addresses the Yellowstone Basin Advisory Council

Phase 3 - Recommendation Development

During the last day of Phase 2 meetings, the stage was set for Phase 3. Several things were done to prepare for the recommendation development phase. The list of all scoping issues and their previous ratings by the BAC was revisited and validated, key decisions previously made by the BAC were revisited, and proposed screening criteria for recommendations were revisited and validated.

BAC facilitator, Barb Beck, proposed a process to the BAC members for developing recommendations. The recommendations will be the ultimate and most important product of the BAC's work and will be provided to the DNRC for the MWSI. Beck explained the multi-step process and then the BAC agreed to take one of their priority issues and try the process. The process was acceptable to the BAC members and recommendations will be developed in Phase 3 using the steps below;

Define the issue under consideration

Describe the ideal situation with respect to that issue (desired future condition)

Ask the following questions,

What did we learn about this issue during scoping in Phase 1?

What did we learn about this issue from the experts in Phase 2?

Who is affected and how?

Do we need to make a recommendation on this issue? If yes,

What do we want to recommend?

How does this recommendation meet the criteria we have agreed upon? And, do we understand the consequences of this recommendation?

DNRC staff developed a summary of the scoping issues across all of the major basins to update the Environmental Quality Council standing legislative committee and the Water Interim Policy Committee in January 2014. Prior to the legislative committee presentation, the Yellowstone BAC Chair, Mack Cole and Vice Chair, John Moorhouse reviewed and commented on the draft summary of scoping issues document for the Yellowstone Basin. *The Yellowstone Basin Advisory Committee Summary of Scoping Issues* (January 2014) and the *Montana Water Supply Initiative Summary of Phase 1-Public Scoping Process* (January 2014) were e-mailed to the BAC members in mid-January.

The summary of scoping issues addresses the eight priority issues for the Yellowstone Basin and will provide the foundation for recommendation development in Phase 3. The eight issues are:

- Drought readiness
- Water information
- Integrated water quality and quantity management
- Water administration and beneficial use
- Watershed planning
- Groundwater/surface water nexus
- Instream flow maintenance, and
- Water storage

Priority Tasks for Developing Recommendations

Task	Date	Who
Attend and participate in the BAC meetings to develop recommendations	February 25, March 12, April 9, 2014	BAC members DNRC staff Contractor
Discuss preliminary recommendations with constituents and report results at BAC meetings	Ongoing	BAC members
Review and guide staff and contractor in agenda development and process management as requested	Ongoing	BAC Chair BAC Vice Chair
Develop and provide agendas and supporting documents to BAC members well in advance of each meeting	February 7, March 3, March 28, 2014	DNRC staff Contractor
Document BAC meetings Provide accurate notes on timely basis	Ongoing	MSU-Billings staff DNRC staff Contractor
Review and adopt final package of recommendations	April 9, 2014	BAC
Prepare Recommendation Development Report (RDR) transmitting the recommendations of the BAC to DNRC for the MWSI and 2015 Legislature	June 1, 2014	Contractor (DNRC staff and BAC review)