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## **8.0 BASIN ISSUES, STRATEGIES, AND WATER USE OPPORTUNITIES**

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## 8.0 BASIN ISSUES, STRATEGIES, AND WATER USE OPPORTUNITIES

### 8.1 REVIEW AND DISCUSSION OF BASIN ISSUES AND STRATEGIES

The Bear River BAG was formed in 1997 to help develop recommendations for citizen involvement in river basin planning. The group completed the Final Report: Bear River Basin Water Planning Advisory Group [http://waterplan.state.wy.us/BAG/bear/report / report.html](http://waterplan.state.wy.us/BAG/bear/report_report.html) in September 1998. The group was asked to develop a list of issues that were important to the citizens in the Bear River Basin and to river basin planning. These issues were included in the 2001 Bear River Basin Plan and are listed in Table 8-1.

In the summer of 1999, as development of the Bear River Basin Plan started, the BAG was given the opportunity to update their list of issues. The group kept the main categories listed in Table 8-1, but added new issues to the list for each category.

After the completion of the Plan in 2001, the updated issues list was not revisited until 2005 during the development of the Framework Water Plan (WWC, 2007). At that time, the group was asked to select the issues that were most important to them and share their concerns at the Statewide Framework Water Planning meetings. The issues the group selected are highlighted in blue and are listed in Table 8-2. The Framework Water Plan was completed in 2007 and this list is included in Volume II of that report

[http://waterplan.state.wy.us/plan/statewide/Volume\\_II.pdf](http://waterplan.state.wy.us/plan/statewide/Volume_II.pdf).

The latest updates to the Bear River BAG's issues list were incorporated to coincide with this report (see Table 8-2).

Using the issues developed by the BAG, the Planning Team developed a list of strategies to meet the needs of the Basin. The strategies are listed in Table 8-3.



*Bear River South of Evanston at River Crossing for Bear River Regional Joint Powers Board Pipeline Project, 2009*

**Table 8-1: Issues Identified by 1998 Bear River Basin Advisory Group**

Category	Issues
1) Water Allocation	<ul style="list-style-type: none"> <li>a) Current water rights perspective and priorities           <ul style="list-style-type: none"> <li>i) Benefits and impacts of current allocations in different uses</li> <li>ii) Restrictions and opportunities of the Bear River Compact</li> <li>iii) Current law and The Prior Appropriation Doctrine</li> <li>iv) Improving existing allocations</li> <li>v) Water transfers and marketing feasibility</li> <li>vi) Water storage</li> <li>vii) Water conservation</li> </ul> </li> <li>b) Groundwater Definitions           <ul style="list-style-type: none"> <li>i) Rights, availability and uses</li> </ul> </li> </ul>
2) Water Quality	<ul style="list-style-type: none"> <li>a) Water quality impacts and benefits           <ul style="list-style-type: none"> <li>i) Municipal</li> <li>ii) Agricultural</li> <li>iii) Recreational</li> <li>iv) Industrial/Mining</li> <li>v) Subdivisions and infrastructure developments (roads, highways, etc.)</li> <li>vi) Groundwater</li> <li>vii) Water flow/quality interaction</li> </ul> </li> <li>b) Water quality standards and regulation (i.e. TMDLs)           <ul style="list-style-type: none"> <li>i) Historical perspective</li> <li>ii) Point and non-point source differentiation</li> <li>iii) Coordinating standards with neighboring states</li> </ul> </li> <li>c) Water quality solutions           <ul style="list-style-type: none"> <li>i) Locally driven and citizen-based problem solving</li> <li>ii) Monitoring activities</li> <li>iii) State agencies and local conservation district involvement</li> </ul> </li> </ul>
3) Future Demands and Growth	<ul style="list-style-type: none"> <li>a) Current allocation patterns           <ul style="list-style-type: none"> <li>i) Water rights</li> <li>ii) Community heritage</li> </ul> </li> <li>b) Potential shortages by water use sector           <ul style="list-style-type: none"> <li>i) Land and water availability</li> </ul> </li> <li>c) Opportunities and solutions to meet existing and future shortages           <ul style="list-style-type: none"> <li>i) Efficiency</li> <li>ii) New technology</li> <li>iii) Additional Upper Division storage</li> <li>iv) Groundwater</li> <li>v) Public education</li> </ul> </li> <li>d) Miscellaneous growth issues (i.e. floodplains, open space)</li> </ul>
4) Habitat, Wildlife, and Fisheries	<ul style="list-style-type: none"> <li>a) Examine impacts and benefits of existing and future water management activities           <ul style="list-style-type: none"> <li>i) Habitat benefits or impacts of agriculture</li> <li>ii) Impacts and benefits of water storage projects</li> </ul> </li> <li>b) Compatibility of consumptive and non-consumptive uses of water</li> <li>c) Endangered species issues and solutions</li> <li>d) Cost sharing opportunities for projects with benefits to habitat, wildlife and fisheries</li> </ul>
5) Economics	<ul style="list-style-type: none"> <li>a) Evaluation of economic impacts           <ul style="list-style-type: none"> <li>i) Growth and Developments</li> <li>ii) Agriculture</li> <li>iii) Additional Storage</li> <li>iv) New technology and efficiency practices</li> <li>v) Water quality improvements &amp; cost/benefit analysis</li> <li>vi) Recreation/Tourism</li> <li>vii) Marketing water resources</li> </ul> </li> <li>b) Solution funding           <ul style="list-style-type: none"> <li>i) Water conservation incentives</li> <li>ii) Industrial partnerships</li> <li>iii) Growth financing</li> <li>iv) Cost share with other beneficiaries</li> <li>v) Water rate structuring</li> <li>vi) Taxation</li> <li>vii) Water marketing revenues</li> </ul> </li> </ul>

**Table 8-2: Bear River Basin Issues List, 1999-Present**

Category	Issues
Water Allocations	<ul style="list-style-type: none"> <li>- Bear River Compact Administration</li> <li>- Storage <ul style="list-style-type: none"> <li>- Smiths Fork</li> </ul> </li> <li>- Compact Allocation</li> <li>- Town of Bear River</li> <li>- Measuring device installation - info available on Web</li> <li>- Conveyance loss study (UW Water Research Program)</li> <li>- USCOE Flood Study</li> <li>- Groundwater - only compact with groundwater specifically in allocations</li> <li>- WWDC Small Water Projects</li> <li>- Spring development with NRCS in Cokeville</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>- Joint 3 State WQ Committee affiliated with Bear River Commission</li> <li>- Water Quality Task Force - Bear Lake Regional Commission staffs this <ul style="list-style-type: none"> <li>- responsible for reviewing state line standards for compatibility</li> </ul> </li> <li>- Upper Bear River Watershed Plan (in lieu of TMDL)</li> <li>- DEQ 319 Projects <ul style="list-style-type: none"> <li>- Bridger Creek, Thomas Fork</li> </ul> </li> <li>- AML Phosphate Mine</li> </ul>
Future Demands and Growth	<ul style="list-style-type: none"> <li>- Town of Bear River</li> <li>- Cokeville spring developments</li> <li>- Smiths Fork (storage)</li> <li>- Wildlife Refuge land acquisition <ul style="list-style-type: none"> <li>- Woodruff Narrows Reservoir deliveries</li> </ul> </li> <li>- Compact tie to elevation of Bear Lake</li> <li>- Downstream growth pressures on Bear River (Washakie Reservoir in Utah)</li> </ul>
Habitat, Wildlife, and Fisheries	<ul style="list-style-type: none"> <li>- Instream flow applications</li> <li>- Bonneville cutthroat trout petitioned</li> <li>- habitat improvements</li> <li>- upgrading measuring devices</li> <li>- Smiths Fork Reservoir project</li> <li>- Wildlife Refuge</li> <li>- Evanston river restoration</li> <li>- Upper Bear River Watershed plan</li> <li>- Aquatic Invasive Species, ex. Zebra Mussels</li> </ul>
Economics	<ul style="list-style-type: none"> <li>- Town of Bear River</li> <li>- WWDC Level I Study - Smiths Fork</li> <li>- Wind generation - Evanston diversifying</li> <li>- Wildlife Refuge development and related tourism impacts</li> <li>- WWDC Small Water Project program</li> </ul>

Note: Per the meeting held 11-7-2005, the words in blue identify some issues that BAG members wanted to have taken forward to the Framework Water Plan consultant. Issues identified in red were added at the 4-28-2009 Bear BAG Meeting.

**Table 8-3: Bear River Basin Identified Issues and Strategies**

Category	Strategies
Water Allocations	
	Encourage planning for future growth to properly manage and allocate water resources.
	Strategies to meet the increased municipal and domestic water demands should be evaluated.
	Evaluate methods to meet agricultural water needs.
	Identify opportunities for water conservation, re-use and recycling within the Basin.
	Work to maintain and protect water rights within the Basin.
	Maintain accurate data on water supply and use in the Basin.
	Groundwater resources of the Bear River Basin should be described and evaluated.
Water Quality	
	Use DEQ/WQD watershed plans to protect water quality.
	Participate in the Bear River Regional Water Quality Task Force.
Future Demands and Growth	
	Project future agricultural and municipal water system needs and compare to current and future water availability.
	Use master plans to assess growth potential and establish water and infrastructure needs for municipalities.
	Conduct watershed studies to assess water resources and opportunities for agriculture.
Habitat, Wildlife, and Fisheries	
	Consider non-consumptive and aesthetic water uses and needs in planning (habitat, wildlife, fisheries, environment and recreation).
	Quantify recreational and environmental water demands.
	Aid in the prevention of Aquatic Invasive Species migration by draining, cleaning, and drying watercraft (& other equipment) before use in WY waters.
Economics	
	Encourage planning for future growth to properly manage and allocate water resources.
	Groundwater resources of the Bear River Basin should be described and evaluated.
	Identify and pursue water storage opportunities to improve the reliability of existing late season water supplies.
	Conduct watershed studies to assess water resources and opportunities.

*Note: Strategies in black text were taken from the 2001 Bear River Basin Plan. Strategies in red text were added by the planning staff following the 4-28-2009 BAG Meeting.*

## 8.2 FUTURE WATER USE OPPORTUNITIES

### 8.2.1 RESERVOIR STORAGE OPPORTUNITIES

The 2001 Plan indicated that future water use opportunities would require storage to supply water in dry years. There were a number of studies discussed in the 2001 Plan that looked at water storage in the Basin during the 1980's. Primarily because of poor cost to benefit ratios, none of these projects were constructed. A Level I reconnaissance study (Sunrise Engineering, 2004) reevaluated potential reservoirs on Smiths Fork. Six sites were evaluated with three sites on the main stem considered best locations from an operational stand point; the Lower Teichert/Bagley site, the Upper Teichert/Bagley site and the Smiths Fork site. These reservoirs were proposed to be multipurpose including irrigation, flood control and recreation with the potential for municipal and industrial uses and perhaps hydropower. Once again, the study concluded construction of a reservoir on Smiths Fork did not have a positive cost benefit ratio and no further study was undertaken.

A site on Muddy Creek, a tributary to the Smiths Fork, had a cursory evaluation as part of the Framework Water Plan (WWC Engineering, 2007). This site may have less environmental impacts, and therefore may be more suitable than other on-channel sites. Construction costs were not developed for the report and no economic evaluation was done for the site.

Reservoir studies in the Basin's Central Division have shifted to sites on Sublette Creek, which could be filled from a canal and deliver water back to the canal (RJH Consultants, Inc., 2010). The reservoir would be for supplemental irrigation water and recreation. Studies are continuing on this potential project. This reservoir would allow storage of water allocated to the Central Division by the State Engineer from Wyoming's compact storage rights.

At this time, there are not sufficient needs or economic drivers for reservoir construction in the Basin's Upper Division. Additionally, there are no documented needs or sufficient economic drivers for constructing a large storage reservoir in the Central Division. Construction of a small reservoir on Sublette Creek for supplemental irrigation water and recreation may prove to be feasible; however, further study is needed.

If reservoir storage is determined to be necessary to meet future development needs within the Basin, there are a number of alternative reservoir sites that may be considered. The WDO Dam and Reservoir Division has compiled a summary of the potential sites in the Basin. This summary is entitled "Bear River Basin WY: Summary of Potential Dam and Reservoir Project Literature" and can be found at:

[http://wwdc.state.wy.us/dam\\_reservoir/Bear\\_DamRes\\_survey07.pdf](http://wwdc.state.wy.us/dam_reservoir/Bear_DamRes_survey07.pdf)

### 8.2.2 GROUNDWATER USE OPPORTUNITIES

The heavily used Cenozoic aquifer group, including the alluvial deposits, has groundwater available for additional use in the Basin. The Mesozoic and Paleozoic bedrock aquifer groups, particularly the widely used Wasatch Aquifer, are also available for further development. However, groundwater is considered in the Amended Bear River Compact, and therefore, groundwater development and depletions cannot exceed the compact allocations. It was

estimated by Lowry (1992) that 9,790 acre-feet of depletions are available annually from both groundwater and surface water within the Wyoming Bear River Basin.

Older and deeper bedrock formations in the Bear River Basin are generally situated in groundwater compartments formed by the geologic structures of the Overthrust Belt. The use of the older and deeper aquifers (Paleozoic and Mesozoic aquifers groups) may require site-specific hydrogeologic investigations to help identify favorable well sites, depending on the desired use for the Basin's groundwater resources.

## REFERENCES

- Lowry, S., Wyoming State Engineer's Office. 1992. Wyoming's Bear River Basin Base Mapping Project & Estimated Increased Depletions, January 1, 1976 through January 1, 1990. Submitted to the Bear River Commission.
- RJH Consultants, Inc., 2010. Sublette Creek reservoir Mau/Covey Canal rehabilitation Level II Project, Preliminary Design Report Volume I & II, prepared for the Wyoming Water Development Commission, Cheyenne, Wyoming.
- Sunrise Engineering, 2004. Cokeville Reservoir Level I Study, prepared for the Wyoming Water Development Commission, Cheyenne, Wyoming.
- WWC Engineering, Inc. 2007. Wyoming Framework Water Plan Volume I, and Volume II Planning Recommendations. Prepared for the Wyoming Water Development Commission, Cheyenne, Wyoming. Prepared in association with Hinckley Consulting; Collins Planning Associates; Greenwood Mapping, Inc.; and States West Water Resources Corporation.