
9.0 PROGRAM STRATEGIES AND RECOMMENDATIONS

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9.0 PROGRAM STRATEGIES AND RECOMMENDATIONS

This chapter provides program strategies and recommendations for future planning in the Bear River Basin. Program strategies guide the WDO in planning efforts for the Basin. Recommendations are to help the BAG, the WDO and others in their efforts to efficiently use and develop water within the Basin.

9.1 PROGRAM STRATEGIES

There are three major program elements that should be used to improve the basin planning process for the Bear River Basin. These elements are: outreach and agency coordination, data acquisition, and simulation model development. Strategies for improving these elements are presented in the following discussion.

9.1.1 OUTREACH AND COORDINATION

Conducting BAG meetings to discuss water resource issues with local groups and individuals is an important part of the outreach and educational efforts of the planning process. BAG meetings should be held on a periodic basis. Coordination with federal, state, and local agencies is also an important part of outreach efforts. Outreach and coordination efforts should include federal and local agencies within the Basin to exchange information on water resources management and development. These agencies should be included in the BAG issues identification and discussion process. Close coordination should be developed and maintained between the SEO Interstate Streams Division and the WDO planning team. Additionally, coordination should be maintained with the Water Division IV Superintendent, their field staff, and the planning team. Regular meetings should be scheduled with the Cheyenne SEO and the field offices.

9.1.2 DATA ACQUISITION

Acquiring hydrologic (stream flow), climate, and water use data is key to basin planning efforts. The planning team should work with the USGS, SEO, WRDS and other agencies to acquire accurate datasets for the planning efforts. Understanding which data are readily available and datasets that need improvement will help direct data collection efforts. The planning team supports maintaining USGS and SEO stream gages and installing or reinstalling stream gages in important reaches. Working with the SEO Division IV Superintendent and field staff to obtain diversion and water use data is important, as well as working with SEO office staff to obtain and improve current water rights information and irrigated lands mapping. The SEO should continue to update their irrigated lands and points of diversion GIS products for future modeling efforts. Diversion records need to be digitized in order that they may be more readily used as inputs to models.

The planning team must coordinate and work with local, state, and federal agencies to gather current economic and population data to make population and economic growth projections. These data provide the basis for developing future water use and availability projections.

Recreational and environmental water uses are non-consumptive uses, but may impact other water use and development opportunities. Recently, the WDC commissioned the Basin

Planning, Environmental and Recreation, Level I Study, and it is recommended that the planning team apply the data collection and analysis methods being developed in the study to better understand the impacts of these non-consumptive uses. The datasets developed for this study allow for better evaluation of where environmental and recreation water uses exist and where there may be conflicts with other water development projects or where there are opportunities to improve environmental and recreational uses through water development projects. Collecting data will require coordination with federal, state, and local agencies as well as private groups and organizations.

9.1.3 SIMULATION MODELING

Hydrologic spreadsheet models are tools used to organize and analyze data collected on the different elements of water availability and use or demand. For this update, spreadsheet models were used to predict natural stream flows for the Bear River under dry, normal, and wet hydrologic conditions. In the model, water depletions are estimated and then subtracted from the available supply to determine the physically available stream flow. The legally available flow is then derived from compacts or decrees to provide the amount of water available for development.

To obtain better estimates of natural flows, depletion and water remaining for development, a simulation model should be developed in lieu of the spreadsheet models. A water rights based simulation model along with more complete datasets will allow more accurate estimations of water available for future use and development. A move toward a decision support system for the Bear River Basin should be part of the basin planning process.

9.2 RECOMMENDATIONS

This section addresses the major issues of concern presented by the BAG through the planning process. There have been several meetings where these issues were discussed and refined. This section further discusses information and suggestions developed during this plan update process. The primary issues presented by the BAG members include water allocation, water quality, future water demand and growth, habitat, wildlife and fisheries, and economics.

9.2.1 WATER ALLOCATION

At this time and for population/use projections out to 2030, there is adequate water within the Basin to address the needs and changes in water use. The Basin population is growing at a moderate rate and this is not expected to change in the near term. However, planning for future growth and expansion is important and an evaluation of potential changes in the economy should be part of this planning effort. A full economic analysis was not completed for this update, however the information gathered did not indicate significant changes in the economy.

The major problem with water allocation is availability throughout the entire year. From October to April there is estimated to be more streamflow than is being used and consumed or depleted; thus there are no estimated shortages. Conversely, during the irrigation season from May through September, there can be easily shortages in both the Upper Division and the Central Division.

To finally determine where shortages and surpluses occur, October to April uses and depletions must be determined. Once established, these variables can then be included in a simulation model that will better predict when and where shortages occur and when and where water is available. Management of stored water and increasing the amount of storage through reservoir enlargements or construction of new reservoirs could address the potential shortages. The WDO is planning to develop a simulation model and decision support system in the near future that will help define shortages and strategies to address them.

Groundwater resources in the Basin could also be used to address some of these shortages. Groundwater use is governed by the Bear River Compact (Amended Bear River Compact, 1978) and its use is considered part of the total water allocation. However, groundwater could be available when surface water supplies are short.

Groundwater resources are not heavily used in the Basin. Cokeville depends on groundwater and all rural domestic water use is from groundwater. Additionally there is some agricultural irrigation from groundwater. However, irrigation using groundwater only makes up about 2% of the irrigated agricultural water use. Groundwater uses do not stress the aquifer system at this time.

A groundwater study is underway by the Wyoming State Geological Survey to further define the groundwater resources of the Basin. Once this study is completed, there will be a better understanding of the groundwater resource, its availability and potential for future use.

Regarding reservoir storage, end of month storage content needs to be collected at all major reservoirs in the basin (i.e. those reservoirs that are used for calculating the consumptive use loss associated with evaporation). Noteworthy differences were found on an annual basis when using actual end of month content (recorded at Woodruff Narrows Reservoir) to determine evaporation amounts rather than using fixed reservoir elevation values.

Where end of month storage content values were available, the mean annual loss to evaporation for Woodruff Narrows over the period 1971-1996 was found to be 850 acre-feet or 20% lower than that calculated using the fixed elevation method in this update.

Additionally, for this update, evaporation data from the weather station at Green River was used, which is in another river basin entirely. To avoid having to extrapolate rates over such distance, monthly, at a minimum, evaporation data need to be collected at the reservoirs and made available in order to more accurately determine water loss.

9.2.2 WATER QUALITY

Water quality in the Basin is generally good. There are two stream segments on the DEQ, WQD 303(d) List of impaired waters: the Bear River between Sulphur Creek and Woodruff Narrows Reservoir and Bridger Creek. Both of these impairments are being addressed through implementation of best management practices. When these impairments are fully addressed, these stream segments should be removed from the 303(d) List. If problems still remain that prevent the development and implementation of a DEQ watershed plan, a WDC watershed study would be advisable.

Furthermore, to be aware of any other potential water quality issues in the Basin, local agencies and the SEO and DEQ, WQD should participate in the Bear River Regional Water Quality Task Force.

9.2.3 FUTURE WATER DEMANDS AND GROWTH

Analysis in this update does not show future water demands and growth exceeding the available water supply under the Compact. Master plans should be used to evaluate potential growth of cities and towns, and watershed studies should be used to assess water resources available for irrigation. These studies should provide options for water development, conservation and management to help meet population growth and increased water demands.

9.2.4 HABITAT, WILDLIFE, AND FISHERIES

This update has added a great deal of information on environmental and recreational water use and demands. Environmental and recreation water demands directly coincide with habitat, wildlife, and fisheries water demands. Most of these demands are non-consumptive but may affect other water uses. Quantifying environmental and recreation water demand is not feasible through this plan update, but knowing where the demands exist will help in project planning and development in the future. From the information available, there are more environmental and recreation demands in the Central Division than in the Upper Division, and many of these demands are on the Smiths Fork.

Depending on the project location, these demands may impact water development projects. Development projects must seek to address environmental and recreation issues and try to complement them through a collaborative planning process. An example would be working with the GFD in their crucial habitat areas to limit impacts to the species of concern.

Controlling and preventing Aquatic Invasive Species remains a major concern in the Basin. Federal, state and local agencies must be aware of the effects of invasive species and work to prevent their migration into the Basin. The GFD has developed a Wyoming Aquatic Invasive Species Management Plan (GFD, 2010). They have conducted boat inspections for Quagga and Zebra mussels at major reservoirs over the state and have a self-check program at smaller less used reservoirs.

9.2.5 ECONOMICS

The economics of the Bear River Basin have not changed greatly since the 2001 Plan. Although a full economic analysis was not undertaken for this update, there were no indications of expansive future growth. As indicated in the previous sections, continuing the planning efforts and tracking growth are the best ways to determine changes in the economic climate. Water is currently available to meet development needs, although some water management or storage may be necessary to meet any significant growth. Future master planning efforts and watershed studies could provide detailed descriptions of available resources and ways to meet increasing water demands for municipalities and industries interested in expansion.

REFERENCES

Bear River Compact, as amended, 1978.

<http://legisweb.state.wy.us/statutes/titles/title41/c12a01.htm>

Wyoming Game and Fish Department. 2010. Wyoming Aquatic Invasive Species Management Plan.