

# Little Bear River Hydrologic Unit Area

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In 1989, in response to landowners' concerns, the Blacksmith Fork Soil Conservation District (SCD), and the Bear River Resource Conservation and Development Council (RC&D), approved and submitted to U.S.D.A.'s Soil Conservation Service, an application for Hydrologic Unit Area (HUA) planning and implementation funds for the Little Bear River (LBR) Watershed. Approval of that request was granted in 1990.

## Project Location, Land Use and Agronomics

The Little Bear River Watershed is located in Cache County, Northern Utah. The watershed encompasses 196,432 acres and includes irrigated cropland, irrigated pasture, meadow pasture, non-irrigated cropland and pasture, and rangeland. Two reservoirs are located within the project area (Porcupine and Hyrum), with a third just down stream from the project area. Land use is approximately 70% range/forest/wildlife, 19% irrigated cropland, 7% dry cropland, and 4% other.

Land ownership is 85% private, 11% national forest, and 4% state lands.

Land within the watershed is primarily used for livestock feed production and as grazing land for livestock and wildlife. There are 36,807 acres of irrigated cropland, and 14,682 acres of nonirrigated cropland within the watershed. Crops produced include corn, small grains, alfalfa and pasture/hayland. The remaining 144,943 acres consist of rangeland, forestland, waterbodies, and towns.

## Non-Point Source Pollution Problems

The Little Bear River watershed was identified by the Utah NPS Task Force as a high priority watershed in Utah, needing treatment to resolve nonpoint source pollution impacts. The most obvious pollutant is sediment produced from streambank erosion of the Little Bear River channel between Porcupine and Hyrum Reservoirs, and between Hyrum and Cutler Reservoirs.

A second problem area includes several tributary drainages to the Little Bear River approximately four miles upstream from the Hyrum Reservoir. These small drainages are heavily impacted by intense summer convection storms and rapid snowmelt runoff. During these events high peak flows cause severe erosion of the main and tributary channels. Sediment and nutrient loading to the river system also results from road damage and cropland erosion.

A third problem is created when excessive amounts of nutrients and coliform enter the system after being flushed from concentrated animal feeding operations (CAFO), pasture

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and cropland located adjacent to the river. A major portion of the river corridor is used for livestock grazing and crop production.

A fourth problem develops from high phosphorous input into the Hyrum and Cutler Reservoirs causing accelerated eutrophication.

A fifth problem occurs along the western and southern shorelines of Hyrum Reservoir when wave action beats against the toe of highly erosive bluffs. This action causes major sloughing that results in sediment deposition to the reservoir.

## Demographics

Approximately 12,000 people live within the hydrologic unit area. About 8,200 individuals live in the incorporated communities of Hyrum, Paradise, Wellsville, and Mendon. The remainder live in unincorporated areas.

## Purpose

The objectives of the Little Bear River Project are as follows:

- Reduce erosion of streambanks by 80 percent and rangeland erosion by 70 percent on acreage identified as critical.
- Reduce nutrient and sediment water pollution impacts coming from cropland, pastureland, farmsteads, CAFO's and rangeland to both surface and ground waters to meet Utah's water quality standards.
- Improve the quality of water within the Little Bear River system to augment fish and wildlife habitat, enhance the aesthetics, recreational, agricultural and municipal water quality.
- Inform and educate all individuals associated with the project area of the need to manage the resource within the watershed in such a way as to maintain and improve water quality and water related resources.

- Isolate water quality problem sources, monitor progress in reducing water quality impacts, determine effectiveness of treatment alternatives, and evaluate economic benefits for implementing water quality improvement activities.

Present conditions do not indicate a groundwater pollution problem within the LBR drainage. The practices planned will help insure that the present quality will be maintained.

## Planning Overview

The Little Bear River Hydrologic Unit Area is large. It includes 34 subwatersheds, over 50,000 acres of cropland and well over a hundred miles of stream channel. The planning and inventory activities were directed to address scoping and technical concerns first.

The watershed plan uses a Geographic Information System (GIS) database. Many of the overlays produced by the GIS have been valuable in developing accuracy in inventory, analysis, planning evaluation, acreage, lengths, and sizes in general.

## Public Participation & Scoping

The majority of planning activities initially were focused on scoping concerns of land-operators, landowners, environmental awareness groups, government agencies with a vested interest, technical considerations, and civic leaders such as city mayors and Soil and Water Conservation Districts.

## Organization

Under guidance of the SCD Board of Supervisors and the RC&D Council with cooperation of various federal, state, and local agencies the Little Bear River Steering Committee (LBRSC) was formed. The responsibility of the Little Bear River Steering Committee includes program leadership and direction. This committee includes community leaders, landoperators, environmental group leaders, and Little Bear River Water Users Association representatives.

In 1989 the Little Bear River Steering Committee established a Technical Advisory Committee for the purposes of inventorying, evaluating, and developing conservation treatment alternatives to address water quality problems. The Technical Advisory Committee is also responsible for providing technical expertise for implementing the approved treatment plans.

The Technical Advisory Committee, in an effort to address nonpoint source water quality concerns, provides leadership for Coordinated Resource Management Planning (CRMP) efforts of five work groups. The five work groups are: Hydrology/Sediment/Range, Cropland, Wildlife and Recreation, Monitoring and Evaluation, and Information and Education.

Work group team leaders are members of the Technical Advisory Committee and direct the planning and implementation efforts of each group.

## Land Treatment and Best Management Practices

In general, bank stabilization measures are being implemented along the banks of the Little Bear River where needed. Efforts to armor the west shoreline of Hyrum Reservoir are planned. Filter strips are being established in areas where they will be most beneficial. Rangeland is benefiting from; grazing management, seeding, fencing, livestock water development and deferred grazing. Pasture treatment includes proper grazing use, fencing, livestock watering facilities, irrigation water management, seeding, and improved irrigation systems. Riparian zones and streams are benefiting from drop structures, rock pools, vegetative enhancement, and streambank protection. Cropland improvements include, irrigation water management, irrigation system improvements, improved tillage practices and crop rotation. Feedlots located along the channel or tributary channels are being managed to reduce pollutants by excluding livestock from the channel and providing alternate sources of water. Also waste control practices such as installing manure storage bunkers and other animal waste control facilities are being implemented. All land treatment practices that reduce NPS pollution in the LBR HUA have beneficial effects on the aquatic life, fisheries, waterfowl, etc.

## Information & Education

Within the Little Bear River Watershed approximately 88 percent of the land is privately owned and approximately one-third is in cropland. Many farmers view their role toward the natural resources they manage from the standpoint of stewardship of the land. Stewardship, however, requires knowledge about environmental problems, such as ground- and surface-water contamination, riparian management, and the adoption of practices that preserve long-term soil productivity and water quality. The effective treatment of NPS ground-water and surface-water pollution in the Little Bear River Hydrologic Unit requires the timely delivery of educational materials and conservation technology.

The LBR hydrologic unit's Information and Education (I&E) work group objective is to attack the problem of NPS water pollution at the local level and use education as a force for increasing understanding and changing current behavior.

## **Technology Transfer**

Technology transfer in the area of water quality and riparian management can be a complex issue. It involves identifying the problems, compiling information and sometimes developing technology capable of making improvements. Next, one must be able to assess the target audience where this technology must be applied. Often the target audience is unaware of the problem or the technology available to remedy the problem. The target audience requires valid reasons why the technology should be adopted and assistance in adapting the technology. Finally, the impacts of this technology on both the targeted audience and the situation it is designed to address must be assessed.

Many groups, organizations and government agencies are seriously concerned about water quality and riparian management but their approaches differ. By addressing the issues within the Little Bear River Watershed in a coordinated resource management planning (CRMP) style, the existing problems have been more accurately identified, the occurrence of conflicting messages to the target audiences are being minimized, inaccuracies are being reduced, the scope has been broadened, information is being better coordinated and misinformation is being curtailed dramatically. In this way the hydrologic unit area is able to communicate a consistent message to effect needed and acceptable changes.

Within the LBR watershed several methods have been used to improve the communication of technology from researchers to landowners, operators and the general public. Continuing efforts to improve this communication link is an important element of the Information & Education work group's efforts. One means, being used to assist in effectively transferring technology is a Geographic Information System (GIS). In addition to being an

effective and accurate means of transferring technology, the GIS provides a rapid means of putting together various planning scenarios, provides accurate measurements of areas and distances and produces impressive visual aids that can be effective tools in helping to gain public and landowner support and participation.

## **Interactions With Cooperators**

Much of the success of the Little Bear River Hydrologic Unit is dependent not only on direct financial support from cooperators but also on their active participation in research and technology transfer. Establishing strong working relationships between researchers, work group members and resource managers is essential for rapid exchange of information. Many individuals within the watershed have developed innovative strategies to deal with problems in resource management. The Information and Education work group is building on this expertise by involving cooperators as speakers on field trips, at workshops, and as contributors to the LBR newsletter. We also seek advice from cooperators on the objectives, topics and design for research. Cooperators are also instrumental in providing operational-scale support such as yearly stream channel maintenance.

Active involvement of key individuals and cooperating organizations, helps work group members focus on significant problem areas and increases the application of research results. The development of open communication between these work group members and cooperators enhances the two-way flow of new information vital to the hydrologic units objectives.

## **Increasing Public Awareness and Cooperation**

Many Cache Valley residents take an active interest in the management of our natural resources, among them the water resource ranks very high, perhaps number one. Unfortunately, public understanding of this resource and of the problems surrounding its management is often incomplete, resulting in misperceptions of the issues and complexity

involved. Consequently, the Information and Education work group will continue to seek an increased public understanding of the Little Bear River Hydrologic Unit's objectives and the steps necessary to achieve those objectives.

Establishing strong linkages between agencies is critical if we are to be successful in addressing water quality and riparian management issues. These linkages take time, a lot of hard work, and a commitment to success. It not easy, but the goal is worth the effort. Just as no one social system is responsible for a problem, no one system alone can solve it. Fragmented communities don't need fragmented services. In a new age, as Appley and Winder put it, "competition as a valued behavior can no longer ensure survival in the turbulent environment." The old Cowboy management approach must go the way of the frontier. Instead, the more we work together, the more we have the possibility of better understanding complex problems and acting on them in an atmosphere of trust, cooperation, and mutual respect.