RESOURCE NOTES

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Sheep Creek Resource Conservation Area: A Model of Interagency Collaboration

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Background

The Sheep Creek Resource Conservation Area (RCA) in southern Utah represents an excellent example of interagency collaboration at the watershed level. The Sheep Creek watershed is in the headwaters of the Paria River drainage, the highest sediment-producing tributary of the Colorado River system. Sheep Creek was selected in 1956 as the site for an interagency project to demonstrate watershed stabilization and sediment reduction measures as part of the U.S. Bureau of Reclamation (USBR) Colorado River water storage plan.

Sheep Creek originates in Bryce Canyon National Park in southern Utah, at an elevation of about 2,400 m. Average annual precipitation varies from 12 inches at the lower elevations to 16 inches at the higher portions of the basin. Vegetation is predominantly pinyon–juniper with open sagebrush flats. The 37-square-mile Sheep Creek RCA was composed of portions of Bryce Canyon National Park and the Dixie National Forest, Bureau of Land Management (BLM)-managed lands now part of the Grand Staircase–Escalante National Monument, and scattered private lands.

Land treatments and participating agencies included:

- Wildlife and livestock barriers—Utah Department of Fish and Game (now the Division of Wildlife Resources), BLM, U.S. Forest Service (FS)
- Vegetation treatments—BLM, FS, National Park Service (NPS), Soil Conservation Service (SCS)
- Climatic and hydrologic monitoring—U.S. Geological Survey (USGS)
- Water and sediment-control structures—USBR, NPS, BLM
- Livestock management—BLM, FS, grazing association, and private landowners in cooperation with the SCS

Vegetation treatments included sagebrush plowing, pinyon–juniper chaining, grass reseeding, browse planting, and ponderosa pine (*Pinus ponderosa* spp.) seeding.

Structural treatments included more than 600 small gully plugs and earthen check dams, two large sediment retention dams, a dike waterspreader system, streambank stabilization, and a mainstem barrier dam with concrete spillway.

Livestock management practices included fence construction, season-of-use changes, reduced stocking rates, and the development of livestock water supplies.

Discussion

Cooperating agencies agreed on Sheep Creek as the demonstration or pilot watershed because it was a tributary to the Paria River, had poor watershed conditions, and exhibited good treatment potential. This was not to be a research undertaking—rather, it was a demonstration of the practical application of structural measures and land treatments for improving watershed conditions, decreasing sediment yield, and increasing the yield of forage and forest products. Each agency determined and implemented the treatment methods and management policies for those lands under its jurisdiction. Agency work plans were coordinated under 5-year cooperative agreements. Work planned by more than one agency within a specific subwatershed was also coordinated across agencies.

Each agency evaluated its own work; periodic RCA-wide evaluations were made cooperatively. The USGS established long-term monitoring sites (permanent transects) on the lower Sheep Creek channel to assess changes in sediment deposition and channel morphology. The transect ends were marked with aluminum monuments, allowing periodic resurveys of

the sediment deposit and stream channel above the barrier dam.

Other BLM scientists and I completed a watershed-wide evaluation of the project, concluding that the Sheep Creek RCA treatments resulted in 1) improved watershed cover on more than 500 acres, 2) an estimated 1,000 acre-feet of sediment trapped, 3) an estimated 5,000 lineal feet of main channel aggradation, 4) an estimated 6 miles of gullies healed, 5) the reduction of flood peaks, 6) the creation of more than 15 acres of riparian and wet meadow vegetation above the Sheep Creek Barrier Dam, and 7) the establishment of perennial flow at the barrier dam.

I completed followup evaluations of the sediment deposit and stream channel morphology behind the barrier dam. By April 1984, the upper limit of sediment deposition was 4,670 feet from and 59 feet above the spillway. At that time, 75% of the deposit was above spillway elevation and a well-defined rectangular channel had formed on the sediment deposit. Since 1984, the sediment deposit has continued to increase in elevation but has stopped migrating upstream. The channel continues to form on top of the sediment deposit, exhibiting a high width-to-depth ratio at the upper end and a low width-to-depth ratio closer to the spillway.

Conclusions

Although the Sheep Creek RCA was planned and implemented under the resource management paradigm that existed in the 1950s and 1960s, the interagency collaboration that occurred at Sheep Creek represents a model of resource management cooperation that is still valid today.

In addition, the Sheep Creek RCA presents an opportunity for continuing to monitor the results of watershed treatments and evaluate the effectiveness of a variety of land treatments, both vegetative and structural. Furthermore, the Sheep Creek watershed could be used as an outdoor laboratory for studying solute transport and storage mechanisms and salinity control practices. Such a use would be entirely consistent with the purposes for which the Grand Staircase–Escalante National Monument was created.

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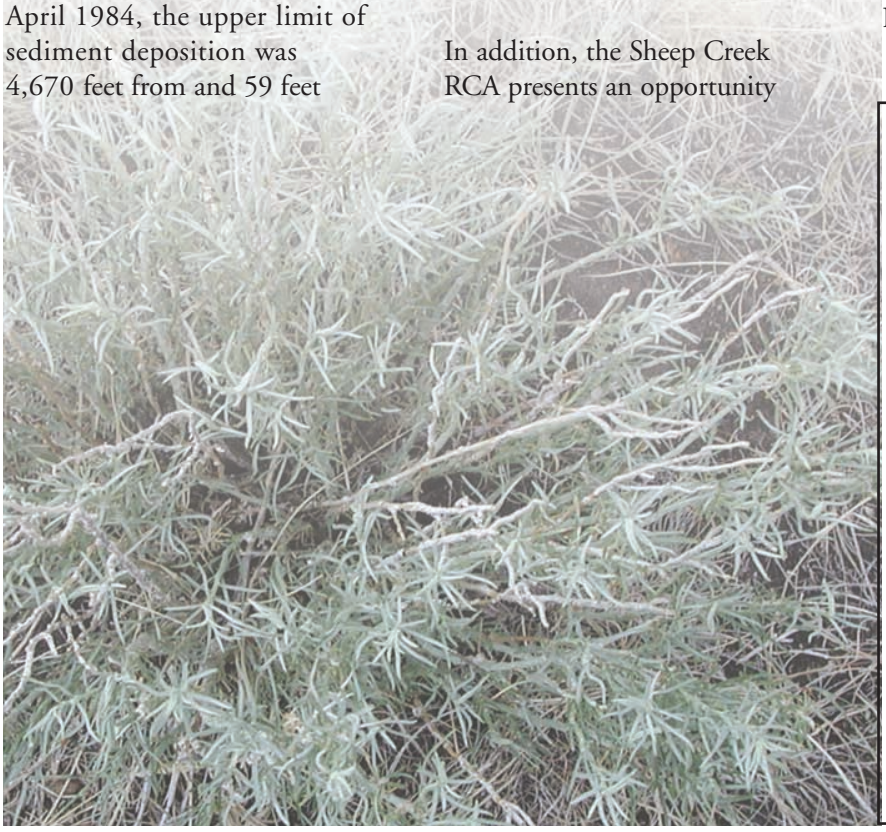

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