

# Crystal River Stream Management Plan

## ■ July 2015 ■



*The goal of the Crystal River Stream Management Plan is to identify, prioritize, and guide management actions that honor local agricultural productivity, preserve existing water uses, and enhance the ecological integrity of the river.*

The Crystal River Stream Management Plan (SMP) project team worked throughout the spring and early summer to further develop Ecological Decision Support Systems (EcoDSS) and Ecological Functional Assessment (EFA) components of the project. Modeling and data collection this summer will help evaluate and compare options designed to support healthy ecological functions of the river. They will provide insight regarding the effects of off-channel storage, improved irrigation efficiency, and modification of the channel bed on habitat availability and quality for trout, recruitment opportunities for cottonwood trees in riparian areas, and conditions suitable for sustaining the macroinvertebrate communities that represent a critical part of aquatic food webs.

Some highlights from recent ecological studies include:

**Riparian Vegetation Evaluation:** In June 2015, a team of Riparian Ecologists conducted a survey of the Crystal River's streamside vegetation to evaluate how native plant species have changed over time. Results will be critical to assessing management options as we work to improve and protect this important aspect of the Crystal River watershed.

**Geomorphology Survey:** Also in June, a team of geomorphologists conducted a second geomorphological survey of the Crystal River, from Marble to the confluence with the Roaring Fork. This survey was conducted at a finer resolution than the first - taking an in-depth look at the shape of the river's channel, the size of sediment in the riverbed, the production and transport of sediment within the watershed, and interactions between the river and streamside land uses. Preliminary findings show the observed channel structure and dynamics reflect expected natural processes with only minor evidence of degradation due to land use practices.

*Geomorphology is the study of landscapes and the processes that create them. Scientists study these dynamics to understand both the function of landforms and also how these landforms respond to changes in energy (i.e. how riverbanks respond to changes in streamflow).*

**Irrigation Efficiency Evaluation:** Many stakeholders remain interested in understanding the impact of employing irrigation efficiency improvements on streamflows at various locations on the Crystal River. Recently completed modeling work helps us understand how managing diversions according to soil moisture and crop needs, and subsequently accounting for lagged groundwater return flows, impacts

The CWCB released the second draft of the Colorado State Water Plan July 15<sup>th</sup>. Public comment period will be accepted through September 17<sup>th</sup>, with the final draft of the plan expected December 10<sup>th</sup>, 2015. The Crystal River SMP is one of the top three Roaring Fork Basin priority projects in the draft Colorado River Basin Implementation Plan (BIP). The draft Colorado River Basin BIP calls for basin-wide stream management planning to determine and balance non-consumptive and consumptive water needs.

patterns of streamflow and agricultural use shortages on the lower Crystal River between Avalanche Creek and the Roaring Fork River. These results will be summarized soon and presented in the fall of 2015.

**Channel Modification Modeling:** In March, Dave Rosgen of Wildland Hydrology Consultants presented a conceptual plan for restoring a 1.7 mile section of the Crystal River running through River Valley Ranch. The plan aims to improve fish habitat, protect against flooding, and create stability in the stream system by engineering the channel with features to slow water down and stabilize the Crystal's banks. The impact of similar types of channel modification on various sections of the Crystal is an important consideration as we continue developing our analysis of alternative water management scenarios. The project team is currently working to develop a model to understand the impacts of installing grade control structures and narrowing/deepening channels on trout habitat availability and quality.

**Next Steps:** The Project Team continues to develop and execute a process that will allow stakeholders to identify and prioritize different water and land management strategies for enhancing and preserving important ecological attributes on the Crystal. Discussions planned for the fall of 2015 will utilize a collaborative process for evaluating the feasibility of management alternatives and outlining the core components and recommendations of an implementation plan.

**Crystal River Conversations:** On March 24, Chris Treese of the Colorado River District led an animated conversation with community members discussing how off-channel storage might be developed in the Crystal River watershed. The discussion covered a variety of topics including: availability of water in the system, potential reservoir sites, funding and management, and implications for the proposed Wild and Scenic designation.

**Update on Agricultural Efficiency Legislation:** The most recent

Join us at the next Crystal Conversation this fall. We will be hosting a conversation with a leading water attorney to discuss how current Colorado Water law supports water conservation and efficiency improvements without compromising water rights. Stay tuned for details!



State legislative bill to create a pilot program for agricultural efficiency transfers to the CWCB died in the Colorado Senate for lack of support. However, SB 13-019, passed in 2013, is being put to use in several parts of the state. This law protects water users who conserve water as part of an approved conservation program with the Colorado River District or another government entity. Water users can conserve and transfer water in 5 years out of 10 and the law prohibits water judges from factoring decreases in use in those years into the historic consumptive use record.

Photo 1: Seth Mason (hydrologist), Scott Gillilan (geomorphologist) and Brad Johnson (riparian ecologist) examine vegetation and sediment near the Carbondale Ditch headgate.

Photo 2: Riparian ecologists Mark Beardsly and Jessica Doran discuss the relationship between the channelization of the Crystal River and the water-loving vegetation observed across from the Colorado Rocky Mountain School.