

S&T Highlights

Improving Decision Support

Improved precipitation estimates.—A new refinement was written for inclusion in a precipitation accumulation algorithm that uses NEXRAD radar data to estimate precipitation at the ground. It excludes from consideration all radar echoes associated with dry surface air. That greatly reduces false estimates from ground effects under clear skies and from virga (precipitation not reaching the ground). These improvements make the precipitation estimates more accurate and believable and therefore more likely to be useful to water managers. The results from the new routine are already available at <http://www.usbr.gov/pmts/rivers/awards/index.html>. (Edmond Holroyd, 303-445-2276)

Improving Water Delivery Reliability

Management guidelines to reduce endangered species conflicts from saltcedar control at Reclamation water projects.—Good progress has been made this winter in meeting with project partners and selecting study sites along the **Rio Grande, Pecos, and Arkansas Rivers**. Avian point counts, acoustic bat surveys, and riparian butterfly surveys and habitat analysis will be conducted in May, June, and July to collect baseline data on planned saltcedar removal sites and on previously controlled sites, using control methods such as aerially applied herbicides, mechanical clearing, burning, and biocontrol. These biological data will be used to determine how wildlife species respond to saltcedar control methods, as well as to determine the potential for unintended adverse impacts to threatened, endangered, and special status species, such as the southwestern willow flycatcher, yellow-billed cuckoo, and Bell's vireo, as well as many other riparian species that are watch listed, or State species of concern. Data and management guidelines developed from this 3-year study will provide Bureau of Reclamation (Reclamation) resource managers with the knowledge and tools to implement saltcedar control projects on Reclamation water projects that are designed to protect and enhance threatened and endangered species' habitat to reduce the risk of adversely impacting water and power deliveries. (Susan Broderick, 303-445-2235)





Biological studies will determine how wildlife species respond to saltcedar control activities. This is a mechanically cleared saltcedar site with a mature cottonwood canopy on the Rio Grande in **New Mexico**.

*Development of revegetation strategies, methods, and infrastructure to meet land retirement and restoration demands in the **Central Valley of California**.*—Under California's Land Retirement Program (LRP), tens of thousands of acres of farmland impacted by drainage are being retired from irrigated agriculture in the central-western **San Joaquin Valley** as one avenue to mitigate a complex drainage problem complicated by elevated soil and groundwater salinity (specifically selenium and boron content). In order to assess restoration potential for, and environmental impacts of land retirement, an interagency team has implemented a 5-year research and demonstration project to test plant materials and planting methods for reestablishment of native, salt-desert shrubland plant communities on these retired agricultural lands. These plant communities supply and augment critical habitat needs for designated species of concern within the Central Valley Project Improvement Act (CVPIA) (e.g., the kit fox, and the giant kangaroo rat). This research will develop viable alternatives for land owners and water users regarding plant establishment techniques, weed control, cover crop usage, soil texture amelioration and species adaptation, soil microbial remediation, and integration of grazing and prescribed fire.

A longer-term, larger-scale goal of this project targets three major activities to develop partnerships and increase involvement of water users and suppliers to (1) expedite refinement and application of research on species adaptation and planting methods in light of limited supplemental water, extreme soil salinity,

and weed competition, (2) develop infrastructure and coordination between research, industry, and end users that will connect agency, commercial, and private stakeholders in common, cost-effective pursuit of site restoration, and (3) determine how plant selection, propagation, seed increase, and supply of plant materials can be coordinated for landscape-scale application. (Kenneth Lair, 303-445-2005)



Tranquility mustard site seeding.



Deep furrow plots.

Improving Water Supply Technologies

Stakeholder participant interviews completed.—Reclamation and the University of Idaho have recently completed stakeholder participant interviews as part of a research project to explore groundwater banking in the **Eastern Snake River** plain aquifer of **Idaho** and across the west. About a dozen participants were interviewed, representing a wide range of interests, including irrigation, aquaculture, fish and wildlife, and environmental interests. Participants agreed on the need for sound hydrologic accounting methods to protect aquifer health, and for the most part were cautiously optimistic about the opportunity to meet a greater range of water needs by managing the additional storage capacity represented by the aquifer. Opinions diverged concerning the proper role of market mechanisms in a banking system and the potential for banking to aid in restoring aquifer health. This research is important to Reclamation in two ways. The first is its potential to aid in obtaining required water for endangered species purposes, while minimizing the impact to other water uses. The second is that exploring banking concepts helps Reclamation fulfill its mission of promoting improved water management practices across the West. (Robert Schmidt, 208-378-5081)

Improving flow measurements to conserve Colorado agricultural water.—Reclamation's Water Resources Research Laboratory (WRRL) group has established a demonstration project in northeast Colorado near **Sterling** for monitoring flow rates with radio telemetry in cooperation with other water entities. Limitations in irrigation water supply in this region are a consequence of the drought conditions of the past 3 years, as well as recent State Supreme Court rulings that forced changes in how groundwater wells are administered.

As a result, irrigators in eastern Colorado are facing dramatically expanded needs for measuring and recording flows, including surface diversions, groundwater pumping, and delivery to artificial recharge ponds. Artificial recharge has become a means of expanding the limited water supply. Excess flow from the **South Platte River** that is available during the nonirrigation season after storage reservoirs have filled is diverted and delivered to ponds. Seepage from the ponds becomes a source of augmentation water to offset depletions caused by operation of groundwater wells.

The rapidly escalating need for measured and recorded flows has overwhelmed the ability of the Colorado Division of Water Resources to process data in a timely manner, the bulk of which are currently recorded using paper chart recording instruments. The State is encouraging water users to consider recording devices with electronic logging capabilities as alternatives to paper chart recorders. For the demonstration project, radio-controller units have been installed. Units at two flow measurement sites on the South Platte Ditch recharge system collect and process flow measurement data.

The cost per installation will be in the range of the price of a paper chart recorder. Real-time, two-way communication represents significant potential value to an irrigation district in terms of timely availability of flow information needed for matching augmentation supplies to pumping depletions. Additionally, the units can operate gates automatically, with the ability to change set points from a remote location. Performance of the units will be monitored and documented during the winter recharge season. (Tom Gill, 303-445-2201)



The signal from the measurement site is received approximately 15 miles away via a not-line-of-site path using a small antenna atop the Lower South Platte Conservancy District Office.



Installation of a radio-controller unit on the Sandhill measurement site of the South Platte Ditch Recharge System.



A computer at the Lower South Platte Conservancy District Office polls and communicates with field sites via radio.