



Aquatic & Wetland News



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Sand Creek Project Honored

Local Stream Restoration Project Receives International Recognition

Aquatic and Wetland Company was internationally recognized earlier this year with the contractor of the year award presented by the International Erosion Control Association. The award honored AWC's design/build/grow team in their restoration of a highly degraded reach of Sand Creek at Bluff Lake Park near the former Stapleton Airport site. The project has also been recognized for environmental excellence by the Colorado Contractors Association and the Association of Landscape Contractors of Colorado. AWC was responsible for designing the erosion control and revegetation components of the project and partnered with Camp, Dresser and McKee for other portions of the design.

Bluff Lake Park is a 123-acre parcel that includes a lake, 30 acres of wetland, a 0.7 mile reach of the Sand Creek corridor, short grass prairie and a remnant cottonwood gallery. The reach of Sand Creek that extends through the park presented particularly challenging erosion control issues. The soils along the entire corridor are highly erodible sands. Runoff to the stream has increased dramatically in recent years due to increased development throughout the watershed. The flows that Sand Creek must convey are extremely flashy and markedly higher than natural levels. The streambanks must accommodate this overload. These flow conditions had created vertical banks that were over 12' high in some areas as well as channel downcut by 4'. Both these factors contributed to the degradation, and in many areas, lack of riparian habitat. The project presented other challenges as well, including existing structures in need of protection. The option of energy dissipation through floodplain widening was not economically or politically feasible. Therefore, the project design/build team developed several

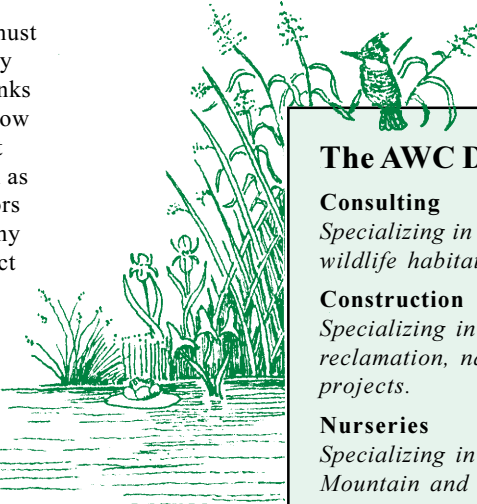


The orchids are blooming and the mice are scurrying (Ute Ladies' Tresses and Preble's Meadow Jumping to be specific). If you are planning a project in the Colorado Front Range that may impact wetland or riparian areas, give AWC a call today to discuss your need for a Threatened and Endangered species survey.

project specific erosion control techniques to address the issues at hand.

The goals of the project were to stabilize the highly erodible banks, lessen the channel gradient to a slope deemed stable for sand systems, restore riparian and upland vegetation along the creek corridor, augment wetland habitat, and maintain compatibility with the adjacent environmental education

(Please see Sand Creek page 3)



Regulatory Update

NWP 26 Replacements Issued

On March 9, 2000 the Federal Register published the 5 new Nationwide Permits and 6 modified NWPs that replaced NWP 26 when it expired on June 7, 2000. The new and modified NWPs authorize many of the same activities that NWP 26 authorized, but the changes have made the permits activity-specific. The Corps is also modifying 9 NWP general conditions and adding two new NWP general conditions. These new conditions will increase protection of designated critical resource waters and waters of the U.S. within 100-year floodplains, ensuring that authorized activities result in minimal negative impacts to the aquatic environment. According to the Corps, the new and modified NWPs will substantially increase protection of aquatic resources while still providing for efficient authorization of activities.

Under the new permits and modifications, the maximum acreage limit for impact to wetlands/waters is 0.5 acre. Most of the new permits require notification to the district engineer for losses of greater than 0.1 acre of wetland/waters. The following NWPs were modified or added:

- NWP 3 Maintenance
- NWP 7 Outfall Structures and Maintenance
- NWP 12 Utility Activities
- NWP 14 Linear Transportation Crossings
- NWP 27 Stream and Wetland Restoration

(Please See Regulatory page 4)

The AWC Design/Build/Grow Teams

Consulting

Specializing in stream and wetland restoration, regulatory issues, wildlife habitat enhancement, and environmental assessments.

Construction

Specializing in the construction of ecological restoration, reclamation, native landscape construction and maintenance projects.

Nurseries

Specializing in wetland and riparian plants for the Rocky Mountain and Southwest Regions.



AWC

**Environmental Consulting
Engineering
Landscape Architecture**

**Construction
Reclamation**

**Landscape Construction
Landscape Maintenance**

**Wetland Plants
Native Trees and Shrubs**

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New(er) Faces at AWC

AWC is excited to welcome some new additions to our staff. **Carolyn Trayler**, fluvial geomorphologist, has joined the consulting team. Carolyn adds a watershed-based perspective to AWC's stream restoration projects by evaluating the relationship of basin-scale hydrology and geology to river hydraulics, sediment regime and morphologic patterns.

Tom Roberts also joins the consulting team to augment our landscape architecture services. Tom's experience and education combine a knowledge and understanding of the functioning of healthy ecosystems with the design skills of landscape architecture. Tom and Carolyn are currently working with other consulting staffers on the West Ten Mile Creek restoration project at Copper Mountain.

In 1999 AWC added threatened and endangered species consulting to our scope of services. **Celine Pliessnig**, a wildlife biologist from the University of Colorado, is a U.S. Fish and Wildlife Service trapping permit holder for the Preble's Meadow Jumping Mouse. This spring marks her second trapping season with AWC. Celine also provides consulting for other species of concern and the Clean Water Act.

Also in 1999 AWC expanded our construction services to include reclamation, native landscape construction and landscape maintenance. **Janet Drotar** brings 18 years of experience to AWC and is exceptionally skilled in all aspects of reclamation implementation. As Reclamation Manager for AWC, Janet is responsible for estimating and managing the implementation of all reclamation projects. **J. J. Dabbs** and **Andy Anderson** will be on the front lines lending their expertise in heavy equipment operations and reclamation technology, to ensure that projects are completed on-time, within budget and meeting all performance and safety standards.

Karen Overlin is utilizing her experience in the design/build and management of large-scale commercial landscape projects to lead the landscape construction team. Karen functions primarily in the construction arena, but her training and experience in landscape design add value through her ability to translate design intent into field construction. **Steve Smith** will be adding his expertise in irrigation design and construction to the landscape construction team as field

coordinator. **Geronimo Guerrero** and **Juan Carlos-Avila** will be helping Karen and Steve fulfill the \$1.3 million of contracts online for 2000.

Judianne Koch will be keeping Janet and Karen busy as the new Reclamation/Landscape Estimator.


Bill Zawacki, Certified Landscape Technician, exemplifies AWC's commitment to total project quality as the manager of the Landscape Maintenance group. As part of the design/build/grow process, the maintenance program is critical for assuring the successful establishment of restoration projects. Independently, the maintenance department provides quality services including native rough-cut mowing, weed management, trash removal, pruning, fertilization, tree and shrub care, shrub bed maintenance, mulching, irrigation maintenance, winter watering and snow removal. Landscape Maintenance can be a dirty job and as Superintendent, **Johnathan McFarlin** and his crews are doing it.

Robert Smith has joined AWC as construction field coordinator. Robert will be overseeing the implementation phase of the design/build/grow project delivery system utilized by the company as well as independent construction projects. In addition to his years of construction management experience, Robert has over 100 hours of OSHA training. **Gus Welch** will be helping out as construction foreman.

AWC will keep on truckin' with our drivers **Kenny Kent**, **Dave Klinge**, **Larry Robertson**, and **Darryl Schriener**. **Tommy Vasquez**, our new Master Mechanic will make sure of it.

The nursery team will continue to increase its availability of native trees and shrubs with the addition of **Jan Steury** as nursery production team leader. Jan brings seven years of experience in the horticulture industry to her new position.

Tiffany Ewing keeps everything running smoothly as the Fort Lupton Office Manager. Behind every successful company are the folks who make sure the bills and the employees get paid. For us it's **Bobbi Lennon**, Accounting Manager, and **Chris Flick**, Accounts Payable/Payroll Clerk.

This article has been brought to you by AWC's tireless Human Resources Manager **Jenny Briggs**. 

(Sand Creek from page 1)

facility. Because of the combination of a high need for stability and the goal to restore biological functioning to the corridor, the design plan needed to creatively integrate stabilization techniques known to be effective for these different challenges. To meet these goals, Aquatic and Wetland Company took a design approach that embodied three main principles: integrate hard protection and bioengineered treatments, restore biological function, and create a meandering low flow channel within an armored flood channel.

AWC used a double terrace with boulder toe and brush layering to treat the high, eroded banks throughout most of the project. This treatment consists of a row of boulders placed on a rubble foundation at the toe and the top of the slope. Brush layering is installed at an angle behind the lower row of boulders and native trees and shrubs are installed on the terrace. The slope protection in this treatment comes primarily from the two rows of boulders and secondarily from the root structure, which will be created as the vegetation matures. The vegetation also serves to create riparian habitat and function. The brush layering will eventually grow out over the boulders, screening them from view to create a more natural look. Additionally, the brush layering provides shade and overhead cover for fish.

In some areas, specifically low-risk inside bends, hard treatment was not necessary. In these areas a willow log designed specifically for the project was used for toe material. The logs were constructed onsite by hand. To construct the willow logs, a rectangular piece of erosion control fabric was laid out flat. A strip of mulch mixture and a strip of

willow cuttings are laid out on opposite sides. The whole thing is rolled up burrito-style with the willows on the outermost layer. The logs were staked into place at the toe of the slope and willow wattling was installed behind. Several months after installation, the treatment showed exceptional growth and resistance to high flow events.

One of the most challenging areas of bank work in the project was at the location of a hazardous waste burial site. Prior to the restoration project, the burial site was treated with loose rubble and grouted riprap. While this treatment provided the needed protection, it did not meet the habitat, aesthetic and environmental education goals of the project. AWC designed a geocellular confinement combination treatment to create biological functionality in this section. By the end of the first growing season, the treatment exhibited full vegetative cover, improved aesthetics and enhanced biological function.

The erosion control solution for Sand Creek was not entirely in the treatment of the streambanks. In order to reduce the velocity of flows through the corridor and consequently reduce the erosive capacity of the water, the channel gradient was lessened utilizing two drop structures. The structures were constructed in a step-pool design with 18" drops and 3' deep pools. The size of the drops was determined to be 18" maximum to allow for fish passage and to create a

natural aesthetic. The stabilized channel invert will promote a stable water table with localized increases which will help to sustain and augment the revegetated riparian corridor.

Aquatic and Wetland Company was responsible for securing the necessary 404 permits for the project. Mitigation required under the permit included the creation of 0.14 acres of wetland habitat to compensate for impacts incurred during construction. The wetland is

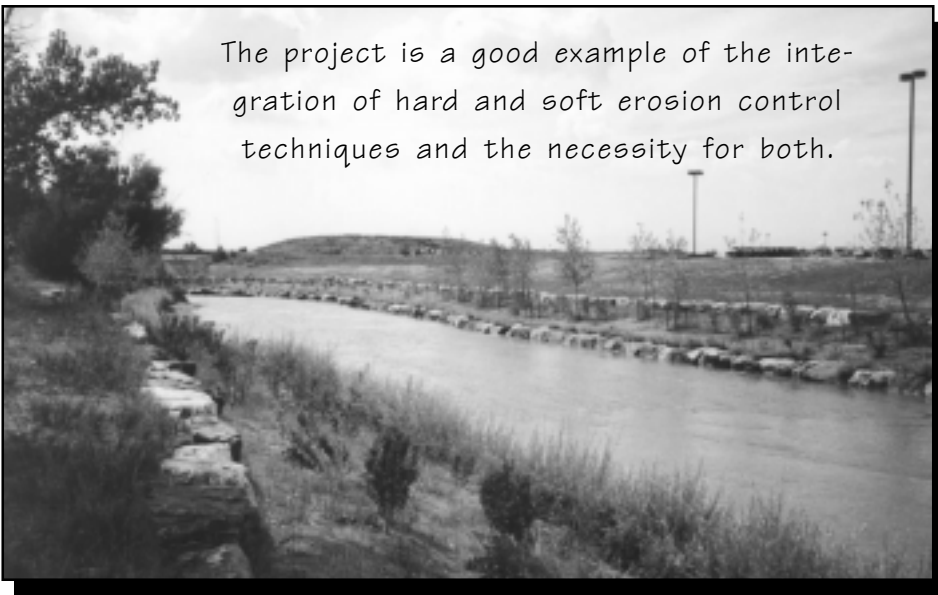
sustained hydrologically by flows in Sand Creek.

AWC designed the planting plan for the corridor to replicate the communities found in undisturbed riparian areas in the Colorado Front Range. These included cottonwood galleries, riparian scrub/shrub and transitional shrub zones, wetland zones, riparian perennial zones and shortgrass prairie zones. The planting plan showed sensitivity to the project's location within an environmental education facility. All of the vegetation was grown at the AWC nursery facility. The diversity of habitat has already proven to be attractive to a variety of wildlife. Great blue heron and black crowned night heron have been seen hunting along the creek and in the new wetland area. A duck family has been routinely observed near the new wetland.

The project is a good example of the integration of hard and soft erosion control techniques and the necessity for both. Combined with the sound application of engineering principals, bioengineering can be an appropriate solution for managing erosive floodwaters. The reach of Sand Creek that runs through Bluff Lake Environmental Education Center will mature to fulfill its obligation as an educational resource that provides functional wildlife habitat while reducing threats to existing structures and adjacent property. Most of the project can be seen by walking the creekside trail at the Bluff Lake Environmental Education Center in Denver. The park is accessed from Havana Street, south of I-70. AWC would like to thank the City and County of Denver and all those who helped make this an award winning project. 🌿

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Return of the Natives

Featured Species:

Mahonia Repens

Creeping Mahonia, Oregon Grape

Creeping Mahonia and its relatives, which include some of the most cold resistant of the broad-leaved evergreens, have leaves that look like holly leaves and fruit that looks like grapes, but they are related to neither. In landscaping, Mahonia is one of those less common plants that provides year-round interest. In the spring, Oregon grapes bear short clusters of bright yellow flowers at the tops of their stems. The flowers are followed by bluish black, edible, berries, which can be made into a tart but tasty jelly. It's feather-shaped leaves, composed of tough, leathery, spiny-edged leaflets, turn an attractive bronze or burgundy in cold weather. In landscaping, Mahonia repens is an attractive ground-cover shrub for borders or beds. It is heat and drought tolerant and is seldom bothered by pests. The grape-like fruits will feed birds all

summer long. This low growing shrub (2-3 ft.) is found on thinly wooded slopes or shaded hillsides up to 10,000'. In native restoration projects, wildlife including birds, black bears, deer and elk enjoy the berries and browse the leaves. Successful stand establishment requires reduction of competing vegetation before and during establishment. Navajo native americans produced a yellow dye from the roots and a lavender dye from the fruit. A tea obtained by boiling the roots was used for thickening blood and curing dysentery. The tea was considered effective for curing coughs, kidney problems and venereal diseases.

AWC's 2000 Plant Selection Guide and Catalog contains detailed information about many more native species. Call 303.442.4766 to request a copy. 🌿

(Regulatory from page 1)

Activities

NWP 39 Residential, Commercial and Institutional Developments

NWP 40 Agricultural Activities

NWP 41 Reshaping Existing Drainage

Ditches

NWP 42 Recreational Facilities

NWP 43 Stormwater Management Facilities

NWP 44 Mining Activities

For complete details of the new and modified permits, please check the AWC website at www.aquaticandwetland.com/regupdate or call the AWC consulting office at 303.442.5770. 🌿

Colorado Water Facts

The average humidity for Colorado, measured at noon, is 38%.

The natural rotation of the Earth has been altered slightly by the 10 trillion tons of water stored in reservoirs over the past 40 years, according to NASA.

AQUATIC AND WETLAND COMPANY

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