

LA Drainage Goes Native

Citydwellers are accustomed to rain water being whisked down a drain and out of sight. While those who live on the edges of concrete flood control channels may have marveled at an occasional torrent in winter, or dreamed of skateboarding down these dry riverine chutes in summer, **the general idea of getting the water away from the people prevails. Esther Feldman thinks otherwise.**

"We're so rich in water-moving infrastructure in our cities and so poor at tapping it where it could do the most good," says Feldman, director of a nonprofit called **Community Conservation Solutions.**

This summer, Feldman's organization is piloting a new analytical tool that not only taps an untapped local water supply — the 969 miles of metropolitan storm drains in Los Angeles — but also has the metrics to earn carbon credits for doing so.

"It's very practical, you just stick your straw in the local water source rather than pumping it into the city from hundreds of miles away," says Feldman. This local water can then be used to irrigate and vegetate the urban ecosystem, and to recharge groundwater.

Decades of ups and downs in Sierra snowpack, California's go-to water supply, capped by five years of drought,

continue to inspire big picture thinkers to come up with greater efficiencies, especially in Los Angeles, where 90% of the supply comes from Northern California, the Owens Valley, or the Colorado River. Moving water from north to south and east to west takes energy and produces greenhouse gases. In an era when climate change impacts on water supply are coalescing around deteriorating infrastructure in still growing cities, finding enough water for the future isn't simple any more. It's all about sharpening our focus on where the water is and how to use it.

In Los Angeles, county public works projects capture enough rainwater to serve the annual needs of 1.5 million residents, but with the right projects, officials think they could double or triple that amount. And it's not just rainfall that's whisked out to the Pacific. In the upper Los Angeles River watershed, people hosing down hardscapes, washing cars, and irrigating greenery produce enough dry season runoff (affectionately known as 'urban drool') every 48 hours to fill the Rosebowl.

According to the pilot Green Solutions tool, **there are many promising spots on public property in the upper Los Angeles River watershed where stormdrains could be tapped to irrigate quiet, leafy, pretty parks and pathways in communities sorely in need of places to stretch legs and push strollers.** "With this

tool you don't have to start from scratch and you don't have to buy land. **It tells you what the best projects are to do and in what order,"** says Feldman.

When Feldman explained the new Green Solutions tool to me, it took an hour to cover all its bells and whistles. In very basic terms, the tool identifies likely stormwater capture sites on public lands and then prioritizes them based on how close they are to a storm-drain, as well as community need and carbon footprint, among other variables. The process has sorted 453 projects within 500-1500 feet of a stormdrain or flood control channel, and identified 87 of highest priority.

The water and energy use analysis is particularly interesting. Apparently, implementing all 453 projects would generate enough new local water supply, and aquifer recharge, to serve 52,000 homes and replace nine percent of the imported supply used in the watershed. Tapping water already in the local system, meanwhile, would reduce the greenhouse gas emissions associated with long-distance delivery by an amount equivalent to travelling 1 billion vehicle miles.

"As funding becomes scarce, it makes no sense to do projects that only achieve one outcome," says Sean Vargas of VS2 Consulting Inc., consulting engineer on the Green Solutions team. "To do multi-benefit projects, we need to choose and prioritize. The good thing about this tool is you can 'twist the dials.' You can balance environment, money, and people equally as you 'squeeze the water balloon,' or you can favor one at the cost of the other. But no matter what you do, the tool will help you deliver a better project."

Ramona Gardens is high on the tool's priority list. When we arrived at this 1940s era cinderblock affordable housing development, the first thing I noticed was the sound of greenhouse gases being produced by thousands of combustion engines. Twelve lanes of highway and a rail line barrel past these homes just a few steps away from the bedrooms of 700 children.

"Most families in our community are used to being told this is what you get, and you should be happy about it," says Lou Calanche, who grew up near the 500-unit housing project in Boyle Heights, one of the three most polluted neighborhoods in California. Calanche now runs a youth leadership and

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A stormdrain and flood control channel in Tuyunga Wash, an early stormwater recapture project; South Los Angeles Wetland Park. Photos: Tira Okamoto & Wikimedia (poppy)

LA DRAINAGE, *cont'd from page 10*

education program called Legacy LA. "Our youth dream about a tree buffer between their homes and the highway to filter the noise and fumes."

This summer, local youth working for Legacy LA will go door-to-door to get residents' opinions on Green Solutions proposals to improve the long linear strip of space between their homes and the freeway. The bones of this proposed greenway include two and a half acres of native plant habitats around a newly created stream, all filled and irrigated by cleaned stormwater or dry weather runoff. The tool estimates the proposed project would develop 80 acre-feet of new water supply every year, replacing potable water now used to water lawns and ballfields while also irrigating new habitat. The project would also sequester 2,300 tons of CO₂ within the plants and trees in 20 years; reduce greenhouse gases by 2,900 tons in the same period; and cost \$5-\$10 million.

"This is an opportunity to change our environment, and it's not just about aesthetics, but also about creating places where people can congregate in positive ways rather than in the negative ways we're known for," says Calanche, referring to the neighborhood's reputation for gang violence and police tension.



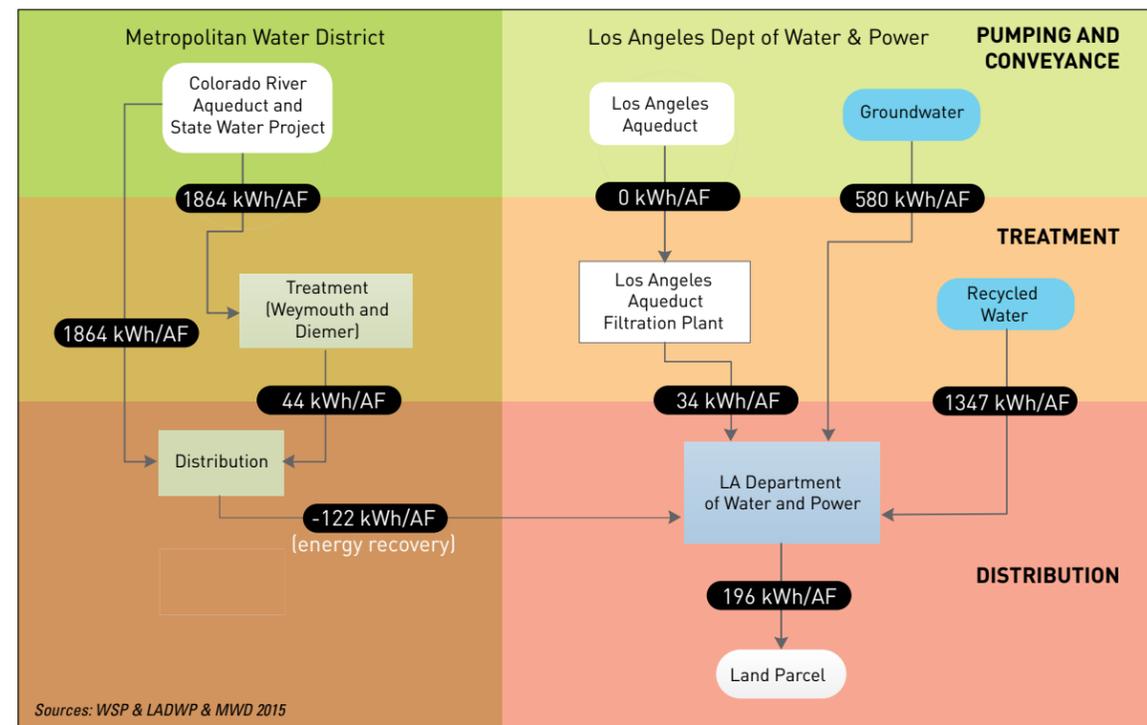
Though Calanche says the community has been focused on environmental justice, she thinks the new project can expand their conversations to include water. "Maybe it's time to change policies so we can have front-yard vegetable gardens instead of green grass, which the housing authority is still watering. There are no brown lawns here, but it is a food desert," she says.

The Green Solutions team and their funders, which include the Santa Monica Mountains Conservancy and the California Coastal Conservancy, made an active choice to work on Ramona Gardens, according to Vargas. "Other projects in other places might be easier to implement, but true sustainability has to include people," he says.

Vargas is no tree hugger, but he's seen the results of making this kind of choice to work in a tough neighborhood first hand. He was the lead engineer for the South Los Angeles Wetland Park (see photo p. 5), now maintained by the City of Los Angeles Bureau of Sanitation. This award-winning project transformed a disused maintenance yard for buses and rail cars (a former toxic brownfield) into a lush wetland park in the midst of the infamous "South Central" area. The project pulls 14,000 gallons of dry-weather runoff (40,000 in wet weather) per day out of an adjacent stormdrain and passes it through three constructed wetland treatment cells. It then returns any excess, much cleaner, to the drain before it flows out to the Pacific.

The community was shocked when they saw the plans for the project for the first time. "When we said 'stormwater treatment' they imagined an ugly black building with smokestacks smelling of sewage," says Vargas. Instead the community ended up with a parkland of pools, boulders, bridges, and cattails and bulrushes now so tall they have to be regularly trimmed. "Every morning when we open the gate at 7 am, people flood in," says Vargas.

ENERGY CONSUMPTION OF LOS ANGELES WATER (LADWP)



Sources: WSP & LADWP & MWD 2015

"In a high-desert Mediterranean climate like Los Angeles, you get rain for 4-5 months then nothing," says Vargas. "So our technical challenge was how to find the water to keep our urban wetland alive year round. We developed a water budget that used urban slobber when it wasn't raining, and also had the capacity to treat the first flush of the dirtiest water when the wet season starts."

The regulatory hammer on storm water pollution prevention has been over the heads of California cities and counties since the most recent update to the Clean Water Act. In 2014, fueled by the Green Solutions' vision of multi-

"missing link," says Feldman, because it was such a challenging stretch of riverbank to drain and plant. On the opposite bank, all we can see is rocky armor. But on this side grow more than 3,000 newly-planted native trees, shrubs, and flowers.

The team doesn't use just any plants, they use a very specific mix, density, and spacing of native species modeled on local habitats long since paved over. By organizing them into something they call "habitat tiles," this planting design offers a scalable unit of upland and riparian species. The unit can be applied to any parcel

and then quantified, in terms of the amount of greenhouse gas each tile's 105-251 trees, shrubs, grasses, and perennials can trap and store.

To get these numbers, the Green Solutions team began by computing the impact of a single tree, and then layered

it into the appropriate species mix and spacing across 5,000 square feet. "The habitat tile is a useful communication tool to help people understand how we're breaking down this problem of quantifying greenhouse gas benefit into a replicable unit," says Tim Kidman of WSP.

Kidman and co-consultants from ESA Associates were responsible for developing all the metrics necessary to calculate the carbon footprint of each potential Green Solutions project. Calculations looked not only at sequestration in plants, but also water delivery distance and onsite energy use for irrigation.

"At the end of the day, it's the weighting of all the metrics, and the chance to create an intersection of this information for decision-making, that's innovative about our tool," says Kidman. The hope is the strong metrics will help these kinds of ultra urban forestry projects become candidates

for cap and trade credits in the climate change mitigation market. **ARO**

Don't miss the extended story online www.sfestuary.org/estuary-news

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LA Green Solutions Tool: <http://gsp.conservationsolutions.org>



LA River Greenway Trail (above) and Ramona Gardens (p. 6).

benefit stormwater projects, California took it to another level. Senate Bill 985, championed by Senator Fran Pavley, offers a framework and incentives for regional land and water managers to do more complex and connected projects.

"Right now we have a very disjointed water management system, both in LA and in other major cities," says Feldman, lamenting the lack of logic in choosing where to do multi-benefit projects, which was a big impetus for development of the tool. "We wanted to come up with a prioritized way to do the best projects and get the most water."

The project Feldman is most excited about is the LA River Greenway Trail, which opened to the public this June. The day of our visit, we slip past a striking metal gate, a welded work of river art, and down a path the Green Solutions team has created along the river. This half-mile project connects two other popular riverside trail projects to create four miles of continuous bike and walking path. For years it was the

TOOLBOX

Bay Area Kit Streamlines Flood Control Choices

The Flood Control 2.0 Project's new online toolbox offers a comprehensive, six-section kit for planning multi-benefit flood control projects.

- 1. Channel Analysis** includes an interactive map illustrating historic and current information for 353 creeks, information on channel sediment dynamics, and high level management concepts for 33 major flood control channels.
- 2. Implementation Projects** presents reports and data on three flood control channels that flow into San Francisco Bay—lower San Francisco Creek, lower Novato Creek, and lower Walnut Creek.
- 3. Regulatory Analysis** assesses the current flood protection infrastructure in the Bay Area and its maintenance and repair needs, analyzes the challenges that come with implementing multi-benefit flood control projects, and offers case studies.
- 4. Economic Analysis** provides a tool for a cost-benefit comparison of traditional flood control vs. multi-benefit flood reduction approaches.
- 5. SediMatch** provides an online database to match dredged sediment with bayland restoration projects that need sediment.
- 6. Podcasts** providing personal perspectives from scientists and managers.

TOOL: floodcontrol.sfei.org

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