Denver says yes to green roofs; GSI gets 24% of capital budgets; Caterpillar magnets for chickadees

News and commentary for emerging green infrastructure markets

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COMING UP THIS WEEK:

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Denver voters say yes to green roof mandate

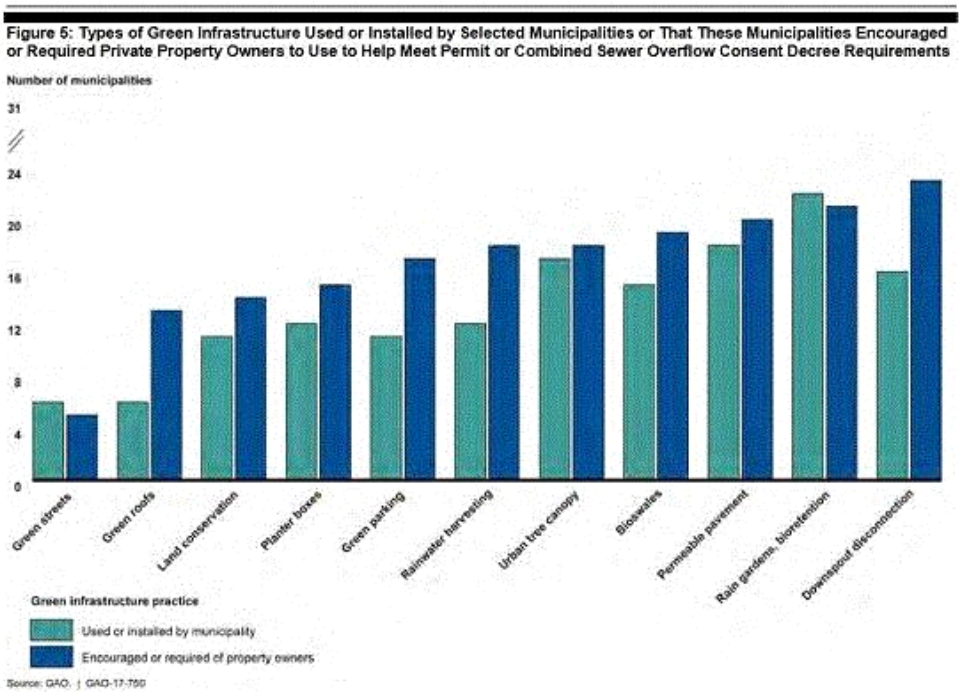
About 54% of those voting on Denver's Green Roof Initiative (I-300) said yes to mandate the use of green roofs. The initiative, which now moves to implementation phase, requires new buildings with 25,000 sq. ft. or more to include green roofs (vegetated and cool roofing materials) that would absorb rainwater and reduce urban heat. Existing buildings may trigger the requirement when replacing their roof if building permits are required for the work.

The measure's proponents say it's time Denver put action to its sustainability rhetoric by putting in place programs to deliver results. The green roof ordinance would be a step in that direction.

Citizens for a Responsible Denver mounted a counter campaign, significantly outspending green roof proponents. Opponents expressed concern that the mandate removes flexibility from construction projects and will raise costs.

As I-300 moves into implementation, Denver's City Council will have a pass at how and to what extent that happens. In September they were briefed on the proposal. Denver's mayor came out against I-300 in advance of the election.

GAO report to EPA shows GSI gains traction



In a report issued this fall by the Government Accountability Office, EPA was encouraged to document collaborative agreements with stakeholders moving forward with green stormwater infrastructure pilot implementation. The report states, “EPA could better assure that the stakeholders will successfully develop long-term stormwater plans if it documents how the stakeholders will collaborate.”

The 31 randomly selected municipalities surveyed regarding their use of GSI were doing so to comply with Clean Water Act (CWA) permits of consent decrees signed regarding their CSOs. 20 with NPDES permits were randomly selected from 5,000 municipalities with NPDES permits and 11 with EPA Consent Decrees were selected randomly from 36 with consent decrees.

Diving into the numbers shows that GSI is a stormwater management tool that’s taking hold. While 26 out of 31 surveyed municipalities said green infrastructure is more challenging than gray infrastructure, 25 of them said they were using it anyway. Among the reasons they cite were because it performed better, had co-benefits or the community wanted to use it.

About half of the 31 municipalities said that less than 5% of the area covered by their permits or consent decree drains into green infrastructure. The three most commonly used types of GSI are 1) downspout disconnection; 2) bioretention and 3 permeable pavement.

Twenty-seven municipalities provided additional information about how much area drains into GSI. Of them, 15 said that less than 5% drained into GSI while 6 said that more than 20% of the relevant area drains to GSI. Six municipalities said from 5-20% of the covered area drains to GSI.

Most fund GSI through general revenues and stormwater fees. Seventeen municipalities provided information comparing capital expenditures for GSI to gray infrastructure. Overall, they reported spending about 24% of capital expenditures on GSI to meet permit or CSO consent decree requirements. The remaining amount was spent on gray infrastructure.

Municipalities choosing to implement GSI in the face of difficulties said they did so for three main reasons: 1) using GSI is a learning opportunity; 2) belief that GSI would perform better or provide additional benefits than gray infrastructure and 3) the community wanted to use GSI. There’s plenty of work to do in convincing staff that GSI is a proven technology. Per the report, "The longer tenured engineers who were reluctant to use green infrastructure had an outsized influence on whether the engineering department would do so.”

EPA began encouraging cities to use GSI to meet permit requirements and to comply with CSO consent decrees

beginning in 2007 under the George W. Bush Administration.

Chickadees prefer native woody caterpillar magnets

Desiree Narango, together with a small army of citizen scientists from Neighborhood Nest Watch, is taking a look at the ecological wildlife value of trees and shrubs planted in the lawns of homeowners throughout the Washington D.C., Maryland and Northern Virginia area. Desiree is one of Doug Tallamy's graduate students at the University of Delaware. She's on a mission to document the value of residential yards to birds.

Desiree has discovered that the plants supporting a greater variety of caterpillar species are the most attractive to chickadees that rely on caterpillars to feed their young. Through her studies of 203 yards, she also found that native species of trees and shrubs attract more caterpillars than non-native species.

"One of the most ubiquitous threats to biodiversity today is the conversion of native plant communities into plant assemblages dominated by non-native species. Such conversions have triggered debate about the benefit of managing non-native species, particularly when it is unclear how well introduced plants support wildlife and management is financially and logistically challenging," the authors write in their introduction.

Top 15 woodies for caterpillars

1. *Quercus*—532 (both)
2. *Prunus*—456 (both)
3. *Salix*—455 (both)
4. *Betula*—411 (both)
5. *Populus*—367 (both)
6. *Malus*—308 (both)
7. *Acer*—297 (both)
8. *Vaccinium*—294 (native)
9. *Alnus*—255 (native)
10. *Carya*—235 (native)
11. *Ulmus*—215 (both)
12. *Pinus*—201 (both)
13. *Crataegus*—168 (native)
14. *Rubus*—163 (both)
15. *Picea*—150 (both)

From: Smithsonian Migratory Bird Center Lepidoptera Index dataset

The study documented more than 375 different tree and shrub species in the 203 yards. Natives fostered more caterpillars and were therefore preferred, but even they differed in their impact. Prunus, Quercus and Ulmus were the most preferred natives for the vast numbers of caterpillars they harbor.

While some non-natives also provide for caterpillars, some like Zelkova, Ginkgo and Syringa don't provide resources for breeding birds.

Non-native species that have native relatives, like ornamental cherries and Japanese maples provide on average 40% fewer caterpillars than their native relatives. "If you had a choice between a black cherry and a Japanese cherry and if you're interested in food for birds, then you should choose the native version," Desiree said in a blog post.

UD's Desiree Narango looks at how residential yards impact food webs by Adam Thomas for the University of Delaware.

Native plants improve breeding and foraging habitat for an insectivorous bird by Desiree L. Narango et al in *Biological Conservation*.

DOI: 10.1016/j.biocon.2017.06.029

CA Sustainable Landscape Organizations to Merge





EcoLandscape California and ReScape California have formally agreed to merge their operations. The merged organization will continue to train landscape professionals and home gardeners in the principles of river-friendly and bay-friendly landscaping, while leveraging the strengths of both organizations to reach more people and transform more landscapes throughout northern California. “Each organization has been using similar methods to bring the benefits of healthier landscapes to our respective regions,” said Marian Bender, Executive Director of EcoLandscape CA, which is based in Sacramento.“This merger will allow us to unify our message and share infrastructure so that we can focus our resources on offering more education programs."

“Our ultimate goal is to transform landscapes across our state to be healthier and more sustainable in the face of water shortages and climate change,” said Ann-Marie Benz, Executive Director of ReScape California, which is based in the Bay Area. The merged organization will retain the name ReScape California, with headquarters in Berkeley. Benz will stay on as Executive Director of the merged organization.

Soil survey database annual refresh

The entire official USDA soil survey database was refreshed October 31, 2017. Four new national interpretations have been added this year:

Farm and Garden Composting Facility—S**urface**. Composting facilities are designed to provide six critical factors in relative proportions so that the process of biological degradation is sustained. Deficits in any of the critical factors, or imbalances among them, may result in extremely slow composting, or a dormant composting system.

Fragile Soil Index. Fragile soils are those that are most vulnerable to degradation. They are easily degraded (have low resistance) and are highly susceptible to erosion with low resilience. They are characterized as having low organic matter contents, low water-stable aggregates, and low soil structure. Fragile soils are generally located on sloping ground, have sparse plant cover, and tend to be in arid and semiarid regions.

NCCPI—**National Commodity Crop Productivity Index** (version 3.0). This NCCPI interpretation replaces version 2.

Soil Susceptibility to Compaction. This interpretation is designed to predict the susceptibility of soils to compaction from operation of ground-based equipment for harvesting and site preparation activities when soils are moist. Root penetration and growth is decreased in compacted soils because the hardness or strength of these soils prevents the expansion of roots.

New research adds insight about milkweed species

Monarchs are host specific to asclepias and cynanchum in the US, but it turns out that not all native milkweeds are equal. Based on experiments conducted in greenhouses at Iowa State University, it was discovered that monarch survival probability varied from 30% to 75% among nine native milkweeds.

Larva had a lower probability of reaching adulthood on prairie milkweed (*A. sullivantii*) and tall green milkweed (*A. hirtella*). In the greenhouse-conducted test, only 30% of the larvae fed *A. hirtella* and 36% fed *A. sullivantii* reached adulthood. *A. tuberosa*-reared larvae reached adulthood 75% of the time while *A. exaltata* reached adulthood 72% of the time. The researchers note that the overall larval survival rate was higher than 50% for the study, higher than larvae survival in the field.

Iowa has 17 native milkweeds, the study included nine of them: common milkweed (*Asclepias syriaca*); swamp milkweed (*A. incarnata*); butterfly milkweed (*A. tuberosa*); whorled milkweed (*A. verticillata*); showy milkweed (*A. speciosa*); poke milkweed (*A. exaltata*); honeyvine milkweed (*Cynanchum laeve*); prairie milkweed (*A. sullivantii*) and tall green milkweed (*A. hirtella*).

Authors stated that monarchs could be successfully raised on all nine of the plants studied and recommended that when planting habitats, the focus should be on selecting plants that will perform best in the specific site and geographic location.

Milkweed Matters: Monarch Butterfly (Lepidoptera: Nymphalidae) Survival and Development on Nine Midwestern Milkweed Species by V M Pocius, D M Debinski, J M Pleasants, K G Bidne, R L Hellmich and L P Brower in *Environmental Entomology*.

Reader comment

The headline "Maryland Heights: Plant natives or else" is not correct. They are only banning invasive non-natives, not all non-natives. I assume they will still allow hosta, begonia, tomatoes, carrots, etc.—Bcorr on *Maryland Heights: Plant natives or else*

Events

November 17: Flora for Fauna Symposium (NY)

The **Flora for Fauna Symposium** at Farmingdale State College brings together top plant, restoration and wildlife professionals to share their vision, leadership and expertise at this one day educational event, to encourage the use and stimulate a commercial supply of ecotypic flora for the benefit of regional fauna.

November 30: New York Ecological Landscape Conference (NY)

The Ecological Landscape Alliance (ELA) and Brooklyn Bridge Park are hosting the **New York Ecological Landscape Conference** at Prospect Park, Brooklyn, New York. Five experts will share their knowledge of the behavior, ecological function, propagation and cultivation of some of the plants they've worked with closely and found successful in plantings in the northeast.

December 2: Planning and preserving freshwater resources (PA)

Green Valleys Watershed Association is hosting **Planning Strategies and Tools that Preserve and Enhance Community Freshwater Resources** at The Washington at Historic Yellow Springs in Chester Springs, PA. Presenters include Theurkauf Design & Planning, Natural Lands, Pennsylvania Horticultural Society, the Delaware Valley Regional Planning Commission, Chester County Water Resources Authority, Land Ethics, LLC and Pennsylvania Department of Conservation and Natural Resources.

Worth reading

Massive Government Report Says Climate Is Warming and Humans Are the Cause by Christopher Joyce on *NPR*.

This City Is Using Nature To Treat Asthma, Allergies & Heart Disease by Emma Loewe on *MBG Planet*.

Urban-Based Evolution: Species Are Rapidly Adapting to City Habitats on *Yale Environment 360*.

Five Years After Superstorm Sandy, Is New York City Better Prepared for the Next Storm? by Signe Nielsen on ASLA's *The Dirt*.

Tollway wants to transform turf into forests by Marni Pyke in the *Daily Herald* (Chicago suburbs).

Green roofs to reduce the effects of climate change from the University of Seville on *Phys.org*.

Why L.A. Residents Are Pissed Off at Trees by Maxine Joselow at *DailyBeast.com*.

Urban trees are growing faster worldwide by the Technical University of Munich (TUM) on *Eureka Alert*.

Why Do D.C.'s Poorer Neighborhoods Have Fewer Trees? by Jacob Fenstonon at WAMU.

Are some natural environments more psychologically beneficial than others? from the University of Surreyon *ScienceDaily*.

Urban Refuge: How Cities Can Help Rebuild Declining Bee Populations by Janet Marinelli on *Yale 360*.

To Help Reduce Risk of Lyme Disease, Union County (NJ) Advises "Plant This, Not That" by Tapinto Elizabeth Staff.

Shock figures reveal park life at an all-time low by Karin Goodwin in *The Herald* (Scotland).

Is the Earth over-populated? by Gilles Pison on *The Conversation* and reprinted on *Phys.org*.

Agreed: We need to begin 'living with water' — but how to pay for it? by Miriam Belbidia and Colleen Butler for *The Lens* (New Orleans).

Insect 'Armageddon': five crucial questions answered by Paula Kover on *The Conversation*.

Steube files bill to abolish city and county tree protections (FL) by Zac Anderson in the *Sarasota Herald-Tribune*.

What wildflowers do for our cities by Michelle Bright and K. Angel Horne in the *Houston Chronicle*.

A Complete Guide to Sedges by Shannon Currey and Zika Wolfe in *American Nurseryman*.

Butterflies mean big business in Valley by Ryan Henry in *The Brownsville* (TX) *Herald*.

Save stormwater at home with a veggie raingarden by Jennifer Feinstein and Paul Hanley on *Phys.org*.

Research reveals controversial insecticides are toxic to songbirds on *Phys.org*.

Thistles - prickly weed or precious resource? by Robert Sivinski in *The Taos News*.

New tool against pollution is ancient: tree canopies by Kaley Fech for *Capital News Service*.

China is building 30 'sponge cities' that aim to soak up floodwater and prevent disaster by Leanna Garfield on *Business Insider*.

An Uncertain Future for Private Tree Regulation in Cities by Jona Elwell for *Casey Trees*.

Landscape architecture students create living laboratory at Rutgers by Jill Odom in *Total Landscape Care*.

Reasons why Green Infrastructure matters by Shawn Fitzgerald and A.D. Ali in *Lawn & Landscape*.

California homeowners could get a tax break to capture rainwater in their backyards by Mina Corpuz in the *LA Times*.

Louisville loses thousands of trees a year. But city leaders still don't agree on how to fix it by James Bruggers in the *Louisville Courier Journal*.

Best,



Debbie Hamrick
NewTerrain

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