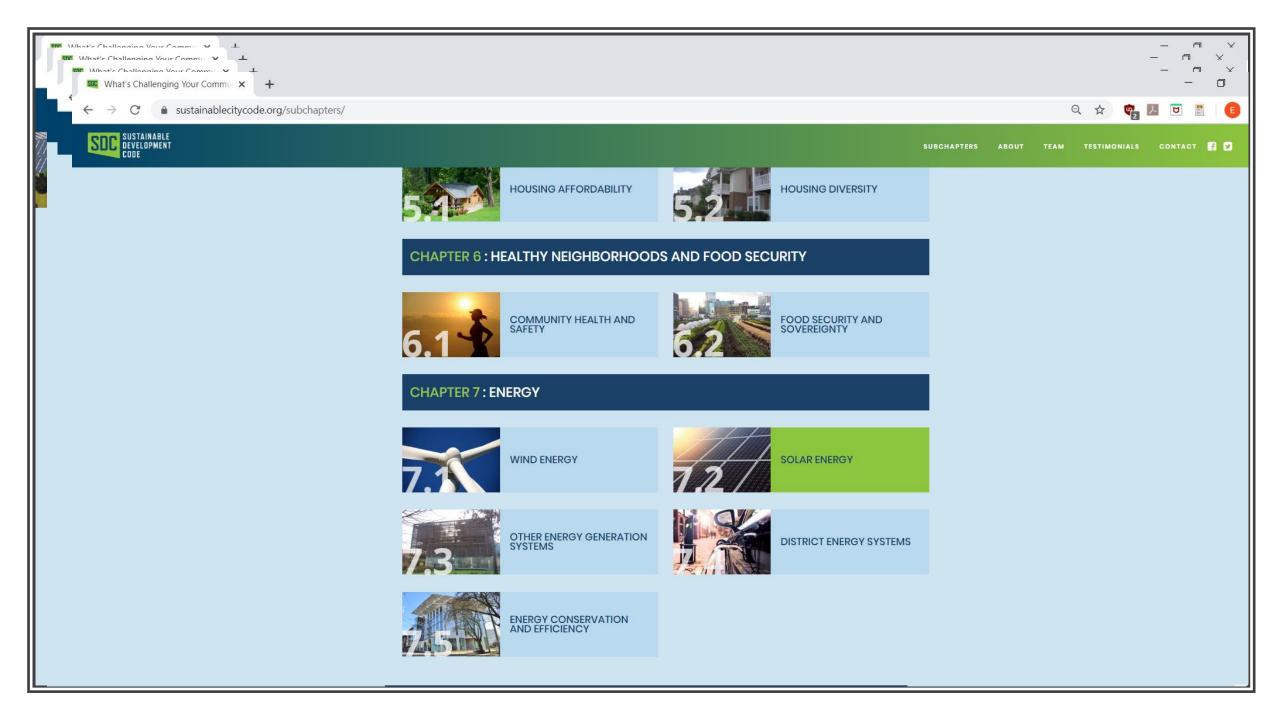


Many Flavors and Options for Green Infrastructure
Jonathan Rosenbloom, RMLUI March 2020







## CHAPTER 1.2 LOW-IMPACT DEVELOPMENT AND STORMWATER MANAGEMENT

#### To explore local ordinances:

- 1. View and select subchapter actions in the grid below
- 2. Perform a word search on the home page

Remove Code Barriers

While we've uploaded several ordinances to this subchapter, it is still under construction. <u>Sign-up</u> to receive our newsletter and we'll inform you when the content is complete!

Fill Regulatory Gans

Create Incentives

	Remove Code Barriers	Create Incentives	Fill Regulatory Gaps
BEST	Revamp subdivision street/sidewalk standards to reduce grey infrastructure (in progress)	Purchase of Development Rights     Rain Gardens     Water Efficient Upgrades for Indoor Fixtures and Appliances	Floodplain development restrictions (in progress)     Green infrastructure as part of stormwater management plans (in progress)     Mitigation of Lost Critical Habitats     Pervious surface maximums (in progress)     Third-Party Certification Requirements     Tree Canopy Cover     Vegetation Protection Areas     Water Efficient Landscaping
BETTER	Limit HOA Restrictions on Rain Barrels and Rain Harvesting Systems     Recycled Water Irrigation Systems for New Developments		Installation of Water Recycling Systems at New and Renovated Car Washes     Native Trees and Removal of Invasive Trees     Open Space Impact Fees     Reduce Soil Compaction during Construction     Removal of Exotic Vegetation     Setbacks Protecting Sensitive Habitats and Water Quality     Subdivision green street requirements (in progress)     Water Wasting Activities
GOOD	Parking Maximums     Rainwater Harvesting	Cluster/Conservation Subdivision in Rural/Urban Area     Green Roofing     Pervious Cover Minimums and Incentives	Green Roofing     Minimum Width and Buffer Requirements for Sidewalks     Native Plants/Vegetation     Pervious Cover Minimums and Incentives

	Remove Code Barriers	Create Incentives	Fill Regulatory Gaps
zst	Revamp subdivision street/sidev standards to reduce grey infrastructure (in progress)	<ul> <li>Purchase of Development Rights</li> <li>Rain Gardens</li> <li>Water Efficient Upgrades for Indoor Fixtures and Appliances</li> </ul>	Floodplain development restrictions (in progress)     Green infrastructure as part of stormwater management plans (in progress)     Mitigation of Lost Critical Habitats     Pervious surface maximums (in progress)     Third-Party Certification Requirements     Tree Canopy Cover     Vegetation Protection Areas     Water Efficient Landscaping
BETTER	Limit HOA Restrictions on Rain Barrels and Rain Harvesting Systems     Recycled Water Irrigation Systems for New Developments		Installation of Water Recycling Systems at New and Renovated Car Washes     Native Trees and Removal of Invasive Trees     Open Space Impact Fees     Reduce Soil Compaction during Construction     Removal of Exotic Vegetation     Setbacks Protecting Sensitive Habitats and Water Quality     Subdivision green street requirements (in progress)     Water Wasting Activities
GOOD	Parking Maximums     Rainwater Harvesting	<ul> <li>Cluster/Conservation Subdivision in Rural/Urban Area</li> <li>Green Roofing</li> <li>Pervious Cover Minimums and Incentives</li> </ul>	Green Roofing     Minimum Width and Buffer Requirements for Sidewalks     Native Plants/Vegetation     Pervious Cover Minimums and Incentives

	Remove Code Barriers	Create Incentives	Fill Regulatory Gaps
BEST	Revamp subdivision street/sidewalk standards to reduce grey infrastructure (in progress)	<ul> <li>Purchase of Development Rights</li> <li>Rain Gardens</li> <li>Water Efficient Upgrades for Indoor Fixtures and Appliances</li> </ul>	<ul> <li>Floodplain development restrictions (in progress)</li> <li>Green infrastructure as part of stormwater purchase (in progress)</li> <li>Mitigation of Lost Critical Habitats</li> <li>Pervices</li> <li>Third-Party Certification Requirements</li> <li>Tree Canopy Cover</li> <li>Vegetation Protection Areas</li> <li>Water Efficient Landscaping</li> </ul>
BETTER	Limit HOA Restrictions on Rain Barrels and Rain Harvesting Systems     Recycled Water Irrigation Systems for New Developments		<ul> <li>Installation of Water Recycling Systems at New and Renovated Car Washes</li> <li>Native Trees and Removal of Invasive Trees</li> <li>Open Space Impact Fees</li> <li>Reduce Soil Compaction during Construction</li> <li>Removal of Exotic Vegetation</li> <li>Setbacks Protecting Sensitive Habitats and Water Quality</li> <li>Subdivision green street requirements (in progress)</li> <li>Water Wasting Activities</li> </ul>
GOOD	Parking Maximums     Rainwater Harvesting	<ul> <li>Cluster/Conservation Subdivision in Rural/Urban Area</li> <li>Green Roofing</li> <li>Pervious Cover Minimums and Incentives</li> </ul>	<ul> <li>Green Roofing</li> <li>Minimum Width and Buffer Requirements for Sidewalks</li> <li>Native Plants/Vegetation</li> <li>Pervious Cover Minimums and Incentives</li> </ul>

#### CHAPTER 1.2 LOW-IMPACT DEVELOPMENT AND STORMWATER MANAGEMENT

#### Mitigation of Lost Critical Habitats

Alec LeSher (author), Jonathan Rosenbloom & Christopher Duerksen (editors)

#### INTRODUCTION

Even the most well designed, environmentally friendly developments may affect land in a way that damages or destroys important wildlife habitat. Nationally, the amount of habitable areas for wildlife is fast diminishing. [1] To ensure that new developments mitigate the loss of habitat that they damage or destroy, local governments are increasingly requiring developers to offset the loss of habitat in a variety of ways, for example, by purchasing equivalent habitat elsewhere or paying for off-site creation of new habitat.

An ordinance or local regulation requiring habitat mitigation should first require on-site preservation and enhancement of existing habitat. However, if on-site preservation is infeasible, offsetting the loss by enhancing wildlife habitat offsite is possible. For example, a local government may require a developer to purchase undeveloped land, enhance the wildlife habitat features, and protect the land with a conservation easement.[2] Increasingly, local governments are establishing or supporting conservation land banks, entities that hold tracts of wildlife habitat and sell conservation credits to developers as a way to meet mitigation requirements. [3] The conservation bank can then use the proceeds from the sale of these credits to purchase additional conservation lands. Overall, the most effective local government mitigation programs will ensure that either there is no net loss of habitat area or, ideally, there is a net gain in habitat area. This requirement is important because replacement habitat can take years to mature to support the same amount of wildlife. Additionally, these ordinances may specify which types of habitat must be offset by mitigation, which zoning districts are subject to the requirements, and the ratio of affected habitat to preserved, replaced, or enhanced habitat.

#### **EFFECTS**

Loss of wildlife habitat has increased over the past decade, and has emerged as the number one cause of a reduction in global biodiversity.[4] Habitat preservation also provides and helps support a range of ecological services such as water purification and management, pollution prevention and remediation, soil formation, food supply, diverse gene pools, recreation, and educational opportunities. 5 If local government does not require the offset of lost habitats, the cost of providing the services associated with the habitats often shifts to the government and taxpayers. By requiring offset of lost habitat, a local jurisdiction can secure the benefits of

















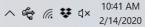




















#### **EXAMPLES**

#### Snowmass Village, CO

The Town of Snowmass Village is located in the Rocky Mountains and is home to a steady population of elk, mule deer, and bighorn sheep. These species utilize the natural habitat in the municipality to live, reproduce, and survive the harsh mountain winters. [8] The Town protects critical habitat areas for these species with restrictive zoning provisions that minimize the potential impact of development on the wildlife habitat. 9

Development within the habitat areas is generally prohibited, unless four out of the five city council members vote to consider such development. 10 If development is allowed to proceed, it must be designed so that large swaths of native vegetation are preserved, and any removed vegetation must be replaced.[11] However, if replacement is not possible, the developer must commit to on-site or off-site habitat enhancement.[12]

The Town's Municipal Code defines enhancement as "the process of increasing wildlife carrying capacity on undisturbed habitat to replace the lost wildlife carrying capacity on habitats impacted, disturbed and/or destroyed by development." [13] The Town sets forth aggressive enhancement requirements. For example, for every one acre of elk or mule deer winter range impacted, the developer must enhance eight acres; and for every acre of elk or bighorn sheep concentration habitat removed the developer must enhance five acres. [14] This results in a net gain of habitat area, promoting significant increases in long term wildlife habitat and biodiversity in the Town.

To view the provisions, see Snowmass Village, CO, Municipal Code § 16A-4-20 (f) (1) (d) (1998).

#### Camas, WA

The City of Camas is mostly residential, but surrounded by a significant amount of natural, undeveloped land. The City designates some of these areas as protected "habitat conservation areas" in which development is generally not allowed.[15] Developers who apply to use these lands must show that the activity will not substantially harm the habitat function or value, and is minimized to the greatest extent possible.[16] If the City finds that the activity would harm the habitat, the developer must take steps to mitigate that damage.[17] On site mitigation is preferred, although off site mitigation may be allowed in some cases.[18] If off-site mitigation is infeasible, the developer must pay a fee in lieu equal to the cost of implementing an off-site mitigation effort.[19]

Alternatively, the City uses habitat banking to allow developers to meet the requirements of the ordinance. [20] The City must approve all habitat banks prior to the issue of any mitigation credits.[21] Importantly, the habitat bank must be within the same watershed as the proposed development.[22] This ensures that the City does not lose the benefits of the habitat to another jurisdiction, and does not bear increased costs due to lost ecosystem services.

To view the provisions, see Camas, WA, Code of Ordinances § 16.61 (2008).

#### ADDITIONAL EXAMPLES

Los Angeles Cty., CA, Code of Ordinances § 22.44.1950 (2014) (prohibiting development in designated areas unless the developer offsets the































#### ADDITIONAL EXAMPLES

Los Angeles Cty., CA, Code of Ordinances § 22.44.1950 (2014) (prohibiting development in designated areas unless the developer offsets the impact to the habitat by permanently preserving a greater amount of land).

Indian River Cty., FL, Code of Ordinances § 928.06 (2) (1990) (requiring developers to replace destroyed wetlands at a ratio of two new wetlands for every one lost).

Pima Cty., AZ, Code of Ordinances §16.30.050 (2005) (requiring mitigation of loss of riparian habitat but allowing the developer an exemption from this requirement upon board approved contribution to a mitigation bank if on site mitigation is infeasible).

Lafourche Parish Council, LA, Code of Ordinances § 22-655 (2016) (detailing the requirements for setting up a habitat mitigation bank and requiring the bank to have financial surety of at least twenty or fifty years depending on the type of land preserved).

Dane Cty., WI, County Ordinances § 11.05 (current through 2017) (requiring submittal of mitigation plans for new developments in shore land and wetland areas).

#### **CITATIONS**

- [1] Global Biodiversity Outlook 3, United Nations (2010), at 9, https://perma.cc/36GY-S9VQ.
- [2] See, e.g., Snowmass Village, CO, Municipal Code § 16A-4-20 (a) (1998).
- [3] See Mitigation & Conservation Banking in the United States: An Emerging Biodiversity-Based Asset Class, New Forests Advisory Inc. (April 2010), https://perma.cc/LC2Q-5HCH; National Wetland Mitigation Banking Study, at v, U.S. Army Corps of Engineers (Feb. 1994), https://perma.cc/NDM3-WRQU.
- [4] Global Biodiversity Outlook 3, supra note 1, at 9.
- [5] Anup Shah, Why is Biodiversity Important? Who Cares?, Global Issues (Jan. 19, 2014), https://perma.cc/M7TF-MUPU; J.B. Ruhl, The Twentieth Annual Lloyd K. Garrison Lecture: In Defense of Ecosystem Services, 32 Pace Envtl. L. Rev. 306, 309 (2015).
- [6] Environmental Protection Agency, What is Open Space/Green Space?, https://perma.cc/L8FR-VVRS (last accessed May 18, 2018).
- [7] Byeongho Lee et al., Carbon Dioxide Reduction through Urban Green Space in the case of Sejong City Master Plan, at 538, https://perma.cc/7R77-28YC.
- [8] See Snowmass Village, CO, Municipal Code § 16A-4-20 (a) (1998).
- [9] Id. at § 16A-4-20 (e).
- [10] Id.
- [11] Id. at § 16A-4-20 (f) (1) (a)-(c).











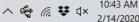


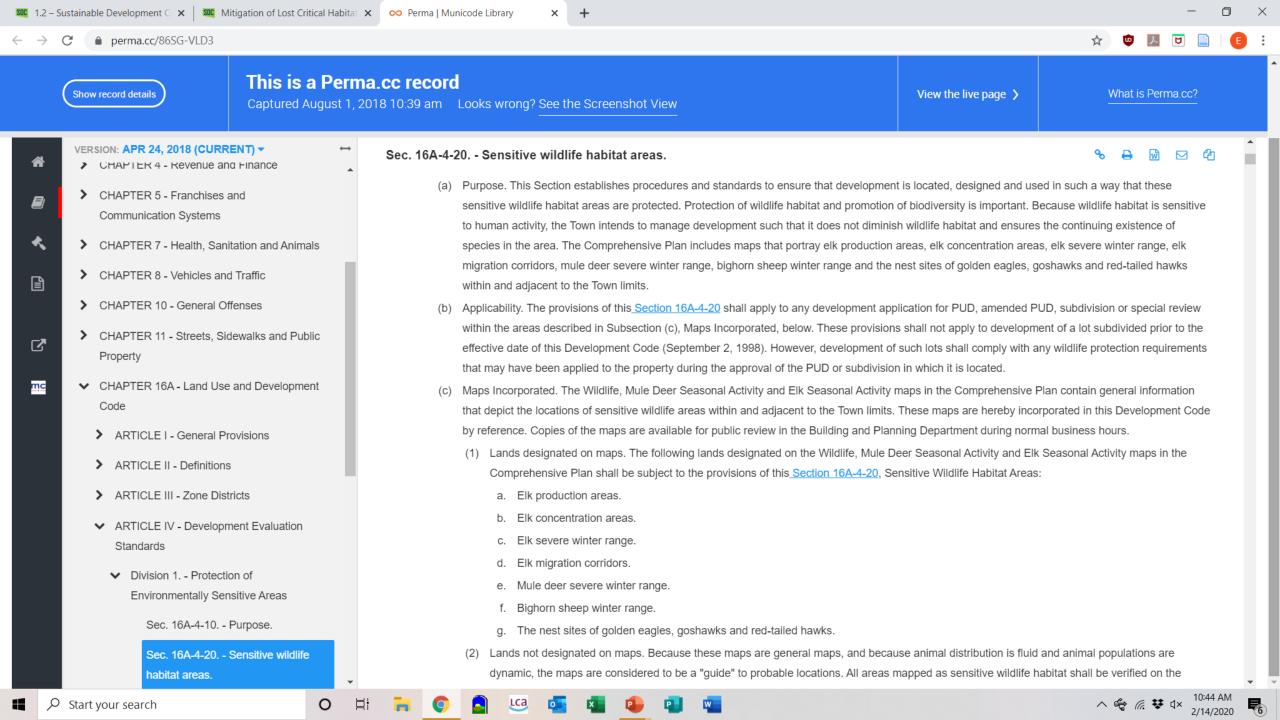


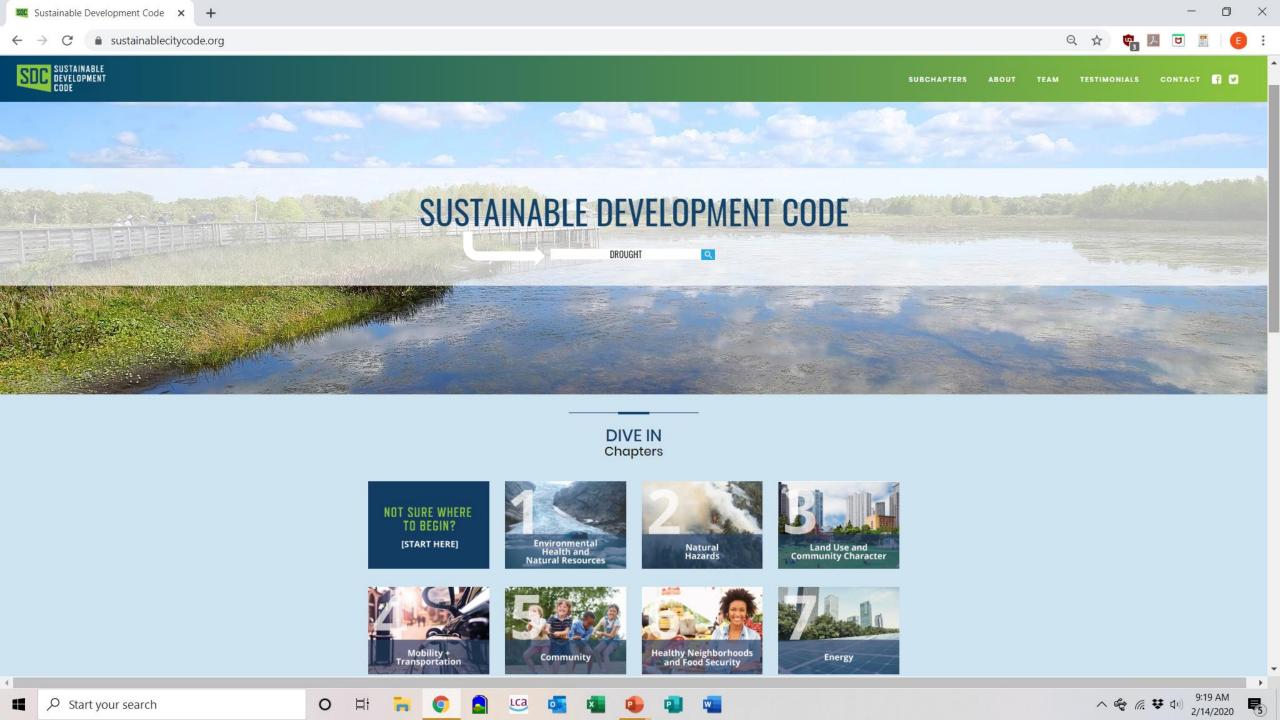


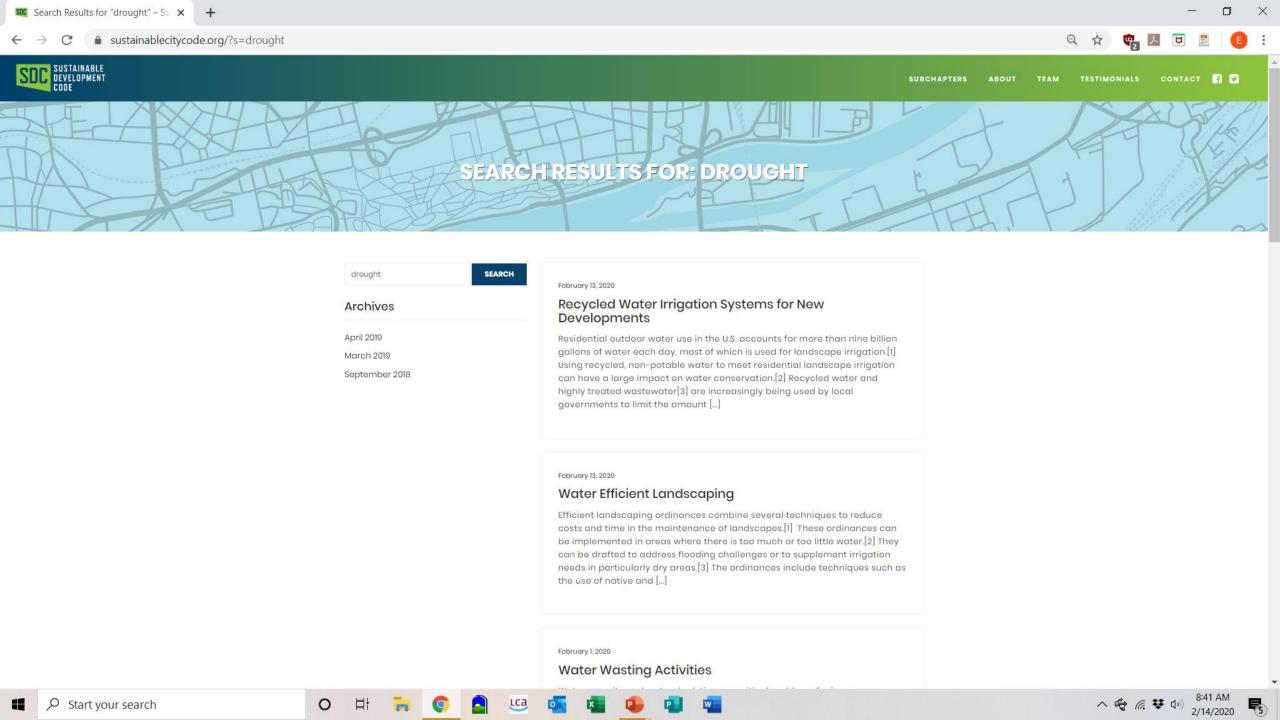












drought

SEARCH

#### **Archives**

April 2019

March 2019

September 2018

February 13, 2020

### Recycled Water Irrigation Systems for New Developments

Residential outdoor water use in the U.S. accounts for more than nine billion gallons of water each day, most of which is used for landscape irrigation.[1] Using recycled, non-potable water to meet residential landscape irrigation can have a large impact on water conservation.[2] Recycled water and highly treated wastewater[3] are increasingly being used by local governments to limit the amount [...]

February 13, 2020

#### Water Efficient Landscaping

Efficient landscaping ordinances combine several techniques to reduce costs and time in the maintenance of landscapes.[1] These ordinances can be implemented in areas where there is too much or too little water.[2] They can be drafted to address flooding challenges or to supplement irrigation needs in particularly dry areas.[3] The ordinances include techniques such as the use of native and [...]

February 1, 2020

#### Water Wasting Activities

























## Protecting Green Space: By area

- Setbacks Protecting Sensitive Habitats and Water Quality
  - Fort Collins, CO Land Use Code § 3.4.1 (2017) (specific limitations on any development within 500 feet of areas designed in land features map).

#### Parking Maximums

• Hartford, CT Zoning Regulations § 7.2.2 (B) (2018) (eliminating min parking; setting out specific maximum parking spaces for all allowed uses).

#### **Vegetation Protection Areas**

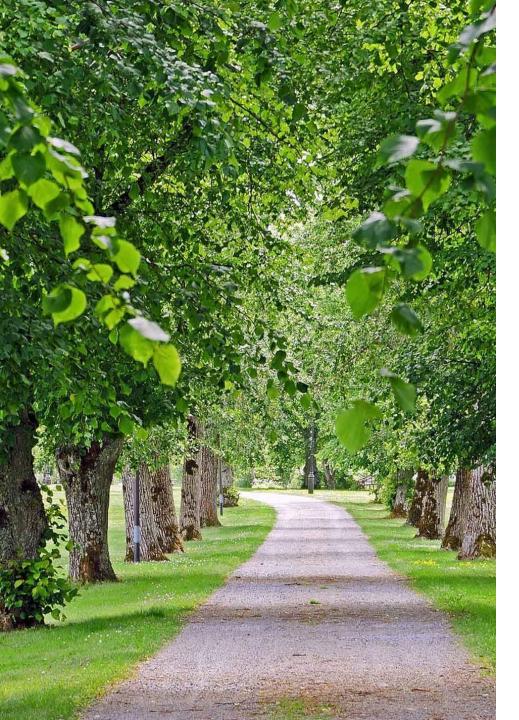
- By natural area: Wayland, MI Code of Ordinances § 20-520 (2006) (2 vegetation zones near riparian areas in which development is limited).
- **By species**: Thurston County, WA Code of Ordinances § 23.36.060 (2018) (requiring 60% of trees within vegetation protection area to be evergreen, native trees).
- Floating: Shasta Lake, CA Code of Ordinances § 17.14.010 17.14.060 (current through 2018) (creating floating protection district designation).

#### Cluster/Conservation Subdivision in Rural/Urban Area

- By % of lot: Thurston Cty., WA Code of Ordinances § 20.30A (1993) (75-85% of lot must remain open)
- **By unit #:** Amherst, MA Zoning Bylaw § 4.34 (2014) (for every dwelling unit, there must be 2,000 square feet of usable common land).

#### Purchase of Development Rights

Lyon, MI Code of Ordinances ch. 48 §§ 38.01-.07 (current through 2018) (PDR program preserving land particularly well suited for woodlands, wetlands, open lands and farming).



## Protecting Green Space: Plantings

#### Water Efficient Landscaping

- **Incentive**: Albuquerque, NM Albuquerque Water Utility Authority Xeriscape Rebate (rebate on water utility bill for replacement of traditional landscaping with xeriscaping).
- **Requirement**: Tuscon, AZ Unified Code of Development § 7.6.4 (2015) (requiring use of drought resistant vegetation for new developments with some exceptions).

#### Removal of Exotic Vegetation

- Collier County, FL Land Development Code § 3.05.08 (current through 2017) (requiring removal of listed exotic plants prior to development; sets process for removal)
- Area: Walworth County, WI Code of Ordinances § 74-174 (C) (2016) (requiring removal of selective invasive species within 35 feet of wetlands and replacing with native plant species).

#### Planting Native Vegetation

- **Minimums**: Sanibel, FL Code of Ordinances § 126-675 (d) (2006) (requiring 75% of vegetation be native in certain zones).
- **Permits:** Scottsdale, AZ Code of Ordinances § 46-106 (1989) (requiring permit before removing any protected native plant species or face a fine of up to \$2,500 or up to six months imprisonment).

#### Native Trees and Removal of Invasive Trees

Union Springs, AL Code of Ordinances § 10.1 (2013) (replacement trees must be native or non-invasive exotics not likely to outcompete native trees).

## Growing Green spaces

#### Tree Canopy Cover

- Increases in mitigation: Ventura Cty., CA Code of Ordinances § 8178-7.6.1 (2016) (requiring developers to plant 10 protected trees for each protected tree removed during development)
- Afforestation: Baltimore, MD Code of Ordinances §§ 33-6-101 to 33-6-122 (2004) (afforestation requirements)

#### Open Space Impact Fees

 Bennett, CO Municipal Code § 4-8-340 (2014) (establishing a park, recreation, and open space impact fee which is used to develop, construct, or acquire land for parks, recreation, and open space facilities).

#### Green Roofing

• Chicago, IL Municipal Code of Chicago § 17-4-1015 (2017) (providing FAR bonuses for green roof covering 50% of the roof area or 2,000 square feet of contagious roof area).

#### Pervious Cover Minimums and Incentives

- Fairway, KS Code of Ordinances Sec. 15-264 Zoning Districts (setting mandatory permeable surface minimums for new development).
- Tybee Island, GA Land Development Code § 3-080(C)(5) (requiring new residential driveways and replacements of more than 50 percent of existing driveways be constructed of permeable materials designed to allow retention of at least the first one-inch of stormwater).





## Water Capture: Rain harvesting

#### **Limiting HOA Provisions**

- Carrboro, NC Land Use Ordinance, Section 15-83.3 (final development approval will not be granted where restrictive covenants bar rain barrels, solar collectors, clotheslines, or any other devices used to conserve energy or to reuse water).
- Albuquerque, NM, Code of Ordinances § 6-1-1-8(c) (2019) (same).

#### **Requiring Implementation**

- Santa Fe, NM Sustainable Land Development Code § 7.13.11.7 (2016) (requiring RWH systems for all new residential and all new or renovated non-residential development).
- Orlando, FL Code of Ordinances § 60.228 (2019) (requiring all landscape plans to demonstrate the volume of water required is provided by rainwater harvesting).
- Tucson, AZ Tucson Code § 6-182,183 (2008) (requiring new commercial development projects have 50% of landscaping water demand met through either active or passive RWH).

#### **Rain Gardens**

 Fontana on Geneva, WI Code of Ordinances § 18-174 (2012) (requiring generously vegetated rain gardens; rain gardens can count toward local landscaping requirements and stormwater management plans).

## Water Capture: Recycled water

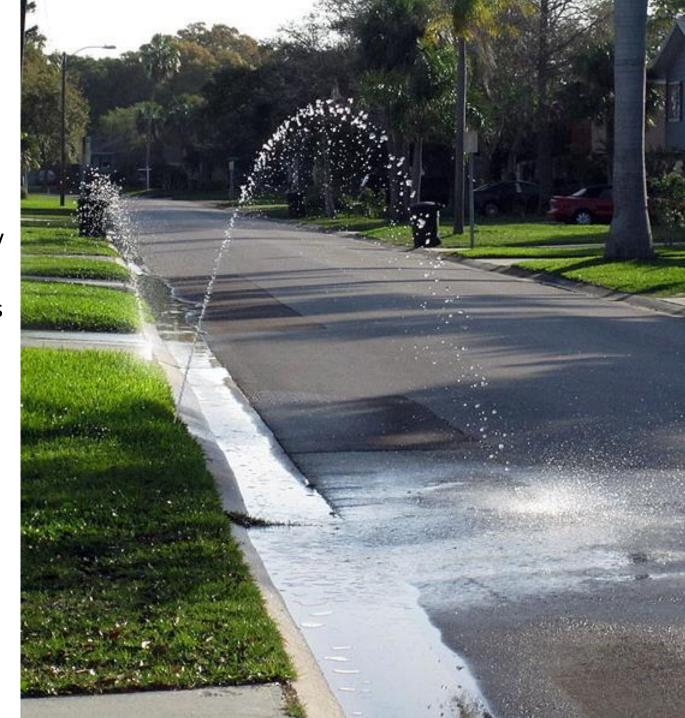
#### Recycled Water Irrigation Systems for New Developments

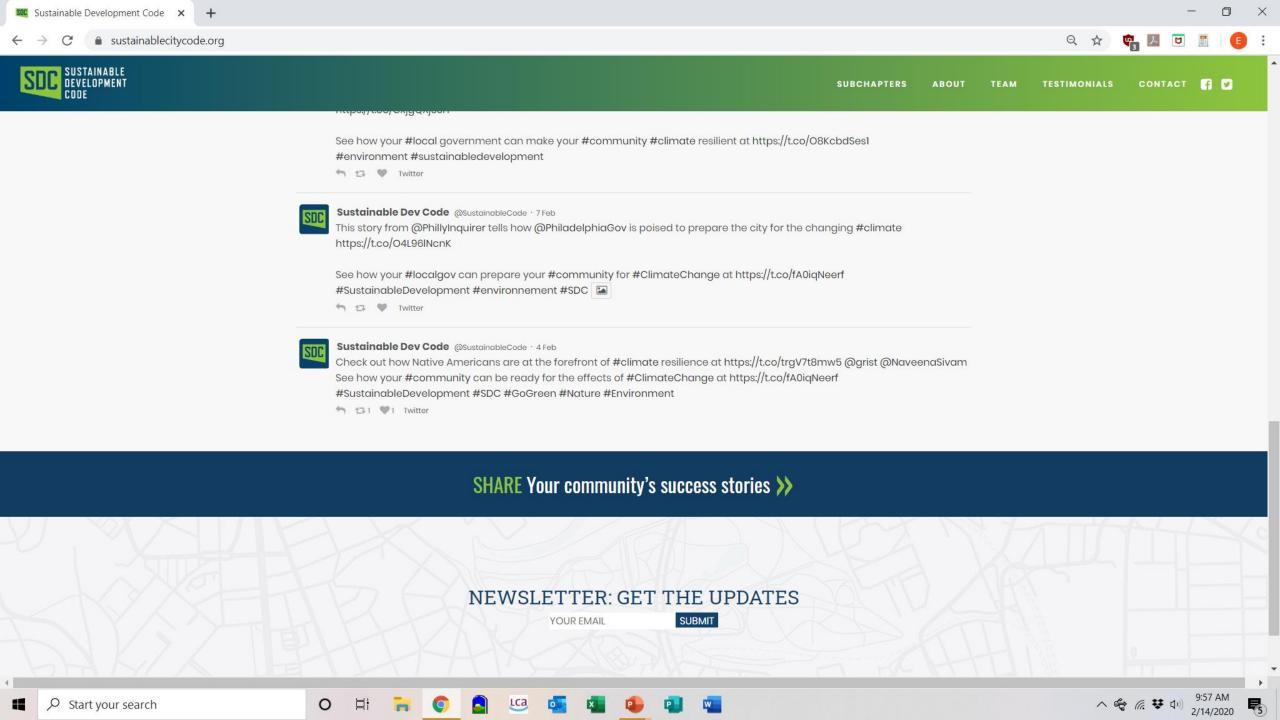
- Austin, TX Code of Ordinances § 6-4-11 (requiring new commercial developments or redevelopments within 250 feet of a reclaimed water main to connect for irrigation, cooling, and other significant non-potable water uses).
- Installation of Water Recycling Systems at New and Renovated Car Washes
  - Arvada, CO Code of Ordinances § 102-108 (2003) (conditions the permit approval to enlarge a service line, replace more than 50% of square footage on the installation of a water recycling system; such system must recycle a minimum of 50 percent of the water utilized).



# Water Wasting Activities

- Weatherford, TX Code of Ordinances §6-6-6 (2018) (it is a misdemeanor to allow water to flow into any street, road, or highway)
- Colusa, CA Code of Ordinances §20-22 (2018) (fines and ultimate termination of water services for wasteful water activities including escape of water through leaks or breaks, irrigation which causes excessive run-off)
- Laredo, TX Code of Ordinances §31-141.38 (2018) (prohibiting using a hose to wash sidewalks, driveways, parking lots, walkways, other hardsurfaced areas, and buildings; also prohibits water running off into any roads, gutters, ditches, or drains, and requires property owners to fix various types of water leaks)







## Over 4,000 recommendations viewed this month!

In addition to a couple of wildlife protection ordinances, recommendations covered a broad spectrum in February from infill to trees to parking. Two time reigning champ, Mid-clock Pedestrian Crossings, was replaced by Mixed Use Zoning. Only two new to the Top 10 this month. In order of most viewed:

#### 1. Mixed-Use Zoning

Third time in the Top 10, jumping up from #2 to claim the #1 spot.

Mixed-use zoning permits a complementary mix of residential, commercial, and/or industrial uses in a single district. Mixed-use zoning can take a . . . .

#### 2. Wildlife-Friendly Fencing Standards

Third time in the Top 10, clawing its way up from #10 to #2.

Countless miles of fences run across the U.S. These fences help contain livestock and define property boundaries. However, many traditional styles . . . .

#### 3. Green Zones

Third time in the Top 10, zoned in at #3.

Green zones (also known as "ecodistricts") are stationary or floating districts created by a local government to promote sustainable practices, to help. . . .

#### 4. Bird-friendly Window and Lighting Standards

Third time in the Top 10, but not seen since last Fall in the Top 10!

Local governments can have a positive impact on the viability of bird populations situated in or migrating through their localities. One of the . . . .

#### 5. Encourage Infill Development

Second time in the Top 10, filling in at #4!

Infill development is the process of developing vacant or under-developed parcels within areas that are already largely developed. As populations . . . .

#### 6. Tree Canopy Cover

Third time in the Top 10, but not seen since last foliage!

A local government's tree canopy is the jurisdiction's area that is shaded by trees. Typically, as land is developed, the tree canopy is reduced because . . . .

#### Mid-block Pedestrian Crossings

Fifth time in the Top 10, knocked down from #1, but continues Top 10 streak!

Mid-block pedestrian crossings are designated areas for pedestrians to cross the street between where vehicular intersections occur. These crossings . . . .

#### 8. Recycle, Salvage and Reuse Building Materials

Third time in the Top 10, illustrating the point!

Every year the construction industry in the U.S. produces over 160 million tons of construction and demolition materials. Most of these materials are sent

#### 9. Parking Maximums

Although widely in place, new to our Top 10!

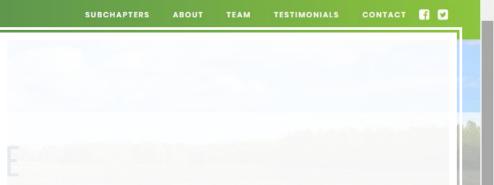
Off-street parking maximum standards in zoning ordinances limit the construction of parking lots that are larger than necessary. Local . . . .

#### Water Efficiency Standards for New Construction

Sliding on in, new to the Top 10!

The average American uses approximately eighty-eight gallons of water every day. Approximately, 24% gets flushed down the toilet, 20% is used in . . . .

Please continue to spread the word and follow us on <u>Twitter</u> and <u>Facebook</u>.



Jonathan Rosenbloom

Sustainable Development Code

jrosenbloom@vermontlaw.edu

**Executive Director** 

(215) 760-8704

## SUSTAINABLE DEVELOPMENT COL

DROUGHT



#### **DIVE IN** Chapters











































