GPHY 520 Land Use Planning

Sustainable Development Code Briefs

Prepared May 2022 by:
Sarah P. Church

[1] People-Places-Water Lab
Department of Earth Sciences
Montana State University
sarah.church@montana.edu

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Introduction

Bozeman's Northeast neighborhood is seeing development pressure as Bozeman continues to grow and the City prioritizes infill development. The neighborhood is also located in a prime location close to downtown and trail networks, making it a desirable place to live. This document includes outputs from an ongoing partnership between MSU, the City of Bozeman, and the Northeast Neighborhood Association (NENA). Members of NENA seek to understand how processes and regulations can help preserve neighborhood character and achieve sustainability goals. To meet these needs, GPHY 520 students wrote model sustainable development codes for a variety of topics related to sustainability goals. The topics covered here cover a range of issues relevant to cities and counties. The first part of the document includes abstracts and graphical abstracts related to the sustainable development code briefs. The second part of the document includes the sustainable development code brief papers.

GPHY 520 has a service learning component, which include the following learning objectives and goals: 1) Learn about neighborhood character and what it means to residents; 2) Gain experience collecting and analyzing data; 3) Apply data to readings to develop connections between theory and the built environment; 4) Determine how the data connects to City plans and policies; and 5) Practice and expand professional skills through assignments and working with a community partner.

Class members included:

Dr. Sarah P. Church, *Earth Sciences, Assistant Professor of Planning and Geography*

Zane Ashford, *MS Land Resources Environmental Sciences*

Liam Bean, *MS Earth Sciences – human geography*

Madison Boone, *Ecology and Environmental Sciences PhD – human geography*

Quinn Bouma, *Master of Architecture*

Kameron Conklin, *Master of Architecture*

Ryen Dalvit, *Master of Architecture*

Ashlie Gilbert, *MS Earth Sciences – human geography*

Elise Otto, *MS Earth Sciences – human geography*

Brennan Radulski, *Ecology and Environmental Sciences PhD – human geography*

Eddi Sachs, *Master of Architecture*

Kim Scanlon, *MS Sustainable Foods*

Lucia Stewart, *Master of Public Administration*

Rafael de Oliveira França Teixeira, *MS Civil Engineering*

Holly Watson, *Master of Public Administration*

Malory Peterson, *Interdisciplinary PhD – health and human development*

Thank you to our partners who helped review various versions of the outcomes you see today!

Karen Filipovich, *NENA*

Dani Hess, *City of Bozeman Community Engagement Coordinator*

Garrett McAllister, *Gallatin County Senior Planner*

Sarah Rosenberg, *City of Bozeman Associate Planner*

Abstracts

Sustainable Development

Wildlife Habitat Connectivity

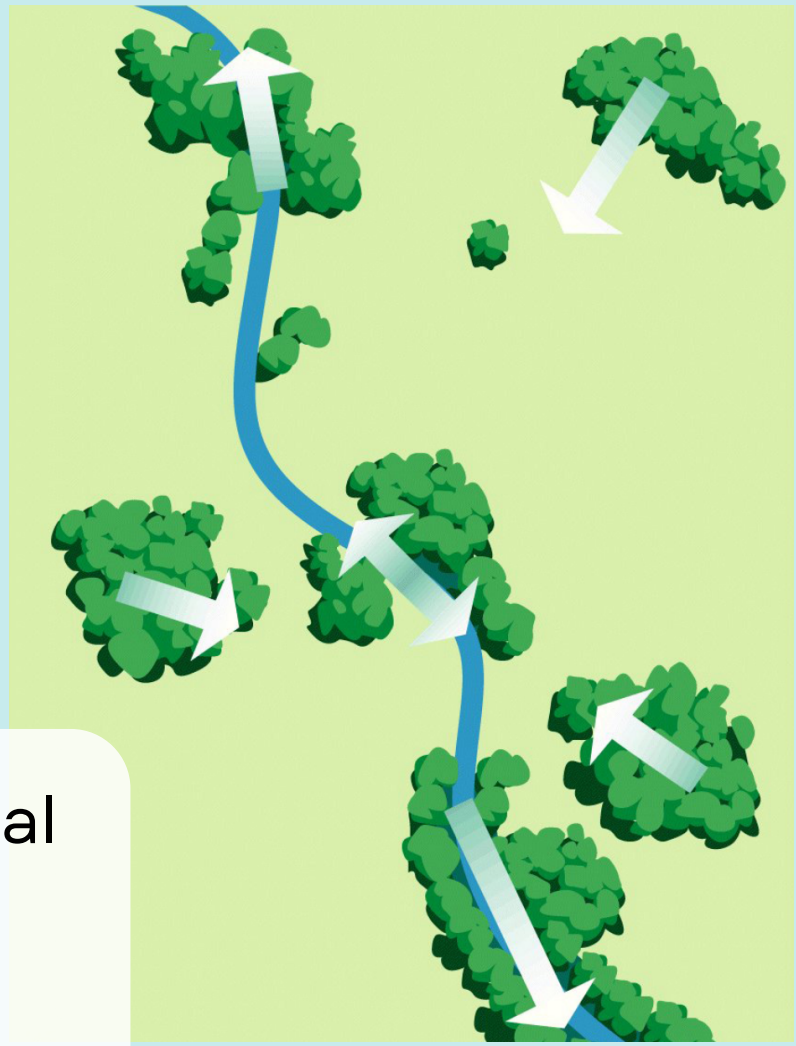
Movement of wildlife is a critical component of their longterm survival & biodiversity conservation.

Without proper planning, urban sprawl can lead to fragmented habitats and constrain migration.

Habitat loss is listed as the primary threat for 85% of the species on the IUCN's red list of threatened & endangered species.

Sustainable Development

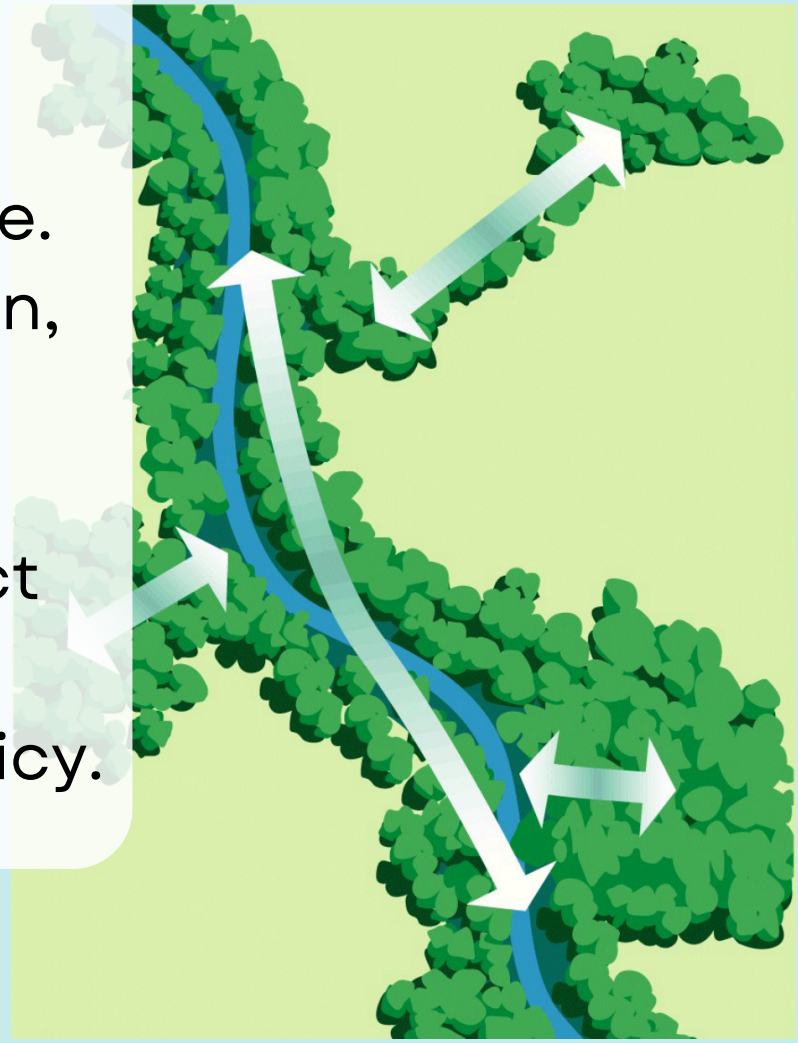
What are wildlife corridors?



Corridors support daily forage, annual migration patterns, & dispersal to protect gene diversity.

Landscape connectivity provides benefits from ecosystem services, i.e. water purification, erosion protection, flood control, & even recreation.

Cities, counties, & states can protect these vital networks of habitats & corridors through ordinances and policy.



Ventura County, CA

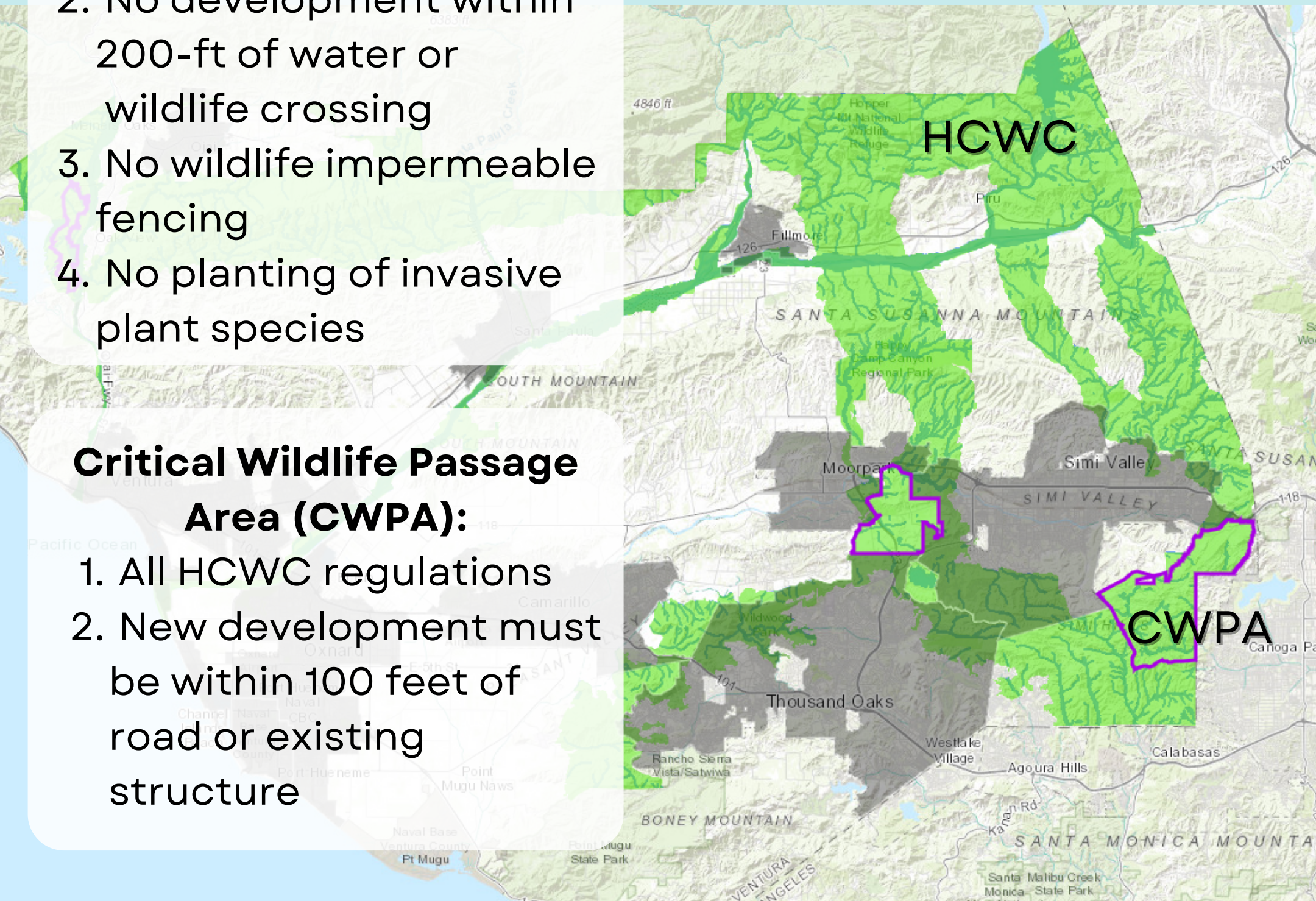
Wildlife Overlay Zone Ordinance

Habitat Conservation Wildlife Corridor (HCWC):

1. Minimize outdoor lights
2. No development within 200-ft of water or wildlife crossing
3. No wildlife impermeable fencing
4. No planting of invasive plant species

Critical Wildlife Passage Area (CWPA):

1. All HCWC regulations
2. New development must be within 100 feet of road or existing structure



Los Angeles, CA

Wildlife Ordinance District

Creation of a Wildlife District & Ordinance to regulate:

1. Size, location, & height of structures
2. Landscaping, buffers, setbacks

Prohibiting Single-Family Zoning

Policy brief prepared by
Liam Bean

Single-Family Zoning

Single-family zoning, or the R1 zone, is a common designation in land-use zoning maps. The R1 zone restricts land use to homes designed for one family, typically on large or mid-sized lots.

An Economic Need

Single-family zoning reduces the amount of homes on a single parcel. As the cost of living in the U.S. continues to rise, single-family zoning prevents important areas from recieving denser development.

An Environmental Crisis

Urban sprawl contributes more to carbon emissions than mid-density urban development. Single-family zoning directly contributes to sprawl.

Negative Impacts

Single-family housing is the most desirable housing type. Removing single-family zoning could undermine public trust and hinder future planning efforts.

Positive Outcomes

Removing single-family zoning allows developers to maximize land use without barriers. This can dramatically increase density and housing stock.

MUNICIPAL ORDINANCES FOR INCLUSIVE AND EQUITABLE PUBLIC PARTICIPATION

WHY PUBLIC PARTICIPATION?

Public participation is an inherent part of democratic governance. Many municipalities require public participation in their decision-making, often in the form of a public hearing. Although this form of engagement is a valuable tool, municipalities should establish ordinances that improve the balance of power between local government and the public. Moving to more inclusive forms of decision-making can build greater trust in local government, legitimize policy actions, and enhance understanding of community challenges.

PARTICIPATORY BUDGETING

Citizens advise and inform budget development processes and city spending.

Central Falls, RI Code of Ordinances § 2-334 (2018)

COMMUNITY BENEFITS

Developers must engage with and benefit impacted communities.

Detroit, MI Code of Ordinances § 12-8 (2016)

ADDITIONAL ORDINANCES

Citizen involvement commissions; expanding remote participation access.

Seattle, WA Municipal Code § 3.62 (2016)

PUBLIC PARTICIPATION AND SUSTAINABLE DEVELOPMENT

Municipal ordinances that create inclusive models of participation integrate diverse perspectives and foster shared knowledge of sustainable development challenges, incorporate the cultural values of a community into decision-making, and ensure that sustainable development policy decisions are beneficial, equitable, and just for both people and the environment.

MONTANA STATE UNIVERSITY

MADISON BOONE | GPHY 520: LAND USE PLANNING

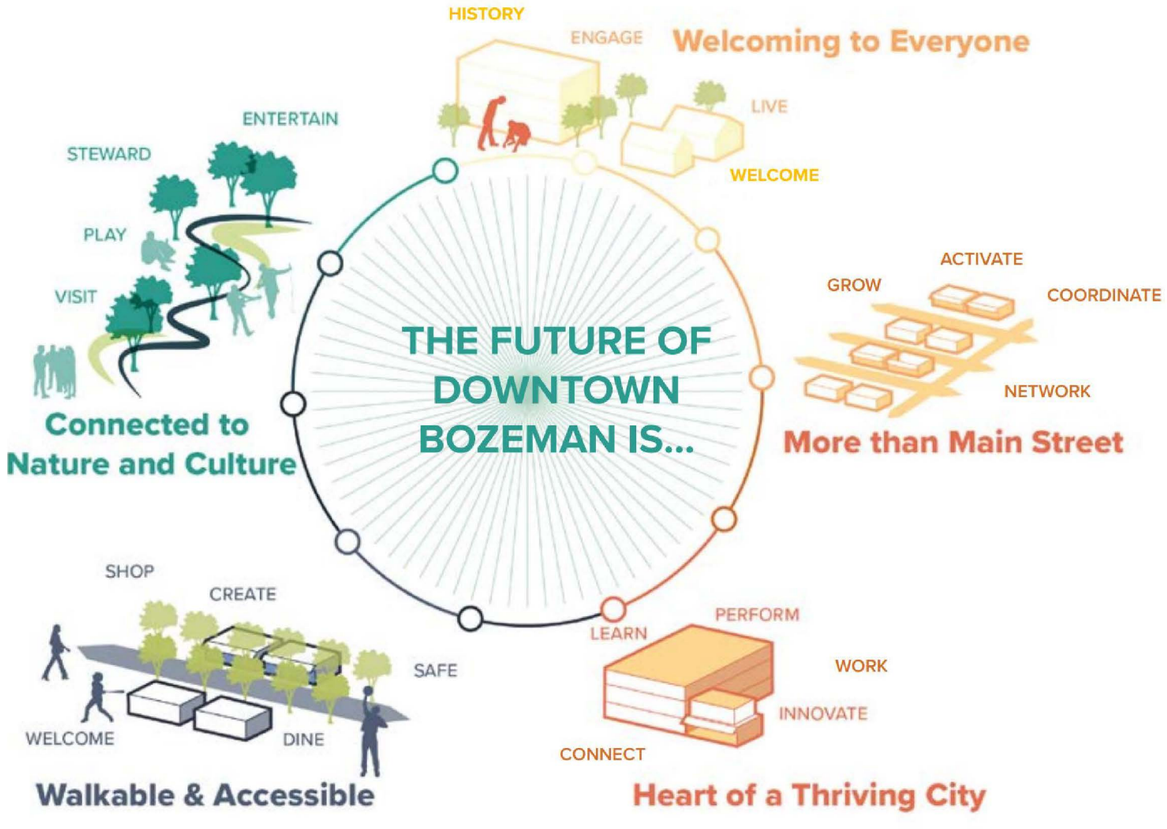
PROJECT ABSTRACT

Quinn Bouma

Looking at the Bozeman Downtown Improvement Plan, the ordinance specifically addresses to improve corridors to become more suitable for pedestrians, recreationalists, and local businesses. In doing so, the downtown region becomes greatly extended in the north and south directions, all which grows the vibrancy and influence of the Bozeman downtown area. This ordinance/plan aims to add green space within certain downtown streets that aren't utilized, such as Grand Avenue, alleyways north and south of Main Street, and rethinking existing park/recreational spaces. An example of this ordinance around the community is the cleanup near Bozeman Creek in order to create inhabitable green spaces close to Main Street and the businesses.

With this neighborhood already valuing the alleyways for easy walkability and social connectivity, the project goal is for the alleyways in the Northeast Neighborhood to follow similar goals and future aspirations as the BDIP alley enhancement plan in creating sustainable social community and character for the historic industrial neighborhood. The hope for this project is to re evaluate underutilized land in popular areas around Bozeman, and how it can inspire new uses for members of the community.

"FIVE BIG IDEAS" OF BDIP FRAMEWORK



Downtown Bozeman Improvement Plan May 2019. https://www.bozeman.net/Home/ShowDocument?id=558.

GREEN CORRIDORS BETWEEN BOZEMAN DOWNTOWN AND NORTHEAST NEIGHBORHOOD

PHASE 1 | PHASE 2 | PHASE 3 | PHASE 4

Fact Finding and Discovery → Framework Ideas and Outreach → Refine and Report → Finalize and Implement

REGULATION HIERARCHY

FEDERAL

STATE

CITY GROWTH PLAN

ZONING

OVERLAYS
- CONSERVATION
- HISTORICAL

COMMUNITY ENGAGEMENT/ INVOLVEMENT OF ALLEY ENHANCEMENT

DIALOGUE BETWEEN STAKEHOLDERS AND LOCAL BUSINESS/BUILDING OWNERS

ALLEY WAY DEVELOPMENT PROPOSAL

WHAT WILL BE THERE?
WHO WILL DO IT?
HOW CAN IT BENEFIT THE TOWN AND DISTRICT?

COMMUNITY DISCUSSION ON BENEFITS/NEGATIVES

ITERATION OF COMMUNITY MEMBER INPUTS

EVALUATION OF DESIGN CRITIQUES

IMPLEMENT COMMUNITY CRITIQUES

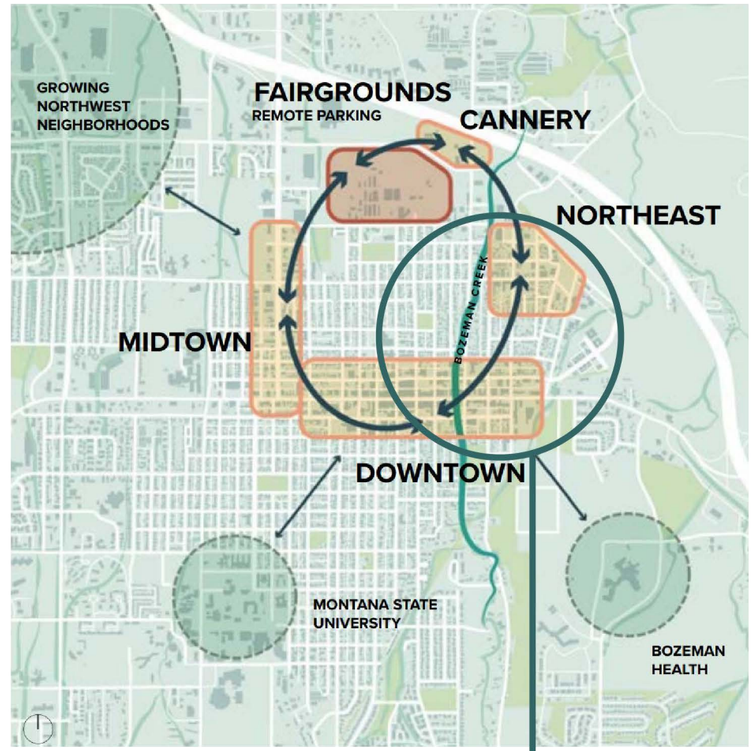
FINAL DESIGN REVIEW → COMMUNITY FORUM

FIRST PHASE IMPLEMENTATION

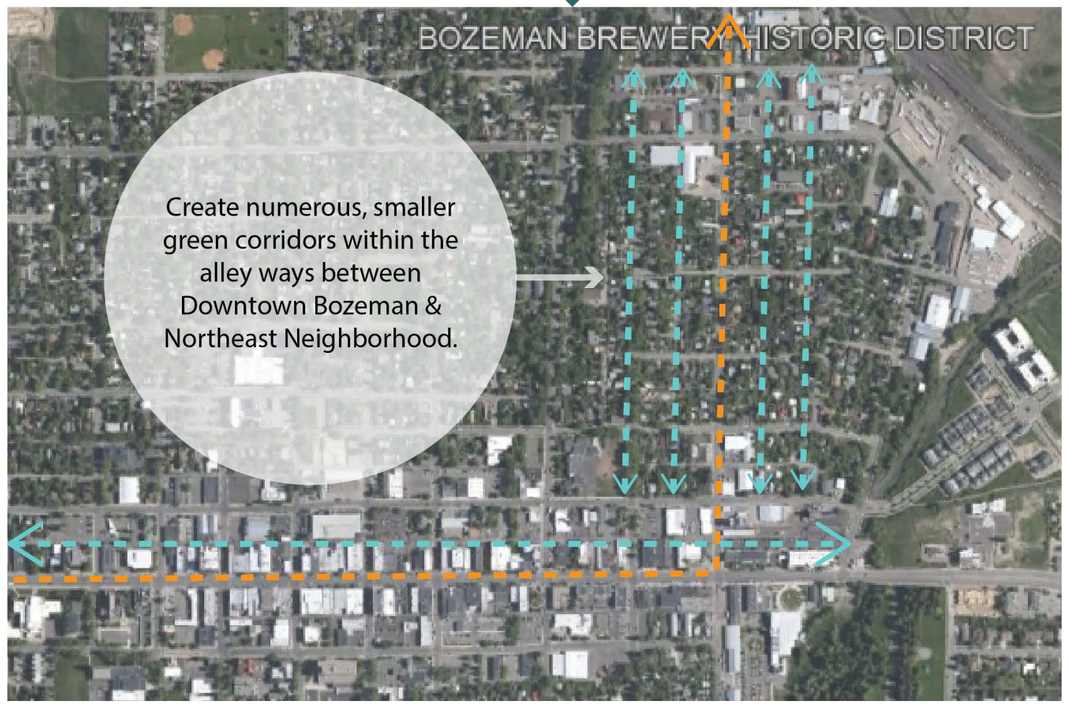
END RESULT CRITIQUE

INCREMENTAL IMPLEMENTATION

Downtown Bozeman Improvement Plan May 2019. https://www.bozeman.net/Home/ShowDocument?id=558.

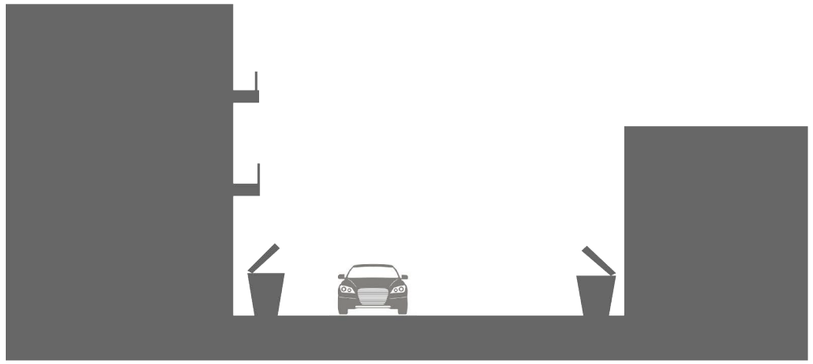


FOCUS AREA



STATUS QUO:

TWO WAY VEHICLE CIRCULATION, GARBAGE COLLECTION, AND BUILDING ACCESS



HISTORIC BUILDING (MAIN STREET) | ALLEY - GARBAGE COLLECTION, DRIVING ACCESS, STORAGE | HISTORIC BUILDING (SIDE STREET)

DEVELOPMENT PROPOSAL PER BDIP:

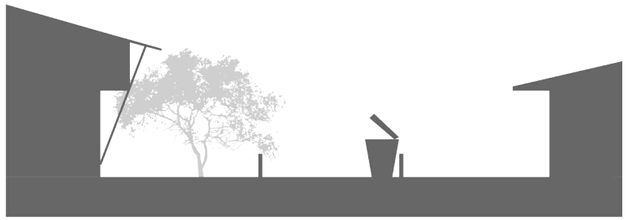
ADAPT ALLEY WAYS FOR ONE WAY VEHICLE CIRCULATION, OCCUPATION, PUBLIC ART, AND GREEN SPACE

HISTORIC BUILDING (MAIN STREET) | ALLEY - GREENWAY, DRIVING ACCESS, ART INSTALLATIONS | HISTORIC BUILDING (SIDE STREET)

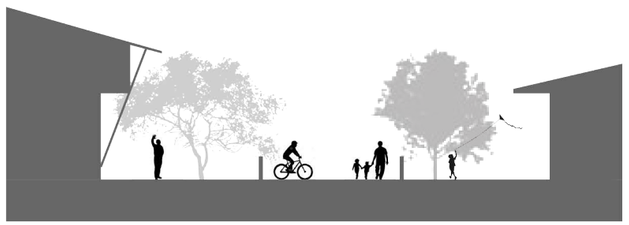
Downtown Green Corridor

Image from the Downtown Bozeman Alley Sketchbook (image by DHM Design)

EXPAND COMMUNITY CIRCULATION AND ENHANCE CONNECTEDNESS AMONG COMMUNITY



NENA HOME | ALLEY - GARBAGE COLLECTION, DRIVING ACCESS, STORAGE | NENA HOME



NENA HOME | ALLEY - GREENWAY, DRIVING ACCESS, GROWING ARE, CORRIDOR TO MAIN STREET TO THE MOUNTAINS | NENA HOME

Northeast Neighborhood Alley Corridors

COMMUNITY PRIORITIES

- MOUNTAINS, NATURAL ELEMENTS
- CONNECTEDNESS, SOCIAL AND PHYSICAL
- PRESERVATION & APPRECIATION
- HEALTH AND EXERCISE

Allows for additional areas to reflect and safely roam and recreate

Preserves and beautifies alley space with park/green space

Makes consistent corridors between two large community hubs to enhance movement between areas

GREEN CORRIDORS

Gives consistent, safe recreation corridor to more isolated recreational destinations

"Alleys are often an underutilized, forgotten part of the city. While they still need to provide service, delivery and emergency access, they remain unused except for a few hours a day. Many cities have recognized this and have begun to give alleys a civic or ecological function. The alleys that wrap around Main can be planted with greenery, provide natural drainage, create a unique pedestrian network, and provide usable outdoor spaces for residents and businesses. When and where possible widen sections of the alleys to improve functionality and consider adding bicycle amenities. In greening these areas, natural drainage features could be utilized, and small plazas and pocket parks tucked along the edges. These improvements would serve to provide a new, unique connection between downtown businesses and residences, and reinforce the finer scale of the downtown area." (Bozeman Downtown Improvement Plan, pg 23)

Downtown Ozeman Alley Sketchbook - S3.US-West-2.Amazonaws.com. https://s3.us-west-2.amazonaws.com/dba-2021/Resource-PDFs/Downtown_Alley_Sketchbook.pdf.

WELCOME TO BOZEMAN'S
NORTH EAST NEIGHBORHOOD ASSOCIATION

The building industry is responsible for almost ***40% of the world's CO2 emissions.*** A building's operation accounts for ***28 percent*** of the total amount of emissions generated by the building.

MIXED-USE DEVELOPMENT

Table 38.310.040.C in the Bozeman city code labels live work(residential with accessory commercial) as permitted in a Business area, and Mixed-Use areas, however not permitted in Industrial, or residential areas. Bozeman would benefit by allowing Live/Work units in all zoning districts to encourage sustainable solutions to the carbon emissions problem in the world today. If live/work units, especially live/work and work/live units, were allowed to flourish in a community, a number of benefits would be conferred.

LIVE/WORK

Sec. 38.700.110.
A single household dwelling unit designed to accommodate ground level commercial uses. The dwelling unit type may be any type that is permitted in the applicable zoning district. Permitted non-residential uses may be those that are permitted in the applicable zoning district.

Sec. 38.360.150
Home-based businesses are subject to first this ordinance in a residential zone. A home-based business is a use that is considered accessory to a dwelling unit.

LIVE WORK IS NOT PERMITTED IN RESIDENTIAL DISTRICTS WHEN OVER 30% OF THE OVERALL SQUARE FOOTAGE IS COMMERCIAL SPACE

NENA Zoning and Ordinances

B-3
Downtown district (downtown B-3). The intent of the downtown B-3 business district is to provide a central area for the community's business, government service and cultural activities with urban residential development as an essential supporting use.

R-2
Residential moderate density district (R-2). The intent of the R-2 residential moderate density district is to provide for one- and two-household residential development at urban densities within the city in areas that present few or no development constraints.

R-3
Residential medium density district (R-3). The intent of the R-3 residential medium density district is to provide for the development of one- to five-household residential structures near service facilities within the city.

R-4
Residential high density district (R-4). The intent of the R-4 residential high density district is to provide for high-density residential development through a variety of housing types within the city with associated service functions.

M-1
Light manufacturing district (M-1). The intent of the M-1 light manufacturing district is to provide for the community's needs for wholesale trade, storage and warehousing, trucking and transportation terminals, light manufacturing and similar activities.

PLI
The intent of the PLI public lands and institutions district is to provide for major public and quasi-public uses outside of other districts. Not all public and quasi-public uses need to be classified PLI. Some may fit within another district; however, larger areas will be designated PLI.

NEHMU
Light manufacturing district (M-1). The intent of the M-1 light manufacturing district is to provide for the community's needs for wholesale trade, storage and warehousing, trucking and transportation terminals, light manufacturing and similar activities.

LIVE/WORK LOFTS - IN BOZEMAN

News
A new development in Baxter Meadows has been approved in Bozeman that would combine residential and commercial buildings. It's called Westland Lofts. An acre and a half of the property will be developed with 31 residential buildings and eight commercial buildings, as well as 70 parking spaces.

"The market kind of determines what people think they want to invest in; this property has been zoned commercial for some time, since 2001, so really the commercial use of this property has been envisioned for quite some time, The mix with residential, I think, is just trying to fit in with the neighborhood.''
- LARISA CASILLAS FROM NBC MONTANA INTERVIEWS RESIDENT, MATSEN

Casillas, Larisa. "Bozeman Approves Work-Live Lofts Development." KECI, KECI, 6 Aug. 2019, https://nbcmontana.com/news/local/bozeman-approves-work-live-lofts-development.

Lofts to be built in Bozeman's Baxter Meadows subdivision

STATUS QUO

The current ordinance allows for residential units with 30% commercial space in R zoning, while B and M zoning allow for 51% commercial and 49% residential of total square footage to be used. This current ordinance complicates these designs for modern Live/Work units, and doesn't permit integration into neighborhoods residents want to live in.

SOLUTION

To encourage the sustainable development of live work units, and lofts within Bozeman, zoning should allow for more lenient mixed use options when integrating both work and life into neighborhoods. This would benefit the NENA residents and businesses owners because it allows for the opportunity for a 5 minute neighborhood.

Abstract

It should be noted that mixed-use zoning ordinances do not apply only to commercial and industrial areas, but also to residential areas where there are only single-family homes. In the case of a multi-story building, the ground floor will typically be used for commercial purposes, such as a grocery store, barbershop, convenience store, etc., to satisfy the needs of the local community, and the new zoning ordinances would permit this to take place in both business and residential areas. As new markets are introduced in a neighborhood, traffic may shift from traveling outside the neighborhood and allow all the amenities to be within walking distance from one's residence. In a mixed-use development, neighborhoods will experience a healthy, sustainable environment within the surrounding community.

Ordinances and regulations governing zoning can prevent live/work units from reaching their full potential. Local governments often classify live/work units as commercial buildings for safety reasons or prohibit them from being built in residential areas due to their mixed-use nature. Consequently, a Live/Work unit is subject to an inefficient, costly, and confusing process that is usually excessive in comparison to any low-risk risk in the work area. In Bozeman, Montana, the ordinance allows for Live-work units under this definition listed under Sec. 38.700.110. *"A single household dwelling unit designed to accommodate ground level commercial uses. The dwelling unit type may be any type that is permitted in the applicable zoning district. Permitted non-residential uses may be those that are permitted in the applicable zoning district."* To then clarify that in Sec. 38.360.150. - Home-based businesses are subject to first this ordinance in a residential zone. A home-based business is a use that is considered accessory to a dwelling unit.

fire safety

Managing Existing Structures in the WUI Zone

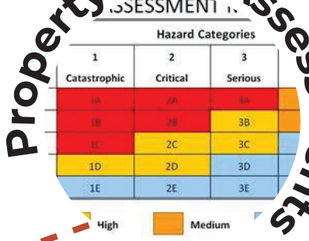
fire safety

Managing Existing Structures in the WUI Zone

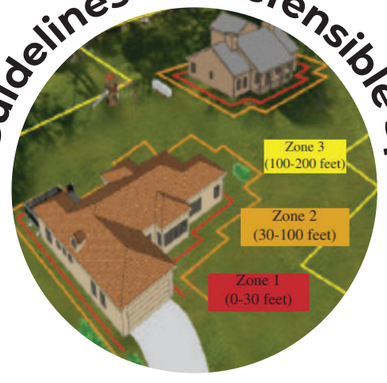
Ignition Resistant Requirements & Guidelines

Chipping Programs

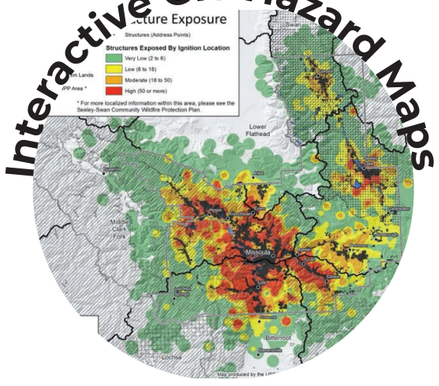
Property Risk Assessments



Guidelines for Defensible Space



Interactive GIS Hazard Maps



WUI Products Handbook

WILDLAND URBAN INTERFACE (WUI) PRODUCTS

gallatin county

Managing Existing Structures in the WUI Zone

Local Jurisdiction

Requirements

Community Wildfire Protection Plan

- Conducting free property assessments to help residents identify hazards;
- Displaying up-to-date maps that show wildfire hazard areas and the WUI;
- Providing current fire season forecasts or updates on any active wildfire events;
- Promoting participation in Fire-Adapted Community programs to encourage neighborhood activities and local recognition;
- Delivering Ready, Set, Go! program messages to residents to help them prepare for wildfires and evacuations; and,
- Working with local schools on youth education programs.

Provided Tools

- Wildland Urban Interface Map
- Ready, Set, Go! Guide (State Specific)
- Free Property Assessments

Major Strengths:

-"Apply for and administer cost-sharing grants to assist private landowners with fuels reduction, structural improvements, and other projects designed to lessen risk from wildfire." (Gallatin County CWPP)
-Major efforts on fire safe education are made through private, non-profit organizations
-Low to zero cost to the homeowner

Major Barriers:

-Local Jursidictions are only allowed to adopt an amended WUI code
-CWPP needs to be updated
-No clear guidelines for ignition-resistant construction and landscaping

Additional Resources:

https://www.readygallatin.com/?wpfb_dl=8
https://www.readygallatin.com/wp-content/uploads/2019/01/DRAFT_Gallatin-County_CWPP_01-07-2019-ver-2.pdf
http://gis.gallatin.mt.gov/webmaps/?map=wui&lat=45.68042&lon=-111.06093&scale=211908&l0=ghjklmnpq

montana

Managing Existing Structures in the WUI Zone

State Legislation

Requirements

Local Jursidictions are not required to regulate WUI

Ignition-Resistant Construction is governed by the Montana Department of Labor and Industry

Model WUI code, based on IWUIC
Amended to focus on building envelope
Local Jursidctions can adopt amended version only
(Administrative Rules of the State of Montana [ARM] § 24.301.181)

Subdivision and Platting Act

Regulations must prohibit subdivisions in hazardous areas unless hazards can be eliminated by approved construction techniques/other mitigation measures. (MCA § 76-3-504). Mitigation measures do not include measures goverend by the Department of Labor and Industry ((MCA § 50-60-901).

Provided Tools

Various Tools are provided to support WUI regulation

Major Strengths:

- **2009 : Montana DNRC Guidelines for Development within the Wildland-Urban Interface**
- **Online Wildfire Risk Portal**
- **Montana DNR Wildfire Preparedness Site Visit**
- **Fire Adapted Montana Learning Network website**

Major Barriers:

However, state prohibits local governments from denying proposed subdivisions based solely on the WUI identification (MCA § 76-13-145)

https://www.communitywildfire.org/wp-content/uploads/2021/08/CWPC_Land-Use-WUI-Report_Final_2021_August_web-version.pdf

REGULATING SHORT-TERM RENTALS

Short-term rentals (STRs) are a popular tourist lodging option utilized across the world. STR platforms such as Airbnb and VRBO allow property owners to connect with guests online and book stays in their homes for a fee.

NON-TRADITIONAL EXPERIENCE

STRs are popular in part because they offer an alternative to traditional lodging and allow guests to stay in a local home as opposed to a motel or hotel.

AFFORDABLE HOUSING CONCERNS

The number of properties converted from long-term rentals or full-time occupied homes to STRs has caused concern about impacts to availability and affordability of housing for local residents and employees, particularly in popular tourist destinations.

NEIGHBORHOOD DISTRUBANCE

Neighbors to STRs complain that guests reduce parking, increase trash and noise, and disrupt the neighborhood character.

REGULATION STRATEGIES

Regulation of STRs can be placed on a spectrum from no regulation at all to complete bans. Forbidding STRs in specific zones is one way to restrict STRs to certain areas. Local governments can capture some of the revenue generated from STRs by collecting licensing fees, implementing transient occupancy taxes, and fining STR hosts for violating regulations.

LICENSING & LIMITATIONS

Many local governments enact ordinances that require STR hosts to apply for licenses to operate. Additionally, many jurisdictions regulate the number of people that may occupy the STR at one time by imposing a people to room ratio and limiting the number of cars that may be present on the property. Safety requirements such as smoke and carbon monoxide detectors may also be required.

EXAMPLE ORDINANCE FROM DENVER, COLORADO

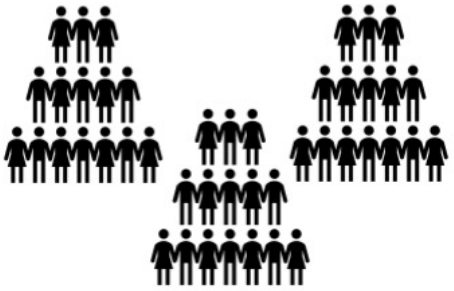
The City of Denver requires all STRs to be the hosts' primary residence. This means that property owners can only rent out parts of their home while they occupy it or when they leave for a vacation or an extended trip.

See **Denver, CO, Code of Ordinances § 33-46 to 55 (2016)**

TAILOR THE APPROACH

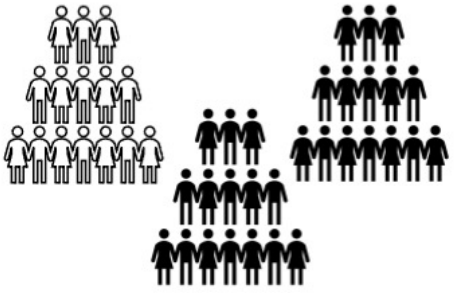
The degree and type of regulation a jurisdiction decides to place on STRs should reflect the desires and needs of the community.

Vacancy and Empty Home Taxes



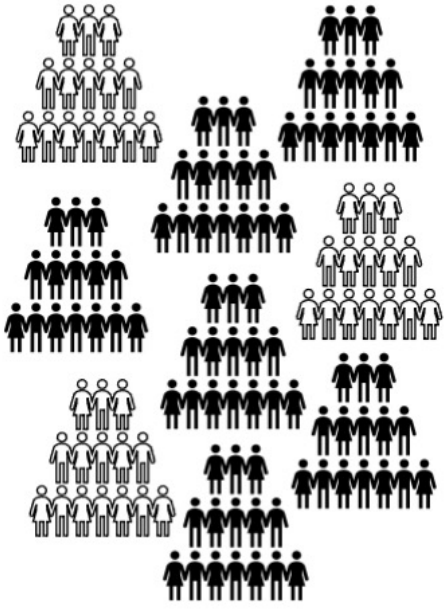
In the US there is a housing crisis.

- **Buying or renting a home is too expensive for many Americans**.
- It might seem simple: X number of people don't' have homes. So we need to build X number of units right?



But in some areas, many homes are empty. They are vacation or investment properties or both. Where there is a housing bubble, homes seem like a good investment for those with equity. **It doesn't matter if more homes are built**: prices go up and homes sit empty.

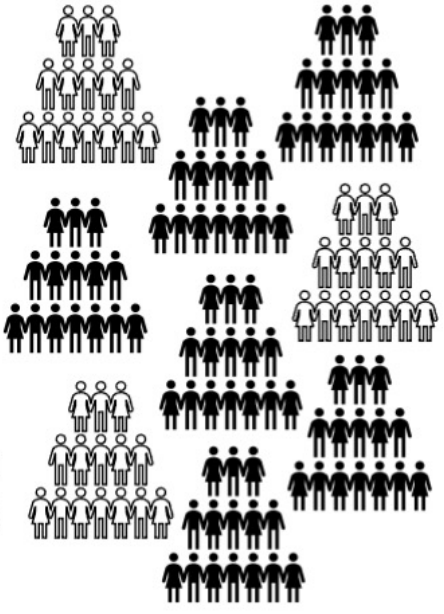
An **empty home or vacancy tax**, charges owners if they leave their home empty. Some owners pay the tax, which is then reinvested in community needs. Other owners return the house to the rental market



Vancouver, B.C. charges 3% on empty properties. It has raised over 80% funding for affordable housing since 2017. **Oakland, CA** has recently implemented a flat fee on empty lots and units.

Could an empty home tax work in a amenity community such as Bozeman?

In Montana, it may require a constitutional amendment to implement a vacancy tax. It would take the will of the people to bring it here. Such movements have happened in Montana before.



Protecting Vernal Pools Through Local Ordinances

What are vernal pools?

Vernal pools, vernal ponds, or woodland ponds are a naturally forming, small, and seasonal type of wetland occurring in the northeast, midwest, and Mediterranean climates of the US. Vernal pools provide a plethora of ecosystem services, including flood protection, water purification, and carbon sequestration, and they provide habitat, food, and water for a wide variety of wildlife and plant species. However, wetlands are one of the most rapidly degrading ecosystems in the US, due to human development, anthropogenic climate change, and other land-use changes. Vernal pools are not as well protected as other types of wetlands, in-part due to their seasonal nature and small size. Municipal ordinances can be used to protect vernal pools.

Protective Ordinances

Protecting vernal pools means protecting wetlands and the ecosystems services and wildlife habitat that they provide. To ensure that human development occurs strategically to better protect small but vital vernal pools, local ordinances can explicitly define vernal pools as a wetland and incorporate them into ordinances protecting wetlands, or new ordinances defining development in areas with vernal pools can be established.

Figure 1: California vernal pool habitat
Art: John Hawkins

Example: Topsham, ME

Vernal pools are protected through Topsham's zoning regulations by an ordinance dictating that development activities on sites with vernal pools must be designed to conserve pools and their adjacent terrestrial habitat. The ordinance also requires property owners to obtain permits from state and federal agencies if they want to develop on land that falls under state or federal vernal pool regulations. Another town ordinance creates a vernal pool district overlap that property owners can use to determine if vernal pools reside on their property.

Example: Boston, MA

In Boston, MA, vernal pools are defined as wetlands within the city's Wetlands Protection and Climate Adaptation ordinance that was enacted in 2019. The ordinance defines significant vernal pool habitat based on the species occurring in a given pool and requires 100-feet buffer zones around vernal pools to protect them from development activities.

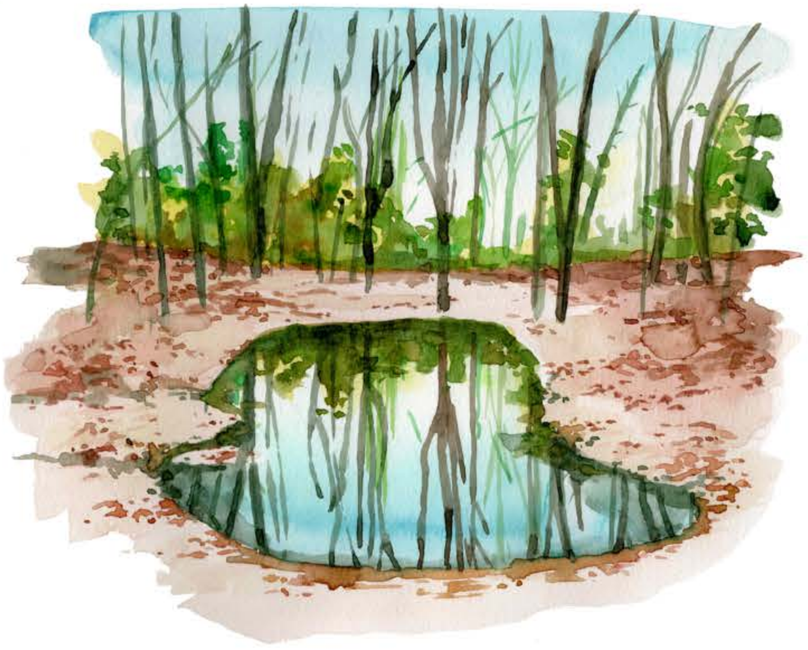
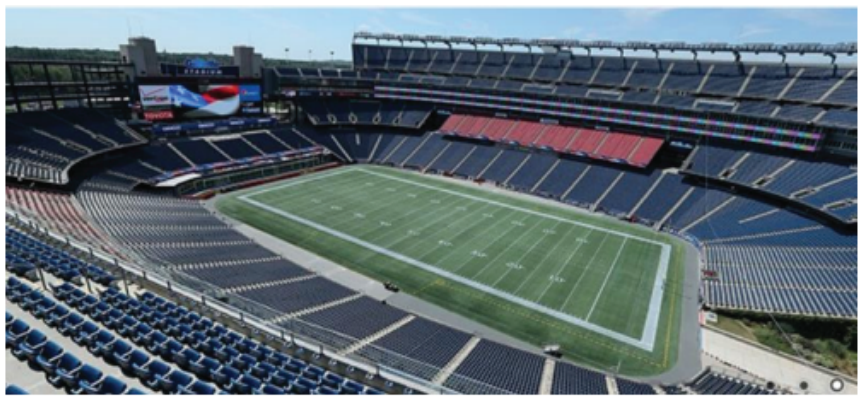


Figure 2: Northeast US vernal pool habitat
Art: John Hawkins

Author Information

Brennan Radulski, PhD student
People-Places-Water Lab, MSU
Email: brennan.radulski@student.montana.edu

Figures 3, 4, and 5: wildlife species that inhabit northeast US vernal pools, from L-R: wood frogs, fairy shrimp, spotted salamander
Art: Massachusetts Audubon



Gillette Stadium in Massachusetts reuses water for toilet flushing
(photo source: www.gillettestadium.com)

The Issue:

In the 21st century, water is, if not, going to be the most scarce resource that we as a nation have. The landscape in the Mountain West, Southwest, and West are all battling each other for this precious resource. Due to higher temps, less water, economic development, etc. this has extenuated the circumstances and increases changes of forest fires, flash foods, and severe droughts. Predictions for the rest of the century are only increasing, with water shortage becoming more frequent and severe.

Irrigation of:

Golf Courses
Residential Grass
Parks
Cemetaries
Agricultural Crops
Athletic Fields
Highway Medians
Industrial Cooling
Land Pasture
Livestock Watering

(photo source: patch.com/new-York/farmingdale/long-island-farmers-markets-farm-stands-check-out-summer)

Urban Reuse:

Toilet Flushing
Commercial Laundry
Street Sweeping
Construction

WATER RE-USE

Through Grey Water

(cel Energy's Cherokee Station in Denver, Colorado
where reclaimed water feeds the plant's cooling towers
(photo source: Xcel Energy)

The Solution:

Golf courses and ski resorts are major users of mass quantity of water. Instead of using potable water sources, hills and courses have been using effluent water from their own communities in order to meet the demand that they need at a much better quality and better for the environment. The grey water is more reliable, has less chemicals in it which makes it better for runoff into rivers and actuallly makes the grass greener. Human demand for water in the Mountain West, Southwest, and West is increasing exponentially. Using non-valuable water for all of our irrigation needs, toilet flushing, and even food growth can be a huge game changer on the region and its future in order to continue allowing the communities to grow.

Real Life:

The Yellowstone Club -
(The Yellowstone Club located in Southwestern Montana recently acquired the permit to use 25 millions gallons of treated wastewater for snow-making operations. This will also preserve the water quality of the surrounding rivers as there is less nitrogen and phosphorus in the grey water. The Big Sky Watershed Forum listed the option as the most viable for preserving the towns water supply, and helping in the spring/-summer season by providing more runoff).

(photo source: www.snowmakers.com)

Invasive Plant Ordinance

A look at prohibiting the point of sale, trade, and import of invasive plant species.

The Big Picture

A noxious weed or invasive plant species is a plant that can directly or indirectly harm crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, and natural resources of the United States, public health, or the environment. Ornamental plants are responsible for nearly 40% of the invasive plants currently found in the US and are the primary point source of invasions. There is little incentive for horticulturists to abandon a species with high market value unless it is consistently regulated.

Effects
Economic & Environmental

The effects of climate change on the range, abundance, and impacts of invasive plant species heighten the challenges of management but also validates the necessity.

- Fire management
- Biodiversity
- Water supply
- Climate
- Wildlife/pollinators
- Agriculture
- Management costs
- Livestock health
- Rangeland
- Erosion

Knox County, IN

In 2018 Knox County, IN banned the sale, trade, and import of regionally specific invasive species (excludes seeds). This ordinance is enforceable through inspections and incentivized through costly fines for vendors found to be noncompliant.

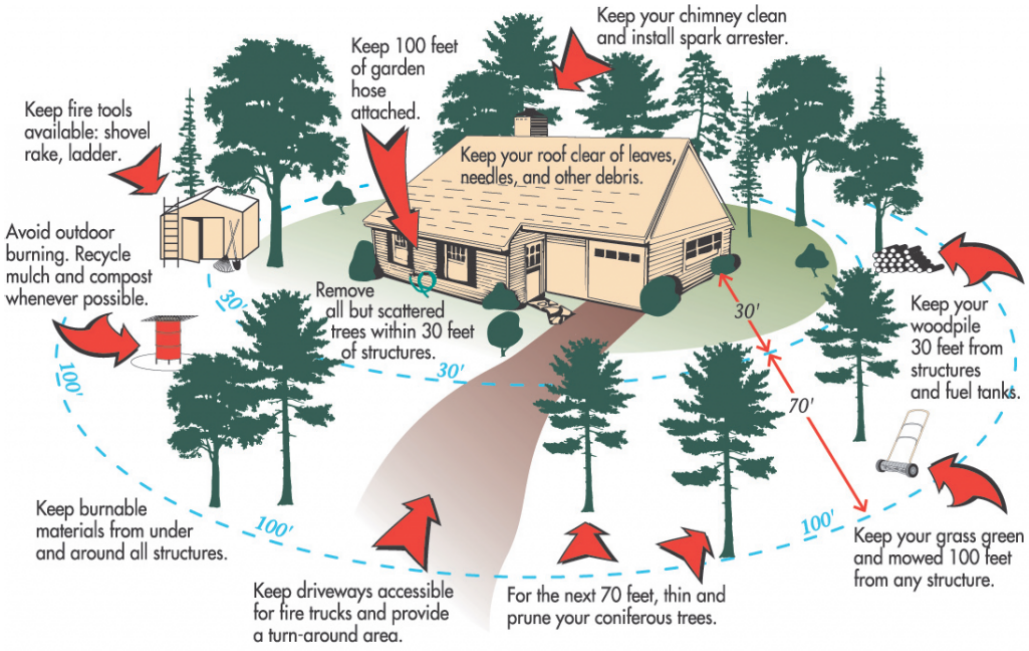
What this ordinance can do...

An ordinance that prohibits the sale, trade, and import of regionally specific invasive species has the ability to...
...manage the spread of invasive species
...protect native plant and wildlife ecosystems
...mitigate fire, water, erosion, and climate changes
...promote education and better practices

The Future

Looking to the future, thinking regionally, and gaining congruity across county and state borders regarding invasive species delineation and regulation could be the next leap in conquering the spread.

Sustainable Development Code
Kimberly Scanlon, MSU



Example

Home structure component	Potential ignition source	Home maintenance suggestion
Decks	Material stored underneath.	Remove and place in closed shed, replace, or treat with ignition-resistant materials.
Gutters	Leaves and pine needles in gutters.	Clean frequently, especially before fire season.
Eaves	Large gaps around.	Caulk or fill and paint over.
Vents	Open unscreened.	Screen with metal screen of about 1/8 inch or replace with baffled or other fire-resistive vents.
Roofs	Poorly maintained, made of wood shakes or other combustible material.	Replace roofs with ignition-resistant designs (e.g., Class A, metal).
Home siding	Poorly maintained, made of wood shakes or other combustible material.	Replace home siding with ignition-resistant designs (e.g., stucco).
Windows and doors	Single-pane windows, gaps around doors.	Replace windows with double-pane, tempered glass. Replace doors with fire-code rated ones. Seal gaps around windows and doors to keep embers out.
Landscape around homes	Overgrown with weeds; dry, dead vegetative matter; large flammable bushes under windows.	Pay special attention to make sure the area within the first 5 feet of the home is lean and green; remove open trash receptacles, building materials and trash from next to the home.
Stucco roof	No bird stops at the ends.	Clean debris such as nests from openings and cement ends or add bird stops.
Fencing	Flammable construction attached to the home.	Replace at least 5 feet of the flammable fence that attaches to the home.

Sustainable Development Code

Incentives for Creating and Maintaining Defensible Space

- The Wildland-Urban Interface (WUI) is the area where human development borders or intermingles with forestland or other wildlands. [1] One-third of homes are located in the WUI and nearly one-third of the U.S. population lives in the WUI. [3]
- One of the best ways to prevent house loss is through structural and vegetation measures in the area immediately adjacent to the home, typically referred to as creating defensible space. [7] **Defensible space** is the buffer you create between a building on your property and the grass, trees, shrubs, or any wildland area that surrounds it. [8]
- A change needs to take place in the relationship between homeowners and the fire services, and with homeowners who live in and adjacent to the wildland fire environment top take primary responsibility for ensuring that their homes have sufficiently low home ignitability. [14]
- Local governments and policy makers can promote and encourage landowners to create defensible space by implementing incentives, programs, rebates, and/or community programs.

Ruidoso, New Mexico

- Ruidoso has invested in infrastructure & staff to create forest debris curbside pick-up service. [22]
- The local public works department provides a forest waste disposal service where 100% of the material is recycled. [23]
- Village residents are charged $4.00/month/acre for compliant properties and $12/month/acre on noncompliant properties on their solid waste billing to pay for this service. [24]

Town of Athol, Kootenai County, Idaho

- FireSmart Kootenai County uses National Fire Plan dollars to pay local contractors to create defensible space for 100 feet around homes in high fire risk areas. [25]
- Work is done by the contractors at no expense to homeowners, with homeowners providing a match by being responsible for disposing of the vegetation debris produced by the treatments. [26]
- Homeowners participate in the program by either contacting the FireSmart office to request having the work done or being recruited by the contractors on door-to-door campaigns. [27]

City of Oakland Municipal Code § 15.12.030 (Long-term, fully implemented mandatory vegetation management with incentives of free chipping of limbs and an annual inspection with fines up to $330 if failure to comply with city codes.)

State of Colorado §39-22-104(4)(n)(II), C.R.S. (Colorado landowners with property located in a wildland-urban interface area may qualify to receive a tax subtraction for the costs of wildfire mitigation work for income tax years 2009 through 2024)

State of Oregon Department of Forestry grants. (These grants help communities reduce their vulnerability to wildfire.)

Sustainable Development Code

Incentives for Creating and Maintaining Defensible Space

- The WUI is commonly known as the area where the human-build environment blends into forest, grass, shrub or wildlands. [2] This blending can cause costly and disastrous results as weather and more dramatic climate changes are influencing an increase of wildfires' likelihood and intensity. [3]

- Creating defensible space is one of the best ways to prevent house loss from wildfires. [4]

  > **Defensible space** is created by clearing a buffer of trees, grass, shrubs, and other naturally flammable sources within a certain distance from the structures on a property. [5]

- This reduces the disasters such as: saving taxpayers dollars; saving lives of residents, firefighters, and wildlife; reducing property damages; and saving community buildings and assets. [9]

- Local governments and policy makers can promote and encourage landowners to create defensible space by implementing incentives, programs, rebates, and/or community programs. [8]

Ruidoso, New Mexico

- The Village of Ruidoso has invested in infrastructure & staff to create forest debris curbside pick-up service. [13]
- The public works department provides a curbside forest waste disposal service where 100% of the material is recycled. [14]
- Compliant properties pay $4.00/month/acre whereas noncompliant properties are charged $12/month/acre on their solid waste billing. [15]

Town of Athol, Kootenai County, Idaho

- FireSmart Kootenai County uses National Fire Plan funding to pay local contractors to clear 100 feet of defensible space around homes in high fire risk areas. [16]
- Work is done by the contractors at no expense to homeowners, but the homeowners are responsible for the disposal of the vegetation debris. [17]
- There are two ways to participate in the program: by either contacting the FireSmart office or by being a key property that is recruited as a fire hazard. [18]

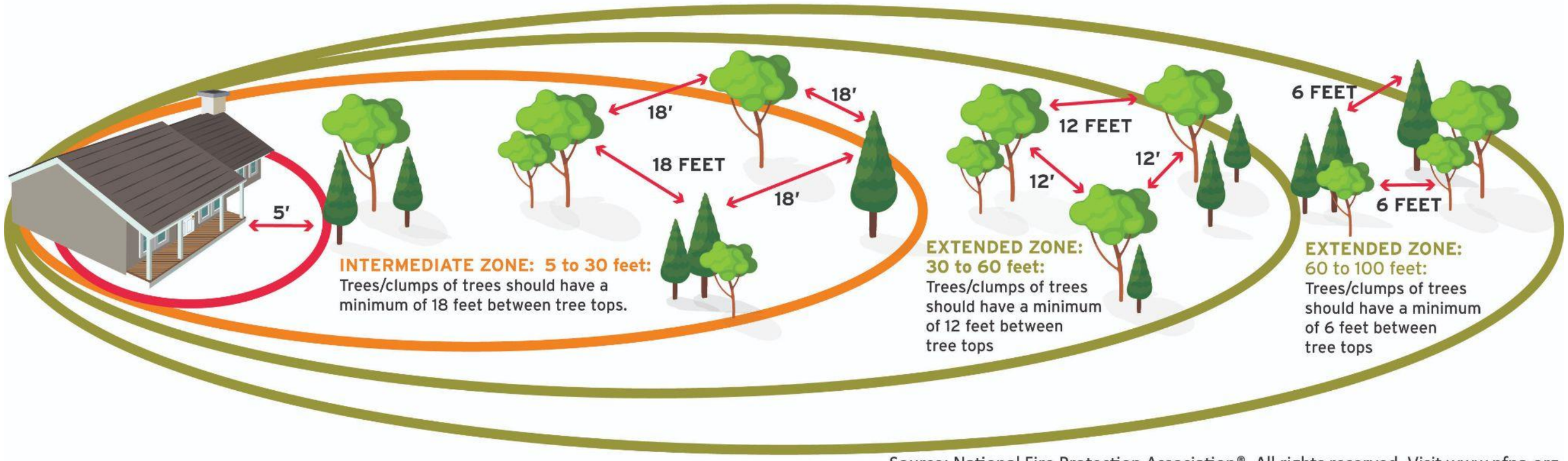
City of Oakland Municipal Code § 15.12.030 (Long-term, fully-implemented mandatory vegetation management with incentives of free chipping of limbs and an annual inspection with fines up to $330 if failure to comply with city codes.)

State of Colorado §39-22-104(4)(n)(II), C.R.S. (For income tax years 2009 through 2024, Colorado landowners with property in the WUI may qualify to receive a tax subtraction for the costs of wildfire mitigation work)

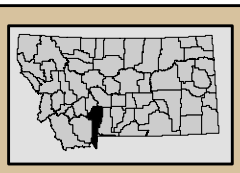
City of Reno, NV: Summer 2021 Incentive (offering free vegetation disposal to create defensible space).

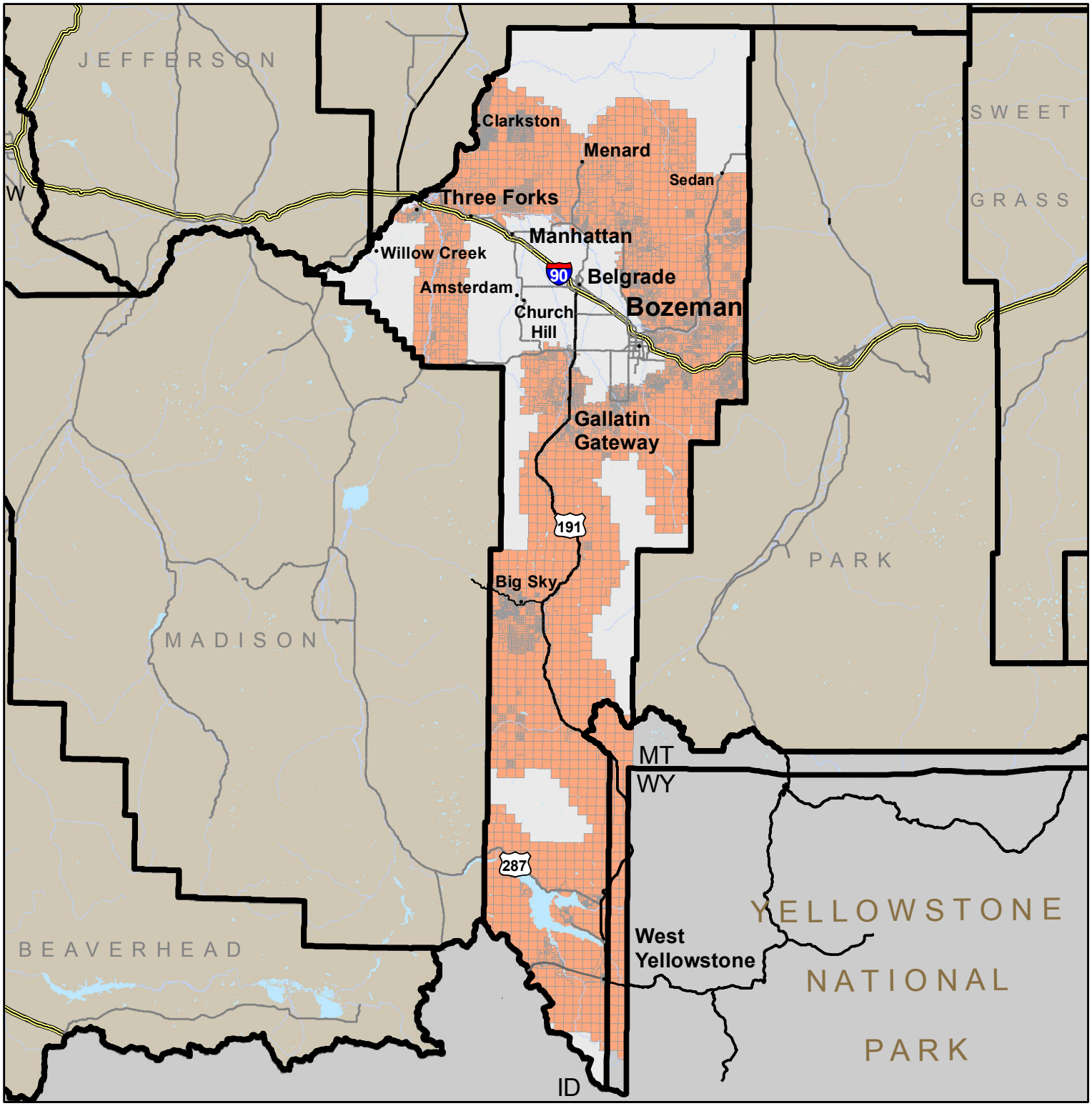
State of Oregon Department of Forestry grants. (These grants help communities reduce their vulnerability to wildfire.)

TREE SPACING



Wildland Urban Interface Parcels
Gallatin County





Gallatin WUI Parcels 2011

0 5 10 20 Miles

WUI boundaries were created by individual counties through their Community Wildfire Protection Plan (CWPP) planning processes. Varying methodologies in WUI delineation resulted in multiple representations that are inconsistent at the state level. Very few counties determined WUI to the parcel level through this process. Montana Department of Natural Resources and Conservation Fire and Aviation Bureau was required by MCA 76-13-145 to identify WUI parcels using CWPP WUI maps.

December 2011

Abstract:

Embracing Shared Mobility

The concept of shared mobility is an evolution from the concepts of bike-sharing and car-sharing, which have been around for over 50 years. Shared mobility refers to transportation services shared among users, such as bikes, e-scooters, and cars. Today, bike-sharing, car-sharing, and other categories such as micro-mobility, micro-transit, and ride-hailing are considered shared mobility options. Shared mobility options such as micro-mobility and ride-hailing have experienced exponential growth due to current technological advancements.

Shared mobility can potentially impact a transportation system and the community that uses it positively and negatively. The outcome depends on how the city deals with this renovated trend. This brief suggests the implementation of regulations that address shared mobility to ensure sustainability, user and pedestrian safety, and transportation equity.

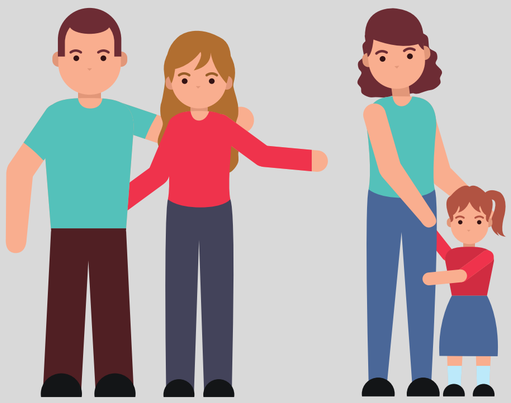
The Californian cities of Los Angeles and Santa Monica recognized the possible impacts and have adapted their municipal code to address the trend. Los Angeles developed and implemented the Mobility Hubs Program in 2016. The program provides the connection of multi-modal transportation throughout the city with the expectation of increased access to transportation modes other than personal vehicles. Santa Monica City Council approved implementing a second pilot program to evaluate the use of shared mobility device services within the city. The new program emphasizes administrative regulations for the latest trend. The ordinance adopted in Santa Monica searches for a more equitable transportation system by requiring operators to redistribute the devices and ensure a reasonable price rate of such devices.

This policy brief exploits possible outcome scenarios that may arise from shared mobility and what may define the outcome. Examples of ordinances that address the issue are included and used as persuasive tools to express the higher likelihood of positive effects when such regulations are used.

A case for reducing ordinance barriers to ADU construction

Social

Increases neighborhood diversity by allowing older residents to age in place and provides housing for younger residents to live in established neighborhoods.



Economic

ADU construction provides work for local construction workers and design firms.

Once built, increased density and infill provides additional customers and employees for local businesses, and income for landlords.

Environment

Smaller footprints decrease emissions through reduced heating and cooling needs.

Fewer materials are required for construction and data show ADU owners drive less.

Health & Safety

Reducing regulatory barriers to ADU construction increases the likelihood of legal ADU construction that meets the health and safety requirements of building codes.

This makes neighborhoods and residents safer.

PROTECT BLACK BEARS

in Bozeman, Montana

WITH A BEAR-RESISTANT TRASH BIN ORDINANCE

1. BOZEMAN HAS AN URBAN BEAR PROBLEM

Bear activity in Bozeman residential areas is a safety risk for the public, pets, and for bears.

2. BLACK BEARS ARE ATTRACTED TO HUMAN TRASH

Unsecured trash containers attract bears. Food-conditioned bears in Bozeman neighborhoods cause property damage and risk lethal management.

3. PROBLEM BEARS ARE EXPENSIVE

Property damage from black bears is expensive for individual residents. Responding to bear problems, lethal management, and relocation are expensive management strategies.

4. BEAR RESISTANT TRASH BINS PREVENT HUMAN-BEAR CONFLICT

Research demonstrates that mandating bear-resistant trash containers in areas with high bear activity is effective in mitigating human-bear conflict.

5. THE CITY OF BOZEMAN CAN REDUCE HUMAN-BEAR CONFLICT

By adopting a City Ordinance to require residential and commercial use of bear-resistant trash bins in designated regions of Bozeman, the City can protect the public, protect bears, and reduce damages!

Take Action!

BEAR-RESISTANT TRASH BINS SAVE MONEY AND LIVES

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Policy Briefs

Sustainable Development Code Ordinance – Wildlife Habitat Connectivity

Land Use Planning

14 December 2021

Zane Ashford

Introduction

Movement of wildlife across the landscape is a critical component to their survival. Long term viability of wildlife populations requires movement and migration across a range of spatial and temporal scales. Daily, wildlife travel for forage and acquisition of resources. Seasonally, animals migrate between summer and winter ranges. And occasionally, individuals embark on once-in-a-lifetime dispersal events to seek out new territories, sometimes travelling thousands of miles in search of resources and mates outside their maternal range.[1] Some large tracts of habitat are conserved through federally protected National Forest and National Park lands, in addition to privately conserved lands. However, increasing habitat loss and fragmentation from development and urban sprawl are threatening movement corridors and the interconnected network of core habitats which wildlife relies on. Loss of connectivity reduces the quality and scale of available habitat, disrupts dispersal and recruitment between populations, and affects seasonal migration patterns.[2] These changes can result in detrimental impacts on wildlife populations, including population decline, reduced genetic variation and "bottlenecking", decreased carrying capacity, and ultimately extinction of entire species.

A wide variety of ecosystem services depend on movement of organisms and materials across the landscape; this makes the provision of ecosystem services inherently linked to landscape connectivity.[3] Ecosystem services are the mutually beneficial services that the natural environment and wildlife provide that people benefit from. For example, plants and soil contribute to improved water quality through purification, erosion control, flood prevention, production of oxygen, and the sequestration of carbon, while insects contribute to pollination and pest regulation. Ecosystem services cannot exist without connection between the various biotic (wildlife, organisms) and abiotic (soil, water, nutrients) elements of the landscape.[3] Therefore, connecting the landscape through corridors between intense human land uses is critical for maintaining the linkages of the ecosystem.

Cities, counties, states, regions, and even countries can protect the movement of wildlife and facilitate the provision of ecosystem services by conserving corridors between high quality habitats. These multiscale approaches are critical as wildlife and habitat connectivity is important in localized areas for daily resource movement, and for large scale movement and migration across mountain ranges or larger territories. Wildlife corridors might look like patches of conserved green space between rurally developed lands, open agricultural lands without the heavy use of pesticides or other wildlife inhibitors, strips of native grasses between houses in a subdivision, or even underpasses or archways over major roadways to allow for safe travel. Within these corridors, it is vital to protect the habitat and food sources

that already exist, while maintaining free passageways without direct or indirect barriers to animal movement. Protection of these corridors will become increasingly important as human populations are growing and expanding outward, into traditionally human-uninhabited wildlife areas.

Effects

Habitat loss and degradation is listed as the primary threat for 85% of the species on the International Union for Conservation of Nature and Natural Resources red list of threatened and endangered species.[4] This is primarily due to the intense anthropogenic impact on the landscape from expansion of agricultural lands, harvest of timber and the associated deforestation, and high land conversion rates to sprawling suburban developments. Further, climate change and major disturbances are contributing to habitat degradation, forcing wildlife to adapt to a changing landscape and move in search of more suitable habitat.[1] This is causing an increase in human-wildlife conflict as animals are dispersing further outside of their core ranges and into areas now dominated by humans in search of food. This poses a critical challenge for the future, as planners must anticipate how habitats may shift with climate change and natural disturbances and where wildlife will need to go to survive.

Regulations and ordinances that require habitat conservation and landscape connectivity have shown overwhelming benefits to increasing biodiversity, enhancing wildlife populations, conserving open spaces for recreation and viewsheds, and promoting public safety.[5] These co-benefits can increase support of projects by giving all stakeholders and members of the public reasons to invest in the improved environmental, social, cultural, and often economic values gained from the project. The co-benefits of habitat conservation and landscape connectivity showcase the reciprocal and dynamic relationship between people and nature. Cultural structures are important for developing sustainable and resilient interactions between humans and the natural landscape and maintaining the co-benefits, especially in the age of climate change.[6]

A key component to the successful implementation of wildlife habitat and landscape connectivity initiatives is building partnerships between the various landowners, whether private ownerships or public agencies, within the region.[5] Diverse stakeholder engagement, including with nongovernmental organizations, can be vital to building relationships with private landowners where there is often a lack of trust with government agencies, or those enacting the change in land use policy when it comes to wildlife habitat ordinances. Further, establishing common goals of a connected landscape where ecological, economic, and social outcomes are integrated together generates a unified vision of the future.[5] Often, this generates enthusiasm and increased public acceptance and engagement in the process. With the shared vision in mind, stakeholders can collaboratively identify the areas of importance for habitat protection. Lastly, outreach campaigns can be an effective tool for clearly communicating the goals of the project to both the public and landowners, ultimately resulting in better outcomes for project success and implementation.

Examples

Ventura County, CA: Habitat Connectivity Overlay Zones

In March of 2019, Ventura County, California approved a county-wide ordinance aimed to protect critical wildlife corridors. With a sole focus on wildlife protection, this was the first ordinance of its kind put into place at a county scale. Initially, a collaborative team of scientists mapped critical habitat corridors within the county used by a large variety of mammals, fish, amphibians, birds, reptiles, insects, and plants to access protected areas of habitat that are essential for their long-term survival. This mapping effort included a variety of scientists from organizations such as the Forest Service, National Park Service, California State Parks, South Coast Wildlands, Wildlands Conservancy, Conservation Biology Institute, San Diego State University, with input from many other stakeholders, and ultimately identified two overlay zones that were adopted to the County's zoning ordinance by a unanimous vote.[7]

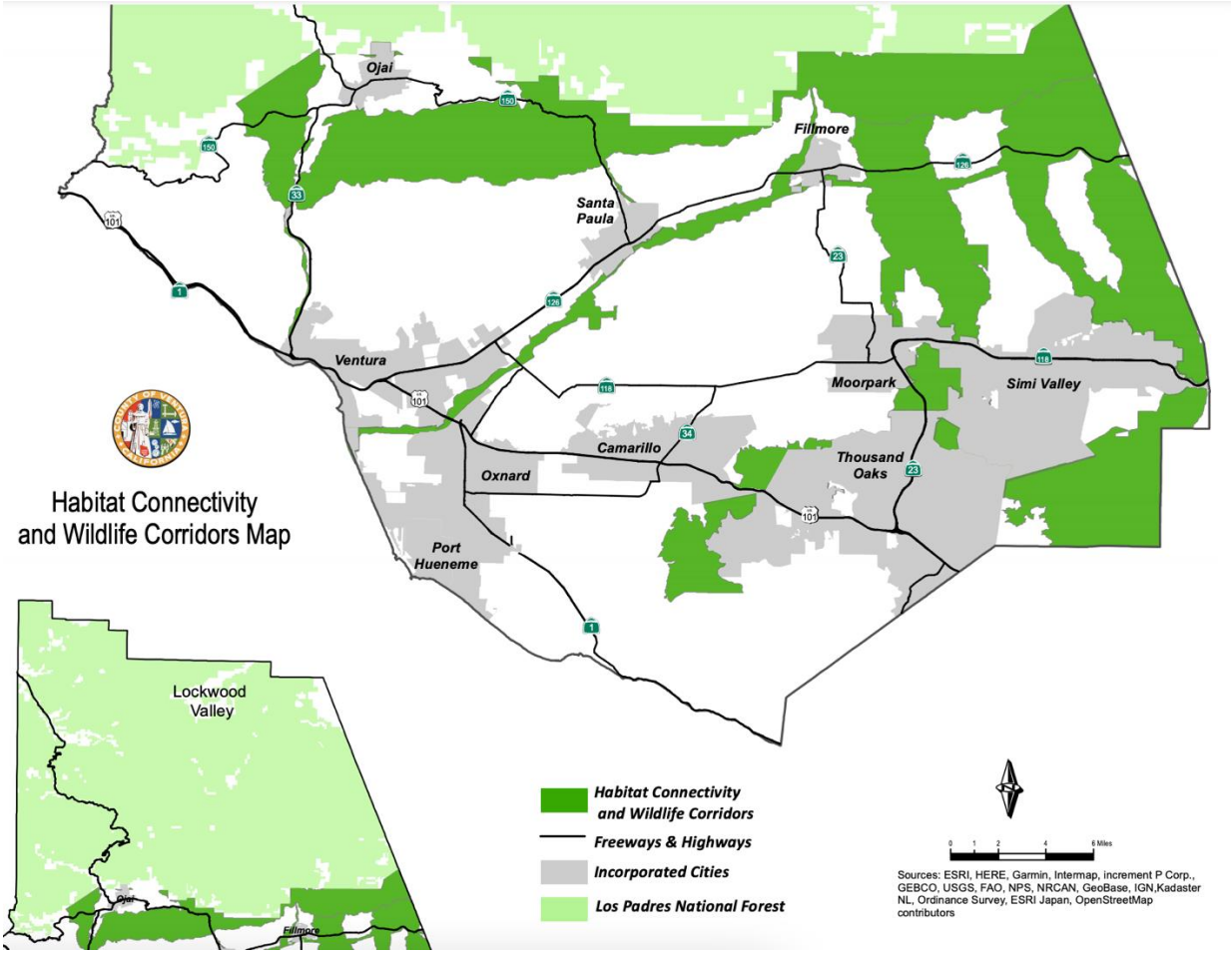

Figure 1. The Ventura County Habitat Connectivity and Wildlife Corridor overlay zone.[7]

The largest overlay zone, seen in Figure 1 above, is the Habitat Connectivity and Wildlife Corridor (HCWC), designed to preserve the functional connectivity for wildlife and vegetation by minimizing direct and indirect barriers to movement, loss of vegetation and habitat

fragmentation, and narrow movement paths. More specifically, the HCWC zone aims to minimize the impacts of outdoor lighting and disorientation of nocturnal species, which disrupts their mating, feeding, migrating, and the predator-prey balance at large. This is achieved through shielded lighting directed downward, with a 10 PM mandatory turn-off time for outdoor lighting fixtures, except for when they are in direct use or motion detected. It also aims to preserve the connectivity and habitat of surface water by including a 200-ft development buffer from surface water features and identified wildlife crossings.[7] The ordinance protects and enhances wildlife crossing structures to facilitate safe wildlife passage. The zone protects the provision of ecosystem services by minimizing introduction of invasive plants which are an inherent fire risk, reduce water availability, and accelerate erosion. Lastly, the ordinance minimizes wildlife impermeable fencing within the HCWC zone, which ultimately creates barriers to food, resources, and movement, by only allowing a maximum of 10% of the lot to be fully enclosed with wildlife impermeable fencing.[8]

The second overlay zone identified three separate areas as Critical Wildlife Passage Areas (CWPA) all located entirely within the HCWC boundary, that are particularly critical for facilitating wildlife movement due to existence of native or beneficial habitat, proximity to water bodies, ridgelines, and roadway crossings, likelihood of development encroachment, and presence of undeveloped and undisturbed lands that connect core habitats at a regional scale.[8] In Figure 2, the Simi Hills CWPA is shown as an additional overlay with its own requirements in addition to those identified in the HCWC. This overlay zone provides increased protection for areas identified as highly susceptible to fragmentation and development.

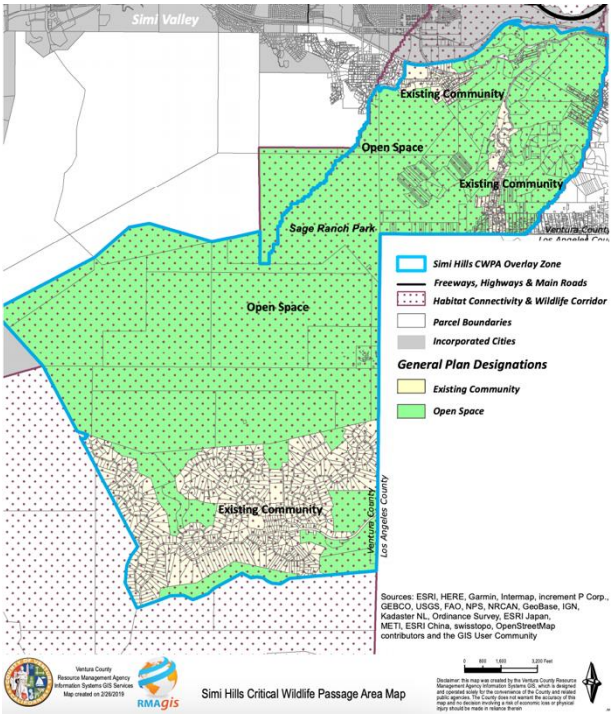

Figure 2. Simi Hills Critical Wildlife Passage Area overlay zone.[7]

These regulations demonstrate straightforward and feasible practices that can be implemented at a regional scale to improve connectivity between core wildlife habitats. One strength of this ordinance is that it has the power to control all lands within the HCWC and CWPA zones, including what can and cannot be done on private property, which constitutes 74% of all land area within the United States and ultimately the majority of wildlife habitat. Protection of private property habitat is vital for achieving landscape connectivity goals at a regional scale. However, this has been perceived as an overreach of governmental control of private property rights and the ordinance has faced multiple lawsuits from agricultural, business, and property rights protection groups. The regulations set forth within the HCWC and CWPA overlay zones identified in Ventura County Ordinance No. 4537 are summed up as follows:

1. Regulation of outdoor night-lighting
2. Prohibition of development within 200-feet of a surface water feature or identified wildlife crossing
3. Limited installation of wildlife impermeable fencing
4. Prohibition of intentional planting of invasive plant species
5. Concentration of new developments within CWPAs within 100 feet of public roads or an existing structure

To read more about Ventura County Ordinance No. 4537, see Non-coastal zoning ordinance to regulate development within the Habitat Connectivity and Wildlife Corridors and the Critical Wildlife Passage Areas overlay zones.

Oregon: An Act Relating to Wildlife Corridors

Oregon has the highest rate of vehicle-wildlife collisions of any state on the West Coast, more than double that of California and Washington combined. At least 3.4% of the state's vehicle collisions were related to wildlife, with deer and elk contributing to over 30,000 collisions from 2016-2020.[9] Wildlife corridors and habitat connectivity are critical for conserving biodiversity and facilitating wildlife movement while simultaneously contribute to reducing safety risk, avoiding quantifiable losses, and minimizing monetary impacts. Protection of wildlife corridors has received bipartisan support in recent years, namely with an initiative backed by the Western Governors' Association to encourage dialogue among partners in the West in effort to identify collaborative solutions for landscape-level habitat conservation.[10]

In 2019, Oregon Governor Kate Brown signed an act into law that requires the Oregon Department of Fish and Wildlife (ODFW) to develop a Wildlife Corridor Action Plan, intended to preserve long-term habitat connectivity for wildlife in Oregon. This act declares that the ODFW must "collect, analyze, and develop the best available science and data regarding the connectivity of wildlife habitat areas."[11] Utilizing this information, the ODFW and Department of Transportation shall provide guidance for the protection of wildlife corridors and work to identify species of concern that are at the most risk of habitat fragmentation and movement barriers, the known migration and dispersal corridors for those at risk species, describe potential impacts of climate change on the movement of these species, and identify the known and potential human-caused movement barriers to wildlife habitat connectivity.[11] This analysis will serve to develop a map of existing and potential wildlife corridors and areas of core high quality habitat. Additionally, it will create a prioritized list of designated areas for wildlife corridors and potential land acquisition. The ODFW is required to review and update the Wildlife Corridor Action Plan every five years. One of the primary goals for this plan is to reduce wildlife-vehicle collisions in areas where public roadways intersect with areas identified as critical wildlife habitat. This may include development of wildlife crossing structures or wildlife fencing.[12]

The Wildlife Corridor Action Plan outlines a statewide habitat connectivity effort that utilizes the expertise of state government agencies and state funding from taxes, vehicle fees, and natural resource related fees for a mutually beneficial outcome for both wildlife and human safety. This plan coalesces with other larger, multi-state efforts at the regional level, expanding the potential impact of this individual Wildlife Corridor Action Plan. The economic incentives of reduced quantifiable losses from wildlife-vehicle collisions makes for a strong case for wildlife corridor protection that can be backed by legislation. The iterative processes required in the development of a Wildlife Corridor Action Plan ensure that it will be adaptive to changes in land use, wildlife behavior, and climate change.

Figure 3. Deer using a designated wildlife crossing built under Highway 97 in Oregon.[12]

To read more about the Wildlife Corridor Action Plan, see Oregon H.B. 2834.

Additional Examples

[Los Angeles, CA Wildlife Ordinance]

This is a draft ordinance to amend the Los Angeles Municipal Code in effort to create a Wildlife Ordinance District where regulations are established to restrict the size, location, and height of structures, in addition to grading, landscaping and design requirements of any development within the Wildlife District. This ordinance would be the first of its kind in a large and growing metropolitan area. Currently, this Ordinance is in the Public Hearing phase of the city legislative process.[14]

Figure 4. Proposed regulations affect the above features of any development within the Wildlife Ordinance District.[14]

[Spokane County, WA Critical Areas Ordinance]

First adopted in 1996 and recently updated in 2018, the Spokane County Critical Areas Ordinance ensures protection of wetlands, fish, and wildlife habitats, geo-hazard areas and critical aquifer recharge areas. This ordinance designated species-specific conservation areas. This ordinance focuses on preservation of wildlife corridors, landscape linkages, and rural open space. It uses incentives such as tax reliefs and transfers of development rights in order to protect property rights and maintain critical habitats on private property.

Figure 5. Infographic explaining how a Transfer of Development Rights works.[15]

Eagle Mountain, UT Wildlife Corridor Overlay Zone

This zoning ordinance was passed in 2021 and is the first wildlife corridor zone approved at the city-level in the state of Utah. This 1300-acre corridor is a collaborative effort of the City of Eagle Mountain, Utah Department of Transportation, the Utah Division of Wildlife Resources, Bureau of Land Management, and nongovernmental wildlife organizations, and the corridor utilizes the existing green and open spaces to connect two critical mule deer habitats on either side of the city. Development is not allowed within the corridor unless it is a roadway, wildlife crossing structures are encouraged above and below roadways, and wildlife impermeable fencing will border the perimeter of the corridor to discourage travel through urban surroundings, but only permeable fencing is allowed within the corridor.

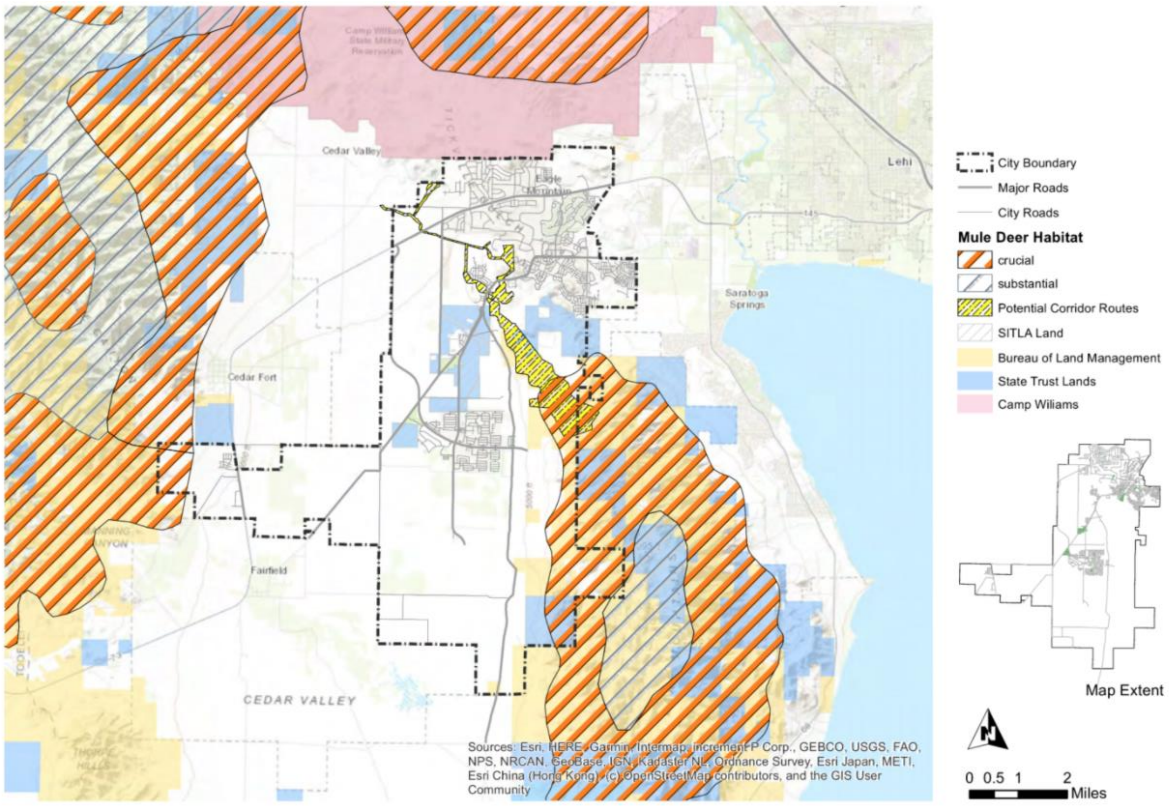

Figure 6. The identified potential wildlife corridor through Eagle Mountain, Utah connecting two crucial mule deer habitats.[16]

Santa Fe County, New Mexico Supports Protecting Wildlife Corridors

In 2019 in New Mexico, six counties, including Santa Fe County, passed a similar resolution in support of the U.S. Congress to pass the Wildlife Corridors Conservation Act, ultimately to protect wildlife corridors in the Upper Rio Grande basin. The resolution also encouraged the regional National Forests within these counties to establish special management areas of wildlife habitat connectivity. This resolution ultimately encourages collaboration between county, state, federal, and tribal land managers. This type of resolution is the basis of regional wildlife habitat connectivity planning.

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Liam Bean

Introduction

Single-family zoning is a hallmark of modern American planning ever since Euclidian zoning was codified in *Village of Euclid v. Ambler Realty Co* (1926) [1][2]. Euclidian zoning is the legal ability for municipalities to restrict development based on land-use type, one of the most common Euclidian zones is the single-family or residential 1 (R1) zone [3]. The R1 zone restricts development in a zone to housing designed for one family, typically on large or mid-sized lots [4]. Most people find this kind of housing to be the most desirable when selecting a place to live [5].

However, there is a growing disillusion with the impact of single-family zoning on the environmental and economic health of our cities [6]. This ordinance would remove or heavily modify the R1 zone effectively prohibiting single-family zoning. Municipalities can do this by either converting to a form-based zoning code (replacing the single-family designation with a neighborhood form designation) or by altering the definition of R1 to include multiunit development [7].

Effects

The effects of removing single family zoning in growing municipalities are still hotly debated. Proponents of prohibiting single family zoning believe that eliminating traditional R1 zones will begin to undo decades of social harms and encourage the development of low-rise density [8].

While single family zoning is not de facto racial segregation it was developed as a response to the supreme court of the United States forbidding racial zoning [9]. Single-family zoning made access to the most desirable part of cities predicated on the ability to buy large lots of land, excluding low-income (typically non-white people) from these areas [10]. As R1 zones became concentrations of the best amenities, such as access to quality education, the value of land in these zones continued to increase and the pattern of exclusion became a feedback loop [11]. Allowing more people to live in these areas, where access was previously so restricted, could begin to redistribute some of these benefits to groups who have been historically excluded.

Single-family housing directly contributes to suburban sprawl [12]. The spread of low-density suburban development is directly corelated with increased CO2 emissions while mid and high-density urban development have much more stable emissions over time [13]. The removal of single-family zoning can encourage sustainability by increasing the opportunity for density. Other ordinances designed to remove sprawl have also stunted urban growth continuing to increase the cost of housing, the prohibition of single-family zoning could potentially feed two birds with one scone [14].

Defenders of maintaining single-family zoning note that removing the R1 zone may not lead to the construction of “missing middle” housing [15]. Developers may still be incentivized to produce single family housing if it would be more profitable than building multiunit homes [16].

Any ordinance removing R1 from a zoning map should likely be paired with ordinances incentivizing density to avoid this effect. For example, the relaxation of building height limits could be considered alongside the prohibition of single-family zoning. It is also important to consider that the existence of single-family zoning is one of the reasons that many Americans support the institution of planning [17]. The guarantee that their home or neighborhood will remain unchanged is a powerful motivator in the American Suburb [18]. Municipalities that remove single-family zoning may face strong resistance from neighborhood organizations and can potentially undermine future planning efforts.

Examples

Minneapolis, MN

The city of Minneapolis advanced their single-family zoning reforms primarily to address the cities growing affordable housing crisis but also to address the racial segregation created by single family zoning in the past and concerns due to climate change [19]. The city redefined all residential districts as multiple-family districts. The new multiple-family zone allows for the construction of duplexes, triplexes, and other multiple unit housing in every residential district in the city [20].

They combined the zoning text amendment with several other reforms to also support increasing density and to encourage development of low-rise residential property [21]. By combining zoning reform with the removal of mandatory parking minimums and increased city budget for affordable housing, the ordinance is set up to make development of mid-density housing as easy as possible [22]. One critique of the Minneapolis ordinance is it was not accompanied by a change in building height standards for most of the affected zones [23].

To view the provision, see Minneapolis, MN, Code of Ordinances §§ 521 – 10 through 521 – 30.

Sacramento, CA

The Sacramento City Council unanimously passed an update to the cities zoning map for the new city 2040 general plan [24]. The new plan is expected to be completed and approved in 2022. The draft master plan zoning map removes all residential zones and replaced them with the new “neighborhood” zone [25]. The city’s new plan does not call for support for mid-density with increased height standards when this new zoning map was included [26]. The city hopes that property owners will be able to add additional new units by 2023 [27].

To view the master plan update, see Sacramento, CA, City Council Meeting 1/19/2021 Agenda Item 15

Additional Examples

Portland, OR – Portland, OR, City Code §§ 33 – 100 – 110 (The city of Portland has amended all residential zones [with the exception of rural residential zones] to allow for the construction

of duplexes in all single family zones. They also include minimum density requirements in the R7, R5, and R2.5 zones as well as allowing the construction of all multiunit housing in the R7, R5, and R2.5 Zones.)

Berkely, CA – City of Berkely**,** 2021 Session, Resolution No. XX (The Berkely city council has passed a resolution promising to amend city code and prohibit single family housing by 2022)

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Municipal Ordinances for Inclusive and Equitable Public Participation
Policy Brief
Madison Boone

INTRODUCTION

Public participation is an inherent part of democratic governance in the United States. Through participation, citizens can engage with policy processes and ensure that governmental decision-making accurately reflects their needs and concerns. Participation also engenders public trust in local government, buy-in for resulting policy actions, and greater understanding of a community's challenges [1]. Many states, counties, and cities have enacted laws requiring public participation in their decision-making processes, with the most common form of mandated engagement being the public hearing [2]. However, such standard avenues of participation do not give the public any decision-making power and are instead superficial acts of engagement [3]. Many scholars argue that moving to collaborative, balanced models of decision-making, where elected officials and the public hold equal power, allow a community to address challenges in impactful and innovative ways [4].

Given the recognition that collaborative forms of decision-making can benefit a community, many municipalities are beginning to try more inclusive models of public participation that acknowledge the important role citizens play in local government. Examples of these efforts include establishing public participation principles, citizen engagement plans, and community advisory groups [5] [6] [7]. The Deliberative Democracy Consortium's Working Group on Legal Frameworks for Public Participation has also drafted a model public participation ordinance that local governments across the country can use to improve their engagement frameworks [8]. While these efforts are a step in the right direction, they are commonly enacted as community initiatives or city resolutions and not as city ordinances. Therefore, such actions are not formalized in a city's code of ordinances and have little binding legal power behind them.

However, some cities are beginning to pass municipal ordinances to foster inclusive public participation. One such kind of public participation ordinance is the establishment of participatory budgeting, in which the public helps decide how a city will spend its money. These kinds of ordinances either focus on citizens helping to develop a city's annual budget or voting on how a set amount of city funding will be allocated, often in the form of citizen-initiated projects [9] [10]. Another type of municipal policy is the community benefits ordinance, which requires that a developer engage with and respond to the concerns of an impacted community [11]. Finally, cities can create public commissions that explicitly target citizen involvement and engagement of groups historically excluded from local government [12]. Despite these examples, some critics claim that authentic public participation will never be possible due to limited public capacity, pervasive power dynamics, and disconnect between a citizen's self-interest and the greater community good. Although these are important considerations when developing inclusive public participation policy, the positive impacts of ordinances like those described above far outweigh their possible drawbacks [13].

EFFECTS

While many municipal ordinances that support inclusive public participation do not explicitly focus on sustainable development, they are foundational to effective sustainable

development planning and policy processes. Sustainable development sits between the competing demands of economics, environment, and equity [14]. Due to its multifaceted nature, sustainable development can be interpreted as a vague goal rather than a concrete set of actions [15]. Making public participation in municipal affairs more inclusive and equitable allows civic officials to hear a greater diversity of perspectives on the topic, thus allowing them to enact sustainable development policies that are grounded in reality and representative of the community [16]. In addition, participation models that empower public decision-making strengthen more than just the equity aspect of sustainable development. For example, ordinances to establish participatory budgeting integrate citizen perspectives on economics and equity in budgetary decision-making to support community spending initiatives that benefit the environment [17]. Many have also begun to call for the inclusion of culture in sustainable development planning and policy processes [18]. Through improved models of public participation, local governments can create avenues to authentically integrate a community's values and beliefs into municipal decision-making [19].

Ordinances that establish inclusive forms of citizen engagement also support public and municipal understanding of sustainable development issues. As mentioned, sustainable development must balance connections between economics, environment, equity, and culture [20]. Local government officials and citizens each come to sustainable development processes with their own perspectives on an issue. By engaging in inclusive forms of participation and dialogue, these groups can foster social learning that helps them understand the interconnected nature of the field [21]. Such forms of participation also bolster a community's ability to work together and balance their respective needs in the context of a municipality's sustainable development goals [22]. Similarly, improved forms of public participation support a citizenship's general sustainability literacy and further empower them to push for positive social change in their communities and personal lives [23].

Inclusive and equitable public engagement models not only ensure that sustainable development is representative and balanced, but that it also benefits as many citizens as possible. Due to its broad nature, sustainable development impacts many groups of people, and as such, impacted groups have a right to be included in related planning and decision-making [24]. Ordinances that focus on including marginalized groups in decision-making amplify these groups' voices and make them known to those who hold positions of power in a community [25]. For example, Detroit passed its community benefits ordinance to create a more equitable development process between wealthy developers and historically disenfranchised city residents [26]. These types of ordinances integrate the community's social and cultural needs with the developer's proposed economic and environmental actions, making sure that the resulting impacts are fair and beneficial. Thus, such ordinances incorporate elements of socio-environmental justice to ensure that development actions are sustainable and equitable for both residents and the environment in which they live and work [27].

EXAMPLES

Central Falls, RI

The City of Central Falls, Rhode Island passed an ordinance in 2018 creating a Central Falls Participatory Budgeting Committee. This committee was created in response to extreme financial turmoil the City experienced from the mid-to-late 2000s. During this time, the city

entered state receivership and went federally bankrupt, resulting in a significant loss of public trust in the local government. Although the situation in Central Falls has since improved and the city has since exited receivership status, many residents have still felt disempowered and unable to engage with and inform city activities [28]. Thus, the participatory budgeting committee was created to give community members greater power in the fiscal process and promote active, authentic participation in City affairs [29].

The Central Falls Participatory Budgeting Committee works with the mayor and the city council to develop the city's annual budget as well as a five-year budget plan [30]. The committee is comprised of ten members and has specific composition requirements. The ordinance states that the committee must have representatives from three named local organizations, including a social services organization, a non-profit, and a youth-based community organization, as well as representatives from the school district, a local charter school, a small business, the Library, the Central Falls Housing Authority, the healthcare sector, a faith-based organization, two businesses, and two homeowners. Each representative is appointed by the mayor and approved by the city council. Except for the two business owners and two homeowners, each of these representatives must be recommended by their corresponding organization or a related entity (for example, the small business owner is recommended by the City's Chamber of Commerce) [31]. The committee meets regularly, as established in its bylaws, and through the request of the chairperson or city council may also hold special meetings [32].

The committee is tasked with multiple duties and responsibilities. First, the committee is required to put together a multi-year plan on how to support active participation and foster diverse viewpoints in the city's engagement processes. This plan is then proposed to the mayor and city council [33]. Second, the committee, with the finance department, must hold quarterly public hearings about the annual budget and five-year budget plan [34]. Third, the committee is tasked with reviewing public participation evaluation results and sharing recommendations with the city council on how to improve existing policies and practices based on these results [35]. Finally, they must develop and submit an annual report by January 31 of each year that covers both the status of their public participation activities and public comments as well recommendations concerning the budget and budget plan [36].

To view the provisions, see Central Falls, RI Code of Ordinances § 2-334 (2018).

Detroit, MI

Detroit, Michigan is the first city in the United States to have passed a Community Benefits Ordinance. This ordinance was established in 2016 as a way for residents to secure benefits from high-impact development projects. In the context of Detroit, it was proposed to create more equitable development projects and for historically disenfranchised, long-term residents to have more influence and say in these processes [37]. When applying the ordinance, Detroit defines two types of development projects, Tier-1 and Tier-2 Development Projects [38]. Tier-1 projects are those with values of $75M or more and receive $1M or more in tax abatements, while Tier-2 projects are valued at $3M or more and with tax abatements of $300k or more. Each project tier has its own community engagement requirements [39].

Tier-1 projects require that the Planning Director hold a public meeting in the impacted area and ensure that area residents, businesses, and organizations are informed of the public

meeting [40]. The City Council also appoints a liaison from the Legislative Policy Division to monitor the community engagement processes and update the City Council [41]. In addition, the Tier-1 project status mandates the creation of a nine-member Neighborhood Advisory Council for the impacted area [42]. Residents in the impact area initially nominate the pool of Council candidates. From these candidates, residents select two members, the Planning Director selects four members, a Council Member whose district contains the largest portion of the impacted area selects one member, and At-Large Council Members select one member [43].

After the Neighborhood Advisory Council is formed, the Planning Director facilitates at least one meeting between the Council and developer so the Council can learn about the project and express any concerns [44]. The Planning Director also develops a Community Benefits Report and provides it to the City Council and the Neighborhood Advisory Council [45]. This report outlines how the public meeting notice was provided, an overview of the Neighborhood Advisory Council, an itemized list of Council concerns, and a method for addressing each concern [46]. When a project is approved, the development agreement between the City and developer must also include a Community Benefits Provision [47]. This document describes how provisions are enforced, what happens if provisions are not followed, how community members can report violations of the provisions, and continued community engagement requirements [48]. An Enforcement Committee is established to monitor Tier-1 projects [49]. This Committee reports to the City Council and Neighborhood Advisory Council and facilitates any proceedings that arise from violations [50].

Tier-2 projects require fewer specific community engagement procedures. In these cases, the developer has to work with the City to promote the hiring, training, and employability of residents [51]. They must also work with the Planning Director to address any negative impacts the project will have on the community and its residents [52].

To view the provisions, see Detroit, MI Code of Ordinances §§ 12-8-1, 12-8-2, 12-8-3, 12-8-4, 12-8-5 (2016).

ADDITIONAL EXAMPLES

Seattle, WA Municipal Code §§ 3.51 (2004), 3.62 (2016), 3.67 (2016) (establishes, respectively, a program to engage youth in local government, a Community Involvement Commission, and a Youth Commission).

Richmond, VA Code of Ordinances §§ 2-1196, 2-1197, 2-1198, 2-1199, 2-1200 (2021) (creates a Participatory Budgeting Steering Commission and outlines associated composition and duties).

Oak Park, IL Code of Ordinances §§ 2-35-1 (1999), 2-35-2 (2011) (establishes a Citizen Involvement Commission to boost public engagement and volunteerism).

Lenoir, NC Code of Ordinances § 2-205 (2021) (emphasizes inclusion of historically disenfranchised citizens in comprehensive planning efforts).

Boston, MA Proposed Ordinance § 1-8 (2021) (a recently proposed ordinance to expand remote participation access in city affairs. The full draft ordinance is located at the bottom of the news story).

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[25] Jill K. Clark, *Designing Public Participation: Managing Problem Settings and Social Equity*, 78 Public Administration Review 3, 362-374 (2017).

[26] Berglund, *supra* note 6.

[27] Julie Gobert, *Environmental justice, community benefits and the right to the city: The case of Detroit*, 2 Spatial Justice, 1-17 (2010).

[28] Katherine Newby Kishfy, *Preserving Local Autonomy in the Face of Municipal Financial Crisis: Reconciling Rhode Island's Response to the Central Falls Financial Crisis with the State's Home Rule Tradition*, 16 Roger Williams U. L. Rev. 2, (2011).

[29] Council Falls, RI, Code of Ordinances § 2-334 (2018).

[30] *Id*. at § 2-334 (b) (1).

[31] *Id*. at § 2-334 (b) (3).

[32] *Id.* at § 2-334 (b) (5).

[33] *Id*. at § 2-334 (b) (2) (a).

[34] *Id*. at § 2-334 (b) (2) (b).

[35] *Id*. at § 2-334 (b) (2) (c).

[36] *Id.* at § 2-334 (b) (2) (d).

[37] Berglund, *supra* note 6.

[38] Detroit, MI, Code of Ordinances § 12-8-2 (2016).

[39] *Id*. at §§ 12-8-3, 12-8-4.

[40] *Id*. at § 12-8-3 (a) (3).

[41] *Id*. at § 12-8-3 (a) (5).

[42] *Id*. at § 12-8-3 (b) (3).

[43] *Id*. at § 12-8-3 (b).

[44] *Id*. at § 12-8-3 (c) (1).

[45] *Id*. at § 12-8-3 (d) (1).

[46] *Id*. at § 12-8-3 (d) (2).

[47] *Id*. at § 12-8-3 (e) (1).

[48] *Id*.

[49] *Id.* at § 12-8-3 (f) (1).

[50] *Id*. at § 12-8-3 (f) (5).

[51] *Id*. at § 12-8-4 (a) (1).

[52] *Id*. at § 12-8-4 (a) (2).

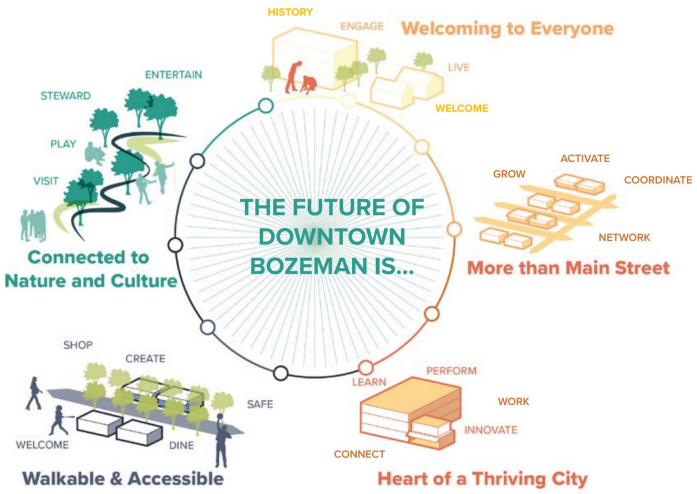
Quinn Bouma
Land Use Planning - GPHY520
Sustainable Development Code Policy Brief
14 December 2021

Bozeman Downtown Improvement Plan

Studying alleyway enhancement for the semester, there were numerous opportunities to look at the development plans and growth projections for the historical areas in eastern Bozeman, Montana. Initially focusing on alleyways near Main Street, further research on the Bozeman Downtown Improvement Plan ordinance/initiative, and the idea of expanding this further into Bozeman neighborhoods started taking shape. The BDIP began in 2019 in which it studied the downtown region, its businesses, people, parks, and circulation. After several months of research and studying the area, the city put into effect an initiative that would begin breaking down zones within the downtown for pedestrian access, green space, recreation, and anything that can benefit the people more. This not only would clean up areas that are currently under utilized, but it would maximize on areas that could be used for the objectives of health, environment, and be culturally beneficial for the town.

This ordinance/initiative not only looks at improving certain areas of the town through pedestrian access and connecting people to new areas of the downtown, but it enhances sustainability.This is by reworking hard scaped pavement areas with permeable products, like pavers, garden beds, etc. that greatly reduce polluted water run off, and allows for cleaner air, water, and habitat.

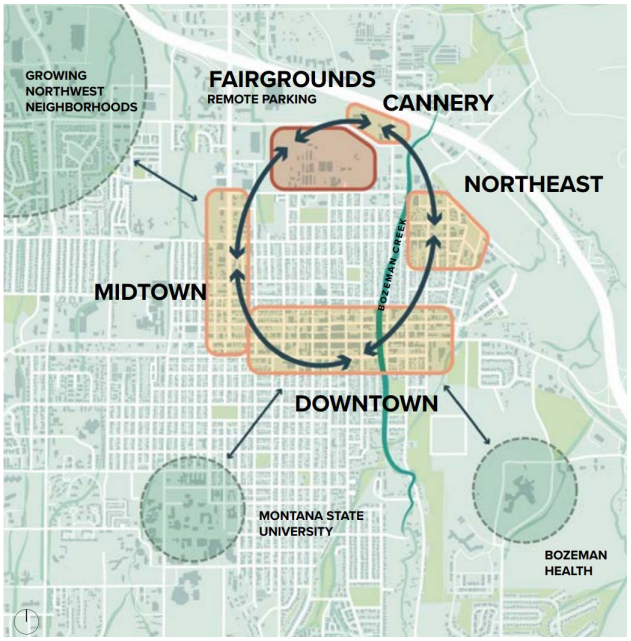
Looking at the concept of sustainability, it can be broken down into three categories of economic, social, and environmental.[1] The ideas of BDIP creates a sustainable process by: reducing harmful materials that can pollute environmental systems, creating vibrant social areas for people to spend time, and bringing more attention to the downtown area for business and connection. In doing so, it will create a more prosperous and enjoyable area for members of the community to congregate. This idea influenced the idea of expanding this ordinance/initiative further north, into the historically industrial Northeast Neighborhood that is currently seeing large amounts of attention and growth over the past several years.



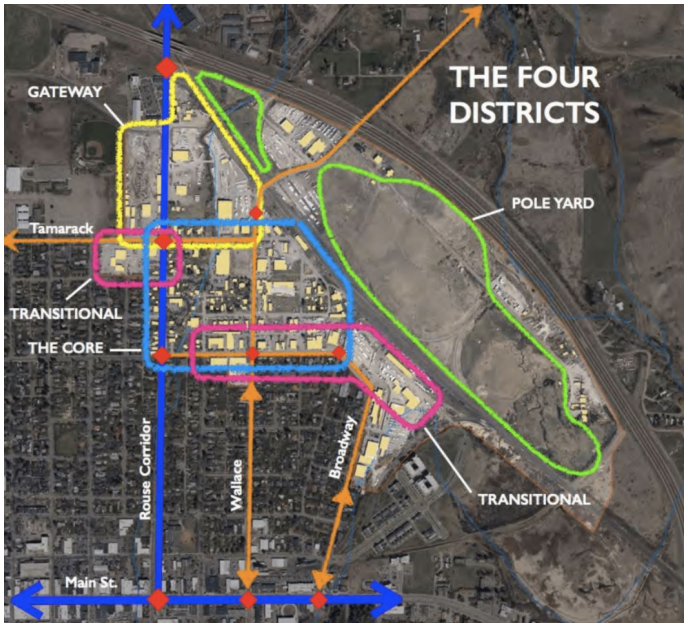
With Bozeman gaining nearly 17,000 new citizens in two decades,[2]

[1] "Pavements." *U.S. Department of Transportation/Federal Highway Administration*, https://www.fhwa.dot.gov/pavement/sustainability/why.cfm.
[2] *Downtown Bozeman Improvement Plan May 2019*. https://www.bozeman.net/Home/ShowDocument?id=558.

infill within this neighborhood and the downtown area has increased drastically: this can lead to a more efficient corridor system that can connect the two districts with a seamless green pedestrian/biking way. Encompassing approximately 180 acres of the dense Bozeman area, the neighborhood has a distinct character with appreciation for historical integrity, walkability, environmental responsibility, social connection, and unique land usage, like alleyways. The BDIP can relate to the Northeast Neighborhood by creating a space where all the values can be incorporated into a project, and create greater connectivity between downtown and this area.



In addition to helping the certain areas of the downtown, it has the potential of making the area safer by utilizing pedestrian lights, sturdier ground surfaces, and signage. These points will make these pedestrian areas far more effective and worthwhile for the community.[3] This helps with sustainability because it is altering the social component of the area. A safer place means greater reoccurrence of people coming back and experiencing the safe qualities over time. An example would be individuals staying in paths that have an overhead light that can help them move from place to place, whereas a dark, secluded area where you cannot see where you're going would lead to little usability and quite unsustainable.



Not only is this neighborhood important for its proximity to downtown and industrial history, but it is a part of the transect that connects Main Street to the Bridger Mountains via a paved bike and walking trail. This enhances the social connection between city members, overall health, and appreciation for the environment, being quite sustainable. This idea of creating paths for community members, and reducing an overall human footprint, such as reducing hard surfaces in alleys and under utilized streets, can also be deemed sustainable because they are preserving the land for a simpler purpose, reducing threat towards the surrounding environment. As put in *Why Ecosystem-Based Management,* "I consider plans more protective if they adopt approaches that scientists regard as conservative or precautionary - that is, they refrain from

[3] *Downtown Ozeman Alley Sketchbook - S3.US-West-2.Amazonaws.com*. https://s3.us-west-2.amazonaws.com/dba-2021/Resource-PDFs/Downtown_Alley_Sketchbook.pdf.

prescribing actions that may impose irreversible damage and do prescribe actions that are environmentally protective, even if the benefits are uncertain," (Layzer, 37).[4] This quote articulates the damage over development can do for the surrounding environment, in which it is better to be more protective and precautionary, than overdo development near ecologically sensitive areas: like neighborhoring Bozeman Creek.

The kind of ordinance/initiative BDIP can become has the potential to impact not only the environmental components, but the social and environmental components as well. Additionally, if this idea is brought into the Northeast area, it can create a green corridor that enhances social connections between downtown and the prevalent district. There are numerous businesses that thrive in the Northeast Neighborhood, and this is in part to their proximity to Main Street. If there were greater pedestrian and bike paths that would draw individuals from either district, the economic and social benefit would be greatly increased.

Currently, there are dozens of small businesses that call the Northeast Neighborhood home, and the local community greatly impacts their success. But, due to it being quite isolated from prominent roads, like Main Street, Interstate-90, and 7th and 19th Avenues, the limited exposure makes it more difficult to succeed as a smaller business in the historical district. The initiative proposed would greatly enhance this exposure by allowing more members of the community to access these businesses, events, and other projects within the neighborhood by foot, bike, or another type of transit that can be done through the alleyway. Discussed in *A Vision for the Northeast Neighborhood*, an R/UDAT Report with Bozeman, the goal for the neighborhood was to create an array of development options that would include potential business opportunities ranging in scale.[5] For instance, small coffee shops, art galleries, retail, etc. that would take part in the historic core of the neighborhood. This would create a strong community culture that would be enhanced with better corridors between downtown Bozeman and the Northeast Neighborhood. Additionally, greater foot and bike traffic, or any exposure to this region of Bozeman would allow the citizens to acknowledge the historical prevalence of Bozeman during the early 20th century. Allowing this foot traffic would build a greater culture for the neighborhood, and the town as a whole. This relates to sustainability because it makes individuals and groups preserve the area for generations.

Situated in downtown Boise, Idaho, "Freak Alley" sits between two 1920's-60's lowrise buildings that have a large amount of foot traffic. In the early 2000's, this alley was created for community members to see wall art. Over time, this alley became more popular by the locals in which they attended the space because of its cultural importance, seclusion, and shade, and eventually made it a full city developed ordinance to finish it. Freak Alley is a relatable example ordinance by a policy creating an effective space that was under utilized. This also required a large amount of public participation, with surrounding businesses to allow it, and members to advocate for it.[6] Today, this alley space has enhanced qualities, like lighting, efficient ground materials for water collection, and a social component. This alley's policy is similar to the DBIP because it led to a sustainable economic area of the downtown, and caused the footprint of downtown to shift and spread out.

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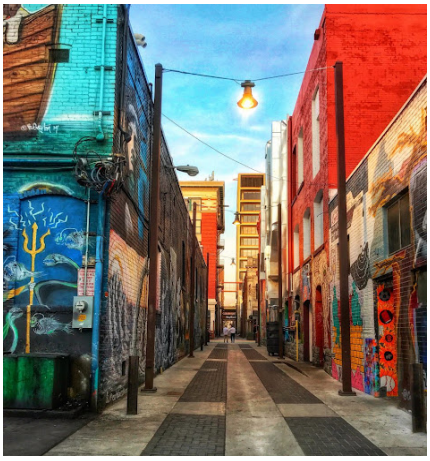
[4] Layzer, Judith A. "Why Ecosystem-Based Management?" *Natural Experiments*, 2008, pp. 9–40., https://doi.org/10.7551/mitpress/9780262122986.003.0002.

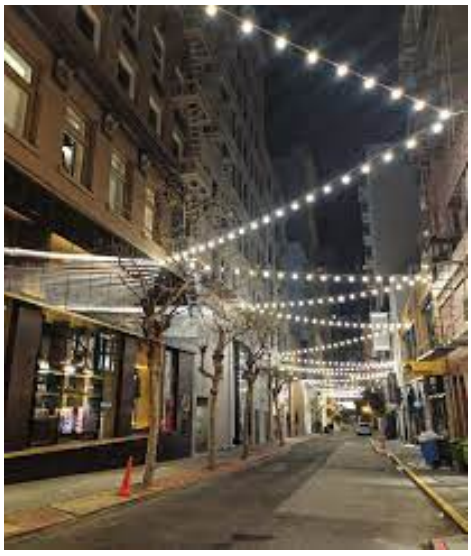
[5] R/UDAT, AIA Communities for Design. *A Vision for the Northeast Neighborhood.* Pg. 35.

[6] "Freak Alley." *The Unofficial Website of Boise's Historic North End Neighborhood*, 19 Feb. 2020, https://northend.org/freak-alley/.



Freak Alley - Boise, Idaho

Another policy example is the Spokane Innovation Alleyway plan in which the city created a schedule and framework on how to successfully plan and coordinate an enhancement plan. A large amount of public participation was needed to establish what the majority of citizens wanted. The data showed concern for safety, cleaning up debris, cost, and architectural character. This is relatable to Bozeman in which it is meant to spread main street out and create safe walking and recreational areas for people throughout the day. This project also began within the decade, and was intended to take several steps, iterations, and years in order to accomplish all the ideas behind the policy.[7] SIA, along with Boise's Freak Alley all require strong communication with the local businesses, in which their buildings are in such close proximity to the policy area.



Spokane, Washington

[7] *Projects - City of Spokane, Washington*. https://my.spokanecity.org/projects/.

Additional Examples:

Nashville Green Alley

Nashville, TN faces a large amount of seasonal flooding, and a community initiative fought to get alleys made into rain gardens to absorb excess rain water. This is a sustainability policy that would reduce polluted water in nearby waterways. This example is similar to BDIP by having one of the main focuses be to address water drainage and contamination.[8]

South Los Angeles

The adapting of alleys in L.A. is an example in which it was an initiative of Land for Public Trust to make the spaces more environmentally efficient with stone pavers, light surfaces to reduce heat island, drought tolerant planting, etc.[9] This is similar to BDIP due to the project being driven by environmental aspects and sustainability.

San Francisco Tool Kit

The San Francisco Tool Kit Emphasizes community input by allowing the public to guide policy requirements based on public meetings and regular communication. The public highly valued the usage of the alley for pedestrian and bike usage, due to great influence in the policy to reduce vehicles. The plan also sought to create strong social and physical connections to the community. This can be applied to BDIP by enhancing the public's input and perspective into the policy, rather than doing it irregardless of different ideas.

Austin, Texas Alleys as Green Space

The enhancement of Austin's alleys began in 2013 in which the city decided to adjust one of the alleys in the downtown area, and how it can become a functional green space to enjoy. This is quite dissimilar from the San Francisco method in which Austin implemented a policy without the public's input or ideas. This is an example for BDIP in which this could be another option of how this kind of policy is executed - with little outside input.[10]

The Bozeman Downtown Improvement Plan is deemed to become an effective enhancement plan, in which the first phase will be created within a year to bring about more green/shrubs and seating around the Parking Garage. This is the first phase because the city has 50% ownership of the structures on the alleyway, and is most attainable for the first step. As the policy continues, addressing the relationship between the Northeast Neighborhood and downtown will become more prevalent due to their close proximity, and growing development pressure. As discussed, implementing potential green corridors in the transition zones between the two neighborhoods have great potential for sustainable planning in the eastern Bozeman area, and reducing growing pressure.

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[8] Daigneau, Elizabeth. "Cities Give Alleys New Life." *Governing*, Governing, 21 Apr. 2021, https://www.governing.com/archive/gov-urban-living-alleyways.html.

[9] "Green Alleys." *The Trust for Public Land*, https://www.tpl.org/green-alleys.

[10] *Activating Austin's Downtown Alleys as Public Spaces*. https://austintexas.gov/sites/default/files/files/EGRSO/Activating_Austins_Downtown_Alleys_as_Public_Spaces.pdf.

Sources:

Activating Austin's Downtown Alleys as Public Spaces. https://austintexas.gov/sites/default/files/files/EGRSO/Activating_Austins_Downtown_Alleys_as_Public_Spaces.pdf.

Daigneau, Elizabeth. "Cities Give Alleys New Life." *Governing*, Governing, 21 Apr. 2021, https://www.governing.com/archive/gov-urban-living-alleyways.html.

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Downtown Ozeman Alley Sketchbook - S3.US-West-2.Amazonaws.com. https://s3.us-west-2.amazonaws.com/dba-2021/Resource-PDFs/Downtown_Alley_Sketchbook.pdf.

"Freak Alley." *The Unofficial Website of Boise's Historic North End Neighborhood*, 19 Feb. 2020, https://northend.org/freak-alley/.

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Projects - City of Spokane, Washington. https://my.spokanecity.org/projects/.

R/UDAT, AIA Communities for Design. *A Vision for the Northeast Neighborhood.* Pg. 35.

Kameron Conklin
GPHY 520
Professor Church
Sustainable Development Code Model Policy Brief
December 14, 2021

Work/ Live

Introduction

A mixed-use development is a type of development that has existed for centuries. Essentially, it consists of a building with residential units and offices attached to it.[i] In most cities and towns, zoning ordinances do not allow for this mix of residential and commercial in central part of towns. The medieval era tended to see people living, producing, and selling goods at the same place at the same time. Consequently, most communities were compact and tended to employ a small number of people. It was not until the Industrial Revolution that the distinction between work and home was established. It seems that the reason for this is due to the fact that most communities permit their citizens to work from home to a certain extent. It was common for large manufacturing plants to require a large area of land to accommodate many laborers, who worked away from their living quarters. Other scenarios exist, such as plague and infestation, which entered many communities and encouraged the development of more isolated living environments. It was for these reasons that regulatory zoning[ii] laws were developed to separate the working and living environments.

Modern industrialization in the world has largely resulted in the reduction in need for commodities. Moreover, this has provided people with the opportunity to work remotely or even from their home. The more workplaces we reduce within a community, the more energy and space can be saved every day. Making a sustainable decision can mean less waste on a daily basis. In recent years, there have been serious signs that flexible spaces are more efficient and more economically viable than traditional buildings due to which interest in mixed-use developments is once again on the rise. Laws and incentives in some countries promote the idea that every aspect of life should be carried out locally in a common environment. Transitioning from a single purpose living and working environment to a mixed use living and working environment, however, poses several challenges regarding most municipal codes and zoning regulations, as well as the current status quo of the average citizen.

It has been observed that most people prefer the idea of living in a strictly residential area. There is an advantage to living in a neighborhood like this one, since it does not suffer from a wide range of pollutants, such as noise, smells, lights, and other disturbances caused by commercial areas in the heart of the city. A mixed-use area presents zoning issues when it comes to defining what can be permitted in the area, considering most are likely to occupy there as their primary residence. In light of the fact that this idea was generated, we need to rethink the way in which we zone residential areas. This is so that businesses such as grocery stores, convenience stores, barbershops, etc., can be permitted. Providing a full circle of convenient

services in a neighborhood is more than just being a place that people live. It is also a place where people can find a place, they can call home for many years to come.

As the modern need for mixed use development projects rises, Greg Luongo Alexander Briseno present the five principles that will drive what people want next in a live/ work environment[iii] from there view as realtors in a flourishing housing market. These principles consist of: Human Connectivity, Adaptability, Connectivity to Nature, Health and Well-being, and Affordability & Equity. People desire a sense of community and social interaction as technology and social media have both connected and isolated us. Adaptability is vital in the application of hybrid principles since no single solution fits all. Adaptability and flexibility are key features of hybrid buildings and programs. They can be adapted to local conditions, such as socio-economic factors. A positive correlation has been found between physical and mental health and exposure to direct and indirect natural elements such as greenery, daylight, and outdoor spaces. Green space is associated with improved social cohesion, reduced aggression, and reduced stress in urban areas. Public spaces and the design of our buildings should be infused with health and wellness considerations. Well-being is enhanced by walkable environments, connections to nature, bike lanes, healthy food options, and community gardens. An approach that combines new policies and delivery methods will be required to balance critical income, housing price and debt equity differences. Everyone, regardless of age, gender, race or socioeconomic status, plays a role and has access to the things they need in a strong community. These principles are intended to help communities develop mixed-use developments that are sustainable.

It should be noted that mixed-use zoning ordinances do not apply only to commercial and industrial areas, but also to residential areas where there are only single-family homes. In the case of a multi-story building, the ground floor will typically be used for commercial purposes, such as a grocery store, barbershop, convenience store, etc., to satisfy the needs of the local community, and the new zoning ordinances would permit this to take place in both business and residential areas. As new markets are introduced in a neighborhood, traffic may shift from traveling outside the neighborhood and allow all the amenities to be within walking distance from one's residence. In a mixed-use development, neighborhoods will experience a healthy, sustainable environment within the surrounding community.

Effects

Ordinances and regulations governing zoning can prevent live/work units from reaching their full potential. Local governments often classify live/work units as commercial buildings for safety reasons or prohibit them from being built in residential areas due to their mixed-use nature. Consequently, a Live/Work unit is subject to an inefficient, costly, and confusing process that is usually excessive in comparison to any low-risk risk in the work area. In Bozeman, Montana, the ordinance allows for Live-work units under this definition listed under Sec. 38.700.110. *“A single household dwelling unit designed to accommodate ground level commercial uses. The dwelling unit type may be any type that is permitted in the applicable zoning district. Permitted non-residential uses may be those that are permitted in the applicable zoning district.”*[iv] To then clarify that in Sec. 38.360.150.[v] - Home-based

businesses are subject to first this ordinance in a residential zone. A home-based business is a use that is considered accessory to a dwelling unit.

As part of the 2030 Challenge, Edward Mazria and Architecture 2030 hope to make all new buildings and renovations carbon neutral, mitigating as much as possible the devastating effects of climate change on the built environment by 2030. The building industry is responsible for almost 40% of the world's CO2 emissions[vi]. A building's operation accounts for 28 percent of the total amount of emissions generated by the building. In terms of embodied carbon, building materials and construction (generally referred to as "embodied carbon") are responsible for 11 percent of the total. This means as we continue to add people to the workforce, a location will be needed to house the trade. There is an expectation that by 2060, the total area of floors in buildings will double globally. During the next forty years, the global building stock is expected to increase by 2.4 trillion square feet (230 billion square meters) of floor area. Much of the embodied carbon that is introduced into the world comes from the building industry, due to this information, we can begin to utilize places such as our home, or existing structures to work toward sustainable living communities.

Table 38.310.040.C[vii] in the Bozeman city code labels live work(residential with accessory commercial) as permitted in a Business area, and Mixed-Use areas, however not permitted in Industrial, or residential areas. Bozeman would benefit by allowing Live/Work units in all zoning districts to encourage sustainable solutions to the carbon emissions problem in the world today. If live/work units, especially live/work and work/live units, were allowed to flourish in a community, a number of benefits would be conferred. By eliminating the need to commute to work, car usage by Live/work unit owners is significantly diminished. As a result, greenhouse gas emissions and vehicle miles are reduced. As a bonus, allowing patrons to walk to their locations reduces both traffic congestion and the need for parking. To Parallel the commute to work, there will be no building necessary to commute to, or the need for new construction. Allowing Live/work units in more zoning districts could negate the need to have office buildings and other buildings necessary for the average job. This could benefit the city of Bozeman by decreasing the amount of embodied carbon overall.

The development of live-work units can also reduce the need for different parcels of land for different purposes, thereby reducing the dependency of communities on automobiles as well as their excessive consumption of natural resources. Furthermore, living and working in a community increases the likelihood of residents investing in the community, because residents have a keen interest in maintaining the community's prosperity. Increased business activity is a benefit for the community and its occupants economically, as a result of which they, in their turn, are able to reinvest themselves.

According to the City of Bozeman, the zoning structure for Live/Work units could be improved by allowing for them to be built in areas such as residential, business, industrial, and mixed-use districts. It will influence more sustainable solutions to the problem of commuting to and constructing buildings. Considering the recent effects that traffic and parking have had on Bozeman, this project will be

beneficial in the long run. The ordinance is one of the main components of Bozeman's sustainable future and will be a key part of it.

Examples

Tribeca, New York

viii

The Tribeca Lofts are referred to as "Loft Dwellings" within the Zoning Code.[ix] As part of New York City, there are several special zoning districts, including the TMU Special District. Generally, the rules of special districts supersede those of the normal zoning codes. In order to maintain the special zoning ordinances, each loft has to abide by a few requirements: Minimum size of each unit, number of units, and recreational space. These requirements are put into place to establish a working environment that is suitable for a live/work development. The minimum floor area of a loft in Tribeca is 2,000 square feet. This comes with a few exceptions such as usable floor area, setbacks, and glazing ratios. These exceptions help improve the healthy living and working within the spaces to allow for natural light and limiting waste of space within a building. The number of units per building needs to fit the ratio of 1 per 1,000 square feet. This is to limit the density of the units in a confined space of the city. In a loft building with 15 or more lofts, at least 30% of the roof area must be set aside for recreational purposes. In the case of each additional loft apartment, there must be an additional 100 square feet. It should be noted that lofts may be subdivided, extended, or enlarged, provided that all applicable regulations and requirements are followed.

It should be noted that there are a number of zoning and building codes that govern the permitted use of live/workspaces in New York City. As of now, there are two distinct options: home occupations and live/work arrangements. There is a small amount of home occupation that may be permitted in a residence or residential zone (a home office, for example), provided the extent of commercial activities does not disrupt the residential environment of the neighborhood. An alternative would be a live/work ordinance, which permits a resident to live in a building or area in which commercial or office uses are allowed. In more simple terms, it is a matter of whether you are working from home or living in the office. A number of laws apply to live-work spaces. These include the Multiple Dwelling Law (also known as the Loft Law), which applies to places that have been converted from commercial to residential use, and the regulations related to artist-in-residences. The growing trend of urban farming and home-schooling has been added to the ongoing debate of where people should live and work.

In Tribeca Lofts, you will be able to maximize space and also be able to renovate projects so that they can be reused for adaptive re-use programs that provide residences and workstations. Due to the fact that they are mostly located in residential districts, it seems to work well in these densely populated areas. There is a very good chance that the unit will be considered a home occupation since less than 25% of the space would be devoted to being an office or workplace. Most of these loft buildings have been rezoned into special districts that offer the opportunity to provide and renovate live/work units.

See New York City's Mixed-Use Ordinance:
https://zr.planning.nyc.gov/index.php/article-xi/chapter-1

Oakland, CA

x

Organizers of Live/Work hope to convey that Oakland is committed to promoting and facilitating the continuation of its distinguished history of accomplishments in the design and construction of living and working environments.[xi] The city of Oakland has the capability to design and build a variety of living and working environments, each tailored to suit the needs of a particular lifestyle and profession. In Live/Work, the types of living and working are explained along with the kinds of places and environments each type would be suited to.

Oakland, California, recognizes the difference between a live/work unit and a work/live unit. While work/live apartments have both residential and non-residential areas, live/work apartments consist primarily of non-residential areas with an accessory residential area.[xii] There are certain criteria that these units must meet for them to be allowed in mixed-use districts. Among the work-live units, there is a differentiation between the amount of floor space which may be used for residential activities. There are three categories. In type one, for example, only one-third of the space may be used for residential activities, while in type three, a maximum of 55 percent of the space may be devoted to residential purposes. As it turns out, however, each type of building has distinct special requirements: type one requires all remaining floor space to be used for non-residential activities, whereas type two requires separate entrances for residential and non-residential areas. There are no limitations on the amount of area of the living/working units that can be used for residential purposes. Thus, both work/live and live/work units need occupants to use the working space on a regular basis.

As one of the new occupancy types included in the 1999 Oakland Building Code, the Urban Core Residential Conversion is one of the new types of urban homes. As part of the plans, residential units will be developed inside existing downtown Oakland commercial buildings through the new type of building. This new section includes many items that are very similar or identical to the code as it applies to F-7, F-8, R-7, and R-8. However, it is included in complete form because it is a new section, and for clarity's sake, the whole thing is included.

See Oakland's Mixed-Use Ordinance:
https://library.municode.com/ca/oakland/codes/planning_code?nodeId=TIT17PL_CH17.65HBHOBUMICOZORE_17.65.160SPREHBLIWOUN

Additional Examples

Grand Rapids, MI

The city of Grand Rapids allows home occupations that respect the neighborhood's character and maintain the quality of the house. There are three types of licenses required for home occupations: class A, which has no adverse impact on the neighborhood, and class B and C, which do have an adverse impact. In Grand Rapids, live/work units are allowed within certain parameters. Units must be located on one of two types of streets: a regional street, which connects Grand Rapids and other communities, or a major street, which passes through the city or region.

See Grand Rapid's Mixed-Use Ordinance: https://perma.cc/7BRH-LAQG

San Francisco, CA

The City's industrial zones and nearby neighborhoods have seen several hearings over the past five years regarding live/work projects and other topics related to the growth of the City's industrial zones.[xiii] Due to the Planning Department's inaction on concerns regarding live/work and office developments in the Mission District, that neighborhood developed its own interim zoning controls, which were adopted by the Board of Supervisors without the involvement of the Planning Department.

See San Francisco's Mixed-Use Ordinance: https://sfbos.org/industrial-protection-zones-livework-projects-and-community-plans

Chicago, IL

Chicago's Planned Manufacturing Districts (PMD) now allow live/workspaces for artists.[xiv] Prior to this change, the zoning code didn't allow residential uses in PMDs, but one artist workspace per building is now permitted in the PMDs that allow artist workspaces. Chicago created a live/work zone called B2 a few years ago.[xv] The project aims to provide artists with more flexible and practical living and working locations on any floor of the building. As a result of the lack of setback requirements on the front or sides of the buildings, developers were able to build larger buildings on commercial and business streets.

See Chicago's Mixed-Use Ordinance:
https://codelibrary.amlegal.com/codes/chicago/latest/chicagozoning_il/0-0-0-50336

Providence, RI

It is not unusual to find single-family homes with a second living area for the use of seniors and the handicapped.[xvi] In this manner, an individual can remain independent while staying close to their families at the same time. Based on how the home is constructed and the type of space available to the public, it is possible to add a separate apartment to a single-family home in three different ways.

See Chicago's Mixed-Use Ordinance:
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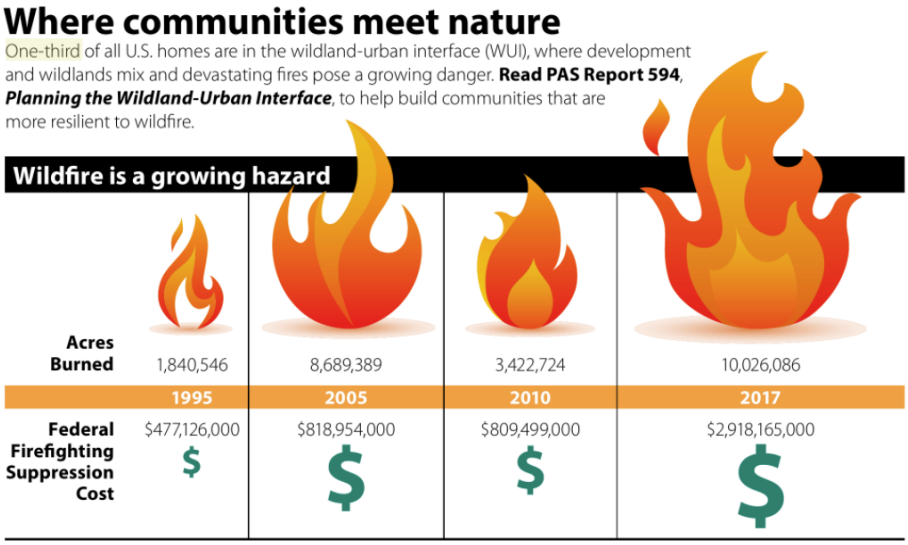
Ryen Dalvit
Dr. Sarah Church
GPHY 520
14 December 2021

Policy Brief: Managing Existing Structures in the WUI Zone

INTRODUCTION

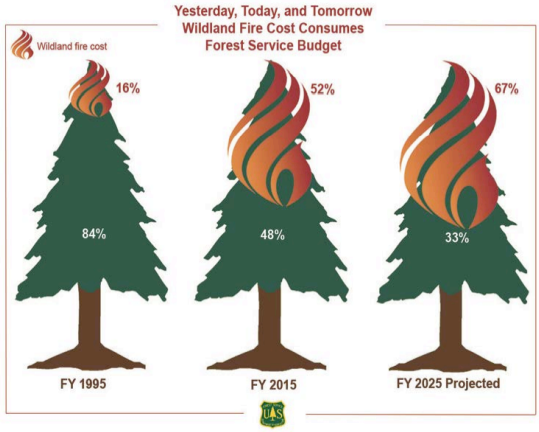
The increase of record-breaking wildfires has shown devastating impacts in communities across the nation through the loss of human life, loss of structures, loss of revenue, severe air quality, and the destruction of some entire towns [1]. While focusing on future land development strategies to avoid building Wildland-Urban Interface (WUI) zones is an imperative strategy to eliminate challenges before they begin, WUI-specific policies can help reduce risk in areas that have already been developed. While the 2021 International Wildland-Urban Interface Code (IWUIC) is a model code aimed to supplement building code for local jurisdictions [2], provisions are not applicable unless specifically adopted. Additionally, fire mitigation for private landowner development in most states is voluntary [1]. The federal government regulates 50% of fuel treatments to WUI zones, however, this is only applicable to federally owned land [1]. Considering that ⅓ of all U.S. residences are located in the WUI, federal fire fighting suppression costs are allocated over millions of acres, and the cost is on the rise with 10,026,086 acres burning in 2017 alone [3]. As this increase in acreage burned is correlated to drier climates and increasing temperatures, land-use planning strategies become an imperative method of reducing the risk to our natural and built resources. Thinking about more regional and specific wildfire policy can help reduce risk in hazardous areas, which not only reduces the loss of life and structure, but saves both human and fiscal resources allocated to fire-safety.



(Figure 1: The Cost of Wildland Fire as a % of Forest Service Annual Budget) [3]

EFFECTS

Wildfire protection costs are funded by Congress through the Department of the Interior and the United States Forest Service. These costs include fuel reduction, wildfire suppression, and site rehabilitation [4]. According to a USDA study in 2015, the fire season on average had become 78 days longer than in 1970 with approximately 1-2 percent of fires consuming at least 30% of the annual firefighting budget [5]. Between 1995 and 2015, the allocation of budget towards wildland fire management costs increased from 16% to 52% [5].



(Figure 2: The Cost of Wildland Fire as a % of Forest Service Annual Budget) [5]

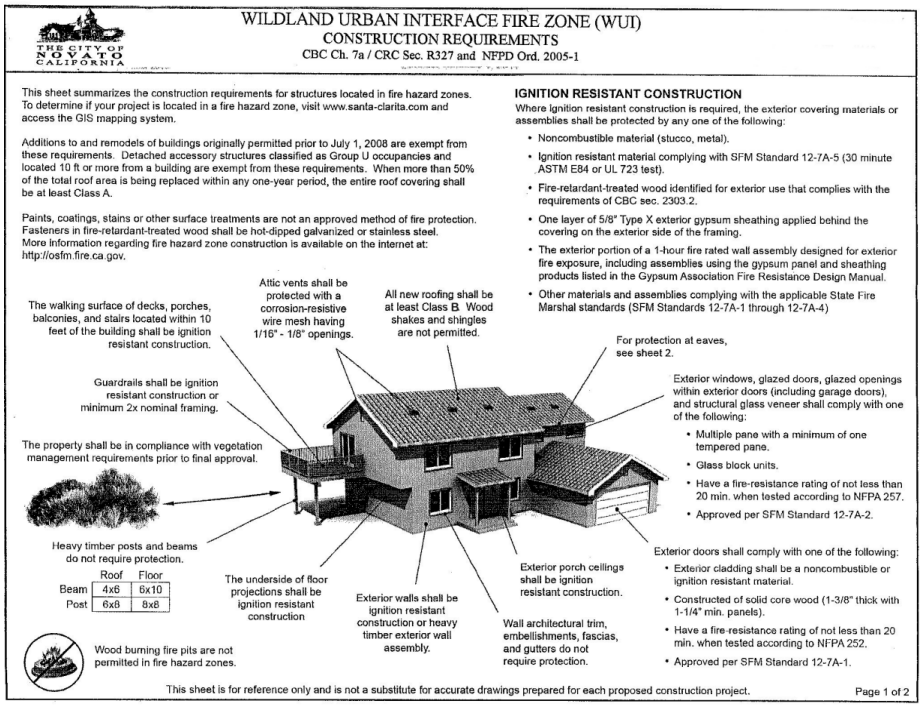
Knowing that continually drier climates will continue to increase the demand for firefighting resources, implementing proactive policies becomes a strategy to save on future economic, environmental, and physical costs. Properties that implement mitigation strategies help reduce the need for fire-safety resources and personnel, which means that in the event of a wildfire, those resources can be prioritized elsewhere. Adjacent properties that don't have consistency in fire mitigation strategies may impose an increased risk on neighboring properties and consequential need for additional firefighting resources [6]. While the IWUIC is a start to prioritizing mitigation strategies, implementing standardized setbacks and vegetation do not account for regional ecology and existing infrastructure. Thus, implementing more specific regional and/or municipal WUI policy helps reduce risk to both existing and future land development in the event of a wildfire.

When implementing a regional policy, it's important to acknowledge the economic cost that a remodel or vegetation plan would have on a homeowner. Remodels to existing structures can cost thousands of unexpected dollars. While various case studies explore ignition resistant-material as a requirement for new construction and remodels, others explore how to implement community programs as a byproduct of voter-approved grants. Thus, selecting the outcome that best embodies the principles of fire protection while promoting economic welfare will likely be specific to each region.

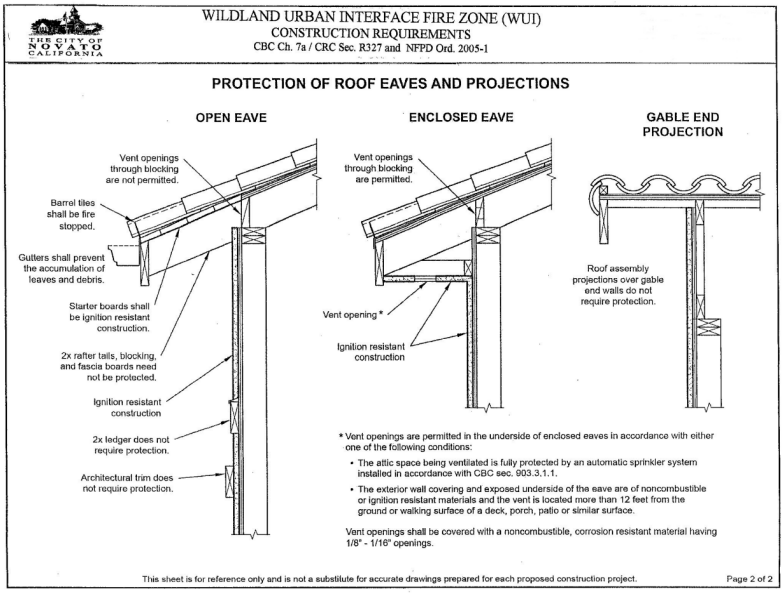
1. Novato, CA

Novato, CA is located in northern Marin county in California. At a population of 55,655 spread over 28 square miles, the City of Novato has a relatively low population density with high amounts of open space and parks [7]. Novato is positioned at a high fire risk, with around 12,000 parcels of land falling in a WUI zone [8]. Due to this threshold, Novato has incorporated city-wide WUI assessments as a part of their GIS base map [9]. so that residents can identify if their home is at risk. The City of Novato then implemented a Wildlife Urban Interface (WUI) policy that makes local amendments to the 2019 edition of the California Building Code (CBC) through Ordinance 2019-2 of the Novato Fire Protection District [10]. This ordinance adopts the Appendix A of the 2018 International Wildland-Urban Interface Code, but takes it a step further through amendments specific vegetation/soil stabilization in the area as outlined in Section 4907.2 of Ordinance 2019-2.

Additionally, the City of Novato provides clear guidelines and construction detail requirements for remodels/alterations/repairs to properties in the WUI interface [11]. These guidelines, developed by the Novato Fire Protection District in 2011, speak to ignition-resistant performance-based construction by recommending noncombustible materials, vegetation management, and setbacks for exterior walking surfaces [12].



(Figure 3: Construction Materials and Setbacks for WUI Fire Zone Properties | Novato, CA) [11]



(Figure 4: Construction Requirements for WUI Fire Zone Properties | Novato, CA) [11]

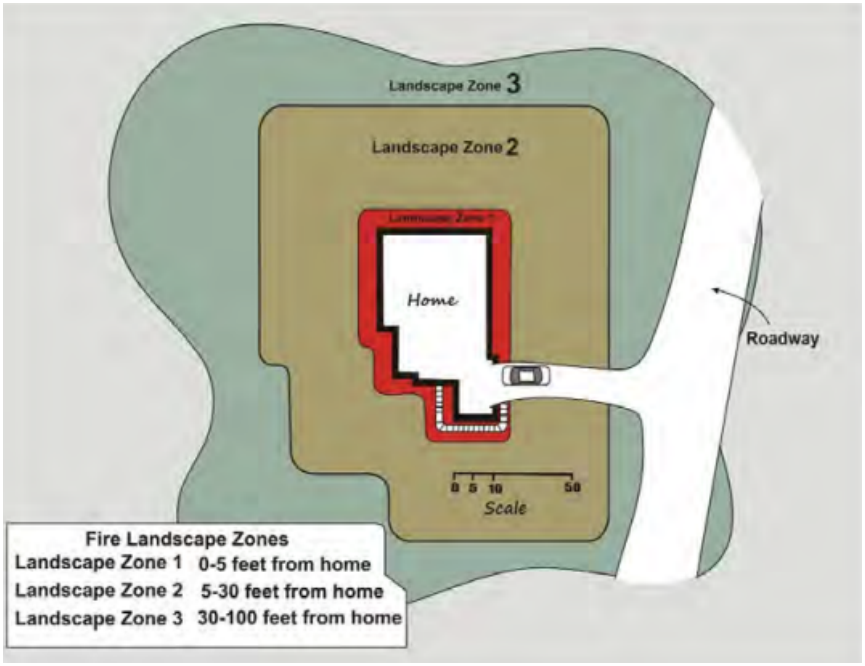
The City of Novato also provides guidelines for establishing fire - defensible space through use of appropriate vegetation and materials and works with a nonprofit organization, Fire Safe Marin, to promote fire safety awareness and provide assistance to residents in preparing for wildfires [13].

To view the provisions for vegetation and fuel requirements, see Novato, CA, Municipal Code §§ ORDINANCE No. 2019-2 (2019).
To view the provisions for construction detailing, see Novato, CA, Novato Fire Protection District §§ ORDINANCE No. 2005-1 (2008).

2. Wenatchee, WA

Wenatchee, WA is the largest city of Chelan County with a population of 34,360. While the state of Washington adopted portions of the International Wildfire Urban Interface Code (IWUIC 2018) to include requirements for developing a 10-year strategic plan and specific ignition-resistant construction [14], Wenatchee took it a step further. Section 3.36 of the Wenatchee City Code presents new policies and goals in the Wenatchee Urban Area Comprehensive Plan to help the city become a fire adapted community. These policies include the regulation of new ignition-resistant structures and additions in tandem with new standards for a 30-foot defensible space.

Additionally, by updating the comprehensive plan and focusing on increased community outreach, the city coordinated with larger Chelan County stakeholder groups to establish a guide for fire resistant plants and landscaping [15].

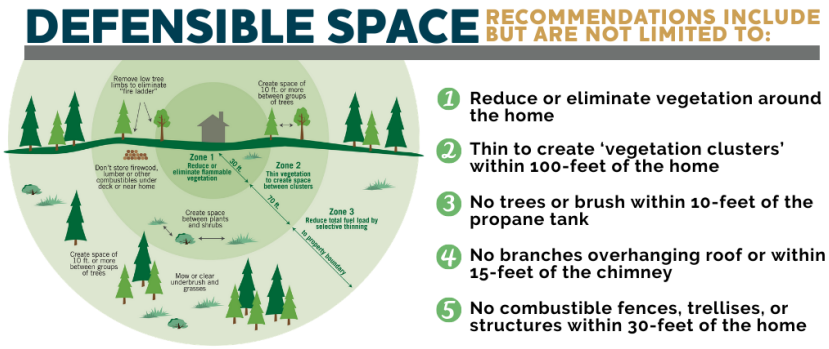


(Figure 5: Landscape Zones for WUI Fire Zone Properties in Chelan/Douglas Counties | Wenatchee, WA) [14]

To view the provisions for localized WUI standards, see Wenatchee, WA, Municipal Code §§ Chapter 3.36

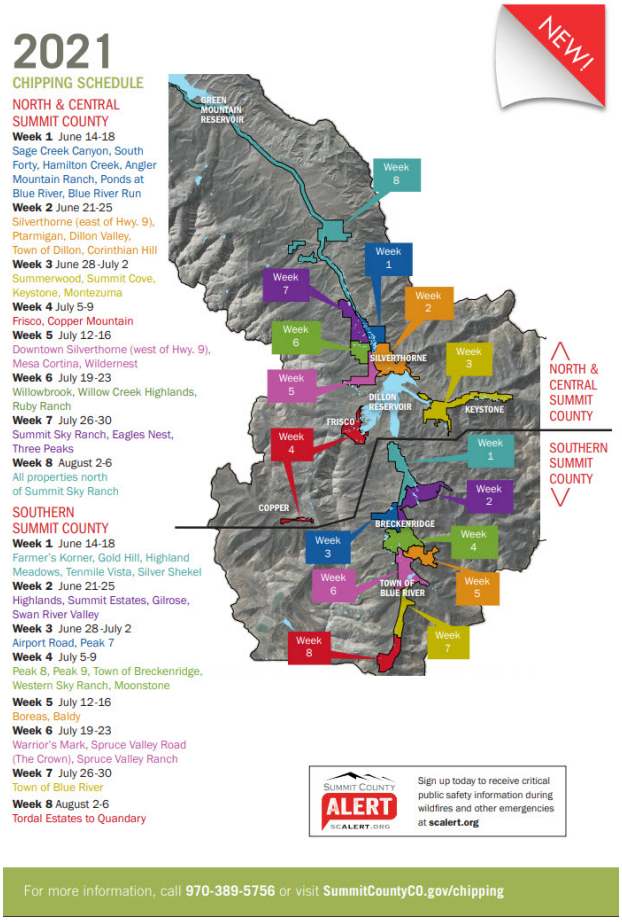
3. Summit County, CO

Summit County, CO covers 608 square miles and is home to 31,055 people. Summit county has more than 23,000 properties at risk for fire in the Wildlife-Urban Interface [16]. Colorado state statues allow local governments to regulate and plan for land use through the regulation of activities and developments in hazardous areas (C.R.S § 29-20-104) [1]. So in 2008, voters passed a mill levy that granted funds to the Hazardous Fuels Reduction (HFR) Grant Program. In this program, the Summit County Wildfire Council matched funding to homeowner groups as a means to reduce hazardous fuels on their properties [17]. Through the HFR program, a representative of the neighborhood works with local wildfire experts to develop a fuels reduction plan, which is then funded with the grant. For properties that do not meet criteria for the HFR Grant Program, the Summit County Community Wildfire Protection Plan (CWPP) grant program provides financial assistance in the form of improved evacuation routes, tree removal, and development of emergency water supplies.



(Figure 6: Defensible Space Recommendations | Summit County, CO) [16]

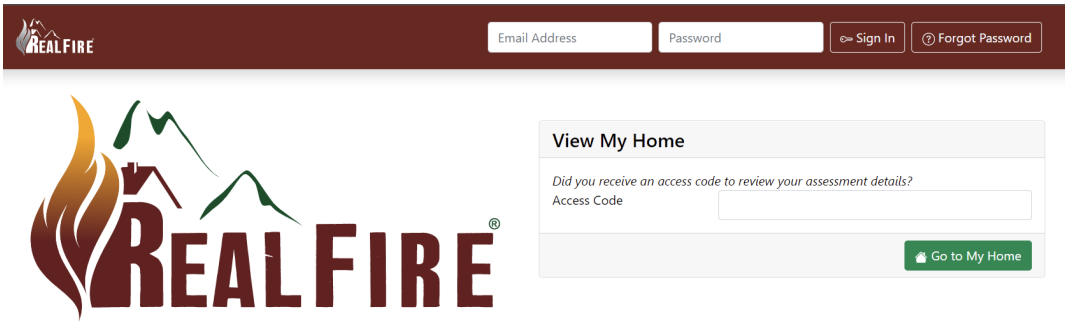
The mill levy also provided other wildfire mitigation strategies and programs, including the Summit County Chipping Program. 11,388 households participated with 37,433 chipped piles and 25,720 cubic yards of woody material collected [16]. The success of this program was continued in 2018, when voters again approved funding for additional fuel breaks and prevention implementations.



(Figure 7: Chipping Program | Summit County, CO) [16]

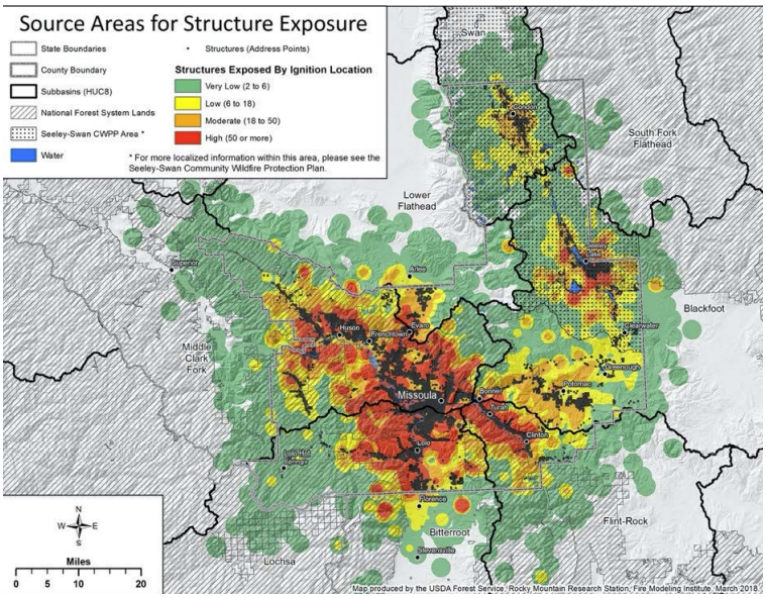
ADDITIONAL EXAMPLES

- ACCIMP, Planning & Land Management (Implements a two step process to identify and develop solutions to hazard impacts in the community followed by the allocation of community planning grants to pursue those solutions).
- Eagle County, CO (Adopts wildfire regulations for all new building construction, development, and exterior remodels. Requires site-specific vegetation management plans for new construction and remodels. Implements a voluntary property assessment program, REALFire®, that allows homeowners the opportunity for an on-site assessment and custom wildfire mitigation report).



(Figure 8: RealFire App with Access to Customized Report | Eagle County, CO)

- Missoula County, MT (Adopts a County Growth Policy, Community Wildfire Protection Plan, County Area Land Use Element, and a Climate Ready Missoula plan. These plans analyze hazardous areas in the WUI and provide recommendations for mitigation strategies. Subdivision regulations in the county have also adopted WUI requirements).



(Figure 9: U.S. Forest Service Map for Structure Exposure in Missoula County | Missoula County, MT)

- Sedona, AZ (Assesses properties and infrastructure in the WUI zone and categories based on predominant fuel model type and severity. Categorizes construction projects into risk categories and presents requirements for the corresponding risk level).

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ADDITIONAL RESOURCES

- NFPA - Firewise USA®
- NFPA 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire
- 635990083098430000 (novatofire.org)
- CWPC_Land Use WUI Report_Final_2021_Addendum (communitywildfire.org)
- Wenatchee, Washington - Community Planning Assistance for Wildfire (headwaterseconomics.org)

Ashlie Gilbert
GPHY 520
December 14, 2021
Policy Brief

Short-term Rentals

Introduction

Maintaining affordable housing for low to moderate-income residents is a major social justice concern for many communities. Social justice is a pillar of sustainable development deeply connected to communities' environmental and economic well-being. [1] In recent years, the popularity of short-term rentals has caused concern about impacts on the affordable housing supply in many jurisdictions [2] and subsequent effects on low-income residents. Short-term rentals (STRs) often refer to living spaces rented out for less than 30 days, although federal and state authorities have yet to adopt a specific definition. [3] STRs are typically facilitated through online booking platforms Airbnb, Vacation Rental by Owner (VRBO), and HomeAway. [4]

Airbnb, the most prevalent STR platform, began listing properties in 2008. [5] Denver was one of the first cities significantly impacted by STRs when the Democratic National Convention was hosted there in 2008; many homeowners utilized Airbnb to gain income from those visiting the convention. [6] The presence of Airbnb can be seen around the world, with listings located in upwards of 34,000 cities. [7] Airbnb is a popular lodging for tourists seeking to enjoy a more authentic travel experience by staying in a local home or with local people instead of a hotel or a motel. [8] Airbnb and transportation services like Lyft and Uber are part of the growing sharing economy, [9] which allows people to profit from letting others utilize their private assets through a technologically facilitated exchange. [10]

For hosts (usually the person who owns the STR property and lists it on an STR platform), STRs are appealing for their convenience and income potential; property owners can easily list their accommodations online and can often earn more by converting their property to an STR than renting it out long-term. [11] Individual STRs fall into one of three categories 1) *Primary Hosted STRs*: Where guests stay in a part of the home while the host also remains on site 2) *Primary Un-hosted STRs:* The owner of the home is absent, and the guests can occupy the entire premises (these sites are the host's primary residence) 3) *Nonprimary STRs*: The guests are allowed to occupy the entire home, but the home is not the host's primary residence. [12] Some governments treat these types of STRs separately and impose separate regulations on each, whereas others treat all three types of STRs equally. [13]

Effects

It is important to note that STR platforms like Airbnb can benefit individual property owners and communities in some cases. Some benefits of STRs include increases in tourism, additional income that can reduce the financial burden of homeownership, and revenue for governments that tax STRs. [14] Though residents dealing with rent spikes, overcrowding, and adverse effects from growing numbers of tourists blame STR platforms, notably Airbnb, for these effects. [15] Homeowners proximal to Airbnbs note decreased values of their homes due to a lack of willingness from buyers to live next to an STR. [16] Locals also express concern over the

affordability and availability of housing due to STRs and hesitation over properties being taken off the market solely to serve tourists. [17] While Airbnbs may increase tourism in lesser-visited neighborhoods, they also compete with more traditional lodging options and, in many cases, are not subject to taxes and regulations in the same way that traditional lodging facilities are. [18] STRs also prompt concerns about the availability of housing for the local workforce. [19]

A particularly concerning aspect of Airbnb is that in areas that are currently gentrifying, or were once gentrifying and now wealthy, property owners have the potential to earn more income by entering the STR market than by renting it out long-term. [20] This phenomenon encourages property owners that typically rent long-term to remove their existing tenants or not sign leases with new ones to utilize their property as an STR. [21] As more property owners seek to increase their income by listing properties as STRs, low-income populations find themselves unable to find affordable housing. [22] However, the number of factors involved makes it challenging to attribute things like gentrification and overcrowding to Airbnb definitively. [23] Therefore, it is important to note that STR regulation alone may not adequately fight gentrification. [24]

Because Airbnb's are often located in higher-income areas, it is unlikely that Airbnb is beneficial for low-income families. [25] Local governments that use the revitalization of low-income neighborhoods as a justification for light STR regulations may find this strategy ineffective. STRs can also negatively impact neighborhoods by reducing available parking, increasing garbage and noise, and utilizing police time when complaints from property owners must be addressed. [26] Airbnb's impact on neighborhood character and the changes that occur from not knowing one's neighbors and feeling a sense of community are also concerns. [27] The effects of STRs on real estate may be especially relevant in popular tourist areas such as resorts and coastal towns or cities that see homes sold for prices well out of the pay grade of residents. [28]

One study calculated that in at least seven cities in Oregon, property owners can collect more money by listing their property on an STR platform than by renting it out to long-term tenants. [29] STR profits may be especially lucrative compared to long-term rentals in areas with stringent rent control policies. [30] Another study that examined the popularity of Airbnb and rent increases in 17 American cities found that there is no distinct correlation between the two, though fears and experiences of gentrification are most frequently the drivers of STR regulation. [31] Another pressing concern regarding Airbnb is the commercialization of the service via investors buying out several homes in the same area to serve as STRs. [32]

Many municipalities have only recently adopted STR regulation, meaning the assessment of these policies is in its infancy [33] and many jurisdictions have no STR regulation at all. [34] Regardless, many municipalities have adopted ordinances to regulate STRs. Some cities require Airbnb hosts to equip their property with safety equipment such as fire extinguishers or smoke detectors. [35] Local governments may also impose regulations on the number of guests that can stay in the STR and how long the host can operate the property as an STR. [36] Municipalities can collect revenue from STRs by including them in transient lodging taxes, benefiting both the host and the local government. [37] Zoning policies may be used to limit the number of STRs and their distance from adjacent structures. [38]

Many municipalities require STR hosts to obtain a license and pay fees. [39] Penalties for hosts that break STR rules include fines per the number of days the rule(s) are broken or a standard amount. [40] Citations and fines are common ways to enforce ordinances, though many regulators find that enforcing STR rules is difficult and costly. [41] Some hosts attempt to evade STR regulations by taking their postings offline when city officials work and putting them back up in the evening. [42] Finding the location of hosts can also be challenging due to the privacy measures taken by online platforms like Airbnb. [43] Despite these challenges to regulation, researchers found that in the City of Denver, the number of Airbnbs available decreased after an ordinance requiring hosts to obtain a license and reside on the property went into effect. [44]

The impacts of STRs are highly dependent on a community's geography and economic makeup; in turn, the degree of regulation that should be placed on STRs in these locales is debatable. [45] Some scholars argue that the level of regulations posed on STRs should correspond with the level of gentrification the city is experiencing. [46] Others conclude that STR regulation is best left to individual communities who can adopt policies that best suit their local needs instead of sweeping state regulation. [47] Thus, while assessing the impacts of STRs and enforcing regulations can be challenging, local governments may utilize a wide range of policy options to meet their unique needs.

Examples

Denver, CO

Denver, Colorado, passed an STR regulation ordinance in 2016, though the process was complicated due to competing views about whether regulation should occur and how. [48] At the time STR regulations were discussed, Denver officials realized that the effects of STR platforms are not entirely negative: "Balancing the positive and negative externalities and making sure that the city benefits from tourism as an economic sector, while remaining liveable and affordable for its residents was the main reason for the City of Denver to draft a new ordinance specifically targeting STRs" (p. 820). [49]

Denver lawmakers wanted to keep their STR regulations basic so that they would be easily followed and monitored. [50] The primary component of Denver's STR ordinance is that the property must be the hosts' primary residence, meaning that property owners can rent out parts of their home while they occupy it or when they leave for vacation. [51] Additionally, all STR hosts must apply for a license, and their license number must be displayed on all advertisements for their property. [52] Hosts must also comply with zoning regulations, taxes, and safety measures. [53] Safety measures require hosts to provide working smoke and carbon monoxide detectors and a fire extinguisher in their STR. [54]

Because STRs utilize online platforms, the City of Denver decided to publicize the new ordinance via online platforms, such as social media. [55] Failure to comply with the ordinance can result in a suspension or withdrawal of a host's license, and a host application will be denied if they are not in compliance with the ordinance. [56] Denver hosts are more compliant with city regulations than other US cities, with about half of hosts in the city holding licenses. [57]

To view the provision, see Denver, CO, Code of Ordinances § 33-46 to 55 (2016)

Isle of Palms, SC
Researchers found that in the popular tourist destination of Isle of Palms, South Carolina, properties licensed as STRs sell at prices much higher than those rented out long-term or full-time owner-occupied homes. [58] Scholars estimate that STR properties sell 10% higher than those occupied by their owner and 15% higher than properties used as long-term rentals in this area. [59] Additionally, the number of Airbnb listings far outnumbers the number of rooms available through more traditional lodging options. [60] Though properties proximal to STRs in the Isle of Palms do not experience decreased sales. [61]

Like Denver, Isle of Palms requires STR hosts to obtain a license to operate. [62] However, Isle of Palms defines an STR as a property rented out for three months or less [63]. The city also imposes limits on the number of people that can stay in the STR to two per bedroom, plus an additional two people, with the max number of people restricted to 6. [64] Additionally, the number of people that can be in the STR at one time must not exceed 40. [65] Isle of Palms also regulates the number of vehicles present at the STR; between 11:00 am and 9:00 pm, only one vehicle per room in the home or 2.5 people present is acceptable. [66]. Finally, STR hosts are required to post ordinances relevant to STR guests within 15 feet of the main entry point to the home as well as local noise ordinances. [67]

To view the provision, see Isle of Palms, SC, Code of Ordinances § 5-4-201 to 206 (2010)

Additional Examples

Bozeman, MT, Code of Ordinances, § 38.360.260 (2018) (uses zoning to restrict STRs to specific areas and declares that properties utilizing city funds. e.g., down payment assistance, may not be utilized as an STR until the lien is paid in full)

Calabasas, CA, Code of Ordinances § 17.12.175 (2018) **(**STRs are prohibited in all commercial and residential zones, the code declares that an STR is considered a property rented out for less than 30 days in exchange for compensation of any type)

Gatlinburg, TN, Municipal Code, § 5-701 to 705 (2017) (Hosts must obtain a permit and pass yearly inspections to remain in compliance; hosts also pay a fee of $200 per property for two or fewer bedrooms and $75 for each additional bedroom; for each violation, the fine is $50)

Santa Monica, CA, Municipal Code § 6.20.010 to 6.20.100 (2019) (Requires hosts to pay a "Transient Occupancy Tax" of 14%, they must also obtain a "home-sharing permit" and a business license)

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[64] *Id.* at § 5-4-202

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Sustainable Building Code: Vacancy (Empty Home) Taxes
Elise Otto
Land Use Planning
December 15th, 2021

Vacancy (Empty Home) Taxes in High Cost of Living Areas

Introduction

Vacancy taxes attempt to address the housing shortage and bubble by taxing vacant properties and/or lots at a higher rate and then redistributing that money to other initiatives such as affordable housing and homelessness initiatives (City of Vancouver, 2021; Gallmeyer, 2021; Gilgoff, 2020; Tadayon, 2019). This new and sometimes controversial intervention is one of only a few local options that directly taxes investment and luxury properties while increasing available housing stock by encouraging investment owners to rent out their empty properties. Though vacancy taxes, sometimes called empty home taxes, have only been applied in a few places, they hold promise for amenity and 'hot market' communities that seek to harvest wealth from real estate transactions and open additional already-developed housing stock.

Effects

A vacancy tax is one of several taxes including the real estate transfer tax, the foreign buyer tax, and the non-resident speculation tax, that can help local governments harvest wealth in areas with high speculation and high second or vacation homes (Gallmeyer, 2021; Gilgoff, 2020). Empty home and vacancy taxes are meant to lessen the effects of housing bubbles that reduce the upward mobility and quality of life for lower- and middle-class residents of financialized real estate markets by taxing real estate that is unused (City of Vancouver, 2021; Gallmeyer, 2021).

Many assume that building more housing will solve regional and national housing shortages, but in areas with high speculation development does occur only to have equity-rich buyers accumulate multiple properties that are then left empty (Darling, 2005; Nelson & Hines, 2018). As a lucrative, low-tax form of investment, real estate has been a windfall for some. Outdated tax codes rarely redistribute that wealth locally as they would have in past generations with manufacturing or natural resource extraction wealth. Many communities question whether solely building creates more housing or only creates more investment opportunities for speculator-vacationers. Cities such as Vancouver, British Columbia, and Oakland, California have begun to tax vacant properties, and other communities such as Crested Butte, Honolulu, and New York City have considered these taxes (Gallmeyer, 2021; Mackie, 2021). Similar laws exist in other cities to prevent blighted properties.

Because this tax structure is relatively new, it remains controversial and there are challenges to the implementation of vacancy taxes. In some states, vacancy taxes might require significant legislation to enact. States where real estate transform taxes are unconstitutional such as Arizona, Louisiana, Missouri, Montana, North Dakota, and Oregon, would probably require a constitutional amendment for a vacancy tax to be implemented (Atkins et al., 2015; Gallmeyer, 2021). Furthermore, critics argue that vacancy taxes are only an inefficient wealth tax. In both Vancouver and Oakland complex exemptions make the taxes "cumbersome" to administer. Local government must carry out audits and investors look for loopholes by getting building permits to do construction but then never actually working on the property (Gallmeyer, 2021). In Vancouver, exemptions have also led to lawsuits, where homeowners feel they were audited and charged incorrectly after the city failed to issue building permits quickly enough (Gallmeyer, 2021).

Furthermore, there is a discontinuity between the needs of the unhoused and the housing that becomes available. Suddenly college students are living in pop star mansions or luxury apartments (Gallmeyer, 2021). Despite the discomfort of critics with this interruption of the social order, having college students live in mansions does increase the housing stock and serves no obvious threat to society.

Despite these critiques, Vancouver's tax has raised significant funds for affordable housing– over 80 million since 2017 (City of Vancouver, 2021). For communities who struggle to raise even modest funds for housing while luxury houses routinely sell for millions and tens of millions of dollars, a vacancy tax could help the community raise significant capital to invest in workforce and affordable housing. Perhaps an inefficient wealth tax is better than none at all.

Vancouver, BC:

Vancouver's Vacancy tax bylaw no. 11764, popularly known as the "empty homes tax" taxes residential property that is unoccupied for more than 6 months of the year at a rate of 3% per year based on the property's assessment value (Vacancy Tax By Law No. 11674, 2016, 2.3). Exemptions are granted for properties that have active building permits, property owners in the hospital or assisted living, the home being sold, empty because of the owner's work, or empty for legal reasons (*Vacancy Tax By Law No. 11674*, 2016). Owners are asked to declare their property as vacant or not and pay the tax (Vacancy Tax By Law No. 11674, 2016, 4.5). To enforce the ordinance, Vancouver audits properties using "a risk-based approach" and conducts random audits (City of Vancouver, 2021).

Between 2017-2020 the empty homes tax has collected 86.8 million dollars and led to a 26% decrease in vacant properties (City of Vancouver, 2021). The rate in vacant properties has continued to decrease. The Empty Home tax is still controversial—with both opponents and the city acknowledging that it is almost impossible to evaluate a single policy's effect on a complex market, but it has raised significant funds for affordable housing and has changed the dialogue around what it means to be an absentee homeowner (Gilgoff, 2020).

Oakland, CA:

In 2019 Oakland voters approved "Measure W" by more than a 2/3rds margin to tax both vacant lots and vacant properties within the city limits (Ordinance No. 13571, 2019). The ordinance is "meant to discourage corporate speculators and spur development as well as raise money to fund homeless services and fight illegal dumping" (Tadayon, 2019). Contrary to Vancouver's empty homes tax, Measure W charges vacant property owners a flat fee (either 3000 or 6000) that is then used for "homeless programs and services, affordable housing, code enforcement, and clean-up of blighted properties and illegal dumping." (Tadayon, 2019). In addition to residences, Measure W also taxes empty lots that could be developed into residential or commercial properties which is where many of the exemptions and controversy occurs.

In Oakland, a "vacant property" is defined as used for 50 days or less a year (ordinance N0. 1357 CMS). Exemptions are granted for elderly, disabled, low-income owners and properties that would be hazardous to develop (Ordinance No. 13571, 2019). Many owners—perhaps over 50% are covered by exemptions (Gallmeyer, 2021). In Oakland's case the city contacted property owners who would be subject to the tax and then held public meetings to discuss the taxes implementation (Gallmeyer, 2021; Tadayon, 2019). While effective in engaging property owners many exemptions resulted from the meetings which will be an administrative burden to the city. Still, the city of Oakland hopes to collect as much as 10 million from Measure W annually, which is currently being implemented (Gallmeyer, 2021).

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Malory Peterson

December 2021

Policy Brief: Bear-resistant trash bins

Local governments can contribute to reduced human-bear conflict through the adoption of ordinances focused on conflict mitigation. Late spring through fall is high conflict season between humans and bears in Montana, including in urban areas (Montana Field Guides, 2021). Unsecured trash bins, bird seed containers, pet food, and fruit trees in residential areas can become attractants for foraging bears (Lewis et al., 2015). Bear activity in urban areas can pose a risk for the public and for bears. Bears in residential areas can cause property damage, financial loss, and may be dangerous to pets and livestock (Johnson et al., 2020). Bears foraging in urban areas experience higher mortality than their non-urban counterparts due to increased risk of vehicle strikes, accidental poisoning, and lethal removal (Johnson et al., 2020).

Black bears are the most frequently reported bear sightings in Gallatin County (McDonald, 2021). Summer of 2021 yielded numerous reports of bear activity in the Bozeman Creek corridor, including reports in the Bozeman Creek Neighborhood, Bogert Park Neighborhood, Story Mill region of the Northeast Neighborhood, and Peet's Hill. The neighborhoods in the Bridger foothills and Bear Canyon also experienced high bear activity (McDonald, 2021; Loveridge, 2021; Montana Right Now, 2021). In September of 2021, reports from the Bozeman Police Department and Gallatin County Sheriff's Office documented daily calls to report black bears along Gallagator trail, including at least one incident of a sow with a dog in her mouth and one incident of a person deploying bear spray (Miller, 2021). Montana Fish, Wildlife, and Parks (FWP) received 26-47 calls per day from Bozeman to intervene on bear activity during summer of 2021 (Loveridge, 2021; Cunningham, personal communication, December 15, 2021). In the last few years, bears have been reported inside Bozeman High School, outside several elementary schools, and outside of a daycare (Schontzler, 2018; Bermes, 2015). Though rare, there have been incidents of bear attacks in Gallatin County as recently as June of 2021 in the Mystic Lake area (Thomas, 2021).

Human-black bear conflict is linked to population growth and development in bear habitat near the wildland-urban interface (Don Carlos et al., 2009). Anthropogenic food sources are the main driver of human-bear conflict for black bears, with research in the Rocky Mountain West identifying garbage as the primary conflict source in residential areas (Can et al., 2014; Lewis et al., 2015; Spencer et al., 2007). Black bears learn foraging behaviors socially and tend to independently forage in the areas they were reared in (Lackey et. Al., 2018; Mazur & Seher, 2008). This means that black bear cubs who are reared on anthropogenic food sources in residential areas are more likely to continue selecting anthropogenic food sources throughout their lifetime, returning to residential areas to forage (Mazur & Seher, 2008). For food-conditioned bears, this behavior puts them at increased risk of lethal removal, or euthanasia. At least two black bear cubs lived in the Bozeman Creek Neighborhood during summer of 2021, highlighting the pressing need for proactive strategies to discourage their habituation (O'Conner, 2019). Although FWP bear management strategies prioritize hazing and relocation of bears who

repeatedly forage in urban areas, lethal removal of black bears in Montana occurs more frequently than relocation (USDA, 2019; FWP, 2021).

Gallatin County is the fastest growing county in the state of Montana (USCB, 2021). With new migrants to a region with bear activity follows increased demand for education to prevent human-bear conflict (Don Carlos et al., 2009). Montana FWP has implemented a *Be Bear Aware* campaign to educate people about behaviors and practices to reduce the likelihood of human-bear conflict and to prevent bear activity in human use spaces (FWP, 2017). The City of Bozeman has not yet implemented a public education campaign to inform residents about strategies to reduce human-bear conflict. While education is a critical tool to reduce bear conflict in Bozeman, stricter preventative measure may be warranted. Many citizens and organizations have requested higher level intervention by the City of Bozeman to prevent human-bear conflict in Bozeman, including through public comment, letters to the editor of the Bozeman Daily Chronicle, and a formal letter to the Bozeman City Commission from the Natural Resources Defense Council (Ball, 2021; NRDC, 2020). However, human-bear conflict prevention strategies implemented by the City of Bozeman only include public sign notice of bear activity in trail areas.

Contemporary research of black bear management strategies demonstrates that physical barriers and education are the most effective tools to prevent human-bear conflict (Can et al., 2014; Lewis et al., 2015). In the Rocky Mountain West, research suggests that effective conflict mitigation must focus on deploying bear-resistant trash containers in areas with bear activity, coupled with public education about how to use the containers and proactive enforcement (Lackey et. Al., 2018; Lewis et al., 2015). An alternative strategy to government mandates is to encourage voluntary securing of attractants by individual landowners. However, a recently published study engaging 4,424 landowners in Montana found that emphasis on individual behavior change is less influential on landowner willingness to secure bear attractants relative to collective factors, including legal intervention (Nesbitt et al., 2021). Overall, strategies to encourage voluntary securing of bear attractants need further research (Nesbitt et al., 2021). At least 19 counties across the United States have successfully reduced human-bear conflict in urban areas by implementing ordinances that require bear-resistant trash bins (Bear Wise, 2017). As such, a city ordinance mandating use of bear-resistant trash bins in certain neighborhoods may be the best strategy to reduce human-black bear conflict in Bozeman residential areas.

Citizens of Bozeman show a strong desire to protect key wildlife migration corridors in the city, and a bear-resistant trash bin ordinance is aligned with the community's values (Bozeman Planning Board, 2020, pp. A-7). Goal EPO 4.6 of the 2020 Bozeman Community Plan recommends that Bozeman "develops a plan to mitigate conflicts between humans and wildlife through the use of proactive, nonlethal measures" (Bozeman Planning Board, 2020, pp. 38). The Gallatin County Growth Plan also recommends implementing development standards to "reduce human-bear conflicts, including requiring bear resistant facilities for garbage collection" (Gallatin County, 2021, pp. 6-37). A city ordinance requiring bear-resistant trash bins in high bear activity residential areas will fulfill goals of both the Bozeman Community Plan and the Gallatin Valley Growth Plan, and will contribute to a safer community for the public, pets, and bears.

Effects

An ordinance requiring the use of bear-resistant trash bins in high activity areas in Bozeman may reduce human-bear conflicts related to anthropogenic waste (Lewis et al., 2015). If enacted, such an ordinance has the potential to improve safety of humans and pets, as well as the safety of black bears that may become habituated to residential environments and human food. If adequate research is available to geographically identify the regions of Bozeman that have the greatest risk of human-bear conflict, the ordinance may only apply to residents within those geographic boundaries.

Black bears that forage in residential neighborhoods have the potential to cause property damage and financial loss for property owners. Property damage can involve damage to structures, such as campers, garages, cars, and pet/livestock enclosures, and damage to trees and landscape structures (Taylor & Phillips, 2020). At present in Montana, public compensation for damage to private property only includes damage to livestock depredation from grizzly bears, meaning individual property owners must pay for damage from black bears (Montana Department of Livestock, 2021). Although data is not available, many public resources are dedicated to reactive response to black bear conflict in residential areas. This includes incident response from the Bozeman Police Department, the Gallatin County Sheriff's Office, and Montana FWP staff. Black bear relocation and lethal management are also high-cost strategies to reduce human-bear conflict.

The total cost of bear-resistant trash bins does not need to be passed onto individual residents. Other counties across the United States with bear-resistant trash bin ordinances have employed several strategies to subsidize the cost of replacing resident trash receptacles. In some communities, such as Missoula, Montana, and Pitkin, Colorado, residents and businesses in designated areas are responsible for purchasing bear-resistant bins, but municipal trash services will offer customers a discounted equipment rate (Power, 2019). Other municipalities, such as Snowmass Village, Colorado, employ a hybrid model of compensation, with the municipality paying for garbage service and the resident paying for equipment (Bear Wise, 2017). Other states, non-profit organizations, and private organizations have offered grants up to $515,000 to support purchases of bear-resistant trash bins in individual municipalities (Bear Wise, 2017). At present neither Bozeman city garbage services nor L&L services offer bear-resistant bins on their websites.

This ordinance may positively affect black bears in the Bozeman area by reducing their risk of exposure to anthropogenic waste, their risk of being struck by a vehicle in an urban area, and their risk of poisoning (Egber, 2021; Johnson et al., 2020). Most critically, by preventing bears from becoming food conditioned in residential areas this ordinance may reduce the likelihood that black bears in the Bozeman region will be euthanized due to repeated human conflict. This ordinance may also reduce pollution caused by bear foraging, such as trash on private property, streets, and waterways.

Implementing a bear-resistant trash bin ordinance in Bozeman may spur dissenting opinions from some residents, though the public attitude towards protecting wildlife is generally supportive of city intervention (Bozeman Community Plan). Recent research in Montana has

shown that interacting with an expert is the most strongly predictive factor to individual securing of bear attractants for Montana landowners, highlighting the importance of community outreach and education to successfully implement a bear-resistant trash bin ordinance (Nesbitt et al., 2021). Public education about bear safety, how to properly use bear-resistant trash bins, and consequences of the ordinance may serve as an opportunity to build trust and face time between affected residents and Bozeman City representatives (Lewis et al., 2015). In Montana, research demonstrates that community buy-in to behaviors that reduce human-bear conflict is highly connected to social pressures and perceived neighbor values (Nesbitt et al., 2021). This suggests that an ordinance requiring bear-resistant trash bins may be more widely accepted if collectively implemented as opposed to individually selected.

Implementation of a bear-resistant trash bin ordinance will benefit from collaboration and support across governmental jurisdiction, community organizations, and private businesses. Collaboration between the City of Bozeman, Gallatin County, and Montana FWP may improve ordinance design, implementation, and enforcement. Implementation of a bear-resistant trash bin ordinance may benefit from support from local organizations such as the Montana Bear Education Working Group and People and Carnivores, and national organizations, such as Bear Wise (MBEWG, 2021; People and Carnivores, 2021; Bear Wise, 2021). Reducing human-bear conflict by preventing access to human trash will improve human safety, reflect community values, and may create opportunities for improved social engagement and cross-organization collaboration.

Examples

City of Missoula, Missoula County, Montana

In 2010, the City of Missoula implemented an ordinance requiring bear-resistant trash bins in specific areas of the city that experienced high bear conflict (City of Missoula, 2010). Missoula has a population of around 73,000 residents and is surrounded by densely forested wilderness areas that include black bear and grizzly bear habitat (USCB, 2021b; Montana Field Guides, 2021). The ordinance applies to residential, public, and commercial properties. The bins must be approved by the Interagency Grizzly Bear Committee or Montana FWP. Alternatively, the ordinance allows for garbage storage in an "enclosure" so long as the enclosure is reliably inaccessible to bears. The bear-resistant bin ordinance is enforced by the city-county health department and the police department. The municipal trash service provider offers a $5.00 discount for the purchase of bear-resistant bins (Power, 2019). People found in violation of the ordinance may be charged with a misdemeanor and fined up to $500.00.

The ordinance has several components that strengthened implementation, community compliance, and effectiveness. First, the ordinance only applies to specific regions of the city that experience high bear activity, known as the "Bear Buffer Zone". The determination of the geographic boundaries of the Bear Buffer Zone was based in research and advice from Montana FWP. Targeting bear-resistant bin requirements to specific geographic regions with the highest bear activity effectively reduced human-bear conflict and was economically efficient, as not all citizens needed to purchase bear-resistant containers. Second, the ordinance allows for an alternative to individual investment in bear-resistant containers by defining specific times property owners can place trash outside. Property owners are allowed to place unsecured trash outside from 5 am till 9 pm on the day of trash collection. This specification reduces individual homeowner cost and improves resident compliance.

The development and implementation process of the Missoula bear-resistant bin ordinance was strengthened by public engagement, cross-agency coordination, and adaptive design. The impetus for the ordinance originated from grassroots support by residents of the Rattlesnake neighborhood in Missoula and a local non-profit agency, Missoula Bears (Missoula Bears, 2021a). Public support from residents affected by bear activity and community buy-in and resource aggregation from Missoula Bears improved acceptability of the ordinance and contributed to equitable public participation. Missoula Bears is a key organization for successful implementation of the ordinance, as they provide education, resources, and regular updates about bear activity for local residents (Missoula Bears, 2021b). In the years since the ordinance was approved, the City of Missoula has used research and public comment to adapt the ordinance, including redrafting boundaries of the Bear Buffer Zone to appropriately target regions at greatest risk of human-bear conflict (. Since the ordinance was drafted and proved effective at reducing human-bear conflict, several municipalities and counties surround Missoula have adopted similar policies and ordinances.

The language of the Missoula bear-resistant trash bin ordinance and a map of the Bear Buffer Zone can be found at:

Ordinance: http://missoulabears.org/wp-content/uploads/2015/07/Missoula_Garbage_Ordinance_3419pdf.pdf

Map: https://bloximages.newyork1.vip.townnews.com/montanarightnow.com/content/tncms/assets/v3/editorial/f/ab/fab642ce-82bb-11e9-a74d-43696389ac24/5cefa0344f5c9.pdf.pdf

Pitkin County, Colorado

Pitkin County in Colorado has a population of 17,000 full-year residents, 10,000 part-time residents, and annually attracts thousands of tourists visiting Aspen and Snowmass (Pitkin County, 2020). The county experienced many years of human-black bear conflict, exacerbated by the high number of vacation-rental properties used by non-residents who were not informed about strategies to avoid bear conflict (Urquhard, 2003). In 2003 Pitkin County adopted an ordinance requiring wildlife-proof refuse containers or enclosures by all residents in the county (Pitkin County, 2003). The ordinance is specified as a wildlife protection ordinance, reflecting the ultimate goal of the county to co-exist with bears encourage bear-safe behavior by residents and tourists alike (Pitkin County, 2021). Wildlife-proof refuse containers must be approved by the county Solid Waste Manger or Animal Safety Officer. Residents may only have refuse containers outside between 6 am and 6 pm on the day of trash pickup. The ordinance is enforced by the Pitkin County Code Enforcement Officer, Pitkin County Animal Control, and any Law Enforcement Officer. If found in violation of the ordinance, residents may receive a penalty ranging from $100.00 to $500.00. Commercial properties found in violation of the ordinance may receive a penalty up to $1000.00.

Implementation of the Pitkin County wildlife protection ordinance was strengthened by multijurisdictional coordination, public education initiatives, and subsidized pricing for residents. The municipalities of Snowmass Village and Aspen adopted wildlife-resistant trash bin ordinances prior to Pitkin County, contributing to consistent language, enforcement, and shared goals across municipal and county jurisdictions (Urquhart, 2003). To reduce cost to residents, the county offered an initial rebate offer to purchase wildlife resistant bins. To sustain availability of bins for new properties, $50 of any fines collected from violations of the ordinance is used to fund purchasing wildlife resistant containers. Furthermore, the cities of Aspen and Snowmass contributed tens of thousands of dollars of city budget to purchase wildlife resistant containers throughout the cities. Pitkin County provides ample educational material online and posted throughout the county to encourage bear-safe behavior and proper use of wildlife resistant refuse containers (Pitkin County, 2021). In years since the ordinance was passed, research has evaluated effectiveness of the ordinance and expanded understanding best practices to mitigate human-bear conflict in urban environments (Lewis et al., 2015).

The language of the Pitkin County wildlife resistant refuse container ordinance can be found here: https://www.pitkincounty.com/DocumentCenter/View/2697/title-06-wildlife?bidId=

Additional examples

West Yellowstone, Montana

Comprehensive ordinance to specifically mitigate human-bear conflict. Chapter 6.08, Ord. 122.

Teton County, Wyoming

Comprehensive ordinance focused on bear conflict area standards to mitigate human-bear conflict and protect bears. Chapter 5.2.2.

Boulder, Colorado

The Bear Protection Ordinance was initially funded by private citizens in 2013 in response to the most lethal year for black bears in Boulder. The ordinance was later adopted by the City of Boulder and specifically focuses on bear protection. Ordinance 8161.

Steamboat Springs, Colorado

Bear-resistant container requirements included in the city's solid waste ordinances. Chapter 19, Article III.

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Protecting Vernal Pools Through Local Ordinances

Introduction

Vernal pools, vernal ponds, or woodland pools are a small and seasonal type of wetland that occur in the northeast (Figure 1), midwest, and western Mediterranean climates (Figure 2) in the US. In eastern climates, they are typically isolated from one another and found in forested landscapes[1]. In western climates, they are characterized by grasslands and other forested landscapes[2]. As seasonal bodies of water, vernal pools are at their fullest in the spring and often dry up during drier times of the year. Due to these characteristics, vernal pools serve as critical breeding and nursery habitat and sources of food and water for wildlife and plants. Additionally, vernal pools deliver significant ecosystem services, including local flood control, water purification, and carbon sequestration[3].

Figure 1: Maine vernal pool; photo credit: Maine Audubon

Figure 2: California vernal pool; photo credit: Ron Edman

However, vernal pools face threats from human development, wetland conversion to agricultural land, and the effects of climate change[4]. As a type of wetland, vernal pools are one of the most rapidly degrading ecosystems in the US due to these listed threats[5]. However, vernal pools have been inadequately protected compared to other types of wetland habitat, in-part due to their seasonal nature and small size[6]. Encompassing vernal pools into existing wetlands policy can help strengthen current protection efforts[7]. Although vernal pool conservation has received attention from policymakers at the state level, resulting in the creation of state legislation (e.g., Massachusetts State Wetland Protection Act), more attention is

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[1] Paul H. Zedler, *Vernal pools and the concept of "isolated wetlands"*, 23 WETLANDS 597–607 (2003).
[2] Jon E. Keeley & Paul H. Zedler, *Characterization and global distribution of vernal pools*, 1 *in* ECOLOGY, CONSERVATION, AND MANAGEMENT OF VERNAL POOL ECOSYSTEMS, PROCEEDINGS FROM 1996 CONFERENCE 14 (1998).
[3] Walter G. Duffy & Sharon N. Kahara, *Wetland ecosystem services in California's Central Valley and implications for the Wetland Reserve Program*, 21 ECOLOGICAL APPLICATIONS S128–S134 (2011).
[4] Jessica P. Doughty, *The Disappearing Wetland Act: Climate Change, Development, and Protection* (2017); Aram JK Calhoun et al., *Creating successful vernal pools: a literature review and advice for practitioners*, 34 WETLANDS 1027–1038 (2014).
[5] Lisa A. McCauley, David G. Jenkins & Pedro F. Quintana-Ascencio, *Isolated wetland loss and degradation over two decades in an increasingly urbanized landscape*, 33 WETLANDS 117–127 (2013).
[6] Calhoun et al., *supra* note 4.
[7] McCauley, Jenkins, and Quintana-Ascencio, *supra* note 5.

needed from local municipalities. In the US, where over 70% of land is privately owned, local ordinances have the potential to enhance vernal pool conservation on private lands.

Effects

Ecologists classify vernal pools as a type of wetland, which contribute to controlling flood waters, purifying water, and sequestering carbon[8]. This also means that destroying vernal pools for human development results in the same adverse effects that occur from destroying wetlands: increased flooding, drought, water pollution, shoreline erosion, and declining wildlife populations[9], all of which can be costly for cities and towns in the long-term if not managed adequately. Regarding declining wildlife populations, many wildlife and plant species rely on vernal pools for habitat, food, and water[10]. For example, a 2015 US Fish and Wildlife Service study found 33 plant and wildlife species in California and Oregon that are endemic to vernal pools. This includes 15 plant species that were listed as threatened or endangered at the time of the study[11]. The Maine Department of Environmental protect likewise notes that many species are endemic to northeastern vernal pools, including state-listed endanger or threatened species such as Blanding's turtles, Spotted turtles, and Bog haunter dragonflies[12]. Protecting these habitats also means protecting the myriad of wildlife species that rely upon them, which can have implications for wildlife recreators and the associated revenue they bring to regions that contain vernal pools. For example, Maine Audubon is heavily involved in the Maine Vernal Pool Special Area Management Plan[13], in-part because birds prey upon the amphibians, reptiles, and invertebrates that rely on vernal pool habitat. Conserving vernal pools thus also benefits bird conservation, which birdwatchers heavily contribute to[14]. Conserving vernal pools and other types of wetlands also enhances the natural scenery of a landscape, which can draw other types of wildlife viewers and their money to a region.

Figure 3: Wood frog (left) and Yellow spotted salamander (right) eggs found in Maine vernal pools; photo credit: Curt Chipman

Natural resource managers have established best management practices for protecting and maintaining vernal pool habitat. The Maine Forest Service defines guidelines for doing so, drawing upon the work of researchers[15]. They define three major areas within the habitat management zone: the vernal pool itself; the terrestrial area within 100-feet of the pool perimeter, known as the 'protection zone;' and the area within 100- to 400-feet of the vernal pool perimeter, known as the 'life zone.' More specific management requirements for each of these zones varies by vernal pool location in the US, however managers emphasize the need to protect each of

[8] Duffy and Kahara, *supra* note 3.
[9] William J. Mitsch & James G. Gosselink, *The value of wetlands: importance of scale and landscape setting*, 35 ECOLOGICAL ECONOMICS 25–33 (2000).
[10] Jamie L. King, Marie A. Simovich & Richard C. Brusca, *Species richness, endemism and ecology of crustacean assemblages in northern California vernal pools*, 328 HYDROBIOLOGIA 85–116 (1996).
[11] California Department of Fish and Wildlife, *California's Vernal Pools*, CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (2013), https://perma.cc/9LYV-ZZ49.
[12] Maine Department of Environmental Protection, *Significant Wildlife Habitat: Significant Vernal Pool Habitat*, MAINE GOVERNMENT , https://www.maine.gov/dep/land/nrpa/vernalpools/index.html.
[13] Vernal Pool SAMP, , OF POOLS AND PEOPLE , https://perma.cc/7CHB-QTUJ.
[14] ERIN CARVER, *Birding in the United States: A Demographic and Economic Analysis* 18 (2013).
[15] Maine Forest Service, *Forest Managment and Vernal Pools* (2006), https://digitalmaine.com/for_docs/222.

these zones to adequately protect and maintain vernal pools[16]. Managers and researchers alike call for expanding efforts to locate and document vernal pools to enhance their protection[17].

Protecting vernal pools means protecting wetlands, which is crucial in light of anthropogenic climate change, increasing land-use changes, and ensuring that human development is sustainable and not threatening ecosystems that provide valuable ecosystems services. At a federal level, vernal pools are protected through Section 401 of the Federal Clean Water Act[18]. California, Maine, and Massachusetts are examples of states that have enacted state legislation to protect vernal pool habitat. There are a few prominent mechanisms that are used at the state level to protect vernal pools, which can also be used at the municipal level. One mechanism categorizes vernal pools as a type of wetland, which leads to the protection of vernal pools through wetland protection legislation. Massachusetts exemplifies this mechanism, where significant vernal pools are protected under the Wetlands Protection Act regulations[19] (although vernal pools are additionally protected under the Massachusetts Surface Quality Water Quality Standards, Massachusetts Forest Cutting Practice Act, and Title 5 of Massachusetts Environmental Code). In Maine, rather than grouping vernal pools under wetlands protection legislation, some vernal pools that host a variety of wildlife species are defined as significant wildlife habitat under the state's Natural Resources Protection Act[20]. This act additionally regulates development activities within 250 feet of these significant vernal pools.

Local vernal pool ordinances have the potential to aid state regulations in protecting vernal pools at a local level. For example, Boston, Massachusetts' municipal ordinance protecting vernal pools is stricter in defining what development activities can occur near vernal pools than the Massachusetts state Wetlands Protection Act. Its definition of vernal pools is also broader than the state Act, meaning more vernal pools can be protected from development[21]. Furthermore, new ordinances protecting vernal pools can spur the creation of new knowledge and raise awareness of vernal pools in a community, which can enhance conservation activities to protect vernal pools. For example, studies showed that the adoption of state regulations for vernal pools in Maine during the 1990s resulted in the creation of new organizations to conserve vernal pools. These new organizations helped researchers gain new knowledge about vernal pools over the first few decades of the 21st century, of which was then used to raise awareness about vernal pools and engage private landowners in vernal pool management[22].

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[16] *Id.*

[17] Jessica S. Jansujwicz, Aram JK Calhoun & Robert J. Lilieholm, *The Maine Vernal Pool Mapping and Assessment Program: engaging municipal officials and private landowners in community-based citizen science*, 52 ENVIRONMENTAL MANAGEMENT 1369–1385 (2013).

[18] UNITED STATES OF AMERICA, *Clean Water Act*, 33 U.S.C. §1251 (1972).

[19] MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION, *Wetlands Protection Act*, 310 CMR 10.00 (2017).

[20] MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, *Natural Resources Protection Act*, §38MRSA 480-B (1987).

[21] BOSTON, MA, *City of Boston Municipal Code*, 7–1.4 WETLAND PROTECTION AND CLIMATE ADAPTATION (2019).

[22] Aram JK Calhoun et al., *Improving management of small natural features on private lands by negotiating the science–policy boundary for Maine vernal pools*, 111 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 11002–11006 (2014); Damon B. Oscarson & Aram JK Calhoun, *Developing vernal pool conservation plans at the local level using citizen-scientists*, 27 WETLANDS 80–95 (2007); Bridie McGreavy et al., *Citizen science and natural resource governance: program design for vernal pool policy innovation*, 21 ECOLOGY AND SOCIETY (2016); Jansujwicz, Calhoun, and Lilieholm, *supra* note 17.

Federal, state, and municipal regulations protecting vernal pools do not come without consequences for other sectors. Generally, wetland protection regulations directly interfere with development[23] and agriculture[24] activities, as regulations tend to prohibit these activities within a set distance from existing wetlands to protect the ecosystems services that wetlands provide. These regulations can potentially make developing a more timely and expensive endeavor, particularly if regulations dictate that developers must recreate wetland habitat that is destroyed in the process of development. In cities such as San Diego and Boston, which have enacted ordinances protecting vernal pools, vernal pool conservation also competes with an increasingly smaller amount of space that can accommodate growing populations. Likewise, by preventing agriculture activities from taking place in proximity of wetland habitat like vernal pools, wetland regulations can adversely impact farm revenue. However, farmers can potentially make up some of this lost revenue through participating in voluntary state and federal agricultural conservation programs, which provide funds to farmers who implement conservation practices on their farms[25] (e.g., Environmental Quality Incentives Program through the Natural Resources Conservation Service).

Examples

Boston, MA

Boston, Massachusetts is a large, coastal New England city that contains vernal pool habitat. In adherence with the Massachusetts state Wetlands Protection Act, Boston municipalities incorporated vernal pools into the city Wetlands Protection and Climate Adaptation ordinance that was enacted in 2019. This ordinance was broadly created to protect wetlands, water resources, floodplains, and city green space under a changing climate, as Boston is a coastal city and prone to future flooding[26]. Vernal pools are included within this ordinance under 'definitions' as part of the larger state Wetlands Protection Act. The ordinance states that vernal pools are naturally occurring confined basins or depressions that hold at least 200 cubic feet of water at some point during the year, hold water for a minimum of two continuous months, do not contain adult predatory fish populations, and provide habitat for breeding and rearing amphibians, reptiles, or other species. This definition stands regardless of whether or not the Massachusetts Division of Fisheries and Wildlife certify existing vernal pools under state-level vernal pool regulations[27] (certain standards are used to determine if a vernal pool is significant. This is based off the type of species present in said vernal pool). In addition to this definition, the ordinance requires 100-feet buffer zones for occurring vernal pools that extend from the highest point of flooding. As a relatively new ordinance for Boston, enacted at the end of 2019, impacts of the ordinance are still being documented.

Topsham, ME

Topsham, Maine is a small town located in Sagadahoc County off the coast of Maine. Unlike Boston, the landscape is additionally characterized by multiple suburbs, historical districts, a regional suburban retail center, deciduous and conifer forests, farms, and other conserved properties. Within these forests exist many upland floodplains and wetlands, including vernal pools. These coastal vernal pools are inhabited by wood frogs, spotted salamanders, blue-spotted salamanders, fairy shrimp, and other wildlife species that are endemic to this type of wetland habitat.

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[23] Flint B. Ogle, *The ongoing struggle between private property rights and wetlands regulation: recent developments and proposed solutions*, 64 U. COLO. L. REV. 573 (1993).

[24] Gerald Torres, *Wetlands and Agriculture: Environmental Regulation and the Limits of Private Property*, 34 U. KAN. L. REV. 539 (1985).

[25] Joy B. Zedler, *Wetlands at your service: reducing impacts of agriculture at the watershed scale*, 1 FRONTIERS IN ECOLOGY AND THE ENVIRONMENT 65–72 (2003).

[26] Paul Kirshen, Kelly Knee & Matthias Ruth, *Climate change and coastal flooding in Metro Boston: impacts and adaptation strategies*, 90 CLIMATIC CHANGE 453–473 (2008).

[27] BOSTON, MA, *supra* note 21.

Within the town's zoning regulations, an ordinance was created in 2016 specifically to address vernal pools[28]. The ordinance dictates that all development activities on sites with significant vernal pools (as defined by the Maine Natural Resources Protection Act) present must be designed to conserve the pools and importantly, the adjacent terrestrial habitat that amphibians use post-breeding. The ordinance specifically states that development cannot happen on a property where a vernal pool or its adjacent terrestrial habitat fall under state or federal regulation without obtaining a specific permit from the respective governing body that regulates the property.

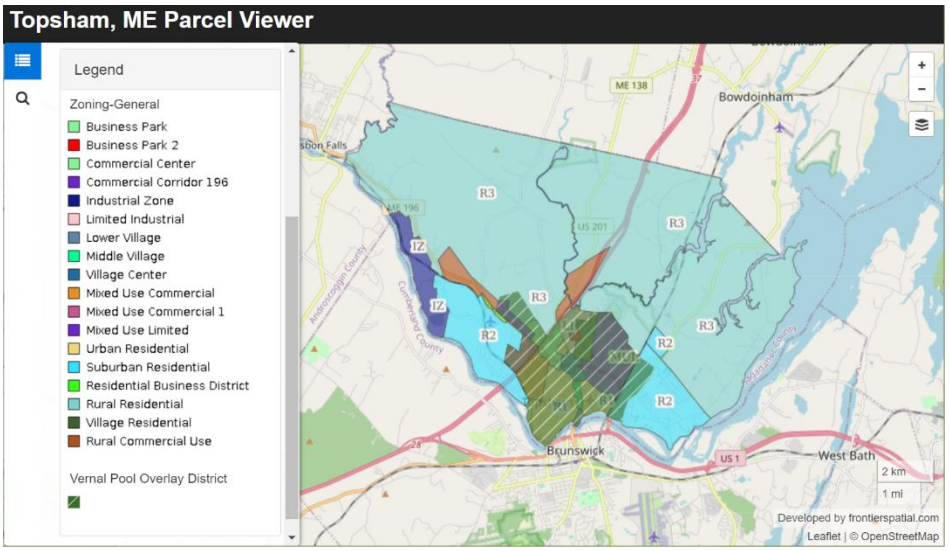

Figure 4: Town of Topsham's vernal pool overlay district; obtained from Town of Topsham zoning map

In addition to this ordinance, under Article VI Zone Regulations, Topsham provides a Vernal Pools Overlay District (Figure 4) to help property owners ascertain whether their property is subject to regulations from the state or federal level regarding vernal pools[29]. This ordinance also helps clarify the development potential of properties where vernal pools are currently located. Developers and/or property owners can choose to not comply with state and federal regulations, however the ordinance then states that these individuals must elect to pay a vernal pool mitigation fee or engage in permitee-responsible mitigation activities. The latter looks like these individuals arranging the protection of vernal pools found within rural areas of their communities or other communities using the conservation criteria defined in the Maine Vernal Pool Special Area Management Plan.

Topsham's vernal pool protection ordinances is still a recent addition to its town code, and impacts of the ordinance to environmental, social, and economic dimensions of planning are not well documented. Researchers at the University of Maine note that vernal pool conservation has mixed reviews among private landowners, where landowners will either enjoy the wildlife viewing benefits created by vernal pools or desire to fill them in[30]. However, one Maine planner notes that ordinances like those of Topsham are viewed as both pro-conservation and pro-development[31], as the ordinances give developers more options for handling vernal pools on properties that could be used for development.

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[28] TOWN OF TOPSHAM, ME, *General Performance Standards*, § 225-41.1 VERNAL POOLS (2016).
[29] TOWN OF TOPSHAM, ME, *Zone Regulations*, § 225-20.2 VERNAL POOL OVERLAY DISTRICT (2016).
[30] Sam Schipani, *It's now spring. Here's what to do when you see water pools emerge in your yard.*, BANGOR DAILY NEWS, March, 2019, https://bangordailynews.com/2019/03/23/living/home-and-garden/its-now-spring-heres-what-to-do-when-you-see-water-pools-emerge-in-your-yard/.
[31] *Id.*

Additional Examples

Natwick, MA: Natiwck defines vernal pools under the city's wetlands protection ordinances. This ordinance dictates what types of activities cannot take place in landscapes with wetlands or protected resource areas, which includes vernal pools[32].

Beverly, MA: Beverly addressed vernal pool protection under its wetlands protection regulations. The ordinance protects vernal pools and adjacent terrestrial habitat within 100-feet of pools regardless of whether the vernal pool is classified as "significant" by state and federal agencies (this is again typically determined by a specific combination of wildlife species). No activity is permitted within these defined areas.

Middleton, RI: Under its subdivision regulations, Middletown has an open spaces and recreation facilities which controls conservation development in the city. Special aquatic sites like vernal pools are deemed as resources to be conserved within Conservation Development and gives power to the Planning Board to authorize plans for use, ownership, management, and maintenance of open space areas within any Conservation Development[33].

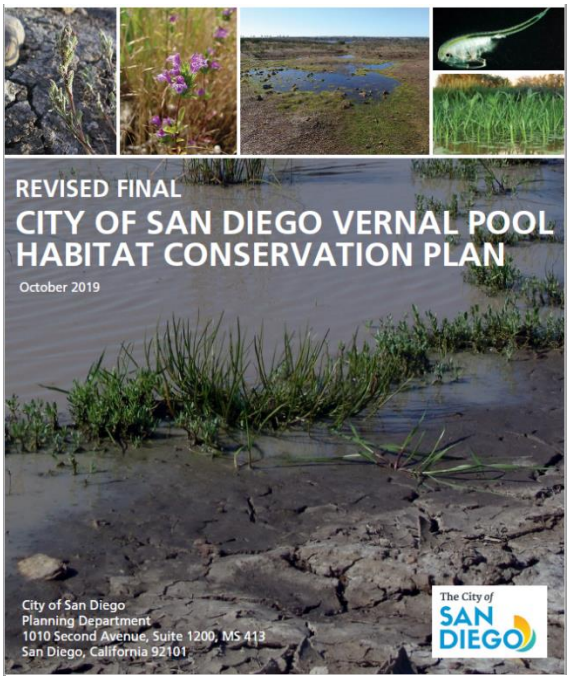

Figure 5: San Diego Vernal Pool Habitat Conservation Plan cover

Porterville, CA: Porterville accounts for vernal pool protection within their general site regulations for development. An ordinance addressing habitat conservation states that new development must protect and preserve areas in which plant and/or wildlife or its habitat are either rare or valuable because of their role in the ecosystem. Vernal pools are included in these categories.[34]

San Diego, CA: San Diego protects vernal pools as part of a larger state plan. They are addressed within supplemental development regulations for environmentally sensitive lands and sensitive biological resources under the city's general regulations code. Within this code, vernal pools that contain fairy shrimp are identified as a sensitive biological resource. Development that encroaches into biologically sensitive resources requires a special permit[35]. San Diego additionally has implemented a vernal pool habitat conservation plan (Figure 5) to further protect and restore vernal pool habitat in congruence with the larger state vernal pool habitat conservation plan[36].

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Land Use Planning 520

Eddie Sachs

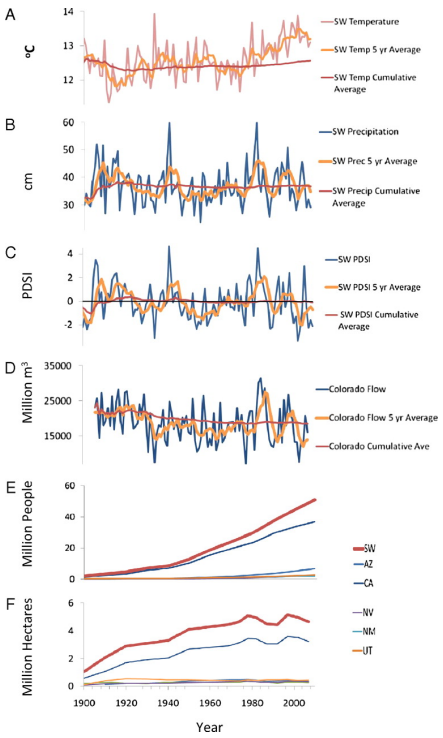
12/14/2021

Sustainable Development Code

Grey Water Reclamation

Introduction:

In the 21st century, water is, if not, going to be the most scarce resource that we as a nation have. The landscape in the Mountain West, Southwest, and West are all battling each other for this precious resource. Due to higher temps, less water, economic development, etc. this has extenuated the circumstances and increases changes of forest fires, flash foods, and severe droughts. Predictions for the rest of the century are only increasing, with water shortage becoming more frequent and severe. Just the increase in domestic use alone will create major problems in city landscapes. Household use, agriculture, and food are all at risk as populations increase. Savings can be realized substantially in household and agricultural use through the implementation of decreased potable water use. Agriculture is an important industry in the West, where water shortages have been taking an impact on the sector/economy and putting food supply in jeopardy. Same with the ski industry, especially in the states of Colorado and Utah, where tourism is an important aspect for these small towns.



(*A*) Southwest (California, Nevada, Arizona, New Mexico, Utah) average annual temperature. (*B*) Southwest average annual precipitation. (*C*) Southwest average annual Palmer Drought Severity Index. (*D*) Naturalized discharge of the Colorado River at Lees Ferry, AZ. (*E*) Southwest population size. (*F*) Southwest irrigated agricultural land area.

Effects:

Human demand for water remains considerable and the top priority. The Colorado River is the main conduit of water flow in the area. The best viable option for extending crucial water supply is the implementation of using grey water for irrigation, snowmaking, and some household use. In Tucson, Arizona the city passed legislation stating that all new construction include grey water infrastructure. This install comes with a one time 25% tax credit and helps save the city millions of gallons of potable water each year. Grey water can be used with any plants and food systems, as the chemical balances are more natural on the environments that potable water. These chemical balances are much more beneficial to plant growth and leads to reduced fertilizer use. The use of grey water helps conserve drinking water, thus reducing the need to expand treatment facilities, which in turns means cheaper water for everybody. In times of drought, effluent water is more reliable as it can be saved with storage tanks. "Every gallon of grey water used for outdoor watering represents a gallon of potable water saved for drinking"(4).

"In 2000, suburbanites accounted for 50% of the population (**7**). Southwestern suburban developments, in which 70% or more of the water is often used for landscaping (**13**), amplify the water demands exerted by the increasing population. Sabo et al. estimate that per-capita virtual water footprints are seven times higher for cities in the arid West than in the East. They suggest that with a doubling of population, the West would require the equivalent of more than 86% of its total streamflow to meet human use at current per-capita levels"(9). This is a region in the US where the majority of water use is for exterior landscaping. If you include snowmaking in this category, the use skyrockets.

Examples:

The Currituck Golf Club

In North Carolina, the Currituck Golf Club is permitted to use 500,000 gallons of effluent water per day to cover the 66 acres of courses. The club has an on site plant that processes the grey water from the neighboring subdivision of homes. The cured water is stored in the courses pond, thus creating a natural water feature for golfers to hit around. Surprisingly enough, the effluent water has better levels of chemicals in it that do not need as much adjustment as "clean" water. This creates better grass conditions.

Issues do arise when the club experiences the seasonal fluctuations of members visiting and having a surplus of greywater but not enough storage capacity. The same is the opposite, homeowners that are not visiting in their usual numbers in the off season do not create any water for the system to use, thus forcing the course to revert back to fresh water.

Credit: https://realestatescorecard.com/community-reviews/coastal-northern-north-carolina/currituck-club

State of California –

California is the second largest user of reclaimed water. It was the pioneer of creating water use regulations back in 1918 and quality acts in 1969. The people of the state voted that water use and recycled water was the primary interest of the community in order to meet future needs. In LA, 6 joint water plants combine 385 million gallons per day, treating enough at a high enough quality for multiple applications. 38% of the total effluent collected is reused so far with studies showing that there are no health effects on the community or local fresh water sources.

Categories of Reuse by the Sanitation Districts of Los Angeles County (1997)

Reuse Application	Specific Areas of Reuse	Amount of Water Reused (mgd)	% of Total Water Reused
Landscape Irrigation	90 parks, 85 schools, 66 roadway greenbelts, 17 golf courses, 19 nurseries, 5 cemeteries, 55 miscellaneous landscaped areas.	11.23	15.8%
Agricultural Irrigation	10 sites.	4.54	6.4%
Industrial Processes	12 sites including paper manufacturing, carpet dyeing, concrete mixing, cooling, oil field repressurization, and construction applications.	6.12	8.6%
Environmental Enhancement	1 wildlife refuge on Edwards Air Force Base.	6.59	9.3%
Ground Water Recharge	Central Groundwater Basin.	42.45	59.9%
	TOTAL	**70.93**	**100%**

Source: Takashi, Asano, ed. *Wastewater Reclamation and Reuse*, (New York: CRC Press LLC, 1998), 926-927.

Heber Valley Utah –

The Wasatch Front Range of the Salt Lake valley is home to the largest population in the state. This project in the Heber Valley has a primary function of reusing water for strictly agricultural use. Due to the population growth in the area, the facilities are maxed out and future storage of the effluent water must be decided. The cheapest option by far is to increase the holding potential of the existing tanks. This option is 1/3 the cost of just dumping the access grey water into the nearby Provo River.

Additional Examples:

Arizona Snowbowl Ski Resort –

(This ski resort just outside of Flagstaff, Arizona was the first in the nation to make artificial snow 100% from sewage effluent. With no natural source of water for the resort to use in snowmaking, the lower elevations of the mountain were difficult to keep snow on for users. The 1.8 million gallons used daily save that much for the local residents in a place where drought is only getting worse).

Credit: https://www.tripsavvy.com/where-to-ski-and-snowboard-in-arizona-4175229

The Yellowstone Club -

(The Yellowstone Club located in Southwestern Montana recently acquired the permit to use 25 millions gallons of treated wastewater for snowmaking operations. This will also preserve the water quality of the surrounding rivers as there is less nitrogen and phosphorus in the grey water. The Big Sky Watershed Forum listed the option as the most viable for preserving the towns water supply, and helping in the spring/summer season by providing more runoff).

Credit: https://www.coolworks.com/yellowstone-club/profile

Ventana Canyon Golf & Racquet Club (1983)–

(Since 1983, this golf course in Tucson, Arizona not because it was the right thing to do, but it is the only available water to use in their daily irrigation. Using over 300 million gallons per year, the course must post signs to make users aware. Constant checking of the nutrients and chemicals in the water is a must to deter algae growth on lakes).

Credit: https://www.tucsongolfestates.com/project/ventana-canyon-country-club/

Meadow Lakes Golf Course (1998)–

(Located in Prineville, Oregon this golf course was built to directly help reduce the inflow of effluent water into the city's wastewater treatment plan. Golf courses are ideal places to use greywater due to all of the soil and turf that acts as natural filter before water finds its way back to natural rivers, streams, and lakes. Grass is actually greener on the course due to the low PH levels).

Credit: https://flickr.com/photos/5140475461

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Kim Scanlon
GPHY 520

Invasive Plant Ordinance

Introduction

A noxious weed or invasive plant species is a plant that can directly or indirectly harm crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, and natural resources of the United States, public health, or the environment [5]. According to some studies the sale, trade, and import of ornamental plants are responsible for nearly 40% of the invasive plants currently found in the United States [16]. The ornamental plant trade (ie. nurseries, botanical gardens, and individuals) has been found to be the primary source of invasive plants throughout the United States [18]. The US Federal Noxious Weed Act identifies 98 species that pose the greatest threat to US natural resources along with additional individual state noxious weed districts identifying specific regional threats (1000+ species) [21]. While these informational sources are helpful the inconsistencies in the way invasive species are regulated across the country remains a major threat (Figure. 1)[22][19].

A study found that of 1285 plant species identified as invasive in the US, 61% of those were available for purchase at 1330 different vendors, resulting in 15,000 opportunities to purchase invasive plants [22]. There is little incentive for horticulturists to abandon a species with high market value unless it is consistently regulated [17][18][20]. Similarly, even well-intentioned growers and consumers may continue to unknowingly foster invasions based on availability in their local markets [11]. When considering the ornamental invasive plant species supply chain, it was found that prevention of the establishment or introduction of potentially invasive species is typically the most cost-effective and environmentally appropriate policy option to manage invasions [17].

Effects

Municipalities have much to gain, economically and environmentally, from prohibiting the sale, trade and import of invasive plant species [22]. The effects of climate change on the range, abundance, and impacts of invasive plant species heighten the challenges of management but also validates the necessity [7]. As carbon dioxide in the atmosphere alters climate change trends (ie. rainfall, cloudiness, wind strength, temperature) higher latitude areas are seeing additional invasive species increase [7][8]. Frederick Steiner observes the correlation between

local climate change and the increasing trends of urbanization and suburbanization through the lens of an ecological approach to landscape planning [8]. These correlations are important to understand when development is occurring to mitigate the negative effects humans can impose on a regions landscape, including the spread of invasive species. Invasive plant species have been shown to promote the frequency and occurrence of wildfires and erosion locally and regionally across the United States [6]. It has also been found that invasive plant species can have a negative impact on regional native plant biodiversity [10]. Pollinators and the health of wildlife is correlated to biodiversity and invasive plant species have been found to greatly disrupt the structure and function of ecosystems (ie. east coast forests vs kudzu vine) [14]. Plants and animals commonly have a symbiotic relationship which can be threatened by incompatible invasive plants (ex. Toothwort and West Virginia White Butterfly vs Garlic mustard) [14]. While communication, research, management, personnel, and funding are common barriers to developing a comprehensive invasive plant species management plan, prohibiting the sale, trade and import of regionally and locally problematic species can awaken community education and cutoff point source introductions [7][22]. Looking to the future, thinking regionally, and gaining congruity across county and state borders regarding invasive species delineation and regulation could be the next leap in conquering the spread [8][22].

Examples

Knox County, Indiana

On August 7, 2018 the Knox County Commissioners recognized the harmful effects that invasive species have had on forests, agriculture, natural habitats, as well as animal and human health in general [12][23]. The Indiana Invasive Species Council introduced this issue to the Commission with the argument that landowners were spending a significant amount of funds to manage the impact of invasive species [13]. The intention is to mitigate the impact of invasive plants by preventing the purposeful introduction of them to Knox County, IN [13]. Based on a list of plant species developed by the Indiana Invasive Species Council, Knox County intends to ban the sale, trade, and import of 64 different invasive plant species [9][12][23]. The plants are ranked High, Medium, and Low levels of impact, Knox County intends to ban High and Medium impact plants and encourage voluntary restrictions for Low impacts plants [9][12]. Nurseries, retailers, grocery stores, chain stores and any other vendors are included in this ban [12]. This ban only includes established plants but excludes seeds [12]. Also, no plants already planted will

be affected by this ordinance, only future introductions [12]. Although, landowners are encouraged to remove invasive species and can contact the Cooperative Invasive Species Management Authority (CISMA) for technical assistance [13].

This ordinance will be enforced by the Natural Resource Specialist along with the Soil and Water Conservation District (SWCD) or other persons designated by the County Commissioners through inspections [13]. This enforcement authority is allowed to order cease and desist of the sale of invasive species, order immediate disposal of the offending species, notice that costs of enforcement will be assessed against the vendor as well a notice of a hearing date [13]. Knox County appointed 5 members to the newly founded Knox County Invasive Species Board (KCISB) to be the hearing authority for the ordinance [13]. This hearing authority may impose financial penalties for first, second and subsequent violations with the discretion to apply the violation per plant or per location [12][13]. While this ordinance does require personnel and funding to be available, on top of already established county boards and ordinances, the long-term effects of regulating invasive species will prove to reduce other costs that the county may currently encounter in management processes [12].

Fayetteville, AR

Fayetteville, AR stressed the importance of removing and replacing invasive plants on the grounds that their ecological and economic well-being is at stake. The Fayetteville economy relies greatly on the local commercial, agricultural, and recreational activities that rely on a healthy ecosystem [4]. They are also an important monarch butterfly migration corridor, emphasizing the importance of supporting natural ecosystem processes that rely heavily on specific native plants (ie. Milkweed) [4].

Fayetteville city council adopted an ordinance on November 3, 2015, to create an Invasive Species Manual [3]. The manual names 18 invasive plants that have, or may become, a threat to the native vegetation in the area [1][2][3]. These plants are restricted in any new developments, requiring a Landscape Plan review by an Urban Forester [4]. In addition, the city is also working to prevent and remove invasive species from city properties such as trails and parks [4]. Development of an Invasive Species Educational Packet helps members of the public to identify and replace invasive plants with native alternatives and advice on removal [1][2].

This ordinance was developed with public input and participation from 13 stakeholders including nursery owners/managers, landscape architects, academic experts, landscape installers, hobby gardeners, botanists, naturalists, conservationists, City Park Managers, and local citizens [2]. This level of participation from a variety of stakeholders exhibits that the resulting ordinance had a high level of community consensus. While prohibiting the sale, trade and import was not yet an enforceable tactic for Fayetteville they will rely on and encourage voluntary actions.

Additional Examples

Mono & Inyo County, CA, Inyo-Mono Water District Invasive Species Strategic Plan (2011)

Eastern Sierra Weed Management Area Strategic Plan

(Coordinated management of noxious and invasive weeds to protect economic and environmental viability of the region by implementing county level education, exclusion, survey, eradication, and reclamation efforts.)

New Jersey, NJ Strategic Management Plan (2011)

(Utilize existing statutory authority to prohibit the sale of invasive or potentially invasive plant species and enforce through NJDA's nursery certification program.)

El Paso County, CO, Schriever Air Force Base Integrated Noxious Weed Management Plan (2017)

(Noxious weed management plan that strives to develop and maintain a noxious weed inventory and monitoring progress, public education, and control strategies that includes inspection of plant sales.)

Additional Resources

California Plant Right Resource for specific regions.
https://plantright.org/about-invasive-plants/plant-list/

Mono & Inyo County, CA Invasive Species Strategic Plan
http://inyo-monowater.org/wp-content/uploads/2011/09/Strategic-Plan.pdf

New Jersey Strategic Management Plan.
https://www.nj.gov/dep/njisc/docs/Final%20NJ%20Strategic%20Management%20Plan%20for%20Invasive%20Species%2011.09.pdf

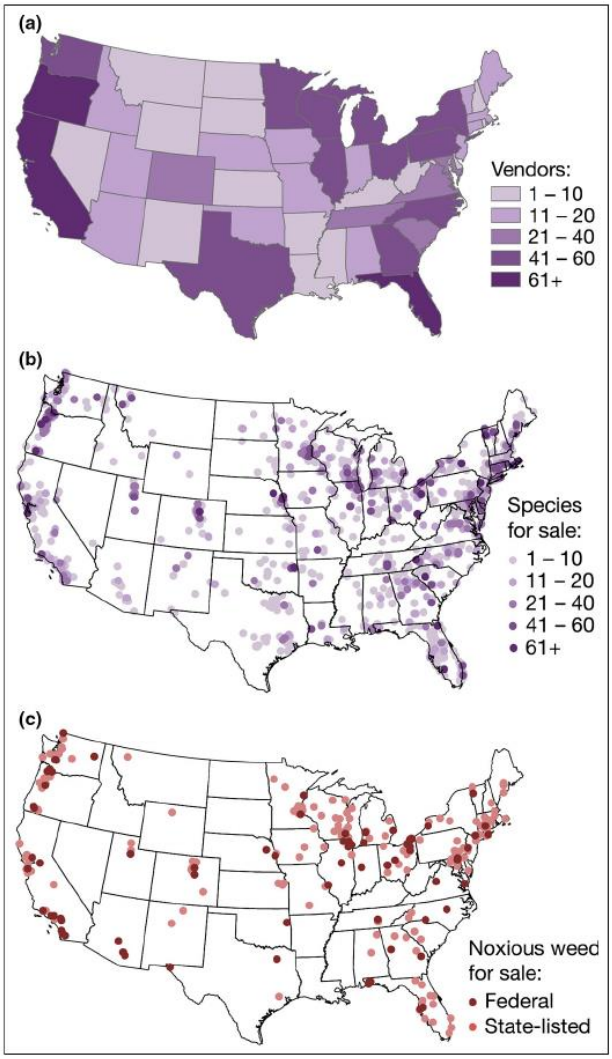

Figure 1. (a) The number of vendors offering invasive plants in each state. (b) The distribution of vendors offering invasive plants across the US; colors correspond to the number of invasive species available for sale by that vendor. (c) vendors offering invasive species for sale within states where their trade is subject to federal or state regulations. [22]

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Sustainable Development Code

Incentives for Creating and Maintaining Defensible Space

Introduction

The Wildland-Urban Interface (WUI) is an area and term that many people are more aware of as growth and development in the WUI has increased dramatically, with over one-third of current homes in the United States being located within the WUI [1]. The WUI is commonly known as the area where the human-build environment blends into forest, grass, shrub or wildlands. [2] This blending can cause costly and disastrous results as weather and more dramatic climate changes are influencing an increase of wildfires' likelihood and intensity. [3]

There are multiple ways to mitigate the risk of ignition. The focus of this policy brief is on creating defensible space, or the reduction of vegetation immediately adjacent to the home or other structures. [4] This can prevent a disastrous loss by reducing ember sources by clearing a buffer of trees, grass, shrubs, and other naturally flammable sources within a certain distance from the structures on a property. [5] From 1995 to 2015, the Forest Service's budget increased by 34% - from 16% to 50% - for the fighting of wildfires. [6]

An individual can decrease their risk by taking direct actions of creating defensible space around their homes, and encouraging their neighbors to do that same. [7] It is the personal responsibilities of the property owners that the burden of the cost and expertise often fall onto, but local governments and policy makers can create incentives, rebates, or other community programs to assist in creating defensible space. [8] It needs to be a combined effort of homeowners, fire mitigation experts, and policy makers to create more opportunities for mitigation before a disaster can occur.

Effects

Mitigation is the key factor that individual landowners in the WUI must do to reduce the disastrous risk of wildfire on their own properties, and in contributing to the spread. This reduces the disasters such as: saving taxpayers dollars; saving lives of residents, firefighters, and wildlife; reducing property damages; and saving community buildings and assets. [9] There are many physical factors (ex: topography, ownership patterns) and social conditions (ex: attitudes, community resources) to take into consideration, but part of the WUI fire mitigation process is to assess these hindrances and create incentives to overcome them. [10] With the federal government spending approximately $1 billion annually responding to wildfires, there is an opportunity for increase mitigation incentives and funding for reduction of fuels in creating defensible space within the WUI. [11]

Examples

Ruidoso, New Mexico

The small village of Ruidoso is a good example of a community that has made significant resources available to assist in WUI compliance. In 2002, the Ruidoso Village Council created ordinances that mandated fuels reduction on all lands within Ruidoso. [12] Their success has been attributed to the investment and implementation of infrastructure and staff dedicated to a forest debris curbside pick-up service. [13] The public works department routinely retrieves and recycles 100% of all local forest waste directly from the landowners yard. [14] Compliant properties pay $4.00/month/acre whereas noncompliant properties are charged $12/month/acre on their solid waste billing. [15]

To view the provisions: Village of Ruidoso, NM, Code §§. Sec. 42-80.

Town of Athol, Kootenai County, Idaho

Kootenai County, Idaho has a fire prevention program called FireSmart Kootenai County. This program pays local fire fuel reduction contractors to create 100ft of defensible space on private property. [16] The fire fuel clearing is paid for by the National Fire Plan at no expense to homeowners, but the homeowners are responsible for the disposal of the vegetation debris. [17] There are two ways to participate in the program: by either contacting the FireSmart office or by being a key property that is recruited as a fire hazard. [18]

To view the provisions: FireSmart Kootenai County, Sheriff's Office.

Additional Examples

City of Oakland Municipal Code § 15.12.030 (Long-term, fully-implemented mandatory vegetation management with incentives of free chipping of limbs and an annual inspection with fines up to $330 if failure to comply with city codes.)

State of Colorado §39-22-104(4)(n)(II), C.R.S. (For income tax years 2009 through 2024, Colorado landowners with property in the WUI may qualify to receive a tax subtraction for the costs of wildfire mitigation work)

City of Reno, NV: Summer 2021 Incentive (offering free vegetation disposal to create defensible space).

State of Oregon Department of Forestry grants. (These grants help communities reduce their vulnerability to wildfire.)

Additional Resources

- International Wildland-Urban Interface Code, International Code Council (2021)
- *Community Wildfire Safety Through Regulation*, National Fire Protection Association (2013)
- *Firebreak: Wildfire Resilience Strategies for Real Estate*, Urban Land Institute (2020)
- *Planning the Wildland-Urban Interface*, American Planning Association (April 1, 2019)
- *Wildfire codes and standards*, National Fire Protection Agency

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[13] *Id.*
[14] *Id.*
[15] Village of Ruidoso Thinning Standards, Adopted July 9, 2013. Sec. 42-80: Fuels management standards.
[16] McCaffrey, S.M., Stidham, M., Toman, E., Shindler, B. (2011). *Outreach Programs, Peer Pressure, and Common Sense: What Motivates Homeowners to Mitigate Wildfire Risk?* Environmental Management 48 (p475–488).
[17] *Id.*
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Embracing Shared Mobility

1. Introduction

The combination of the evolution of smartphones and the search for equity, efficiency, and sustainability allowed for transportation mobility to transcend through the renovation of the shared mobility concept. Shared mobility refers to transportation services shared among users, such as bikes, e-scooters, and cars (1). The first form of the shared mobility concept was introduced in 1948 as car-sharing (2). In 1960, Amsterdam, Netherlands, launched the first bike-sharing program (3). Car-sharing and bike-sharing are systems where the user can rent a vehicle or bike for a short period. Bike-sharing is an example of micro-mobility. The micro-mobility category includes transportation modes that are smaller than cars, such as bikes and the popular e-scooters. Another option for shared mobility is micro-transit. The users of micro-transit share medium-size vehicles to get to or near their desired locations. Micro-transit benefits commuters in low-transit density areas in which travel demand is not significant enough for the use of buses, trains, or subways (1). Current technological advancements and the increase in travel demand gave rise to the popular ride-hailing, a new category of shared mobility in which the rider requests a vehicle through an online platform for the desired trip.

Shared mobility has proven its value to society. This method can provide environmental, economic, and social benefits. This method can solve first and last-mile issues by connecting users to a public transportation station through bike-sharing, micro-mobility, or micro-transit. And can also worsen transportation equity by economically segregating the system with unfeasible price rates. It can improve public health by emphasizing bike usage and lowering the same aspect by not regulating designated areas for micro-mobility options (4). It can reduce vehicle miles traveled (VMT) with the more robust integration of micro-mobility possibilities. It can increase VMT with heavier use of ride-hailing modes for short trips.

Shared mobility is an inevitable change to the transportation system. If not managed correctly, this change may bring negative effects to communities. An ordinance that embraces and helps public agencies deal with shared mobility may be the only way to ensure transportation equity, safety, and sustainability.

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2. *Portland Bureau of Transportation*. Portland Bureau of Transportation RSS. (2011). Retrieved December 14, 2021, from https://www.portlandoregon.gov/transportation/?referer=%2Ftransportation%2Farticle%2F370287
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4. Thomas et al. (2021). (rep.). *The Role of Transit, Shared Modes, and Public Policy in the New Mobility Landscape*. Retrieved December 14, 2021, from https://www.nap.edu/read/26053/chapter/1#v.

2. Effects

The embracement of the Shared Mobility concept can influence society in various ways. This policy brief will discuss the possible impact of Shared Mobility in a city's environmental, social, and economic aspects and its surrounding region.

The embracement of shared mobility could affect the environment positively or negatively, depending on how the city manages its transportation system to accommodate an increase in the use of shared mobility options. The most significant environmental impact that will arise from the higher use of shared mobility devices can be either in VMT, congestion, or emissions. The transportation mode of shared mobility a city chooses to prioritize will dictate the likelihood of the positive or negative environmental effects.

Transportation modes that require the use of smaller devices are typically found not to depend on combustion engines; the higher use of such modes, with no combustion engines, would decrease gas emissions. Some of the most common transportation modes of this sort are bikes, e-bikes, and e-scooters. Surveys show a decrease in the use of motor vehicles and an increase in bike-sharing, e-bikes, and e-scooters (4). The transportation modes that showed an increase in use and similar others are called micro-mobility. Transportation modes considered as micro-mobility had a 60% use growth between 2018 and 2019. An increase in the use of non-motor vehicles as a transportation mode is directly related to lower gas emissions. The majority of such devices are electronic, and the use of such devices causes a reduction in VMT and congestion (5).

Autonomous Vehicles (AVs) are a future option for shared mobility. The full deployment of AVs still depends on technological advancements. Therefore, such vehicles' impact on the transportation system can only be speculated. When AVs are integrated into the transportation system, a potential preference for the new technology needs to be considered. A relevant use of AVs could result in a more consistent flow of traffic, where platooning occurs more frequently and high acceleration/deceleration rates arise less often. In this case, AVs could increase fuel efficiency. Another possible scenario is the use of AVs as single-occupancy vehicles, more specifically in ride-sharing through apps such as Lyft and Uber. In this scenario, AVs would be significantly used in short trips, which would increase vehicles miles traveled. The usage for short trips could also result in higher congestion as the vehicles would stop to drop-off riders, influencing the fluidity of the traffic stream.

Options for shared mobility significantly impact the lives of those who do not own a car or have a limited ability to operate one safely. Transportation equity becomes more reachable with this concept. Commuters dependent on public transportation often need to get to and from the bus/subway/train station of their use. This issue is referred to as first and last-mile. Shared mobility options can solve this issue by providing affordable, safe, and efficient methods to travel to and from public transport stations. Bike-sharing, an option for shared mobility, has been heavily used in New York City since 2013 and has increased the city’s net public health. Studies have also associated bike usage with a reduced risk of cardiovascular disease and cancer (4). Another positive impact of shared mobility is fewer alcohol-involved crashes (4). Current ride-hailing options provide those who have consumed alcohol with the opportunity to get around safely, quickly, and easily.

The economic impact assessment that the growth of shared mobility options brings to a city is a challenge in itself. Shared mobility can increase access to jobs by providing efficient ways to

travel, but it can also decrease job access if congestions arise more frequently. With the integration of AVs, taxi and truck drivers may lose their jobs, but jobs will be created to maintain and operate such vehicles (5). The increase in the use of micro-mobility options can lower the average transportation costs for all transportation system users by affecting the cost of vehicle insurance and fuel. The relation of micro-mobility with reduced VMT can reduce vehicle crashes, thus improving the economic growth of a transportation system. (5)

The shared mobility market has grown exponentially. Private companies recognized the growth potential of this concept and took action to capitalize on it. Uber and Lyft dominate the current demand for ride-hailing in the US. The young ride-sharing market of e-scooters already has companies that dominate it, such as Bird and Lime. This pattern can potentially give rise to oligopolies and result in complete economic control of such companies over these markets (5). To prevent this issue and improve transportation equity through shared mobility, a public-private partnership over mobility networks may be ideal (6)

4. Thomas et al. (2021). (rep.). *The Role of Transit, Shared Modes, and Public Policy in the New Mobility Landscape*. Retrieved December 14, 2021, from https://www.nap.edu/read/26053/chapter/1#v.
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3. Examples

Santa Monica, CA

The City of Santa Monica, California, adopted a pilot program to evaluate the use of shared mobility device services within the city. After realizing the pilot program's success, Santa Monica's City Council agreed on deploying a second pilot program – emphasizing the program's administrative regulations. The City Council expects the program to show flexibility parallel to the industry's evolvement, adapting to all changes that may come (7).

This new ordinance aims at defining regulations for the use of new shared mobility and micro-transit options to ensure driver, user, and pedestrian safety while ensuring the industry's sustainability. The second pilot program studies correcting the designation of right-of-way to pedestrians and users. The correction can reduce the blockage of sidewalks and pathways and increase awareness of safe and legal behaviors while operating the devices. The ordinance requires operators to maintain affordable price rates to provide equitable access to the public, ensuring the shared mobility options as a viable transportation mode. The regulation requires operators to distribute devices among eight pre-determined deployment zones and operate a daily relocation of the machines to ensure device availability at all times in all city neighborhoods.

With new technology arriving every year, this ordinance attempts to address possible environmental effects quantitively. The program requires devices to be approved before deployment and sets a maximum fleet volume. The program also requires operators to submit a Life Cycle Analysis for all approved vehicles – life expectancy, material composition, and recycling & reuse and/or disposal options must be included in the analysis. The enforcement of this requirement, along with the natural decrease of gas emissions in short trips, is expected to positively contribute to a more environmentally friendly transportation system in the city of Santa Monica.

Minneapolis, MN

Minneapolis recently announced the integration of shared vehicles in the Minneapolis 2040 comprehensive plan. The city of Minneapolis recognized the positive effects that improving the support of shared mobility can bring to the community by reducing transportations costs (8) (9).

7. *City of santa monica shared mobility device pilot program ...* (2021). Retrieved December 14, 2021, from https://www.smgov.net/uploadedFiles/Departments/PCD/Transportation/SM-AdminGuidelines_07-15-2020_FINAL.pdf
8. Bernard, J., & Witternberg, J. (2021). *Parking, loading, and Mobility Zoning Code Text Amendment ...* Minneapolis 2040. Retrieved December 14, 2021, from https://minneapolis2040.com/media/1774/parkingtdm_cpccow_03_11_2021.pdf
9. *Minneapolis 2040*. (2019). Retrieved December 14, 2021, from https://minneapolis2040.com/media/1488/pdf_minneapolis2040.pdf

The Minneapolis 2040 plan sets forth action steps to better use shared mobility options. The action steps bring attention to experimentation, design, and regulatory policy initiatives; implementation of parking guidelines to address the shared vehicle fleet; and requiring private transportation network company operators to share data that can support the city's ongoing transportation planning work and focus on equitable access and minimizing greenhouse gas emissions.

The code adaption requires adjustments to travel demand management and parking regulations. The proposed approach to travel demand management suggests implementing a point system to quantify traffic demand management strategies of new developments that focus on a higher distribution of travel demand among different transportation modes, which results in the reduction of greenhouse gas emissions. The point system is tiered between minor and major roadways and requires higher standards for larger projects. Electric vehicles and devices used in shared mobility were considered and addressed in the adapted parking regulations. The new comprehensive plan requires at least 10% of spaces designated for long-term parking to have a charging station for electric vehicles. The changes to parking regulations were implemented with the intent of anticipating an increase in the use of electric vehicles, reducing costs of installing infrastructure for electric vehicles, and providing equitable access to charging stations.

Los Angeles, CA

The Mobility Plan 2035 was approved by the City Council of Los Angeles in 2016 and implemented in the same year by the Los Angeles Department of City Planning. The plan suggests implementing the Mobility Hubs program to provide focal points in the transportation network. Mobility hubs integrate different transportation modes and provide effortless connections to transit stations (10) (11).

Mobility Hubs are found in three levels, neighborhood, central, and regional. The level designation of the hubs allows for differences in travel demand, local land use, and local traffic volume to be addressed. The amenities found in each mobility hub also depend on the hub's level designation. Each amenity can be judged as vital, recommended, or optional. Some amenities are bike connections (bike-sharing and parking), vehicle connections (ride-share pickup/drop-off zones, car share, and electric vehicle charging stations), bus infrastructure, and real-time information to users with wi-fi connectivity.

10. *Mobility Hubs A Reader's Guide*. LADOT. (2016). Retrieved December 14, 2021, from https://ladot.lacity.org/sites/default/files/documents/mobility-hubs-readers-guide.pdf
11. *Mobility Plan 2035*. Mobility | Los Angeles City Planning. (2016). Retrieved December 14, 2021, from https://planning.lacity.org/plans-policies/initiatives-policies/mobility

4. Additional Examples

Chicago, IL

The Shared-Use Mobility Center is a community-driven organization that has equitable mobility as its highest principle. The organization works alongside public agencies to address all that is related to shared mobility. It also serves as a research data-base for the same content (12).

Colorado Springs, CO

The City of Colorado Springs recently adapted its city's code to address the growth in use micro-mobility options, such as bikes, e-bikes, and e-scooters. The changes in the code were made to more clearly define which behaviors are allowed and which are illegal while using such devices as a transportation mode. Now, the code addresses parking of e-mobility devices and use of bike-lanes (13).

Rio de Janeiro, Brazil

The Brazilian City of Rio de Janeiro implemented a public-private partnership to deploy a bike-sharing system in the city in 2011. The system, heavily used by tourists and locals, connects places and allows for a scenic bike ride by the beaches of Rio (14).

Europe

Sixteen European cities now count with the European Shared Mobility Index. The index provides governments with usage data, which can then be analyzed and used to improved the transportation systems of such cities.

12. Stone, T. (2021). *New European Shared Mobility index launched across 16 Cities*. Traffic Technology Today. Retrieved December 14, 2021, from https://www.traffictechnologytoday.com/news/multimodal-systems/new-european-shared-mobility-index-launched-across-16-cities.html
13. *Home - shared-use Mobility Center*. Shared-Use Mobility Center. (2021). Retrieved December 14, 2021, from https://sharedusemobilitycenter.org/
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15. *Prefeitura Lança Bike Rio, Novo Sistema de Aluguel de Bicicletas da Cidade - Cidade*. Veja Rio. (2011). Retrieved December 14, 2021, from https://web.archive.org/web/20130402101912/http://vejario.abril.com.br/especial/aluguel-bicicleta-rio-645043.shtml

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3. Guardian News and Media. (2016). *Story of cities #30: How this Amsterdam inventor gave bike-sharing to the world*. The Guardian. Retrieved December 14, 2021, from https://www.theguardian.com/cities/2016/apr/26/story-cities-amsterdam-bike-share-scheme
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9. *Minneapolis 2040*. (2019). Retrieved December 14, 2021, from https://minneapolis2040.com/media/1488/pdf_minneapolis2040.pdf
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A Case for Reducing Ordinance Barriers to ADU Construction
GPHY 520 – Land Use Planning at Montana State University

By

Holly Watson

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of

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Introduction

Accessory Dwelling Units (ADU) are known by several synonyms, but they all describe a small independent, self-contained housing unit that shares a lot with a principal home (1). They come in a variety of forms depending on what is allowed in their jurisdiction. Most commonly, they can be found within the primary home, like a basement, they can be attached, like an addition, or detached as an independent structure, or on top of another structure like a garage. ADUs have a long history, before zoning, landowners were allowed to build as many structures as they wished, and they did (2). This was done for various reasons, they housed extended family, served as temporary homes during the construction of the larger home, carriage houses often had living quarters for stable hands, and they did not fall out of favor until suburban single family housing developments became the standard post World War II (2).

Restrictive zoning practices were widely adopted to meet the demands for low density housing which led to prohibited ADU construction in jurisdictions across the United States (3). By the 1950s and 1960s, high demand for workers in the Bay Area resulted in the construction of 20,000-30,000 units, 90% of them built illegally (3). Planning gradually responded to concerns about suburban sprawl, traffic congestion, affordable housing shortages, and environmental degradation (3). Planners instead started to focus on developing communities with higher density, less car dependency and more diversified in terms of population and housing choices (3). ADUs started making a comeback in the 1990s and efforts were made to ease zoning laws, but they were largely unsuccessful and unproductive in increasing the supply of ADUs (3). The demand for housing has only intensified, and communities are responding with relaxed zoning codes for homeowners.

When considering barriers to ADU construction, they are consistent across the United States and fall into two basic categories that are not necessarily discrete: rules or regulations and financial. It is important to remember who is developing ADUs, and why. In most cases, homeowners are the developers, and they are doing it based on needs whether they be economic, personal, or some combination (4). What is important for municipalities to realize is that the average homeowner is unfamiliar with the regulations, permitting, and development process for most municipalities (4). Rules like requiring off street parking, fees like System Development Charges (SDC) and special “conditional use” or “discretionary action” processes can be financially onerous (4)(5). Each of these can cost thousands on their own and special processes can be financially draining without guaranteed approval and no refunds are given if the permit is denied (5). Other rules and regulations regarding lot size, setbacks, size limits or floor-area ratio requirements and design requirements, can simply eliminate potential legal ADU construction (4)(5).

The other most common barrier to ADU construction is the cost of building and finding financing (5). While ADUs are much smaller than a single-family home, they can easily cost six figures to build, and financing can be challenging because most banks lack ADU specific financial products (5). Regulations such as owner occupancy requirements intended to make short-term rentals and speculative investing more difficult, end up make financing more difficult for homeowners. The problem is that banks are less likely to lend with these requirements in place, because they are deed restrictions that prevent the owner from moving off the property without selling (5). Many of the concerns about owner occupancy and short-term rentals are unfounded based on surveys of current ADU owners in Portland. Survey respondents said 80% of their ADUs are used for long term rentals and 64% are occupied by their owner (6). Use restrictions can make homeowners less likely to build over concerns that restrictions could prevent their ability to convert to a short-term rental to recoup development and construction expenses or obtain financing (5)(6).

If the goal is to increase the supply of ADUs in a community, the recommendations are generally to reduce rules and regulatory barriers, provide resources to guide homeowners throughout the

process, and even provide financing opportunities such as the City of Napa's Junior Unit Initiative, Program that provides forgivable financing up to $50,000 (7), the City of Boston's ADU pilot program that provides a zero interest deferred equity loan up to $30,000 (8), the City of Los Angeles' Backyard Homes Project that provides a list of incentives to homeowners who agree to rent their unit in section 8 housing for five years (9), and Los Angeles' ADU Accelerator Program that guarantees subsidized rent and support for five years to homeowners to participate by renting their unit to tenants who are 62 years of age and older and earn at or below 30% of the area median income (10).

Effects:

In general, the relaxing of laws regarding ADUs is correlated with increased permitting and construction. In California, after the passage of new legislation in 2019 that further relaxed laws regarding ADUs, permits increased from 5,911 issued in 2018 to 15,571 in 2019 in all jurisdictions (11). Portland's SDC waiver and increased ADU size, is correlated with a substantial increase in permitting for ADU construction. In 2009, a year before the waiver policy was adopted, only 24 permits were issued. By 2016 that number increased to 615 permits per year (12). In Austin Texas, laws relaxing ADU requirements passed in 2015 which resulted in a tenfold increase in permits (13).

Relaxing laws governing the construction of ADUs can help older homeowners age in place. According to AARP's 2021 Home and Community Preferences Survey, 79% of older adults own their own home debt free and 3 out of 4 wish to age in place (14). 34% of them understand that their homes will likely need renovation in order to accommodate their wishes (14). Two thirds say that if they were to become ill or disabled, they would prefer to be assisted by a combination of paid professionals and family (14). 69% of them say as they age, they would consider sharing their home with a family member and 54% say they would do the same with a friend (14). In fact, the same survey shows that 86% of people would consider building an ADU to provide a home for a loved one requiring care or to provide housing to friends and family and 74% they would use it to house a caregiver (14).

Economically, the Northwest Economic Research Center finds that on average ADUs are less expensive per square foot than apartments in Portland, and the discrepancy only increases in more expensive neighborhoods (12). The Family Housing Fund found similar results in Minneapolis, ADUs tend to cost less to rent (13). The construction of ADUs supports local trades like construction and design firms and once built, they support and create dynamic neighborhoods to support local businesses and services (13). In cities where high property values and taxes are outstripping wages, supplemental income generated by rental income from an ADU should not be underestimated when considering policies affecting both short-term and long-term rentals (15).

Environmentally, ADUs make an impact in some very powerful ways. For one, they are smaller than a typical single-family home requiring fewer carbon producing materials for construction (5). They are more efficient to heat and cool, and depending on where they are located, they can reduce emissions from commuters (5). Expensive housing typically increases the distance commuters drive between work and home (16). In Portland, those who live in ADUs own fewer cars than the average home with an average of .93 cars vs 1.31 for new rentals, suggesting that ADUs are located in areas with high walkability scores and/or public transportation (6).

The health and safety implications of reducing barriers to ADU construction are worth mentioning. According to the AARP survey mentioned previously, 67% of the survey respondents reported building an ADU would make them feel safer by having someone living close (2). For those ageing in place, having caregivers or family in an ADU on the property provides a health and safety benefit. In areas where there is high demand for housing, unpermitted ADUs are being developed without permits. The Oregon Department of Environmental Quality estimates that it may exceed 10% of the housing stock and one study in San Francisco estimated that more than 20% of residential buildings

contained an ADU (6). It is likely that some of these units are unsafe and likely housing some vulnerable populations with few options for housing alternatives. By making ADUs easier to construct and creating amnesty laws to bring existing structures into compliance, neighborhoods will be safer overall.

Examples:

Santa Cruz California

Some states are tacking laws to ease code restrictions at the state level. The California Legislature passed a series of bills in 2019, AB-68 (17), AB-587 (18), AB-887 (19), SB-13 (20) designed to make ADU construction easier across the state. Santa Cruz was already considered a relatively friendly place for ADUs, but the state legislature helped to eliminate barriers like owner occupancy requirements for some types of units. For example, owner occupancy is no longer required for an ADU constructed after January 1, 2020, but are still required for a Junior ADU, (an ADU constructed within an existing home) (21). The county developed a relatively simple process that only involves applying for a building permit and many fees for ADUs have been reduced or waived entirely (21). For existing unpermitted ADUs, there is a Safe Structures Program designed to assist property owners whose ADU cannot be legalized through recent relaxed laws (22). When the only alternative to bringing the structure up to code is demolishing, a building inspector will work with the property owner to grant a certificate allowing the ADU to be used for housing. If a code enforcement notice regarding an illegally constructed ADU is issued, the property owners can request a 5-year extension to resolve violation if it is not a health and safety issue (23). As a matter of helping property owners navigate ADU laws, the county provides a website that is dedicated to ADUs including calculators for fees, construction costs and increases in appraised property value. This same page includes several free ADU plans available for download along with resources covering regulations, financing, rental information, and links to state regulations (24).

Portland Oregon

Portland Oregon might be considered the most ADU friendly city in the United States (25)(26). Portland has been removing barriers to ADU construction while providing financial incentives by waiving System Development Charges (SDC) which can cost up to $13,000, if they agree to not use the property as a short-term rental for 10 years (27). However, the regulations make provisions for owners to use the property as a short-term rental if they pay the SDC. To encourage the construction of ADUs, the City of Portland adopted increasingly permissive laws regarding ADU construction. Recent code changes in 2021 add changes such as: depending on zoning, they allow more than one ADU on a single lot (28), they are not counted in maximum dwelling calculations, maximum size restrictions to control cost to renters, and waived vistability standards for existing structures for conversion (28). These changes are in addition to already permissive codes that do not require owner occupancy, development by right zoning and no off street parking requirements for ADUs (28). Portland also has code 33.260 (30), allowing for the occupancy of recreational vehicles, including tiny homes on trailers on sites with an existing home. Many of these changes went into effect August 2021 as part of Portland's Residential Infill Project (RIP) (30) in response to House Bill 2001 passed in the 2019 Oregon Legislature requiring changes to zoning codes statewide to allow duplexes on each lot or parcel zoned for residential use that allows for the construction of single-family homes (31).

ADDITIONAL EXAMPLES:

San Francisco, CA Municipal Code 201.7(G): (2021) ADUs fall under the general rental unit definition which does not require owner occupancy 37.2(r)

Seattle, WA Municipal Code 23.44.041(A)(6): (2021) No off street parking is required for ADUs

Boulder, CO Municipal Code 9-6-1: (2021): (2021) Accessory dwelling use is allowed by right in all residential zones

Arlington, VA County Code 12.9.2(A)(2)(a): (2021) Allows for any detached accessory building prior to the date of adopting new Accessory Use Standards (2019), to be altered to create an accessory dwelling

Washington, D.C. Code of the District of Columbia 30-201.01(5): (2021) Allows for a short-term rental to operate within the host's residential property (ADUs are allowed to be rented short term)

Accessory Dwelling Unit Model Code (2021) (AARP was used because it is current as of 2020)

San Jose, CA Second Unit Amnesty Program (2021) designed to bring illegitimate ADUs into compliance

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