Our County

Landscapes and Ecosystems

October 2018

Our County

Contents

Our County

Introduction

The L.A. County Chief Sustainability Office in partnership with BuroHappold Engineering, UCLA and LARC is hosting a series of workshops to inform Our County, the countywide sustainability plan. Our County is an effort to outline a bold, inclusive vision for the future that balances the co-equal values of environment, equity, and economy.

At this workshop, we will discuss a broad range of topics relating to land use, landscapes and ecosystems that are intimately connected, including open space, recreation, biodiversity, habitat and land use. We will address issues and opportunities for the region, and take a deep dive into where and how these topics intersect with equity, public health, labor, housing, and other issues. This document is provided as background information to inform the workshop and presents draft goals and strategies as a starting point for discussion.

The health of ecosystems in L.A. County is inextricably intertwined with human health and wellbeing. The diverse landscapes of L.A. County provide mutual benefits for ecosystems and humans by providing a habitat for flora and fauna to thrive, offering a place for recreation and exercise, reducing surrounding heat levels, sequestering climate pollution and filtering pollutants from the air, reducing polluted stormwater runoff, and promoting natural water filtration.

Our County

Governance

There are over 100 entities that manage landscapes and ecosystems across L.A. County including federal, state, regional, county, city park departments, special recreation and park districts, open space districts, joint power authorities, water agencies, utilities, and land conservation organizations. This does not include private properties such as forests, farms, ranches, and mines.

Los Angeles County Department of Parks and Recreation (DPR) operates, manages, and maintains over 70,000 acres of parkland, including local and regional parks, arboreta and botanic gardens, wildlife sanctuaries and natural areas, golf courses, and multi-use trails. The Department of Beaches and Harbors is responsible for the operation and maintenance of all County owned and operated beaches, while the Department of Regional Planning is responsible for the Significant Ecological Areas (SEA) program - officially designated areas within L.A. County with irreplaceable biological resources.

A number of Special Districts such as the Los Angeles County Flood Control District and Landscape Maintenance Districts within the Los Angeles County Department of Public Works also manage landscapes and ecosystems in L.A. County. State agencies such as the California Department of Fish and Wildlife (CDFW), which controls riparian corridors, State Universities, State Marine Conservation Areas (SMCA) and State Marine Reserves (SMR), and federal agencies such as the U.S. National Park Service, U.S. Coast Guard, U.S. Forest Service, U.S. Department of Agriculture, U.S. Army Corps of Engineers and partnerships between them (e.g., Angeles National Forest) have jurisdictional control of specific landscapes and ecosystems within L.A. County. Municipal parks in L.A. County are managed by their respective city and county departments and agencies. Greenways and trails along rivers, rail routes and utility corridors are managed by various agencies such as Los Angeles County Department of Parks and Recreation, Los Angeles County Department of Public Works, transportation authorities such as Metro and Caltrans, and utilities such as Southern California Edison and Los Angeles Department of Water and Power.

L.A. County's 2035 General Plan provides the policy framework for how and where the unincorporated County will grow through the year 2035, and encompasses several sub-plans and programs including the Bicycle Master Plan, Community Climate Action Plan, and Transit Oriented Districts. The General Plan thus serves as the foundation for all of the land uses that occur in the unincorporated areas, and the Department of Regional Planning (DRP) performs all land use planning functions for each unincorporated community. DRP's services include: long range planning; land development counselling; project/case intake and processing; environmental review; and zoning enforcement. In addition to the General Plan, the County's unincorporated land use policy is established through any of the several types of community-based plans that comprise the General Plan: area plans, community plans, neighborhood plans, local plans, local coastal plans, and specific plans.[i]

Conversely, the 88 incorporated cities within the county, each with their own city council, are responsible for their own land use planning, administration, and enforcement. Each city's planning department develops its own zoning and land use codes and is not required to share them with the DRP.[ii]

The Southern California Association of Governments (SCAG's) efforts in planning and policy development include providing a forum for policy dialogue, information sharing, technical analysis and consensus on critical mobility, housing and natural resource issues confronting the region. SCAG encompasses six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura) and 191 cities. The agency develops provides technical assistance and delivers long-range regional transportation plans including a Sustainable Communities Strategy and growth forecast components, regional transportation improvement programs, air quality conformity, and regional housing needs allocations..[iii]

Our County

Definitions of Key Terms

Term	Definition	Example
Organizing Principle	A core value at the heart of the plan - the "why"	Fostering a healthy relationship with the environment
Goals	Broad, aspirational statement of what we want to achieve	Ensure all low-income residents have access to a park or open space within ½ mile or a 10-minute walk
Strategies	Approach or approaches that we take to achieve a goal	Preserve and increase the amount of affordable housing surrounding open space amenities
Actions	Specific policy, program, or tool we take to achieve a strategy	Require new development in proximity to open space amenities to include affordable housing
Indicators	Quantitative and qualitative measures used to assess performance	Acres of open space amenities per 1,000 residents
Targets	Levels of performance that are sustainable	All low-income residents have access to a park or open space within ½ mile or a 10-minute walk

Our County

Landscapes and Ecosystems in L.A. County

L.A. County has a Mediterranean-type climate, characterized by cool wet winters and warm dry summers. With a population of over 10 million residents, the county is the most populated in California, and one of the largest counties in size in the nation. L.A County boasts a diversity of landscapes, and species and is made up of a vast unincorporated area and 88 cities that span mountains, deserts, beaches, and islands. The County is also biologically diverse. Southern California is home to the largest set of threatened and endangered plants and animals in the continental United States, making it the most urbanized area to be designated one of Conservation International's global Biodiversity Hotspots.[iv]

Urban ecosystems are dynamic combinations of natural, social, and constructed features. The County's ecosystems span natural and urban landscapes and can be thought of as an interconnected system of biological communities with organisms interacting with a range of physical environments (Figure 1). This diverse ecosystem not only serves as important habitat for the region's biodiversity, but provides extraordinary value to residents through recreational and educational opportunities, agricultural and other extractive land uses, aesthetic enjoyment, and a variety of other ecosystem services such as shading, air purification, water filtration, and flood control.

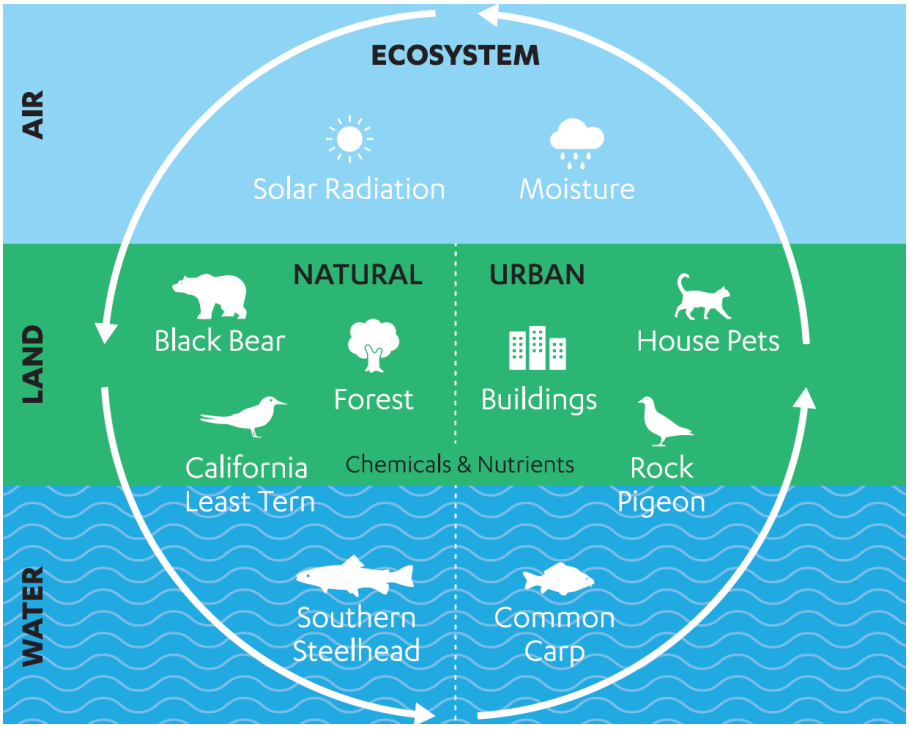

Figure 1: L.A. County ecosystems with sample species and environments.[v] There are a number of ecosystems in the county that make up the overall system. Ecosystems include the nonliving and living elements and differ greatly between natural and urban areas.

Protected Areas

There are 886,443 acres of protected public lands in L.A. County, comprising 34% of the total County land area.[vi] There are 41,807 acres of marine protected areas.[vi] The majority of protected areas within L.A. County are public lands under management by Federal, State and local agencies and/or municipalities, and include State Marine Conservation Areas (SMCA), State Marine Reserves (SMR) and conservancies such as the Santa Monica Mountains Conservancy and the Baldwin Hills Conservancy. Private entities also play an important role. The Catalina Island Conservancy, a private land trust, protects 88% of Santa Catalina Island.

Protected areas are primarily restricted to high elevation, mountainous areas in the San Gabriel mountains and (to a lesser extent) the Santa Monica mountains, with few protected areas in southeast Los Angeles and the San Fernando Valley. Nearly all of the protected areas are along the coast or in local mountains that are more difficult to develop; some have been protected since the late nineteenth century for their water recharge value. Overall, there are very few acres of protected area in the portions of the county with flat topography because this land has been utilized for urban development. At the same time, it must be recognized that the City of Los Angeles' Griffith Park is the largest urban park in the United States and contains numerous acres of natural lands.

Protected areas in L.A. County (Figure 2) provide long term conservation of habitats and species, as well as a range of other benefits. Within L.A. County, these areas also serve as outdoor recreation for over 10 million people which can cause competition for resources. They also provide a wide range of ecosystem services such as water quality, carbon sequestration, and protection against extreme events including floods and storm surges. As a National Forest impacted by the urbanized region, the Angeles National Forest – San Gabriel Mountains National Monument provides a wide range of products and services including fuelwood and siting locations for electricity and telecommunications infrastructure as well as dams and reservoirs.

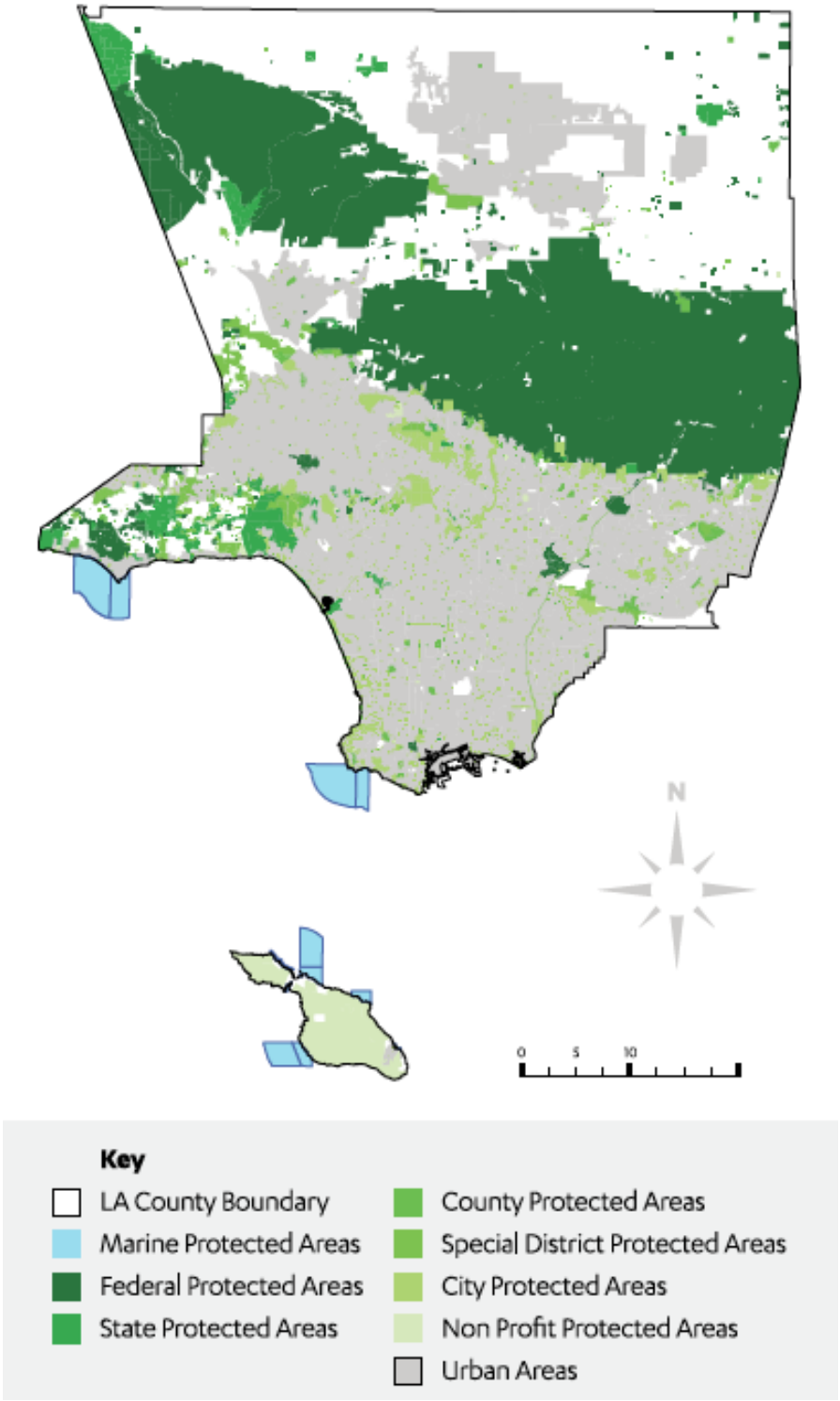

Figure 2: L.A. County protected and urban areas.[vii]

Our County

Parks and Beaches

Public Parks

Healthy, safe communities have thriving parks that contribute to public health and well-being, create a sense of place, increase community cohesion, improve the environment, and boost the economy. Adopted by the Board of Supervisors in July 2016, the Countywide Comprehensive Parks and Recreation Needs Assessment documented existing parks and recreation facilities in cities and unincorporated communities to determine the scope, scale, and location of park need in L.A. County. The Parks Needs Accessment inventoried four types of open space (Figure 3):

- Local Parks: under 100 acres and containing active amenities such as athletic courts and fields, playgrounds, and swimming pools.
- Regional Recreation Parks: over 100 acres and containing active amenities such as athletic courts and fields, playgrounds, and swimming pools.
- Regional Open Space: over 5 acres and containing passive amenities such as visitor centers, trails, picnic shelters, or restrooms.
- Natural Areas: generally larger than 100 acres.

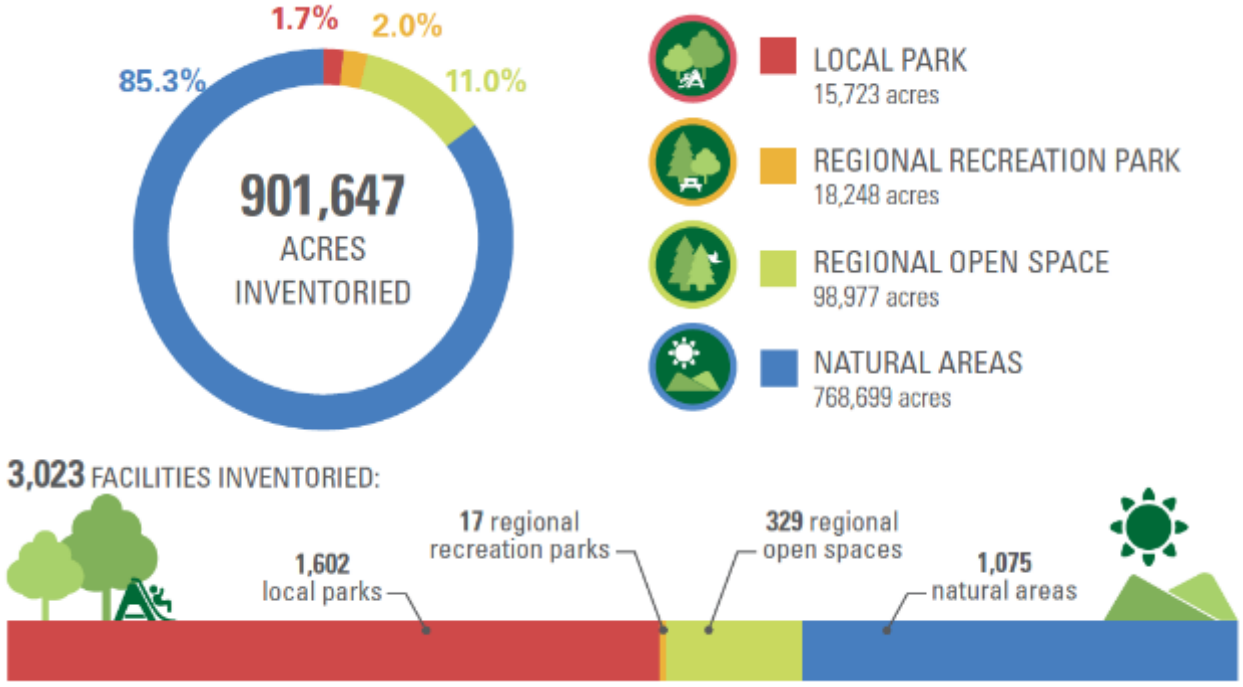

Figure 3: L.A. County Park and Open Space Inventory.[viii]

The Park Needs Assessment found that more than 50% of L.A. County's population lives in areas of high or very high park need. Such areas vary considerably in their locations and socio-economic and demographic characteristics, and include Van Nuys, Boyle Heights, and Venice. Areas with high park need have an average of 1.6 acres of park land, while areas with very high need have less than an acre of park land per 1,000 residents. Areas in high park need would have to add a combined total of more than 3,250 acres of new park land in order to provide the County average of 3.3 acres per 1,000 residents. Areas with very high need would need to add a combined total of more than 8,600 acres of new park land in order to provide 3.3 acres per 1,000 residents.

Beaches

Over 50 million residents and visitors enjoy swimming, surfing, and other water recreation at L.A. County's beaches every year. For many others, however, lack of public transportation, affordable parking, and affordable lodging present significant barriers to beach access.[ix] Maintaining high levels of water quality is vital for public safety and enjoyment of these iconic landscapes. From April 2017 to March 2018, L.A. County had 64 individual sewage spill events that discharged a total of over 200,000 gallons (Table 1). Four of the spills reached the ocean in Marina del Rey and Alamitos Bay.

Table 1: Sewage Spills Summary.[x]

64 **SEWAGE SPILLS** were reported to have reached a waterbody in Los Angeles County	**6** **Major Spills** (10,000+ gallons)	**212,440** **GALLONS OF SEWAGE** Total Volume reported to have reached waterbody in Los Angeles County	2 health warnings
	24 **Minor Spills** (1-10,000 gallons)		4 beach closures
	34 **Small Spills** (<1,000 gallons)		

The recent drought in Southern California improved beach water quality. The combination of drier conditions and water conservation measures means less bacteria-laden urban runoff carried to the sea, and bacterial pollution at our local beaches dipped dramatically in 2017-18. Over 90% of L.A. County beaches assessed in Heal the Bay's 2017-18 Beach Report Card – including Malibu and Palos Verdes – earned "A" grades during the busy summer season, a 9 percentage-point increase from the reporting period's five-year average. Santa Monica Pier received grades of D or lower for summer dry, winter dry, and wet weather for the fifth consecutive year.

Our County

Working Lands

Working lands refer to the farms, ranches, forests, and other extractive land uses that support economic activity and land-based livelihoods. These activities occur on private land, as well as public and protected lands discussed above. In 2013, the value of agricultural production across L.A. County – including ornamentals, root vegetables, and fruit and nuts – exceeded $200m.[xi] Products from these activities are sold in L.A. County's hundreds of local farmers markets.

In 2012, 91,689 acres across L.A. County were devoted to agriculture, down 15% from 108,463 acres in 2007. From 2014-2016, all conversion of irrigated farmland to urban land was due to the construction of solar facilities and groundwater recharge basins in the Antelope Valley and Santa Clarita areas. Indeed, renewable energy production – particularly solar photovoltaics (PV) – has expanded rapidly. In the City of Lancaster in northern L.A. County, over 4,000 acres are now devoted to utility-scale solar generation. The largest conversion occurred north of Fairmont Butte along the county line where the Solar Star I facility (~700 acres) was added and adjacent groundwater recharge basins (~400 acres) were constructed over a number of years for the AVEK Water Supply Stabilization Project No. 2.[xii] Continued demand for renewable energy resources driven by state and local energy policy suggests this trend may continue.

There are also currently 68 active oil fields in the Los Angeles Basin, and thousands of active and inactive oil and gas wells countywide.[xiii] Working lands and public lands serve to host a large array of utility infrastructure such as power transmission lines, gas pipelines, water pipes and more.

Conversions from non-irrigated land uses and other land to urban land between 2014-2016 were primarily due to the construction of new homes and businesses and solar facilities. The City of Santa Clarita exhibited the largest addition of new homes totaling approximately 250 acres, including additions to the River Village and Villa Metro developments.[xiv] The proposed Centennial project on Tejon Ranch will likely continue this trend.

Biodiversity and Habitat

Mediterranean ecosystems are rare and highly diverse. Despite expansive suburban and urban development, L.A. County is home to a rich diversity of species and ecological communities, many of which are found nowhere else in the world. This richness is driven by diverse ecosystems and microclimates spanning over 10,000 feet in elevation change from the coast to mountains. L.A. County is also home to charismatic megafauna such as mountain lions, bobcats, hawks and over 150 threatened and endangered species.[xv] L.A. County contains a wide variety of ecosystems, including sage scrub, chaparral, oak woodland, montane woodland, grasslands, desert, riparian, and wetlands.

The region's biodiversity, however, is under tremendous threat from urbanization and climate change. Healthy, native-dominated ecosystems now exist primarily in pockets, most often in protected mountain areas—including one of the nation's largest urban national parks, the Santa Monica Mountains National Recreation Area, and the recently created, San Gabriel Mountains National Monument. Impacts from development can be caused by direct loss from land conversion, but also from 'edge effects' from site engineering, pets, light and noise pollution, and changes to natural processes such as fire suppression, hydrology, and habitat fragmentation. Housing demand and land shortages have also lead to increased infill development, decreasing small green pockets throughout the urban landscape.

Urban L.A. County has become an unplanned sanctuary for plant and animal species that are endangered in their original habitats, such as the Green-Cheeked Amazon parrot. Species introduced to the area by humans, such as palm trees, have vastly increased local biodiversity and generated novel ecosystems whose functioning we are only beginning to understand; while the invasive shot hole borer beetle is spreading a deadly disease that could destroy up to 38% of the trees in the region.[xvi] Although the region has one of the most diverse urban tree species in the United States, this beetle has the ability to affect 58 different tree species.

Most flat areas in L.A. County have been built upon and development has spread to the foothills, with increased expansion to inland valleys far from the urban core, as well as on many of the region's important alluvial fans that serve to recharge groundwater and buffer urban development from wildlands, and even the steepest slopes. The lower watersheds have been developed even more intensely with much of the streams and rivers being channelized to avoid flood risk. In some parts of the region, there are also important spreading grounds for seasonal river flows that help recharge groundwater. L.A. County also includes wetlands, estuaries and low-elevation coastal areas that have experienced heavy development pressures.

Biodiversity

A formal biodiversity assessment has never been done for L.A. County. However, in 2017 the City of Los Angeles unanimously passed a Biodiversity Motion and published their first-ever biodiversity report in 2018.[xv] This assessment used the Singapore Index framework, which included 23 indicators. These indicators involved natural resources, ecosystem services, governance, and outreach. The City's analysis concluded that Los Angeles hosts over 1,200 native species identified through community science efforts. The City received the highest score for percentage of natural area (which did not account for the distribution of these natural areas), number of bird species in the city, and protection of sensitive species and ecosystems. The City received the lowest score for its urban tree canopy and limited formal education programs addressing local biodiversity.

The next step for the City is to create a City of L.A.-specific biodiversity index that more appropriately measures the health of local ecosystems. This process was initiated by a UCLA Biodiversity Working Group that is developing a methodology that would be transferrable to a countywide scale.

Our County

Table 2: Singapore Index of Cities' Biodiversity Score summary for City of Los Angeles 2016.[xvii]

Indicator	Numeric Result	Index Score (0 weak, 4 strong)					Total
		0	1	2	3	4	
1. Natural Areas	20.5% of City (~62,000 acres)					4	4
2. Connectivity Measures	738 ha. effective mesh			2			2
3. Native Birds in Built Areas	306 native species recorded					4	4
4. Native Vascular Plants Change	461 native species recorded	NA in year 1					
5. Native Birds Change	325 native species recorded	NA in year 1					
6. Native Butterflies/Moths Change	218 total species* recorded	NA in year 1					
7. Native Freshwater Fish/BMI Chg.	6 fish/291 BMI native spp. recorded	NA in year 1					
8. Native Reptiles/Amphibians Chg.	69 total species* recorded	NA in year 1					
9. Protected Natural Areas	12.2% of City (~36,800 acres)				3		3
10. Invasive Species	~19% invasive plant species			2			2
11. Pervious Surfaces	~62% pervious surfaces			2			2
12. Urban Forest Canopy	~19% tree canopy		1				1
13. Access to Natural Areas	3.33 ha/1000 population					4	4
14. Natural Area Educational Visits	0.09 visits/student/year	0					0
15. Biodiversity Budget	1.2% of budget ($110M)		1				1
16. # Biodiversity Projects	117 projects/programs					4	4
17. Biodiversity Strategy/Action Plan	no Biodiversity Action Plan	0					0
18. # Biodiversity Related Institutions	>3 functions					4	4
19. Interagency Cooperation	5 agencies cooperate on bio.				3		3
20. Public Consultation Process	proposed as routine process			2			2
21. # City Biodiversity Partnerships	40+ partners					4	4
22. School Curricula	included					4	4
23. Public Outreach Events	550+ events per year					4	4
Total (72 potential points in year 1)		average = 2.67					48

Significant Ecological Areas

Significant Ecological Areas (SEA) are officially designated areas within L.A. County that are regulated through the land use process to conserve genetic and physical diversity.[xviii] These areas represent the wide-ranging biodiversity of the County and contain some of the County's most important biological resources. The County's SEA Odinance establishes the permitting, design standards, and review process for development within SEAs (Title 22 zoning regulations), while balancing preservation of the County's natural biodiversity with private property rights. The General Plan goals and policies are intended to ensure that privately-held lands within the SEAs retain the right of reasonable use, while avoiding activities and developments that are incompatible with the ability of SEAs to thrive in the long term.

Wetlands

Wetland habitats continue to play a key ecological role in the region, despite their vastly reduced acreage. In addition to habitat benefits as fish nurseries, nesting areas, and foraging and resting grounds for the Pacific Flyway, wetlands provide critical hydrologic and biogeochemical services such as carbon sequestration, flood control, groundwater recharge, and water quality improvement. The total area of wetland habitats, the composition of that area among the different wetland types (e.g., estuarine, riverine, depressional), and the physical and biological condition of those wetlands, are all important measures of wetland health.

Both the total area and types of coastal wetlands have changed dramatically since 1850. L.A. County has lost 73% of its total estuarine area from 1850 to the present, from 8,181 acres to 2,229 acres (Table 3). Vegetated and unvegetated estuarine areas have experienced 96% and 98% losses, respectively. There has been a two-fold increase in subtidal waters (a gain of 1,040 acres), but this was due to the creation of the Ports of L.A. and Long Beach, and Marina del Rey, which serve as infrastructure.

Table 3: Historical Change in L.A. County Coastal Wetland Areas[xix]

	Total Estuarine Area (acres)		Absolute Change (acres)	% of Total Wetlands in County	
	Historical	Contemporary		Historical	Contemporary
Estuarine Unvegetated Wetland	3,118	54	-3,064	38	2
Estuarine Vegetated Wetland	4,087	158	-3,929	50	7
Subtidal Water	976	2,016	1,040	12	90
Los Angeles County Total	8,182	2,229	-5,953 (-73%)		

Figure 4: Significant Ecological Areas and Coastal Resource Areas

Urban streams throughout L.A County exhibit poor biological condition and very poor functional condition. The California Rapid Assessment Method for Wetlands (CRAM) assesses wetland condition based on four attributes: landscape context, hydrology, physical structure and biotic structure. Forty-six percent of sites assessed scored in the lowest CRAM category. Low CRAM scores are dominant in urban areas generally, and in the Los Angeles and San Gabriel River watersheds. None of the assessed L.A. County urban streams fell within the best CRAM categories (Class 1 or 2), reflecting the impact of channelization and loss of floodplain connectivity.

There have been recent additions to L.A. County coastal wetland acreage in public ownership. The state purchased parcels expanding Ballona Wetlands to 600 acres in 2003, and 172 acres of Los Cerritos were acquired by the Los Cerritos Wetlands Authority between 2006-2010. Public purchase, protection and enhancement (such as the Malibu Lagoon restoration completed in 2013) of wetland areas in L.A. County should be a high priority.

Kelp Forests

Kelp forests provide habitat and protection for hundreds of species of fishes and invertebrates, second only to tropical reefs in the number of marine species supported. Kelp canopy is affected by a variety of factors including storm wave disturbance, density of grazers (especially sea urchins), nutrient availability, and sunlight penetration, and erosion in developed areas in the coastal zone. From 2003-2013, kelp canopy coverage approximately doubled overall (from ~1.25 square miles to almost 2.5 square miles, although canopy cover has decreased from 2009-2013 off Palos Verdes Peninsula. The recent positive trendis likely influenced by the many active restoration efforts recently completed or underway. However, within the larger historic context kelp canopies in all four regions are less than 30% of the historic high of 1911.

Table 4: L.A. County kelp canopy coverage from 2011-2013 and comparison to 1911 historic high.[xx]

Year	Total Canopy Coverage Area (sq-km)	Percent of Total Historic High Coverage
1911 - Historic high	15.1	–
2011	2.8	19%
2012	4.0	26%
2013	3.7	25%

Habitat Linkages (Connectivity)

Linkage, or connections, between habitats are critical to maintaining healthy populations of many species, especially large carnivores that require more space, and provide opportunities for species' range shifts to occur in response to climate change, urbanization, or other disturbances. Landscape linkages in the County were analyzed by the National Park Service Santa Monica Mountains Recreation Area using data from the South Coast Missing Linkages Study conducted by the South Coast Wildlands.[xxi] Out of 136,697 acres of wildlife linkage area within L.A. County, 58% (~79,000 acres) is currently protected public land. The areas with large missing wildlife linkages are: San Gabriel to Castaic in the Angeles National Forest, the Santa Monica Mountains to the Sierra Madre in Los Padres National Forest, and the Sierra Madre to Castaic linkage between Los Padres and Angeles National Forests and the Chino Hills.

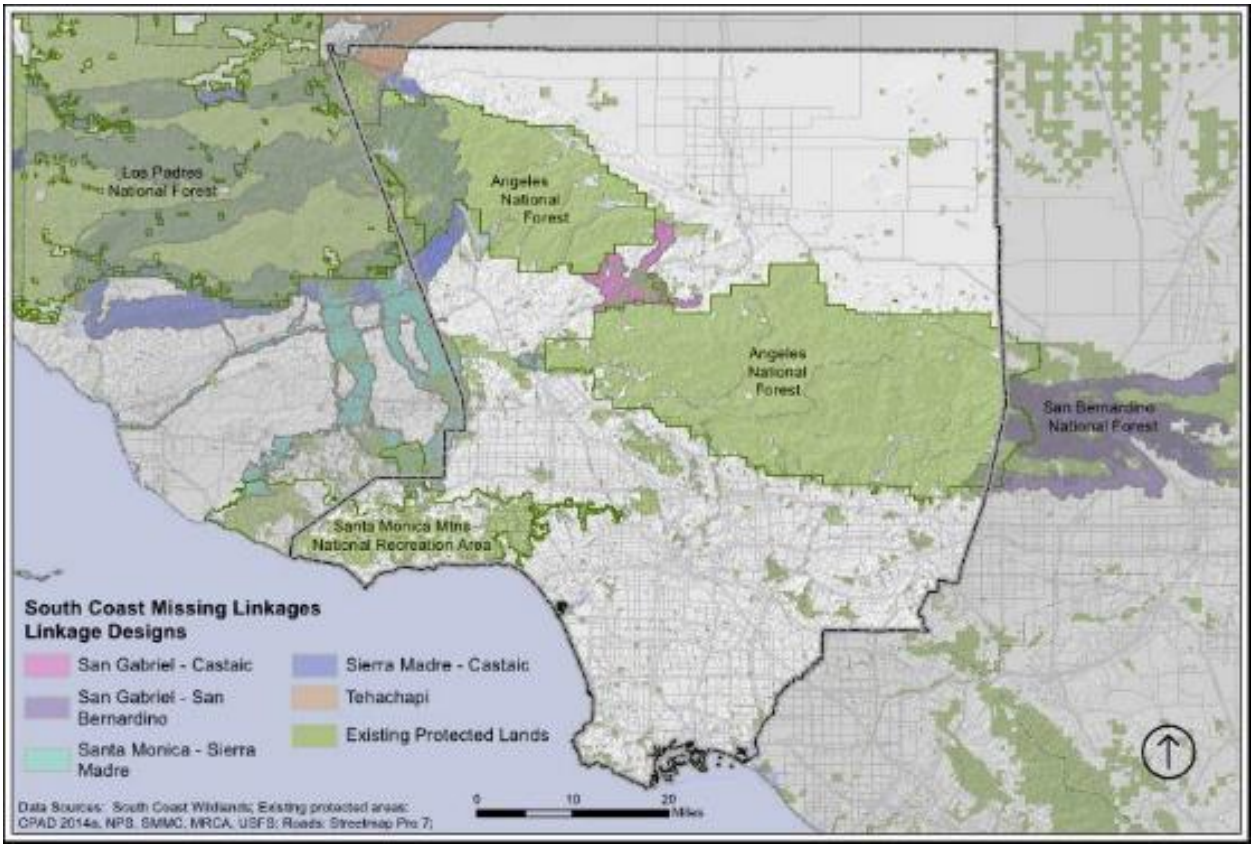

Figure 5: Missing linkages in and around L.A. County.[xxii]

Table 5: Linkage status summary statistics.[xxii]

	Acres	%
Total linkage area in LA County	136,697	
Total linkage area protected in LA County	78,943	58%
Protected Status by Linkage Area		
	Acres	%
San Gabriel - Castaic linkage area protected in LA County	5,126	21%
San Gabriel - San Bernardino linkage area protected in LA County	3,303	79%
Santa Monica - Sierra Madre linkage area protected in LA County	5,012	39%
Sierra Madre - Castaic linkage area protected in LA County*	65,524	73%
Tehachapi linkage area protected in LA County	48	1%

* Sierra Madre - Castaic linkage overlaps 3 others so combined acreage of all linkages is greater than total linkage area

Data limitations

Much of what is known about L.A. County's local species, habitats, and ecosystems is from work done in natural and protected areas; little is known about its urban ecosystems. Birds have received the greatest attention, and researchers have carried out partial surveys of trees and some insect groups, but few data exist for most species. Most studies address smaller areas of the County such as Griffith Park, Ballona Wetlands, El Segundo Dunes, and the Santa Monica Mountains. About six-dozen local native species are listed as threatened or endangered, including the El Segundo blue butterfly and the Southern California steelhead.[xxiii]

Assessing the state of the region's ecosystems is extremely difficult as it requires the synthesis of disparate data sets for a very large region, including activities on both public and private lands and in urban and natural areas. In addition, there are very few county-wide biological monitoring programs. The City of L.A., in collaboration with UCLA is developing an L.A.-specific Biodiveristy Index, which has the potential to be expanded to include the entire county.

Changing Landscapes and the Future of L.A. County

The County's landscapes and ecosystems are under pressure from the 10 million residents (plus far more visitors), many of whom recreate in its protected open spaces on a regular basis. Extensive habitat loss and fragmentation, pollution, increased wildfire risk, and invasive species have taken their toll on the region's landscapes and ecosystems, and "edge effects" of development further degrade the habitat quality of undeveloped land. Compounded by a changing climate, such trends are likely to pose significant challenges to both the human and non-human inhabitants of the region if left unaddressed.

Urban Development

Patterns of urban development have a profound impact on landscape and ecosystem change. L.A. County's long history of decentralized development – characterized by a preference for single-family homes that, due to affordabiltiy issues, are typically located a significant distance from places of employment and other amenities – has contributed significantly to habitat loss and fragmentation, as well as increased public costs, and a waning sense of community.[xxiv] In addition, the rise of turf removal and introduction of drought tolerant and native vegetation has resulted in a change in landscape and biodiversity that did not exist previously in many neighborhoods.

Large-scale exurban developments continue to be approved. Such patterns of urban development not only contribute to landscape and ecosystem fragmentation, but can also expose future residents in those areas to increased incidences of extreme heat and wildfire, depending on their location. Conversion of urban landscape areas into high density development may reduce urban biodiversity and habitat connectivity.

Climate Change & Drought Stress

Climate change presents additional challenges, as well as additional unknowns. While it is clear that hotter temperatures, reduced snowmelt, and increased wildfire risk add to the suite of environmental stressors already facing the County's species and ecosystems, how particular species will be impacted – and what can be done to limit or prevent these impacts – is largely unknown. Environmental changes are affecting human wellbeing too. Ecological imbalances, combined with climate change, are already promoting the local emergence and spread of previously unseen diseases such as West Nile Virus,[xxv] while pollution and changes in pollen production are worsening respiratory ailments that disproportionately affect children.[xxvi,xxvii] The need to better coordinate ecosystem health and human health has never been more urgent.

Vegetation “greenness” varies naturally with the wet and dry seasons in L.A. County and usually peaks in March and is lowest in August or September. For L.A. County as a whole, peak greenness has decreased since 2011. Extreme lows in greenness have occurred since 2013 for the County. This suggests that L.A. County as a whole has experienced reduced photosynthetic activity, plants are assimilating less carbon, and native vegetation is experiencing extreme water stress due to the ongoing drought. The reduction in greenness also reduces the benefits of vegetation on urban heat island.

Wildfire

Similar to many other Mediterranean-climate regions, wildfire is an integral component of ecological processes. In L.A. County, the fire season extends throughout most of the year and is strongly influenced by periodic dry easterly “Santa Ana” winds.

Land use practices, fire management policies, and climate change have altered fire regimes, affecting ignition frequency, vegetation patterns, and ecological processes. These elements interact with each other, with natural climate variability, and with human-induced climate change in highly complex ways. Climate change is expected to increase wildfires in L.A. County as a result of increasing temperatures and higher levels of evapotranspiration.

Increased fire frequency in native shrublands can result in cumulative loss of dominant native shrub species, and increase of easily ignitable exotic, annual grasses and broadleaf weeds. Over the course of several critically short fire return intervals this process can lead to vegetation type conversion from native shrubland to exotic annual grassland. Many plant and animal species in the southern California foothills and low mountains are threatened by overly- frequent fire (for example, some species of California lilac, cypress, and pine; coastal sage scrub that supports the California gnatcatcher). Conversely, higher elevation forestlands may be impacted negatively by reduced fire frequency due to fire suppression policies, changing forest species composition and potentially resulting in higher severity fires when they do burn. Finally, increased fire frequency surrounding LA County trails and regional parks can result in loss of parkland amenities and vegetation. Planning and preparation for these events is necessary.

Landscape and Ecosystem Restoration

Across L.A. County, a growing number of efforts are underway to renew and restore damaged and degraded ecosystems. Such efforts include plans to restore Ballona Wetlands and part of the San Gabriel River, the on-going invasive species removals in the Santa Monica Mountains, the El Segundo Dumes restorations, and kelp forest reforestation efforts along the Palos Verdes Peninsula.

One of the most ambitious efforts is the proposed restoration of the Los Angeles River ecosystem. The Los Angeles River flows for 51 miles from the San Fernando Valley to Long Beach, snaking through areas already covered by some 114 community, regional, and river- related plans, as well as bike and pedestrian plans, general plans, and design guidelines.

The Los Angeles River Master Plan provides for the optimization and enhancement of aesthetic, recreational, flood control and environmental values by creating a community resource, enriching the quality of life for residents, and recognizing the river's primary purpose for flood control. The plan is currently being updated in a County led, multi-stakeholder effort.

Our County

Draft Goals, Potential Strategies, and Indicators

The following are major goals and some of the potential strategies in support of maintaining and enhancing L.A. County's landscapes and ecosystems. While there are hundreds of possible strategies related to this topic, we have focused on those that will benefit most from collaborative planning and implementation across L.A. County. We also intend for each goal to also enhance equity, so as to reduce disparate outcomes experienced by disadvantaged communities, particularly low-income communities of color, with respect to benefits, resources, and impacts, related to open space, recreation, biodiversity and habitat. Additionally, landscape and ecosystem goals and strategies must take resilience into consideration, including but not limited to the impacts of a changing climate. Economic benefits and risks are also key concerns. Please note that these goals and strategies are presented as a basis for discussion; our intention is that they be edited, removed, or added to as a result of stakeholder input.

Draft Goals and Potential Strategies

Goal A: Ensure the region's landscapes and ecosystems meet the needs of the present without compromising the ability of future generations to meet their own needs.

Potential Strategies:

- Minimize exposure to fire risk due to habitat fragmentation, roads and habitat transformation.
- Identify how much and where the county urbanized area can be infilled, at what densities and proximities to transit.
- Consider Transfer of Development Rights (TDR) and Transfer of Floor Area Rights (TFAR) programs to direct new development away from ecologically sensitive areas, as well as those areas most at risk from future climate impact.

Goal B: Increase and enhance native biodiversity, habitat, and connectivity.

Potential Strategies:

- Apply innovative techniques for rapidly assessing biodiversity in an area, tracking wildlife, identifying critical habitat islands and patches, and mapping current and future ecosystem health.
- Consider management strategies to increase the biological connectivity of protected areas.
- Incorporate habitat, biodiversity, and connectivity into planning, design, and development projects at all scales.
- Improve and increase native species and the presence of native plant communities.
- Consider biodiversity and habitat value when selecting urban tree species such as diversification of street tree species to satisfy various needs including urban tree canopy and creating urban ecological system rather than one tree specie to identify neighborhood characteristic.

- Strategically plan restoration, preservation and recovery projects to increase and improve habitat and native biodiversity.
- Develop designs for infill structures appropriate to existing backyards and alleys that improve biodiversity, habitat, and connectivity.

Goal C: Ensure parks, open space and natural areas benefit human and ecosystem health in the context of a changing climate.

Potential Strategies:

- Capture, clean, and store rainwater, urban runoff, and wastewater in appropriate locations.
- Better understand and promote the mental and physical health and community-building qualities of access to nature.
- Develop urban-wildlands interface guidelines that acknowledge the risk of wildfire and use the most up-to-date scientific research for standards that are appropriate for Southern California's unique ecologies.
- Design and renovate parks and facilities to meet the Sustainable Sites Initiative's gold certification.

Goal D: Ensure parks, open spaces, and natural areas are resilient in the face of drought, wildfire, climate change, and gaps in maintenance.

Potential strategies:

- Support DPR in the preparation and implemention of its departmental sustainability plan.
- Improve sustainability guidelines for future parks to account for climate change-related risks.
- Identify areas at high risk of fire in order to prioritize brush clearance and landscape maintanence.
- Identify areas that will be affected by climate changes and are most vulnerable to extreme heat to utilize cooling measures in recreational spaces such as cool pavement, trees, and increased landscaping.

Goal E: Create and manage the built environment's nature based infrastructure to optimize multiple benefits and ecosystem services.

Potential strategies:

- Support street tree programs, living streets, landscape transformation and stormwater capture and infiltration efforts in the incoprorated and unincorporated areas.
- Conserve trees to ensure that parks and open spaces provide cooling infrastructure.
- Identify trees that are resilient, with broad tree canopy, and native to ensure the resilient landscape.
- Provide assistance to the general public to promote landscape that attract diverse habitat.

Goal F: Ensure all residents have access to parks, beaches and other recreational open space

Potential Strategies:

- Work with cities and across agencies to plan parks, greenways, and joint-use green schoolyards in those neighborhoods with gaps in park access.
- Plan and manage parks, open spaces, and natural areas to be universally accessible and inclusive by adopting the Principles of Universal Design for County parks, open space, and natural areas and their associated facilities.
- Prioritize disadvantaged communities that lack access to nature's restorative qualities when acquiring, planning, and developing parks, greenways, street tree plans, and natural areas.
- Increase safety for pedestrians surrounding park areas, for example midblock crossings and increased lighting.
- Preserve and increase the amount of affordable housing surrounding open space amenties.

Goal G: Improve ecological literacy.

Potential Strategies:

- Build off of Community Science programs, such as the Natural History Museum's, to collect and share data on species occurrences to schools, colleges, city park employees, and the general public.
- Expand training and coordination of open space maintenance and management throughout the County on the benefits of native species, biodiversity, habitat, and connectivity.
- Increase community involvement in voluntary monitoring programs including new mechanisms to easily communicate maintenance and violation issues (trail deterioration, signage problems) in recreation areas.
- Integrate ecological literacy programs, such as the California Education and Environment Initiative, and events at public schools.
- Promote awareness of agricultural and environmental management practices of the region's indigenous groups.
- Understand the cultural component of biodiversity, for example by exploring whichspecies and ecosystems are favored by the County's communities and cultures, and how human preferences and activities have historically shaped the gradient of landscapes and ecosystems.

Our County

Potential Indicators

All indicators apply to L.A. County unless otherwise stated.

Protected Areas	Acres of terrestrial and aquatic areas of special ecological significance
	Public purchase, protection and enhancement of wetlands
	Acreage of coastal wetlands (loss)
	Functional assessment scores and bioassessment scores for perennial, wadable streams
Working Lands	Percentage of total county area dedicated to agriculture and community gardens
	Conversions from non-irrigated land uses and other land to urban land
Parks and Beaches	Population Countywide that lives within 1/2 mile
	Park Condition (Good, Fair, Poor) based on methodology established in the Countywide Parks Needs Assessment
	Beach Report Card Scores and Closure Days
Biodiversity and Habitat	Kelp Canopy Coverage (square miles and percent)
	Change in Vascular Plant Species
	Biodiversity Index utilizing Indicator Species
	Wildfire Distribution and Frequency
	Normalized Difference Vegetation Index (NDVI) or Greenness
Changing Landscapes and Future of Landscapes	Yearly suppression costs for wildfires, total ($) damage costs associated from adverse events

	Neighborhoods implementing traditional turf removal projects and incorporating native and drought tolerant plant material
	Number and types of Citizen-Science Monitoring Projects overseen by the L.A. County Museum of Natural History

Our County

Cross-Cutting Themes

Economy & Workforce Development

- Working lands support economic activity and land-based livelihoods.
- Habitat restoration and urban forestry present significant opportunities for workforce development in land management.
- Ecotourism industries such as surfing, wildlife viewing, gardens attract visitors from near and far.
- Green infrastructure projects such as stormwater projects, green street projects, solar projects present opportunity for providing partnerships training and jobs to local communities in these areas.

Public Health, Safety, and Well-being

- Exurban development produces additional exposure to fire risk due to habitat fragmentation, more roads and habitat transformation.
- Access to parks and open space enables people to exercise and to improve physical, psychological, and overall wellbeing.
- High temperatures and other factors can lead to poor working conditions for outdoor workers in L.A. County landscapes.
- Preservation of agricultural lands facilitates access to organic, local food throughout L.A. County.
- Wildfires release large amounts of carbon dioxide, black carbon, brown carbon, and ozone precursors into the atmosphere, adversely impacting air quality.

Land Use and Housing

- Zoning requirements can either limit or promote development near open space and conservation areas.
- Integrating habitat (connectivity) and biodiversity into development plans can limit the impacts of urban growth on the region's ecosystems.
- Provision of affordable housing can potentially alleviate development pressure on habitats and ecosystems in the urban periphery.
- There are approximatley 3.3 million households in L.A. County (291,000 households in the unincorporated areas) (2015).[xxviii]

Water

- The County loses over 100 billion gallons of rainwater each year due to its high percentage of impervious surface - a massive loss for a water-strained region.
- The high percentage of impervious surfaces in L.A. County impacts stormwater runoff and water quality while prohibiting groundwater recharge. Impervious surfaces can also cause flash flooding and riparian habitat degradation. Initiatives to create more pervious surfaces in the form of parks, infiltration open spaces, and green infrastructure can help capture valuable rainwater while reducing environmental impacts and flood risks.
- Low-density sprawl throughout the County is associated with sprawling water infrastructure as well as high per-capita water use for single-family lawns and gardens.

Energy & Climate

- Patterns of urban development have a profound impact on energy usage and GHG emissions.
- L.A. County's long history of decentralized development has contributed significantly to energy use and GHG emissions in both the building and transportation sectors.

Our County

Local/Regional, State, National and International Targets

A number of regional and state planning efforts have established strategies and set targets around parks, open space, recreation, biodiversity, and habitat. These include:

Local/Regional

L.A. County Safe, Clean Neighborhood Parks and Beaches Measure of 2016	This implements an annual parcel tax of 1.5 cents per square foot of development, which will generate approximately $94 million a year to be used on local parks, beaches, and open space areas. The funding provided by this tax will be used to fulfill LA County's needs based on the Countywide Comprehensive Parks & Recreation Needs Assessment of 2016, an 18-month long process in which the County partnered with community stakeholders and 88 cities to assess the parks and recreational needs of various communities.
Cal FIRE Funded Park Inventory	The State of California granted funds to L.A. County for conducting tree inventories for twenty-eight County parks. These inventories determine these parks' overall health and spatial needs.
LA City Biodiversity Motion (2017)	This Motion, enacted by LA City Council in May of 2017, set biodiversity goals for the Los Angeles Bureau of Sanitation by implementing the Singapore Index of Cities' Biodiversity. This Index is used to assess the city's current level of protection, enhancement, and mitigation of adverse impacts to biodiversity. The results of this Index will help develop policies to enhance biodiversity, including access for disadvantaged communities to engage with ecosystem sustainability projects.
Enhancing Biodiversity for the City of Los Angeles (UCLA Grand Challenge Program, 2017)	Project that developed an index used to characterize the state of urban biodiversity in the City of Los Angeles. This index provides biodiversity metrics and goals indicate to gaps and successes in natural area connectivity, and equitable access and distribution of natural areas within urban areas of the City. This index has become a priority in the City of Los Angeles' Sustainability pLAn.

State

California Environmental Quality Act	Requires California local and state agencies to analyze and disclose, and consider the environmental impacts of proposed discretionary project approvals, before approving a project. CEQA requires projects to incorporate mitigation of all significant impacts to the extent feasible, and requires decisionmakers to receive and respond to public and expert comments before project approval.
California Drought, Water, Parks, Climate, Coastal protection, and Outdoor Access for All Act of 2018	This bill reallocates $100,000,000 of funds originally authorized for use under the Water Quality, Supply, and Infrastructure Improvement Act of 2014; the Clean Water, Clean Air, Safe Neighborhood Parks and Coastal Protection Act of 2002; and the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 to finance programs affecting drought, water, parks, climate, coastal protection, and outdoor access for all. Many of the programs and specific uses for these funds will be provided as grant money to public entities for the purpose of expansion, rehabilitation, protection, and acquisition of open spaces for the benefit of the natural habitat and local communities.
California Ocean Protection Act	Partners with local agencies to increase public awareness of Marine Protection Areas through education, and reduce ocean pollution impacts. The Ocean Protection Council, which implements COPA, grants funds periodically to various non-profit groups and universities.
Fire Prevention grant program	Program created to reduce the risk of wildland fires on habitable structures in urban areas and maximize carbon sequestration. Specifically, Cal FIRE provides funding for projects regarding Hazardous Fuel Reduction, Fire Prevention Education, and Fire Prevention Planning.
Landscaping and Lighting Act of 1972	State law that directs local agencies to collect taxes to maintain landscape improvements for special Landscape Maintenance Districts. The L.A. County Department of Public Works makes improvements within three of these Districts.

Sustainable Agricultural Lands Conservation Program	Pprovides funding for agricultural land conservation easements, agricultural land strategy plans, and other mechanisms that reduce greenhouse gas emissions while serving agricultural communities.
California Water Action Plan	Helps fund grants to public utilities looking to help achieve the three objectives of the California Water Action Plan: find reliable water supplies, restore important species and habitat, and create a more resilient, and manage water resources more sustainably.
Environmental Enhancement and Mitigation Program	Funds projects that mitigate harmful effects of transportation facilities, including urban forestry projects that offset vehicular emissions, to both public and private entities. This involves acquiring and enhancing resource lands to mitigate harm from lands nearby rights-of-way, among others within a similar scope. Funds are received from California Climate Investment Fund revenue.
Natural Community Conservation Planning Program	Provides funding beyond the species and habitat conservation objectives of the Federal and California Endangered Species Acts in partnership with public and private entities. There are currently 14 approved NCCPs that cover over 7 million acres that is habitat for 400 special status species.
California Urban Forestry Act of 1978 (reapproved in 2017)	The California Department of Forestry and Fire Prevention provides funding grants for local government agency programs designed to improve urban forest health, and local water capture for urban forest maintenance.
California State Wildlife Action Plan	Examines the health of wildlife and prescribes actions to conserve wildlife and vital habitat before they become more rare and more costly to protect.
Regional Advanced Mitigation	A science-based approach to identify mitigation opportunities to support regional conservation priorities. By considering mitigation development early in the planning process prior to design and permitting phases, proponents can identify higher-quality mitigation opportunities.

Metropolitan Transportation Commission – Priority Conservation Area grant program	Counties in the Bay Area region compete for $16 million in grant funding from the State Coastal Conservancy for projects that enhance property designated as a Priority Conservation Area (PCA). These PCAs are identified by private and public entities as key natural lands for conservation efforts, and can include farming, ranching, recreational, and resource lands.
San Diego Association of Governments – Environmental Mitigation Program	Provides funds for regional transportation projects looking to mitigate habitat impacts, including habitat acquisition, management, and monitoring activities. This funding program will help implement San Diego County's Multiple Species Conservation Program and Multiple Habitat Conservation Program, ensuring compliance with the federal Endangered Species Act.
AB 32 (Nuñez/Pavley, 2006)	California Global Warming Solutions Act of 2006 requires California to reduce its GHG emissions to 1990 levels by 2020 — a reduction of approximately 15 percent below emissions expected under a "business as usual" scenario.
SB 375 (Steinberg, 2008)	Under the Sustainable Communities Act, CARB sets regional targets for GHG emissions reductions percent change in per capita passenger vehicle emissions relative to 2005. As of October, the targets for the Southern California Association of Governments will be -8% by 2020 and -19% by 2035. SB 375 ties land use and transportation planning together, and emphasizes building transit-oriented development.

Federal

Endangered Species Act	Federal law that protects species listed as endangered or threatened, as well as critical habitat required to avoid extinction of endangered or threatened species. Section 6 of the ESA enacted the Cooperative Endangered Species Conservation Fund (CESCF), which provides funding to states for the four types of programs listed below. Funding provided to states can be available to local governments as sub-grantees for applicable species recovery programs.

	- Recovery Land Acquisition grants: states receive funds to acquire land for species recovery purposes. - Conservation grants: states receive funds for conservation projects - Habitat Conservation Planning Assistance: states receive funds to support the development of Habitat Conservation Plans (HCPs) - HCP Land Acquisition: states receive funds to acquire land associated with approved HCPs.
Clean Water Act	Federal water pollution law that regulates pollutants discharged into waters of the United States, which are comprised of wetlands, tributaries, and other surface water sources. - Wetland Program Development Grants: competitive grant program available to local governments every other year to fund projects that will restore natural wetlands.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund)	CERCLA assigns liability for hazardous waste releases to potentially responsible parties (PRPs). Any PRPs responsible for the release of hazardous waste are liable to pay cleanup costs, damages to natural resources, costs of conducting health assessments, and injunctive relief when a site presents imminent and substantial endangerment.

International

Sustainable Sites Initiative (SITES)	Rates the sustainability of landscape development by providing SITES certifications to landscape architects. These certifications are administered exclusively by the Green Business Certification, Inc., which also provides LEED building certifications. Similar to receiving a LEED certification, a SITES certification is a marketable achievement that signals to the public that this landscape site has achieved best practices in health, safety, and welfare. Eligible projects include open spaces, screetscapes and plazas, commercial office areas, residential areas, industrial parks, cemeteries, parking lots, local parks, among many others. The site must have been constructed within two years and be at least 2,000 sq. ft. to be eligible for a SITES certification.

Appendix: Regional Case Studies

Protected Areas

- **National Forests:** As a National Forest impacted by the urbanized region, the Angeles National Forest – San Gabriel Mountains National Monument provides a wide range of products and services including recreation, fuelwood,siting locations for electricity and telecommunications infrastructuredams, and reservoirs.

Public Parks

- **Park Needs Assessment:** The Park Needs Assessment found that more than 50% of L.A. County's population lives in areas of high or very high park need. Such areas vary considerably in their locations and socio-economic and demographic characteristics, and include Van Nuys, Boyle Heights, and Venice. Areas with high park need have an average of 1.6 acres of park land per 1,000 residents, while areas with very high need have less than an acre of park land per 1,000 residents.

Beaches

- **Heal the Bay's 2017-18 Beach Report Card**: Over 90% of L.A. County beaches assessed in Heal the Bay's 2017-18 Beach Report Card – including Malibu and Palos Verdes – earned "A" grades during the busy summer season, a 9 percentage-point increase from the reporting period's five-year average. Santa Monica Pier received grades of D or lower for summer dry, winter dry, and wet weather for the fifth consecutive year.

Working Lands

- **Farmland Mapping and Monitoring Program:** From 2014-2016, all conversion of irrigated farmland to urban land was due to the construction of solar facilities and groundwater recharge basins in the Antelope Valley and Santa Clarita areas. Indeed, renewable energy production – particularly solar photovoltaics (PV) – has expanded rapidly. In the City of Lancaster in northern L.A. County, over 4,000 acres are now devoted to utility-scale solar generation.
- The City of Santa Clarita exhibited the largest addition of new homes totaling approximately 250 acres, including additions to the River Village and Villa Metro developments.[xiv] The proposed Centennial project, in the Antelope Valley, will likely continue the trend of converting non-irrigated land uses and other land to urban land.

Biodiversity

- **Biodiversity Motion:** Species introduced to the area by humans, such as palm trees, have vastly increased local biodiversity and generated novel ecosystems whose functioning we are only beginning to understand; while the invasive shot hole borer beetle is spreading a deadly disease that could destroy up to 38% of the trees in the region.[xvi] Although the region has one of the most diverse urban tree species in the United States, this beetle has the ability to affect 58 different tree species. In addition, in 2017 the City of Los Angeles unanimously passed a Biodiversity Motion and published their first-ever biodiversity report in 2018.

Habitat

- **South Coast Wildlands:** Landscape linkages in the County were analyzed by the National Park Service Santa Monica Mountains Recreation Area using data from the South Coast Missing Linkages Study conducted by the South Coast Wildlands.[xxi] Out of 136,697 acres of wildlife linkage area within L.A. County, 58% (~79,000 acres) is currently protected public land. The areas with large missing wildlife linkages are: San Gabriel to Castaic in the Angeles National Forest, the Santa Monica Mountains to the Sierra Madre in Los Padres National Forest, and the Sierra Madre to Castaic linkage between Los Padres and Angeles National Forests and the Chino Hills.

Workforce and economy

- **Green Zones:** Initiated by the County Board of Supervisors in 2015 and led by LA County Dept of Regional Planning, the Green Zones Program seeks to enhance public health and land use compatibility in the unincorporated communities that bear a disproportionate pollution burden. In order to create implementable and effective planning tools, the Green Zones Program employs data-driven approach and robust stakeholder outreach strategy. The program includes groundtruthing activities in partnership with community-based organizations and residents to document environmental hazards block-by-block and inform the Program's land use policies and toxic hotspots map.

Racial justice

- **Center for Health Equity:** The Center for Health Equity strives to advance racial, social, economic and environmental justice in partnership with committed County partners, local organizations and community members. The goal is to reduce identified heath inequities based on where a person lives, their race or ethnicity, or other social status that unfairly influences health outcomes. Their focus areas include Infant Mortality, Sexually Transmitted Infections, Cultural and Linguistic Competency, Health Neighborhoods, and Environmental Justice.

Transportation

- **Vision Zero:** Los Angeles County Public Health and Public Works are co-leading the development of a Vision Zero Action Plan to reduce traffic deaths and severe injuries in unincorporated areas. A Vision Zero approach recognizes that people make mistakes and that our transportation system needs to be designed so that mistakes are less likely to lead to death and injury. Agencies that adopt Vision Zero commit to the systematic elimination of deaths and severe injuries due to traffic collisions for all roadway users, including people walking, bicycling, driving, using a motorcycle, and others.

Landscapes and Ecosystems

- **Life is Better with Trees (SD1):** Supervisor Solis allocated $1M from Prop A funds to plant and water (for 6 months) approximately 2,000 street trees in four communities (East LA, Walnut Park, Bassett, and Valinda). The San Gabriel Valley Conservation Corps trained a cohort of Corps members to plant the trees. Local youth were trained on the benefits of trees and conducted the public education and outreach. These youth will also do post-planting follow up with residents and help collect evaluation data. Corps members and at risk-youth receive job and life skills training throughout the project.

ENDNOTES

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