What?

WHAT SHOULD FACTOR INTO A NETWORK OF MULTI-BENEFIT LANDS?

Who?

WHO COULD BE BETTER CONNECTED TO SUPPORT A COORDINATED NETWORK OF LAND MANAGEMENT?

THE PUBLIC

LANDOWNERS

GOVERNMENT ENTITIES

ASSETS + EXISTING CONDITIONS

RISKS + SUITABILITIES

EQUITY

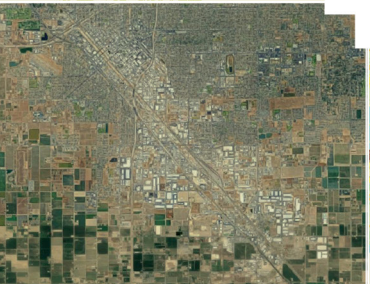
PRIME FARMLAND

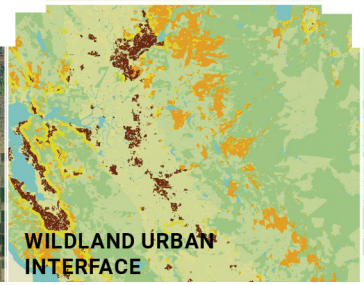
SOCIAL VULNERABILITY

PASTURE

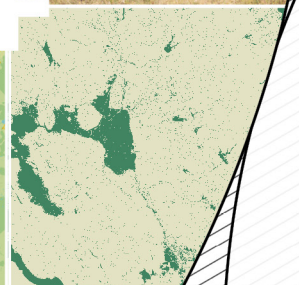
ASSETS, SUITABILITIES, PRESSURES, AND NEEDS

Inputs to the prioritization tool are weighted and combined.





WILDLAND URBAN INTERFACE



CLIMATE & JUSTICE

INITIATIVES WILL BE WON OR LOST

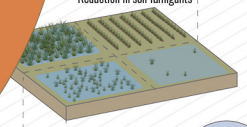
AT SCALE

POLICIES

INCENTIVES

ECONOMICS

Heightened yields
Increased lease revenue
Reduction in soil fumigants

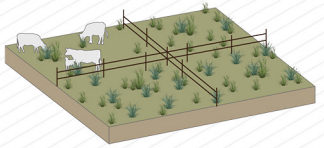


DISADVANTAGES

Increased water demand
Land out of production temporarily

ECOLOGY

Creation of bird habitat
Increased soil fertility
Reduced soil pests



ECOLOGY

Uniform soil fertility levels
Increased forage productivity
Improved water regulation

ECONOMICS

Helps extend grazing season
Reduced supplemental feeding
Increased weight gain and milk production per acre

DISADVANTAGES

More fencing
Time to move cattle
Need to move water to desired paddock location

How?

HOW DO WE MOVE BEYOND SILOED LAND USES?

The @Scale project is framed around three interconnected questions: what (what lands should be prioritized), how (how might we move beyond existing divisions between land uses toward multi-benefit solutions), and who (what sorts of partnerships could facilitate all this).

97% of the American landscape exists largely outside of the influence of landscape architecture practice.

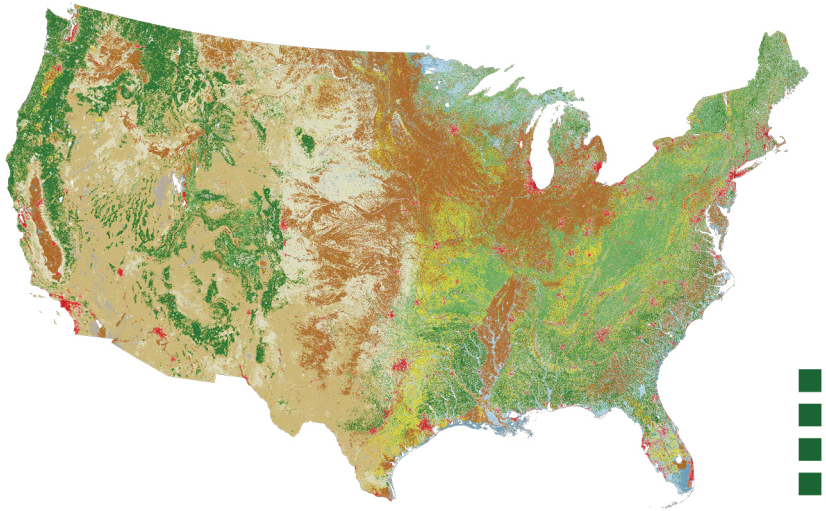
Landscape architects must work across the urban-rural divide.

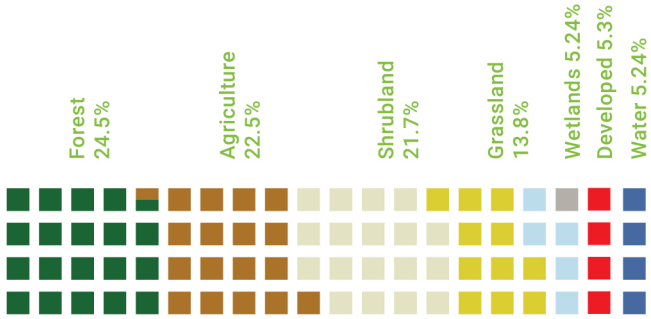
URBAN

PLACES OF 2,500 OR MORE PERSONS

RURAL

ANYTHING NOT IN AN URBAN AREA



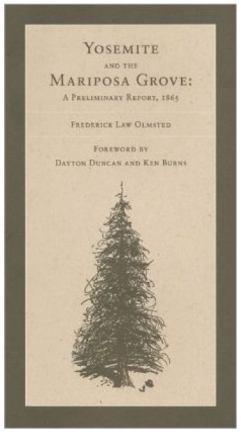


Source: Dewitz, J., and U.S. Geological Survey, 2021, National Land Cover Database (NLCD) 2019 Products (ver. 2.0, June 2021): U.S. Geological Survey data release, https://doi.org/10.5066/P9KZCM54

This requires learning more about about how land is used across the vast majority of the United States.

Contemporary landscape architecture practice tends to focus on urban areas, which comprise only about 3% of the country's land area. Beyond, vast rural areas of forest, shrubland, grassland, and agriculture warrant our attention, too.

1865 YOSEMITE PROTECTED



"Yosemite should be held, guarded and managed for the free use of the whole body of the people forever"

Frederick Law Olmsted, *Yosemite and the Mariposa Grove: A Preliminary Report* (1865)

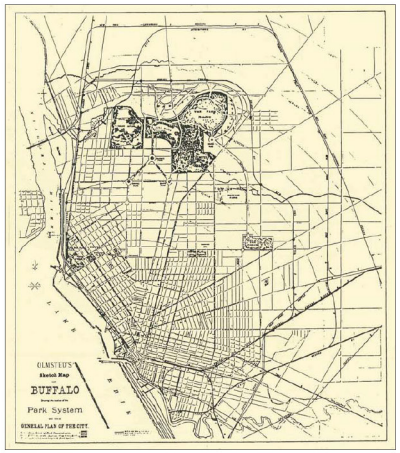
1865 NATIONAL PARK SERVICE ESTABLISHED

"...to conserve the scenery and the natural and historic objects and the wildlife therein... for the enjoyment of future generations"

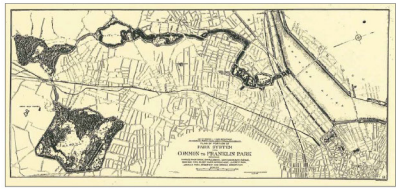
The Organic Act (1916)

LATE 19TH C. ONWARD

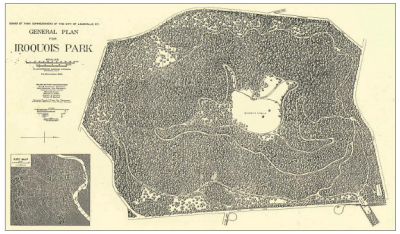
MUNICIPAL AND REGIONAL PARK SYSTEMS DESIGNED



BUFFALO (F.L.O., 1876)

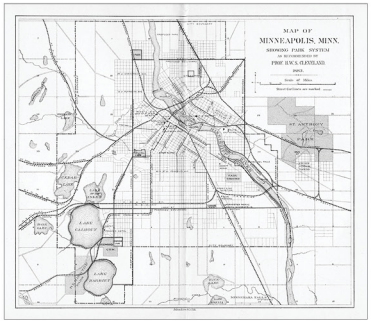


BOSTON (F.L.O., 1894)

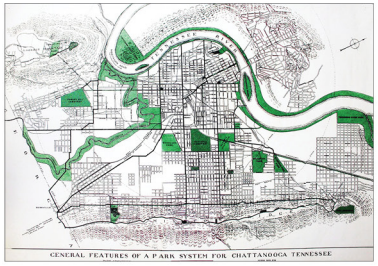


LOUISVILLE (F.L.O., 1897)

1928 OLMSTED JR. CONDUCTS SURVEY FOR CALIFORNIA STATE PARK SYSTEM



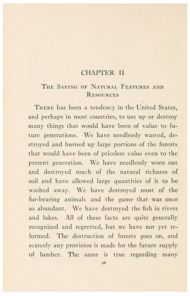
MINNEAPOLIS, MN (CLEVELAND, 1883)



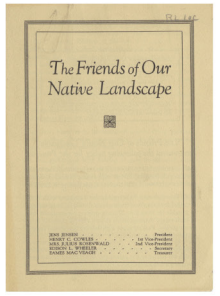
CHATTANOOGA, TN (NOLEN, 1911)

EARLY 20TH C. REGIONAL APPROACHES, PRESERVATION, AND ADVOCACY

CHARLES ELIOT (1859-1897)



OSSIAN COLE SIMONDS (1855-1931)

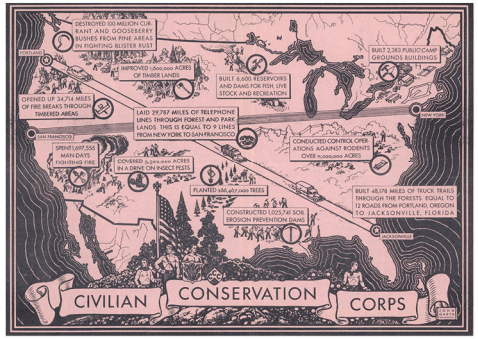


JENS JENSEN (1860-1951)

Charles Eliot Scrapbook 1888-1901, courtesy of The Trustees of Reservations, Archives & Research Center; O.C. Simonds, *Landscape Gardening*, New York: The Macmillan Company, 1920; Jens Jensen, "The Friends of Our Native Landscape," courtesy of Special Collections Department, Richard J. Daley Library, U. of Illinois at Chicago.

1930s - 1940s

ERA OF THE NEW DEAL INCLUDES LANDSCAPE ARCHITECTS IN THE CCC, TVA, ETC.



John Garth San Francisco, "Civilian Conservation Corps" (San Francisco: State of California Emergency Relief), prepared by State Division of Public Relations.

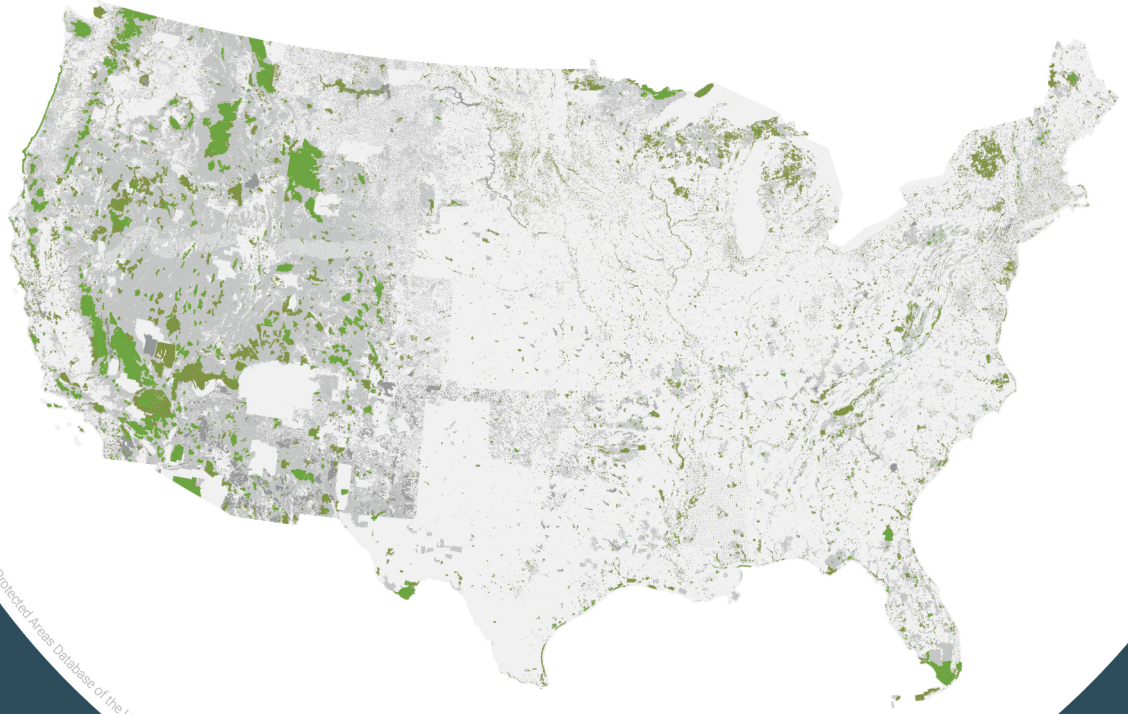
1960s - 1970s MCHARG'S CALL FOR STEWARDSHIP OF THE BIOSPHERE

Ian McHarg, *Design With Nature* (American Museum of Natural History, 1969).

Sources: Cover of Frederick Law Olmsted, *The Yosemite Valley and the Mariposa Grove of Big Trees: A Preliminary Report, 1865*, reprinted with foreward by Dayton Duncan and Ken Burns, Yosemite Conservancy, 1995; Frederick Law Olmsted maps for Buffalo, Boston, and Louisville courtesy of Frederick Law Olmsted National Historic Site, as cited in City of Louisville, *Louisville's Olmsted Parks and Parkways Master Plan*, 1994; John Nolen, "General Features of a Park System for Chattanooga, Tennessee: Report to the Board of Park Commissioners," 1911; HWS Cleveland, Minneapolis Park System Map, 1883; "Map of California State Parks and Historical Monuments," c. 1950, courtesy of the United States Department of the Interior, National Park Service, Frederick Law Olmsted National Historic Site.

While work in urban environments has historically tended to dominate landscape architecture practice, there has been a lineage of designers who have embraced hinterlands, rural landscapes, broad regions, and specialized landscape types.

About 12% of national land and water is permanently protected from development.



Source: U.S. Geological Survey (USGS) Gap Analysis Project (GAP). 2022. Protected Areas Database of the United States (PAD-US) 3.0: U.S. Geological Survey data release, https://doi.org/10.5066/P9Q9LQ4B.

A national goal aims to conserve an additional 18% by 2030.

GAP 1

Including National Parks, Wilderness Areas

- natural land cover permanently **protected from conversion**
- mandated **management plan** in operation to maintain a natural state
- **disturbance events allowed** or mimicked

GAP 2

Including National Wildlife Refuges, State Parks, The Nature Conservancy Preserves

- natural land cover permanently protected from conversion
- mandated management plan in operation
- some suppression of disturbance events

GAP 3

Including National Forests, BLM Lands, State Forests, State Parks

- natural land cover mostly protected from conversion
- subject to extractive uses (e.g. logging, mining)
- confers protection to federally listed endangered / threatened species

GAP 4

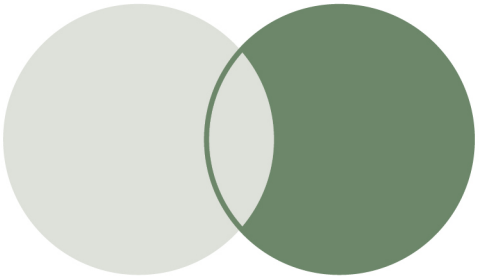
Including unknown areas, private lands, developed or agriculture areas

- no known mandates or restrictions to prevent conversion of natural habitat types
- management intent is unknown

7.91%	4.67%	17.26%	70.16%
PROTECTED		SEMI-PROTECTED	UNPROTECTED (OR UNKNOWN)

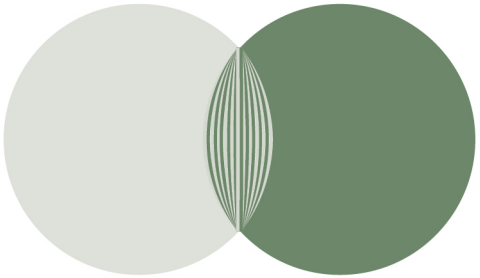
One current initiative for shaping future land use on a broad scale is 30x30, which aims to conserve at least thirty percent of national lands and waters by the year 2030. Landscape architects can help establish criteria for land prioritization.

Development Continues, Sensitive Land Lost

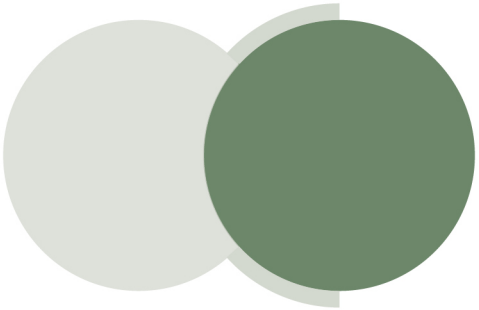


Default

Conservation Development



Land Protected, Development Redirected



Between 2001 and 2016,
2,000 acres of farmland and ranchland were converted daily

Over the next 15 years,
another 18 million acres of farmland and 45 million acres of working forests will be at risk of fragmentation

Source: American Farmland Trust, "Farms Under Threat: The State of the States" (Northampton, MA: American Farmland Trust, 2020), https://farmlandinfo.org/publications/farms-under-threat-the-state-of-the-states/; American Farmland Trust, "Farms Under Threat 2040: Choosing an Abundant Future" (Washington, DC: American Farmland Trust, 2022), https://farmlandinfo.org/publications/farms-under-threat-2040/.

The most vulnerable lands are often those that are also the most attractive for development. This conflict must be managed for these environmentally sensitive lands, so they are not lost to development forever.

Individual dataset inputs...

FOREST

CULTIVATED CROPLAND

PRIME FARMLAND

SPECIES BIODIVERSITY

WILDLIFE-URBAN INTERFACE

PARK ACCESS

GRAZING LAND

WETLANDS & OPEN WATER

WATERSHED VULNERABILITY

HABITAT CONNECTIVITY

ANTICIPATED DEVELOPMENT

VULNERABILITY TO CLIMATE CHANGE

...were weighted and combined into three categories:

ASSETS & EXISTING CONDITIONS
33.33%

\+

RISKS & SUITABILITIES
33.33%

\+

EQUITY
33.33%

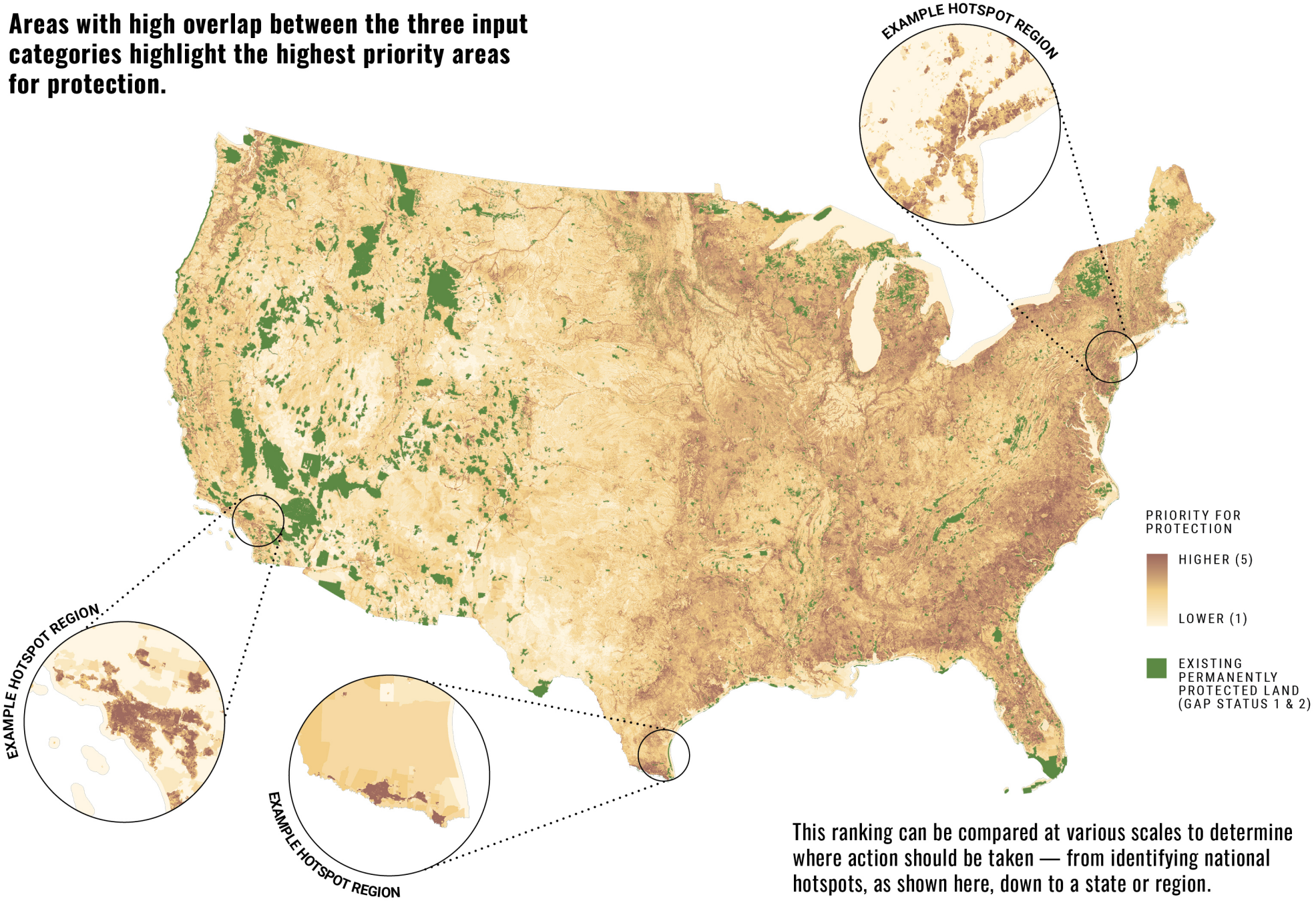
Assets and existing conditions are locations where multi-benefit large scale land management practices can be leveraged for the greatest impacts on sustainability and long term health of the land.

Risks and suitabilities are areas where ecological and hydrological qualities of the land have a heightened vulnerability to external threats.

Areas focused on equity highlight demographic and geographic disparities in exposure to environmental burden and pressure from land loss.

To create a pilot land prioritization mapping tool in GIS, twelve publicly available datasets representing assets and vulnerabilities were selected and combined into three 'input' categories. When combined, these datasets indicate the need and opportunity for land protection.

Areas with high overlap between the three input categories highlight the highest priority areas for protection.



This ranking can be compared at various scales to determine where action should be taken — from identifying national hotspots, as shown here, down to a state or region.

Prioritization scores are generated for every acre of the continental US using publicly available datasets. The resulting map can be used to visualize and identify contiguous regions across political boundaries with unique opportunities and challenges to land protection.

Southeastern Nebraska

EXAMPLE HOTSPOT REGION

170,256 acres in Nebraska

Prioritization Tool Output

Overall Score: 3.13

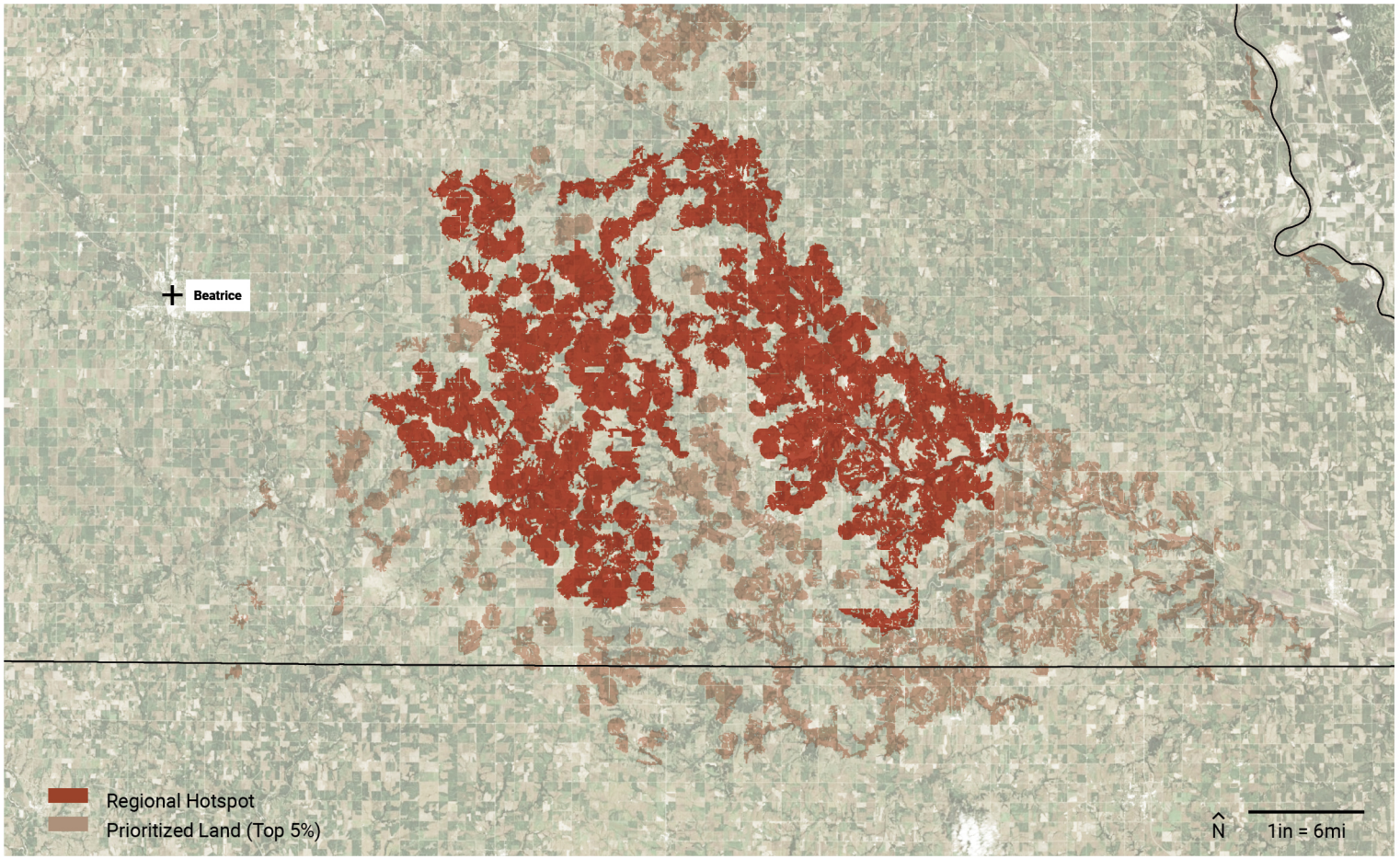
Physiography: 4.6
Suitability: 3.7
Equity: 1.1

Highest Ranking Inputs

Biodiversity, Cropland, Grazing, Watershed Vulnerability, Forest, Wetland

Nebraska Statistics

99.3% rural land area
97.6% privately owned



Regional Significance and Land Management Strategies

The Southeast Prairie ecosystem is considered a Biologically Unique Landscape (BUL) in Nebraska, comprising biotic and abiotic elements that set it apart from the surrounding tallgrass prairies of Nebraska Kansas. Due to the complex soil microbiomes of millenia of prairiegrasses, the soil is incredibly fertile and suitable for agriculture. This and the Homestead Act caused much of the decline in the prairie's natural habitat, making today's conservation of this land a high priority.

Windbreaks are rows of trees that reduce erosion through the lowering of wind speeds through croplands. The adoption of this conservation strategy was popularized after the Dustbowl of the 1930s, which stripped topsoil from much of the US. Windbreaks have the added benefit of reducing runoff and creating habitat for wildlife.

Conservation Reserve Areas are zones within agriculture fields adjacent to streams, wetlands, or sensitive ecosystems that farmers keep from planting in order to create habitat for native wildlife and vegetation. In return for this service to the environment, the federal government pays up to $250/acre of conserved land.

Crop rotation is the cycling through of crops to a certain field (typically 7-8 years per crop) in order to balance nutrient levels within the soil. For example, soybeans are often used in these rotations because they add nitrogen to the soil, and after many years corn will be planted and thrive on the remaining nitrogen. Corn and soybeans dominate the agricultural region, so maintaining proper levels of nutrients helps preserve these farm's production.

Zooming in on "hotspots" with large, connected areas of high-priority lands provides opportunities to learn about regionally specific issues and test how different conditions (from existing land use patterns to political conditions) intersect with at-scale land management strategies.

Access Initiatives

Recreation

Hunting and fishing

Arts and culture

Education

Physical Practices

Wetland restoration

Prescribed burns, fuel load reduction and stand improvement

Cultivation of a native nursery

Logging (where appropriate)

Rotational/cell grazing

Solar energy generation

No-till farming

Periodic species survey

Edge-of-field conservation practices

Groundwater recharge basin

Economic Incentives

Carbon offset market

Conservation fees

Tax assessments

Land management assistance

Grants

Conservation easements

Performance-based conservation

Mitigation and conservation banks

Solar rental

Grazing leases

Water trading

Policy & Planning

Native knowledge and management practices

Conservation easements

Private land ownership management Plans

Contracts with private landowners

Land management assistance

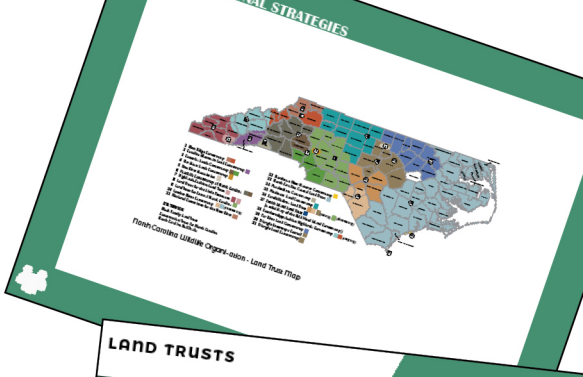
Proactive land-loss mitigation

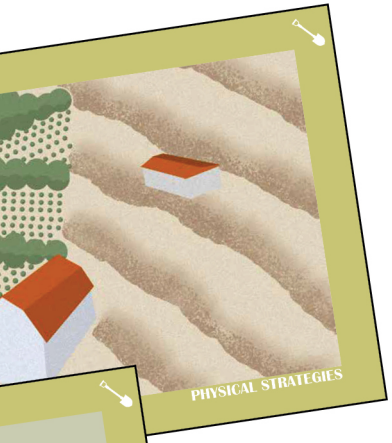
Land trusts

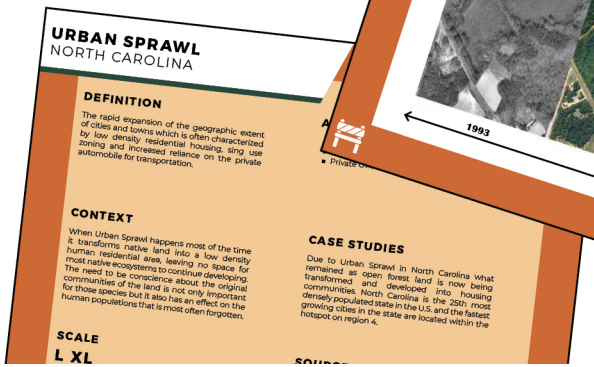
Conservation leases

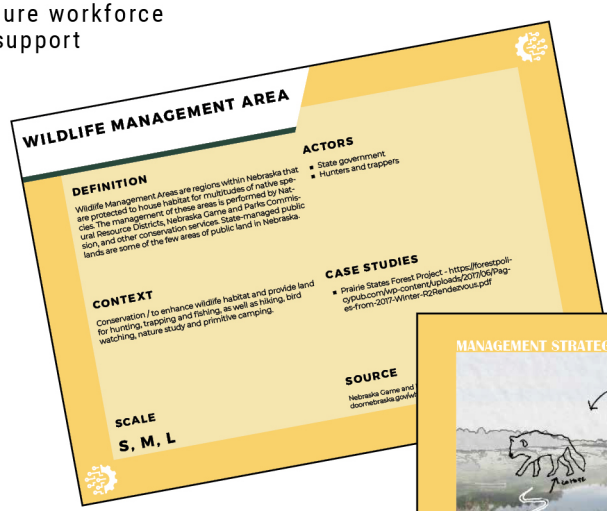
Block management program

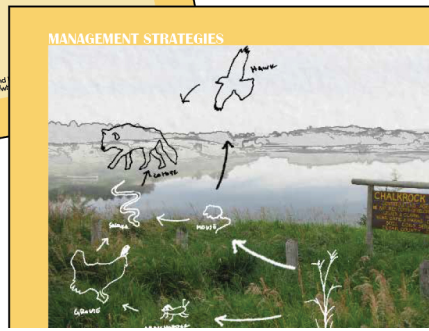
Agriculture workforce support











By visualizing multi-benefit land management strategies through a card deck, new combinations and partners can be tested. The card deck allows for a comprehensive inventory and increased legibility of the many factors playing out across public and private lands.

ROW CROPS

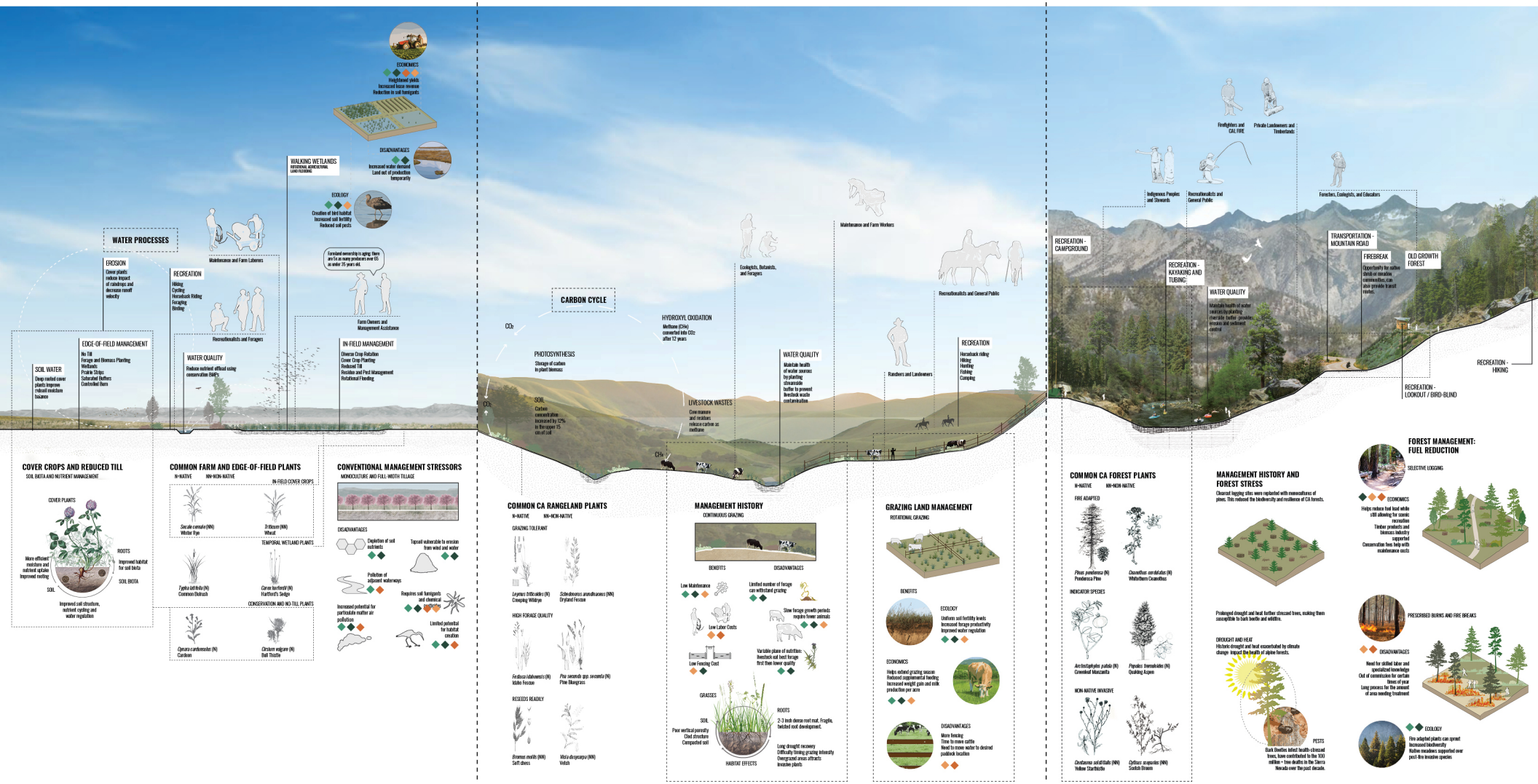
- Environmental toxin release
- Monoculture and the pollinator shortage
- Carbon-heavy machinery

PASTURE

- Methane production
- Monoculture and grazing practices
- Feed productoin

FOREST

- Forest health and invasive species
- Wildland megafires and WUI
- Water quality / quantity



Three key land typologies, row crops, pasture, and forest land, comprise the majority of land use in the United States. Transects of each typology highlight obstacles and opportunities for multi-benefit land management, which provide ecological benefits and increased access.

The forest is not a monolith. Of California's 33 million acres of forest, there are areas of...

DENSE FOREST

WOODLANDS / GRASSLANDS

CHAPPARAL / SHRUBLANDS

...that each require management strategies to match their particular qualities and vulnerabilities, especially against wildfire.

Management is shared across several entities:

57% is federally managed

3% is state and locally managed

40% is owned by families, Native American Tribes, or companies.

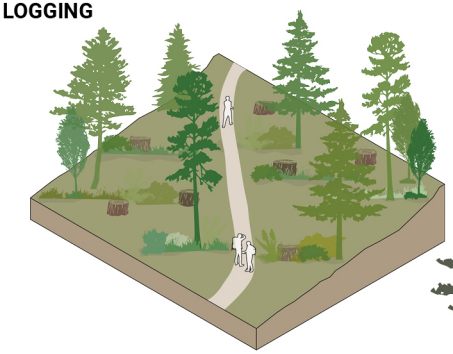
In August 2020, Governor Newsom and Vicki Christiansen, Chief of the United States Department of Agriculture's Forest Service (USFS), announced a historic **Agreement for Shared Stewardship of California's Forest and Rangelands** to improve the health of California's forests and reduce wildfire risk across the state.

EXAMPLE MANAGEMENT STRATEGIES FOR FUEL REDUCTION

SELECTIVE LOGGING

ECONOMICS

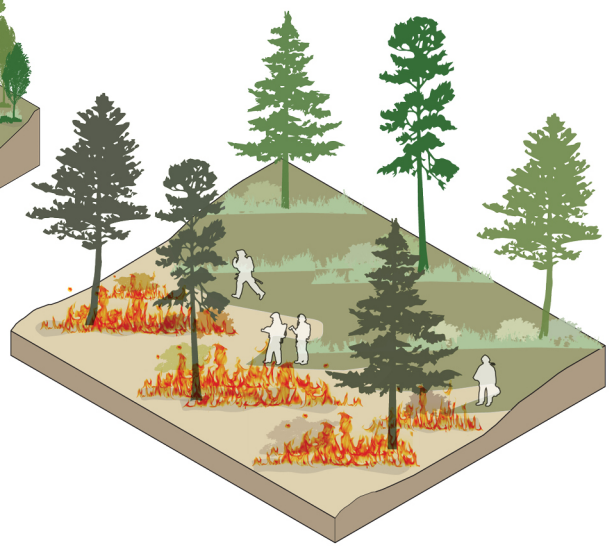
- Helps reduce fuel load while still allowing for scenic recreation
- Timber products and biomass industry supported
- Conservation fees help with maintenance costs



PRESCRIBED BURNS AND FIRE BREAKS

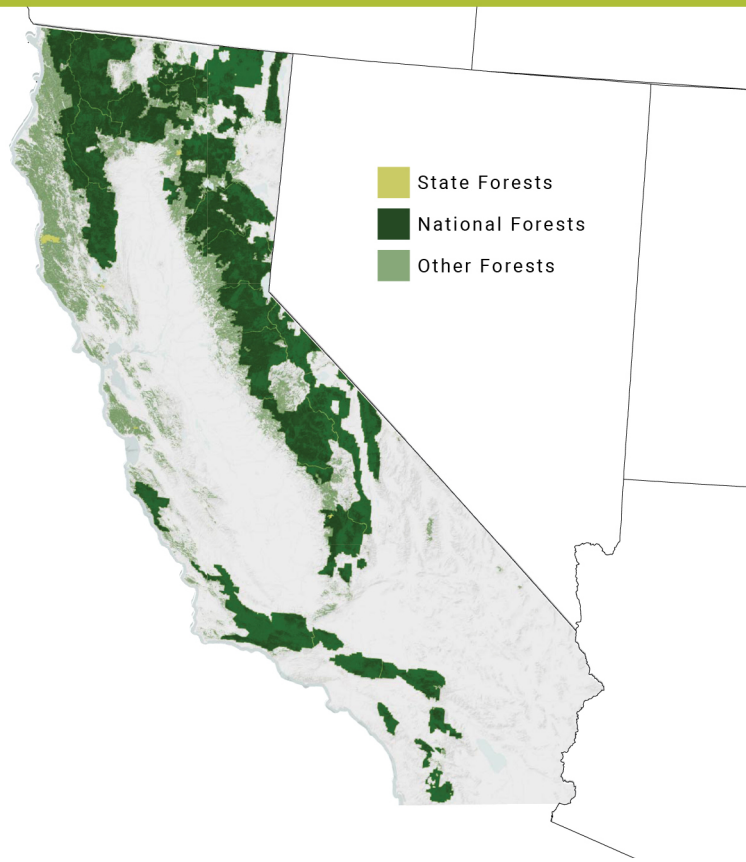
DISADVANTAGES

- Need for skilled labor, specialized knowledge
- Out of commission for certain times of year
- Long process for the amount of area needing treatment



ECOLOGY

- Climate / Carbon
- Jobs
- Justice



Within each land typology, specific microclimates and actors present opportunities for physical interventions and coordinated policies. A case study of California forests highlights a web of governance and potential fuel reduction and recreation strategies for economic and ecological benefits.

FEDERAL AGENCIES

- Bureau of Land Management (BLM)
- National Park Service (NPS)
- National Fish and Wildlife Service (NFWS)
- US Forest Service (USFS)
- Natural Resources Conservation Service (NRCS / USDA)
- US Army Corps of Engineers (USACE)

TRIBAL GROUPS

STATE AGENCIES

- Parks and Recreation
- Fish and Wildlife
- Food and Agriculture
- Water Resources
- Conservation and Natural Resources

LOCAL GOV'T

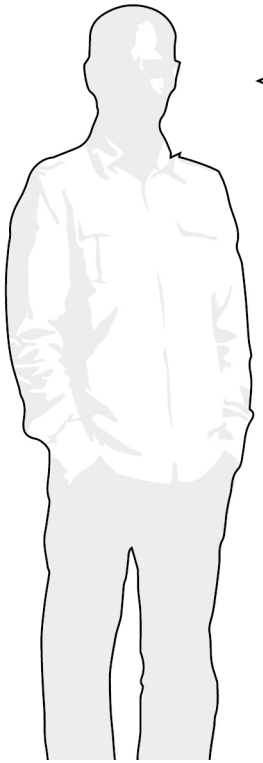
NON-PROFITS & NGOs

- Land Conservancies
- Land Banks
- The Nature Conservancy
- Partnerscapes
- Land Trust Alliance
- National Fish and Wildlife Foundation
- American Farmland Trust
- The Wilderness Society
- Pew Charitable Trust
- Open Space Institute
- McConnell Foundation
- LandCAN

INDIVIDUALS & PRIVATE ENTITIES

- Individual Landowners
- Landowner Coalitions (e.g. Western Landowners Alliance, South Dakota Grasslands Coalition)
- Professional Organizations (e.g. American Society of Landscape Architects, Society for Range Management, Society of American Foresters)

"Private landowners are stewards of more than 2/3 of the nation's land"



Conserving and protecting the refuges is a collective effort... We have to have buy-in from the community to be successful, and that's what we have.

Greg Austin, Project Leader
Klamath Basin National Wildlife Refuge

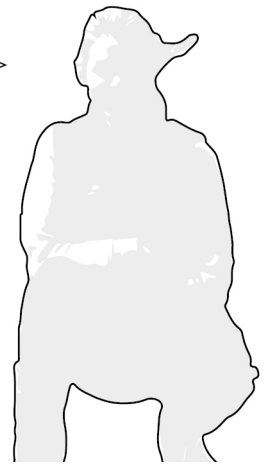
"Landscape architects **need to be building coalitions with non-designers** in the climate movement if we want to participate professionally in the world-historical project of addressing the impacts of climate change."

-Billy Fleming

"Design and the Green New Deal," **2019**

People need to get back to understand the value of fertile land and at the same time if you can do something that is beneficial for wildlife and still make your lands more fertile, and economically justify what you're doing... That's a good strategy.

Rob Crawford
Tulelake Basin Farmer



It is imperative to build broad coalitions around issues like land use and land protection. Initiatives like 30x30 will depend on creative collaboration and political action, on finding the right alignments among actors, even those who seem like unlikely partners.