



# A Primer on Landscape Conservation Design

Landscape Conservation Design (LCD) is a means to achieve a resilient, sustainable socio-ecological landscape by bringing stakeholders together to prioritize and coordinate actions on the ground. The approach empowers stakeholders at all levels of the decision-making process and optimizes operations by aligning actions to achieve outcomes at appropriate scales. Through an iterative, collaborative, and holistic process, the LCD results in maps, analytical tools, and strategies that enable stakeholders to achieve collective landscape goals.

The LCD concept emerged as grassroots partner groups across North America initiated action-oriented, landscape-scale conservation planning with the support of Landscape Conservation Cooperatives (LCCs). LCCs provided the platform for innovation: Staff and partners integrated multi-disciplinary approaches, vetted concepts, and developed a framework that is stakeholder-driven and informed by science.

This primer, based on *Recommended Practices for Landscape Conservation Design* (2018), is organized around the five components of the design process. Each component illustrates how an LCD might incorporate practices employed and vetted by existing designs. Key hallmarks in design development are recognition that landscape context, cross-disciplinary perspective, and availability of high-quality data benefits place-based conservation delivery. By working together to create and implement a landscape design, partners can more effectively conserve ecosystems and extend those benefits to human communities far into the future.

“Regional information really helps you focus. You can fine tune it with location information or field visits, but regional perspective gives you the broad brush to optimize, and then zoom into important areas you can verify.”

Alicia Logalbo, US Army Corps of Engineers

**INITIATE** 1  
Initiate the LCD



**CONVENE** 2  
Convene stakeholders & frame the LCD



**ASSESS** 3  
Assess current & future desired conditions



**SPATIAL DESIGN** 4  
Identify where functions & opportunities exist



**STRATEGY DESIGN** 5  
Arrive at a design for decision making





# 1 Initiate the LCD

- plan for iteration
- solicit leadership support
- develop shared vision
- seek compatibility with other planning processes
- assess budgeting & resources
- structure the decision-making process

Developed by the North Atlantic Landscape Conservation Cooperative in 2014, the Connecticut River Watershed LCD expanded in 2017 into a larger LCD called Nature's Network. This expansive LCD encompasses the entire Northeast and Mid-Atlantic geography. Key to the expansion was a core team that worked to ensure Nature's Network would be supportive and useful for State Wildlife Action Plan implementation.

This successful LCD has roots in leadership that played a vital role in the early design process. Agency and organization leads provided guidance and momentum, developed a shared vision, identified projects that created the necessary scientific basis, and supported staff participation. Additionally, to support collaborative decision-making, an innovative modeling approach developed by the Designing Sustainable Landscapes project at the University of Massachusetts was used with the best available regional science.



Farmland is an important feature of the Connecticut River landscape. Credit: Lamar Gore



# 2 Convene stakeholders & frame the LCD

- be inclusive
- engage leadership
- develop fundamental objectives
- define performance metrics
- build trust
- use common language
- engage consistently
- communicate frequently
- define scope
- identify threats & risks
- select conservation features & targets
- determine intermediate objectives



A tree farm owner meets with field trip participants in Washington. Credit: John Mankowski

The Cascades to Coast Landscape Collaborative started with a question to a broad group: Is there a need to collaboratively design a sustainable coastal ecoregion in Oregon and Washington? The consensus was yes, and this new network began to co-produce an LCD. During three large workshops and several webinars, the group identified a vision, goals, fundamental objectives, geographic scope, and collaborative principles.

The group also completed a social network analysis that identified a major gap—the absence of the working lands community. To engage them in the LCD process, the Collaborative held forums focused on family-owned forests. At the forums, participants helped reshape the original work plan in ways not previously considered. Not only was the plan improved, but trust was built with new stakeholders. Providing opportunities for stakeholders to join the design process is essential.

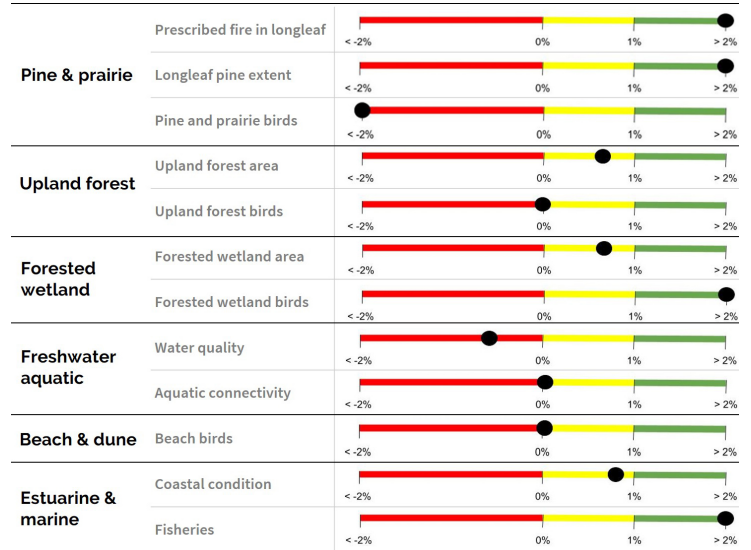


# 3 Assess current & future desired conditions

- assemble oversight team
- integrate existing efforts
- base on fundamental objectives
- conduct a situation analysis
- identify uncertainty
- engage in scenario planning

The Southeast Conservation Blueprint is the primary product of the Southeast Conservation Adaptation Strategy (SECAS), a regional conservation initiative started in 2011 by a partnership of state and federal agencies. The Blueprint is a living, spatial plan that identifies important areas for conservation and restoration across the Southeast and Caribbean. It stitches together smaller subregional plans into one consistent map, incorporating the best available information about the current condition of key species and habitats, as well as future threats.

Because the Blueprint is a living plan, it evolves through a yearly revision cycle driven by improvements to the underlying science, the growing understanding of on-the-ground conditions, and input from new partners. So far, more than 1,700 people from 500 different organizations have actively participated in its development.

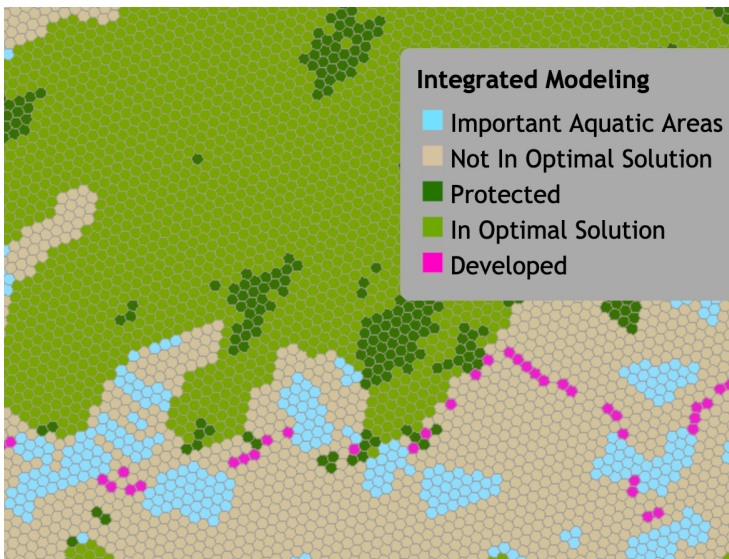


SECAS monitors ecosystem indicators to measure progress toward its goal. Black circles are trend results using the most recent 3-6 years of available data.



# 4 Spatial design

- assemble technical team
- select datasets
- assemble datasets
- vet datasets
- manage data
- agree on spatial products
- incorporate ecological principles
- document and archive
- ensure accessibility



Visualization of modeling results from the NatureScope online tool.

In the development of the Appalachian NatureScope Design, partners employed the help of a research team from Clemson University. Using super-computing technology and Marxan software (the most widely used conservation planning tool in designing networks of terrestrial, aquatic, and marine conservation areas), the team generated spatial products. The products help partners identify ecologically significant habitats and natural resources that are connected across the landscape and may be more resilient to future threats.

To move from optimization outputs to a transparent and user-friendly network design, an open access, online decision-support tool was created. This tool allows partners to identify areas of least cost and greatest value to inform regional conservation objectives, while also providing online data visualizations that help identify key conservation targets.



# 5 Strategy design

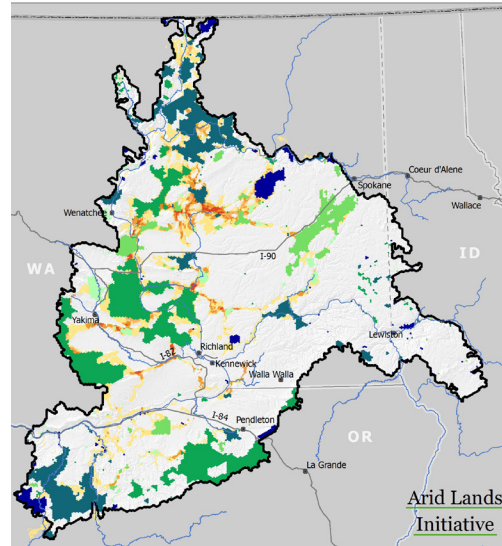
- confirm compatibility with other plans
- integrate with partners
- consult adjacent LCDs
- implement through network
- exchange information & technology
- monitor, evaluate, take action
- iterate

A strategy design complements the spatial design (Section 4) and describes a cooperative approach toward achieving desired future conditions (Section 3). The strategy helps partners answer the questions: Who does what and where should it be done? This provides a landscape context for the partner network to align and implement their plans, and evaluate conservation investments and actions.

Based on priority strategies, the Arid Lands Initiative's (ALI) Columbia Plateau LCD employed sets of a results chains (a diagram depicting actions that contribute to desired outcomes) to visualize how individual partner contributions lead to a collective impact. Scorecards are used to identify how actions in priority core areas contribute to desired landscape-scale conditions for conservation features. Future iterations of the LCD will incorporate monitoring and evaluation steps to inform and enhance conservation delivery.

## Implementing the LCD

An actionable LCD provides cohesive context for partner organizations implementing their individual management plans. For example, ALI's partners are using the shared priorities to guide or inform planning and conservation investments. Because all partners are using the common LCD spatial and strategic designs,



### ALI Priority Areas

#### Priority Core Areas

- Contribution of priority area to under-represented targets
- Low
  - Medium-low
  - Medium
  - Medium-high
  - High

#### WHCWG Linkages

- Linkage centrality rating
- Very high
  - High

#### Number of overlapping WHCWG species networks

- 6 - 9
- 4 - 5

Data Sources: Arid Lands Initiative (ALI), WHCWG, Esri, USGS NHD, Natural Earth

Priority core areas and linkages in the Arid Lands Initiative LCD across the Columbia Plateau in portions of Washington, Oregon, and Idaho.

landscape threats are being addressed and high-priority species and habitat are benefiting. The collective outcome: Each partner achieves their individual mission and management objectives which collectively scale up to more resilient intact ecosystems.



The Columbia Plateau is a diverse landscape supporting over 235 plant and wildlife species while producing billions of dollars in crops and livestock annually. Photo credit: Palouse River Canyon, Williamborg/Wikimedia Commons; Sharp-tailed Grouse, USFWS; Wind turbines, M McFadzen; Washington ground squirrels, USFWS; Apple orchard, ARS

## Resources

- Appalachian NatureScape: <https://www.landscapepartnership.org/plan-design/conservation-design>
- Arid Lands Initiative: <http://aridlandsinitiative.org>
- Assessing the Condition and Resilience of Collaborative Conservation Priority Areas in the Columbia Plateau Ecoregion: <https://www.sciencebase.gov/catalog/item/54ee1862e4b02d776a684a11>
- Campellone, R. et al. 2018. The iCASS Platform: Nine principles for landscape conservation design: <https://www.sciencedirect.com/science/article/pii/S0169204618302354?via%3Dihub>
- Cascades to Coast Landscape Collaborative: <https://www.ctoclc.org>

- Connect the Connecticut: <http://connecttheconnecticut.org>
- Nature's Network: <http://naturesnetwork.org>
- Recommended Practices for Landscape Conservation Design: <https://www.fws.gov/science/pdf/LCD-Recommended-Practices.pdf>
- Southeast Conservation Blueprint: <http://secassoutheast.org/blueprint.html>

## Contact

- Sean Finn, USFWS R6 Science Applications, [sean\\_finn@fws.gov](mailto:sean_finn@fws.gov)

Cover photo: Conservation professionals review a draft of the Conservation Blueprint in the South Atlantic subregion. Credit: Rua Mordecai, USFWS