



Landscape Conservation Initiative

Linking science, policy, and
management to benefit people,
places and biodiversity in
a changing West

NORTHERN
ARIZONA
UNIVERSITY



Taking the Initiative in Science and Conservation

Most conservation challenges involve multiple species whose fates are influenced by many factors playing out at the landscape level. Solutions emerge when people work together to plan and act at scales appropriate to the challenges. The need for practical science to guide landscape conservation in the American West is growing, due to increasing human needs and our rapidly changing environment. But science alone is unlikely to generate solutions. As the complexity of land and resource management challenges increases, so too does the complexity of policy decisions and the need to engage the public in developing solutions and creating the base of support necessary for implementing them. Strengthening this linkage between science and policy, and bridging the gap between theory and practice defines the core mission of the Landscape Conservation Initiative (LCI).

Our work links a strong research program in ecology and environmental science with innovative models for landscape assessment, planning, and management. Building on this expertise, our education programs take students into the field, where they experience the relationship between rigorous science and practical solutions through experiential learning in some of the world's most breathtaking geographies. These three program areas—research, collaborative planning, and experiential education—draw on a broad network of collaborating scientists and land stewards, providing a solid foundation for innovative conservation work.

As a research center at Northern Arizona University, the LCI draws on expertise from across the academic sector, from a board range of partners in state, federal and tribal agencies, and from private landowners and public interest groups. Our business model is based on partnerships that reach beyond the university to define a new way of operating that leverages science in the practice of conservation and sound stewardship. As in all true partnerships, each participant brings vital skills and perspective to the table, and the outcomes surpass what we might have accomplished individually. In this spirit of interdisciplinary inquiry, collaboration, and informed action, we invite you to join us.

Tom Sisk, Director

Olajos-Goslow Chair of Environmental Sciences and Policy

Research and Applications

Today's conservation challenges pose novel questions about organisms and their habitats, and how each will respond to environmental change. LCI's Lab of Landscape Ecology and Conservation Biology (LLECB), working with Conservation Science Partners, Inc. and many collaborating scientists across the West, is increasingly involved in projects that develop and test innovative approaches for integrating rigorous science into planning and policy development, particularly as it relates to the restoration, conservation, and sustainable management of public lands. The following examples illustrate the capacity of LCI researchers to meet the scientific needs of the conservation community.

Field Research:

California Condors

The California condor (*Gymnogyps californianus*) remains one of the most endangered species in the world and an icon for conservation, despite twenty years of captive breeding and reintroduction efforts. One reason for this is the high mortality due to lead poisoning, accounting for 50% of diagnosed deaths in free-ranging condors in California and Arizona. Recently, the LCI began a partnership with The Peregrine Fund, the lead organization in condor recovery, to develop new approaches for analyzing spatial data on condor movements and habitat use, as well as new approaches for disseminating the results, and new insights on the effects of lead exposure and how to reduce its impacts on wildlife and humans.



Photo by C. Parish

Spatial Analysis:

Bighorn Sheep

The desert bighorn sheep (*Ovis canadensis mexicana*) is one of the few ungulate species native to North America that is capable of surviving in harsh desert environments and xeric conditions. However, the effects of an increasingly arid climate on this species and its habitat are not known. The LLECB integrated remotely sensed data on resource availability with landscape-scale statistical models of space use to identify key areas in the Kofa National Wildlife Refuge for bighorn sheep habitat conservation efforts, namely areas with forage and preformed water resources, as well as steep, rugged escape terrain.



Photo by C. Hoglander

Modeling:

Fire in the Sonoran Desert

In the Sonoran Desert of southwestern Arizona, climate change and non-native plant invasions may increase the frequency and size of wildfires. This project maps the probability of large fire occurrence, incorporating fire and biophysical data in a statistical framework. The results are then coupled with wind simulations to model the spread of fire under high-risk conditions. Resource managers use these results to monitor annual fire risk under changing environmental conditions. Coordinated management across jurisdictional boundaries will also benefit from these spatially explicit, landscape-scale estimates of fire likelihood.



Photo by S. Henry, USFWS

Collaborative Planning

Fostering well-informed societal responses to environmental challenges requires establishing a common information base, developing community-based approaches for examining a diverse range of ideas and management alternatives, and providing new tools for visualizing current conditions and the expected outcomes of proposed policies and future actions. LCI's approach to assessment and planning, validated through peer-review and trialed in real-world planning efforts, establishes a practical foundation for linking land and resource management challenges to a transparent and accessible process that empowers participants of diverse backgrounds.

Greater Grand Canyon Landscape Assessment

With its astounding natural beauty and great cultural significance, the Grand Canyon region warrants the highest level of stewardship for all of its resources. The Greater Grand Canyon Landscape Assessment is assessing the condition of natural and cultural resources for the Grand Canyon and surrounding landscape by evaluating current conditions for a subset of collaboratively-defined focal resources, reporting on trends in resource condition and relevant threats, and identifying critical data gaps. It provides an opportunity for stakeholders to participate in a collaborative process to develop a sound, scientific foundation that will inform future planning and stewardship efforts in Grand Canyon National Park.



NPS photo

Green River Basin Landscape Conservation Design

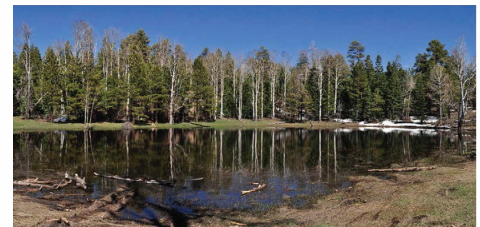
LCI and Conservation Science Partners are leading collaborative planning and climate adaptation for Utah's Green River Basin Landscape Conservation Design. The project examines regional natural resource values in the context of increasing stressors like climate change. Stakeholders participate in spatial analysis, exploring management scenarios to determine how to best mitigate resource degradation and identify high impact areas where conservation, restoration, or protection are most needed and feasible. This work empowers managers and stakeholders to discuss priorities, common objectives, and future actions in a deep, informed way.



Photo by Ken Lund

Kane and Two-Mile Research and Stewardship Partnership

Building on a long-term partnership with the Grand Canyon Trust, LCI joined with other state, federal and university organizations to found the Kane and Two Mile Research and Stewardship Partnership. This collaborative group of scientists, livestock producers, and resource managers is actively pursuing science-based solutions to the emerging challenges across almost a million acres of public lands on the North Rim of Grand Canyon. This dramatic landscape is the site of ambitious research, planning, and educational efforts—all building on collaborative efforts to integrate novel approaches to livestock management with conservation strategies addressing the spread of non-native species and the effects of climate and land-use change.



NPS photo

Education and Training

LCI designs, implements, and supports experiential learning opportunities that blend traditional classroom methods with authentic field-based experiences to create a more engaged and informed conservation science and stewardship base for students. The majority of LCI's educational efforts supplement and enrich existing programs at Northern Arizona University and partnering institutions through research projects addressing conservation-relevant issues, hands-on field experiences in working landscapes, and the examination of real-world case studies using data collected and analyzed in concert with LCI scientists.

Grand Canyon Semester

The Grand Canyon Semester offers a life-changing learning experience in the high mountains of northern Arizona and the deep canyon country of the Colorado Plateau. Students with a wide variety of interests and passions come from across the country and around the world to join faculty in the natural sciences, social sciences, arts, and humanities to investigate how humans impact, manage, interact with, and value the natural world. On backcountry field trips, in classrooms and art galleries, around campfires and in traditional hogans, and floating down the Colorado River through the Grand Canyon, we confront key environmental and social challenges in these diverse natural and cultural landscapes.



LCI photo

Doris Duke Conservation Scholars Program

The Doris Duke Conservation Scholars is a multi-year program for undergraduate students who have an interest in conservation and experience working across ethnic, cultural or racial lines.

During the first summer, students participate in an immersion program followed by a research internship working with a team in the Grand Canyon region. During subsequent summers, scholars pursue conservation research projects nationwide mentored by natural resource professionals. The program is committed to mentoring, advising, and providing networking opportunities for students during their undergraduate education, after graduation, and once they enter the conservation workforce.



LCI photo

Wyss Scholars for the Conservation of the West

The Wyss Scholars program identifies, supports, and cultivates a new generation of western conservation leadership. Scholarships are awarded to NAU graduate students who demonstrate academic excellence and dedication to conservation in the Intermountain West. Scholars receive financial support while they complete their degree and have the opportunity to receive post-graduation awards contingent upon them conducting qualifying non-profit or agency conservation work. The Scholars are also inducted into a network of emerging conservation leaders from other Wyss Scholars universities including the University of Montana, University of Michigan, and Yale.



Dylan DesRosier photo

LCI Partners

(as of 08-01-2015)

Arizona Game and Fish Department
Conservation Science Partners
Diablo Trust
Flagstaff Arts Council
Grand Canyon Trust
Museum of Northern Arizona
National Park Service
The Peregrine Fund
Southwest Fire Science Consortium
US Department of Defense
US Fish and Wildlife Service
US Forest Service

So many conservation debates are either academic or ideological. LCI brings a scientific rigor combined with a commitment to collaboration that greatly enhances our collective chances of resolving the most vexing conservation challenges in a science-based and also socially durable manner.

Ethan Aumack, Grand Canyon Trust

Establishing effective collaborative solutions across social and jurisdictional boundaries is just one of the potential goals to be achieved by combining the efforts of LCI and The Peregrine Fund.

Chris Parish, The Peregrine Fund



Photo by Grand Canyon Trust

LCI Faculty, Staff, Students and Associates (as of 08-01-2015)

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Photo by BLM



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