

# Resources for Ecological Restoration in the Mojave, Sonoran and Chihuahan Desert Ecosystems

## **GENERAL** (including techniques, and sources that cover a variety of restoration issues)

- The Society for Ecological Restoration [www.ser.org](http://www.ser.org)
- Soil Ecology and Restoration Group <http://www.serg.sdsu.edu/SERG/techniques.html>
- High Altitude Revegetation <http://www.highaltitudereveg.com>
- NatureServe <http://natureserve.org/>  
(Umbrella group for State Heritage and other Biological Inventory Groups)
- Nature Serve Online Encyclopedia of Life**
- Offers information on plants and animals or communities from searchable database.
  - Information available in form of distribution maps, summaries, or comprehensive.
  - Information for some species is not fully complete.

Mojave Desert Science Symposium <http://www.werc.usgs.gov/mojave-symposium/>  
A list of related links of Mojave Desert Research also

## **PLANNING** (including landscape planning)

### The Nature Conservancy

**ConserveOnline** <http://www.conserveonline.org/>  
ConserveOnline is a public library of conservation tools, techniques, and experience. It provides information and support to anyone making conservation-related decisions, from the staff of conservation organizations to land managers at government agencies to local land trusts and private landowners. ConserveOnline is an open forum for sharing successes and failures, and for connecting scientific research with field-based conservation practice.

**Landscape Conservation Networks** <http://tnc-ecomangement.org/>  
Landscape Conservation Networks (LCNs) are a highly effective vehicle for accelerating both conservation work at specific portfolio landscapes, as well as organizational learning about conservation planning, threat abatement, and strategy development and implementation. LCNs bring together Conservancy field staff, partners, and scientific experts in a series of facilitated, progressive workshops focused on key threats and strategies identified in ecoregional and conservation area plans. The networks are coordinated by the Conservancy's Learning Networks Program.

### Wildlands Project Related Sources and Contacts

- Sonoran Desert Conservation Plan: <http://www.co.pima.az.us/cmo/sdcp/>
- Sky Islands Wildlands Network Conservation Plan: <http://www.skyislandalliance.org/sia/siwn.htm>

### Contacts

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(520)629-0525 fax [csdp@azstarnet.com](mailto:csdp@azstarnet.com) [www.sonorandesert.org](http://www.sonorandesert.org)

Soulé, M. E. and J. Terborgh, editors. 1999. **Continental Conservation: Scientific foundations of regional reserve networks**. Washington, D.C.: Island Press.

Continental Conservation represents the work of thirty leading experts-including Michael Soulé, John Terborgh, Reed Noss, Paul Paquet, Dan Simberloff, Rodolfo Dirzo, J. Michael Scott, Andrew Dobson, and others-brought together by The Wildlands Project to examine the science underlying the design and management of these regional-scale networks. It provides conservationists and biologists with the latest scientific principles for protecting living nature at spatial scales that encompass entire regions and continents. Following an opening chapter that sets the stage by introducing major themes and the scientific and policy background, the contributors:

- consider scale in the identification, selection, and design of biological reserves
- examine the role of top carnivores in regulating terrestrial ecosystems
- suggest the need for a paradigm shift in the field of ecological restoration
- consider the scientific details of implementing regional conservation in core areas, corridors, and buffer zones
- discuss the need for megareserves and how to design them

The book ends by challenging the reader, whether scientist or advocate, to commit more time to the effort of saving nature. The authors argue that the very survival of nature is at stake, and scientists can no longer afford to stand behind a wall of austere objectivity. Continental Conservation is an important guidebook that can serve a vital role in helping fashion a radically honest, scientifically rigorous land-use agenda. It will be required reading for scientists and professionals at all levels involved with ecosystem and land management.

The Wildlands Project is a far-reaching effort by scientists and activists to develop better ways of protecting nature, wilderness, and biodiversity. Its ultimate goal is to establish an effective network of nature reserves throughout North America-core conservation areas linked by corridors, and buffered, where appropriate, by lands that may also serve economic objectives.

**Leanne Klyza Linck's** email is [leannekl@wildlandsproject.org](mailto:leannekl@wildlandsproject.org) and she is at the main office in Richmond VT.

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### **Ecological models and Desired Future Conditions**

#### **Server for Ecological Modeling**

<http://eco.wiz.uni-kassel.de/ecobas.html>

The Register of Ecological Models (REM) is a meta-database for existing mathematical models in ecology.

## **RESOURCE AREAS**

### **Wetland/Riparian/Aquatic**

#### **Natural Resources Conservation Service**

<http://Plant-Materials.nrcs.usda.gov/idpmc/>

(select Riparian/Wetland Project)

Aberdeen Plant Materials Center – Technical publications on wetland and riparian plant propagation, bioengineering methods, restoration of wetland and riparian systems, and more for the Intermountain West

#### **New York State Salt Marsh Restoration and Monitoring Guidelines**

<http://www.dos.state.ny.us/pdfs/saltmarsh.pdf>

#### **Stream Corridor Restoration: Principles, Processes, and Practices**

[http://www.usda.gov/stream\\_restoration/newgra.html](http://www.usda.gov/stream_restoration/newgra.html)

#### **U.S. Environmental Protection Agency**

<http://www.epa.gov/owow/wetlands>

Extensive information on wetlands, including restoration publications

#### **USDA – Fire Effects Information System**

<http://www.fs.fed.us/database/feis/>

Information on ecology of many wetland and other plant species

#### **USGS-Biological Resources Division**

<http://www.npwrc.usgs.gov/resource/literatr/wetresto/wetresto.htm>

Wetland Ecology and Restoration Bibliography

#### **USGS**

<http://www.npwrc.usgs.gov/resource/literatr/ripareco/ripareco.htm>

Riparian Ecosystem Creation and Restoration Literature Summary

#### **Natural Resources Conservation Service**

<http://www.pwrc.usgs.gov/wli/>

Wetland Science Institute

### **Fire**

#### **Fire Effects Information System**

<http://www.fs.fed.us/database/feis>

#### **Association for Fire Ecology (AFE)**

<http://www.ice.ucdavis.edu/afe/>

An organization of professionals dedicated to improving the knowledge and use of fire in land management.

#### **Fire and Fire Surrogates Study**

<http://ffs.fs.fed.us>

The USDI-USDA [Joint Fire Science Program](#) has provided funding for a long-term study to assess how ecological components or processes may be changed or lost, if fire "surrogates" such as cuttings and mechanical fuel treatments are used instead of fire, or in combination with fire.

#### **The Nature Conservancy Fire Management Program** <http://www.tncfire.org/>

The Nature Conservancy's Fire Initiative oversees fire management on TNC preserves nationwide, fosters fire ecology research, and promotes the judicious use of prescribed fire to meet biodiversity conservation needs through publications, information exchange, and fire policy reviews.

#### **Information Resource Center**

<http://www.tncfire.org/resource/resource.htm>

## **Native Plants**

### **The Native Plant Network**

<http://www.nativeplantnetwork.org>

The Native Plant Network is devoted to the sharing of information on how to propagate native plants of North America (Canada, Mexico, and US). Feel free to search the database for species you have interest in, and please take the time to upload protocols of species you successfully grow. You will receive full credit for your entry and have the opportunity to add your company logo to the protocol. If you would like to share some propagation techniques, entry is easy using the Protocol Interface.

### **PCA (Plant Conservation Alliance)**

<http://www.nps.gov/plants/>

The PCA is a consortium of ten federal government Member agencies and over 145 non-federal Cooperators representing various disciplines within the conservation field: biologists, botanists, habitat preservationists, horticulturists, resources management consultants, soil scientists, special interest clubs, non-profit organizations, concerned citizens, nature lovers, and gardeners. PCA Members and Cooperators work collectively to solve the problems of native plant extinction and native habitat restoration, ensuring the preservation of our ecosystem.

### **USDA-NRCS – Plants Database**

<http://plants.usda.gov/>

### **Plant Materials program website**

<http://plant-materials.nrcs.usda.gov/>

## **Native Plant Society/State Information**

### **North American Native Plant Society**

<http://www.nanps.org>

The North American Native Plant Society. NANPS was founded in 1984 by conservationists as the Canadian Wildflower Society, and now includes member throughout North America. One of the first initiatives was the founding and fostering of North America's foremost native plant magazines: *Wildflower*.

NANPSs goal is to reverse this trend through education and information -- aiding the restoration of healthy ecosystems across the continent.

### **Arizona Native Plant Society**

<http://aznps.org/>

- Member oriented site that offers links to native plant resources such as herbariums, societies and gardens in Arizona.
- List of sources that sell native plants and seed.

### **California Native Plant Society**

<http://www.cnps.org>

The California Native Plant Society (CNPS) is a statewide non-profit organization of amateurs and professionals with a common interest in California's native plants. The Society, working through its local chapters, seeks to increase understanding of California's native flora and to preserve this rich resource for future generations. Membership is open to all. Members have diverse interests including natural history, botany, ecology, conservation, photography, drawing, hiking, and gardening.

Also (<http://www.nativehabitats.org/calnat.htm>)

### **Nevada Native Plant Society**

<http://www.nanps.org>

The Nevada Native Plant Society (NNPS) is a non-profit corporation organized solely for educational, scientific and charitable purposes for the stimulation of interest in and the developing of an appreciation for native Nevada plants and their preservation.

### **Utah Native Plant Society**

<http://www.unps.org/>

The Utah Native Plant Society is dedicated to the appreciation, preservation and conservation of the native plant and plant communities found in the state of Utah. Our goal is to foster public recognition of the spectacularly diverse flora of the state--a natural treasure to be valued, respected and protected.

**Native Plant Society of Texas**<http://www.npsot.org/>

Goals of this group are to:

- To educate both its members and the general public, and to foster a greater awareness and understanding of native flora;
- To preserve rare and endangered species and their habitats;
- To encourage landscaping with appropriate native plants, for their beauty, ease of maintenance, and water-conserving qualities;
- To protect, conserve and restore native plants threatened by development;
- To encourage the responsible propagation of native plants;
- To promote an appreciation and understanding of current, historical and potential uses of native plants.

**Native Plant Society of New Mexico**<http://npsnm.unm.edu/>

The purpose of the Native Plant Society of New Mexico is to promote the conservation of our native flora, plant habitats and encourage the appropriate use of native plants in New Mexico. We support research and educational activities in New Mexico schools and universities. [NPSNM Business](#) pages detail the budget, by-laws, and minutes of the board meetings.

**Colorado Native Plant Society**<http://carbon.cudenver.edu/~shill/conps.html>

The Colorado Native Plant Society is a non-profit organization dedicated to the appreciation and conservation of the Colorado native flora. Membership is open to all with an interest in our native plants, and is composed of plant enthusiasts both professional and non-professional.

**LadyBird Johnson Wildflower Center**<http://www.wildflower.org/>**Texas Native Shrubs**<http://aggie-horticulture.tamu.edu/ornamentals/nativeshrubs/>

Database with pictures and good information on 338 species of shrubs. Desert/arid species are included. Search by picture or common name.

**Southwest Colorado Wildflowers, Ferns, & Trees**<http://www.swcoloradowildflowers.com>

- Great site for plant identification (even for beginners).
- Search by flower color, type or by plant name.
- Offers a variety of color pictures and detailed information on native plants.
- Plant chart that has information on vegetative zone, habitat and blooming season.

**Desert USA**<http://www.desertusa.com/index.html>

- Directory of all desert related information (plants, animals, geology, etc).
- Desert plants and wildflowers link offers articles and information on special desert plants.
- Wildflower field guide and update on what is currently in bloom.

**Land Use History of North America- The Colorado Plateau**<http://cpluhna.nau.edu>

- Great site for overall description of Colorado Plateau (native and non-native plants, animals, historical uses, etc.)
- Description of biotic communities within Colorado Plateau.
- Some non-native plant information pertaining to Colorado Plateau such as Tamarisk.

**Northern Arizona University Native Plants**<http://www.for.nau.edu/azproject/>

- Arizona biomes map with descriptions of ecology and representative plant species.
- Offers some native plant descriptions and images of more common species.

**California Native Plant Nursery**<http://www.laspilitas.com/>

Lots of information, plant photos, plant growth requirement, and a design program. CA specific.

**Wildflowers of Southern California**<http://www.clunet.edu/wf/index.htm>

Photos of wildflowers identified to scientific, common, or family names. Interactive “What’s that Plant” program for basic plant identification.

**Salt Tolerant Plants**<http://www.ussl.ars.usda.gov/pls/caliche/Halophyte.query>

Database of salt tolerant plants and their uses

**Non-Native Species****USDA-NRCS-Plant Data Center**<http://plants.usda.gov>

Central database and information on native and non-native plants.

**The Nature Conservancy Wildland Weed Program** <http://tncweeds.ucdavis.edu/>

Directs you to various planning, decision and action support sources including:

- ESA on exotic species.
- Photo collection with many pictures of different plant parts.
- Management library for specific species management information.
- Invasive species alert for any new exotics or of special concern.

**Federal Noxious weed list**<http://www.aphis.usda.gov/ppq/bats/noxweed.html>

List of all noxious species both animals and plants.

**Alien Plant Working Group**<http://www.nps.gov/plants/alien>

- Offers fact sheets on non-natives with images.
- Basic information on non-natives, terms, definitions, problems, and prevention.

**Encycloweedia**<http://pi.cdfa.ca.gov/weedinfo/>

- California State Noxious weeds biology information listed.
- Photo gallery with multiple pictures of plant parts (juvenile form, leaves, flowers, seed head, etc).

**“An Illustrated Guide to Arizona Weeds”**<http://www.vapress.arizona.edu/online/bks/weeds/titlweed.htm>

Descriptions and illustrations from book available to view online.

**The Weed Web**<http://www.ext.usu.edu/ag/weeds/index.htm>

- Plant descriptions and pictures.
- Offers multiple pictures of some southwest exotics.

**Colorado Weed Management Association**<http://www.cwma.org/>

- Information on non-natives in categories.
- List of exotics specific to Colorado with descriptions and pictures.
- Events calendar and newsletter.

**Virginia Tech Weed Identification Guide**<http://www.ppws.vt.edu/weedindex.htm>

- A few southwest exotics such as thistles and knapweeds but mainly northeast exotics.
- Offers excellent photos of these exotics in juvenile form and close up of leaves for identification. If in doubt of species, check here!

**Invasive species information**<http://www.invasivespecies.gov/>

- Site brings a large network of weed resources on the net.

- Offers profiles, laws & regulations, databases, education resources, geographic, management & prevention information.
- Lists only exotics species of high concern (leafy spurge, tamarisk, etc).

### **Crop Management**

<http://www.crop-net.com>

- Covers crop management issues in Northwest, Midwest, West and Southern areas.
- Information on weeds, insects or disease pertaining to crops.
- News headlines about current crop issues (flooding, drought, or pests).

### **Jointed Goatgrass**

<http://jgg.unl.edu/index.html>

- Site dedicated to Jointed Goatgrass.
- In depth biology, pictures, ect.
- Access to research papers, distribution maps and information on control and management plans.

### **Arizona-Sonora Desert Museum**

<http://www.desertmuseum.org/conservation/invasive/>

### **Montana Weed Control Association**

<http://www.mtweed.org/>

- Identification of weeds, general weed descriptions with pictures.
- Information on impacts, control, herbicide and news.
- Montana Management plan and newsletter.

### **Global Invasive Species Database**

<http://www.issg.org/database/welcome/>

- List of exotics both plant and animal
- 100 Worst invasive species in the world
- Search engine for exotic information

### **Southwest Exotic Plant Mapping Program (SWEMP)** <http://sbsc.wr.usgs.gov/research/projects/swepic/swepic.asp>

- Regional exotic mapping information.
- Species information for Colorado Plateau plants
- Data collection and management information

### **Northern Arizona Weed Council**

<http://www.infomagic.net/~tnc/weedcouncil/weedhome.htm>

The *Northern Arizona Weed Council* works to protect biological diversity and promote healthy ecosystems by preventing introduction and spread of invasive, non-native plants in northern Arizona. The Council is a partnership to promote cooperation and coordination among public and private organizations and interested individuals. NAWC also maintains current maps and information about local Weed Management Areas.

### **University of Arizona Pesticide Information and Training Office**

<http://ag.arizona.edu/pito/>

Manuals, handbooks, training resource

### **EXTOXNET**

<http://ace.orst.edu/info/extoxnet>

Pesticide information and profile

### **Arizona Department of Agriculture**

<http://agriculture.state.az.us>

Links to pesticide information and training; noxious weed lists and IPM information

### **Herbicide Resistant Weeds**

<http://www.weedscience.org/Case/Case.asp?ResistID=512>

### **Books**

Chambers N. and T.O. Hawkins. **Invasive Plants of the Sonoran Desert.** (I cannot figure out from this book who actually published it – but it is a great reference)

## Ecosystem Types

Desert Grasslands

[http://www.ecoreresults.org/restorations\\_cedar\\_mt.html](http://www.ecoreresults.org/restorations_cedar_mt.html)

Great Basin

[http://www.natureali.com/great\\_basin\\_desert.htm](http://www.natureali.com/great_basin_desert.htm)  
<http://www.fire.blm.gov/gbri/>

## Soils

**Natural Resource Conservation Service of the USDA**  
check the Technical Resources and Programs tab, and related,  
**Soil Survey Section page:**

<http://www.nrcs.usda.gov/>

[http://soils.usda.gov/soil\\_survey/main.htm](http://soils.usda.gov/soil_survey/main.htm)

**Mycorrhizal Fungi**

General introduction to mycorrhizal fungi and links.

<http://www.mycorrhiza.com>

**Soil Ecology and Restoration Group (SERG)**

<http://www.serg.sdsu.edu/SERG/index.html>

## Dumps

**California Integrated Waste Management Board**

<http://www.ciwmb.ca.gov/leacentral/Closure/Revegetate/Part2.htm>

Landfill revegetation guideling

## HazMat sites

**EPA**

<http://www.epa.gov/epahome/whereyoulive.htm#regiontext>

Select your region on this page to find specific information

**Hazardous Substance Research Centers**

<http://www.hsrc.org/>

These centers bring together researchers from a variety of disciplines to collaborate on integrated research projects, which involve practical problems of hazardous substance management as well as long-term, exploratory research.

## Mines

**Groundwater Restoration at Wyoming Uranium Solution Mining Sites**

<http://www.wma-minelife.com/uranium/papers/isl00006.html>

**National Park Service Disturbed Lands Restoration Program:**

<http://www2.nature.nps.gov/grd/distland/index.htm>

**National Park Service Abandoned Mine Lands Program:**

[http://www2.nature.nps.gov/grd/distland/about\\_aml.htm](http://www2.nature.nps.gov/grd/distland/about_aml.htm)

## Threatened and Endangered Species

### US FISH AND WILDLIFE SERVICE SECTION 7 REGIONAL CONTACTS

[Pacific Region](#) (Region 1)

California, Idaho, Nevada, Oregon, Washington, Hawaii and the Pacific Islands.

Larry Salata and Kristi Young

503/231-6241

[Southwest Region](#) (Region 2) Arizona, New Mexico, Oklahoma and Texas.  
Sarah Rinkevich and Delfinia Montano

[Mountain-Prairie Region](#) (Region 6)  
Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah and Wyoming.  
Janet Mizzi 413/253-8627  
Sue Detwiler 303/236-7400 ext 280  
907/786-3868

**National Park Service Threatened and Endangered Species Program**  
Peter Dratch, PhD Acting Manager  
Biological Resources Management Division, Natural Resources Program Center  
[peter\\_dratch@nps.gov](mailto:peter_dratch@nps.gov) 970/225-3596

## Tech/GIS

ESRI <http://www.esri.com/>

ESRI Virtual Campus <http://campus.esri.com/>  
Training, both free and for a fee

## Monitoring

### *Books*

Elzinga, C.L., Salzer, D.W., Willoughby, J.W. 1998. **Measuring and Monitoring Plant Populations.** BLM Technical Reference 1730-1 492 pages.

Interpreting Indicators of Rangeland Health <http://www.blm.gov/nstc/library/pdf/1734-6.pdf>

## Knowledge and Research

USGS Forest and Rangeland Ecosystem Science Center <http://fresc.fsl.orst.edu/>  
Provides research and technical assistance in support of sound management and conservation of biological systems in the western United States.