

N C S R News



Return of the Wolf: Lessons in Natural Resource Education, Lester W. Reed, Ph.D

For the first time in nearly 70 years, the howl of the wolf is being echoed throughout Yellowstone National Park. Gray wolf populations were extirpated from the western U.S. by the 1930s. Subsequently, wolves from Canada occasionally dispersed south into Montana and Idaho but failed to survive long enough to reproduce. As public attitudes toward predators changed wolves received legal protection with the passage of the Endangered Species Act in 1973. With this protection Canadian wolves began to successfully re-colonize northwest Montana in the early 1980s. Additionally, several dozen wolves were captured in Canada and turned loose in Yellowstone in March 1995. Wolves were also reintroduced to central Idaho in the 1995-6 period and a small colony has populated Isle Royale National Park Michigan for over 35 years. These animals have done remarkably well, reproducing at a rapid rate. As a result in 2003 the gray wolf was down-listed from “endangered” to “threatened” in its western and eastern ranges. However, as of January 2005 the down-listing has been overruled by the federal courts and a final resolution to its status is unknown.

The research associated with the reintroduction of the wolf into the western US provides natural resource educators an excellent store of information for developing teaching modules. This is particularly true for courses in wildlife management and environmental science. The information is available in the extensive internet postings covering a wide range of wolf-based data



and subjects associated with research findings and anecdotal reports. Sites expressing both pros and cons of the wolf reintroduction effort provide information which educators and their students can review to achieve a balanced opinion based on factual scientific evidence. A few suggestions on topics and supporting sites are:

Reintroduction techniques and results:

www.yellowstone-natl-park.com/wolf.htm

www.wolftracker.com

www.yellowstone-bearman.com/wolves.html

Ecosystem impact of wolf reintroduction:

www.pacificviews.org/weblog/archives/000260.html

www.esajournals.org

A structured exercise to determine the impact of wolf reintroduction:

www.powayschools.com/projects/mt&r/ConflictYellowstoneWolf.htm

NOTE: some site links are not active but basic format of the study is helpful for creating a student project

The above is only a small sampling of available resources. “*The Searching Wolf*” site (<http://www.searchingwolf.com/ws.htm#st2b>) has extensive resource links on a variety of topics. Also, a search of the web for *Yellowstone Wolf*, *Wolf Impact*, or other keywords associated with the reintroduction will provide instructors and their students a rich find of information.

Technician Program Directory

NCSR has developed and posted a web-based directory of associate degree natural resource programs at its web site www.ncsr.org. The directory lists programs by college and by major discipline areas. The site provides the program title, degree awarded, and contact information including a link to the institution’s web site. The directory should prove useful to faculty wishing to network with other natural resource program directors and instructors. Natural resource faculty interested in having their programs included in the directory should contact the NCSR staff at ncsradm@chemeketa.edu for a program information form.



Learning Science – ANCSR Approach By Lester W. Reed, Jr. Ph.D.

A major goal of the Advanced Technological Education Program (ATE) is to improve the understanding and use of science by technicians graduating from associate degree programs. NCSR, in turn, has focused a significant portion of its natural resource curriculum development effort on creating activities that support this goal. The strategy employed by NCSR is to have students do science so they understand the process of how scientific information is developed and its implications for technology.

Several premises support the NCSR approach. They are:

- Maximum gain in understanding the process of science is made by doing science;
- Relevance of the activities to the technical discipline is essential;
- The process of science is structured and replicable although the topical focus of activities can vary widely;
- Activities are inquiry-based (i.e. outcomes are not predetermined but are “discovered” as the students apply the scientific process);
- Understanding the scientific process enables technicians to critically evaluate new procedures and information related to their profession.
- Familiarity with scientific processes increases understanding of the culture in which knowledge-based management decisions are made.

The laboratory and field teaching modules included in NCSR curriculum and educational guides are structured to meet this approach to learning. Feedback from other educators using these materials support the contention that the process of doing “discovery science” in a program leads to increased understanding and future use of science methodology.

A challenge still faced in adaptation of the NCSR approach to natural resource science education is the time and effort needed to create the instructional environment. Without question it is significantly greater

than doing “cookbook exercises” with predetermined outcomes. Many activities such as the determination of the impact of log decomposition on forest nutrient cycles are long-term processes that demand instructor involvement for years. Others, such as identifying and classifying soil invertebrates, require significant “pre-lab” preparation to ensure a meaningful student outcome. Not all instructors are willing to invest the time needed. However, the NCSR staff is convinced this effort is essential to develop advanced natural resource technicians with the knowledge of science needed in today’s workforce.

For those interested in improving science education in their courses by implementing elements of the NCSR approach to the staff is available for assistance and mentoring. All you need to do is ask!

For assistance contact NCSR at:

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Fire and Forestry: The Burning West

Insights Gained from the Western Forestry Conference in Coeur d'Alene, Idaho, December, 2004

by Ara Andrea, PhD

Forestry professionals gathered in December to share information on the ecological, economic and social consequences of, and lessons learned from, increasing occurrences of wildland fires in the Northwest. The Northwest has been plagued with increasing amounts of severe wildfires over the last decade. Now, fewer fire starts are burning as many, or more, acres as fires in the past, with more severity and intensity.

As millions of acres have burned over the last century, the response has been to implement fire suppression strategies. Decades of successful fire suppression have resulted in over-dense, stressed, and insect-infested stands of trees that are dead or dying; these trees have historically depended on periodic low-intensity fires for maintaining optimal health, regeneration and density. We now understand that fire is a necessary and integral part of the forest ecosystem. Many plant species need fire and/or smoke to reproduce; some insects can detect fire and only breed in burned trees. Many wildlife species depend on standing, burned trees for their preferred habitat. Eliminating fire may have, in the short run, protected trees from burning and property from being lost, but as the catastrophic fires of recent years have shown, it has not saved our forests from destructive wildland fires. In addition, fire suppression strategies have introduced imbalances within the forest ecosystem that may never be corrected.

The St. Maries River and St. Joe River watersheds in northern Idaho, sites that are showing the effects of decades of fire suppression, are suffering nearly complete lodgepole pine mortality. Insect infestations have reached epidemic levels in these over-dense, stressed stands of pine, leaving millions of acres in a high-risk category for a major wildfire event. Besides the ecological damage to the watersheds themselves from such a fire, the implications to cities and rural communities that rely on these watersheds will be severe and long lasting.

There are several silvicultural treatments that are currently being used to reduce fuel loads in areas stressed by past fire suppression strategies. Several of these treatments involve some sort of tree removal. Different methods of *thinning* can remove overtopped and stressed trees, reduce competition, and reduce the immense fuel loads in forests. Thinning also delivers the best defense against infestations and other stress-inducing disturbances—providing a healthy, vigorously growing stand of trees. *Sanitation* cuts remove diseased trees and provide buffer areas, which can reduce the spread of an insect or disease infestation, and thus, reduce risks of fires. *Salvage* operations, which remove timber that is dead or dying as a result of a disturbance (whether it is a fire, a windstorm, or an insect infestation), can also help reduce fuel loads. Selected stand-improvement cuts are now designed to remove dead and dying materials that can cause a low-intensity fire to spread into a catastrophic stand-wide wildfire. Thinnings, and cleaning of ladder fuels (shrubs, downed trees, small snags), are currently important silvicultural focal points in our forests, and are the basis of forest management activities in several projects being implemented in accordance with our National Fire Plan, Healthy Forest Restoration Act, and Stewardship End Result Contracting Projects. Logging contractors are implementing newer technologies in many of these operations. Feller-bunchers and harvester-processors are providing efficient thinning operations and reducing fuel loads, with minimized impacts to soils and the residual stand.

Social concerns about risks to communities and natural areas are driving an increasing interest in these silvicultural strategies. Natural resources and forestry educators need to widen their descriptions of thinning techniques in their curricula to promote discussion of these current management objectives as well as the scientific support for these land-management strategies.





BioScience as an Educational Resource by Wynn W. Cudmore, PhD



The Information Age brings with it a persistent challenge for educators. Of the myriad resources available to consider, which ones should be consulted on a regular basis and, what information contained in these resources should be gleaned for incorporation into our courses? With millions of web sites, new books and journal articles, this may seem like a nearly insurmountable task. Yet, in the rapidly evolving disciplines of natural resources and environmental science, an understanding of new information is critical to the success of our students.

Among the resources I have found to be particularly useful is a journal published monthly by the American Institute of Biological Sciences (AIBS), *BioScience*. AIBS is a national umbrella organization comprised of more than 80 professional societies and organizations committed to the advancement of "biological research and education for the welfare of society". AIBS programs of particular interest to natural resource and environmental science educators include the "dissemination of up-to-date biological science to a broad audience" and "the improvement of formal and informal biological science education for all ages and professions".

The majority of *BioScience* content is comprised of peer-reviewed "Overview Articles" which frequently describe the current state of knowledge on topics relevant to natural resources education. For example, recent issues have included comprehensive reviews of gap analysis as a conservation strategy, the impacts of salvage logging after forest fires, the enhancement of carbon sequestration in soils, nontarget effects of transgenic crops, ecological applications of remote sensing technology and a new assessment of the limits of world population growth. Although most articles are probably most appropriate as background and updates for instructors, occasional articles (particularly those from the "News and Features" section) may be appropriate for student reading.

Other regular features in *BioScience* include short articles on advances in biology education, news of the latest advancements in research and discussions on public policy. Roundtables, forums and viewpoint articles provide the perspectives of leaders in the field and can be used to stimulate discussion of sometimes contentious natural resource issues in the classroom. AIBS also hosts a comprehensive web site (www.aibs.org) that includes on-line access to articles, reviews, commentaries and additional resources.

In recent years, I have used *BioScience* articles to develop and enhance lectures, in-class activities, laboratories and field exercises for a course in *Environmental Science*. Topics as diverse as endangered species management, agricultural soil analysis, commercial fisheries, forest fires and human population growth have been improved with these materials.

NCSR is committed to improving the level of science in natural resource education programs across the nation. While NCSR curriculum and professional development opportunities provide instructors with some tools that we hope will help to achieve this goal, instructors may find *BioScience* and other AIBS resources to be a worthy addition to their own toolbox.

