



Overview of Vol.3, No.2 – Reclamation of Contaminated Ecosystems

Bruce Carlson

Amish quilters always sew an intentional flaw into their otherwise pristine designs to avoid creating a perfect work that would attract the attention of the Devil. Restorationists working with contaminated ecosystems face flaws so substantial in their "environmental quilts" that any hope of crafting a pristine restored ecosystem lies more in the realm of Faustian fantasy rather than in the realm of earthly possibility. Unglamorous tasks such as containing oil spills, detoxifying aquifers, and stabilizing abandoned mine sites lie far from the idealistic goals of recreating pre-disturbance ecosystems. Yet the magnitude and extent of reclaiming contaminated ecosystems places these activities among the largest restoration efforts in the United States.

The papers in this section illustrate five major programs dealing with contaminated ecosystems in the U.S. Both the oldest and most recent programs examined address contamination from mine sites under the authority of the Office of Surface Mining. Tim Thoreen discusses the Abandoned Mine Land (AML) Program established in 1977 and Kevin Springob examines the Appalachian Clean Streams Initiative (ACSI) established in 1994. Remediation programs created under the Superfund laws of the 1980's include the Environmental Protection Agency's Oil Spill Program (OSP) discussed by Brett Bryngelson and the Department of Defense's Defense Environmental Restoration Program (DERP) presented by Amy Jo Petersen. The final paper in the section, written by Scott Benik, looks at a state-level program of the Minnesota Department of Transportation dedicated to Integrated Roadside Vegetation Management (IRVM) which has been re-introducing native vegetation along roadsides since the late 1970's.

The goals of these programs focus primarily on removing the immediate and long-term threats to human and ecosystem health through pollution containment or reduction. Dealing with ongoing contamination is also a concern. However, examples of explicit habitat improvement goals are also given, including encouraging use of native vegetation along Minnesota highways, restoring landscapes for biotic communities in Guam, and restoring healthy trout streams in Appalachia. Techniques to achieve these various goals have developed with the programs through experimentation, often at great expense. Primary treatments are typically directed at the source of the contaminants, although contaminants that have moved off-site are also targeted: capping landfills at defense sites; stabilizing slopes at abandoned mines; chemically or thermally treating soils; pumping and treating aquifers; and chemically reducing acidity in streams. Techniques that integrate ecosystem functions into the cleanup processes are also cited: bioremediation of contaminated soils; facilitating natural attenuation of oil spills; using wetlands as natural filters; and selecting vegetation that can survive road contaminants.

The ecosystem goals are closely associated with tangible socio-economic goals: reducing mowing and maintenance costs along roadways; improving populations of pheasants for hunters; improving trout streams to support tourism and fishing; developing reclaimed mined land for timber or recreation to support local economies. This emphasis across programs suggests that such linkages have been important to maintaining the respective programs. While many ecologists and biologists seem to welcome working with engineers, economists and politicians

about as much as working with the Devil himself (personal observation), these papers illustrate the fact that significant cooperation across disciplines and stakeholder groups is essential to success in ecosystem reclamation. Many of the fundamental challenges identified in these papers are socio-economic, bureaucratic, or political, including setting multi-purpose resource goals, gaining public acceptance, holding to tight budgets and schedules, maintaining consistency in large programs, and considering legal ramifications of program activities.