

**Historical, Novel and Hybrid  
Ecological Restoration**

**By J.S Vallance**

**Written for partial  
Fulfillment of the  
Requirements of NR552**

Many options are available to ecological land managers when working to restore degraded land into historical, novel and hybrid ecosystems. Depending on the goals on a particular site the tools and methods for restoration can be tailor-made. The ecosystem services available on an individual site, the current political leanings, the worth of the resources being analyzed, the value to human livelihood and the military mission will all be taken into consideration when developing a plan of restoration on military land.

Because of species invasion, global warming and land use historical ecosystems make up a small percentage of landscapes. They often are dispersed among novel and hybrid landscapes, which serve to create connectivity and provide corridor protection. If not managed carefully these corridors can actually degrade the historical patches if invasive species, large climate changes and proximity to wastewater treatment facilities, golf courses, or agricultural fields can move these regions into a irreversible novel state.

(Hobbs 2014)

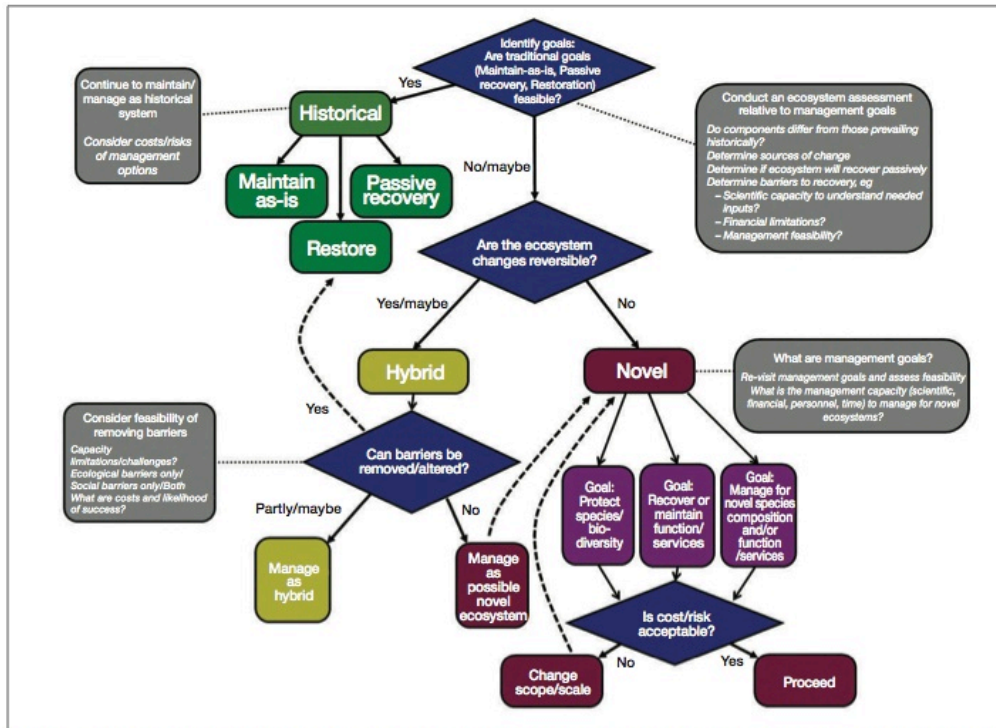
An interesting fact about U.S Military land is that much of it was acquired after the great dustbowl before World War II. Much of the land was geographically remote and severely degraded agricultural land. Extensive restoration work was done to increase the natural resources on these installations and as a result they now are home to the greatest biodiversity on U.S soil. As urbanization has increased, these lands have increased as safe havens for endangered species and serve as habitat where habitat is lost on a great portion of our quickly changing landscape. Historical restoration work was not necessarily

accomplished then, as it cannot now in many areas. But novel and hybrid restoration work can still provide biodiversity, the military mission and natural resource management.

In establishing ecological restoration and management models many factors need to be taken into consideration. Instead of partitioning the environment into divided categories- these areas are analyzed as a mosaic of complex ecosystems or “patches” that are in many stages of development and present various ecological challenges and opportunities. These patches are interconnected into a wider system that considers water flow, animal migration and habitat with an urgent conservation plan of action that respects those rapidly changing factors. One of the first points of assessment is identifying the goals and state of degradation of the ecosystem and asking the question “Are the ecosystem changes reversible?” If the answer is “Yes” then a “historical” restoration can be implemented. If the answer is “No” then a “Novel” restoration must be implemented. A “Yes/Maybe” response will mean a “Hybrid” intervention is called for. When looking at ecological restoration it is important to keep in mind there are many objectives of ecosystem management. The needs of people as well as biodiversity conservation, ecosystem services such as fiber and food production, recreation, multiple use, military mission and spiritual enrichment are the key variables in managing Military lands.

(Hobbs, 2014)

When looking at different patches of landscapes for restoration the crucial factor to observe is if changes have occurred to the ecosystem



that are irreversible. Has damage occurred that will make it impossible to revert a particular patch back to historical standards? Are their resources available to pay for extensive interventions required to get a highly degraded patch back? The criticalness of the ecosystem services are also a highly important factor. Is an endangered species being affected by degraded habitat and will resources be prioritized for that species' habitat to be extensively altered to restore it to historical requirements? - For example.

Much research is being done now on the historic continuity of longleaf pine forest restoration. Longleaf pine habitat used to cover a 92 million acre range in North America. Because these pine trees on private property make great power poles and can be cleared away for malls only 3 percent of the longleaf pine's historical range thrives today and

about 1/3 survives on Military land. What has survived is the most biodiverse habitat north of the tropics. Fort Bragg, Fort Stewart and Savannah River nuclear site are all serving as the historical references for reestablishing longleaf understory. “When it comes to longleaf pine management, the military is by far the best,” said John Kush, a forest ecologist at Auburn University. Camouflage maneuvers, ample room for tanks and Humvees movements make longleaf pine habitat the perfect grounds for military training. “The openness of the longleaf pine and the thin stands provides visibility and maneuverability that is very consistent with what a mechanized force like the Third Infantry division likes to fight in,” said Tim Beaty, a U.S. Army wildlife biologist. DoD is funding long-term studies on how to restore some of the pine’s ecosystems. Ecologists have set a 15-year goal of restoring the longleaf pine habitat on public and private land from its current 3.4 million acres to 8 million acres in its Southeastern historic range. (Dormeney 2011)

An example of novel ecological restoration work would be the hypothetical idea of providing habitat for the regal fritillary- a vulnerable butterfly native to the east- central United States. It survives primarily on Military land in the grasslands from the Canadian Maritimes to the southern Appalachians and west to the Rocky Mountains. It has been found that the feeding nectar for it’s larvae and adult populations survive on first succession plants that only thrive in heavily disturbed soil like those created from armored- vehicles on grassland. Common wilkweed, butterfly milkweed, field thistle, pasture thistle and especially bluestem. Goldenrod, sweet-fern, broomsedge and deertongue were varieties of low-growing bushy plants and dense grasses that provide

habitat for the regal fritillary and require a permanent program of disturbance to thrive. (Latham, 2007) This seems like the perfect pairing of a Military that creates constant disturbed soils and a habitat that thrives in them. This first succession planting could prepare the disturbed soil for the second succession planting after several years of habitat restoration on highly disturbed ruts on military land.

Beginning in 1988 the Base Realignment and Closure Commission in response to global security requirements began restructuring military land into larger more remote locations to accommodate evolving security concerns and changing weapon technologies. During the period from 1988 to present time dozens of major military sites were closed and converted to Wilderness Refuges. Military-to-wildlife (K 2U) are examples of “hybrid geographies” The way that these land masses are unique is that they are some of the most contaminated areas of Federal land, they have the potential to be part of the National Wildlife Refuge System that has the strongest ecological directive governed by the U.S Fish and Wildlife Service. Military lands are also typically quite biologically diverse. Often Military lands have unspent munitions and some of these conversions have no or limited plans to remove these contaminants as this type of cleanup falls out of the scope of many biologists’ training and are extremely costly. Traditional concepts categorizing federal land as “pristine”, “natural”, “artifactual” or “degraded” no longer apply. These sites call for an integration of nature and society into a hybrid category that offers challenges as well as immense opportunity to create landscapes improved to serve modern communities. (Havlick, 2011)

Often these highly biological diverse military lands will fall into the scope of the Endangered Species Act and will receive funding and personnel to maintain wilderness access on part of the property while the more dangerous (because of munitions) areas will be prohibited by the public. This change over of name from Military installation into Wilderness Refuge changes the public perception of the land very quickly. Though, of the four federal public land categories the National Wildlife Refuge System is the least visited by the public, this changeover elicits a perception in the community of the land now being a sanctuary and a haven for wildlife rather than a perceived place of destruction. These hybrid ecosystems can serve local livelihoods, create recreation opportunities, create habitat for pollinators and



critical species and supply abundant clean water. (Havlick, 2011)

## References:

Dorminey, B. (2011). *Military Bases Provide Unlikely Refuge for South's Longleaf Pine* Environment 360- Yale School of Forestry and Environmental Studies. Nov 10, 2011

Hobbs (2010) *Guiding Concepts for Park and Wilderness Stewardship* Frontiers in Ecological Environments 2010

Hobbs, R. J., Higgs, E., Hall, C. M., Bridgewater, P., Chapin III, F. S., Ellis, E. C., ... & Yung, L. (2014). *Managing the whole landscape: historical, hybrid, and novel ecosystems*. *Frontiers in Ecology and the Environment*, 12(10), 557-564.  
doi:10.1890/130300

Havlick, D.G. (2018) *Bombs Away: Militarization, Conservation, and Ecological Restoration*, University of Chicago Press

Havlick D (2011) *Disarming Nature: Converting Military Lands to Wildlife Refuges*. *Geographic Review*. April 2011

Latham et al. (2007) *The Role of Disturbance in Habitat Restoration and Management for the Eastern Regal Fritillary (*Speyeria idalia idalia*) at a Military Installation in Pennsylvania*. *Ecological Restoration*. April 2007