Native Plant Materials Policy

A Strategic Framework

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POLLINATOR PARTNERSHIP

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Introduction

Native plant communities are key to ecosystem health, resiliency, and productivity. Since its creation, the Forest Service has been using native plants in reforestation, rangeland improvement, watershed restoration, wildlife enhancement, mine reclamation, and myriad other planting and seeding activities (hereafter collectively referred to as 'revegetation'). Over the years, the Forest Service has made major strides in genetics research, seed collection, nursery propagation, storage procedures, and the design of appropriate management monitoring practices, particularly for native tree species associated with timber production.

Recognizing the need to maintain native plant communities as part of fully functioning ecosystems, Forest Service Chief Bosworth directed natural resource professionals from within the National Forest System, State and Private Forestry, and Research deputy area to develop Forest Service policy for promoting the use of native plants in revegetation projects on National Forest System lands. This policy (FSM 2070), issued in 2008, is designed to help combat invasive species, mitigate impacts of climate change, and maintain healthy forests.

What is the native plant materials policy?

A NATIVE PLANT IS AN ENDEMIC plant species that occurs naturally in a plant community, ecosystem, ecoregion, or biome habitat without direct or indirect human involvement. One of the agency's goals is to promote the use of native plant materials for the revegetation, restoration, and rehabilitation of native plant communities to provide for the conservation of ecosystem diversity and maintain healthy ecosystem functions.

According to the new policy, native plant materials are to be given primary consideration when selecting plant materials for use in land management projects. Land management prescriptions will include the selection and use of native plant species that are genetically appropriate and adapted to on-the -ground ecological conditions. When and where necessary, nonnative species may be used that enhance the likelihood of successful native plant survival, growth, and adaptation. The policy also directs that these prescriptions be written and/or approved by a plant materials specialist who is knowledgeable and trained in the plant community type where

Locally Adapted Natives Developed for Commercial Production

The geographic origins of plants are an important consideration for revegetation. Use of native materials is vital for restoring and building healthier ecosystems. Native seed plantings can fail when seed sourced from coastal populations with no frost tolerance are used in inland locations where heavy frosts occur, for example. This means that plants have a better chance for survival if they are locally adapted to the area being revegetated.

The Colorado Plateau of the American Southwest is a land of extremes with elevations ranging from 2,000 feet near the bottom of the Grand Canyon to over 12,500 feet at its highest peaks. The region experiences extremely hot summers and cold winters, with significant snow depths at the higher elevations. Under these conditions revegetation can be a daunting task.

The Colorado Plateau Native Plant Program (CPNPP) and the Uncompahgre Partnership in southwestern Colorado were created in response to a lack of sufficient quantity of regionally adapted native plant materials for ecosystem restoration in the southwestern States. The partnership includes Federal and State agencies, nonprofit organizations, and universities.

As a result of these partnership programs, seven grass species and six forb species have been developed for commercial production and will be made available to private sector growers for increased market availability of local native plant materials. One of these, "UP Ruin Canyon Muttongrass," is already available in the marketplace and is currently being grown by Southwest Seed, Inc., in Dolores, CO, http://www.upproject.org/upartnership/publications/pdfs/POFE%20flyer.pdf. This muttongrass (Poa fendleriana) originated from sites adjacent to the Uncompahgre Plateau in western Colorado and was selected for commercial production based on studies of its drought tolerance, forage quality, and seed quality attributes. These and other similar native plant materials will be used for restoration on the Colorado Plateau.

vegetation management will occur. National Forest System units are to anticipate plant material needs for emergency and planned revegetation projects and develop core plant lists, planting guidelines, and lists of appropriate and adequate plant material sources and seed storage and propagation facilities.

The native plant policy emphasizes the importance of going beyond past revegetation goals and objectives, which focused solely on erosion control or rehabilitation of degraded sites, to native plant community restoration that addresses a broad range of ecosystem services. In doing so, the native plant policy is linked to all agency programs as well as to the Shared Vision Action Plan, the Invasive Species Strategy, the National Fire Plan, and the agency's strategic goals and objectives.

Forest Service policy restricts the use of persistent, nonnative plant materials to situations in which timely reestablishment of a native plant community is not likely to occur either through natural regeneration or seeding of native plant materials. Nonnative plants that have the potential to hybridize with local native plant species should never be used. Any nonnative plant species proposed for use in a vegetation management project cannot have the potential to permanently displace native species or offer serious long-term competition to the recovery of native plants and their pollinators. Finally, under no condition are noxious weeds to be used for revegetation activities.

The native plant materials policy directs national forests and grasslands to cooperate and coordinate the development and use of native plant materials across administrative units as well as with other Federal agencies, States, tribes, nongovernmental organizations, private industry, and other stakeholders.

Strategic Framework

TO IMPLEMENT THE NATIVE PLANT MATERIALS POLICY, the agency has developed a framework to support policy goals and objectives. This framework deals primarily with grass, forb, and shrub species and focuses on:

- Assessing the need for native plant materials;
- Determining how to meet plant material needs;
- Developing production and establishment practices;
- Developing workforce skills and experience in effectively using native plant materials;
- Collaborating with other internal and external native plant user groups;
- Providing a long-term commitment to information acquisition, research and

development (R&D), and technology transfer; and

- Monitoring restoration, revegetation, and rehabilitation land management activities for policy compliance as well as to learn from project successes and failures.

Comprehensive Assessment

AS A FIRST STEP IN POLICY IMPLEMENTATION, vegetation management units should conduct an assessment to determine present and future need for native plant materials, including species, quantities, and timelines for supply and application. Units should prioritize development of adequate quantities of seed for "workhorse" species appropriate to specific ecosystems within their administrative boundaries.

Federally listed threatened or endangered species can only be successfully recovered when the ecosystem to which they belong is restored. Several steps are involved in this undertaking.

- Each region, national forest, and national grassland should identify a core group of "workhorse species" within important plant community and ecological characteristics. These should be the first species cultivated for seed sources, seed release, and establishment practices.

- Regions, national forests, and national grasslands should develop an overall seed management plan. Project scale, type, and desired future plant communities will determine the amount and type of native plant materials needed. As we gather knowledge of the ecological needs for a species, the Forest Service will increase its ability to develop appropriate seed sources for any species.

- Because National Forest System lands often are associated with other landowners with similar objectives, it will be important to work with other agencies, such as the Bureau of Land Management, Department of Defense, U.S. Fish and Wildlife Service, State agencies, tribes, and nongovernmental organizations, as we consider native plant material needs and establishment.

- Finally, to the Forest Service should promote integration of native plant materials use into interdisciplinary programmatic and project plans. This use encompasses a range of projects, from forest plans to site-specific projects for recreation, watershed, range, timber sales, road decommissioning, mining reclamation, and other purposes. The goal is to make the use of native plant materials second nature and inherent when designing and developing vegetation projects.

Nursery Production of Native Seeds and Plants

Forest Service nurseries and seed extractories have been leaders in growing native tree seedlings for reforestation for more than a century. Now, these facilities have turned to production of native shrubs, grasses, and wildflowers, too.

Native plants are required for repairing plant communities damaged by weed invasions, changing fire regimes, human activities, and climate change. These facilities address the increasing demand for a variety of native species, many of which have rarely been propagated.

Seed extractories have adapted equipment designed for propagating forest, horticultural, and agricultural species to process the fruits and seeds of hundreds of species in a wide array of plant families and genera.

Nurseries collaborate with a large and diverse clientele to produce seeds and seedlings for a variety of plant habitats in need of revegetation after disturbance, from sagebrush steppe to alpine meadows. Successful seed production entails recognition of pollinator requirements, diseases, and seed predators encountered when native species are grown in monocultures. Forest Service nurseries have also developed germination and propagation protocols for each species in order to effectively produce native trees, shrubs, grasses, and wildflowers as bare-root and container stock. Nurseries collaborate with researchers to leverage expertise, propagating seedlings for common garden genecology studies needed to establish seed zones for widespread revegetation species and participating in the installation and management of these studies. Forest Service nurseries carry out initial seed increase of materials resulting from these studies. In return, researchers provide nurseries with relevant answers to native plant propagation questions.

Because of their production experience, Forest Service nurseries and seed extractories are in a position to assist private seed growers and nursery managers. Forest Service professionals share information on seed cleaning and seedling production through consultations, field tours, workshops, and by posting propagation protocols on the NativePlant-Network database. Through the efforts of Forest Service nurseries and seed extractories, land managers are able to obtain genetically appropriate materials of a great variety of species to meet their land management objectives.

Longleaf Pine

Today, longleaf pine forests cover only a remnant of their former extent. Less than 3 percent of this significant ecosystem, which once covered over 90 million acres of the Southeastern United States, remains today. The Southern Region of the Forest Service, along with other agency partners and private landowners, is committed to the restoration of the longleaf pine ecosystem. In a cooperative venture, America's Longleaf Conservation Plan (http://www.americaslongleaf.org) outlines a restoration goal of almost 5 million acres of longleaf pine ecosystem, from the current 3.4 million acres to 8 million acres, in the next 15 years.

Successful restoration of the longleaf ecosystem relies, in part, on the successful restoration of the diverse understory that is integral to the functional health of the system. The species composition of the longleaf understory is one of the most diverse in the world, with some areas containing as many as 40 plant species per square meter. The variety of native forbs and grasses are part of the biological, cultural, and spiritual heart of the South's longleaf culture.

The Forest Service is not only committed to providing seeds and plants for longleaf restoration on Federal lands, but is assisting as a partner with other longleaf pine land managers and owners by sharing seed sources and other resources across ownership boundaries. All eight national forests located in the longleaf pine range participate in local native plant/seed councils or groups, and all have projects underway to increase the availability of longleaf pine seeds and plants across all lands. Cooperators include State agencies, nurseries, farmers, conservation groups, and many more.

A long-term commitment

THE AGENCY RECOGNIZES THE NEED TO INVEST in a long-term commitment to R&D, education, and technology transfer. R&D will come from within the Forest Service and from other Federal and non-Federal organizations. Forest Service R&D has a long history in developing appropriate seed sources, seed application guidelines, and establishment practices for ecosystem restoration. Forest Service researchers operate from an "ecosystem" mindset that addresses the long-term considerations of ecosystem restoration rather than a crop-breeding mindset that addresses the needs of agriculture.

In addition, questions regarding the impacts of climate change, disease and pest resistance, and introduction of invasive species further complicate the selection of appropriate seed sources and establishment techniques. An "adaptive management" approach will be needed to ensure that the agency does the best that it can with available information. For example, provisional seed zones are being developed for many regions based on temperature, precipitation, and other ecological data (such as defined ecoregions). Seed transfer zones can then be updated

with genetic data from common garden studies that are currently being conducted under regional, interregional, and interagency initiatives for high-priority "workhorse" species restoration. Furthermore, the Forest Service will need to expand the role and resources of the Research branch to provide information about the biological and ecological characteristics of native plant species to improve success rates in establishing healthy native plant ecosystems.

In order to achieve such R&D goals, the Forest Service must also include and encourage institutions and principal investigators outside the agency working on native plant materials research such as State universities, other Federal agencies, and private entities. Forest Service research efforts should be coordinated with such institutions to ensure that funds are used efficiently. Current examples of such efforts include the Great Basin Restoration Initiative; the Reforestation, Nurseries, and Genetics Resource (RNGR) team projects; and garden studies being conducted for priority restoration species in Forest Service Regions 1 (Northern) and 6 (Pacific Northwest).

Employee training opportunities on the selection and use of native plant materials are crucial at all levels of the agency. Training must be easily accessible, immediately available, and fiscally justifiable. Training will be established for Burned Area Emergency Rehabilitation (BAER) teams, fire suppression specialists, botanists, line officers, field crews, and other professionals and technicians—everyone who will be part of policy implementation.

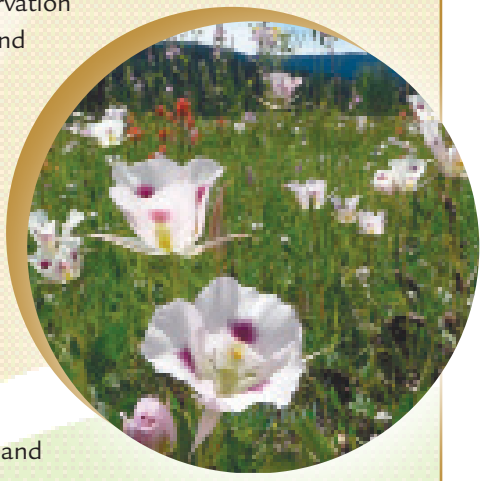
As the volume and complexity of the native plant material program increases, it will become increasingly important for seed sources to maintain corporate seed inventory and track and coordinate plant material resources.

Availability of native plant materials

THE STRATEGIC FRAMEWORK IS DEPENDENT ON the continued availability of native plant materials as, without an adequate supply of native plant materials, the goal of increasing the use of native plant materials cannot be realized. To begin with, The Forest Service needs a sustainable and cost-effective supply of native plant materials—principally seeds—through collection projects in the wild and through cultiva-

Genecology

Genecology is the study of genetic variation across the landscape and its relationship to environmental variation. Common garden trials are used to study genecology, typically in short-term tests. Because seed sources are grown at the same time in a common environment, any differences among them are ascribed to their genetic composition. If the genetic variation can be correlated to physiographic or climatic variables in the seed source locations, it provides evidence that a trait has responded to selection pressure and may be of adaptive importance. Adaptive traits in plants include growth rate, phenology, form, seed traits, cold tolerance, and drought tolerance. Genecology may be used to map genetic variation across the landscape and to develop seed zones and seed movement guidelines for restoration projects. Historically, these studies concentrated on conifers, but recently, the methodology has been used to establish seed movement guidelines for grasses, shrubs, and forbs, especially in the Northwest (Forest Service Regions 1, 4, and 6). These efforts have been supported by Forest Service Research and Development and National Forest Systemdeputy areas, the Agricultural Research Service, the Natural Resources Conservation Service, and the Bureau of Land Management. Species have included Elmus glaucus (Erickson et al. 2004), Festuca roemeri (Wilson et al. 2008), Bromus carinatus (Johnson et al. 2010), Lupinum latifolius (Doede 2005), and Hodiscus discolor (Horning et al. 2008). Studies have been completed or are underway for 15 grass species, 9 forbs, and 7 trees and shrubs.



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Genecology / Landscape Genetic Studies

SPECIES		DISTRIBUTION SAMPLED
GRASSES		
Indian ricegrass	Acnatherum hymenoides	Great Basin & Colorado Plateau
Thurbers' needlegrass	Acnatherum thurberianum	Great Basin
Rough bentgrass	Agrostis scabra	Idaho and Montana
California brome	Bromus carinatus	W. Oregon
Mountain Brome	Bromus marginatus	NE. Oregon
California oatgrass	Danthonia californica	W. Oregon
Tufted hairgrass	Deschampsia caespitosa var. caespitosa	
Saltgrass	Distichlis spicata	Rangewide
Bottlebrush squirreltail	Elymus elymoides	Great Basin & Columbia Plateau
Blue wildrye	Elymus glaucus	NE. Oregon
Idaho fescue	Festuca idahoensis	Idaho and Montana
Roemer's fescue	Festuca idahoensis	W. Oregon & Washington
Prairie junegrass	Koleria macrantha	Columbia Plateau
Basin wildrye	Leymus cinereus	
Sandberg's bluegrass	Poa secunda	Great Basin & Columbia Plateau
Bluebunch wheatgrass	Pseudoroegneria spicata	Great Basin & Columbia Plateau / Northern Idaho & Montana
FORBS		
Tapertip onion	Allium acuminatum	Great Basin
Pearly everlasting	Anaphalis margaritacea	Idaho and Montana
Dusty maiden	Chaenactis douglasii	Great Basin

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Genecology / Landscape Genetic Studies

SPECIES		DISTRIBUTION SAMPLED
Sulfur flower buckwheat	Eriogonum umbellatum	
Fernleaf biscuitroot	Lomatium dissectum	Oregon and Idaho
Bigdeer vetch	Lotus crassifolius	OR Cascades & Coast Range
Broadleaf lupine	Lupinum latifolius	W. Oregon & Washington
Hoary aster	Machaeranthera canescens	Great Basin
Silverleaf phacelia	Phacelia hastata var. hastata	Idaho and Montana
TREES/SHRUBS		
Alder	Alnus rubra	W. Oregon & Washington
Sagebrush	Artemisia spp.	Rangewide
Big Sagebrush	Artemisia tridentata	Rangewide
Fourwing saltbush	Atriplex canescens	Rangewide
Redosier dogwood	Cornus sericea	Idaho and Montana
Oceanspray	Holodiscus discolor	W. Oregon & Washington
Antelope bitterbrush	Purshia tridentata	E. Oregon & Washington
Shinyleaf spirea	Spiraea betulifolia var. latifolia	Idaho and Montana

tion. The Forest Service must foster a sustainable native plant materials industry that involves agency nurseries, nongovernmental organization (NGO) partners, and private industry sectors through innovative business models and production agreements.

Forest Service nurseries and seed extractories will continue to play a key role in providing a strong native plant production infrastructure. These will help increase native plant materials; design protocols on seed cleaning, germination, and storage; and provide native plant materials that are not profitable for the private sector to produce but are nevertheless needed to meet resource management objectives. The identification of best strategies for production will be very important. The Forest Service nurseries will serve as centers where various production models can be tested for adoption by other producers and also serve as experiment facilities for R&D.

Consistent with policy and best management restoration practices, the use of genetically appropriate seed and other plant materials is a requirement in vegetation projects. This will require that all plant materials used are of known origin, and field production will follow standards required for certification. Testing standards for purity and weed content will be incorporated into all seed production contracts.

Expertise in revegetation

ACCUMULATION OF TECHNICAL KNOWLEDGE WILL INCREASE revegetation skills in the use of native plant materials. Native plant materials will be matched to existing site conditions while recognizing and managing factors that limit germination and establishment. In addition, management will consider both pre- and post-establishment requirements for successful establishment of self-sustaining native plant communities.

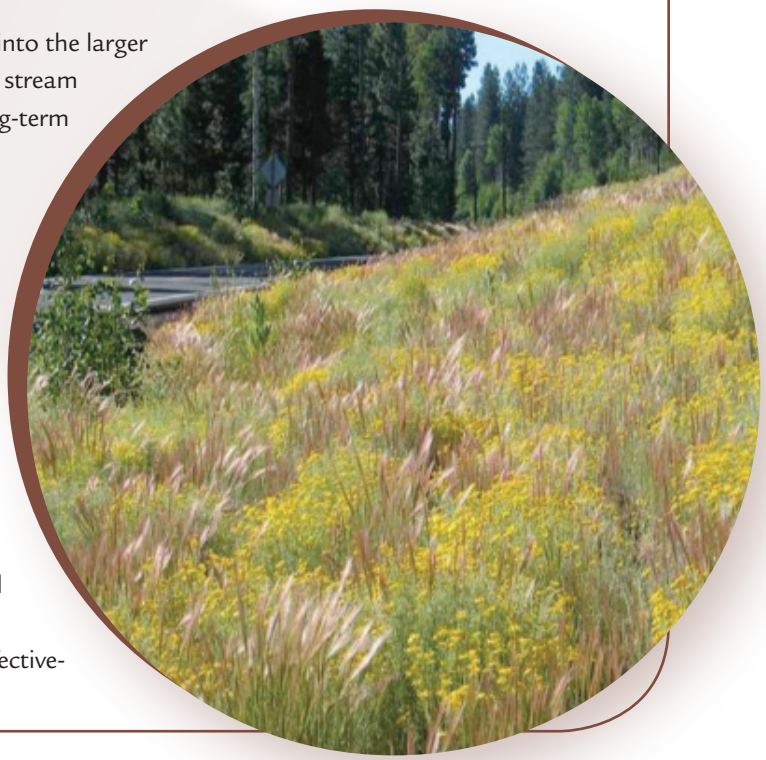
Internal and external collaboration and communication

Collaboration between governmental and private entities is essential to the successful implementation of this native plant policy. The native plant materials program will require partnership among Federal agencies; tribes,State agencies, local governments and NGOs, academic institutions, and the private sector.

Roadside Revegetation with Native Plants: A Federal Partnership for Success

Revegetating roadsides can be challenge in the western United States due to steep erosive slopes, lack of topsoil, shallow soil depths, soil compaction, and lack of appropriate plant materials. While there are many restoration tools, products, and methods available, appropriately integrating these practices into the road engineering and the revegetation process is often a weak link in completing this mitigation. A unique partnership has been formed between the Forest Service and the Federal Highway Administration in the West to involve Forest Service revegetation specialists in all phases of road maintenance and construction.

Beginning in the early phase of the road project, engineers, environmental specialists, and revegetation specialists work together to define and implement revegetation goals within the context of the road plans. These efforts have led to many significant accomplishments, including new applications of native plant species and innovations in plant stock types, equipment, application methods, and monitoring techniques.



Native vegetation needs and concerns are becoming fully integrated into the larger processes of road design and construction, resulting in reductions in stream sedimentation and the spread of invasive plants, with benefits to long-term ecological health and aesthetic quality. Methods and findings from this collaboration were recently synthesized by the two agencies in a comprehensive, state-of-the-art guide for practitioners and planners entitled *Roadside Revegetation: An Integrated Approach to Establishing Native Plants* (see http://www.nativerevegetation.org/).

In addition to assisting in development of the manual, Forest Service revegetation specialists have provided direct technical expertise to numerous complex and large-scale revegetation projects as well as on-the-ground training and consultation to personnel from multiple Federal, State, and county agencies, and private businesses, promoting better stewardship and natural resource management. Forest Service nurseries and seed extractories have contributed significantly to this work by processing and storing seed, producing plant materials, and helping to establish studies to determine the effective-

To promote and facilitate such partnerships, the Forest Service will develop and share communication plans for native plant materials policy efforts at national, regional, and organizational levels. Each communication plan will identify target audiences, articulate key messages, and determine the appropriate tools to achieve the desired outcomes.

Some products to help us communicate our message might include: An internal agency white paper on the role of native plants in maintaining ecosystem resilience to global climate change, invasive species threats, and habitat alteration and fragmentation for use in national strategic planning and forest and grassland management planning;

- A native plant materials website linked to appropriate invasive species and plant pollinators websites;
- A targeted effort promoting public awareness of native and nonnative species and the contributing role that citizens can play in native plant restoration;
- National and international native species conferences to improve information transfer and collaboration among organizations, researchers, and managers; and
- A best-practices information series for outreach to different audiences, including agency management and resource specialists, external interest groups, and industry managers.

Adequate monitoring

MONITORING IS AN OFTEN OVERLOOKED PROCESS IN the implementation of new policies and programs. The Forest Service will monitor the use and application of native plant materials to ensure their successful establishment and the effective suppression of invasive species in order to prevent or mitigate negative side-effects, such as soil erosion and watershed sedimentation. Monitoring will help to correct revegetation shortcomings, improve species selection and planting practices, and add to technical and management expertise.

The Forest Service will also use existing reporting mechanisms to communicate the success of revegetation activities in plant community restoration or rehabilitation. Monitoring plans will include examples that illustrate how goals can be met.

Conclusion

THE US FOREST SERVICE NATIVE PLANT MATERIAL POLICY is in its infancy. This framework provides initial direction in developing an effective and efficient program that can meet both short-term and long-term revegetation goals. The framework is intended to be dynamic and evolve to meet new challenges. The ideas set forth in this strategic framework should promote the growth of the native plant materials program and its processes as part of the agency's ongoing mission to protect and promote the resources under its care.

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