Native Plant Materials Development Program

Progress Report for FY2001-2007

December 2009

BLM

U.S. Department of the Interior

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Order number P-461

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Bureau of Land Management

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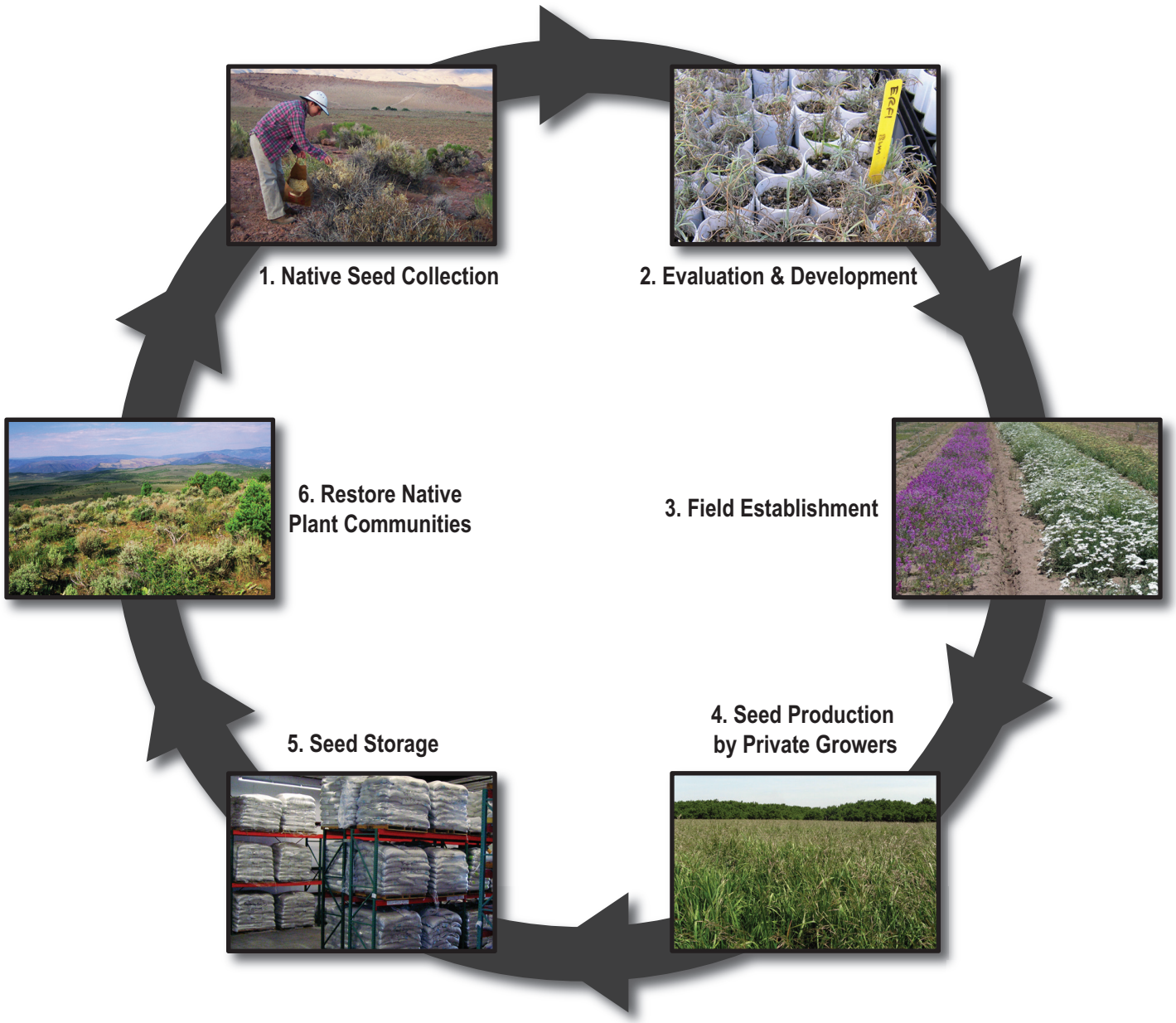
BLM/WO/GI-10/008+1800

Native Plant Materials Development Process



There are many steps involved in the process of developing a reliable, stable crop from wild collected species. Native plant materials, like agronomic crops, take an average of 10-20 years to develop as consistent, reliable commercially available species. Starting with native seed collection, the time and length of each step in the development process varies for each grass, forb and shrub. Adequate and consistent funding is critical to the success of this long-term endeavor. The goal of the Native Plant Materials Development Program is to facilitate this process and to increase capacity within the Federal agencies and the private sector for ecologically appropriate native seed.

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LIST OF REFERENCES

The following reports prepared by Native Plant Materials Development Program partners can be found in electronic format on the accompanying CD.

2002 Interagency Report to the Congress on Native Plant Materials
Center for Plant Conservation Plant Conservation Directory

Genetic considerations in ecological restoration: an annotated bibliography (Center for Plant Conservation)

Great Basin Information

- Great Basin Native Plant Selection and Increase Project Annual Reports
  - Great Basin Native Plant Selection & Increase Project 2002 Progress Report
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  - Great Basin Native Plant Selection & Increase Project 2006 Progress Report
  - Great Basin Native Plant Selection & Increase Project 2007 Progress Report
  - Great Basin Restoration Initiative Progress Report 2001

  - Nevada Native Plant Development Project Progress Report 2001-2002
  - Nevada Native Plant Development Project Progress Report 2003
  - Nevada Native Plant Development Project Progress Report 2004
  - Nevada Native Plant Development Project Progress Report 2005
  - Nevada Native Plant Development Project Progress Report 2006
  - Nevada Native Plant Development Project Progress Report 2007
- Great Basin Native Seed Guide
- 2003 Great Basin Seed Logistics Report

An Introduction to Restoration Genetics (Society for Ecological Restoration International)

Mojave Desert Initiative Action Plan

Native Alternatives to Invasive Plants (Brooklyn Botanic Garden)

Native Plant Materials Development Program Native Seed Data

- Alaska.xls
- Arizona.xls
- California.xls
- Colorado.xls
- Idaho.xls
- Montana.xls
- New Mexico.xls
- Nevada.xls
- Oregon and Washington.xls
- Utah.xls
- Wyoming.xls
- Great Basin.xls
- Other Partners.xls
- Totals.xls

Native Seed Network Information

- Focus List for the Northern Basin and Range Ecoregion of Oregon
- Native Plant Materials Profiles
- Plant Material Profiles Great Basin

Pacific Northwest Native Plant Materials Program Information

- 2007 BLM Roseburg District Annual Report (NRCS Corvallis Plant Materials Center)
- California Brome (*Bromus carinatus*) Genecology Study
- Guidelines for Seeding Native Plants (Deschutes Basin Native Plant Seedbank)
- Interagency Native Plant Materials Working Group Success Story
- Lotus crassifolius (Big deer Vetch) Common Garden Study
- Native Plant Species Program Guidelines (Western Oregon)
- Native Seed Collection & Restoration Geo-Database
- Native Seed Restoration and Evaluation in the Eugene District
- Oregon and Washington Native Plant Materials Development Program Overview
- Policy on Use of Native Species Plant Materials (BLM OR & WA)
- Revegetation Using Native Plants: A Practical Guide to Project Planning and Implementation
- Roemer's Fescue Common Garden Study
- Seed Collection, Propagation and Reintroduction of Native Wildflowers in the Columbia Basin
- Understanding and Restoring Oregon's Native Plants: A K-12 Native Plant Curriculum

Plant Conservation Alliance Survey Results (Center for Plant Conservation)

Pollinator Garden Wheel (North American Pollinator Protection Campaign)

Seeds of Success Information

- Seeds of Success Annual Report 2006
- 2006 SOS Collections Information

Uncompahgre Plateau Information

- Progress Report on the Uncompahgre Plateau Native Plant Program FY 2005
- Progress Report on the Uncompahgre Plateau Native Plant Program FY 2006
- Progress Report on the Uncompahgre Plateau Native Plant Program FY 2007
- Uncompahgre Plateau Project Plan

INTERAGENCY NATIVE PLANT MATERIALS DEVELOPMENT PROGRAM EXECUTIVE SUMMARY

This Progress Report summarizes the activities and achievements of the Native Plant Materials Development Program (NPMDP) from its inception in Fiscal Year 2001 through September 30, 2007. It also provides a detailed account of program funding, allocation to state and regional partnerships and annual performance as measured with the Action Items identified in the 2002 Native Plant Materials Report to Congress.

The NPMDP was created by Congress in the FY2001 Department of Interior and Related Agencies Appropriations Act. The accompanying report stated: "to ensure a stable and economical supply of native plant materials, the agencies need to implement measures that facilitate the development of a long-term program to supply and manage native plant materials for restoration and rehabilitation efforts on public lands." From FY2001 to FY2007, Congress appropriated a total of $30.5 million for the NPMDP. The funds have been appropriated through the Wildland Fire Management account and program. The Bureau of Land Management has administered the NPMDP funds, allocating them to BLM states and ecoregional programs in the West. The BLM states and ecoregional programs have Memoranda of Understanding and Interagency Agreements with other Federal and state agencies, tribal entities, non-governmental organizations and private sector partners for distributing NPMDP funds to native plant materials development projects. The NPMDP also leverages significant matching funds and in-kind contributions from public and private partners.

Through the NPMDP, the BLM and its partners have invested in priority activities as identified in the 2002 Report to Congress. From FY2001 to FY2007, over 1,149 projects have been funded through this program in 14 western states. Projects include ecoregional and local needs assessments, establishment of state and ecoregional programs, native plant materials production, research and development, outreach, education and technical assistance, and monitoring and evaluation of native plant materials used in restoration. In addition, native seed collections have been made in a total of 29 states.

PROGRAM MISSION & GOALS

Mission

- Ensure sufficient native plant materials in the commercial market for maintaining the natural landscape on Federal land, including sufficient quantity of native seed for emergency stabilization and rehabilitation following a 15 million acre fire season.
- Build sufficient capacity among Federal agencies and private sector partners to produce plant materials for 1,000 native restoration species. (122 native plant species have been developed through this NPMD program.)

Long-term Goals

- Increase Federal seed storage capacity to 5 million pounds.
- Expand seed collection and curation to 15,000 collections.
- Develop guidelines for seed transfer zones for 250 "workhorse" species.
- Establish ecoregional Native Plant Materials Development Programs.
- Provide cohesive programmatic leadership and infrastructure.
- Increase public outreach on NPMDP.

Additional funding needed to achieve these goals will be evaluated in the context of future budgets and, where appropriate, included in future budget requests.

PERFORMANCE

Wildland native seed collections for conservation and propagation are the foundation of a native plant materials program. Therefore, native species selection and cooperative development of native seed agricultural techniques have been a major focus of the NPMDP since its inception. Native plant materials, like agronomic crops, take an average of 10-20 years to develop as consistent, reliable commercially available species. Starting with native seed collection, the time and length of each step in the development process varies for each grass, forb and shrub. Adequate and consistent funding is critical to the success of this long-term endeavor.

The indicators of performance listed below cover 2001 through 2007 and are organized by the five action items identified in the 2002 Report to Congress.

Action Item 1: Undertake a comprehensive assessment of needs on public land for native plant materials.

- Conducted ecoregional needs assessments for 11 of the 30 ecoregions in the western United States.
- Developed 60 ecoregional native species target lists to guide Seeds of Success collecting efforts.

Action Item 2: Make a long-term commitment to native plant materials production, research and development, education, and technology transfer.

- Established Seeds of Success program for seed collection and coordination across the US. Currently 40 teams are collecting native plant seeds from BLM, FWS, FS, DOD, state, local and private lands.
- Developed germination and propagation protocols for 3,000 native species.
- Entered more than 2,000 native species into National Plant Germplasm System for researchers and growers.
- Supported 20 academic theses and dissertations advancing native plant materials development.
- Developed the Plant Conservation Alliance website for the Seeds of Success protocols and ecoregional seed collection lists (www.nps.gov/plants/sos).
- Trained more than 1,500 people in native seed selection, collection, buying and deployment.
- Received National Association for Interpretation Award for the "Oregon Ecoregions: Preserving Our Natural Diversity" DVD.
- Developed a K-12 native plant curriculum.
- Created two high school native plant programs.

Action Item 3: Expand efforts to increase availability of native plant materials.

- Made 122 native species commercially available.
- Made 6,689 native seed collections available through the Seeds of Success program.
- Established interagency ecoregional partnerships to develop native seed.
- Established 1,000 demonstration seedings.
- Provided foundation seed of 193 species to commercial growers.
- Developed interagency Indefinite Delivery, Indefinite Quantity contracts to purchase native plant materials from potential private sector growers.
- Increased the number and diversity of native seeds in the BLM Consolidated Seed Buy from 2 types of native seed in 1992 to 89 types of native seed in 2007.

Action Item 4: Invest in partnerships with state and local agencies and private sector organizations.

- NPMDP involves more than 500 partners, including 9 Federal agencies, 20 state agencies, 22 tribal entities, 24 local agencies, 96 non-governmental organizations, 23 botanical gardens and 118 industry partners.
- The Plant Conservation Alliance (PCA) (10 Federal agencies and 265 non-governmental partners) has focused 25% of its bimonthly interagency meetings on native plant materials development since 2000, thus providing a national forum for dialogue between national, regional and local partners.
- Conducted a 2004 PCA survey and held a conference with non-governmental partners to more effectively involve them in developing native plant materials.

Action Item 5: Ensure adequate monitoring of restoration and rehabilitation efforts.

- Monitoring is occurring at all steps of the native plant materials development process, including seed germination studies, agricultural field trials, and ultimately on the restoration projects the native seed is developed for, such as the interagency success story in the BLM Eugene and Salem Districts in Oregon.

CHAPTER 1: INTRODUCTION

This Report highlights Interagency Native Plant Materials Development Program accomplishments, performance, and progress. The Program is actively developing a sufficient supply of high quality native seed and plant materials, as well as increasing the diversity of species available for restoration and rehabilitation of federal and non-federal lands. Additionally, the Report outlines a strategy for future direction of an integrated program across federal departments and agencies. Chapter 2 summarizes program accomplishments nationally. Chapter 3 highlights accomplishments of ecoregional programs across the country. Chapter 4 identifies the future direction of the Native Plant Materials Development Program. Chapter 5 offers concluding remarks about the Native Plant Materials Development Program's contributions to the restoration of native plant communities across the more than 650 million acres of federal land.

Background

Native plants are those that evolved naturally in North America. They typically grow in communities with other plant and animal species adapted to similar soil, moisture and weather conditions. Native plants play a critical role in the intricate web of life with all other organisms. There is a complex link between native plants and native wildlife. In North America alone, 96 percent of terrestrial birds rely on native insects to feed their young and the native insects rely on native plants for their food. Non-native plants do not provide the food or homes for native insects, resulting in no insect food for the young birds.

Native plants are the backbone of healthy ecological systems. They capture energy from the sun and unlock nutrients from the soil and water to transform these elements into the leaves, roots and shoots that provide food and cover for all the other organisms in that ecosystem. They are also critical to help heal landscapes that have been damaged, degraded and destroyed by wildfire, invasive species, and other severe events. Once established, native plants better withstand variations in local climate such as droughts and freezes. Native plants stabilize soil and reduce erosion; they more effectively filter storm water than exotic plantings, thus improving water quality; and they promote biodiversity, offering the food, nectar, cover, and nesting areas which animals, including pollinators such as bees, birds, butterflies, bats, and mammals, need.

The Bureau of Land Management (BLM), National Park Service (NPS), U.S. Fish and Wildlife Service, USDA Forest Service, and the Department of Defense are responsible for managing one-third of the United States land base (map in Chapter 2). Though not evenly distributed across the U.S., federal lands often make up significant parts of important ecological systems. Natural resources management decisions on federal lands have ecological impacts beyond federal boundaries on the plants and animals that live on surrounding public, tribal and private lands. These lands have a special role to play in ensuring healthy ecological systems both within their boundaries and across the surrounding landscape. Stewardship of these 650 million acres includes maintaining and restoring the native plant communities upon which fish, wildlife and people depend for a wide range of ecological services, habitat, and recreational opportunities.

Threats to Native Plant Communities

Healthy native plant communities are faced with major threats from wildland fire, invasive plant species, and climate change.

While fire is a natural part of many ecosystems, and native plant communities are typically adapted to fire, circumstances today resulting from decades of fire exclusion and the invasion of exotic plant species have significantly altered the fire regimes of many ecosystems, including those of the arid west. Fires which are fueled by exotic annual grasses are often more frequent, severe, and larger in size than the historic fire regimes under which native plant communities evolved. This is threatening many native plant communities, as well as the native wildlife populations that require them to survive.

According to the National Interagency Fire Center, between 1996 and 2007 approximately 74 million acres burned in the United States. Fifty-seven percent of that total acreage burned was on federal lands. An average of 9 million acres burned during each of the past 4 years (2004, 2005, 2006, and 2007), far exceeding the previous 12 year average of 6.1 million acres annually. Figure 1 depicts the previous eleven year history of acres burned in the United States.

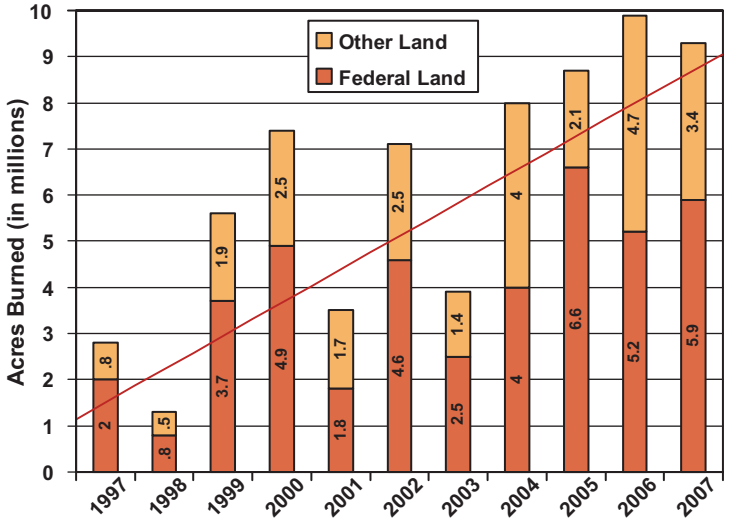


Figure 1. Eleven year history of the number of acres burned in the United States with a red line showing the increasing trend.

There are now 2,000 non-native plant species established in the United States, of which 400 are invasive. Invasive plants have taken over more than 15 percent of our nation's natural landscapes - more than 133 million acres of land under public and private ownership. According to the National Invasive Plant Information Center, an additional 1.7 million acres of native plant communities are being displaced each year. For example, cheatgrass and other weeds are replacing native sagebrush and grasses in the Great Basin, significantly altering natural processes. As cheatgrass, red brome, and other invasives crowd out native plants, larger and more frequent fires become likely. These repeated fires are destructive to some native sagebrush and grasses, but perpetuate the growth and spread of cheatgrass.

Global climate change is altering native plant communities at a greater rate than previously anticipated. Federal agencies have recently begun to look much closer at this issue and the effects on native plant communities could be extensive. To avoid the threat of habitats dominated by monocultures of invasive species, we may need to move and establish native plant materials to more northern latitudes if plant communities can not adapt to climate change.

Developing native plant materials and having native seed stored in long-term conservation storage and available on the market for restoration will provide federal agencies with some of the most important tools to help address threats to natural systems posed by destructive events such as wildfires, invasive species, and climate change.

Federal Role

Federal agencies fill critical bridging and sustaining roles in working with both public and private partners to develop the native plant crops from wild species that are required to address these threats across the country, regardless of land ownership. Federal land covers significant areas, so restoration needs are great. The federal involvement in the process of native plant materials development lessens the risk that the private sector must take to produce the materials federal agencies need.

Developing native plant materials is a cooperative effort involving federal, state, and tribal agencies, the seed industry and the plant research and restoration communities. It is similar to the process used to develop seed for food crops grown commercially on farms across the United States. For both food crops and native plants, it takes an average of 10-20 years to develop seeds and learn to grow them successfully for a commercial market. The risk and investment in research and development to commercialize seed for food crops has often been shared by federal agencies, public universities and private companies. Similar cooperative investments are necessary to commercialize the native plant species used by federal agencies and others in restoring native ecological systems.

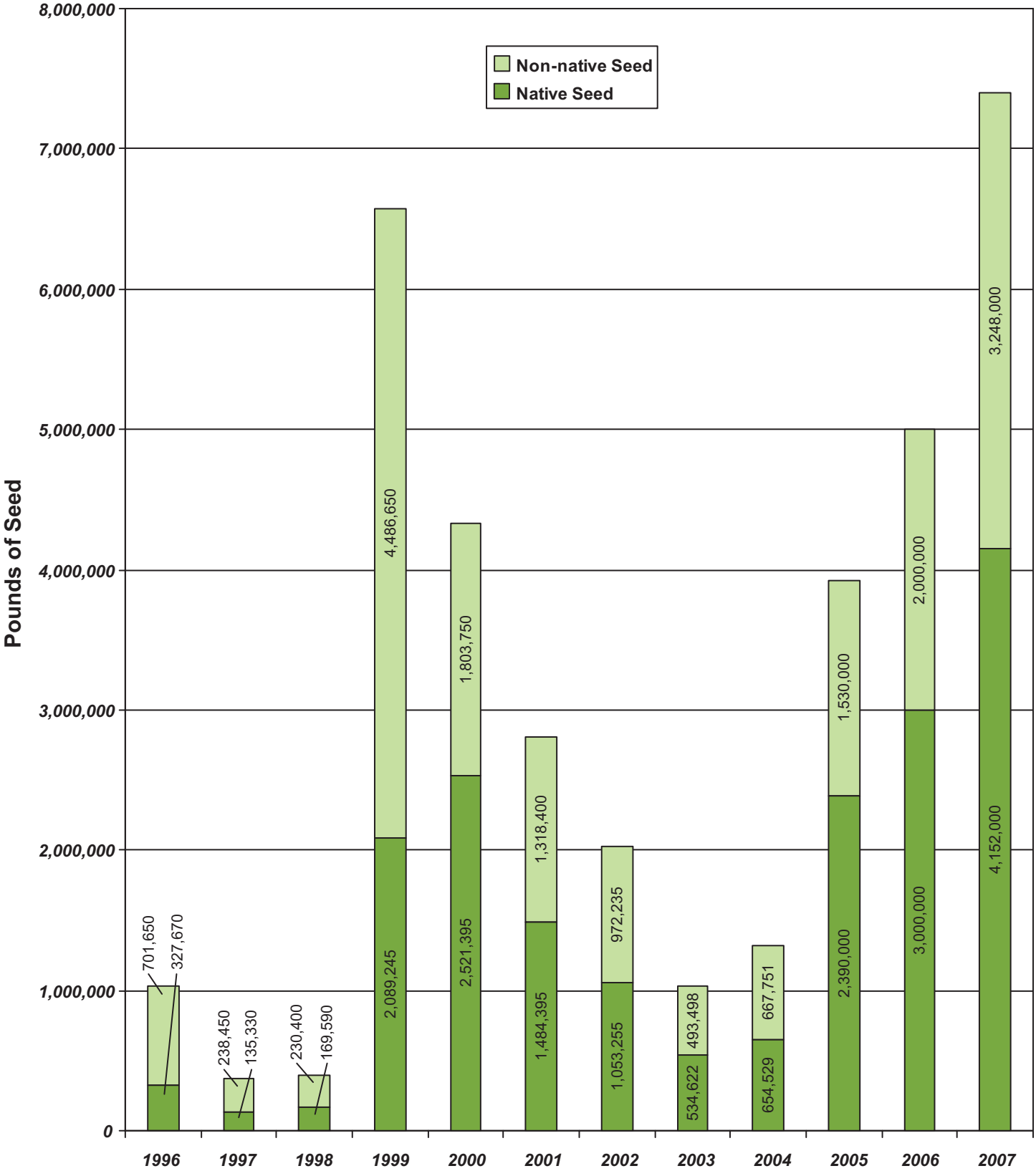


Figure 2. Twelve year history of the number of pounds of seed bought through the Bureau of Land Management Consolidated Seed Buys (1996-2007).

The Bureau of Land Management (BLM) is the largest single buyer of native seed for ecological restoration projects in the western hemisphere. BLM and other federal land managers prefer to buy native seed, but historically, native seed has not been available in sufficient quantity or diversity to meet BLM's need for fire rehabilitation, reclamation and restoration projects. Therefore, the need for restoration materials is often met with non-native seed. The main barrier to adequate native seed availability is inconsistent demand, which

affects private growers' willingness to propagate native seed.

Figure 2 shows how BLM's seed buying fluctuates annually as a direct relationship to the number of acres burned by wildfire. Since 2000, BLM has made a commitment to purchase native seed for rehabilitation projects as often as possible. As a result, BLM has reversed the proportions of native and non-native seed purchased from 33% native in 1999 to 60% native in 2007. Although progress has been made, this huge fluctuation in demand from the largest buyer in the market place makes it challenging for private seed growers to plan their investments to commercially develop native plant species in appropriate quantities.

Congressional Direction and Appropriations

In 2001, Congress directed the Bureau of Land Management and the Forest Service to develop a program to ensure a stable and economical supply of native plant materials for restoration and rehabilitation of federal lands. The Interagency Native Plant Materials Development Program (NPMDP) was established under this directive. Congress recommended that the NPMDP be coordinated through the Plant Conservation Alliance (PCA). PCA is a public/private partnership of 10 federal agencies, the American Seed Trade Association, and over 265 additional non-federal partners who have the knowledge and are positioned to assist the federal government in this significant effort.

In 2002, Congress directed "the Secretaries of Interior and Agriculture to report jointly to the Congress… with specific plans and recommendations to supply native plant materials for emergency stabilization and longer-term rehabilitation and restoration efforts." The Report prepared subsequent to this direction, referred to as the 2002 Report to Congress, identified five action items to be implemented by the NPMDP and is included in the Appendices.

Fiscal Year	Amount in Millions
2001	$5.3
2002	$4.7
2003	$2.3
2004	$4.6
2005	$4.6
2006	$4.4
2007	$4.6
GRAND TOTAL	**$30.5**

Figure 3. Seven year history of Congressional Appropriations for Native Plant Materials Development Program.

Program Funding, Partnerships and Accomplishments

Since the 2001 inception of NPMDP, $30.5 million has been appropriated in Wildland Fire funds for this program, an average of approximately $4.4 million per year. The BLM administers and distributes the NPMDP funds. Congressional appropriations for FY2001-FY2007 are displayed in Figure 3. These funds are distributed to BLM State Offices for projects that have been submitted through the Budget Planning System (Figure 4), and they support federal, state, tribal, non-governmental organizations, universities and private sector partners working together on projects to develop native plant materials. Through this program, an increased supply of native plants is available and more species will be available on the open market for use in short-term reclamation and rehabilitation projects, as well as in long-term restoration at the ecoregional level.

BLM Office	Total Funding (in millions)	Projects Numbers
Alaska	$0.2	11
Arizona	$0.3	20
California	$2.4	77
Colorado	$0.5	22
Eastern States	$0.1	3
Idaho	$1.5	32
Montana	$0.7	18
Nevada	$0.8	64
New Mexico	$0.6	16
Pacific Northwest (OR/WA)	$6.5	534
Utah	$0.7	19
Wyoming	$0.2	8
Great Basin (NV/ID/UT)	$7.3	127
Uncompahgre/Colorado Plateau (CO/UT)	$1.3	121
National Office	$7.4	77
Totals	**$30.5**	**1,149**

Figure 4. The allocation of NPMDP funds to BLM Offices and the corresponding number of projects funded from 2001-2007.

USDA Forest Service receives separate appropriations for native plant materials development on Forest Service lands. This Report does not address those appropriations. USDA Natural Resource Conservation Service Plant Material Centers and USDA Agricultural Research Service facilities are also actively

participating with the interagency NPMDP in developing native plant materials and providing private sector growers with seed and agricultural techniques.

National and international non-governmental partners have also made significant financial and technical contributions to this program in collecting native seed from their part of the country as part of Seeds of Success. In addition, each of the ecoregional programs has many different partners, including state, local and tribal governments, along with non-governmental organizations. Figure 5 displays funding matches by the major partners from 2001-2007, totaling $14.2 million. Total contributions exceeded $15 million. Appendix 1 identifies all the partners, both federal and non-federal, who are integral to NPMDP implementation.

Partner	Funds in Millions
Center for Plant Conservation	$1.5
Chicago Botanic Garden	$2.1
Great Basin Native Plant Selection and Increase Project	$3.0
Lady Bird Johnson Wildflower Center	$0.8
National Fish & Wildlife Foundation	$1.3
Native Seed Network	$1.7
Pacific Northwest Native Plant Program	$1.5
Royal Botanic Gardens, Kew	$2.3
Uncompahgre Plateau Project	$1.4
GRAND TOTAL	**$14.2**

Figure 5. Major contributions from partners including funds and in-kind match from 2001-2007.

CHAPTER 2: NATIONAL PROGRAM ACCOMPLISHMENTS

The national NPMDP is coordinated through the Bureau of Land Management's Plant Conservation Program in Washington, DC. Congress specifically recommended the agencies work through the Plant Conservation Alliance (PCA) and its network of 10 federal agencies and over 265 partners. BLM's Plant Conservation Program Lead serves as the Chair of the Federal Committee of the PCA. BLM provides the programmatic leadership and national infrastructure for NPMDP. BLM administers and distributes the Congressional appropriations through the BLM State Offices to regional and local projects. The distribution of funds for ecoregional programs is depicted in Figure 6.

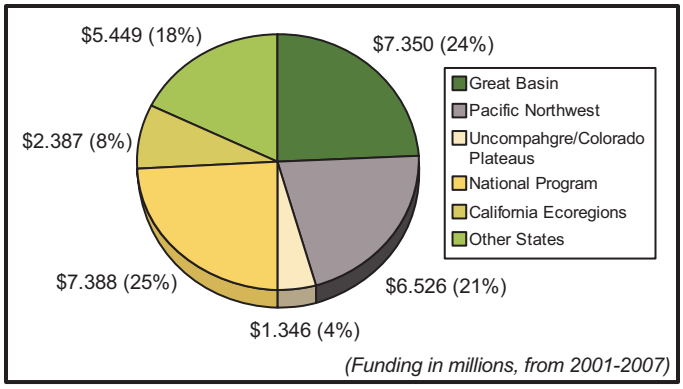


Figure 6. Percentages of Native Plant Materials Development Program funds distributed to ecoregional programs and other BLM states.

In addition to the Wildland Fire funds, other BLM programs in Management of Land and Resources Appropriation and Oregon & California accounts have provided support through funding infrastructure, labor, and operations. The BLM programs that have played a major role include the following: Oregon & California, Wildlife Management and Fisheries Management, Threatened and Endangered Species, Challenge Cost Share, Cooperative Conservation Initiative, Rangeland Management, and Riparian Management.

NPMDP funds are distributed and matched by non-governmental entities who partner on projects that contribute to the success of the program nationally. Major national partners include, but are not limited to, Royal Botanic Gardens, Kew, Center for Plant Conservation, Chicago Botanic Garden, and Native Seed Network. The National Fish and Wildlife Foundation provided $1.3 million in grant funding for projects such as common garden studies. Non-governmental partners have provided substantial assistance to this program. Figure 5 displays funding matches by the major partners from 2001-2007. Appendix 1 identifies the partner organizations, with thousands of individuals, who make this integrated interagency NPMDP succeed. Not all partners receive federal funds for their contributions to the program. Some partners provide funding, technical assistance and in-kind contributions. Royal Botanic Gardens, Kew is one such example.

Key National Program Partners

Following is a list of key partners and a brief description of their contributions to NPMDP, using both BLM NPMDP funding and their own contributed funds.

Royal Botanic Gardens, Kew and Seeds of Success

The Bureau of Land Management began its partnership with the internationally renowned Royal Botanic Gardens, Kew (KEW) in 1999 to coordinate native seed collecting in the U.S. as part of KEW's Millennium Seed Bank Project (MSB). KEW, located in England, partners with 128 countries around the globe collecting native seed. The seed is stored at the MSB in England and within the country of origin, thus ensuring seed conservation at two localities. The MSB and its global partners' goal is to bank seed from ten percent of the world's wild plant species by 2010. MSB is the largest *ex situ* conservation project ever conceived having over one billion seeds (www.kew.org/msbp). KEW has contributed more than $2.3 million towards native

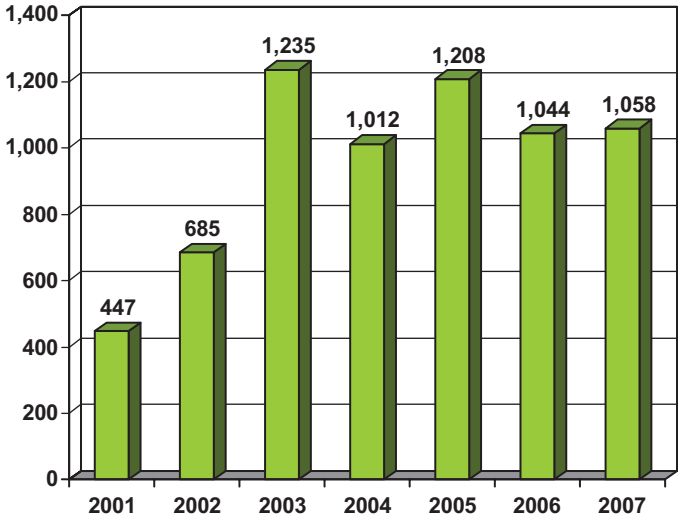


Figure 7. Seeds of Success yearly seed collection numbers.

plant materials development through the funding of native seed collecting in the U.S. as part of the Millennium Seed Bank Project.

Seeds of Success (SOS), a national native seed collection program for the U.S., began in 2001. SOS started with 14 western states and expanded its partnerships and coverage across the country with more than 40 teams making over 6,600 native seed collections from 2001 through 2007 (Figure 7). SOS is coordinated through the BLM with PCA. The PCA website (www.nps.gov/plants/sos) hosts the Seeds of Success protocols and species collecting lists for the teams. The SOS partners include the following: Chicago Botanic Garden, Lady Bird Johnson Wildflower Center, North Carolina Botanical Garden, New England Wild Flower Society, New York City Department of Parks and Recreation-Greenbelt Native Plant Center, and Zoological Society of San Diego. These organizations' contributions are highlighted in Chapter 3.

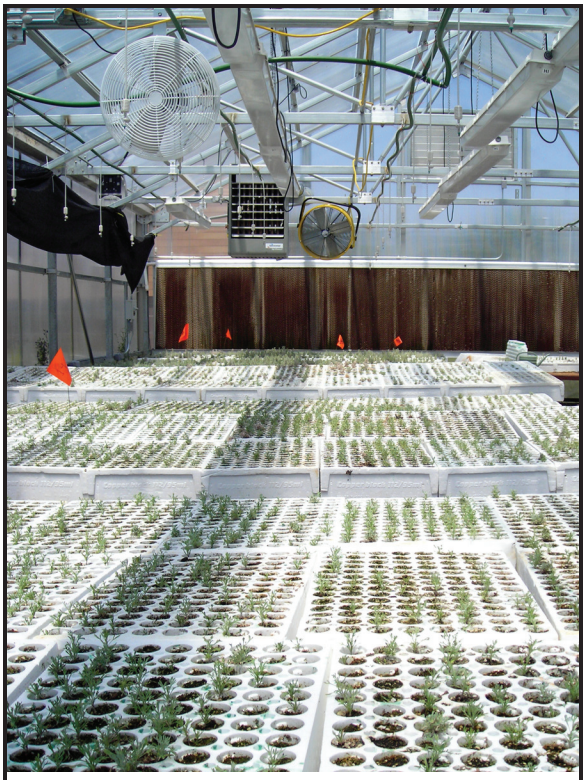
Seeds collected through Seeds of Success are stored in both the United States and England for long-term conservation to ensure the materials are protected for use in the future. The materials stored in England at the Royal Botanic Gardens Kew Seed Bank are a back-up to the materials stored here in the United States at the USDA Agricultural Research Service's National Plant Germplasm Storage facility in Ft. Collins, CO. The materials in the U.S. are divided into two groups for storage. One part of the seed is in long-term storage for future use, if necessary. The other part of the seed is in short-term storage and is used for current research in the development of native plant crops for restoration and rehabilitation of federal lands. This short-term storage allows for the distribution of seeds to any researcher, worldwide, who is interested in working with native seed.

Private Sector Collaboration: The Truax Company

Jim Truax of the Truax Company, located in New Hope, Minnesota, began reengineering the standard rangeland drill in 2000. The Rough Rider rangeland drill evolved and with it several key improvements in planting technology including 1) metering and planting seeds of different sizes and shapes at the same time and at different depths; 2) minimizing soil disturbance and reducing damage to residual biological soil crusts and native species; 3) planting surface seeded species between rows of drilled species; and 4) planting into heavy litter without plugging. This partnership has been mutually beneficial, increasing the effectiveness of research treatments and highlighting further equipment modification needs for rugged western terrain. Recently, Truax has been adding GPS to the drill to monitor both equipment utilization and seed placement.

Plant Conservation Alliance

The Plant Conservation Alliance (PCA) and its 265 partner organizations are an integral part of the Native Plant Materials Development Program as a forum connecting government staffers, conservation organizations, university researchers, restoration experts and industry personnel. The PCA Federal and NGO Committees have been working together and with the American Seed Trade Association on developing native seed for federal agencies. The PCA serves as a conduit for information on the Native Plant Materials Development Program and Seeds of Success through its website (www.nps.gov/plants), bimonthly public meetings, bimonthly Federal Committee meetings, web links with many of the 265 non-federal cooperators and 5 PCA e-mail discussion lists on general native plant, alien plant, medicinal plant, restoration, and seed collecting issues. Exhibits on NPMDP were created and presented at national and regional scientific conferences across the U.S, to a variety audiences from scientists to land managers to the seed industry. Thousands of people have been educated and hundreds of partnerships have been formed from these interactions.



Partnering with Native Americans

Since 2005, the Idaho BLM State Office has been working on a tribal partnership with the Shoshone-Bannock and Shoshone-Paiute focusing on development of native plant materials and greenhouse facilities. The Great Basin Native Plant Selection and Increase Program tribal partnership has collaborated on seed collecting, seed cleaning, agronomic farming of native plants for seed, and providing technical assistance on greenhouse production with the Shoshone-Bannock, Shoshone-Paiute, Richfield Band of Paiutes, and Ibapah Band Goshute Tribe.

Center for Plant Conservation

The Center for Plant Conservation (CPC) is a national network of 35 botanical gardens located throughout the U.S., who are working on native plant conservation, propagation and research. CPC (www.centerforplantconservation.org), its participating institutions and their associated colleges and universities have provided significant assistance to the NPMDP. CPC's contributions have included assistance with native seed collection and database development for Seeds of Success, research on seed germination and seed storage, common garden studies and genetic analysis on numerous species, and a survey of non-governmental partners in PCA on how PCA partners could assist in the NPMDP. Six of CPC's botanic gardens have collected SOS materials on BLM and USDA Forest Service (FS) land. CPC's institutions have the knowledgeable staff that are trained and experienced in native seed collection, germination, propagation and storage.

A fundamental concern federal land managers have in restoring degraded habitats centers on native plant materials to be used in the project. All managers want to maximize the chances for successful restoration and minimize the possibility of putting materials into the project site that would have deleterious effects. One of the most important projects produced by CPC is an extensive literature review on the importance of ecotypes in restoration. Along with the literature review, CPC convened a meeting of internationally recognized geneticists to evaluate the literature review and determine the knowledge gaps related to restoration of native plant communities. The Genetic Considerations in Ecological Restoration Bibliography was the result of this project and is available online through PCA and CPC.

In addition, CPC and Coevolution Institute developed a Pollinator Conservation Digital Library which is available online through the Coevolution Institute (libraryportals.com/PCDL). CPC, with its national network, assisted the NPMDP with several regional meetings on native plant materials issues, such as the 2007 Wildflower Propagation Research Symposium and 2007 American Public Garden Association Conference. The Center for Plant Conservation and its participating institutions contributed $1.5 million in matching funds to NPMDP through seed collection, propagation research, and seed transfer zone guidelines.

Native Seed Network

The Native Seed Network (NSN) is a program within the Institute of Applied Ecology dedicated to providing information about how to select and use the right seed for ecological restoration. NSN (www.nativeseednetwork.org) provides a searchable database of native seed vendors, information about released plant materials, such as cultivars, articles about restoration genetics, and species lists and recommendations for most ecoregions of the U.S. The Native Seed Network was established to fulfill the needs of federal agencies by

connecting them with private sector growers. NSN developed lists of restoration species for the Northern Basin and Range Ecoregion of Oregon and the Great Basin. NSN also provides a service to the private sector growers in addition to identifying their native seeds that are available for purchase, and that is the opportunity to see what the potential species are that federal agencies would be interested in for various ecoregions. The Native Seed Network and its partners have contributed $1.7 million in matching funds to NPMDP for projects such as development of native plant material profiles for over 425 restoration species.

USDA Agricultural Research Service's National Plant Germplasm System

USDA Agricultural Research Service (ARS) conducts research to develop and transfer solutions to agricultural problems and provide information. ARS's expertise in this field makes them an essential partner in native plant materials development. Once cleaned and processed, the SOS collections are shipped to restoration and native plant material development projects, with portions transferred to ARS National Plant Germplasm System's facilities at the Western Regional Plant Introduction Station in Pullman, WA and the National Center for Genetic Resource Preservation in Ft. Collins, Colorado for long-term and short-term storage in state-of-the-art seed storage facilities. (www.ars.usda.gov)

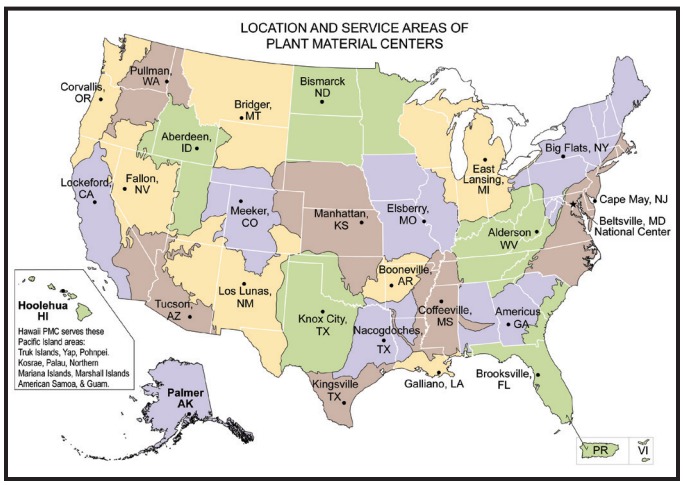
The ARS Western Regional Plant Introduction Station and BLM have an interagency agreement for ARS to be a repository for both short-term and long-term conservation storage of SOS collections. Over 2,000 SOS collections have become part of ARS's National Plant Germplasm System, which distributes materials for research and development through its Germplasm Resource Information Network. ARS distributes SOS materials to researchers around the world. ARS also works collaboratively with other federal agencies in the Great Basin and Pacific Northwest, collecting multiple populations of native species to conduct common garden studies and genetic analysis for development of seed transfer zones. (www.ars.usda.gov)

USDA Forest Service Facilities

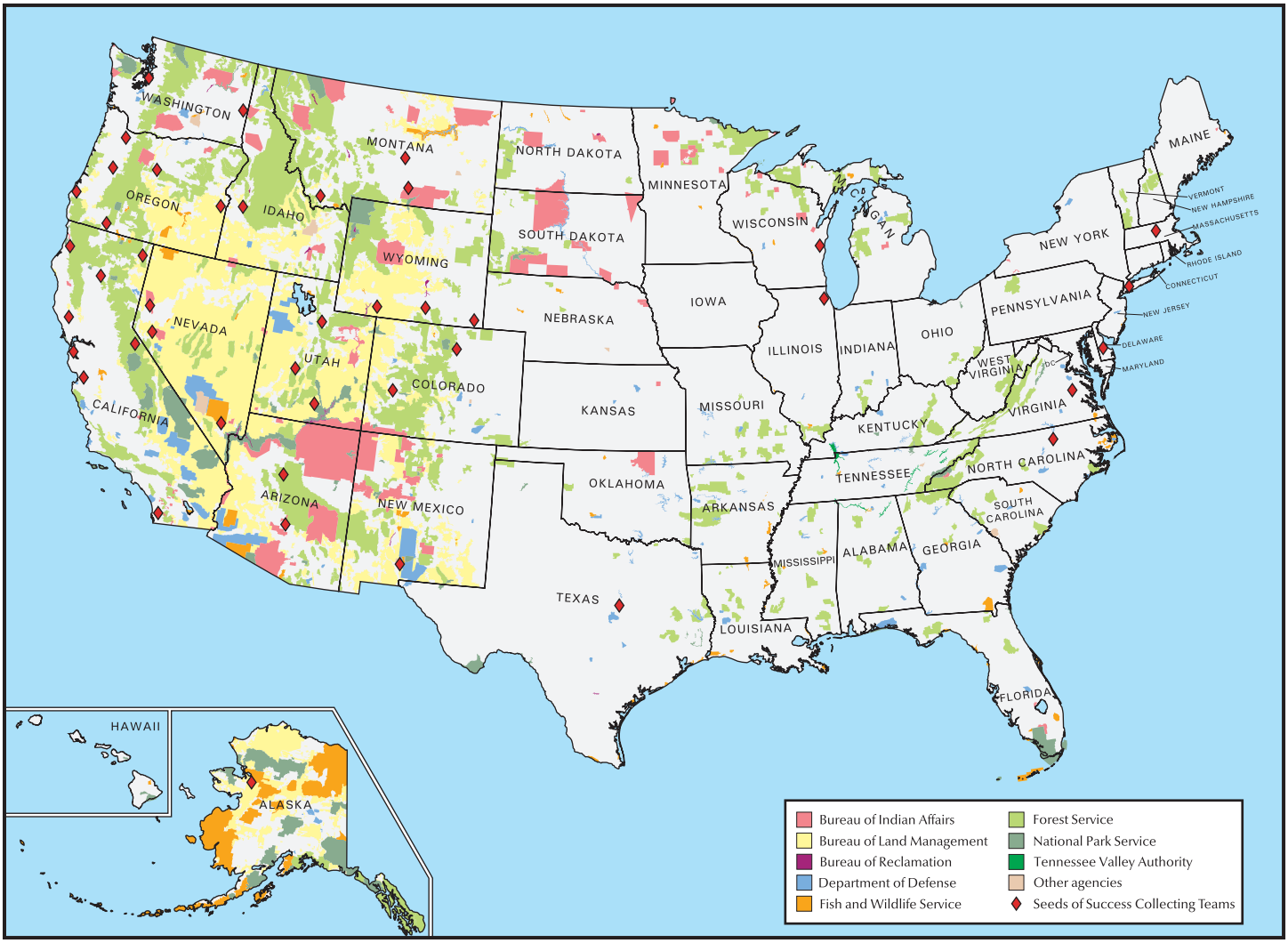
The USDA Forest Service receives separate appropriations for native plant materials development on FS lands. This Report does not address those appropriations. The FS began its breeding programs for forest trees in the early 1900's and has a comprehensive research program that developed practices for collecting, processing, testing, and use of tree seeds. FS staff and several of its facilities have been instrumental in the NPMDP, including the Rocky Mountain Research Station in Boise Idaho, the Pacific Northwest Research Lab in Corvallis, Oregon and the Bend Seed Extractory in Bend, Oregon. (The work of both the Rocky Mountain Research Station and the Pacific Northwest Research Lab will be discussed in Chapter 3.) The BLM has an interagency agreement with the Bend Seed Extractory to clean, test, process, package, store and ship native plant materials collected through Seeds of Success. The Bend Seed Extractory has processed over 500 native seed collections for this effort since 2003.

NRCS Plant Material Centers

USDA Natural Resource Conservation Service Plant Material Centers (PMCs), located across the U.S., are actively participating with the interagency NPMDP in developing native plant materials at the local and regional level. Much of the agricultural techniques for growing out native species is done at these PMCs. PMCs also provide the private growers with seed and agricultural methodologies. The partnerships between PMCs and the private growers have been essential to native plant materials development. BLM Field Offices use these materials for all types of rehabilitation and restoration projects.



National Native Plant Materials Development Program Overview



Map of the United States showing Federal lands and Seeds of Success collecting team locations.

Major Accomplishments of the NPMDP (including BLM and its partners)

- Worked with 9 federal agencies in over 188 field offices.
- Formed over 500 partnerships.
- Partners contributed over $15 million in matching funds.
- Worked with 118 industry partners.
- Coordinated with 23 botanic gardens.
- Engaged over 13 universities in native plant studies.
- Conducted 1,149 projects nationwide.
- Coordinated with the American Public Gardens Association and American Seed Trade Association.
- Made 6,689 native seed collections.
- Coordinated 40 seed collecting teams and 400 volunteers.
- Received 10 nationally recognized awards.
- Completed 11 ecoregional assessments.
- Supported 20 theses & dissertations.
- Developed 4 courses on seed collection, selection, buying, deployment, and restoration.
- Trained over 1,500 people.

The table on the following page summarizes the Native Plant Materials Development Program accomplishments by Bureau of Land Management states and ecoregions. The table was developed with data from BLM State Offices and shows the number of seed collections made and stored, the number of species undergoing the necessary studies for crop development, and the number of species that are in some phase of commercial development. Note that the number of collections at the top of the chart is substantially larger than the number of commercially available species at the bottom of the chart. For every species available on the commercial market, many more collections were made because each species needs collections from multiple populations and some of the species fail in the evaluation and development studies and can not be produced commercially.

Native Plant Materials Development Program Activity Across the United States from 2001-2007

	AK	AZ	CA	CO	ID	MT	NV	NM	OR / WA	UT	WY	Great Basin	National Total
COLLECTIONS (units in # of collections)													
Wildland Seed Collection	97	301	521	256	166	32	190	58	809	293	29	586	6,689*
Native Seed Storage	97	264	342	170	167	32	211	46	617	281	22	255	3,770
EVALUATION AND DEVELOPMENT STUDIES (units in # of studies)													
Seed Zones and Genetic Variability			24	83					76		18	346	547
Pollinator Biology				56					104		1	30	191
Research on Predator/Diseases/Soil Biota Relationships				51		1		2	53		8	162	277
Agricultural Practices		1	13	36			4	25	434		9	216	738
Seed Harvesting, Cleaning and Storage	93		26	29			6		353		10	62	579
Plant Propagation			53				7	5	387		10	149	611
Protocol Development				12			3		343		10	37	405
Shrub Stand Management			1	12					38		12	8	71
Seeding Strategies		4	183	16			2		64		4	22	295
Seedbed Ecology		3	174	16					137		4	22	356
Species Interactions			139	16					21		4	44	224
Demonstration Seedings			175	16			2		268		4	60	525
Operational Seedings			53	15			2		403		1		474
Exotic Grass Monoculture Diversification			1	0					9		12	33	55
COMMERCIAL DEVELOPMENT (units in # of species)													
Initial Increase of Foundation Crop			2	23			3	2	244		9	106	389
Seed to Growers		1	6	1		3	2		114	1	9	56	193
Commercially Available			1	15			2		72		1	31	122

** includes additional collections information from the Uncompahgre/Colorado Plateaus and other collectors*

CHAPTER 3: ECOREGIONAL PROGRAM ACCOMPLISHMENTS

Since the beginning of the NPMDP, the funds have been distributed through the BLM National Office to BLM State Offices for projects at the local or regional level. Each of the BLM State Offices differs in the staffing, infrastructure, funding, experience and/or length of time involved in native plant materials development. For example, the Pacific Northwest Ecoregional Program is coordinated by the Oregon BLM State Office. The Oregon/Washington Plant Conservation Program has been working on native plant materials for their region since 1992. While the Great Basin Native Plant Selection and Increase Project is funded through the Idaho and Nevada BLM State Offices, it is coordinated by the FS Rocky Mountain Shrub Lab and began in 2001. The Uncompahgre Plateau and Colorado Plateau funding has come through both Colorado and Utah BLM State Offices and is an interagency, multi-state partnership.

Currently, within the NPMDP, there are four ecoregional programs, which focus on the Great Basin, Pacific Northwest, Uncompahgre Plateau and Mojave Desert. Each ecoregional program has many different partners, including other federal, state and local agencies, tribal entities, and non-governmental organizations. The partners bring a variety of skills to the table and many play a key role in administering and managing the ecoregional programs with BLM. It is because of the differences within BLM and the variety of partners engaged in the ecoregional programs that the approach to native plant materials development in each of the programs varies. The Great Basin program focuses on evaluation and development of native plant materials and equipment, while the BLM botanists in the Pacific Northwest work more with the private sector grass farmers who are willing to experiment and grow native seed instead of non-native grass seed, such as Jerry Benson of Moses Lake, Washington.

In Chapter 2, Figure 6 depicts the distribution of NPMDP funds to the BLM State Offices and ecoregional programs, with the Great Basin (Idaho, Nevada, Utah) receiving one-fourth of the appropriated funds from 2001-2007. The Pacific Northwest (Oregon, Washington) and California Ecoregions follow with twenty-one percent and eight percent of the appropriated funds, respectively. The Uncompahgre Plateau and Colorado Plateau (Colorado and Utah), together, received four percent of the appropriated funds. The other BLM State Offices (Alaska, Arizona, Eastern States, Montana, New Mexico, and Wyoming) collectively received eighteen percent of the appropriated funds. These six BLM State Offices did not have existing infrastructure in place when the NPMDP started and are currently creating the expertise, partners and infrastructure for native plant materials development in their ecoregions. Funding to these programs will increase as their capacity increases for native plant materials development.

The following section presents an overview of the activities and accomplishments by the ecoregional programs.

A Student Conservation Association team collects seed spiny greenbush seed for Oregon's Baker Resource Area Field Office.

Great Basin Native Plant Selection and Increase Project

Background: Great Basin Native Plant Selection and Increase Project (Great Basin Project) was initiated in 2001 to foster the development of native plant materials based on analysis of adaptive traits for use in the Great Basin. The Great Basin Project also provides information to managers that will be useful in selecting appropriate plant material for seedings that will conserve the natural variation and genetic integrity of the restoration site. Another major objective of the Great Basin Project is to evaluate and develop the equipment and techniques needed for restoring native plant communities. The Great Basin Project focused its efforts on forbs and shrubs because those were the types of plants not commercially available for restoration and rehabilitation projects in the Great Basin. About 25 percent of Native Plant Materials Development Program (NPMDP) funds have gone into the Great Basin Native Plant Selection and Increase Project.

Map of the Great Basin ecoregion.

Current: Research priorities include: 1) improvement in the availability of native plant materials adapted to major bio-geographic areas of the Great Basin with an emphasis on native forbs; 2) development of seed technology and agricultural practices required for agricultural seed increase of native forbs and grasses; 3) management or re-establishment of wildland shrubs to improve seed availability for seed collection and conserve native plant communities; 4) evaluation of the potential for increasing native plant diversity in established crested wheatgrass stands in the Great Basin while minimizing weed invasion; 5) investigation of the biology of the native forbs, emphasizing seed germination and seedling establishment; 6) examination of interactions among restoration species and between restoration species and invasive exotics; 7) evaluation of rangeland drills and strategies for establishing diverse native communities; and 8) technology transfer.

Accomplishments:

- Made 2,762 seed and bulb collections, contributing to 137 common garden studies.
- Provided over 100 seed lots (2,800 pounds of stock seed) to growers.
- Worked with over 50 cooperators who contributed $3 million to the NPMDP.
- Established 21 plant propagation protocols, 14 seed testing protocols, with 9 in progress.
- Published and peer reviewed over 100 research publications, technical bulletins, and other guides on native plant materials development.
- Developed a nationally recognized, award-winning, on-line revegetation equipment catalog that gets over 100,000 visitors annually.
- Supported 19 graduate theses and dissertations advancing native plant materials development.
- Received 3 national awards: Blue Ribbon Educational Website Award from the American Society of Agricultural and Biological Engineers, Service First Award from the Bureau of Land Management and USDA Forest Service (FS), and the National Grasslands Research and Technology Award from NRCS and FS.
- Gave presentations and poster sessions on native plant materials development at 16 international, 99 national, and 120 regional/local conferences.
- Held 17 field days for all partners to showcase new technologies.
- Maintained a demonstration area at the NRCS Aberdeen Plant Materials Center.
- Created 4 databases for the Great Basin Project and contributed to three other databases.
- Worked with 4 tribes, and contributed to sections of the Tribal Nursery Manual.
- Published 6 Great Basin Project and 5 Nevada Native Plant Development Program annual reports.

Pacific Northwest Ecoregion Program

Map of the Pacific Northwest

Background: The Pacific Northwest Ecoregion Program is coordinated by the Oregon BLM State Office Plant Conservation Program Lead and was initiated in the early 1990s by the five western Oregon BLM districts. Managers, botanists, and other program leads recognized the need for development of native species for restoration projects and a small scale program for the development of native plant materials began. Funding was contributed by BLM programs, such as wildlife, forestry, and recreation programs in the MLR and O&C accounts. With the establishment of the Native Plant Materials Development Program (NPMDP) in 2001, Oregon BLM was able to expand to the five eastern BLM districts and develop a long-term native plant materials program. The program involves an interagency approach working with the U.S. Forest Service and other federal agencies, and to a lesser degree, state, county, city, and other interested organizations, to develop native seed for use in variety of programs such as wildland fire, restoration of wildlife habitats, and recreation projects. About 21 percent of NPMDP funds have gone into the Pacific Northwest Native Plant Materials Program.

Current: The overall goal is to develop local native plant materials for restoration and rehabilitation activities that are consistent with the policy and the mission of the BLM. In 2001, the Oregon BLM State Office developed a policy (IM-OR 2001-014) on the use of native plant materials, which included recommendations to:

- Coordinate with other agencies to increase the availability of native plant materials.
- Develop genetic studies to assist in the preparation of transfer guidelines on the appropriate movement of plant materials.
- Provide training and workshops in each district for employees on the importance of native plants.
- Develop an interagency coordination and information exchange.
- Develop a native plant materials program at the district level.

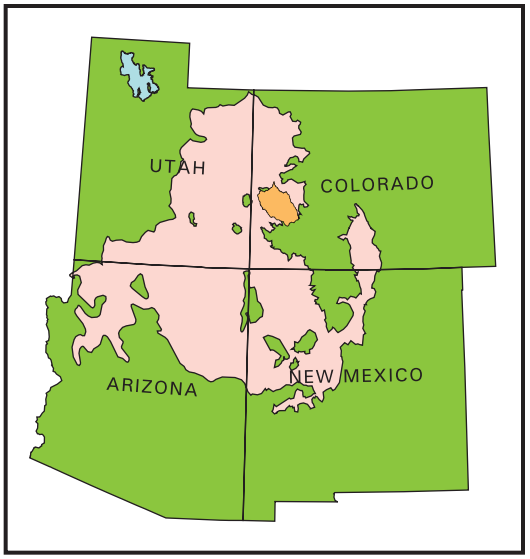
Accomplishments:


In the heart of the Columbia Basin in Washington, Benson Farms began raising grass seed in 1987. Owner Jerry Benson has been working extensively with NPMDP, and now annually produces over 90 ecotypes of grasses and forbs.

- Developed Interagency Native Plant Materials Working Groups.
- Created over 100 partnerships.
- Conducted needs assessments for native plant material on all BLM districts using an interdisciplinary approach and utilizing the districts past ten years use of plant material.
- Developed priority species lists for each ecoregion.
- Developed multi-year/multi-state interagency contracts for seed collection and production activities, such as indefinite delivery/ indefinite quantity contracts with six pre-qualified growers.
- Produced 250,000 pounds of native seed being used on “demonstration seedings” on wildfire and other restoration projects.
- Established the private sector Deschutes Basin Native Plant Seedbank.
- Received $1.3 million in matching funds from partners for native plant materials development.
- Worked with over 30 new growers in developing grass seed and herbaceous and shrub plants.
- Conducted education and outreach at multiple levels through conferences and workshops, public tours, elementary school class room presentations, high school mentoring, posters, reports, and web pages.
- Developed a K-12 Native Plant Curriculum, “Understanding and Restoring Oregon’s Native Plants.”
- Received 2 awards.
- Established over 35 plant propagation protocols.

Uncompahgre Plateau and Colorado Plateau

Background: The Uncompahgre Plateau, located in southwestern Colorado, is comprised of over 1.5 million acres of federal, state and private land. Seventy-five percent of the area is public land. The Uncompahgre Plateau Project (UPP) was formed in 2001as a partnership among the Bureau of Land Management (BLM), USDA Forest Service (FS), Western Area Power Administration, Colorado Division of Wildlife and the Public Land Partnership to restore and sustain the ecological, social, cultural and economic values of the Uncompahgre Plateau. UPP is working on 54 native forbs, shrubs and grasses with more than 15 partners. About 4 percent of Native Plant Materials Development Program (NPMDP) funds have gone into the Uncompahgre Plateau and Colorado Plateau efforts.



Map of the Colorado Plateau ecoregion (larger pink area) and the Uncompahgre Plateau ecoregion (smaller orange area).

Current: In 2007 alone, over 580 pounds of seed were produced from 33 species. UPP has 15 species (1 shrub, 4 grasses, and 10 forbs) available for interested growers. UPP is offering a buy back program as incentive to growers and is also working within the agencies to promote the local ecotypes now available.

BLM, FS, and State Wildlife Agencies from Colorado, Utah, Arizona and New Mexico have met with the Uncompahgre Plateau Project to begin the development of a regional Colorado Plateau Native Plant Initiative, which would include the UPP. This initiative will be an interagency, multi-state native plant materials program similar to the Great Basin Native Plant Selection and Increase Program. NPMDP provided funds to the Utah BLM State Office to coordinate the Colorado Plateau effort.

Accomplishments:

- Over 300 wildland seed collections of 50 key native species.
- 25 species are in seed increase fields, and 36 are in study plots.
- Seed from 15 species (1 shrub, 4 forbs, and 10 grasses) is currently available for growers.
- Held a 3-day native plant restoration workshop in 2007, with over 100 attendees.
- Snow College and Brigham Young University produced over 280 pounds of seed from 29 species; the Meeker Plant Materials Center produced 24 pounds; Colorado State University produced 169 pounds; and a private grower in Delta, Colorado harvested 180 pounds of mountain brome in 2007.
- Established three research study sites in 2006.
- Received 4 nationally recognized awards: USDA Forest Service Regional Honor - Caring for the Land Stewardship Award, Colorado Chapter of Wildlife Society Outstanding Achievement Award, National Fire Plan Award, and Secretary of the Interior's Four C's Award.

Mojave Desert Initiative

Background: Since 2005, over one million acres of the Mojave Desert have burned in Arizona, Utah and Nevada. The wildfires were fueled by invasive, non-native plants such as cheat grass and red brome. In 2006, the Native Plant Materials Development Program (NPMDP) assisted the U.S. Fish and Wildlife Service's Reno Office in organizing a two-day meeting in Las Vegas to discuss the issue of native plant materials for rehabilitation and restoration after wildland fire in the Mojave Desert.

Current: In 2007, the Mojave Desert Initiative was formed to focus on protection and restoration of native plant habitats in the northeast Mojave Desert. Partners include: BLM (Las Vegas Field Office, Ely Field Office, Battle Mountain Field Office, St. George Field Office, Arizona Strip District, Colorado River District), National Park Service's Lake Mead National Recreation Area, Department of Defense's Nellis Air Force Base, Arizona Department of Game and Fish, Nevada Department of Wildlife and Utah Department of Wildlife Resources.

Map of the Mojave Desert ecoregion.

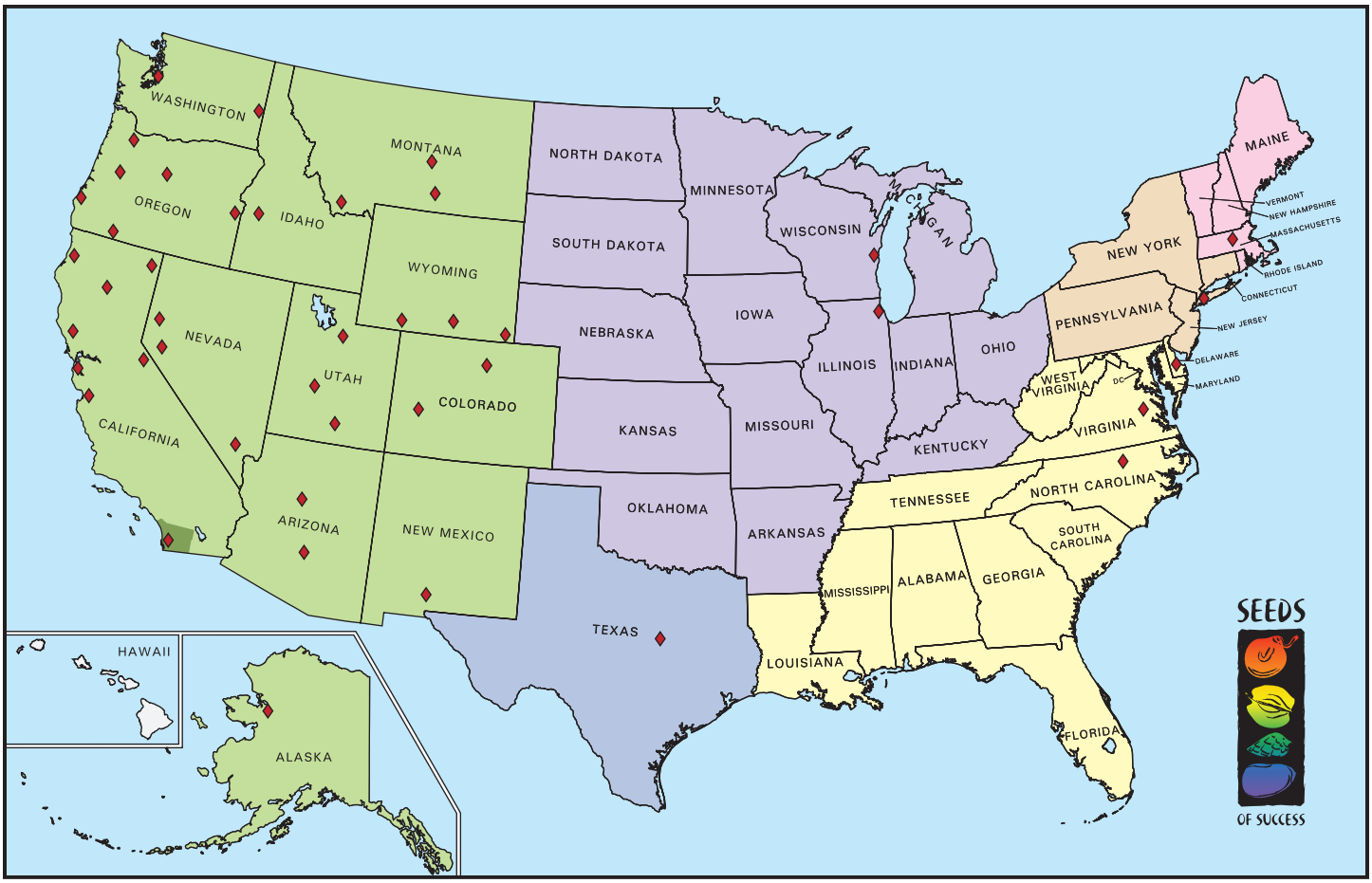
Native plant materials development is a key item in the draft Mojave Desert Initiative Action Plan. NPMDP supported the initial 2006 Mojave meeting and supported the Nevada Native Seed Pilot Project with Natural Resource Conservation Service's Tucson Plant Materials Center and will continue to support the Mojave Desert Initiative.

Seeds of Success Program

Background: Seeds of Success (SOS) was established in 2001 by the Bureau of Land Management (BLM) in partnership with the Millennium Seed Bank Project (MSB) to collect, conserve, and develop native plant materials for restoration across the United States. The initial partnership between BLM and MSB quickly grew to include many additional partners, such as botanic gardens, arboreta, zoos, and municipalities. These SOS teams share a common protocol and coordinate seed collecting and species targeting efforts.

Current: To date, SOS has 6,689 native seed collections in its National Collection. This material is being used for direct seeding in restoration projects, native plant materials development projects such as germination trials, common garden studies, and protocol establishment. Portions of each collection are also being held in long-term storage facilities for conservation.

SOS has partnerships nationwide for permits to collect seeds on 30 USDA Forest Service National Forests, 10 U.S. Fish & Wildlife Service National Wildlife Refuges, 6 Department of Defense areas, The Nature Conservancy's lands and multiple state and local lands. The SOS partners, who are non-governmental organizations, have made significant collections of the Midwest, Texas, Eastern U.S., and San Diego County. They have contributed matching funds totaling approximately $3.3 million. On the next page are highlights from the Native Plant Materials Development Program's SOS partners.



Map of the Seeds of Success collecting areas. The red diamonds show the locations of collecting teams. The shaded states show the different areas of coverage: green (Bureau of Land Management), dark green (Zoological Society of San Diego), purple (Chicago Botanic Garden), blue (Lady Bird Johnson Wildflower Center), pink (New England Wild Flower Society), orange (New York City-Department of Parks & Recreation–Greenbelt Native Plant Center), yellow (North Carolina Botanical Garden).

Western United States: BLM Collecting Teams

Currently, 20 BLM offices are participating in SOS. These collecting teams cover the 14 BLM western states, and have made over 4000 collections that have gone towards native plant materials development. A portion of all the collections have gone to KEW and ARS for long-term conservation storage.

Great Lakes, Midwest, and Prairie Regions: Chicago Botanic Garden

The Chicago Botanic Garden (CBG) is involved in all phases of the native plant materials development process. The CBG SOS team has made over 600 collections. CBG has conducted: 26 seed zones and genetic variability studies, 26 pollinator biology and management studies, and 19 cultural practices studies, and has established plant propagation protocols for 24 species. CBG also manages the Conservation and Land Management Intern program which has placed hundreds of interns in BLM offices to work on public land natural resource issues, including native seed collection. BudBurst is another program that CBG manages. BudBurst is a national citizen science effort to record bloom dates for plant species in a centralized database, which will be used for climate change research. CBG has contributed over $2.1 million in matching funds.

Texas: Lady Bird Johnson Wildflower Center

Taking on the entire state of Texas, the SOS team at Lady Bird Johnson Wildflower Center (LBJWC) has recruited hundreds of volunteers who have put in over 4000 hours. LBJWC has been working very closely with over 100 private landowners, growers, and U.S. Fish and Wildlife Service National Wildlife Refuges to make about 500 collections. LBJWC has made 275 native species commercially available to the public. LBJWC has contributed approximately $1 million in matching funds.

Eastern United States: NYC-DPR Greenbelt Native Plant Center, New England Wild Flower Society, and North Carolina Botanical Garden

In 2006, SOS expanded its coverage to include the Eastern U.S. With federal, state and local partners, the SOS Eastern U.S. collecting teams have been able to collect approximately 200 species. Without these collecting teams, much of the eastern flora would not be conserved in long-term storage for use in restoring native plant communities.

San Diego County: Zoological Society of San Diego

San Diego County has a rich flora, and the Zoological Society of San Diego (ZSSD) is working with local and federal partners to ensure that its flora is banked. To date, the ZSSD SOS team has made over 200 collections and is also working on propagation, germination and cleaning studies with its partners including the San Pasqual Band of Mission Indians.

CHAPTER 4: FUTURE DIRECTIONS

Goal and Objectives

The long-term goal of the Native Plant Materials Development Program is to build sufficient capacity in federal agencies to develop native plant materials and provide appropriate native seed to the private sector for commercialization. The objectives of the program are to develop 1000 native restoration "workhorse" species, which will be available on the commercial market, and to have sufficient quantity of native seed for emergency stabilization and rehabilitation in a 15-million acre fire season.

An interagency strategy will be developed by the NPMDP to help increase the availability of native forbs, shrubs and grasses for short-term reclamation, fire rehabilitation and long-term restoration on federal land. The strategy will guide agencies' efforts and investments toward the goals listed below. The pace and extent to which progress is made in implementing these goals will be determined by the availability of future funding which cannot be estimated at this time.

- Increase Seed Storage Capacity.
- Expand Seed Collection and Curation.
- Develop Seed Transfer Zones and Guidelines.
- Establish Interagency Ecoregional NPMDPs.
- Provide Programmatic Leadership and Infrastructure.

Increase Seed Storage Capacity

High quality seed storage warehousing is necessary to protect and maintain the viability of native seed for use in a 1-5 year period. This provides sufficient time to even out the demand for native seed by federal agencies. Native seed is expensive and lasts longer at lower humidity and lower temperatures; therefore, it is cost effective to warehouse adequate quantities of sagebrush and other shrub species in cold storage.

The biggest barrier to the development of sufficient, appropriate native plant materials is the federal agencies' unpredictable annual need for native seed. The wide fluctuation in demand makes it difficult for private seed growers to appropriately invest in propagation and commercialization of native plant species because they do not know how much agencies will need. Agencies can stabilize their need for native seed by integrating the fire rehabilitation need with the reclamation and restoration needs for native seed. The overall concept is that in big fire years, stored seed would be used for fire rehabilitation and in small fire years stored seed can be used for reclamation and restoration. Successfully stabilizing native seed demand also requires developing more seed storage capacity to maintain the viability of seed purchased but not needed in years when fire rehabilitation needs are smaller, and a consistent commitment to restoration projects. This would not be possible at the current funding level.

For BLM alone, current seed storage capacity at the Boise Seed Warehouse is 800,000 pounds of seed, including a capacity for 25,000 pounds in cold storage. Appropriate temperature and humidity conditions are essential for maintaining viability and preventing loss to rodents and other seed pests. For example, seed from some key native species, such as sagebrush and bitterbrush, require cold storage to remain viable if they are to be stored more than 6-12 months.

Currently, native seed needed for both fire rehabilitation and restoration must be supplied using the 800,000 pounds of storage capacity available in Boise, Idaho and temporary storage facilities across the west. In 2002, the BLM Fire Rehabilitation Program estimated that 3 million pounds of storage capacity was needed for seed to supply fire rehabilitation needs alone. BLM estimates that meeting both its fire rehabilitation and restoration needs would require the capacity to store 5 million pounds of native seed, including 300,000 pounds of cold storage capacity. The 5 million pound capacity only reflects BLM's estimated needs, not the storage

needs of other federal agencies. In FY2009, BLM received funding from the Southern Nevada Public Lands Management Act (SNPLMA) special account to build a seed storage facility that will provide an additional 800,000 pounds of capacity, including 100,000 pounds of cold storage capacity.

Expand Seed Collection and Curation

Federal agencies will continue to focus on the long-term goal of developing, evaluating, and commercializing 1,000 native plant species which have been identified as restoration "workhorse" species.

A restoration "workhorse" species is one that occupies a large part of one or more ecoregions. To date, BLM and its SOS partners have made more than 6,600 native seed collections which will be used to identify "workhorse" species. Continued emphasis will be placed on the collection of multiple populations of the restoration "workhorse" species to obtain broader genetic diversity within a species.

The long-term goal of the NPMDP is to increase the Seeds of Success collection effort to 15,000 new collections. The native seed collections will focus on the 1,000 restoration "workhorse" species identified in ecoregions across the country. NPMDP will work with all federal land managing agencies to identify restoration species for collection by ecoregion. An assessment of native seed needs for each federal agency interested in participating in this program will be conducted to quantify native seed needed by ecoregion. At the current funding levels, NPMDP would make 800-1,000 collections per year.

Develop Seed Transfer Guidelines/Zones

The long-term goal of the NPMDP is to develop seed transfer guidelines for 250 of the restoration "workhorse" species. At the heart of native plant restoration is the question of how far from the seed source can future generations of plant materials be used. This distance, which defines the seed transfer zone, is the area where a species is genetically adapted to grow. Geneticists have determined that at least 20 collections of a native species within its range are necessary to start a common garden study. Common garden studies, along with genetic analysis, contribute to the development of the seed transfer zone for each species.

Partnerships with universities, botanic gardens and other agencies will enable more common garden studies to be conducted. Common garden studies for each of the 250 native species must be conducted in several locations and the NRCS Plant Material Centers provide one such venue for these studies. There are ten western NRCS Plant Material Centers (PMCs), located in Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, and Washington.

Seed transfer zones for most native grasses, forbs and shrubs are not well defined in the United States, although tree seed transfer zones have been in place for decades. Developing seed transfer zones for some of the restoration "workhorse" species will be done collaboratively with USDA Forest Service, U.S. Geological Service, USDA Agricultural Research Service, and USDA Natural Resources Conservation Service. Collaboration with other university and botanical garden researchers will be necessary. Common garden studies are necessary to determine the plant material most appropriate for restoration. This costs approximately $40,000 per species. It appears that seed transfer zones need to be developed on a species by species basis. At current funding levels, about 50 seed transfer zones would be developed over the next 10 years. NPMDP will work with all federal land managing agencies to identify species for seed transfer zones.

Establish Ecoregional Native Plant Materials Development Programs

Every wild native plant species must go through a six-step process to be developed into a native plant crop for restoration (see inside cover). Each species undergoes: seed technology and cultivation studies, life history studies, pollination studies, disease studies, seed predation studies, harvesting and planting equipment studies, seed increase plots, and foundation plots. Other areas of study include examining interactions of native restoration species and exotic invasive species, collaborating with seed regulatory agencies and the private seed

industry to improve native seed supplies, or developing application strategies and technologies to improve the establishment of native seedings in restoration projects. This is a new science which is exploring how these native species work as crops. These studies will take several years to conduct because native forbs and shrubs may flower only once every 4-5 years. The NPMDP's long-term goal is to establish ecoregional native plant materials development programs across the United States. At the current funding level we have 2 ecoregional native plant programs in the Great Basin and Oregon/Washington.

Provide Cohesive Programmatic Leadership and Infrastructure

The continued success of the NPMDP requires the assistance of a broad array of federal and non-federal partners working towards the common goal of developing the most appropriate native plant materials for restoration. This is especially critical in adapting to the transition brought about by global climate change. Effective program leadership will optimize the allocation of resources and delegate responsibilities and tasks associated with implementation of the NPMDP. Programmatic leadership and infrastructure will facilitate the process by providing coordination, development, management, and maintenance of national agreements with agencies and organizations. There are many unanswered questions concerning the development of native plant materials. Therefore, federal research agencies, such as U.S. Geological Survey, USDA Agricultural Research Service, Natural Resources Conservation Service and Forest Service will be critical in answering these important research questions. In addition, federal facilities such as J. Herbert Stone Nursery (Oregon), Lucky Peak Nursery (Idaho), Horning and Sprague Orchard (Oregon) and the Bend Seed Extractory (Oregon) greatly assist in developing native plant materials

In May, 2008, BLM conducted an Interagency Program Review of the Native Plant Materials Development Program. Several positive findings were identified through the evaluation process, such as broad support for objectives and benefits of the program and a great need for native plant materials. It is the long-term goal of the NPMDP to implement the following major recommendations made in the Native Plant Materials Development Program Evaluation Report.

- Establish an interagency Advisory Board under the auspices of the Plant Conservation Alliance.
- Develop an Interagency NPMDP Strategic Plan.
- Develop a national communication plan for the NPMDP.
- Identify priority "workhorse" species.
- Develop an estimate of the total annual need for native plant materials by the federal land managing agencies.
- Develop long-term seed storage capability.
- Continue consolidated seed buys.
- Complete common garden studies to determine seed transfer zones for "workhorse" species.
- Continue emphasis on the science of native plant materials development.

CHAPTER 5: CONCLUSIONS

Native plants are an essential component of all ecosystems across the United States. Not only do they transform the sun's energy into food on which most other organisms depend, but their presence brings considerable economic, aesthetic, and ecological value to our lives and culture. Native plant communities give us our sense of place and inspire our stewardship of the American landscape. We would not have the Sonoran Desert without the saguaro cactus, the Great Basin without the sea of sagebrush, nor the Rocky Mountains without the majestic Ponderosa pines. These places and their unique native plant communities are threatened by non-native invasive plants and altered fire regimes and fire severity associated with these exotic invaders. To address these concerns and to conserve the wide range of ecological services, habitats, and recreational opportunities that native plants provide, the NPMDP has been partnering with federal, state, tribal and local governments and private sector organizations to develop commercially available native plant materials to restore degraded landscapes on public and private lands. Because the effects of global climate change on native plant communities are uncertain, it is especially important for the federal government to build capacity within its agencies, as well as partner with the private sector, to ensure that appropriate native plants are available and used.

To sustain healthy native plant communities, the NPMDP has a long-term goal of developing genetically appropriate native plant materials in sufficient quantities to meet federal agencies' needs after catastrophic events such as wildfires. The NPMDP also aims to establish more effective ecoregional programs across the country to work with local partners to better develop protocols and priorities for native seed.

While implementing projects within the ecoregional programs, the NPMDP recognizes the need to concurrently build and broaden the participation in the program so that needs across the entire United States are addressed. The program is currently entering a second phase in its development and plans on closer collaboration with other federal departments and agencies such as the U.S. Fish & Wildlife Service, Department of Defense, National Park Service, USDA Forest Service, U.S. Geological Survey, Environmental Protection Agency, Bureau of Indian Affairs, Federal Highways Administration, Department of Energy, and the National Science Foundation. After the 2007 fire season, with the largest number of acres burned, it is apparent that there will be a greater need for native plant materials than we have ever seen. The NPMDP and its partners are already developing an interagency strategy to address this greater need for appropriate native seed.

The development and implementation of the NPMDP's strategy for native seed provides a framework to increase the availability of native forbs, shrubs and grasses for short-term reclamation, fire rehabilitation and long-term restoration on federal land through the following actions, which will be implemented over the long-term as available funding permits.

- Increase Federal seed storage capacity to 5 million pounds.
- Expand seed collection and curation to 15,000 collections.
- Develop guidelines for seed transfer zones for 250 "workhorse" species.
- Establish ecoregional Native Plant Materials Development Programs.
- Provide cohesive programmatic leadership and infrastructure.
- Increase public outreach on NPMDP.

GLOSSARY OF NATIVE PLANT MATERIALS DEVELOPMENT TERMS

Agricultural practices – the steps that are followed to establish and maintain a crop, including seeding, fertilizing, irrigating, weed control, and harvesting.

Common garden study – see genetic variability study.

Cultivar – a variety, strain, or race that has originated and persisted under cultivation or was specifically developed for the purpose of cultivation.

Demonstration seeding – a seeding that displays or demonstrates the use or adaptation of plants for a specific area.

Deployment of materials – selection, collection, increase (seed production or propagation of seedlings/cuttings), preparation of seed mix, delivery to the planting site, and application (transplanting, drill seeding, etc.) of plant materials.

Ecoregion – an area of general similarity in ecosystems and in the type, quality, and quantity of environmental resources.

Ecotype – a population, populations, or strain within a given species adapted to a particular environment.

Exotic grass monoculture diversification – an interseeding or planting of native plant species into a monoculture of exotic grasses such as various wheatgrasses, smooth brome, cheatgrass, or others.

Forb – perennial or annual herbaceous, broad-leafed plant.

Foundation field – a plot of land containing original seed stock maintained by the plant breeder(s) for the genetic integrity of material.

Genetic integrity – the natural condition of a gene pool; freedom from genetic contamination such as genes introduced from non-native or non-local populations.

Genetic variability study/common garden study – a research project to examine the genetic diversity within a species or ecotype. Information from such a study is used to develop seed transfer zones and determine ecotypes.

Genotype – the genetic code of an organism.

Germination – the resumption of active growth by the embryo, culminating in the development of a young plant from the seed.

Germination trial – the subjection of seeds to selected pretreatments and incubation environments to determine optimal procedures and conditions for enhancing germination.

Germplasm – a collection of genetic resources in the seed of a specified plant population.

Initial increase – seed from an initial source grown in a plot or field to augment the total amount of seed available.

Life history study – examination of the evolution, taxonomic relationships, biology and ecology of a species.

Monitoring – the orderly collection, analysis, and interpretation of resource data over time to evaluate progress toward meeting management objectives.

Native plants – the indigenous terrestrial and aquatic species that have evolved and occur naturally in a particular region, ecosystem, or habitat. Species native to North America are generally recognized as those occurring on the continent prior to European settlement. They represent a number of different life forms, including conifer trees, hardwood trees and shrubs, grasses, forbs, and others.

Native plant development/native plant materials development – a process where one develops seed that is adapted to a planting site or region and has appropriate genetic variation for the objective of the planting. This can be achieved by a number of procedures, including collection of seed from populations (sites) having similar adaptive characteristics. These collections can then be combined to increase genetic variation and adaptive potential.

Native plant materials – roots, shoots, bulbs, seedlings, or seeds of native species.

Operational seedings – seedings conducted with commonly used equipment at an application-level scale (as opposed to small-plot research treatments).

Pollinator biology and management practices – the study of the interaction between pollinator organisms and plant species and techniques for maintaining populations of these organisms in agricultural, horticultural, or wildland settings.

Propagation – multiplication of plant material by seed or vegetative means (cuttings, sprigs, bulbs, etc.).

Protocol – a convention, guideline or standard.

Rehabilitation – altering a degraded habitat in order to improve ecological function.

Restoration – altering an area in such a way as to reestablish an ecosystem's structure and function, usually bringing the area back to its original (pre-disturbance) state or to a healthy state close to the original.

Seed curation – the process of establishing and developing a long term repository for seed storage to meet current and future needs.

Seed drills – consist of seed hoppers, metering devices and seed placement devices. They create a furrow, place seed in the furrow and press soil around the seed. Double disk openers with depth bands and presswheels can be used on clean-tilled sites. If debris and rocks are present, coulters, modified disk openers, cultipackers, chain drags, and rubber-tire packers are used. Different seed types must be metered separately.

Seed increase – similar to initial increase but may also include further improvement of seed harvest or yield.

Seed lot – the seed of known species, type or cultivar harvested from a specified field or plot and given a name and/or number, usually by the seed grower that identifies the year grown.

Seed predation – includes any process inflicted on a plant's seeds by other organisms that results in seed damage or loss of viability. Predation includes consumption of seed as well as parasitization. Seed predation can affect reproductive success, population dynamics and evolution of defensive morphological and physiological traits and plant dispersal mechanisms.

Seed storage, long-term – placing seeds in sealed, moisture-proof containers in cool, dry environments to maintain their viability.

Seed transfer zone – a mapped area with fixed boundaries in which seeds or plant materials can be transferred with minimal risk of maladaptation. Continuous zones, or seed transfer guidelines, are similar in that they recommend how far seeds can be transferred from the point of origin, and describe the relative risk associated with that transfer.

Shrub – a perennial plant species, usually with a woody basal area and multiple stems, not to exceed 15 feet in height at maturity.

Technological transfer – the process of converting scientific findings from research laboratories into useful products or applications. Sharing scientific information by means of education and training.

Weed – a plant(s) growing where it is not wanted. Weeds adversely affect the use, economic value, and aesthetic aspect of the land and waters that they infest.

Wildland seed collection – collections of seed made from wild plant populations. This does not include collections from cultivated or human seeded populations.

Workhorse species – those species that occupy a large part of one or more ecoregions.

APPENDIX 1: PARTNERS INVOLVED IN THE NATIVE PLANT MATERIALS DEVELOPMENT PROGRAM

FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
Department of Defense, Army Corps of Engineers, Clinton Lake Wildlife Area, KS				x				
Department of Defense, Army Corps of Engineers, Fisher Butte Research Natural Area, OR				x				
Department of Defense, Army Corps of Engineers, Perry Lake, KS				x				
Department of Defense, U.S. Air Force, Kotzebue Long Range Radar Site, AK				x				
Department of Defense, U.S. Air Force, Nellis Air Force Base Nevada Test and Training Range, NV				x				
Department of Defense, U.S. Army Corps of Engineers, Canyon Lake Park, TX				x				
Department of Defense, U.S. Army, McGregor Range/Ft. Bliss Military Reservation, NM				x				
Great Basin Native Plant Selection & Increase Project				x				
Great Basin Restoration Initiative				x				
Secure Rural Schools and Community Self-Determination Act of 2000 (Title II)				x				
Uncompahgre Plateau Project		x		x			x	
USDA Agricultural Research Service		x		x				
USDA Agricultural Research Service, Bee Biology and Systematics Laboratory, Logan, UT		x		x				
USDA Agricultural Research Service, Eastern Oregon Agricultural Research Center, Burns, OR		x		x				
USDA Agricultural Research Service, Forage and Range Research Laboratory, Logan, UT		x		x				
USDA Agricultural Research Service, High Plains Grassland Research Station, WY		x		x				
USDA Agricultural Research Service, Jornada Experimental Range, NM		x		x				
USDA Agricultural Research Service, Logan, UT		x		x				
USDA Agricultural Research Service, National Center for Genetic Resources Preservation, Ft. Collins, CO		x		x				
USDA Agricultural Research Service, Western Regional Plant Introduction Center, Pullman, WA		x		x				
USDA Cooperative Research, Education and Extension Service				x				
USDA Cooperative Research, Education and Extension Service, National Research Initiative Program				x				
USDA Forest Service				x				
USDA Forest Service, Bend Seed Extractory, OR		x		x				
USDA Forest Service, Boise National Forest, ID				x				
USDA Forest Service, Buffalo Gap National Grasslands, SD				x				
USDA Forest Service, Cedar River National Grassland, ND				x				
USDA Forest Service, Chequamegon National Forest, WI				x				
USDA Forest Service, Chippewa National Forest, MN				x				
USDA Forest Service, Coconino National Forest, AZ				x				

FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
USDA Forest Service, Coronado National Forest, AZ				x				
USDA Forest Service, Crooked River National Grassland, OR				x				
USDA Forest Service, Custer National Forest, Billings, MT				x				
USDA Forest Service, Gifford Pinchot Genetics Program, Vancouver, WA		x		x				
USDA Forest Service, Gifford Pinchot National Forest, Vancouver, WA				x				
USDA Forest Service, Gunnison National Forest, CO				x				
USDA Forest Service, Hiawatha National Forest, MI				x				
USDA Forest Service, Humboldt-Toiyabe National Forest, NV/CA				x				
USDA Forest Service, Huron-Manistee National Forests, MI				x				
USDA Forest Service, Inyo National Forest, Bishop, CA				x				
USDA Forest Service, J. Herbert Stone Nursery, Central Point, OR		x		x				
USDA Forest Service, Little Missouri National Grassland, ND				x				
USDA Forest Service, Lucky Peak Nursery, Boise, ID		x		x				
USDA Forest Service, Malheur National Forest, OR				x				
USDA Forest Service, Medicine Bow National Forest, WY				x				
USDA Forest Service, Midewin National Tallgrass Prairie, IL				x				
USDA Forest Service, Mt. Baker-Snoqualmie National Forest, WA				x				
USDA Forest Service, Mt. Hood National Forest, OR				x				
USDA Forest Service, National Seed Laboratory, Dry Branch, GA		x		x				
USDA Forest Service, Nicolet National Forest, WI				x				
USDA Forest Service, Ochoco National Forest, Prineville, OR				x				
USDA Forest Service, Oglala National Grassland, NE and SD				x				
USDA Forest Service, Okanogan National Forest, WA				x				
USDA Forest Service, Ottawa National Forest, MI				x				
USDA Forest Service, Pacific Northwest Research Station, Corvallis, OR		x		x				
USDA Forest Service, Prescott National Forest, AZ				x				
USDA Forest Service, Rocky Mountain Research Station, Shrub Sciences Laboratory, Provo, UT and Boise, ID		x		x				
USDA Forest Service, Rogue River-Siskiyou National Forest, Medford, OR				x				
USDA Forest Service, Seven Springs Recreation Area, AZ				x				
USDA Forest Service, Sheyenne National Grassland, ND				x				
USDA Forest Service, Siskiyou National Forest, OR				x				
USDA Forest Service, Siuslaw National Forest, Corvallis, OR				x				

FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
USDA Forest Service, Superior National Forest, MN				x				
USDA Forest Service, Tonto National Forest, AZ				x				
USDA Forest Service, Umatilla National Forest, Pendleton, OR				x				
USDA Forest Service, Wallowa-Whitman National Forest, OR				x				
USDA Forest Service, Wasatch-Cache National Forest, UT				x				
USDA Forest Service, Wayne National Forest, OH				x				
USDA Forest Service, Wenatchee National Forest, WA				x				
USDA Forest Service, Willamette National Forest, Eugene, OR				x				
USDA Natural Resources Conservation Service		x		x				
USDA Natural Resources Conservation Service, Aberdeen Plant Materials Center, Aberdeen, ID		x		x				
USDA Natural Resources Conservation Service, Plant Materials Center, Beltsville MD		x		x				
USDA Natural Resources Conservation Service, Plant Materials Center, Bridger, MT		x		x				
USDA Natural Resources Conservation Service, Plant Materials Center, Corvallis, OR		x		x				
USDA Natural Resources Conservation Service, Plant Materials Center, Los Lunas, NM		x		x				
USDA Natural Resources Conservation Service, Plant Materials Center, Meeker CO		x		x				
USDA Natural Resources Conservation Service, Plant Materials Center, Palmer AK		x		x				
USDA Natural Resources Conservation Service, Plant Materials Center, Tucson, AZ		x		x				
USDA Natural Resources Conservation Service, Plant Materials Program, DC		x		x				
USDA Natural Resources Conservation Service, PLANTS Database, Baton Rouge, LA		x		x				
USDA Natural Resources Conservation Service, Upper Colorado Plant Materials Center, Meeker, CO		x		x				
USDI Bureau of Land Management				x				
USDI Bureau of Land Management, Alaska State Office, AK				x				
USDI Bureau of Land Management, Albuquerque Field Office, NM				x				
USDI Bureau of Land Management, Alturus Field Office, CA				x				
USDI Bureau of Land Management, Anchorage Field Office, AK				x				
USDI Bureau of Land Management, Arcata Field Office, CA				x				
USDI Bureau of Land Management, Arizona State Office, AZ				x				
USDI Bureau of Land Management, Arizona Strip Field Office, AZ				x				
USDI Bureau of Land Management, Baker Resource Area, OR				x				
USDI Bureau of Land Management, Bakersfield Field Office, CA				x				
USDI Bureau of Land Management, Battle Mountain Field Office, NV				x				
USDI Bureau of Land Management, Bishop Field Office, CA				x				

FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
USDI Bureau of Land Management, Boise District Office, ID				x				
USDI Bureau of Land Management, Borders Resource Area, OR				x				
USDI Bureau of Land Management, Burley Field Office, ID				x				
USDI Bureau of Land Management, Burns District Office, OR				x				
USDI Bureau of Land Management, California Desert District, CA				x				
USDI Bureau of Land Management, California State Office, CA				x				
USDI Bureau of Land Management, Carrizo Plain National Monument, CA				x				
USDI Bureau of Land Management, Carson City, NV				x				
USDI Bureau of Land Management, Casso Seed Orchard				x				
USDI Bureau of Land Management, Cedar City Field Office, UT				x				
USDI Bureau of Land Management, Challis Field Office, ID				x				
USDI Bureau of Land Management, Colorado State Office, CO				x				
USDI Bureau of Land Management, Coos Bay District Office, OR				x				
USDI Bureau of Land Management, Cottonwood Field Office, ID				x				
USDI Bureau of Land Management, Couer d'Alene District Office, ID				x				
USDI Bureau of Land Management, Dillon Field Office, MT				x				
USDI Bureau of Land Management, Eagle Lake Field Office, CA				x				
USDI Bureau of Land Management, Eastern States Office, WI				x				
USDI Bureau of Land Management, Elko Field Office, NV				x				
USDI Bureau of Land Management, Ely Field Office, NV				x				
USDI Bureau of Land Management, Eugene District Office, OR				x				
USDI Bureau of Land Management, Farmington District Office, NM				x				
USDI Bureau of Land Management, Fillmore Field Office, UT				x				
USDI Bureau of Land Management, Folsom Field Office, CA				x				
USDI Bureau of Land Management, Glenwood Springs Field Office, CO				x				
USDI Bureau of Land Management, Grand Canyon-Parashant National Monument, AZ				x				
USDI Bureau of Land Management, Grand Junction Field Office, CO				x				
USDI Bureau of Land Management, Grand Staircase-Escalante National Monument, UT				x				
USDI Bureau of Land Management, Gunnison Field Office, CO				x				
USDI Bureau of Land Management, Hollister Field Office, CA				x				
USDI Bureau of Land Management, Horning Seed Orchard				x				
USDI Bureau of Land Management, Idaho Falls District Office, ID				x				

FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
USDI Bureau of Land Management, Idaho State Office, ID				x				
USDI Bureau of Land Management, Jarbidge Field Office, ID				x				
USDI Bureau of Land Management, King Range National Conservation Area, CA				x				
USDI Bureau of Land Management, Klamath Falls Resource Area, OR				x				
USDI Bureau of Land Management, Lakeview District Office, OR				x				
USDI Bureau of Land Management, Lander Field Office, WY				x				
USDI Bureau of Land Management, Las Vegas Field Office, NV				x				
USDI Bureau of Land Management, Lewistown Field Office, MT				x				
USDI Bureau of Land Management, Little Snake Field Office, CO				x				
USDI Bureau of Land Management, Medford District Office, OR				x				
USDI Bureau of Land Management, Milwaukee Field Office, WI				x				
USDI Bureau of Land Management, Moab Field Office, UT				x				
USDI Bureau of Land Management, Montana State Office, MT				x				
USDI Bureau of Land Management, Monticello Field Office, UT				x				
USDI Bureau of Land Management, Nevada State Office, NV				x				
USDI Bureau of Land Management, New Mexico State Office, NM				x				
USDI Bureau of Land Management, North Dakota Field Office, MT				x				
USDI Bureau of Land Management, Northern Field Office, AK				x				
USDI Bureau of Land Management, Oregon/Washington State Office, OR				x				
USDI Bureau of Land Management, Phoenix South Field Office, AZ				x				
USDI Bureau of Land Management, Pocatello Field Office, ID				x				
USDI Bureau of Land Management, Prineville District Office, OR				x				
USDI Bureau of Land Management, Rawlins Field Office, WY				x				
USDI Bureau of Land Management, Redding Field Office, CA				x				
USDI Bureau of Land Management, Richfield Field Office, UT				x				
USDI Bureau of Land Management, Rock Springs Field Office, WY				x				
USDI Bureau of Land Management, Roseburg District Office, OR				x				
USDI Bureau of Land Management, Royal Gorge Field Office, CO				x				
USDI Bureau of Land Management, Salem District Office, OR				x				
USDI Bureau of Land Management, Salt Lake City Field Office, UT				x				
USDI Bureau of Land Management, San Luis Valley Public Lands Center, CO				x				
USDI Bureau of Land Management, Shoshone Field Office, ID				x				

FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
USDI Bureau of Land Management, Sonoran Desert National Monument, AZ				x				
USDI Bureau of Land Management, Spokane District Office, WA				x				
USDI Bureau of Land Management, St. George Field Office, UT				x				
USDI Bureau of Land Management, Surprise Field Office, CA				x				
USDI Bureau of Land Management, Taos Field Office, NM				x				
USDI Bureau of Land Management, Tonopah Field Station, NV				x				
USDI Bureau of Land Management, Twin Falls District Office, ID				x				
USDI Bureau of Land Management, Tyrell Seed Orchard, OR				x				
USDI Bureau of Land Management, Ukiah Field Office, CA				x				
USDI Bureau of Land Management, Uncompahgre Field Office, CO				x				
USDI Bureau of Land Management, Upper Snake Field Office, ID				x				
USDI Bureau of Land Management, Utah State Office, UT				x				
USDI Bureau of Land Management, Vale District Office, OR				x				
USDI Bureau of Land Management, Vernal Field Office, UT				x				
USDI Bureau of Land Management, Washington Office, DC				x				
USDI Bureau of Land Management, Wenatchee Resource Area, WA				x				
USDI Bureau of Land Management, West Eugene Wetlands, OR				x				
USDI Bureau of Land Management, White River Field Office, CO				x				
USDI Bureau of Land Management, Winnemucca Field Office, NV				x				
USDI Bureau of Land Management, Worland Field Office, WY				x				
USDI Bureau of Land Management, Wyoming State Office, WY				x				
USDI Bureau of Land Management, Yuma Field Office, AZ				x				
USDI National Park Service, Lake Mead National Recreation Area, NV				x				
USDI National Park Service, Pinnacles National Monument, San Benito County, CA				x				
USDI U.S. Fish and Wildlife Service, Anahuac National Wildlife Refuge, TX				x				
USDI U.S. Fish and Wildlife Service, Aransas National Wildlife Refuge, TX				x				
USDI U.S. Fish and Wildlife Service, Ash Meadows National Wildlife Refuge, NV				x				
USDI U.S. Fish and Wildlife Service, Balcones Canyonlands National Wildlife Refuge, TX				x				
USDI U.S. Fish and Wildlife Service, Canaan Valley National Wildlife Refuge, WV				x				
USDI U.S. Fish and Wildlife Service, Desert National Wildlife Refuge, NV				x				
USDI U.S. Fish and Wildlife Service, Great Swamp National Wildlife Refuge, NJ				x				
USDI U.S. Fish and Wildlife Service, Laguna Atacosa National Wildlife Refuge, TX				x				

FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
USDI U.S. Fish and Wildlife Service, Lower Rio Grande Valley National Wildlife Refuge, TX				x				
USDI U.S. Fish and Wildlife Service, Marin Islands National Wildlife Refuge, CA				x				
USDI U.S. Fish and Wildlife Service, Moapa Valley National Wildlife Refuge, NV				x				
USDI U.S. Fish and Wildlife Service, Neal Smith National Wildlife Refuge, IA				x				
USDI U.S. Fish and Wildlife Service, Nevada Fish and Wildlife Office, NV				x				
USDI U.S. Fish and Wildlife Service, Pahranagat National Wildlife Refuge, NV				x				
USDI U.S. Fish and Wildlife Service, R1, Snake River Basin, ID				x				
USDI U.S. Fish and Wildlife Service, Trinity River National Wildlife Refuge, TX				x				
USDI U.S. Geological Survey		x		x				
West Eugene Wetlands Partnership, OR				x	x	x	x	

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
A Wild Crafter's Growers Group, MO			x				x	
Agassiz Seed & Supply, West Fargo, ND			x					
Alt House Nursery, Cave Junction, OR			x					
American Public Gardens Association							x	
American Seed Trade Association							x	
Antelope Valley Paiute Tribe, NV	x							
Applewood Seed Co., Arvada, CO			x					
Arboretum at Flagstaff, Flagstaff, AZ							x	x
Arizona Department of Game and Fish					x			
Arizona Native Seed Resource, Tucson, AZ			x					
Arkansas Valley Seed Testing Lab, AR			x					
Ashland High School, Ashland, OR						x		
Association of Official Seed Certifying Agencies							x	
Ball Horticultural Co., Chicago, IL			x					
Bamert Seed Co., Muleshoe, TX			x					
Barton Seed Co., Ephraim, UT			x					
Bear Creek Watershed Council, Medford, OR							x	

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
Benson Farms Inc., Moses Lake, WA			x					
Benton Paiute Tribe, NV	x							
Berry Botanic Garden, Portland, OR		x					x	x
BG-BASE, Inc.		x						
Big Sky Wholesale Seeds, Shelby, MT			x					
Biota of North America Program, Chapel Hill, NC		x						
Boise Cascade, Boise, ID			x					
Boise State University, Department of Biological Sciences, Boise, ID		x						
Bolson Seed Co., La Grande, OR			x					
Botanic Gardens Conservation International							x	
Botanical Development, OR			x					
Botanical Liaisons, LLC, Boulder, CO			x					
Botanical Society of America							x	
Brett-Young Seed Ltd., Winnipeg, Manitoba, Canada			x					
Bridgeport Paiute Tribe, NV	x							
Brigham Young University, Department of Plant and Animal Science, Provo, UT		x						
Brigham Young University, Provo, UT		x						
Brooklyn Botanic Garden, Brooklyn, NY		x					x	x
Buggy Crazy Nursery, Lebanon, OR			x					
Butterfly Pavilion & Insect Center, Denver, CO							x	x
California Native Plant Society, CA		x					x	x
CC Headley			x					
Cedera Seed, Inc., Swan Valley, ID			x					
Center for Plant Conservation		x					x	
Center for Urban Horticulture, Seattle, WA		x					x	x
Central Modoc Resource Conservation District, Alturas, CA							x	
Central Utah Seed, Ephraim, UT			x					
Chapman Farms, Nampa, ID			x					
Chelan-Douglas Land Trust, WA							x	
Chicago Botanic Garden, Glencoe, IL		x					x	x
Circle S Seeds of Montana, Inc., Three Forks, MT			x					
City of Ashland, OR						x		

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
City of Bend, OR						x		
City of Eugene, OR						x		
City of Topeka Parks and Recreation, KS						x		
Clackamas Memorandum of Understanding, OR						x		
Clarno Nursery, OR			x					
Clearwater Seed LLC, Spokane, WA			x					
Colorado Crop Improvement Association, Ft. Collins, CO		x					x	
Colorado Division of Wildlife, CO					x			
Colorado Native Plant Society, CO							x	
Colorado State Seed Testing Lab, CO					x			
Colorado State University, Rogers Mesa, CO		x						
Colorado State University, Tri-River Area Cooperative Extension, Grand Junction, CO		x			x			
Colville Confederated Tribes, WA	x							
Comstock Seed, Gardnerville, NV			x					
Confederated Tribes of Warm Springs Reservation, OR	x							
Cook County Forest Preserve District, IL						x		
Cool Waters Nursery			x					
Crook County Weed Control, OR			x					
Crooked River Watershed Council, Prineville, OR							x	
Curtis & Curtis Seed, Clovis, NM			x					
Deepest Valley Cooperative Native Plant Propagation Center, CA		x						
Denver Botanic Gardens, Denver, CO							x	x
Deschutes Basin Land Trust, Bend, OR							x	
Deschutes Basin Native Plant Seedbank, Prineville, OR		x						
Deschutes County Soil & Water Conservation District, OR						x		
Deschutes County, OR						x		
Deschutes River Conservancy, OR							x	
Desert Botanical Garden, Phoenix, AZ		x					x	x
DuPage County Forest Preserve District, IL						x		
E&S Environmental Restoration Inc., Corvallis, OR			x					
Eastern Oregon Stewardship Services, Prineville, OR			x					
Emerald Commodities, Inc., Harrisburg, OR			x					

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
Ernst Conservation Seed, Meadville, PA			x					
Erstrom, Jerry, Vale, OR			x					
Fallon Paiute-Shoshone Tribe, NV	x							
First Creek Seeds, Saco, MT			x					
Flick Seed Company, Kingsville, MO			x					
Ford Seed, Boise, ID			x					
Garden of Inner Peace, NC								x
Geertson Seed Farms, Greenleaf, ID			x					
Gillian Watershed Council							x	
Go Wild! Consulting, CA			x					
Gooding Seed Co., Gooding, ID			x					
Granite Seed, Lehi, UT			x					
Grassland Oregon, Keizer, OR			x					
Grassland West, Clarkston, WA			x					
Great Basin Seed, Ephraim, UT			x					
Harvest Moon Seed Co., Gunnison, UT			x					
Hedgerow Farms, Winters, CA			x					
Heritage Nursery			x					
Heritage Seedlings, Salem, OR			x					
High Desert Native Seed, Redmond, UT			x					
High Desert Resource Conservation and Development Council, Inc.			x					
Honey Lake Paiute Tribe, NV	x							
Ibapah Band Goshute Tribe, UT	x							
Idaho Botanical Garden, ID							x	x
Idaho Crop Improvement Association, ID		x					x	
Idaho Department of Fish and Game, ID					x			
Idaho Department of Transportation, ID					x			
Idaho Grimm Growers, Blackfoot, ID			x					
Idaho Native Plant Society							x	
Idaho State Department of Agriculture, Seed Testing Lab, ID					x			
Illinois Nature Preserves Commission, Springfield, IL						x		
Institute for Applied Ecology, Corvallis, OR		x					x	

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
Intermountain Seed Co., Ephraim, UT			x					
Iowa Ecotype Project, Cedar Falls, IA		x	x					
Ivan Matveev			x					
J. Raymond Farm & Reforestation, Central Point, OR			x					
Jacksonville Woodlands Association, OR							x	
James Reneau Seed Co., Shamrock, TX			x					
Jefferson County Weed Control, OR						x		
John Goble, Gunnison, UT			x					
Jornada Experimental Station, NM		x						
Keeley Family Farm, St. Paul, OR			x					
Kenagy Family Farms, Inc., OR			x					
Klamath Tribes, OR	x							
L&H Seeds, Inc., Connell, WA			x					
Lady Bird Johnson Wildflower Center, Austin, TX		x					x	x
Lake County Forest Preserve District, IL						x		
Landmark Native Seed Inc., Spokane, WA			x					
Lovelock Paiute Tribe, NV	x							
Lower and Upper Nehalem Watershed Councils, OR							x	
Mahmia Nursery, Salem, OR			x					
Maple Leaf Company Seed Division, Ephraim, UT			x					
Marion County Soil and Water Conservation District, Salem, OR						x		
Mattole Restoration Council, Petrolia, CA							x	
Maughan Seed Co., Manti, UT			x					
McClintick Farms, Inc., Orovada, NV			x					
McCormick Seeds, Inc., Muleshoe, TX			x					
Mercer Arboretum & Botanic Gardens, Houston, TX							x	x
Methow Natives Inc., Winthrop, WA			x					
Missouri Botanical Garden, St. Louis, MO		x					x	x
Missouri Department of Conservation, MO					x			
Missouri Native Plant Society, MO							x	
Mono Lake Paiute Tribe, NV	x							
Montana State University, Department of Land Resources and Environmental Sciences, Bozeman, MT		x						

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
Mosman, David R. Ranch, Inc., Craigmont, ID			x					
Mountain View			x					
Mountain West Seed Co., Ephraim, UT			x					
Mt. Cuba Center, Inc., DE							x	x
National Fish and Wildlife Foundation							x	
Native Plant Conservation Campaign							x	
Native Plant Society of Oregon							x	
Native Seed Network, Corvallis, OR		x					x	
Native-Seed Company LLC, Park City, UT			x					
Natural Areas Association							x	
NatureServe		x					x	
Nestucca Neskowin Watershed Council, OR							x	
Nevada Department of Wildlife, NV					x			
New England Wild Flower Society, Framingham, MA		x					x	x
New York City Department of Parks & Recreation, NY		x				x		
New York City, NY						x		
NezPerce Tribe, ID/OR	x							
North American Pollinator Protection Campaign							x	
North Carolina Botanical Garden, Chapel Hill, NC		x					x	x
Norwest Seed, Ltd., Ashburton, New Zealand			x					
NP Seed Co., Ephraim, UT			x					
NuSeCo, West Vancouver, BC			x					
Oconto County, WI						x		
Oregon Department of Fish and Wildlife					x			
Oregon Department of Transportation					x			
Oregon Job Council, Medford OR						x		
Oregon Seed Certification			x		x			
Oregon State University Extension Service, Deschutes County, OR		x						
Oregon State University, Malheur Experiment Station, Ontario, OR		x						
Oregon State University, Seed Testing Lab, Corvallis, OR		x						
Oregon Stewardship, Medford, OR			x					
Oregon Wholesale Seed, Silverton, OR			x					

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
Oregon Youth Authority, OR							x	
Owyhee Trail Seed, Nyssa, OR			x					
Pacific Coast Seed, Livermore, CA			x					
Pacific Forest Seeds, Eagle Point, OR			x					
Pacific Northwest Natives, Albany, OR			x					
Pawnee Buttes Seed, Inc., Greeley, CO			x					
Peterson, Greg B.S.E.E., Moses Lake, WA			x					
Phipps - OR State Nursery, OR		x						
Pineview Horticultural Service, Inc., Hayden Lake, ID			x					
Plainview Seed Co., Shedd, OR			x					
Plant Conservation Alliance							x	
Plummer Seed Co., Inc., Ephraim, UT			x					
Polk Soil and Water Conservation, Polk County, OR							x	
Portland General Electric, OR			x					
Pyramid Lake Paiute Tribe, NV	x							
Rain Shadow Nursery, Oroville, WA			x					
Rainier Seeds, Inc., Davenport, WA			x					
Rana Creek Ranch, Carmel Valley, CA			x					
Rancho Sanata Ana Botanic Garden, Claremont, CA							x	x
Red Butte Botanic Garden, Salt Lake City, UT		x					x	x
Reno Sparks Indian Colony, NV	x							
Research Seeds Inc., Longmont, CO			x					
Richard Pearson			x					
Richardson Agco, Vega, TX			x					
Richfield Band of Paiutes, UT	x							
Rocky Mountain Seed Co., Aurora, UT			x					
Royal Botanic Gardens, Kew, United Kingdom		x					x	x
S&S Seeds, LLC, Albany, OR			x					
Saco Dehy Inc., Saco, MT			x					
Santa Barbara Botanic Garden, Santa Barbara, CA		x					x	x
Scappoose Bay Watershed Council, OR							x	
Seed-Rite, Inc., Odessa, WA			x					

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
Sharp Bros. Seed Co., Healy, KS			x					
Shoshone-Bannock Tribes, ID	x							
Shoshone-Paiute Tribes, ID	x							
Skinner Seed Farms, Inc., New Plymouth, ID			x					
Snow College, Ephraim, UT		x						
Society for Ecological Restoration International		x					x	
Society for Range Management							x	
Southwest Seed Inc., Dolores, CO			x					
Special K Ranch, Columbus, MT			x				x	
State Departments of Natural Resources, Parks, and Forests of AK, AZ, CO, IL, IN, KS, MI, MO, MS, NJ, NY, OH, WA, WI					x			
State Foundation Seed Programs of CO, ID, MT, NV, OR, UT, WA, WY			x		x			
Stevenson Intermountain Seed, Ephraim, UT			x					
Strategic Sourcing, Inc., Reading, PA			x					
Student Conservation Association							x	
Texas A&M University, Revegetation Equipment Catalog, College Station, TX			x					
The Nature Conservancy							x	
The Nature Conservancy, Accola Woods, MO							x	
The Nature Conservancy, Anderson County Preserve, KS							x	
The Nature Conservancy, Bennett Spring Savanna, MO							x	
The Nature Conservancy, Cheyenne Bottoms Preserve, KS							x	
The Nature Conservancy, Chilton Creek Preserve, MO							x	
The Nature Conservancy, Chiwaukee Prairie State Natural Area 54, WI							x	
The Nature Conservancy, Dobbins Woodland, MO							x	
The Nature Conservancy, Goodnight-Henry Prairie, MO							x	
The Nature Conservancy, Konza Prairie (co-owned by Kansas State University), KS		x					x	
The Nature Conservancy, Makoce Washte, SD							x	
The Nature Conservancy, Marmaton River Bottoms Wet Prairie, MO							x	
The Nature Conservancy, Rockhill Prairie, MO							x	
The Nature Conservancy, Shelton L. Cook Meadow, MO							x	
The Nature Conservancy, Sioux Prairie, SD							x	
The Nature Conservancy, Smoky Valley Ranch, KS							x	
The Nature Conservancy, Spring Green Prairie, WI							x	

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
The Nature Conservancy, Staffanson Prairie, MN							x	
The Nature Conservancy, Tallgrass Prairie National Preserve, KS							x	
The Nature Conservancy, Tallgrass Prairie Preserve, OK							x	
The Nature Conservancy, The Hogback, WI							x	
The Nature Conservancy, Thorny Mountain, MO							x	
The Nature Conservancy, Vermillion Prairie, SD							x	
The Nature Conservancy, Williams Woods, MO							x	
The Nature Conservancy, Zahorsky Woods, MO							x	
Tillamook County Soil and Water Conservation District, OR						x		
Tillamook Estuaries Partnership, OR							x	
Tillamook Riparian Native Plant Cooperative MOU, OR						x		
Treasure State Seed, Inc., Fairfield, MT			x					
Trillium Nursery			x					
Truax Company Inc., New Hope, MN			x					
Tualatin River Watershed Council, OR							x	
University of California Berkeley Botanic Garden, Berkeley, CA		x						x
University of California, Davis, CA		x						
University of California, Irvine, CA		x						
University of California, White Mtn. Research Station, CA		x						
University of Florida, Orlando, FL		x						
University of Idaho, College of Natural Resources, ID		x						
University of Maryland, College Park, MD		x						
University of Michigan, Matthaei Botanical Gardens and Nichols Arboretum, Ann Arbor, MI		x					x	x
University of Nevada, Reno, NV		x						
University of St. Louis, MO		x						
Upper Deschutes Watershed Council, OR							x	
Utah Crop Improvement Association, Logan, UT		x					x	
Utah Department of Natural Resources, UT					x			
Utah Division of Wildlife Resources, Great Basin Research Center, Ephraim, UT					x			
Utah Native Plant Society							x	
Utah State University, Department of Plants, Soils, and Biometeorology, Logan, UT		x						
Wagstaff Seed, Wallsburg, UT			x					

NON-FEDERAL PARTNERS	Tribe	Research	Industry	Fed. Gov.	State Gov.	Local Gov.	Non-profit	Garden
Walker River Paiute Tribe, NV	x							
Washburn University, KS		x						
Washington Department of Fish and Wildlife, WA					x			
Washington Native Plant Society							x	
Washington State Seed Testing Lab, WA					x			
Washington University, St. Louis, MO		x					x	
Washoe Tribe of California and Nevada, CA/NV	x							
Western Productions Inc., Woodburn, OR			x					
Western Reclamation, Inc., Mesa, WA			x					
Westland Seed Inc., Ronan, MT			x					
Wheatland West Seed, Brigham City, UT			x					
Wilbers (ABT Wilbers), Miller, SD			x					
Wildlands, Inc., Richland, WA			x					
Willamette Gardens, Corvallis, OR			x					
Willamette Province Workforce Partnership, OR						x		
Willow Creek, Ephraim, UT			x					
Wind River Seed, Manderson, WY			x					
Winnebago County Forest Preserve District, Severson Dells Forest Preserve, IL						x		
Winter Creek Restoration, OR			x					
Wyoming State Seed Testing Lab, WY					x			
Yakama Tribe, WA	x							
Yamhill Watershed Council, OR						x		
Yerington Paiute Tribe, NV	x							
Yomba Shoshone Tribe, NV	x							
Zoological Society of San Diego, CA							x	x

Reference CD goes here.