PULLMAN, WASHINGTON
PLANT MATERIALS CENTER

LONG-RANGE PLAN

2005 – 2015

I. Introduction

The mission of the Pullman, Washington Plant Materials Center (PMC) that serves the eastern halves of Washington and Oregon and the northern portion of Idaho is to develop and transfer state-of-the-art plant science technology to meet customer and resource needs. The purpose of the Plant materials program is to: 1) assemble, test, and release plant materials for conservation use, 2) determine techniques for successful use and management of conservation species, 3) facilitate the commercial increase of conservation species, 4) provide for the timely development and transfer of effective state-of-the-art applied science technology to solve conservation problems and 5) promote the use of plant science technology to meet goals and objectives of the NRCS Strategic Plan.

II. Long-Range Plan Development

This long-range plan (LRP) was developed in accordance with the National Plant Materials Manual, Part 540.01 (June 2000). This plan may also serve as a reference to develop specific action items which will be incorporated into the Washington, Oregon and Idaho state Business Plans.

The listing of identified customer, resource, and program needs were developed by the Washington State Plant Materials Committee. The Washington State Plant Materials Committee is comprised of PMC staff, Oregon PMC manager, NRCS Area representatives, NRCS state specialists, and the State Resource Conservationist. Along with input provided by committee members and the Oregon PMC manager, NRCS field staff prioritized vegetative challenges. Field staff rankings were tabulated and used to help identify key elements of the LRP. Oregon NRCS did not provide a list of needs. North Idaho was not solicited for a list of needs. The Idaho and Oregon State Plant Materials Long Range Plans were reviewed, and needs identified in Washington are synonymous with the needs of eastern Oregon and north Idaho.

The rankings were reviewed at the WA Plant Materials committee meeting held on January 13, 2004. The consensus of the committee was that: 1) riparian technology is currently in high demand but this need should decrease in the next few years, 2) the upcoming resource need will be technology development for implementing NRCS buffer practices. Another immediate and on-going need is wetland restoration technology.

III. Description of the Area

Soil, climate, and resource uses vary significantly throughout the Tri-state area. The annual rainfall ranges from six inches in the Columbia Basin to over 65 inches in the mountainous regions of Kittitas County, Washington.

Sub-zero temperatures (-50F) have been known to occur when continental air masses move south from interior Canada. The frost-free growing season ranges from 70 days at Pierce, Idaho to 213 days in Benton County, Washington. The majority of the cropland areas have an average growing season of 120-150 days at 32F, and 150-180 days at 28F.

Elevations range from 350 feet along the Columbia River to 9,675 feet in the eagle Cap Wilderness Area of Union County, Oregon. Most agricultural land is below 2,800 feet elevation.

Summers are warm and dry.

Livestock, grain, timber production and recreation are major land uses.

There are large acreages of rangeland and irrigated cropland in the 8-14 inch annual precipitation zones, and large acreages of dryland cropland in the 15-10 inch precipitation zones. Winter wheat is the dominant dryland crop, with much acreage in a summer-fallow rotation.

Orchards and vineyards are increasing in protected valleys adjacent to streams where irrigation is possible and in the Columbia Basin. The leading orchard crop is apples. There are extensive acreages of alfalfa, beans, potatoes, corn, and other cash crops in the Columbia Irrigation Project Area.

Where precipitation is less than 16 inches, irrigation is essential for economical annual cropping. Pivot irrigation systems sprinkling up to 160 acres per unit are important. Many soil and water management problems are associated with this practice.

Some silver, gold, lead, and zinc mining exists in northern Idaho and the northern area of eastern Washington.

Wind is common in the treeless expanses of Oregon, Idaho, and Washington resulting in wind erosion. While wind erosion is prevalent in the 8-12 inch precipitation areas, water erosion predominates in the higher precipitation zones, particularly from water running off frozen ground. Concentrated flow runoff in all zones results in waterway, gully, and streambank soil erosion, and water quality degradation.

Private land-ownership is common throughout the WAPMC service area, although there are large blocks of state and federal lands including the Coulee Dam National Recreation Area, Hanford Works U.S. Atomic Energy Commission, and 14 National Forests. The

Colville, Spokane, Coeur d'Alene, Kootenai, Nez Perce, Umatilla, and Yakima Indian Reservations each have large land holdings. The Bureau of Land Management (BLM) has scattered acreage in Washington and extensive acreage in eastern Oregon, which is mostly rangeland.

Major Land Resource Areas in the WAPMC Service Area:

Washington	B-6, 7, 8, 9, and E-43, 44
Oregon	B-6, 7, 8, 9, 10, 11, D-21, 23, 24, 25, and E-43
Idaho	B-9, 10, and E-43, 44

IV. Plant Related Conservation Concerns within the Pullman PMC Service Area

Issue	Rank
Successfully establishing native woody plants in riparian areas that are droughty and/or have a widely fluctuating water table.	1
Successfully establishing native woody plants in riparian areas that are infested with reed canarygrass.	2
Successfully establishing native woody plants in riparian areas where deer predation is high.	3
Successfully establishing native woody plants in riparian areas where rodent predation is high.	4
Successfully establishing black cottonwood in riparian areas.	5
Successfully establishing conservation grasses in upland sites that are infested with knapweeds/starthistle.	6
Increasing the success of establishing wetland plantings in eastern Washington.	7
Successfully establishing conservation grasses in upland sites that are infested with rush skeletonweed.	8
Successfully establishing conservation grasses in upland sites that are infested with cheatgrass.	9
Lack of information on species suitable for filter strip applications that will remove sediments.	10

V. Work Plan

RESOURCE CONCERN	OBJECTIVE	RECOMMENDED ACTION	LEAD PERSON	TIME FRAME
Healthy watersheds providing clean and abundant water	Stabilize cropland to prevent water erosion	1. Develop WA Planting Guide and associated plant tables that list erosion control attributes.	WAPMS	2005
		2. Install WA Planting Guide onto WA NRCS eFOTG website.	WAPMS	2005-2006
	Stabilize streambanks to prevent bank erosion	1. Develop Streambank Buffer Project Plan with studies, leads, and times frames	WAPMC	2005
	Filter sediments coming off of cropland	1. Develop WA Planting Guide and associated plant tables that list sediment filtration attributes.	WAPMS	2005
		2. Develop Sediment Filtration Project Plan with studies, leads and time frames	WAPMC	2005
	Filter nutrients and animal wastes	1. Conduct thorough review of literature as it pertains to nutrient and animal waste filtration	WAPMC	2005
		a) Develop Nutrient/Animal Waste Project Plan with studies, leads, and time frames	WAPMC	2006
		4. Develop WA Planting Guide and associated tables that list nutrient management attributes	WAPMS	2005

Healthy watersheds providing clean and abundant water (cont'd)	Prevent and repair mass wasting	1. Promote clematis in CFTs	WAPMS 2007
		2. Photodocument proper roadside vegetation and publish findings as NRCS Tech Note	WAPMS 2011
		3. Arrange for NRCS field staff training in bioengineering tech	WAPMS 2010
Healthy and Productive Cropland	Prevent wind erosion on dry cropland	1. Establish CFTs showing value of various buffer practices.	WAPMS 2005
		2. Develop Wind Erosion Buffer Project Plan that will include studies, leads, and time frames	WAPMC 2005
	Capture saltated particles to prevent fugitive dust process	1. Develop Wind Erosion Buffer Project Plan that will include studies, leads, and time frames	
	Stabilize sites that are prone to excessive destruction of soil aggragation	1. Develop Wind Erosion Buffer Project Plan that will include studies, leads, and time frames	WAPMC 2005
Healthy and Productive Wetlands	Restore wetland plant communities	1. Develop species lists for prominent Washington wetland types.	WAPMS 2006
		2. Generate Plant Materials Technical Notes #12 "Wetland Revegetation" with link to ABPMC wetland website.	WAPMC 2005
	Improve sustainability of created wetlands	1. Monitor WRP plantings and document plant community dynamics	WAPMS 2014

High Quality Wildlife Habitat	Improve species diversity of upland plant cover	1. Release 9033982 Canada milkvetch.	WAPMC	2007
		2. Release 2 blue wildrye accessions	WAPMC	2007
		3. Compare PMC dryland alfalfa and release as appropriate.	WAPMC	2009
		4. Continue Palouse Prairie Restoration Project.	WAPMC	2005-2015
	Improve species diversity of riparian plant cover	1. Promote the use of Trailar western clematis via CFTs.	WAPMS	2007
		2. Improve techniques to establish woody vegetation in riparian areas infested with reed canarygrass	WAPMC	2006
		3. Improve techniques to establish woody vegetation in riparian areas with widely fluctuating water tables	WAPMC	2010
		4. Determine which woody species persist best in low management riparian areas	WAPMS	2014

Healthy and Productive Grazing Lands and Animal Feed Operations	Improve air quality around animal feed operations	1. Install CFTs demonstrating value of windbreaks to control offsite air movement.	WAPMS	2012
		2. Continue release process for Lind Douglas Fir	WAPMC	2015
	Improve waste utilization to prevent off-site movement and groundwater contamination	1. Develop Nutrient/Animal Waste Project Plan with studies, leads, and time frames	WAPMC	2006
		a. Evaluate nutrient uptake of warm season grasses	WAPMC	2008-2012
		b. Evaluate nutrient uptake of perennial legumes	WAPMC	2008-2012
	Improve pasture quality	1. Develop low lignin, late maturing orchardgrass from Latar crossing block.	WAPMC	2009
Effective and Productive Workforce	Improve workload	1. Assist PMS with establishing CFTs as needed	WAPMC	2005
		2. Conduct annual workload analysis and work with SO and NPMS on staffing needs	WAPMC	2005
	Improve training of staff	1. Review PMC staff training on an annual basis and document needs in Annual Business Plan.	WAPMC	2005
		2. Attend area meetings and provide training on use of new WA Planting Guide	WAPMS and WAPMC	2005-2006

Effective and Productive Workforce (cont'd)		3. Attend area meetings and provide short training sessions in lieu of training at the PMC.	WAPMC	Annually
	Adhere to EEO/CR policies	1. Follow guidance from NRCS as provided.	WAPMC	Annually
		2. Maintain and post documents as appropriate.	WAPMC	Annually
	Improve safety	1. Install practices as suggested by the USDA Security Review.	WAPMC	Annually
		2. Maintain pesticide licenses.	WAPMC, WAPMS	Annually
		3. Provide timely training to summer crew on proper use of safety gear, equipment use, vehicle use, sun/heat protection, pesticide protection, etc.	WAPMC	Annually
	Protect Cultural Resources	1. Hire archeologist to conduct a cultural resources survey on the USDA owned property at the Pullman PMC.	WAPMC	2006

NUTRIENT AND ANIMAL WASTE BUFFER PROJECT PLAN
2005-2015

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WASHINGTON STATE PLANT MATERIALS SPECIALIST

Goal: Reduce nitrogen loss to deep percolation.

Plant Releases: None are planned. An adequate array of plants are commercially available

Technology Development:

1. Determine the spatial and temporal nitrogen use patterns of alfalfa, corn, sorghum, eastern gamagrass, mustard + triticale.
    a. Lead Staff: Stannard
    b. Time Frame: Install planting 2007, collect data 2008-2009

Technology Transfer:

1. Develop Technical Note on nitrogen capture by various crops.
    a. Lead Staff: Stannard
    b. Time Frame: 2010

Training:

1. Field day for field office staff.
    a. Lead Staff: Stannard
    b. Time Frame: 2008
2. 20 minute talks given at Area meetings.
    a. Lead Staff: Stannard
    b. Time Frame: 2009-2010

Field Plantings, Conservation Field Trials, and Demonstration Plantings:

None planned.

STREAMBANK BUFFER PROJECT PLAN
2005-2015

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Goal: Reduce bank erosion.

Plant Releases: None are planned. An adequate array of plants are commercially available

Technology Development:

1. Determine the speed of rooting of woody species adapted to streambank environments.
    c. Lead Staff: Crowder
    d. Time Frame: 2005
2. Determine cottonwood establishment via cuttings, bare root material, and containerized material.
    a. Lead Staff: Stannard
    b. Time Frame: 2005-2007
3. Determine effectiveness of reed canarygrass suppression techniques.
    a. Lead Staff: Stannard
    b. Time Frame: 2005-2010
4. Determine efficiency of planting density (low vs high).
    a. Lead Staff: Crowder
    b. Time Frame: 2007-2015

Technology Transfer:

1. Distribute Washington Planting Guide (Technical Note #1) and link to eFOTG.
    c. Lead Staff: Kuhn
    d. Time Frame: 2005
2. Develop and distribute streambank plant booklet with information on growth rates, moisture zones, high quality photos, plant longevity, and soil limitations.
    a. Lead Staff: Kuhn
    b. Time Frame 2010
3. Reformat (electronically) Plant Materials Technical Notes and link to eFOTG.
    a. Lead Staff: Stannard
    b. Time Frame: 2005

Training:

1. Plant Identification
    a. Lead Staff: Kuhn
    b. Time Frame: 2006-2015
2. Use of soil information
    a. Lead Staff: Kuhn
    b. Time Frame: 2006-2015
3. Site selection (weeds, soils, stability, water table etc)
    a. Lead Staff: Kuhn
    b. Time Frame: 2006-2015
4. Speed of rooting
    a. Lead Staff: Crowder

b. Time Frame: 2006-2015

Field Plantings, Conservation Field Trials, and Demonstration Plantings:

1. Long term persistence of species in low management environments
    a. Lead Staff: Kuhn
    b. Time Frame: 2006-2015
2. Weed control comparisons.
    a. Lead Staff: Stannard
    b. Time Frame: 2006-2015

WIND EROSION BUFFER PROJECT PLAN
2005-2015

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Goal #1: Create buffers that will reduce soil particle saltation

Saltation Plant Releases:

1. Dryland Alfalfa. Germplasm originating from Saddle Mountain breeding studies.
    a. Variety Trial
        i. Lead Staff: Harwood
        ii. Time Frame: 2006-2008
    b. Analyze Results and develop release documentation
        i. Lead Staff: Harwood
        ii. Time Frame: 2008

Technology Development:

1. Determine how wide a grass buffer is needed to capture saltated soil particles.
    a. Evaluate CRP downwind of eroding field. Model wind velocity to effective width.
        i. Lead Staff: Stannard
        ii. Time Frame: 2007
2. Determine how tall the grass buffer must be to capture saltated soil particles.
    a. Lead Staff: Stannard
    b. Time Frame: 2009
3. Determine minimum management required to maintain a functional dryland grass buffer.
    a. Lead Staff: Stannard
    b. Time Frame: 2005-2009
4. Develop seeding methods to improve stand establishment of Russian wildrye.
    a. Lead Staff: Stannard
    b. Time Frame: 2010-2012

Technology Transfer:

1. Distribute Washington Planting Guide (Technical Note #1) and link to eFOTG.
    a. Lead Staff: Kuhn
    b. Time Frame: 2005
2. Develop buffer poster
    a. Lead Staff: Stannard
    b. Time Frame: 2006
3. Reformat (electronically) Plant Materials Technical Notes and link to eFOTG.
    a. Lead Staff: Stannard
    b. Time Frame: 2005

Training:

1. Use of soil information and WA Planting Guide (TN #1)
    a. Lead Staff: Kuhn
    b. Time Frame: 2005-2009

2. Plant identification
    a. Lead Staff: Kuhn
    b. Time Frame: 2005-2009

Field Plantings, Conservation Field Trials, and Demonstration Plantings:

3. HHH Cemetery Road shrub demo planting.
    a. Lead Staff: Stannard
    b. Time Frame: 2005-2015

<u>Goal #2: Create "tall" woody buffers that will slow wind velocity</u>

Wind Velocity Reduction Plant Releases:

1. Lind Douglas Fir tree development.
    a. Maintain seed orchard at Pullman PMC.
        i. Lead Staff: Skinner
        ii. Time Frame: 2005-2015

Technology Development

1. None planned at this time

Technology Transfer:

1. Distribute Washington Planting Guide (Technical Note #1) and link to eFOTG.
    a. Lead Staff: Kuhn
    b. Time Frame: 2005
2. Develop drought tolerant tree poster
    a. Lead Staff: Kuhn
    b. Time Frame: 2007
3. Reformat (electronically) Plant Materials Technical Notes and link to eFOTG.
    a. Lead Staff: Stannard
    b. Time Frame: 2005

Training:

1. Use of soil information and WA Planting Guide (TN #1)
    a. Lead Staff: Kuhn
    b. Time Frame: 2006-2015
2. Plant identification
    a. Lead Staff: Kuhn
    b. Time Frame: 2006-2015

Field Plantings, Conservation Field Trials, and Demonstration Plantings:

1. Horse Heaven Hills Cemetery Road shrub demo planting.
    a. Lead Staff: Stannard
    b. Time Frame 2005-2015
2. Lind Experiment Station Windbreak planting
    a. Lead Staff: Crowder
    b. Time Frame 2005-2015

Goal #3: Stabilize soils that are prone to excessive aggregate destruction.

Aggregate Stability Plant Releases:

1. 9033982 Canada milkvetch: data compilation, write release notice
    a. Lead Staff: Crowder
    b. Time Frame 2005-2007

Technology Development

1. Compare PAM, paper pulp, straw mulching, green manure crop on field edges
    a. Lead Staff: Harwood
    b. Time Frame 2006-2007

Technology Transfer:

1. Distribute Washington Planting Guide (Technical Note #1) and link to eFOTG.
    a. Lead Staff: Kuhn
    b. Time Frame: 2005

Training:

1. Soil organic matter development
    a. Lead Staff: Harwood
    b. Time Frame 2007

Field Plantings, Conservation Field Trials, and Demonstration Plantings:

None planned at this time

PALOUSE PRAIRIE RESTORATION PROJECT PLAN
2005-2015

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DESCRIPTION: The Palouse Prairie ecosystem, located in eastern Washington and adjacent areas of northern Idaho, and northeastern Oregon, and the associated environmental benefits are endangered to the point of extinction. The Palouse Prairie is considered to be one of the twenty most endangered ecosystems in the United State by Reed Noss (*Wild Earth*, Spring, 1997) and others. It may actually be the rarest prairie ecosystem in North America. Many important native conservation plants, such as beardless bluebunch wheatgrass, Idaho fescue, prairie junegrass, biscuitroots, and camas, were components of this plant community. The Palouse ecotypes of these plants are now extremely rare. The Palouse region is now an annual cropland of cereal grains and annual legumes planted on highly erosive steep hillsides.

The objective is to restore/rehabilitate a native Palouse Prairie to a *Festuca idahoensis* - *Symphoricarpos albus* plant community at the Pullman PMC and other sites as appropriate. This may involve establishment of native prairie in blocks or plots in a prepared seedbed formerly in grass sod or annual cropland at the Pullman PMC.

STUDY LEADER: Dave Skinner

Goal #1: Create technology to restore Palouse Prairie vegetation in former cropland.

Releases:

1. Union Flat Blue Wildrye Germplasm.
    a. Increase breeder seed and prepare release documentation 2005-2007

Technology Development:

1. WAPMC-T-9908-RA	Palouse prairie Initial Seed Increase
2. WAPMC-T-9909-RA	Palouse prairie grass competition
3. WAPMC-T-9910-RA	Palouse prairie forb transplant trials (2001 plots)
4. WAPMC-T-0003-RA	Forb seeding trials
5. WAPMC-T-0004-RA	Evaluation of seed treatments to improve establishment of *Gaillardia aristata*.
6. WAPMC-T-0005-RA	Evaluation of potting mixes for enhanced rooting of native species; 2-99A
7. WAPMC-T-0105-RA	Palouse Prairie propagation trials
8. WAPMC-T-0106-RA	Palouse Prairie transplant trials (2000 plots)
9. WAPMC-T-0107-RA	Downy brome/*Poa secunda* lithosol trials
10. WAPMC-T-0208-RA	*Geranium viscosissimum* scarification trials
11. WAPMC-T-0214-RA	Snowberry growth form trials
12. WAPMC-T-0306-RA	Seeds per pound determinations
13. WAPMC-T-0307-RA	Evaluation of forb seeding times

Technology Transfer:

1. Development of Propagation Protocols for native species of the Palouse
2. Development of Brochure describing procedures for creating small “Palouse Prairie Gardens”

Training:

1. Greenhouse Techniques for establishing Palouse Prairie native plants.
2. Plant Identification.