

# FY 2007 and FY 2008 Progress Report for the Apache-Sitgreaves National Forests Production of Riparian Plant Materials

David R. Dreesen  
Los Lunas Plant Materials Center  
US Department of Agriculture–Natural Resources Conservation Service

The Los Lunas Plant Materials Center (LLPMC) was asked to produce riparian plant materials as containerized stock or dormant pole cuttings for the Apache-Sitgreaves National Forests for use in riparian restoration and revegetation activities. This stock was propagated from plant propagules (cuttings or seed) collected within the Forest.

## Narrowleaf Cottonwood Dormant Pole Cuttings

Over the past two decades, the LLPMC has installed several narrowleaf production fields at their facility. The later pole production fields were installed with cuttings from the original planting installed in the early 1990's. Some of the older fields were removed in the late 1990's and again in 2008 because they were no longer producing numerous, vigorous poles. As of September 30, 2008, there were two fields (32N and 31S) containing eight rows (about 0.5 acre) and approximately 1,000 poles.

## Bebb's Willow Containerized Stock

Over the course of the past 10 years, the LLPMC has produced large numbers of Bebb's willow (*Salix bebbiana*) containerized stock for the Apache-Sitgreaves National Forests. The original cuttings were taken from Los Burros and McCormack Spring. A year later, seed from Lookout Pasture was collected and used to start seedlings. Figure 1 shows Bebb's willow seedlings in containers (4-cubic-inch) at the end of one growing season. Because these two ecotypes flowered at different times, seed from these stock plants was used to perpetuate the two ecotypes. The majority of these plants were picked up in 2007 for wetland mitigation related to the Sunrise Park - Big Lake Road project (see Table 1), but substantial numbers had been picked up in prior fiscal years.

**Table 1. Bebb's willow picked up in 2007 for use in the wetland mitigation related to the Sunrise Park – Big Lake Road project.**

Origin	Pick Up Date	No. of One-Gallon Treepots	No. of Two-Gallon Treepots
Los Burros and McCormack Spring	July 12, 2007	430	130
Lookout Pasture	July 12, 2007	260	230
Los Burros and McCormack Spring	September 27, 2007	238	30
Lookout Pasture	September 27, 2007	200	34
<b>Total</b>		<b>1128</b>	<b>424</b>



**Figure 1. Bebb's willow seedlings at the end of the first growing season (9/25/06) in 4-cubic-inch containers. Seed was harvested from LLPMC stock plants on 5/1/06.**

### **Arizona Willow Containerized Stock**

The following excerpt from the *LLPMC 2002 Progress Report of Activities* describes the initial stages of the Arizona willow propagation effort:

#### *Propagation of Arizona Willow, a Rare and Sensitive Species on the Apache-Sitgreaves National Forest*

The Apache-Sitgreaves National Forests have implemented a recovery program for Arizona willow (*Salix arizonica*), a US Forest Service Sensitive Species and a species listed as highly safeguarded by the Arizona Native Plant Law. A number of management practices have been implemented including installation of grazing exclosures surrounding individuals or groups of plants at 17 sites where the willow has been identified on the Forest. The Forest asked the LLPMC to propagate transplants for eventual reintroduction. In April 2002, cuttings were collected from four individual plants from the West Fork of the Little Colorado River and the West Fork of the Black River by Terry Myers (Wildlife, Fish, and Rare Plant Program Manager on the Forest) and Carl-Eric Granfelt (volunteer expert on willow identification and ecology). These cuttings yielded 73 micro-cuttings (1" to 1.5" long and 0.05" to 0.10" caliper) and the eventual production by the fall of 2002 of 27 plants in one-gallon treepots with stems up to 2 feet in length. Several plants of each of these clones will be potted during 2003 into large nursery containers to serve as seed and cutting stock plants. In June 2002, seed from three female Arizona willow plants was collected by Carl-Eric Granfelt from the West Fork of the Little Colorado River and from one introduced plant from the Burro Drainage and sent to the LLPMC for propagation. These seed were germinated in mini-plug trays (each cell 0.5" x 0.5" x 1.1") and transplanted into 10 cubic inch containers in late July

2002. By the fall of 2002, 420 seedlings had been produced which will be transplanted into one-gallon treepots in the spring of 2003. If sufficient growth occurs in 2003, the Forest intends to reintroduce these transplants into their native drainages during 2004.

Substantial mortality of the one-gallon treepot material substantially reduced the number of vigorous plants available for outplanting in the years 2004 through 2006. The initial propagation in the small containers was not difficult. After transplanting into one-gallon treepots, willow rust became prevalent. Several tactics reduced disease severity including growing the plants in full sun as well as applying fungicidal sprays. Even with these measures, most of the plants did not thrive. Some plants survived, but many started a slow decline. Arizona willows were picked up on several occasions as both one-gallon treepot and small container stock before FY 2007. The last pick up occurred on September 21, 2006 when Apache-Sitgreaves personnel picked up 20 one-gallon treepots and 30 tubelings (10-cubic-inch Supercells).

Approximately 15 Arizona willow stock plants have been maintained and will provide micro-cuttings for propagation activities in FY2009. The Arizona willow seed received in 2007 and 2008 provided only a limited number of seedlings to expand the stock plant numbers.

### Other Willow Species

In 2006, seed of a number of willow species was collected by Carl-Eric Granfelt and was propagated at the LLPMC. The following list describes the species and collection locations:

- Geyer’s (*Salix geyeriana*) near McNary, Arizona – 7,300 feet, Porter Spring – 8,500 feet , and West Fork Little Colorado – 9,160 feet
- Pacific (*Salix lucida ssp. lasiandra*) Walnut Creek, Arizona
- strapleaf (*Salix ligulifolia*) Walnut Creek, Arizona
- arroyo (*Salix lasiolepis*) near Flagstaff, Arizona
- bluestem (*Salix irrorata*) Walnut Creek, Arizona
- mountain (*Salix monticola*) West Fork Little Colorado – 9,160 feet

In FY 2007, 1,600 willow tubelings (four-cubic-inch) were transplanted into one-gallon treepots. Figure 2 shows an example of *Salix geyeriana* seedlings. In FY 2008, 1,000 tubelings (ten-cubic-inch) were propagated from cuttings harvested from the one-gallon treepot stock. In addition to the species above, Bebb’s willow was also included in the propagation effort. As of September 2008, the number of Apache-Sitgreaves willows at the LLPMC totaled over 2,400 and are listed in Table 2.

**Table 2. Apache-Sitgreaves National Forests willows at the Los Lunas Plant Materials Center as of September 2008.**

Common Name	Species	Origin and Elevation	No. of One-Gallon Treepots
Geyer’s	<i>Salix geyeriana</i>	McNary – 7,300 feet	150
Geyer’s	<i>Salix geyeriana</i>	Porter Spring – 8,500 feet	360
Geyer’s	<i>Salix geyeriana</i>	West Fork Little Colorado – 9,160 feet	90
Pacific	<i>Salix lucida ssp. lasiandra</i>	Walnut Creek	210
strapleaf	<i>Salix ligulifolia</i>	Walnut Creek	240
arroyo	<i>Salix lasiolepis</i>	Flagstaff	440
bluestem	<i>Salix irrorata</i>	Walnut Creek	220
mountain	<i>Salix monticola</i>	West Fork Little Colorado – 9,160 feet	220
Bebb’s	<i>Salix bebbiana</i>	Los Burros and Lookout Pasture	480
<b>Total</b>			<b>2,410</b>



**Figure 2. Geyer's willow seedlings on 9/25/06. Seed from Porter Spring sown on 6/1/06.**