

# **NCRPIS 2008 Missouri – Illinois Germplasm Reconnaissance and Collection Trips**

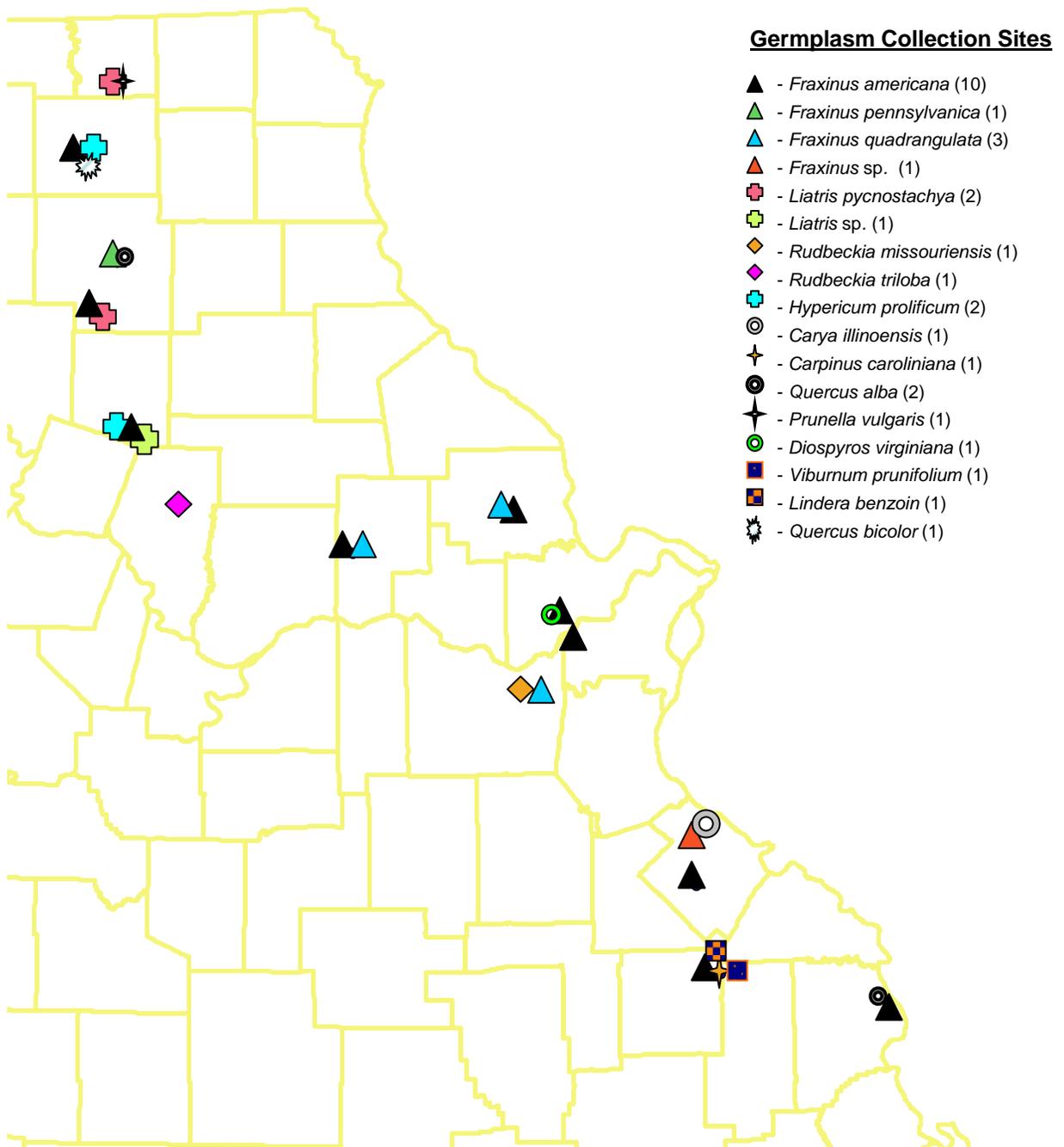
**July 28 – August 2, 2008  
October 6 – 14, 2008**



United States Department of Agriculture

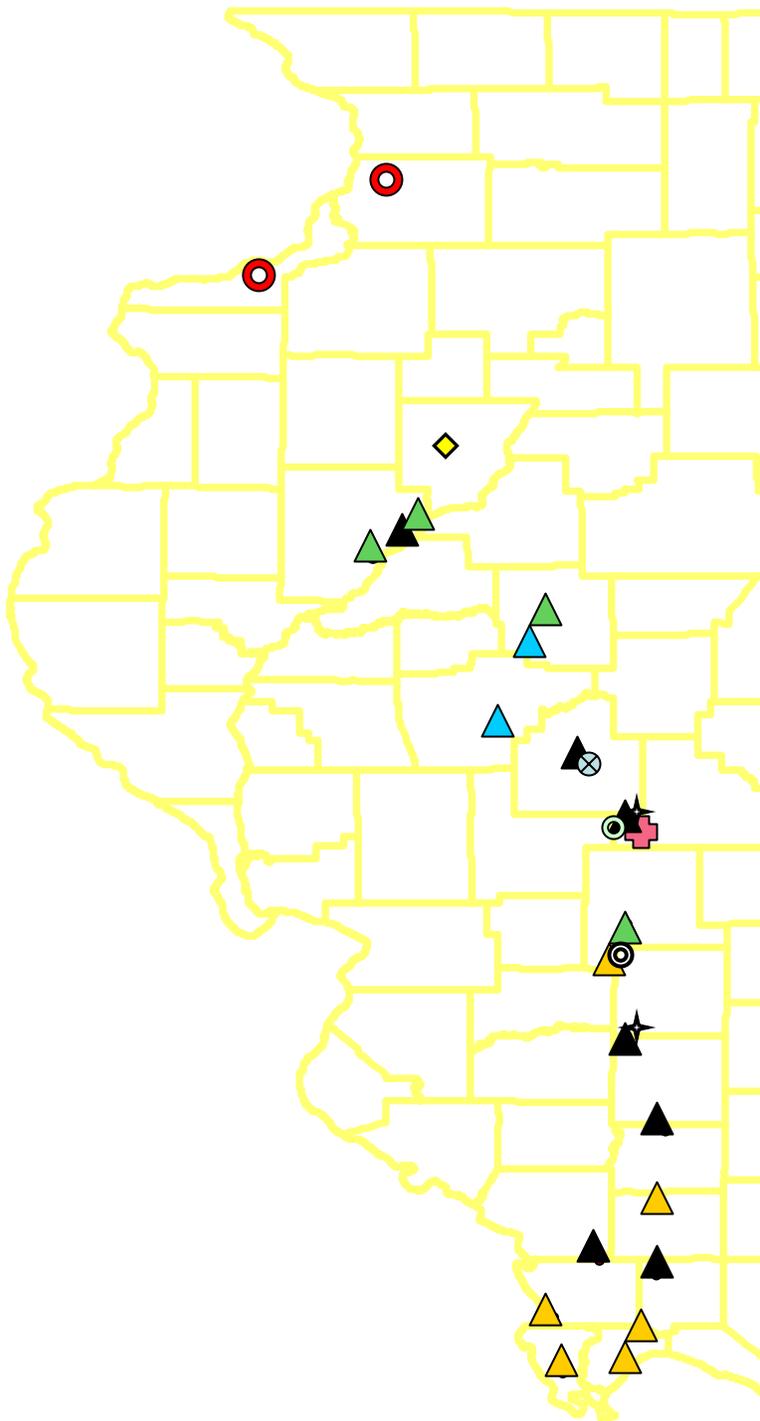
**North Central Regional Plant  
Introduction Station – Ames, IA**

# Missouri Germplasm Sites



Map of locations where germplasm was vouchered/collected/identified

# Illinois Germplasm Sites



## Germplasm Collection Sites

- ▲ - *Fraxinus americana* (7)
- ▲ - *Fraxinus pennsylvanica* (4)
- ▲ - *Fraxinus quadrangulata* (2)
- ▲ - *Fraxinus profunda* (6)
- - *Liatris aspera* (1)
- ◎ - *Quercus alba* (1)
- ★ - *Prunella vulgaris* (2)
- - *Cornus alternifolia* (2)
- ◆ - *Rudbeckia lacinated* (1)
- ◎ - *Penstemon digitalis* (1)
- ⊗ - *Baptisia* sp. (1)

Map of locations where germplasm was vouchered/collected/identified

# TABLE OF CONTENTS

Introduction.....	4
Importance of <i>Fraxinus</i> conservation.....	5
Reconnaissance Trip Plan.....	6
Reconnaissance Trip Summary.....	7
List of Vouchers Collected.....	15
Alphabetical List of Vouchers Collected.....	24
Alphabetical List of Germplasm Collected.....	25
Collection Trip Plan.....	26
Collection Trip Summary.....	29
Acknowledgments.....	40
List of Germplasm Collected.....	41
Alphabetical List of Germplasm Collected.....	54
List of Vouchers Collected.....	55
References.....	56

# Introduction

The USDA-ARS Plant Introduction Station (Ames, IA) completed reconnaissance and collection trips to Missouri and Illinois in 2008. Funding was supported by the USDA Plant Exploration Program, which is coordinated by the Plant Exchange Office, National Germplasm Resources Laboratory, USDA-ARS, Beltsville, Maryland.

Participants included:

- **Dr. Mark P. Widrechner**, Horticulturist, USDA-ARS Plant Introduction Station, Ames, IA (left)
- **Jeffrey D. Carstens**, Agricultural Science Research Technician, USDA-ARS Plant Introduction Station, Ames, IA (center)
- **Nathan R. Johnson**, Biological Science Aide, USDA-ARS Plant Introduction Station, Ames, IA (right)



The objectives were to:

- Identify and voucher *Fraxinus* populations and potentially other NPGS genera within Missouri and Illinois during the summer and fall of 2008
- Collect *Fraxinus* germplasm not already represented at the USDA-ARS Plant Introduction Station in Ames, Iowa during the fall of 2008
- Store and backup collections at the USDA-ARS Plant Introduction Station and the National Center for Genetic Resources Preservation in Fort Collins, Colorado, respectively
- Ultimately conserve and preserve genetic diversity of North American *Fraxinus* germplasm in response to the threat of loss these species from their native range to the emerald ash borer, *Agrilus planipennis* Fairmaire

# Importance of *Fraxinus* Conservation

The emerald ash borer (EAB) was accidentally introduced to North America from Asia. North American *Fraxinus* species evidently have no resistance to this pest. Since its introduction in the vicinity of Detroit, it has devastated native *Fraxinus* populations in Michigan, Indiana, Ohio, and Ontario, and it continues to spread. The loss of these species has cultural, ecological, and economic implications that warrant preserving the genetic resources before too much is lost to the insect. Trees, as do all plants, must be adapted to their environment to thrive. Natural ash populations have adapted to their environments. Preserving a significant number of these populations is required for successful reintroduction of these species, once adequate environmental control measures for EAB are developed or trees resistant to the insect are bred and introduced. Breeding resistant ash trees for reintroduction will ultimately require an array of adapted parental populations. Given the projected degree of EAB destruction to native stands, only well-conserved ex situ germplasm collections will be able to provide this needed material. The easiest way to assemble such collections is to collect seeds from representative native stands following a systematic plan. The seeds will not transmit EAB to non-infested areas. Studies have shown no loss in viability over 7 years for green and European ash seeds stored at 5°C (Barton 1945). Seed regenerations at the Plant Introduction Station (Ames, Iowa) reported successful germination of 9-year old green ash seeds stored at -18°C. Therefore, when properly handled, seeds should survive well under medium and long-term storage conditions. Seeds can be easily distributed to scientists and growers to produce seedlings for EAB research, breeding, other scientific study, and future ecological restoration work. This report describes one component of a comprehensive plan to organize these seed collections.

A GIS map, the Emerald Ash Borer Viewer, is posted on the Internet at: <http://eabviewer.rsgis.msu.edu/viewer.htm>, showing all identified regional EAB infestations and quarantine areas.

# Reconnaissance Trip Plan

## **Monday, 28 July 2008**

Explore Thousand Hills State Park near Kirksville, MO; Long Branch State Park near Macon, MO; Finger Lakes State Park, MO

## **Tuesday, 29 July 2008**

Explore Graham Cave State Park near Danville, MO; Cuivre River State Park near Troy, MO; Weldon Spring Conservation Area near Weldon Spring, MO; Babler Memorial State Park near Wildwood, MO

## **Wednesday, 30 July 2008**

Meet with Scott Woodbury, Curator, Shaw Nature Preserve near Gray Summit, MO; explore Hawn State Park and Pickle Springs Natural Area near Millers, MO; Trail of Tears State Park near Cape Girardeau, MO

## **Thursday, 31 July 2008**

Explore Union County Conservation Area near Ware, IL; Horseshoe Lake Conservation Area near Olive Branch, IL; Cache River State Natural Area near Karnak, IL; Fern Clyffe State Park near Goreville, IL; Giant City State Park near Makanda, IL

## **Friday, 1 August 2008**

Investigate Wayne Fitzgerald State Park near Whittington, IL; Ramsey Lake State Park near Ramsey, IL; Cottonhill Park near Springfield, IL; private property (permission granted) near Elkhart, IL

## **Saturday, 2 August 2008**

Edward R. Madigan State Park near Lincoln, IL; Rice Lake State Fish and Wildlife Area near Liverpool, IL; Banner Marsh State Fish and Wildlife Area near Banner, IL

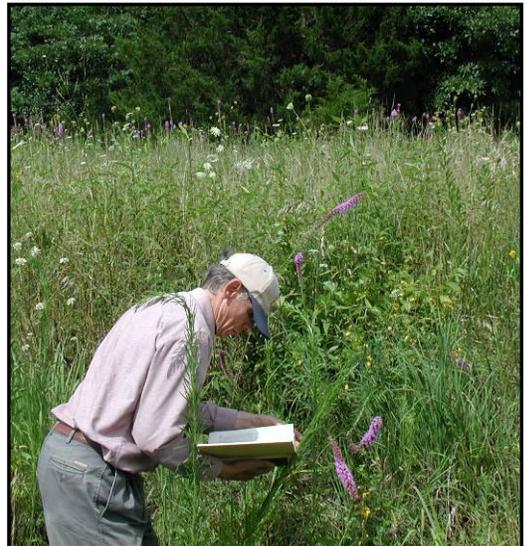
# Reconnaissance Trip Summary

## Monday, 28 July 2008

Exploration at Thousand Hills State Park resulted in finding a nice population of *Fraxinus americana* (Voucher MPW#591). Numerous specimens were located in the state park however, many *Fraxinus* seedlings of unknown origin have been planted. Voucher MPW#591 was collected in an area approximately one half mile distant from any cultivated *Fraxinus*. Noted good seed production on all plants. Surrounding vegetation predominately consisted of *Quercus alba*, *Hypericum prolificum* (Voucher MPW#592), and *Carya* sp. A nice population of *Cornus florida* existed throughout the park.

Long Branch Lake also had numerous *Fraxinus* cultivars planted throughout the park generally concentrated around high public use areas (e.g. campgrounds, boat docks, etc.). Along one of the shorelines near the northern portion of Long Branch Lake we came across a population of *Fraxinus pennsylvanica* (Voucher MPW#593).

While heading south towards Columbia, MO, two additional populations of white ash with large amounts of seed production were vouchered. One population was identified near Thomas Hill Reservoir (Voucher MPW#594) which had numerous specimens of *Polygala sanguinea* (Voucher MPW#595). After a couple miles, a nice population of *Liatris pycnostachya* (photo) was noticed along the road. Continuing south, a very large population of white ash was encountered throughout Rudolph Bennitt Conservation Area (Voucher MPW#596), where numerous females were noted with an abundance of seeds.



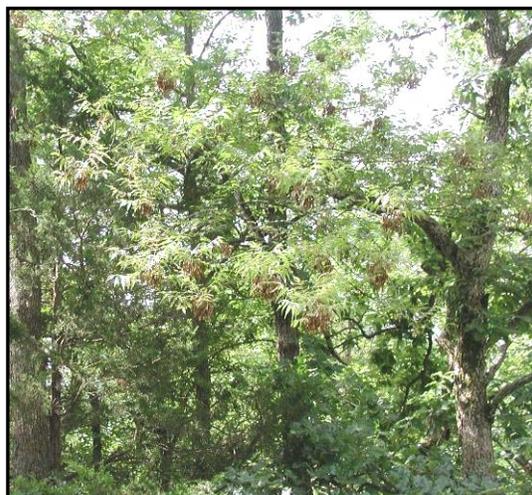
The last stop for the afternoon at Finger Lakes State Park resulted in finding a limited number of *Fraxinus* specimens as well as a fair amount of planted ash cultivars. It was decided that this area was not worth sampling. Departure from Finger Lakes along East Peabody Road resulted in the spotting of a large population of *Rudbeckia triloba* (Voucher MPW#597) for future collecting.

# Reconnaissance Trip Summary (cont'd)

## Tuesday, 29 July 2008

Tuesday morning efforts made in Graham Cave State Park located a *Fraxinus americana* (Voucher MPW#599) population worthy of collecting. Numerous specimens loaded with seeds were identified while approaching the park entrance.

In addition, a population of *Fraxinus quadrangulata* (Voucher MPW#598/photo) was identified occasionally throughout the park, but generally restricted to drier, hotter exposed slopes (west and south facing). Plants from this species had a fair amount of insect feeding on the foliage which aided in the identification of additional specimens. Unfortunately, we could not identify the exact cause of the damage. Damaged leaves exhibited small, scattered BB size holes distributed randomly. Damage was viewable from approximately 30-40 feet. To our surprise, the blue ash seeds were starting to ripen. Therefore, seeds were collected from nine specimens (Ames 29526). Seeds tended to have a strong attachment to the pedicles.



While searching for mature blue ash specimens, numerous juvenile seedlings were scattered throughout the park. Leaf samples for DNA analysis were harvested and immediately shipped to Jennifer Koch, U.S. Forest Service, Delaware, Ohio.

The next destination, Cuyahoga River State Park, also resulted in the discovery of both white ash (Voucher MPW#600) and blue ash (Voucher MPW#601) populations. In comparison to the blue ash population at Graham Cave State Park, seeds were at similar stage of maturation. However, adult specimens were much narrower and taller. Seeds were harvested from seven specimens (Ames 29527). The blue ash population located on the far western edge of the state park presented itself as a very high quality, isolated population. Understory plants of *Ptelea trifolia* and *Monarda bradburiana* were abundant.

In communication with Dr. Rick Hall (Iowa State University), *Fraxinus quadrangulata* has perfect flowers.

# Reconnaissance Trip Summary (cont'd)

## Tuesday, 29 July 2008(cont'd)

While enroute to Weldon Spring Conservation area, discovery of a nice white ash population located near August A. Busch Memorial Area (Voucher MPW#602) resulted in diverting efforts away from Weldon Spring CA. Plant associates included abundant specimens of *Diospyros virginiana*, *Cornus drummondii* and *Lonicera maackii*. During collection of white ash seeds this fall at August A. Busch Memorial Area, additional time will be allowed to search for *Fraxinus pennsylvanica* along the Missouri River shoreline, which is approximately 5 miles south.

Final reconnaissance efforts at Dr. Edmund A. Babler Memorial State Park resulted in easy identification of multiple, large white ash specimens (Voucher MPW#603). All females had abundant seeds.

After catching a shower at our hotel in Gray Summit, MO, a nice dinner was prepared and hosted by Scott Woodbury (Shaw Arboretum/Nature Preserve) along with his wife Abigail and son Miles. Dinner was enjoyed while overlooking the Meramec River. During dinner conversation, Scott informed us of a population of *Fraxinus quadrangulata* along the bluffs of the Meramec River that were ready to be harvested. Plans were made to collect the following morning.

## Wednesday, 30 July 2008

Wednesday morning resulted in a early morning start to collect seeds from a blue ash population located along the Meramec River identified by Scott Woodbury. Due to the extreme slope (70%) and rugged conditions, seed collection occurred on only four specimens (Ames 29528) of the southeast-facing population (Voucher MPW#604). Approximately 25 plants were noted. Plant associates included *Juniperus virginiana*, *Amelanchier laevis*, *Ruellia humilis*, *Rhamnus caroliniana*, and numerous *Quercus muhlenbergii*.

Scott also showed us a native population of a narrow leaved rudbeckia (*Rudbeckia missouriensis*:Voucher MPW#605), located on the Shaw Nature Preserve property. Scott noted that the presence of this species appeared immediately after invasive woody plants were removed.

# Reconnaissance Trip Summary (cont'd)

## Wednesday, 30 July 2008 (cont'd)

While heading towards Hawn State Park, we were able to take a few back roads near Magnolia Hollow Conservation Area. A population of *Fraxinus* identified only as sp. was vouchered (MPW#606 and MPW#606A). This population seemed to be growing in a habitat suitable for green ash and having a leaf shape resembling green ash, but the leaves tended to be pubescent and whitish underneath (characteristics of white ash). Voucher #606 is lighter underneath than voucher #606A. Special attention will be focused on buds and bud scars during fall seed collection to prevent a potential species mixture.

As we traveled to our next destination at Hawn State Park, a distinct change in plant composition occurred most likely due to an increase in soil acidity. An increase in the occurrence of acid loving plants, such as *Vaccinium arboreum* and *Liquidambar styraciflua*, was noted. The soil composition seemed to consist mostly of sand. The presence of *Fraxinus* was essentially nonexistent. Exploration throughout Hawn State Park took additional time to find ash trees. However, four trees of *Fraxinus americana* (Voucher MPW#607) bearing seeds were identified. Specimens were approximately, 50-60' in height and 2' d.b.h. Only one male specimen was observed. Due to the rare occurrence of this species throughout this type of distinct, essentially unfavorable ash environment, plans to collect seeds this fall will go forward.

While enroute to Cape Girardeau, MO, we stopped along County Road J to mark a white ash population (Voucher MPW#608) as a potential seed collection. Immediately following this stop our destination had us pass through Amidon Memorial Conservation Area where numerous *Carpinus caroliniana* plants were noted all abundant with seeds. Seed collection from this population will occur if time permits.

# Reconnaissance Trip Summary (cont'd)

## Thursday, 31 July 2008

Thursday morning efforts made in Trail of Tears State Park took longer than expected due to the scarcity of *Fraxinus*. The habitat seemed appropriate, however the appearance of *Liriodendron tuliperifera* and *Fagus grandifolia* suggests a slight change flora composition. Eventually a relatively decent sized population of *Fraxinus americana* (Voucher MPW#609) was identified in the lower elevations of this state park.

Crossing into Illinois our first stop at Union County Conservation Area literally took a few minutes to identify *Fraxinus* growing in the bottomlands. The habitat was generally composed of standing water (couple inches) or had standing water at one time. After close inspection, it was clear that this population was *Fraxinus profunda* (Voucher MPW#610). The leaves of this species tend to resemble white ash. However, the tendency to grow in an essentially water-logged environment and have a growth habit that is more upright helps separate the two species visually from afar.

At Horseshoe Lake Conservation Area (photo), *Fraxinus profunda* (Voucher MPW#611) was found growing along the shoreline along with *Taxodium distichum*, *Quercus michauxii*, and *Nelumbo* sp. This population would most likely be considered part of the Mississippi River drainage.



While enroute to the Cache River State Natural Area, another pumpkin ash population approximately 12 miles east of MPW#611 was discovered along a drainage ditch near Olmsted (Voucher MPW#612). This population would be considered part of the Ohio River drainage and is approximately half way between Cache River State Natural Area and Horseshoe Lake. Numerous specimens ranging from 30-50' in height were marked for potential collection.

# Reconnaissance Trip Summary (cont'd)

## **Thursday, 31 July 2008 (cont'd)**

While visiting the Cache River State Natural Area we noticed that there are numerous restoration projects in progress where pumpkin ash was widely planted. After consultation with Jim Waycuilis (park superintendent), seedlings for restoration were obtained via local source within park boundaries. Therefore, seeds from numerous specimens (Voucher MPW#613) only 20' in height will be sampled in the fall.

Moving out of the pumpkin ash habitat, *Fraxinus americana* populations were easily found at Fern Clyffe State Park (Voucher MPW#614) and Giant City State Park (Voucher MPW#615).

## **Friday, 1 August 2008**

During a May 2008 visit to the Illinois Natural History Survey Herbarium in Urbana, IL, a voucher for a northern population of *Fraxinus profunda* in Williamson County was recorded. Using the location and legal description, this population was relocated and vouchered (Voucher MPW#616).

Heading north along Interstate 57, a white ash population in Franklin County (Voucher MPW#617) and a pumpkin ash population in Jefferson County (Voucher MPW#618) county were identified. Finally, a sizeable green ash population (Voucher – MPW#619) was discovered east of Carlyle Lake around the Northfork Kaskaskia River drainage along 100 North Road in the far southeast corner of Fayette County. Permission to collect in the fall was obtained by the land owner, Kathy Robb. Approximately 10 miles north, an additional, green ash population was marked along the Hickory Creek River drainage which was not vouchered.

After no desirable population of *Fraxinus* was found in Ramsey Lake State Park, efforts continued north on US highway 51, where a *Fraxinus americana* (Voucher MPW#620) population was recorded along the Opossum River drainage in Shelby County. A similar population of white ash (Voucher MPW#621) along the Sangamon River drainage just south of Taylorville was also identified.

# Reconnaissance Trip Summary (cont'd)

## Friday, 1 August 2008 (cont'd)

In communication with Guy Sternberg (Starhill Forest Arboretum, Petersburg, IL) two populations of *Fraxinus quadrangulata* (Voucher MPW#622 and MPW#623) were located.

Cottonhill West Park (MPW#622) near Springfield was most likely established via removing previously established trees. Twelve mature blue ash trees found at this site of which seeds from eight trees were harvested (Ames 29529). Plant associates included *Quercus muhlenbergii* and *Quercus x Deamii* which are most likely pre-settlement trees due to their extreme size. Other trees of great size included *Quercus imbricaria* and *Juglans nigra*. The blue ash in Cottonhill Park were very large (approximately 80' in height), but declining rapidly. It is expected that numerous blue ash specimens at this location will die in the near future.

The second population of blue ash (MPW#623) was located near Elkhart, IL. This privately owned population was definitely the healthiest of all blue ash specimens encountered throughout the reconnaissance trip. Very large (approximately 120' in height) specimens (photo) were located throughout the farm. Seeds from six specimens resulted (Ames 29530) and were easily obtained due to very low growing branches (photo). Very large *Gymnocladus dioica*, *Quercus macrocarpa*, *Celtis occidentalis*, *Asimina triloba*, and *Prunus serotina* were noted. This population seemed to exist essentially on a small elevated knoll surrounded by a vast amounts of corn and soybean fields.



# Reconnaissance Trip Summary (cont'd)

## **Saturday, 2 August 2008**

Our final reconnaissance day, resulted in finding three populations of *Fraxinus pennsylvanica*. One very small (12 plants) population (Voucher MPW#624) located in Edward Madigan (formerly Railsplitter) State Park and a very large (100+) population (Voucher MPW#625) located near the Chautauqua National Wildlife Refuge.

Our last visit at Rice Lake State Fish and Wildlife Area resulted in finding both a lowland *F. pennsylvanica* population (not vouchered) and a *F. americana* (Voucher MPW#626) located along the higher areas of the park.

During our journey back towards Ames, we stopped at Blackhawk Forest in Rock Island, IL and noted numerous fruiting plants of *Cornus alternifolia*. Specimens were very tall, reaching 20', and were very clean of leaf diseases. Paula Cross was contacted in order to receive permission to collect as this park is part of the Illinois Historic Preservation Agency. Permission was granted to collect the seeds. Seeds were collected from 18 specimens (Ames 29532).

## **Wednesday, 6 August 2008**

After returning to Ames, Jeff Carstens spent additional time traveling throughout the northeast portions of Iowa collecting *Cornus alternifolia* and *Cornus rugosa*. After spending a night near Dubuque, Iowa, it was decided to make a quick trip to Morrisson Rockwood State Park in Whiteside County. A population of 17 *Cornus alternifolia* plants was sampled (Ames 29523).

# List of Vouchers Collected

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Collection Number: MPW#591/Ames29626  
Scientific Name: *Fraxinus americana* L.  
Date: 28 July 2008  
County, State: ADAIR COUNTY, MISSOURI  
Elevation: 920'  
Latitude: 40.18812°N  
Longitude: 92.64506°W (NAD83)  
Locality: Thousand Hills State Park – Kingsville, Missouri  
Herbarium Specimen: yes  
Plant associates: *Quercus bicolor*, *Quercus alba*, *Hypericum prolificum*, *Carya* spp., *Ulmus* sp., *Quercus imbricaria*, *Rhus aromatica*, *Ruellia* sp., and *Quercus velutina*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#592/Ames 29655  
Scientific Name: *Hypericum prolificum* L.  
Date: 28 July 2008  
County, State: ADAIR COUNTY, MISSOURI  
Elevation: 920'  
Latitude: 40.18812°N  
Longitude: 92.64506°W (NAD83)  
Locality: Thousand Hills State Park – Kingsville, Missouri  
Herbarium Specimen: yes  
Plant associates: *Quercus bicolor*, *Quercus alba*, *Fraxinus americana*, *Carya* spp., *Ulmus* sp., *Quercus imbricaria*, *Rhus aromatica*, *Ruellia* sp., and *Quercus velutina*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#593/Ames 29643  
Scientific Name: *Fraxinus pennsylvanica* Marshall  
Date: 28 July 2008  
County, State: MACON COUNTY, MISSOURI  
Elevation: 800'  
Latitude: 39.82536°N  
Longitude: 92.51559°W (NAD83)  
Locality: Long Branch State Park – Macon, Missouri  
Herbarium Specimen: yes  
Plant associates: *Ptelea trifolia*, *Rudbeckia hirta*, *Ulmus* sp., *Carya* sp., *Quercus* sp., *Salix* sp., *Quercus palustris*, and *Rhus aromatica*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#594/Ames 29627  
Scientific Name: *Fraxinus americana* L.  
Date: 28 July 2008  
County, State: MACON COUNTY, MISSOURI  
Elevation: 820'  
Latitude: 39.68716°N  
Longitude: 92.59426°W (NAD83)  
Locality: Near Thomas Hill Reservoir – approx. 3 miles west of Binkley, Missouri  
Herbarium Specimen: yes  
Plant associates: *Helianthus strumosus*, *Rhus copallina*, *Juniperus virginiana*, *Quercus imbricaria*, *Polygala sanguinea*, and *Rhus aromatica*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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# List of Vouchers Collected

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Collection Number: MPW#595  
Scientific Name: *Polygala sanguinea* L.  
Date: 28 July 2008  
County, State: MACON COUNTY, MISSOURI  
Elevation: 820'  
Latitude: 39.68716°N  
Longitude: 92.59426°W (NAD83)  
Locality: Near Thomas Hill Reservoir – approx. 3 miles west of Binkley, Missouri  
Herbarium Specimen: yes  
Plant associates: *Juniperus virginiana*, *Helianthus strumosus*, *Rhus copallina*, *Quercus imbricaria*, *Fraxinus americana*, and *Rhus aromatica*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#596/Ames 29628  
Scientific Name: *Fraxinus americana* L.  
Date: 28 July 2008  
County, State: RANDOLPH COUNTY, MISSOURI  
Elevation: 840'  
Latitude: 39.27514°N  
Longitude: 92.43387°W (NAD83)  
Locality: Rudolf Bennitt Conservation Area – Columbia, Missouri  
Herbarium Specimen: yes  
Plant associates: *Rhus glabra*, *Rhus copallinum*, *Quercus bicolor*, *Salix* sp., *Ulmus rubra*, *Hypericum prolificum*, *Viburnum prunifolium*, *Carya* sp., *Euphorbia corollata*, and *Vernonia* sp.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#597/Ames 29672  
Scientific Name: *Rudbeckia triloba* L.  
Date: 28 July 2008  
County, State: BOONE COUNTY, MISSOURI  
Elevation: 710'  
Latitude: 39.07440°N  
Longitude: 92.32119°W (NAD83)  
Locality: Creeklund Dr. south of Peabody Rd. – Columbia, Missouri  
Herbarium Specimen: yes  
Plant associates: *Campanula americana*, *Fraxinus americana*, *Elaeagnus umbellata*, *Quercus imbricaria*, and *Juglans nigra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#598/Ames 29526  
Scientific Name: *Fraxinus quadrangulata* Michx.  
Date: 29 July 2008  
County, State: MONTGOMERY COUNTY, MISSOURI  
Elevation: 760'  
Latitude: 38.90606°N  
Longitude: 91.57810°W (NAD83)  
Locality: Graham Cave State Park – approx. 2.5 miles north of Mineola, Missouri  
Herbarium Specimen: yes  
Plant associates: *Quercus muhlenbergii*, *Quercus imbricaria*, *Fraxinus americana*, *Acer saccharum*, *Taenidia integerrima*, *Heliopsis* sp., and *Vernonia* sp.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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# List of Vouchers Collected

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Collection Number: MPW#599/Ames 29629  
Scientific Name: *Fraxinus americana* L.  
Date: 29 July 2008  
County, State: MONTGOMERY COUNTY, MISSOURI  
Elevation: 760'  
Latitude: 38.90606°N  
Longitude: 91.57810°W (NAD83)  
Locality: Graham Cave State Park – Montgomery City, Missouri  
Herbarium Specimen: yes  
Plant associates: *Quercus imbricaria*, *Quercus muhlenbergii* (numerous), *Fraxinus quadrangulata*, *Vernonia* sp., *Heliopsis* sp., *Taenidia integerrima* and *Acer saccharum*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#600/Ames 29630  
Scientific Name: *Fraxinus americana* L.  
Date: 29 July 2008  
County, State: LINCOLN COUNTY, MISSOURI  
Elevation: 620'  
Latitude: 39.01518°N  
Longitude: 90.92275°W (NAD83)  
Locality: Cuivre River State Park – Troy, Missouri  
Herbarium Specimen: yes  
Plant associates: *Sassafras albidum*, *Vernonia baldwini*, *Heliopsis* sp., *Cacalia* sp., *Rhus glabra*, and *Juglans nigra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens, Matthew Albrecht and Mark P. Widrechner

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Collection Number: MPW#601/Ames 29527  
Scientific Name: *Fraxinus quadrangulata* Michx.  
Date: 29 July 2008  
County, State: LINCOLN COUNTY, MISSOURI  
Elevation: 640'  
Latitude: 39.03466°N  
Longitude: 90.95915°W (NAD83)  
Locality: Cuivre River State Park – Troy, Missouri  
Herbarium Specimen: yes  
Plant associates: *Rhus aromatica*, *Ptelea trifolia*, *Monarda bradburiana*, *Campsis americana*, *Quercus muhlenbergii*, (numerous), and *Quercus stellata*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD and HS  
Collectors: Jeffrey D. Carstens, Matthew Albrecht and Mark P. Widrechner

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Collection Number: MPW#602/Ames 29631  
Scientific Name: *Fraxinus americana* L.  
Date: 29 July 2008  
County, State: ST. CHARLES COUNTY, MISSOURI  
Elevation: 600'  
Latitude: 38.70444°N  
Longitude: 90.72959°W (NAD83)  
Locality: Busch Conservation Area – St. Charles, Missouri  
Herbarium Specimen: yes  
Plant associates: *Diospyros virginiana*, *Sassafras albidum*, *Lonicera maackii*, *Rhus* sp., *Juglans nigra*, *Cornus drummondii*, and *Campsis radicans*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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# List of Vouchers Collected

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Collection Number: MPW#603/Ames 29632  
Scientific Name: *Fraxinus americana* L.  
Date: 29 July 2008  
County, State: ST. LOUIS COUNTY, MISSOURI  
Elevation: 710'  
Latitude: 38.61867°N  
Longitude: 90.68811°W (NAD83)  
Locality: Babler Memorial State Park – Chesterfield, Missouri  
Herbarium Specimen: yes  
Plant associates: *Juglans nigra*, *Quercus alba*, *Quercus palustris*, *Cercis canadensis*, and *Sassafras albidum*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#604/Ames 29528  
Scientific Name: *Fraxinus quadrangulata* Michx.  
Date: 30 July 2008  
County, State: FRANKLIN COUNTY, MISSOURI  
Elevation: 600'  
Latitude: 38.45536°N  
Longitude: 90.82390°W (NAD83)  
Locality: Shaw Nature Reserve – Gray Summit, Missouri  
Herbarium Specimen: yes  
Plant associates: *Amelanchier laevis*, *Juniperus virginiana*, *Diospyros virginiana*, *Juglans nigra*, *Fraxinus americana*, and *Quercus muhlenbergii*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD and HS  
Collectors: Jeffrey D. Carstens, Scott Woodbury and Mark P. Widrechner

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Collection Number: MPW#605/Ames 29671  
Scientific Name: *Rudbeckia missouriensis* Engelm. Ex C.L. Boynton & Beadle  
Date: 30 July 2008  
County, State: FRANKLIN COUNTY, MISSOURI  
Elevation: 640'  
Latitude: 38.46183°N  
Longitude: 90.82940°W (NAD83)  
Locality: Shaw Nature Reserve – Gray Summit, Missouri  
Herbarium Specimen: yes  
Plant associates: *Houstonia* sp., *Ruellia humilis*, *Rhus aromatica*, *Linum sulcatum*, and *Verbena simplex*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens, Scott Woodbury and Mark P. Widrechner

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Collection Number: MPW#606 and MPW#606A – similar to JDC/2008/FP/038/108/Ames 29654  
Scientific Name: *Fraxinus* sp.  
Date: 30 July 2008  
County, State: STE GENEVIEVE COUNTY, MISSOURI  
Elevation: 390'  
Latitude: 38.01269°N  
Longitude: 90.18885°W (NAD83)  
Locality: White Sands Rd. near Magnolia Hollow Conservation Area – Ste Genevieve, Missouri  
Herbarium Specimen: yes  
Plant associates: *Gleditsia triacanthos*, *Carya illinoensis*, *Cassia fasciculata*, *Acer saccharinum*, *Menispermum canadense*, *Campsis* sp., and *Celtis laevigata*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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# List of Vouchers Collected

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Collection Number: MPW#607/Ames 29633  
Scientific Name: *Fraxinus americana* L.  
Date: 30 July 2008  
County, State: STE GENEVIEVE COUNTY, MISSOURI  
Elevation: 860'  
Latitude: 37.83801°N  
Longitude: 90.2309°W (NAD83)  
Locality: Hawn State Park – Ste Genevieve, Missouri  
Herbarium Specimen: yes  
Plant associates: *Quercus alba*, *Quercus stellata*, *Carya cordiformis*, *Pinus echinata*, *Diospyros virginiana*, *Sassafras albidum*, and *Rhamnus caroliniana*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#608/Ames 29634  
Scientific Name: *Fraxinus americana* L.  
Date: 30 July 2008  
County, State: MADISON COUNTY, MISSOURI  
Elevation: 840'  
Latitude: 37.56998°N  
Longitude: 90.18746°W (NAD83)  
Locality: along County Rd. J (east of Missouri 72), near Amidon Memorial Conservation area – Hahn's Mill, Missouri  
Herbarium Specimen: yes  
Plant associates: *Silphium terebinthinaceum* var. *terebinthinaceum*, *Juniperus virginiana*, *Cassia fasciculata*, and *Quercus velutina*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#609/Ames 29635  
Scientific Name: *Fraxinus americana* L.  
Date: 31 July 2008  
County, State: CAPE GIRARDEAU COUNTY, MISSOURI  
Elevation: 490'  
Latitude: 37.43763°N  
Longitude: 89.48127°W (NAD83)  
Locality: Trail of Tears State Park – Moccasin Springs, Missouri  
Herbarium Specimen: yes  
Plant associates: *Ostrya virginiana*, *Quercus alba*, *Cercis canadensis*, *Liriodendron tuliperifera*, and *Fagus grandifolia* (multiple).  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#610/Ames 29648  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 31 July 2008  
County, State: ALEXANDER COUNTY, ILLINOIS  
Elevation: 340'  
Latitude: 37.36492°N  
Longitude: 89.37784°W (NAD83)  
Locality: south end of Union County Conservation area (along Old Cape Rd.) – Dutch Mills, Illinois  
Herbarium Specimen: yes  
Plant associates: *Carya illinoensis*, *Liquidambar styraciflua*, *Acer rubrum*, *Ulmus americana*, and *Cornus amomum*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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# List of Vouchers Collected

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Collection Number: MPW#611/Ames 29649  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 31 July 2008  
County, State: ALEXANDER COUNTY, ILLINOIS  
Elevation: 329'  
Latitude: 37.15328°N  
Longitude: 89.34267°W (NAD83)  
Locality: Horseshoe Lake Conservation Area – Granite City, Illinois  
Herbarium Specimen: yes  
Plant associates: *Ampelopsis cordata*, *Cornus drummondii*, *Quercus michauxii*, *Sassafras albidum*, *Celtis laevigata*, and *Campsis radicans*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#612/Ames 29650  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 31 July 2008  
County, State: PULASKI COUNTY, ILLINOIS  
Elevation: 335'  
Latitude: 37.17975°N  
Longitude: 89.09459°W (NAD83)  
Locality: on Illinois Highway 37 – Olmsted, Illinois  
Herbarium Specimen: yes  
Plant associates: *Salix* sp., *Acer negundo*, *Robinia pseudoacacia*, *Toxicodendron radicans*, and *Ulmus rubra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#613/Ames 29651  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 31 July 2008  
County, State: JOHNSON COUNTY, ILLINOIS  
Elevation: 330'  
Latitude: 37.29725°N  
Longitude: 89.05332°W (NAD83)  
Locality: Cache River State Natural Area – White Hill, Illinois  
Herbarium Specimen: yes  
Plant associates: *Taxodium distichum* (state champion nearby), *Brunnichia ovata*, *Acer saccharinum*, *Hibiscus* sp., *Cephalanthus occidentalis*, and *Forestiera acuminata*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#614/Ames 29636  
Scientific Name: *Fraxinus americana* L.  
Date: 31 July 2008  
County, State: JOHNSON COUNTY, ILLINOIS  
Elevation: 650'  
Latitude: 37.53562°N  
Longitude: 88.97385°W (NAD83)  
Locality: Fern Clyffe State Park (north of lake) – Goreville, Illinois  
Herbarium Specimen: yes  
Plant associates: *Celtis tenuifolia*, *Juniperus virginiana*, *Quercus stellata*, *Ulmus alata*, and *Juglans nigra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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# List of Vouchers Collected

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Collection Number: MPW#615/Ames 29637  
Scientific Name: *Fraxinus americana* L.  
Date: 31 July 2008  
County, State: UNION COUNTY, ILLINOIS  
Elevation: 490'  
Latitude: 37.59486°N  
Longitude: 89.19944°W (NAD83)  
Locality: Giant City State Park – Giant City, Illinois  
Herbarium Specimen: yes  
Plant associates: *Rhus copallinum*, *Ostrya virginiana*, *Euphorbia corollata*, *Cassia fasciculata*, and *Celastrus orbiculatus*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#616/Ames 29652  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 01 August 2008  
County, State: WILLIAMSON COUNTY, ILLINOIS  
Elevation: 395'  
Latitude: 37.81704°N  
Longitude: 88.94961°W (NAD83)  
Locality: along Interstate 57 exit, west on E. Herrin Rd. – Johnston City, Illinois  
Herbarium Specimen: yes  
Plant associates: *Phragmites* sp., *Fraxinus americana*, *Salix* sp., *Ulmus rubra*, *Platanus occidentalis*, and *Morus alba*  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#617/Ames 29638  
Scientific Name: *Fraxinus americana* L.  
Date: 01 August 2008  
County, State: FRANKLIN COUNTY, ILLINOIS  
Elevation: 425'  
Latitude: 38.09464°N  
Longitude: 88.94480°W (NAD83)  
Locality: Wayne Fitzgerrell State Park – Benton, Illinois  
Herbarium Specimen: yes  
Plant associates: *Acer saccharum*, *Fraxinus profunda*, *Sassafras albidum*, *Quercus imbricaria*, *Quercus velutina*, *Quercus palustris*, and *Parthenocissus* sp.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#618/Ames 29639  
Scientific Name: *Fraxinus americana* L.  
Date: 01 August 2008  
County, State: JEFFERSON COUNTY, ILLINOIS  
Elevation: 530'  
Latitude: 38.43828°N  
Longitude: 89.07822°W (NAD83)  
Locality: 2150 North Rd. (east of Irvington) – Irvington, Illinois  
Herbarium Specimen: yes  
Plant associates: *Cercis canadensis*, *Prunella vulgaris*, *Sassafras albidum*, *Platanus occidentalis*, *Quercus imbricaria*, *Helianthus strumosus*, *Asclepias syriaca*, and *Juglans nigra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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# List of Vouchers Collected

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Collection Number: MPW#619/Ames 29653  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 01 August 2008  
County, State: FAYETTE COUNTY, ILLINOIS  
Elevation: 460'  
Latitude: 38.75253°N  
Longitude: 89.16763°W (NAD83)  
Locality: along 100N Road near Northfork Kaskaskia River drainage - 3.5 miles west of Patoka, Illinois  
Herbarium Specimen: yes  
Plant associates: *Campsis radicans*, *Ulmus rubra*, *Acer saccharinum*, *Toxicodendron radicans*, *Gleditsia triacanthos*, *Juglans nigra*, *Acer negundo*, *Celtis occidentalis*, *Cephalanthus occidentalis*, *Carya cordiformis*, *Quercus bicolor* and *Ipomoea pandurata*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#620/Ames 29640  
Scientific Name: *Fraxinus americana* L.  
Date: 01 August 2008  
County, State: SHELBY COUNTY, ILLINOIS  
Elevation: 656'  
Latitude: 39.30535°N  
Longitude: 89.08393°W (NAD83)  
Locality: 100 yards north of Opossum Creek, U.S. Highway 51 – Oconee, Illinois  
Herbarium Specimen: yes  
Plant associates: *Liatris aspera* (nice population), *Euphorbia corollata*, *Prunella vulgaris*, *Penstemon digitalis*, *Quercus alba*, *Helianthus strumosus*, and *Daucus carota*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#621/Ames 29641  
Scientific Name: *Fraxinus americana* L.  
Date: 01 August 2008  
County, State: CHRISTIAN COUNTY, ILLINOIS  
Elevation: 600'  
Latitude: 39.53738°N  
Longitude: 89.25769°W (NAD83).  
Locality: Southeast of Taylorville, just southeast of Sangamon River – Taylorville, Illinois  
Herbarium Specimen: yes  
Plant Associates: *Cercis canadensis*, *Baptisia* sp., *Liatris aspera*, *Fraxinus profunda*, *Acer saccharinum*, *Cornus drummondii*, *Ulmus rubra*, *Corylus americana* and *Liquidambar styraciflua*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#622/Ames 29529  
Scientific Name: *Fraxinus quadrangulata* Michx.  
Date: 01 August 2008  
County, State: SANGAMON COUNTY, ILLINOIS  
Elevation: 575'  
Latitude: 39.69056°N  
Longitude: 89.63009°W (NAD83).  
Locality: Cottonhill Park (West) – Springfield, Illinois  
Herbarium Specimen: yes  
Plant Associates: *Quercus x Deamii* (very old, pre-settlement specimens), *Quercus muhlenbergii*, *Juglans nigra*, *Quercus imbricaria*, *Quercus palustris*, and *Fraxinus pennsylvanica*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD and HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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# List of Vouchers Collected

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Collection Number: MPW#623/Ames 29530  
Scientific Name: *Fraxinus quadrangulata* Michx.  
Date: 01 August 2008  
County, State: LOGAN COUNTY, ILLINOIS  
Elevation: 700'  
Latitude: 40.01324°N  
Longitude: 89.47484°W (NAD83).  
Locality: Elkhart, Illinois  
Herbarium Specimen: yes  
Plant Associates: *Quercus macrocarpa*, *Gymnocladus dioica*, *Celtis occidentalis*, *Asimina triloba*, and *Prunus serotina*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD and HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#624/Ames 29645  
Scientific Name: *Fraxinus pennsylvanica* Marshall  
Date: 02 August 2008  
County, State: LOGAN COUNTY, ILLINOIS  
Elevation: 545'  
Latitude: 40.12572°N  
Longitude: 89.38898°W (NAD83).  
Locality: RailSplitter – E. Madigan State Park – Lincoln, Illinois  
Herbarium Specimen: yes  
Plant Associates: *Acer saccharinum*, *Morus* sp., *Salix* sp., *Carya x Lecontei*, *Vitis cinerea*, *Juglans nigra*, and *Lysimachia nummularia*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#625/Ames 29646  
Scientific Name: *Fraxinus pennsylvanica* Marshall  
Date: 02 August 2008  
County, State: FULTON COUNTY, ILLINOIS  
Elevation: 453'  
Latitude: 40.35111°N  
Longitude: 90.08667°W (NAD83).  
Locality: along Illinois Highway 97/78 – Buckheart, Illinois  
Herbarium Specimen: yes  
Plant Associates: *Acer saccharinum*, *Morus* sp., *Lactuca floridana*, and *Phytolacca americana*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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Collection Number: MPW#626/Ames 29642  
Scientific Name: *Fraxinus americana* L.  
Date: 02 August 2008  
County, State: FULTON COUNTY, ILLINOIS  
Elevation: 450'  
Latitude: 40.45574°N  
Longitude: 89.96099°W (NAD83).  
Locality: Rice Lake Fish and Wildlife Refuge – Canton, Illinois  
Herbarium Specimen: yes  
Plant Associates: *Platanus occidentalis*, *Robinia pseudoacacia*, *Eupatorium purpureum*, *Cercis canadensis*, *Celtis occidentalis*, *Phytolacca americana*, *Lactuca floridana*, *Quercus* sp., and *Fraxinus pennsylvanica* var. *subintegerrima*.  
Biomass Type (seed, plant, cutting, herbarium specimen): HS  
Collectors: Jeffrey D. Carstens and Mark P. Widrechner

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# Alphabetical List of Vouchers Collected

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MPW#591	<i>Fraxinus americana</i> L. (Ames 29626)
MPW#594	<i>Fraxinus americana</i> L. (Ames 29627)
MPW#596	<i>Fraxinus americana</i> L. (Ames 29628)
MPW#599	<i>Fraxinus americana</i> L. (Ames 29629)
MPW#600	<i>Fraxinus americana</i> L. (Ames 29630)
MPW#602	<i>Fraxinus americana</i> L. (Ames 29631)
MPW#603	<i>Fraxinus americana</i> L. (Ames 29632)
MPW#607	<i>Fraxinus americana</i> L. (Ames 29633)
MPW#608	<i>Fraxinus americana</i> L. (Ames 29634)
MPW#609	<i>Fraxinus americana</i> L. (Ames 29635)
MPW#614	<i>Fraxinus americana</i> L. (Ames 29636)
MPW#615	<i>Fraxinus americana</i> L. (Ames 29637)
MPW#617	<i>Fraxinus americana</i> L. (Ames 29638)
MPW#618	<i>Fraxinus americana</i> L. (Ames 29639)
MPW#620	<i>Fraxinus americana</i> L. (Ames 29640)
MPW#621	<i>Fraxinus americana</i> L. (Ames 29641)
MPW#626	<i>Fraxinus americana</i> L. (Ames 29642)
MPW#598	<i>Fraxinus quadrangulata</i> Michx. (Ames 29526)
MPW#601	<i>Fraxinus quadrangulata</i> Michx. (Ames 29527)
MPW#604	<i>Fraxinus quadrangulata</i> Michx. (Ames 29528)
MPW#622	<i>Fraxinus quadrangulata</i> Michx. (Ames 29529)
MPW#623	<i>Fraxinus quadrangulata</i> Michx. (Ames 29530)
MPW#593	<i>Fraxinus pennsylvanica</i> Marshall (Ames 29643)
MPW#624	<i>Fraxinus pennsylvanica</i> Marshall (Ames 29645)
MPW#625	<i>Fraxinus pennsylvanica</i> Marshall (Ames 29646)
MPW#610	<i>Fraxinus profunda</i> (Bush) Bush (Ames 29648)
MPW#611	<i>Fraxinus profunda</i> (Bush) Bush (Ames 29649)
MPW#612	<i>Fraxinus profunda</i> (Bush) Bush (Ames 29650)
MPW#613	<i>Fraxinus profunda</i> (Bush) Bush (Ames 29651)
MPW#616	<i>Fraxinus profunda</i> (Bush) Bush (Ames 29652)
MPW#619	<i>Fraxinus profunda</i> (Bush) Bush (Ames 29653)
MPW#606	<i>Fraxinus</i> sp.
MPW#592	<i>Hypericum prolificum</i> L. (Ames 29656)
MPW#595	<i>Polygala sanguinea</i> L.
MPW#605	<i>Rudbeckia missouriensis</i> Englem. Ex C.L. Boynton & Beadle (Ames 29671)
MPW#597	<i>Rudbeckia triloba</i> L. (Ames 29672)

# Alphabetical List of Germplasm Collected

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JDC/CA/2008/008/078	<i>Cornus alternifolia</i> L. f. (Ames 29532)
JDC/CA/2008/015/085	<i>Cornus alternifolia</i> L. f. (Ames 29523)
MPW#598	<i>Fraxinus quadrangulata</i> Michx. (Ames 29526)
MPW#601	<i>Fraxinus quadrangulata</i> Michx. (Ames 29527)
MPW#604	<i>Fraxinus quadrangulata</i> Michx. (Ames 29528)
MPW#622	<i>Fraxinus quadrangulata</i> Michx. (Ames 29529)
MPW#623	<i>Fraxinus quadrangulata</i> Michx. (Ames 29530)

# Collection Trip Plan

## **Monday, September 2008**

- Leave Ames early in the morning – 5:30 a.m.
- Private property near Greentop, MO – (*Liatris pycnostachya*)
- Thousand Hills State Park – (*Fraxinus americana*, *Hypericum prolificum*, *Quercus muhlenbergii*, *Quercus alba*, *Quercus bicolor*)
- Long Branch State Park – (*Fraxinus pennsylvanica*)
- Thomas Hill Reservoir – (*Fraxinus americana*, *Liatris pycnostachya*)
- Rudolph Bennitt Conservation Area – (*Fraxinus americana*, *Hypericum prolificum*, *Liatris sp.*) – initiate collecting
- Spend the night in Moberly, MO

## **Tuesday, September 2008**

- Rudolph Bennitt Conservation Area – (*Fraxinus americana*, *Hypericum prolificum*, *Liatris sp.*) – finish collecting
- Finger Lakes State Park – (*Rudbeckia triloba*)
- Graham Cave State Park – (*Fraxinus americana*, *Quercus muhlenbergii*, *Quercus alba*, *Quercus velutina*)
- Cuivre River State Park – (*Fraxinus americana*)
- August A. Busch Memorial Area – (*Fraxinus americana*)
- Weldon Springs Conservation Area – (if time permits, explore area near Mississippi River shoreline for *Fraxinus pennsylvanica*)
- Spend the night in Weldon Springs, MO

## **Wednesday, September 2008**

- Dr. Edmund A. Babler Memorial State Park – (*Fraxinus americana*)
- Magnolia Hollow Conservation Area – (*Fraxinus pennsylvanica*)
- County Road J. East of Fredericktown – (*Fraxinus americana*)
- Amidon Memorial Conservation Area – (*Carpinus caroliniana*)
- Spend the night in Farmington, MO

# Collection Trip Plan

## **Thursday, September 2008**

- Hawn State Park – (*Fraxinus americana*)
- Trail of Tears State Park – (*Fraxinus americana*, *Fagus grandiflora*, *Liriodendron tuliperifera*, possibly *Liquidambar stryaciflua*)
- Union County Conservation Area – (*Fraxinus profunda*)
- Time permitting - possibly check out other areas around the Union County Conservation Area, Horseshoe Lake Conservation Area and Shawnee National Forest – (Little Grand Canyon, Fountain Bluff, Oakwood Bottoms)
- Spend the night in Cape Girardeau, MO

## **Friday, September 2008**

- Check out areas around Union County Conservation Area, Horseshoe Lake Conservation Area and Shawnee National Forest – (Little Grand Canyon, Fountain Bluff, Oakwood Bottoms)
- Spend the night in Cape Girardeau, MO

## **Saturday, September 2008**

- Horseshoe Lake Conservation Area – (*Fraxinus profunda*, *Quercus phellos*, *Quercus michauxii*)
- Olmsted, IL – (*Fraxinus profunda*)
- Cache River State Park – (*Fraxinus profunda*)
- Fern Clyffe State Park – (*Fraxinus profunda*)
- Spend the night in Giant City State Park Lodge

## **Sunday, September 2008**

- Giant City State Park – (*Fraxinus americana*)
- Herrin Road – Interstate Exit – (*Fraxinus profunda*)
- Wayne Fitzgerrell State Park – (*Fraxinus americana*)
- Big Muddy Creek Drainage – (*Fraxinus americana*)
- Spend the night in Centralia, IL

# Collection Trip Plan

## **Monday, September 2008**

- Patoka, IL – population near Northfork Kaskaskia River – private property – (*Fraxinus pennsylvanica* and *Quercus alba* – 300 year old pre-settlement trees)
- Shobonier, IL –population of *Liatris pycnostachya*
- Hickory Creek River Drainage – (*Fraxinus pennsylvanica*, *Liatris pycnostachya*) – no voucher taken during initial reconnaissance trip
- Opossum Creek Drainage – (*Fraxinus americana* and *Liatris aspera*)
- South of Taylorville, IL along IL highway 29 – (*Fraxinus americana* and *Liquidambar styraciflua*)
- Spend the night in Taylorville, IL

## **Tuesday, September 2008**

- Edward Madigan State Park (formerly Railsplitter State Park) – (*Fraxinus pennsylvanica*)
- Along IL highway 97/78 adjacent to Chautauqua National Wildlife Refuge – (*Fraxinus pennsylvanica*)
- Area along US highway 24 adjacent to Rice Lake State Fish and Wildlife Area – (*Fraxinus americana* and *Fraxinus pennsylvanica*)
- Spend the night in Lewistown, IL

## **Wednesday, September 2008**

Drive back on Wednesday to Ames, IA from Lewistown, IL – 5 hour drive – arrive early to mid afternoon

# Collection Trip Summary

## Monday, October 6<sup>th</sup>, 2008

Jeff Carstens and Nathan Johnson departed from Ames at approximately 5:30a.m. in hopes to arrive at Thousand Hills State Park around 8:00a.m. Despite a wrong turn early in the morning and encounters with road construction, we were still able to arrive at our first collection site near Greentop, MO on time. Mark Lay, property owner, granted us permission to collect on a small piece of ground northeast of highway 63 and County Road J. Our first collection was from 13 specimens of *Liatris pycnostachya* (Ames 29658). Nathan's expertise on the NC-7 medicinals project resulted in the identification of *Prunella vulgaris* in the same vicinity. This resulted in the acquisition of seeds from 50 specimens (Ames 29662).

Six days prior to leaving for Missouri, (October 1<sup>st</sup>) a population of white ash was collected just outside of Ames, IA in the Des Moines River valley. Numerous specimens had seeds that were shattering readily. Not knowing the exact maturation of the white ash in Thousand Hills State Park (180 miles south of Ames, IA), it was pretty safe to assume that seeds might be still a little on the green side. Much to our surprise, the maturation of white ash seeds in Missouri was essentially the same. A lack of rainfall during the previous two months have hastened their maturation.



After visiting with numerous other plantsmen on collecting tactics for woody ornamentals, the idea of using a tarp to catch seeds (photo) was very helpful at Thousand Hills State Park as the seeds for this population shattered easily. We ended up collecting seeds from 16 specimens (Ames 29626). Majority of the specimens collected ranged from 6-18" d.b.h. and 50-70' in height. In addition, seeds of *Hypericum prolificum* (Ames 29655) and *Quercus bicolor* (Ames 29669) were harvested from 24 and 2 specimens, respectively.

# Collection Trip Summary

## Monday, October 6<sup>th</sup>, 2008 (cont'd)

Our next stop to Long Branch State Park resulted in the harvest from three specimens of *Fraxinus pennsylvanica* (Ames 29643). The water levels at Long Branch Lake dropped approximately 10-20' since the reconnaissance trip. In addition, acorns of *Quercus alba* (Ames 29665) were collected along the shoreline in the same location. A heavy crop of germinating acorns covered the forest floor. Seeds were collected from four trees that were approximately 2' d.b.h. and 90' in height. The leaves were relatively large for the species and the degree of lobing was not as pronounced. This collection of white oaks may be slightly unique (saturated substrate) as the trees were essentially growing in the shoreline of Long Branch Lake. Generally this species tends to dominate higher elevations.

The next collection of white ash was made near Thomas Hill Reservoir. Seeds from a total of 12 specimens were collected (Ames 29627). Fall color on this population was very colorful consisting of nice, dark red tones. Timing of peak fall color was occurring, but was variable with males being showier.

A couple of miles away, a *Liatris pycnostacha* population was targeted in the ditch along a railroad. Unfortunately, a broad spectrum herbicide was applied in the area and essentially killed all of the native plants in the area. This was quite a surprise as this area had been quite an impressive prairie remnant due to the lack of invasive weeds.

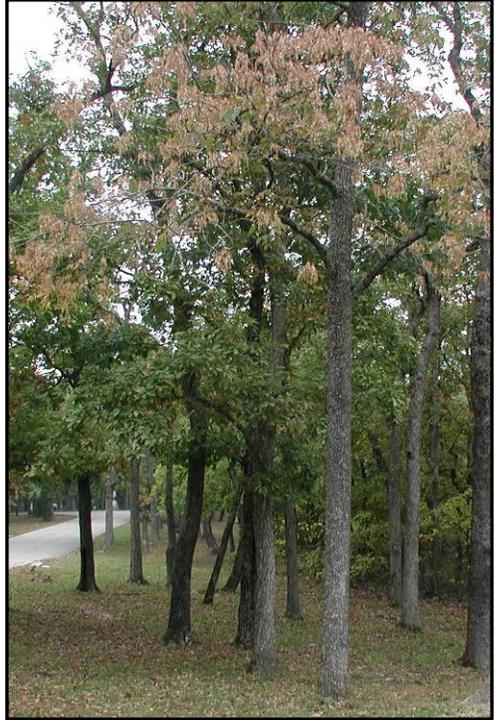
Our final location at Rudolf Bennitt Conservation Area resulted in the collection of an unidentified species of *Liatris* (Ames 29659 – 50 specimens), *Hypericum prolificum* (Ames 29656 – 32 specimens), and *Fraxinus americana* (Ames 29628 – 17 specimens).

# Collection Trip Summary

## Tuesday, October 7<sup>th</sup>, 2008

The first collection on Tuesday morning started with *Rudbeckia trioloba* located near Finger Lakes State Park. A large population of 50 plants was sampled (Ames 29672).

*Fraxinus americana* was the next collection, made located in Graham Cave State Park. A total of 18 specimens was sampled (Ames 29629). Majority of the larger trees located in the campground seemed slightly stressed. Potentially a lack of summer moisture and continuous soil compaction (human foot traffic and lawn mowing equipment) may be the most likely causes. Majority of the females sampled had already dropped most of their leaves making easy identification of white ash within the park (photo).



Additional time was spent collected twig samples of *Fraxinus quadrangulata* (Ames 29526) for DNA analysis for the U.S. Forest Service, Delaware, Ohio (Jennifer Koch).

Our afternoon found us putting on rain gear as it down poured during our collection of white ash at Cuivre River State Park. We sampled a total of 12 trees (Ames 29630). A very large, mature female white ash was sampled near the entrance of Turkey Hollow Trail. This specimen had plenty of low hanging branches abundant with seeds. Due to the amount of moisture and wet bags of seeds, we decided to finish our day by scouting for green ash along the Missouri River in Weldon Springs Conservation Area. Unfortunately, no green ash were noted. The floodplain seemed to be dominated by *Acer saccharinum* and *Salix* spp.

# Collection Trip Summary

## Wednesday, October 8<sup>th</sup>, 2008

An early morning start at August A. Busch Memorial Conservation Area resulted in the collection of 16 trees of *Fraxinus americana* (Ames 29631) and 13 trees of *Diospyros virginiana* (Ames 29625). This area seemed to be dominated by persimmon and white ash. Additional specimens could have been sampled, but due to similarity in morphological characteristics and age in the population, a stratified sampling technique was used in order to adequately sample the diversity represented.

Concerning white ash (Ames 29632), Dr. Edmund A. Babler Memorial State Park seemed to represent probably the best variation in age/size and color of fall foliage than all other areas sampled. However, the seed quality was probably the worst due to ash seed weevils. It was noted that some specimens with all brown and dry seeds (photo) generally had a greater population abundance of weevils (poor quality). Specimens that had slightly green or partially green seeds contained within a cluster seemed to have slightly lower infestations. It is not clear at this point if there is actually a difference in plant chemistry that make some specimens essentially less susceptible to weevil attack or if weevils simply attack the earliest flowering trees.



Non-infested vs. infested seeds

Our next stop at Magnolia Hollow Conservation Area presented an array of problems in trying to accurately identify *Fraxinus* in the area to the species level. Some of the specimens seemed to exhibit characteristics of *F. profunda*, *F. pennsylvanica*, and *F. americana*. Additional time was spent in order to find and strategically sample specimens with characteristics closest to that of *F. pennsylvanica*. We sampled a total of 6 trees (Ames 29654).

# Collection Trip Summary

## Wednesday, October 8<sup>th</sup>, 2008 (cont'd)

While at Magnolia Hollow Conservation Area, it was decided that a voucher should be taken from one of the specimens that was sampled (JDC/FP/2008/038/108). After closer inspection, the voucher does not seem to accurately key out to *F. pennsylvanica*, so the current taxonomy has been left as *Fraxinus* sp. in GRIN until further verified. Before leaving we decided to collect from four specimens of *Carya illinoensis* (Ames 29624). These specimens were very large measuring approximately 4' d.b.h. and 120' in height. Seeds were actively dropping during collection. A balanced sample of 100 nuts per tree were harvested.

Continuing west to Hawn State Park, our daylight was quickly diminishing which left us essentially trying to finish our last site in the dark. Fortunately, our reconnaissance efforts were successful in marking the only four female trees via gps coordinates. However, three out of four specimens were located within the forest, which under such conditions the trees only produce seeds where abundant sunlight is available in upper portions of the forest canopy. Therefore, climbing gear and a pole saw were used together in order to obtain seed samples (Ames 29633). *Rhamnus caroliniana* specimens were noted in the same vicinity. No fall color was evident, but fruits were completely black.

## Thursday, October 9<sup>th</sup>, 2008

Our morning started with a white ash collection made east of Fredericktown, MO. We sampled a total of 12 trees (Ames 29634). Continuing east, led us directly into Amidon Memorial Conservation Area. This area definitely defines the terms isolated, remote, and natural. Collections included: *Lindera benzoin* (photo)(Ames 29660 – 50 plants), *Carpinus caroliniana* (Ames 29623 – 30 plants), and *Viburnum prunifolium* (Ames 29673 – 1 plant).



# Collection Trip Summary

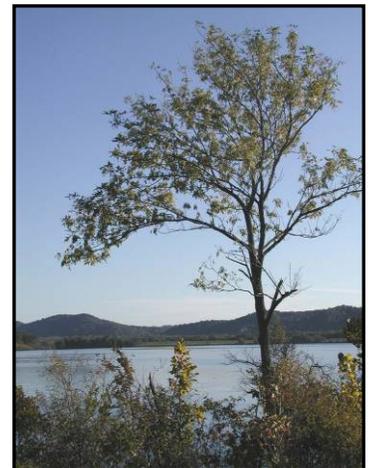
## **Thursday, October 9<sup>th</sup>, 2008 (cont'd)**

Due to the high quality, high degree of floral diversity and variation in elevation (200' change in ¼ mile) of this 1,600 acre park, additional time should be spent potentially documenting or collecting woody and herbaceous ornamentals here in the future.

Our final stop for the afternoon was Trail of Tears State Park. Again, seed quality was questionable due to weevils. We sampled a total of 8 trees (Ames 29635). In addition, we sampled 3 very large trees of *Quercus alba* (Ames 29666). Acorn production was abundant along with many weevils.

## **Friday, October 10<sup>th</sup>, 2008**

Our first collection of *Fraxinus profunda* was at Union County Conservation Area, with a sample of 12 trees (Ames 29648). This species can be appreciated because of the extreme height the specimens express, especially under saturated conditions (photo – note specimen is growing in standing water). This species may serve as a good candidate as a woody ornamental for highly compacted/anaerobic soils. Habitat type seems to be a fairly good indicator for being able to separate green and pumpkin ash. Unfortunately, little to no fall color was observed on any population of pumpkin ash. Our second collection of pumpkin ash was made in Horseshoe Lake Conservation Area. We sampled a total of 14 specimens (Ames 29649). Six specimens were very large, measuring in the range of 17-22" d.b.h. and 80-110' in height. *Nyssa aquatica* was noted as a plant associate. This was the only collection site where we noted this species.



# Collection Trip Summary

## **Friday, October 10<sup>th</sup>, 2008(cont'd)**

Our last seed collections for the day were of *Fraxinus profunda* made near Olmsted, IL (Ames 29650 – 10 trees sampled) and in Cache River State Park (Ames 29651 – 8 trees sampled). It was brought to our attention after discussion with the Cache River State Park superintendent, that these areas experienced very dry conditions due to a lack of rainfall over the last two months. In addition, large weevil populations added to poor seed quality.

While en route to our hotel in Metropolis, IL, we took some time to look around Heron Pond Little Black Slough Natural Area. Floodplains of this area was dominated by *Fraxinus profunda* and the presence of nice, mature *Quercus michauxii* (Voucher JDC/QM/2008/052/122) trees were noted. One swamp chestnut oak specimen measured 94” circumference, 29” d.b.h. and approximately 120’ in height. Foliage was very clean and dark green. Acorns were still green.

## **Saturday, October 11<sup>th</sup>, 2008**

Saturday morning efforts started in Mermet Lake State Fish and Wildlife Area. *Fraxinus profunda* and *Quercus phellos* were noted. Unfortunately, the *Q. phellos* did not produce acorns this year. Next fall they will most likely produce a bumper crop. No vouchers or seeds were collected in this area in the interest of time and accessibility of the ash at this site.

Our first successful seed collection for the day began at Fern Clyffe State Park from 8 trees (Ames 29636) of *Fraxinus americana*. A stratified sampling technique was utilized in order to target specimens with quality seed. The phenomenon of having random specimens with brown and dry seeds due to weevils was similar to what was found at Dr. Edmund Babler Memorial State Park.

# Collection Trip Summary

## **Saturday, October 11<sup>th</sup>, 2008(cont'd)**

Our last collection site for the day was Giant City State Park. Since it was a weekend, an increase in the number of park guests was apparent. Numerous bystanders were curious as to our business of collecting seeds. Additional white ash females were noted while enroute to the previously marked coordinates. These specimens were located near an abandoned maintenance shed. This collection included some of the largest specimens of white ash (Ames 29637) encountered throughout the trip.



Therefore, some climbing gear was utilized in order to attain seeds (photo). The specimen in the photo measured 98" in circumference.

## **Sunday, October 12<sup>th</sup>, 2008**

During the summer of 2008, Mark Widrlechner and Jeff Carstens had a brief visit in Urbandale, IL for a scheduled NC7 trial site cooperator visit. It was decided that a quick stop at the Illinois Natural History Survey Herbarium may be beneficial. Numerous notes were made on past vouchers, especially concerning the northernmost specimen of *Fraxinus profunda*, vouchered in a Williamson County on E. Herrin Road (Steven R. Hill 34653 – 4 June 2002). There we sampled a total of 11 trees (Ames 29652). In addition, an extra voucher of specimen #7 (JDC/FP/2008/058/128) was taken due to the extreme size of the seeds and its' tomentose stems.

Our next stop at Wayne Fitzgerald State Park resulted in the collection of 15 specimens of *Fraxinus americana* (Ames 29638). Special notes were made to indicate that a few *Fraxinus profunda* specimens were found throughout the park in both upland and lowland habitats.

# Collection Trip Summary

## **Sunday, October 12<sup>th</sup>, 2008 (cont'd)**

A final collection of 5 white ash trees (Ames 29639) for the day was made east of Irvington, IL along 2150 North Road. Again, Nathan was able to identify a population of *Prunella vulgaris* resulting a seed collection sampled from 21 plants (Ames 29663). Interestingly, plants were only noted on the south side of the road which has a north-facing slope and a fair amount of shade from nearby trees.

## **Monday, October 13<sup>th</sup>, 2008**

Monday morning collecting started at some private property located west of Patoka, IL near the North Fork Kaskaskia River. After close inspection, the voucher for this location originally identified as *F. pennsylvanica* was later determined to be *F. profunda*. We sampled 11 trees (Ames 29653). Directly east on 100 N. road was a population of seven *Quercus alba* most likely approaching 350-400 years in age (photo).



The degree of weevil infestation was very high, but a sample of acorns was gathered from 3 specimens (Ames 29667). This area is another potential area for further exploration due to the large number of mature, massive specimens (*Quercus alba*, *Q. macrocarpa*, and *Q. bicolor*) as well as serving as a collection site for *Fraxinus profunda*.

The next site was located approximately 3 miles south of Vandalia adjacent to the Vandalia ditch and Hickory Creek. A mixed population of *F. profunda* and *F. pennsylvanica* was observed. Special attention was made in order to selectively sample only ash trees with characteristics of or closest to *F. pennsylvanica*. A total of 11 trees were sampled (Ames 29644).

# Collection Trip Summary

## Monday, October 13<sup>th</sup>, 2008 (cont'd)

The next stop was located near Opossum Creek approximately 5 miles south of Pana, IL. This location resulted in the collection of the following species: *Fraxinus americana* (Ames 29640 – sampled 15 plants); *Liatris aspera* (Ames 29657 – sampled 50 plants); *Prunella vulgaris* (Ames 29664 – sampled 50 plants); and *Penstemon digitalis* (Ames 29661 – sampled 50 plants).

The final stop of the day just south of Taylorville resulted in the collection from 15 white ash trees (Ames 29641). This population represented the nicest display of fall color, which varied from dark purplish-red to peachy-orange tones. While collecting, a small population of *Baptisia* was noted. Seed samples were harvested from 3 plants (Ames 29622). *Liquidambar styraciflua* was a common plant associate, but fruits were still very green. It was also interesting to run across a fairly large population of *Corylus americana* displaying a beautiful display of reddish fall colors.

## Tuesday, October 14<sup>th</sup>, 2008

Tuesday morning at Edward Madigan State Park (formerly Railsplitter State Park) definitely made us feel at home as the temperatures in the morning were close to 54°F. Although this park had a fair amount of cultivated trees planted throughout, a fairly isolated area near the northeast section of the park along Salt Creek was identified harboring numerous *Fraxinus pennsylvanica* specimens. The size and longevity is definitely worth mentioning. 12 trees were sampled (Ames 29645).

Continuing northwest near Havana, IL, approximately 50 miles, another green ash population was sampled adjacent to the Chautauqua National Wildlife Refuge. 24 trees were sampled (Ames 29646). Some selective harvesting occurred in order to harvest only seeds with minimal weevil damage. A mature population of *Carya illinoensis* was noted as a future site for collecting.

# Collection Trip Summary

## Tuesday, October 14<sup>th</sup>, 2008 (cont'd)

Our final stop located near Rice Lake State Fish and Wildlife Area resulted in collection from 7 trees of *Fraxinus americana* (Ames 29642) and 13 trees of *Fraxinus pennsylvanica* (Ames 29647).

The use of a pole saw throughout the trip was definitely key in obtaining seeds from ash trees. Simply pruning one small branch can generate a large amount (2,000-5,000) of seed.

In total, we obtained 28 populations of *Fraxinus* from 339 trees. The biggest factors limiting the sampling of *Fraxinus* were the presence of Poison Ivy, weevil abundance/poor quality seeds, and standing water. Conservation areas tended to result in higher-quality collections compared to state parks due to the presence of urbanization and tree plantings. *Fraxinus profunda* and *Fraxinus pennsylvanica* can be easily confused. A few characteristics that separate them include:

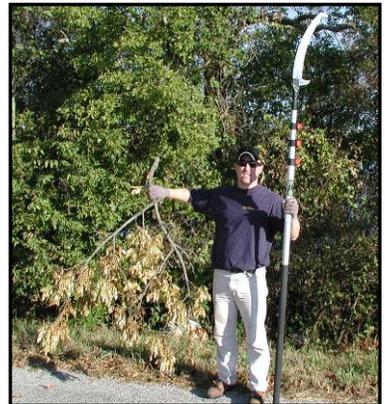
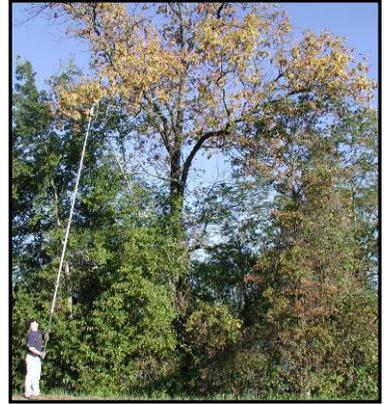
### *Fraxinus profunda*

- No serrated leaves
- Yellowish-brown undersides of leaves
- Slightly "V" shaped bud scars
- Buds are generally ½ the size of bud scars
- Essentially no fall color

### *Fraxinus pennsylvanica*

- Serrated leaves
- Straight bud scars
- Buds are generally the same size of bud scars
- Yellowish fall color

Other species collected included: *Prunella vulgaris* (3), *Hypericum prolificum* (2), *Carya illinoensis* (1), *Quercus bicolor* (1), *Quercus alba* (4), *Lindera benzoin* (1), *Viburnum prunifolium* (1), *Carpinus caroliniana* (1), *Liatris spp.* (3), *Diospyros virginiana* (1), *Penstemon digitalis* (1), *Baptisia sp.* (1), and *Rudbeckia triloba* (1).



# Acknowledgments

Thanks to Guy Sternberg (Starhill Arboretum, Petersburg, IL); Matthew A. Albrecht (Missouri Botanical Garden, St. Louis, MO); and Scott Woodbury (Shaw Nature Preserve, Gray Summit, MO) for identifying and/or providing information concerning high quality populations of native germplasm.

Special thanks to Karen Willams and Edward Garvey from the USDA-ARS Plant Exchange Office, National Germplasm Resources Laboratory, Beltsville, MD for funding this project.

# List of Germplasm Collected

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Collection Number: JDC/LP/2008/021/091 – Ames 29658  
Scientific Name: *Liatris pycnostachya* Michx.  
Date: 6 October 2008  
County, State: SCHUYLER COUNTY, MISSOURI  
Elevation: 967'  
Latitude: 40.3671°N  
Longitude: 92.5612°W (Topozone)  
Locality: Greentop, Missouri  
Herbarium Specimen: no  
Plant associates: *Prunella vulgaris*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/PV/2008/022/092 – Ames 29662  
Scientific Name: *Prunella vulgaris* L.  
Date: 28 July 2008  
County, State: SCHUYLER COUNTY, MISSOURI  
Elevation: 967'  
Latitude: 40.3671°N  
Longitude: 92.5612°W (Topozone)  
Locality: Greentop, Missouri  
Herbarium Specimen: no  
Plant associates: *Liatris pycnostachya*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#592; JDC/HP/2008/023/093 – Ames 29655  
Scientific Name: *Hypericum prolificum* L.  
Date: 28 July 2008  
County, State: ADAIR COUNTY, MISSOURI  
Elevation: 920'  
Latitude: 40.18812°N  
Longitude: 92.64506°W (NAD83)  
Locality: Thousand Hills State Park – Kingsville, Missouri  
Herbarium Specimen: yes  
Plant associates: *Quercus bicolor*, *Quercus alba*, *Fraxinus americana*, *Carya* spp., *Ulmus* sp., *Quercus imbricaria*, *Rhus aromatica*, *Ruellia* sp., and *Quercus velutina*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/HP/2008/024/094 – Ames 29669  
Scientific Name: *Quercus bicolor* Willd.  
Date: 6 October 2008  
County, State: ADAIR COUNTY, MISSOURI  
Elevation: 920'  
Latitude: 40.18812°N  
Longitude: 92.64506°W (NAD83)  
Locality: Thousand Hills State Park – Kingsville, Missouri  
Herbarium Specimen: yes  
Plant associates: *Hypericum prolificum*, *Quercus alba*, *Fraxinus americana*, *Carya* spp., *Ulmus* sp., *Quercus imbricaria*, *Rhus aromatica*, *Ruellia* sp., and *Quercus velutina*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD and HS  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: MPW#591; JDC/FA/2008/025/095 – Ames 29626

Scientific Name: *Fraxinus americana* L.

Date: 6 October 2008

County, State: ADAIR COUNTY, MISSOURI

Elevation: 920'

Latitude: 40.18812°N

Longitude: 92.64506°W (NAD83)

Locality: Thousand Hills State Park – Kingsville, Missouri

Herbarium Specimen: yes

Plant associates: *Quercus bicolor*, *Quercus alba*, *Hypericum prolificum*, *Carya* spp., *Ulmus* sp., *Quercus imbricaria*, *Rhus aromatica*, *Ruellia* sp., and *Quercus velutina*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#593 JDC/FP/2008/026/096 – Ames 29643

Scientific Name: *Fraxinus pennsylvanica* Marshall

Date: 6 October 2008

County, State: MACON COUNTY, MISSOURI

Elevation: 800'

Latitude: 39.82536°N

Longitude: 92.51559°W (NAD83)

Locality: Long Branch State Park – Macon, Missouri

Herbarium Specimen: yes

Plant associates: *Ptelea trifolia*, *Rudbeckia hirta*, *Ulmus* sp., *Carya* sp., *Quercus* sp., *Salix* sp., *Quercus palustris*, *Quercus alba*, and *Rhus aromatica*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/QA/2008/027/097 – Ames 29665

Scientific Name: *Quercus alba* L.

Date: 6 October 2008

County, State: MACON COUNTY, MISSOURI

Elevation: 800'

Latitude: 39.82536°N

Longitude: 92.51559°W (NAD83)

Locality: Long Branch State Park – Macon, Missouri

Herbarium Specimen: no

Plant associates: *Ptelea trifolia*, *Rudbeckia hirta*, *Ulmus* sp., *Carya* sp., *Quercus* sp., *Salix* sp., *Quercus palustris*, *Fraxinus pennsylvanica*, and *Rhus aromatica*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#594; JDC/FA/2008/028/098 - 29627

Scientific Name: *Fraxinus americana* L.

Date: 6 October 2008

County, State: MACON COUNTY, MISSOURI

Elevation: 820'

Latitude: 39.68716°N

Longitude: 92.59426°W (NAD83)

Locality: Near Thomas Hill Reservoir – approx. 3 miles west of Binkley, Missouri

Herbarium Specimen: yes

Plant associates: *Helianthus strumosus*, *Rhus copallina*, *Juniperus virginiana*, *Quercus imbricaria*, *Polygala sanguinea*, and *Rhus aromatica*

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: MPW#596; JDC/FA/2008/029/099 – Ames 29628  
Scientific Name: *Fraxinus americana* L.  
Date: 6 October 2008  
County, State: RANDOLPH COUNTY, MISSOURI  
Elevation: 840'  
Latitude: 39.27514°N  
Longitude: 92.43387°W (NAD83)  
Locality: Rudolf Bennitt Conservation Area – Columbia, Missouri  
Herbarium Specimen: yes  
Plant associates: *Rhus glabra*, *Rhus copallinum*, *Quercus bicolor*, *Salix* sp., *Ulmus rubra*, *Hypericum prolificum*, *Viburnum prunifolium*, *Carya* sp., *Euphorbia corollata*, and *Vernonia* sp.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/HP/2008/030/100 – Ames 29656  
Scientific Name: *Hypericum prolificum* L.  
Date: 6 October 2008  
County, State: RANDOLPH COUNTY, MISSOURI  
Elevation: 840'  
Latitude: 39.27514°N  
Longitude: 92.43387°W (NAD83)  
Locality: Rudolf Bennitt Conservation Area – Columbia, Missouri  
Herbarium Specimen: no  
Plant associates: *Rhus glabra*, *Rhus copallinum*, *Quercus bicolor*, *Salix* sp., *Ulmus rubra*, *Fraxinus americana*, *Viburnum prunifolium*, *Carya* sp., *Euphorbia corollata*, and *Vernonia* sp.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/LX/2008/031/101 – Ames 29659  
Scientific Name: *Liatris* sp.  
Date: 6 October 2008  
County, State: RANDOLPH COUNTY, MISSOURI  
Elevation: 840'  
Latitude: 39.27514°N  
Longitude: 92.43387°W (NAD83)  
Locality: Near entrance to Rudolf Bennitt Conservation Area – Columbia, Missouri  
Herbarium Specimen: no  
Plant associates: *Rhus glabra*, *Rhus copallinum*, *Quercus bicolor*, *Salix* sp., *Ulmus rubra*, *Fraxinus americana*, *Viburnum prunifolium*, *Carya* sp., *Euphorbia corollata*, and *Vernonia* sp.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#597; JDC/RT/2008/032/102 – Ames 29672  
Scientific Name: *Rudbeckia triloba* L.  
Date: 7 October 2008  
County, State: BOONE COUNTY, MISSOURI  
Elevation: 710'  
Latitude: 39.07440°N  
Longitude: 92.32119°W (NAD83)  
Locality: Creeklund Dr. south of Peabody Rd. – Columbia, Missouri  
Herbarium Specimen: yes  
Plant associates: *Campanula americana*, *Fraxinus americana*, *Elaeagnus umbellata*, *Quercus imbricaria*, and *Juglans nigra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: MPW#599; JDC/FA/2008/033/103 – Ames 29629  
Scientific Name: *Fraxinus americana* L.  
Date: 7 October 2008  
County, State: MONTGOMERY COUNTY, MISSOURI  
Elevation: 760'  
Latitude: 38.90606°N  
Longitude: 91.57810°W (NAD83)  
Locality: Graham Cave State Park – Montgomery City, Missouri  
Herbarium Specimen: yes  
Plant associates: *Quercus imbricaria*, *Quercus muhlenbergii* (numerous), *Fraxinus quadrangulata*, *Vernonia* sp., *Heliopsis* sp., *Taenidia integerrima* and *Acer saccharum*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#600; JDC/FA/2008/034/104 – Ames 29630  
Scientific Name: *Fraxinus americana* L.  
Date: 7 October 2008  
County, State: LINCOLN COUNTY, MISSOURI  
Elevation: 620'  
Latitude: 39.01518°N  
Longitude: 90.92275°W (NAD83)  
Locality: Cuivre River State Park – Troy, Missouri  
Herbarium Specimen: yes  
Plant associates: *Sassafras albidum*, *Vernonia baldwini*, *Heliopsis* sp., *Cacalia* sp., *Rhus glabra*, and *Juglans nigra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#602; JDC/FA/2008/035/105 – Ames 29631  
Scientific Name: *Fraxinus americana* L.  
Date: 8 October 2008  
County, State: ST. CHARLES COUNTY, MISSOURI  
Elevation: 600'  
Latitude: 38.70444°N  
Longitude: 90.72959°W (NAD83)  
Locality: Busch Conservation Area – St. Charles, Missouri  
Herbarium Specimen: yes  
Plant associates: *Diospyros virginiana*, *Sassafras albidum*, *Lonicera maackii*, *Rhus* sp., *Juglans nigra*, *Cornus drummondii*, and *Campsis radicans*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/DV/2008/036/106 – Ames 29625  
Scientific Name: *Diospyros virginiana* L.  
Date: 8 October 2008  
County, State: ST. CHARLES COUNTY, MISSOURI  
Elevation: 600'  
Latitude: 38.70444°N  
Longitude: 90.72959°W (NAD83)  
Locality: Busch Conservation Area – St. Charles, Missouri  
Herbarium Specimen: no  
Plant associates: *Fraxinus americana*, *Sassafras albidum*, *Lonicera maackii*, *Rhus* sp., *Juglans nigra*, *Cornus drummondii*, and *Campsis radicans*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: MPW#603; JDC/FA/2008/037/107 – Ames 29632  
Scientific Name: *Fraxinus americana* L.  
Date: 8 October 2008  
County, State: ST. LOUIS COUNTY, MISSOURI  
Elevation: 710'  
Latitude: 38.61867°N  
Longitude: 90.68811°W (NAD83)  
Locality: Babler Memorial State Park – Chesterfield, Missouri  
Herbarium Specimen: yes  
Plant associates: *Juglans nigra*, *Quercus alba*, *Quercus palustris*, *Cercis canadensis*, and *Sassafras albidum*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/FX/2008/038/108 – Ames 29654  
Scientific Name: *Fraxinus* sp.  
Date: 8 October 2008  
County, State: STE GENEVIEVE COUNTY, MISSOURI  
Elevation: 390'  
Latitude: 38.01269°N  
Longitude: 90.18885°W (NAD83)  
Locality: White Sands Rd. near Magnolia Hollow Conservation Area – Ste Genevieve, Missouri  
Herbarium Specimen: yes  
Plant associates: *Fraxinus profunda*, *Fraxinus pennsylvanica*, *Carya illinoensis*, *Gleditsia triacanthos*, *Cassia fasciculata*, *Acer saccharinum*, *Menispermum canadense*, *Campsis radicans*, and *Celtis laevigata*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD and HS  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/CI/2008/039/109 – Ames 29624  
Scientific Name: *Carya illinoensis*.  
Date: 8 October 2008  
County, State: STE GENEVIEVE COUNTY, MISSOURI  
Elevation: 390'  
Latitude: 38.01269°N  
Longitude: 90.18885°W (NAD83)  
Locality: White Sands Rd. near Magnolia Hollow Conservation Area – Ste Genevieve, Missouri  
Herbarium Specimen: no  
Plant associates: *Fraxinus profunda*, *Fraxinus pennsylvanica*, *Gleditsia* sp., *Cassia fasciculata*, *Acer saccharinum*, *Menispermum canadense*, *Campsis* sp., and *Celtis laevigata*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#607; JDC/FA/2008/040/110 – Ames 29633  
Scientific Name: *Fraxinus americana* L.  
Date: 8 October 2008  
County, State: STE GENEVIEVE COUNTY, MISSOURI  
Elevation: 860'  
Latitude: 37.83801°N  
Longitude: 90.2309°W (NAD83)  
Locality: Hawn State Park – Ste Genevieve, Missouri  
Herbarium Specimen: yes  
Plant associates: *Quercus alba*, *Quercus stellata*, *Carya cordiformis*, *Pinus echinata*, *Diospyros virginiana*, *Sassafras albidum*, and *Rhamnus caroliniana*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: MPW#608; JDC/FA/2008/042/112 – Ames 29634  
Scientific Name: *Fraxinus americana* L.  
Date: 9 October 2008  
County, State: MADISON COUNTY, MISSOURI  
Elevation: 840'  
Latitude: 37.56998°N  
Longitude: 90.18746°W (NAD83)  
Locality: along County Rd. J (east of Missouri 72), near Amidon Memorial Conservation area – Hahn's Mill, Missouri  
Herbarium Specimen: yes  
Plant associates: *Silphium terebinthinaceum* var. *terebinthaceum*, *Juniperus virginiana*, *Cassia fasciculata*, and *Quercus velutina*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/CC/2008/043/113 – Ames 29623  
Scientific Name: *Carpinus caroliniana* Walter  
Date: 10 October 2008  
County, State: BOLLINGER COUNTY, MISSOURI  
Elevation: 784'  
Latitude: 37.5676°N  
Longitude: 90.1330°W (Topozone)  
Locality: Amidon Memorial Conservation Area – Fredericktown, Missouri  
Herbarium Specimen: no  
Plant associates: *Lindera benzoin*, *Quercus muhlenbergii*, *Carya sp.*, *Cercis canadensis*, *Juglans nigra*, *Staphylea trifolia*, *Acer saccharum*, *Ulmus sp.* and *Viburnum prunifolium*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/LB/2008/044/114 – Ames 29660  
Scientific Name: *Lindera benzoin* (L.) Blume  
Date: 10 October 2008  
County, State: MADISON COUNTY, MISSOURI  
Elevation: 761'  
Latitude: 37.5602°N  
Longitude: 90.1398°W (Topozone)  
Locality: Amidon Memorial Conservation Area – Fredericktown, Missouri  
Herbarium Specimen: yes  
Plant associates: *Carpinus caroliniana*, *Quercus muhlenbergii*, *Carya sp.*, *Cercis canadensis*, *Juglans nigra*, *Staphylea trifolia*, *Acer saccharum*, *Ulmus sp.* and *Viburnum prunifolium*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD and HS  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/VP/2008/046/116 – Ames 29673  
Scientific Name: *Viburnum prunifolium* L.  
Date: 10 October 2008  
County, State: BOLLINGER COUNTY, MISSOURI  
Elevation: 784'  
Latitude: 37.5676°N  
Longitude: 90.1330°W (Topozone)  
Locality: Amidon Memorial Conservation Area – Fredericktown, Missouri  
Herbarium Specimen: no  
Plant associates: *Lindera benzoin*, *Quercus muhlenbergii*, *Carya sp.*, *Cercis canadensis*, *Juglans nigra*, *Staphylea trifolia*, *Acer saccharum*, *Ulmus sp.* and *Carpinus caroliniana*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD and HS  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: JDC/QA/2008/045/115 – Ames 29666  
Scientific Name: *Quercus alba* L.  
Date: 9 October 2008  
County, State: CAPE GIRARDEAU COUNTY, MISSOURI  
Elevation: 490'  
Latitude: 37.43763°N  
Longitude: 89.48127°W (NAD83)  
Locality: Trail of Tears State Park – Moccasin Springs, Missouri  
Herbarium Specimen: no  
Plant associates: *Ostrya virginiana*, *Fraxinus americana*, *Cercis canadensis*, *Liriodendron tuliperifera*, and *Fagus grandifolia* (multiple).  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#609; JDC/FA/2008/047/117 – Ames 29635  
Scientific Name: *Fraxinus americana* L.  
Date: 9 October 2008  
County, State: CAPE GIRARDEAU COUNTY, MISSOURI  
Elevation: 490'  
Latitude: 37.43763°N  
Longitude: 89.48127°W (NAD83)  
Locality: Trail of Tears State Park – Moccasin Springs, Missouri  
Herbarium Specimen: yes  
Plant associates: *Ostrya virginiana*, *Quercus alba*, *Cercis canadensis*, *Liriodendron tuliperifera*, and *Fagus grandifolia* (multiple).  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#610; JDC/FP/2008/048/118 – Ames 29648  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 10 October 2008  
County, State: ALEXANDER COUNTY, ILLINOIS  
Elevation: 340'  
Latitude: 37.36492°N  
Longitude: 89.37784°W (NAD83)  
Locality: south end of Union County Conservation area (along Old Cape Rd.) – Dutch Mills, Illinois  
Herbarium Specimen: yes  
Plant associates: *Carya illinoensis*, *Liquidambar styraciflua*, *Acer rubrum*, *Ulmus americana*, and *Cornus amomum*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#611; JDC/FP/2008/049/119 – Ames 29649  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 10 October 2008  
County, State: ALEXANDER COUNTY, ILLINOIS  
Elevation: 329'  
Latitude: 37.15328°N  
Longitude: 89.34267°W (NAD83)  
Locality: Horseshoe Lake Conservation Area – Granite City, Illinois  
Herbarium Specimen: yes  
Plant associates: *Ampelopsis cordata*, *Cornus drummondii*, *Quercus michauxii*, *Sassafras albidum*, *Celtis laevigata*, and *Campsis radicans*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: MPW#612; JDC/FP/2008/050/120 – Ames 29650  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 10 October 2008  
County, State: PULASKI COUNTY, ILLINOIS  
Elevation: 335'  
Latitude: 37.17975°N  
Longitude: 89.09459°W (NAD83)  
Locality: on Illinois Highway 37 – Olmsted, Illinois  
Herbarium Specimen: yes  
Plant associates: *Salix* sp., *Acer negundo*, *Robinia pseudoacacia*, *Toxicodendron radicans*, and *Ulmus rubra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#613; JDC/FP/2008/051/121 – Ames 29651  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 10 October 2008  
County, State: JOHNSON COUNTY, ILLINOIS  
Elevation: 330'  
Latitude: 37.29725°N  
Longitude: 89.05332°W (NAD83)  
Locality: Cache River State Natural Area – White Hill, Illinois  
Herbarium Specimen: yes  
Plant associates: *Taxodium distichum* (state champion nearby), *Brunnichia* sp., *Acer saccharinum*, *Hibiscus* sp., *Cephalanthus occidentalis*, and *Forestiera acuminata*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#614; JDC/FA/2008/056/126 – Ames 29636  
Scientific Name: *Fraxinus americana* L.  
Date: 11 October 2008  
County, State: JOHNSON COUNTY, ILLINOIS  
Elevation: 650'  
Latitude: 37.53562°N  
Longitude: 88.97385°W (NAD83)  
Locality: Fern Clyffe State Park (north of lake) – Goreville, Illinois  
Herbarium Specimen: yes  
Plant associates: *Celtis tenuifolia*, *Juniperus virginiana*, *Quercus stellata*, *Ulmus alata*, and *Juglans nigra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#615; JDC/FA/2008/057/127 – Ames 29637  
Scientific Name: *Fraxinus americana* L.  
Date: 11 October 2008  
County, State: UNION COUNTY, ILLINOIS  
Elevation: 490'  
Latitude: 37.59486°N  
Longitude: 89.19944°W (NAD83)  
Locality: Giant City State Park – Giant City, Illinois  
Herbarium Specimen: yes  
Plant associates: *Rhus coccinifera*, *Ostrya virginiana*, *Euphorbia corollata*, *Cassia fasciculata*, and *Celastrus orbiculatus*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: MPW#616; JDC/FP/2008/058/128 – Ames 29652  
Scientific Name: *Fraxinus profunda* (Bush) Bush  
Date: 12 October 2008  
County, State: WILLIAMSON COUNTY, ILLINOIS  
Elevation: 395'  
Latitude: 37.81704°N  
Longitude: 88.94961°W (NAD83)  
Locality: along Interstate 57 exit, west on E. Herrin Rd. – Johnston City, Illinois  
Herbarium Specimen: yes  
Plant associates: *Phragmites* sp., *Salix* sp., *Fraxinus americana*, *Ulmus rubra*, *Platanus occidentalis*, and *Morus alba*  
Biomass Type (seed, plant, cutting, herbarium specimen): SD and HS  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#617; JDC/FA/2008/059/129 – Ames 29638  
Scientific Name: *Fraxinus americana* L.  
Date: 12 October 2008  
County, State: FRANLKIN COUNTY, ILLINOIS  
Elevation: 425'  
Latitude: 38.09464°N  
Longitude: 88.94480°W (NAD83)  
Locality: Wayne Fitzgerald State Park – Benton, Illinois  
Herbarium Specimen: yes  
Plant associates: *Acer saccharum*, *Fraxinus profunda*, *Sassafras albidum*, *Quercus imbricaria*, *Quercus velutina*, *Quercus palustris*, and *Parthenocissus* sp.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#618; JDC/FA/2008/060/130 – Ames 29639  
Scientific Name: *Fraxinus americana* L.  
Date: 12 October 2008  
County, State: JEFFERSON COUNTY, ILLINOIS  
Elevation: 530'  
Latitude: 38.43828°N  
Longitude: 89.07822°W (NAD83)  
Locality: 2150 North Rd. (east of Irvington) – Irvington, Illinois  
Herbarium Specimen: yes  
Plant associates: *Cercis canadensis*, *Prunella vulgaris*, *Sassafras albidum*, *Platanus occidentalis*, *Quercus imbricaria*, *Helianthus strumosus*, *Asclepias syriaca*, and *Juglans nigra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/FA/2008/061/131 – Ames 29663  
Scientific Name: *Prunella vulgaris* L.  
Date: 12 October 2008  
County, State: JEFFERSON COUNTY, ILLINOIS  
Elevation: 530'  
Latitude: 38.43828°N  
Longitude: 89.07822°W (NAD83)  
Locality: 2150 North Rd. (east of Irvington) – Irvington, Illinois  
Herbarium Specimen: no  
Plant associates: *Cercis canadensis*, *Fraxinus americana*, *Sassafras albidum*, *Platanus occidentalis*, *Quercus imbricaria*, *Helianthus strumosus*, *Asclepias syriaca*, and *Juglans nigra*.  
Biomass Type (seed, plant, cutting, herbarium specimen): SD  
Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: MPW#619; JDC/FP/2008/062/132 – Ames 29653

Scientific Name: *Fraxinus profunda* (Bush) Bush

Date: 13 October 2008

County, State: FAYETTE COUNTY, ILLINOIS

Elevation: 460'

Latitude: 38.75253°N

Longitude: 89.16763°W (NAD83)

Locality: along 100N Road near Northfork Kaskaskia River drainage - 3.5 miles west of Patoka, Illinois

Herbarium Specimen: yes

Plant associates: *Campsis radicans*, *Ulmus rubra*, *Acer saccharinum*, *Toxicodendron radicans*, *Gleditsia triacanthos*, *Juglans nigra*, *Acer negundo*, *Celtis occidentalis*, *Carya cordiformis*, *Quercus bicolor*, *Cephalanthus occidentalis*, and *Ipomoea pandurata*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/QA/2008/063/133 – Ames 29667

Scientific Name: *Quercus alba* L.

Date: 13 October 2008

County, State: FAYETTE COUNTY, ILLINOIS

Elevation: 475'

Latitude: 38.7524°N

Longitude: 89.1607°W (Topozone)

Locality: Intersection of 100N and 475E Road – west of Patoka, IL

Herbarium Specimen: no

Plant associates:

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/FP/2008/067/137 – Ames 29644

Scientific Name: *Fraxinus pennsylvanica* Marshall

Date: 13 October 2008

County, State: FAYETTE COUNTY, ILLINOIS

Elevation: 465'

Latitude: 38.9163°N

Longitude: 89.0861°W (Topozone).

Locality: Vandalia Ditch on west side of Highway 51 south of Vandalia, IL

Herbarium Specimen: no

Plant Associates: *Fraxinus profunda*, *Acer saccharinum*, and *Quercus sp.*

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#620; JDC/FA/2008/068/138 – Ames 29640

Scientific Name: *Fraxinus americana* L.

Date: 13 October 2008

County, State: SHELBY COUNTY, ILLINOIS

Elevation: 656'

Latitude: 39.30535°N

Longitude: 89.08393°W (NAD83)

Locality: 100 yards north of Opossum Creek, U.S. Highway 51 – Oconee, Illinois

Herbarium Specimen: yes

Plant associates: *Liatis aspera* (nice population), *Penstemon digitalis*, *Prunella vulgaris*, *Euphorbia corollata*, *Quercus alba*, *Helianthus strumosus*, and *Daucus carota*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: JDC/FA/2008/069/139 – Ames 29657

Scientific Name: *Liatris aspera* L.

Date: 13 October 2008

County, State: SHELBY COUNTY, ILLINOIS

Elevation: 656'

Latitude: 39.30535°N

Longitude: 89.08393°W (NAD83)

Locality: 100 yards north of Opossum Creek, U.S. Highway 51 – Oconee, Illinois

Herbarium Specimen: no

Plant associates: *Fraxinus americana*, *Penstemon digitalis*, *Prunella vulgaris*, *Euphorbia corollata*, *Quercus alba*, *Helianthus strumosus*, and *Daucus carota*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/FA/2008/070/140 – Ames 29661

Scientific Name: *Penstemon digitalis* Nutt. ex Sims

Date: 13 October 2008

County, State: SHELBY COUNTY, ILLINOIS

Elevation: 656'

Latitude: 39.30535°N

Longitude: 89.08393°W (NAD83)

Locality: 100 yards north of Opossum Creek, U.S. Highway 51 – Oconee, Illinois

Herbarium Specimen: no

Plant associates: *Liatris aspera* (nice population), *Fraxinus americana*, *Prunella vulgaris*, *Euphorbia corollata*, *Quercus alba*, *Helianthus strumosus*, and *Daucus carota*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: JDC/FA/2008/071/141 – Ames 29664

Scientific Name: *Prunella vulgaris* L.

Date: 13 October 2008

County, State: SHELBY COUNTY, ILLINOIS

Elevation: 656'

Latitude: 39.30535°N

Longitude: 89.08393°W (NAD83)

Locality: 100 yards north of Opossum Creek, U.S. Highway 51 – Oconee, Illinois

Herbarium Specimen: no

Plant associates: *Liatris aspera* (nice population), *Penstemon digitalis*, *Fraxinus americana*, *Euphorbia corollata*, *Quercus alba*, *Helianthus strumosus*, and *Daucus carota*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#621; JDC/FA/2008/072/142 – Ames 29641

Scientific Name: *Fraxinus americana* L.

Date: 13 October 2008

County, State: CHRISTIAN COUNTY, ILLINOIS

Elevation: 600'

Latitude: 39.53738°N

Longitude: 89.25769°W (NAD83).

Locality: Southeast of Taylorville, just southeast of Sangamon River – Taylorville, Illinois

Herbarium Specimen: yes

Plant Associates: *Cercis canadensis*, *Baptisia* sp., *Fraxinus profunda*, *Acer saccharinum*, *Cornus drummondii*, *Ulmus rubra*, *Liatris aspera*, *Corylus americana*, and *Liquidambar styraciflua*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: JDC/BX/2008/073/143 – Ames 29622

Scientific Name: *Baptisia* sp.

Date: 13 October 2008

County, State: CHRISTIAN COUNTY, ILLINOIS

Elevation: 600'

Latitude: 39.53738°N

Longitude: 89.25769°W (NAD83).

Locality: Southeast of Taylorville, just southeast of Sangamon River – Taylorville, Illinois

Herbarium Specimen: no

Plant Associates: *Cercis canadensis*, *Fraxinus americana*, *Acer saccharinum*, *Cornus drummondii*, *Ulmus rubra*, *Liatris aspera*, *Corylus americana*, and *Liquidambar styraciflua*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#624; JDC/FP/2008/074/144 – Ames 29645

Scientific Name: *Fraxinus pennsylvanica* Marshall

Date: 14 October 2008

County, State: LOGAN COUNTY, ILLINOIS

Elevation: 545'

Latitude: 40.12572°N

Longitude: 89.38898°W (NAD83).

Locality: RailSplitter – E. Madigan State Park – Lincoln, Illinois

Herbarium Specimen: yes

Plant Associates: *Acer saccharinum*, *Morus* sp., *Salix* sp., *Carya x Lecontei*, *Vitis cinerea*, *Juglans nigra*, and *Lysimachia nummularia*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#625; JDC/FP/2008/075/145 – Ames 29646

Scientific Name: *Fraxinus pennsylvanica* Marshall

Date: 14 October 2008

County, State: FULTON COUNTY, ILLINOIS

Elevation: 453'

Latitude: 40.35111°N

Longitude: 90.08667°W (NAD83).

Locality: along Illinois Highway 97/78 – Buckheart, Illinois

Herbarium Specimen: yes

Plant Associates: *Acer saccharinum*, *Morus* sp., *Carya illinoensis*, *Quercus* sp., *Lactuca floridana*, and *Phytolacca americana*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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Collection Number: MPW#626; JDC/FA/2008/076/146 – Ames 29642

Scientific Name: *Fraxinus americana* L.

Date: 14 October 2008

County, State: FULTON COUNTY, ILLINOIS

Elevation: 450'

Latitude: 40.45574°N

Longitude: 89.96099°W (NAD83).

Locality: Rice Lake State Fish and Wildlife Refuge – Canton, Illinois

Herbarium Specimen: yes

Plant Associates: *Platanus occidentalis*, *Robinia pseudoacacia*, *Eupatorium purpureum*, *Cercis canadensis*, *Celtis occidentalis*, *Phytolacca americana*, *Taxodium distichum*, *Lactuca floridana*, *Quercus* sp., and *Fraxinus pennsylvanica*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# List of Germplasm Collected

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Collection Number: JDC/FP/2008/077/147 – Ames 29647

Scientific Name: *Fraxinus pennsylvanica* Marshall

Date: 14 October 2008

County, State: FULTON COUNTY, ILLINOIS

Elevation: 450'

Latitude: 40.4441°N

Longitude: 89.9601°W (Topozone).

Locality: Rice Lake State Fish and Wildlife Refuge – Canton, Illinois – along Duck Creek Road

Herbarium Specimen: no

Plant Associates: *Platanus occidentalis*, *Robinia pseudoacacia*, *Eupatorium purpureum*, *Cercis canadensis*, *Celtis occidentalis*, *Phytolacca americana*, *Taxodium distichum*, *Lactuca floridana*, *Quercus* sp., and *Fraxinus americana*.

Biomass Type (seed, plant, cutting, herbarium specimen): SD

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# Alphabetical List of Germplasm Collected

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Ames 29622	<i>Baptisia</i> sp.
Ames 29623	<i>Carpinus caroliniana</i> Walter
Ames 29624	<i>Carya illinoensis</i> (Wangenh.) K. Koch
Ames 29625	<i>Diospyros virginiana</i> L.
Ames 29626	<i>Fraxinus americana</i> L.
Ames 29627	<i>Fraxinus americana</i> L.
Ames 29628	<i>Fraxinus americana</i> L.
Ames 29629	<i>Fraxinus americana</i> L.
Ames 29630	<i>Fraxinus americana</i> L.
Ames 29631	<i>Fraxinus americana</i> L.
Ames 29632	<i>Fraxinus americana</i> L.
Ames 29633	<i>Fraxinus americana</i> L.
Ames 29634	<i>Fraxinus americana</i> L.
Ames 29635	<i>Fraxinus americana</i> L.
Ames 29636	<i>Fraxinus americana</i> L.
Ames 29637	<i>Fraxinus americana</i> L.
Ames 29638	<i>Fraxinus americana</i> L.
Ames 29639	<i>Fraxinus americana</i> L.
Ames 29640	<i>Fraxinus americana</i> L.
Ames 29641	<i>Fraxinus americana</i> L.
Ames 29642	<i>Fraxinus americana</i> L.
Ames 29643	<i>Fraxinus pennsylvanica</i> Marshall
Ames 29644	<i>Fraxinus pennsylvanica</i> Marshall
Ames 29645	<i>Fraxinus pennsylvanica</i> Marshall
Ames 29646	<i>Fraxinus pennsylvanica</i> Marshall.
Ames 29647	<i>Fraxinus pennsylvanica</i> Marshall
Ames 29648	<i>Fraxinus profunda</i> (Bush) Bush
Ames 29649	<i>Fraxinus profunda</i> (Bush) Bush
Ames 29650	<i>Fraxinus profunda</i> (Bush) Bush
Ames 29651	<i>Fraxinus profunda</i> (Bush) Bush
Ames 29652	<i>Fraxinus profunda</i> (Bush) Bush
Ames 29653	<i>Fraxinus profunda</i> (Bush) Bush
Ames 29654	<i>Fraxinus</i> sp.
Ames 29655	<i>Hypericum prolificum</i> L.
Ames 29656	<i>Hypericum prolificum</i> L.
Ames 29657	<i>Liatris aspera</i> L.
Ames 29658	<i>Liatris pycnostachya</i> L.
Ames 29659	<i>Liatris</i> sp.
Ames 29660	<i>Lindera benzoin</i> (L.) Blume
Ames 29661	<i>Penstemon digitalis</i> Nutt. ex Sims
Ames 29662	<i>Prunella vulgaris</i> L.
Ames 29663	<i>Prunella vulgaris</i> L.
Ames 29664	<i>Prunella vulgaris</i> L.
Ames 29665	<i>Quercus alba</i> L.
Ames 29666	<i>Quercus alba</i> L.
Ames 29667	<i>Quercus alba</i> L.
Ames 29669	<i>Quercus bicolor</i> Willd.
Ames 29672	<i>Rudbeckia triloba</i> L.
Ames 29673	<i>Viburnum prunifolium</i> L.

# List of Vouchers Collected

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Collection Number: JDC/QM/2008/052/122

Scientific Name: *Quercus michauxii* Nutt.

Date: 10 October 2008

County, State: JOHNSON COUNTY, ILLINOIS

Elevation: 383'

Latitude: 37.3947°N

Longitude: 88.9750°W (Topozone).

Locality: Floodplain Cache River – Heron Pond Little Black Slough Natural Area, Illinois

Herbarium Specimen: yes

Plant Associates:

Biomass Type (seed, plant, cutting, herbarium specimen): HS

Collectors: Jeffrey D. Carstens and Nathan R. Johnson

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# REFERENCES

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Barton LV. 1945. Viability of seeds of *Fraxinus* after storage. Contributions of the Boyce Thompson Institute 13: 427B432.