Propagating Recommended Bluff Plants

Shrubs

- **Silky Dogwood, *Cornus sericea***

  Seed propagation: Gather these seeds in the fall. You should remove the fruit flesh because it inhibits germination, and stratify it by storing it in the refrigerator in a baggy of slightly moist peat moss. This is called a **cold-moist treatment**. It will require 3 or more months of cold before its dormancy will be overcome. Germination is reportedly very slow, taking a year or more. We had no luck germinating these seeds, but had allowed them to sit at room temperature and dry before giving them the above cold-moist period. We'll try again this year. An easy method for growing silky dogwood from seed is said to be to sow it as soon as it is ready to be picked in the fall, directly into a cold frame or garden plot.

  Propagation by cuttings: Silky dogwood proved to be very easy to propagate by cutting. Cuttings (6-8 inches long and pencil-thick or thicker) that were taken in early March and simply stuck directly into the garden, rooted 90%. Trials were done with and without rooting hormone and no difference in success rate was noticed. In mid-June, they were gently dug from the garden and planted in gallon pots. After one month in the pots (to get good root growth) the small shrubs were ready to be planted on the bluff.

- **Red-osier Dogwood, *Cornus amomum***

  Seed propagation: Gather the seed in the late summer or fall when the fruit is ripe. Remove the fruit and stratify the seeds as described above for silky dogwood. Seeds that we treated this way germinated well (about 70%) and gave us a large number of seedlings to plant. Seeds that we simply removed the fruit and put in the refrigerator in an envelope (cold-dry treatment) showed no germination. Some sources say that seeds should be scarified using boiling water or sulfuric acid, but we certainly did not find this necessary.

  Propagation by cuttings: Red-osier dogwood, treated as described above for silky dogwood, also rooted well (but only 65% of the cuttings rooted).

- **Staghorn Sumac, *Rhus typhina***

  Seed propagation: The large seed heads of the staghorn sumac are easy to find and harvest. They can be rubbed on a sieve (or some suggest putting them in a blender with water and pulsing gently for a short time). It is hard

to get these seeds to germinate. The only method that worked for us was to stratify them (cold-moist) for 3-4 months, then scarify them with sandpaper. After rubbing the seeds between two layers of sandpaper (about 40 good, hard rubs) we got very good germination. Not all the seedlings came up at once, but over a period of several weeks, we got about 80% germination. None of our other methods gave us a single seedling. (These methods included hot water scarification and scarification with various strengths of bleach solution.)

Propagation by cuttings: We have not tried this yet, but our staghorn sumac stock area has many young sumacs coming up from the roots of older plants. Root cuttings are the recommended way to propagate this plant and can be taken at two times of year. First, when dormant- (dig roots and cut into 8 – 12" lengths from Nov. through early spring, holding them in slightly moist peat moss in a root cellar (cool but not freezing), then –in Jan.- cut to 4 inch pieces, treat with a rooting hormone, and plant horizontally in flats/ pots in a greenhouse. The second recommended time to dig roots for cuttings is as soon as the frost leaves the ground. These can be treated with rooting hormone, calloused, and stuck in the field, vertically or horizontally. (**Dirr, p.190) We have not yet tried the root cutting methods.

- **Purple-flowering Raspberry, *Rubus odoratus***

  Seed propagation: Hundreds of seeds of this plant can be easily gathered by picking the berries in summer to early fall. We found it easy to simply "smash" the berries onto a paper towel, and then let them dry there. (They are a little hard to remove from the towel, and we wondered if smashing on wax paper might be easier.) The seeds need a cold period before they will germinate (3 months worked well for us). We tried storing them dry in an envelope in the refrigerator, and also "cold-moist" in a baggie with damp peat moss. Only the cold-moist seeds germinated; no dry-stored seeds grew. We had over one hundred seedlings from the few berries we crushed. They will be ready to plant in the wild this spring after grow in all summer and spending the winter outside in pots.

  Propagation by cuttings: The care-free method that we have had great success with for this plant was tip-layering. You can just bend down a branch of the plant and cover it with soil, leaving a few inches of the tip sticking out. After a month or two, the covered area of the stem will have roots and you can cut it free from the mother plant. This new plant could be transplanted elsewhere, but I'd recommend that if you are taking it to the extreme environment of the bluff, that you let it develop more roots in a pot first.

- **Sandbar Willow, *Salix exigua***
  Seed propagation: We did not try this. (Taking cuttings is so much easier!) The seeds are not supposed to exhibit any dormancy and could therefore be planted immediately after harvesting them. According to some sources, fruit (which is very small) must be collected in spring as it changes from green to yellow. After direct sowing, it is recommended that the seed flats be kept moist and shaded.

  Propagation by cuttings: This is extremely simple. Cuttings can be taken at virtually any time of year. Our students just took a set of cuttings as the buds were breaking this spring – the worst time of year for taking cuttings – and every one rooted. We have had 100% success from cuttings taken in February, March, April, and July. We used stems with pencil- to thumb-thick wood and rooted them with no hormone in peat moss, vermiculite, perlite, potting soil, or even water. Willows are just very vigorous growers.

- **Common Elderberry, *Sambucus Canadensis***
  Seed propagation: Seeds have double dormancy- one source recommends hot water scarification, then 3 mo. of cold-moist. Otherwise, it is said, you'll wait two or more years for germination. We did not try these seeds. But following mother nature's lead with difficult seeds seems like a good idea, and this year, we will plant a group of seeds outside in a garden plot, let nature take its course and see what comes up..

  Propagation by cuttings: Softwood cuttings, taken in mid July, rooted very well, as long as they were treated with one of the stronger rooting hormone. We used "dip-and-grow" for woody plants and also Hormodin #2 and #3. Untreated cuttings did not survive, and those treated with Hormodin #1 were only 50% successful. The leaf area left on the stems was reduced to one healthy leave to prevent too much water loss. The new cuttings were stuck in a flat and kept in a protected area (3/4 shade) and misted daily.

- **Maple-leaved Viburnum, *Viburnum acerifolium***
  Seed propagation: Seed propagation is difficult in maple-leaved viburnum because the seeds have a double dormancy – of the seed coat and of the embryo. In nature, it takes two to three years for seedlings to emerge. In cultivation, it is suggested that immediately upon collection (do not let them dry out), the seeds be given a cold-moist/ warm-moist/ cold-moist treatment.

  Propagation by cuttings: We had excellent results with semi-hardwood cuttings taken in August and treated with Hormodin# 2 and 3. The treated

cuttings were stuck in flats of peat/vermiculite (1:1) and kept outside in the shade with daily misting. Our success rate was 85%. Softwood cuttings should also give good results according to some sources, while hardwood cuttings are not recommended.

- **Northern Arrowwood, *Viburnum recognitum***
  Seed propagation: Same as for maple-leaved viburnum above. We tried many variations of cold-moist and warm-moist with no success. Sowing these directly outside and waiting 2-3 years may be the best procedure, though we are trying some additional variations to speed the process.

  Propagation by cuttings: While hardwood cuttings are not recommended in the literature, we had fair success with this process. 50% of our winter cuttings rooted when stuck outside (garden plot) in March. Our softwood cuttings did not root at all; this was likely because those soft leafy cuttings need an intermittent mist and we did not have that kind of set-up.

Trees

- **Sugar Maple, *Acer saccharum***
  Seed propagation: Planting sugar maples by seed is easy and fun. When collecting the seed, give the seed a squeeze to determine if it is hollow or full. (A large % are often empty.) Save your good seeds in moist peat moss in a baggie. Refrigerate for 2-3 months. Our seeds began to germinate in the baggies and were very easy to pot up. They are slow-growing, so don't expect too much size in one year. We have also had very good success simply digging seedlings from under the parent trees.

  Propagation by cuttings: Some sources say that softwood cuttings will work; none were found to recommend hardwood cuttings. We did not experiment with sugar maple cuttings

- **Speckled Alder, *Alnus incana***
  Seed propagation: Seeds treated as described above for sugar maple grew very well, with a high % germination. Sources differ in the recommended time of cold required (from zero to 4 months) but we found 3 months worked well.

  Propagation by cuttings: not recommended, but hardwood cuttings did give us a few rooted cuttings (4 out of 40). We had no success with softwood cuttings.

- **Gray Birch, *Betula populifolia***
  Seed propagation: Seeds were collected in the end of September. For us, a cold-moist treatment of three months worked very well. Some seeds left in cold-moist for four months began to sprout right in the baggie in the refrigerator. We got many nice seedlings from these seeds, but we got no germination at all from seeds stored cold-dry. It is thought that the seeds require light to germinate, so they should not be planted deeply.

  Propagation by cuttings: We tried semi hardwood cuttings in July as recommended, but had no rooting. This tree is considered difficult to root, and we were happy that seeds were so easy to grow.

- **Iron wood, Musclewood, *Carpinus caroliniana***
  Seed propagation: Seeds were collected in early October, and given either four months of cold-moist, or two months of warm-moist, then two months of cold-moist. Best results were obtained from seeds treated with four months of cold-moist. More than 70% of the seeds germinated and were grown on. (Most sources recommend the warm period, then the cold period, but our results seemed to indicate that just the cold-moist period was the best method.)

  Propagation by cuttings: We had no success with softwood cuttings, but will try again. The literature recommends softwood cuttings in spring as early as possible until June, but not July and treated with 1% IBA. Hardwood cuttings are not mentioned as a method.

- **Red Ash, *Fraxinus pennsylvanica***
  Seed propagation: This is another type of seed for which a warm-moist period followed by a cold-moist period is recommended, but different sources conflict on the best method. We were not successful with this seed and will collect again this year and try again.
  Note: We have been able to collect a few seedling ashes from our Elk Creek property and pot them up with success. This leads us to consider growing the seeds naturally in a garden plot as a viable alternative for this difficult seed.

  Propagation by cuttings: Cuttings are not suggested as a method for propagating Red Ash (or any of the ashes).

- **Black Walnut, *Juglans nigra***
  Seed propagation: Our very simple method for growing walnut trees from seed is to remove the husks and plant the nuts in a garden plot in the fall.

We covered our small plot with a screen on a wooden frame to keep the squirrels out. By spring, we had 100% germination and we easily (gently) dug the hardy seedlings and potted them up.

Propagation by cuttings: Propagation of walnut by cuttings is said to be difficult and to be possible only in very young walnut shoots. We have not tried the young shoots, but had no success with typical cuttings.

- **Hophornbeam, *Ostrya virginiana***
  Seed propagation: Sources recommend treating these seeds by placing them in cold-moist for five months, but we only were able to get them to germinate after nearly eight months. This gave us a small number of seedlings (about 15%).

  Propagation by cuttings: Cuttings are not suggested as a method for propagating hophornbeam. We had no success with the softwood cuttings we tried.

- **Eastern Cottonwood, *Populus deltoids***
  Seed propagation: Cottonwood seeds are easy to collect when the "cotton" is released. They can be planted immediately and will germinate very well. Like many early season seeds, they exhibit no dormancy.

  Propagation by cuttings: Hardwood cuttings (and softwood cuttings) are said to be easy to root.

- **Black Locust, *Robina pseudoacacia***
  Seed propagation: Seeds can be collected easily, even throughout the winter. They require a cold period, but it does not need to be cold-moist. The key to germinating the seeds is to scarify them by rubbing them between two sheets of sandpaper. This nicks the seed coat to allow the seedling to push through. Some sources recommend scarifying with acid or hot water as well. One of our students (Rebecca Turner) experimented with black locust seed and found that in addition to the sandpaper technique, hot water also worked well. Her method was to boil water, pour it into a cup and cool it for 5 minutes, then add the seeds and allow them to soak for 12 hours before planting.

  Propagation by cuttings: Root cuttings are recommended. Roots (1/2 to 1" diameter) can be dug early in the spring, cut into 2-3" pieces, and stored in barely moist sand. After 3 weeks in a cool place, the root pieces will be

"calloused" and can be planted horizontally in soil or pots. (Method from Dirr, 1987)

- **White Pine, *Pinus strobes***
  Note: we have not done any experimentation with this yet. We have newly added it to our list.
  Seed propagation: Seeds can be collected from August to September, whenever the cones just begin to open. The seeds need a 2-3 month cold-moist period.

  Propagation by cuttings: Difficult.

Herbaceous Plants

- **Tickle Grass, *Agrostis perennans***
- **Goldenrod, *Solidago sp.***
- **Indian Grass, *Sorghastrum nutans***
- **Aster, *Aster sp.***
- **Boneset, *Eupatorium perfoliatum***
- **Virginia Creeper, *Parthenocissus quinquefolia***
- **Pale Touch-me-not, *Impatiens pallida***
- **Spotted Touch-me-not, *Impatiens campensis***
- **Jack-in-the-pulpit, *Arisaema triphyllum***

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References

Dirr,M.A., and C.W. Heuser, Jr. 1987. The Reference Manual of Woody Plant Propagation. Varsity Press, Inc.

Native Plants Journal and Native Plants Network, http://www.nativeplantnetwork.org

Bluff Soil Tests

Soil type	pH	Nitrogen (%)	Phosphate (lb/A)	Potash (meq/100g)	Magnesium (meq/100g)	Calcium (meq/100g)	CEC (desired=15)
Bluff- Red, sandy	5.6	0.04	very low (36)	very low (0.1)	optimum (1.2)	very low (3.5)	3.5
Bluff- Gray, clay	7.8	0.05	extremely low (2)	low (0.2)	above optimum (3.4)	extremely high (29.2)	18.6
Meadow Soil	6	0.3	very low (30)	low (0.3)	optimum (1.5)	low (7)	11

Summary:

- Nitrogen appears to be extremely low in both bluff soils, on the order of 10X lower than our control (meadow soil).
- pH – high in the gray, clay-like soil; low in the red sandy soil.
- CEC – high in the gray, clay-like soil; low in the red sandy soil.
- Phosphate, potassium and calcium are all very low in the red, sandy soil.
- Phosphate and potassium are very low in the gray clay soil, but calcium and magnesium are very high.