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**SEED AND LIVE TRANSPLANT COLLECTION PROCEDURES FOR 7 WETLAND
PLANT SPECIES**

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SEED COLLECTIONS

Wetland plant seeds were collected according to directions laid out in advance. Collectors generally concentrated their collection efforts on National Wildlife Refuges and Wildlife Management Areas where contiguous stands could easily be found. At each collection location, the owner, manager, or person-in-charge was contacted to obtain permission for the seed collection.

A collector should try to find a dense stand with few other intermixed species and to pick the best population within the collection area. When harvesting, the collector should use the best harvesting method for each species in order to get enough viable seed to meet the planting goals for the planting project. This means determining how much bulk material to collect to reach those goals. Seed is harvested by either stripping the seed heads off the stalk or taking hand clippers and cutting the stem off below the seed heads. The heads (with or without the stem) can be placed into a brown paper sack. A brown paper sack is used because the seed heads are dried right in the sacks. After collection, the seeds and seed heads need to be cleaned in a seed cleaner like a Crippen Cleaner.

Collection notes have provided us with an indication of bulk material collection needs for each species and time required for the collection. Each species also has an optimum time period when the seed is ready to collect. Information has been developed for the following wetland species:

Juncus balticus - A dense stand can be mowed to obtain enough seed, but the stems must be kept up right so that the seed doesn't fall out. One large grocery bag of bulk material will yield about 1/16 of a cup of seed. This species is ranked first in time period for collecting. Shattering date will be affected by elevation. At 600-900 m (2000-3000 ft.) elevation, the plants had shattered by the beginning of August.

Scirpus acutus - Less than half an hour is required to make a decent collection. One large grocery bag of bulk material will yield about 1 to 2 cups of seed. Ranked second in collection priority. Ease of collection was affected by water depth.

Polygonum species- Easiest to collect. Collectors can experience significant confusion over identification of *Polygonum* species. About 15 to 20 seed heads will yield about 1/2 cup of seed. Since these species are a favorite of waterfowl, it is ranked third.

Scirpus pungens (*S. americanus*) - A good collection can be made in a short amount of time from a dense stand, using hand clippers. One large grocery bag of bulk material will yield about 1/2 to 2/3 cup of seed. Ranked fourth in collection priority. Collect before September.

Scirpus maritimus - Since the inflorescences are large, a collection can be made quickly with hand clippers. One large grocery bag of bulk material will yield about 2 cups of seed. Ranked fifth in collection priority. Plants begin to shatter at the end of September.

Eleocharis palustris - A dense stand can be mowed to obtain seed. If lodged, the stand can be lifted up to remove the seed head, which is held tight. One large grocery bag of bulk material will yield about 1/2 to 2/3 cup of seed. Ranked sixth in collection priority because it lodges and holds the seed tight. It is a favorite food of waterfowl, livestock, and other wildlife. A major problem with collection of seed is to beat the birds and animals to the seed.

Carex nebrascensis - Fifteen to twenty individual seed heads usually provides enough seed for 1/4 cup of seed. Ranked last in collection priority, it usually has not shattered by the end of September. Grazing can be a problem because it is very palatable.

LIVE PLANT COLLECTIONS

Germination problems have been reported in the literature for *Scirpus pungens* (*S. americanus*), *Eleocharis palustris*, *Scirpus acutus*, and *Scirpus maritimus*. Consequently, live plant collections of these species specifically may be needed.

Transportation of the plants from the collection sites to the planting site may be a problem if long distances and hot summer temperatures are involved. Plants should be transported in a truck with a camper shell to keep the wind off the plants. The target temperature for the plants in the truck bed is approximately 24°C (75°F) or less. Sliding windows between the cab and the covered bed can be installed to allow the truck air conditioning unit to cool the bed. For additional cooling, the plants can be transported in Styrofoam coolers. Add enough water to the coolers to cover the root system. In addition, a small amount of ice can be added to the coolers on particularly hot days. During the days, keep the cooler lids on and add ice. During the night, remove the cooler lids to allow the plants to "breathe" and cool down. On the average, the temperature in the coolers should range between 18°- 26°C (65°-79°F). With the above procedures, this temperature range is possible even when the outside temperature is 40°- 41°C (104°-106°F).

It has been reported in the literature that if no more than 0.09 m² (1 ft²) of plant material is removed from a 0.4 m² (4 ft²) area, the plants will grow back into the hole in one good growing season. If a total of 1 m² of plant material is harvested, it is possible to get 4-5 individual plants plugs. When digging the plugs up, it is not necessary to go deeper than 15 cm (6 in). This will get a majority of the root mass, but also leave enough roots to grow back into the hole during the growing season.

Based on information from our greenhouse experience and literature reviews, it is best to cut off the tops of the plants before transporting them to the planting location. We recommend the procedures listed below for the different species:

JUBA, CANE2, SCPU3, SCMA, ELPA3 - cut tops to 15 cm (6 in).

SCAC - Cut to 26 cm (10 in) to prevent the tops from being submerged when transplanted to the ponds at the PMC.

POLYG4 - Based on our experience from the greenhouse with cutting, we recommend not clipping the tops.

Uncut plants tended to take longer to get established and the tops will generally die off any way with new growth coming up from the roots

After collecting live transplants, the main concern should be on planting the collected plants as soon as possible. The 0.09 m² (1 ft²) samples can be split with a shovel into as many individual plants as possible. Generally, the smallest plugs should be 6 x 6 cm (2.4 x 2.4 in) with healthy rhizomes and tops. Any weeds in the plugs should be removed by hand. Every effort should be made to keep the soil on the roots.

We did look at washing the soil off the roots before planting the plugs. The theory was that washing the soil off the roots would reduce the risk of noxious weed infestation and reduce the volume of material that needed to be transported. However, washing the roots proved to be too time consuming and actually seemed to stress the plants which in turn increased the establishment time. Another advantage to keeping the natural soil around the root mass is that the natural wetland soil contains many much needed microbes which are essential for a healthy functioning wetland. Without these microbes which do not normally occur on non-wetland, non-organic mineral soil used to construct wetlands, it will take much longer for the newly constructed wetland to start functioning as a wetland should.

HYDROLOGY

The each species requires a specific water regime:

1) Moist Group-- *Carex nebrascensis* (CANE2), *Eleocharis palustris* (ELPA3), and *Juncus balticus* (JUBA)

2) Standing Water Group-- *Scirpus pungens* (*S. americanus*) (SCPU3), *Scirpus maritimus* (SCMA), *Scirpus acutus* (SCAC), and *Polygonum sp.* (POLYG4).

These groups were based on the water requirements for each plant that one would expect in a "natural" situation. The moist group will normally be found in a fluctuating water regime. They can be totally inundated for short periods of time (1 to 3 months) and then dried out for short period of time. The standing water group will normally require standing water about 30-40 cm

(12-18 inches) deep. They can tolerate water up to about 0.9 m (3 feet) for limited periods of time without dying out. Cattails will move into the same water regime until the plants are well established. The *Polygonum* plants should be planted around the edge a wetland. In this position, they are in a more typical (for them) fluctuating water level regime. The *Polygonums* can also be used for quick cover as they are normally successional. This will help reduce weed growth that can occur with newly disturbed ground.

If you would like further Information Series technical papers or Technical Notes, write or call me:

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