NRMT PROGRAM SUMMER PLANT COLLECTION
For Botany Course UC.RRR.1030.L

To be done prior to fall – please make plant collection during the summer

Incoming NRMT students are required to collect **15 flowering** plant specimens of which **five (5) must be aquatic plants**, with field notes, over the summer. The purpose of this collection is to provide you with a variety of plants to study during the Botany Course. (The variety and number of flowering plants available for collection after classes commence in September is very limited.) The intent of the course is to make the study of plants as practical and as valuable to you as possible. By starting now, you will witness the diversity of plants that are native to Manitoba, (over 2000 species), or elsewhere.

Time will be provided in class labs for mounting and identifying your collection, but it will also require time out of class. The identification of plant species may be started during the summer if you wish (A good resource book to use is Newcomb's Wildflower Guide, Lawrence Newcomb), however, **do not place your plants on the Herbarium sheets prior to coming to school.** Herbarium sheets for the mounting of specimens can be obtained at the University College of the North Bookstore when you come for classes in the fall.

HERBARIUM COLLECTION

Collect 15 different species of plants over the summer. When picking, ensure that there is more than one plant in the area as it may be the last! Also, it is wise to pick at least two samples (three is better) in case one gets damaged during pressing. **PLEASE DO NOT COLLECT RARE, PROTECTED SPECIES OR GARDEN FLOWERS** – weeds are acceptable. Rare, endangered or protected species in Manitoba include: Round-lobed Hepatica, Small White Lady's-Slipper, Bloodroot, Buffalograss, Western Spiderwort, Hairy Prairie-Clover, Smooth Goosefoot and Rough Agalinis. Visit the Manitoba Sustainable Development website for complete descriptions and pictures http://www.gov.mb.ca/sd/cdc/pdf/field_report_2007.pdf

Please do not collect the noxious weeds PURPLE LOOSESTRIFE (Figure 1 and 2) or LEAFY SPURGE (Figure 3 and 4).

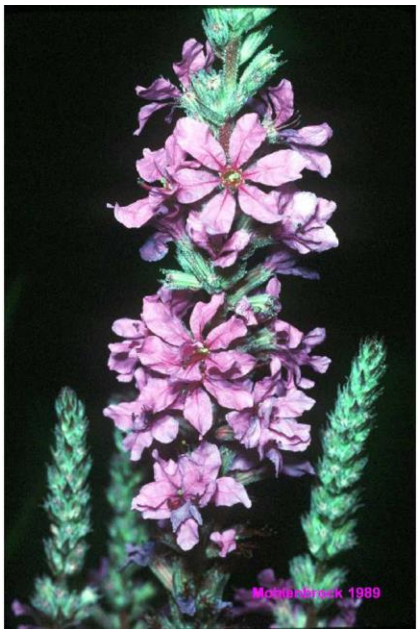

Figure 1: Purple loosestrife close-up.

Figure 2: Purple loosestrife plants.

Figure 3: Leafy Spurge seed head.

Figure 4: Leafy Spurge plant.

Take the entire plant with leaves, stems, roots, flowers and seeds for smaller plants; parts for large ones. (For trees or really large plants, take only representative parts.) Do not collect coniferous (or evergreen) plants as their needles will fall off and we have a variety of live coniferous trees around the college to observe for identification purposes. Asters (daisy and dandelion like flowers) and goldenrods (yellow flowers in bunches up the stem) are difficult to identify, although acceptable.

- **Five (5) plants should come from an aquatic environment**; the remainder from terrestrial environments;
- Collect plants that interest you and about which you would like to learn.

2. Field notes are required for each collected specimen and are included in the marking scheme of your herbarium. **You will be required to hand in these notes prior to the start of classes.** The field notes should include:

    - **Date** collected; Day, Month, Year.

    - **The Location**: be very specific (e.g. "south side of gravel pit, 10 km north of The Pas on the east side of Highway #10") – enough detail that one would be able to return to that location. The use of UTM coordinates or Latitude and Longitude (must be to the second) are also acceptable. This information will be required for inclusion on the Herbarium sheets.

    - **The Habitat**: The more information the better. Make notes as you collect – otherwise you will miss important information. This should reflect the environment where you collected the plant, (e.g. Amount of light/shade; type of soil – dry, moist, or wet; how deep in the water; how far from shore; what other types of plants are present in the area; environment – ditch, river shore, swamp, lake, field, forest, etc.)

    - **Drawings & notes on the Flowers**: Draw what you see, not what you think you see! Take the flower apart and study the different parts – how many petals, the arrangement. You do not have to be an artist. If you only had the drawing to use for identification, would you be able to? (It is almost impossible to dissect dry flowers for the necessary information. You need sketches and field notes that are made when the flower is fresh.) Photographs may also prove useful. NOTE: Count the number petals and whether they are single or fused together. Also, note the arrangement of the leaves on the plant – are they opposite each other, alternate up the stem or are they all at the base of the plant? Finally note the margins of the leaves – are they serrated (have teeth?), are they lobed like oak leaves or are they smooth**? These observations will help with identifying later (I can't stress that enough!).**

    - **Any other observations that may be relevant.** Possible common names; color of the flowers – sometimes the colors change or fade as they dry; height of the plant – especially when you are taking only representative parts of a large plant; etc.

3. What you need to know to effectively press plants:

    - **To press**: please see attached notes.

    - **Some additional hints**:

- Have pre-cut, corrugated cardboard, (can be cut from grocery boxes), and newspaper ready in advance of collecting;
- Collect specimens that have flowers or fruits on them otherwise it is almost impossible to identify them correctly;
- Collect extras just in case;

- **The following are included in the marking scheme of your herbarium**:

- The leaves should be arranged and pressed so that one is turned for an underside view;
- At least one flower should be pressed so as to provide a view of the back, another for a side view, and another for a front view;
- Larger plants may need to be folded into a "V", "N", or "W" shape to fit into pressings; and
- Check plants frequently and add dry paper as required to avoid mold and mildew forming on the specimens.

The herbarium collection counts toward your course mark and also provides you with real plant specimens to examine during the winter months. Have fun collecting. We look forward to seeing you and your pressed plants, field notes, and sketches when classes start. If you have questions or require further information, contact Mitch Leclaire by e-mail: at mleclaire@ucn.ca or by phone: 204-627-8529 Ext. 6 (toll-free 1-866-627-8500).

PRESERVATION OF SPECIMENS

The two main steps in preserving floral collections are pressing and drying.
Correct pressing prevents plant parts from curling or wrinkling during the drying process, and allows the requisite plant parts to be visible for identification. Care in pressing specimens will result in more useful and visually appealing herbarium specimens. The process consists of laying the plant specimens in folded sheets of newsprint separated by cardboard sheets, and placing them in a pressing frame, which is then tightened with straps.

Drying involves an adequate length of time and exposure to ''dry'' air, and maintenance of the specimens in the press, e.g., changing the newsprint to speed up the drying process and cinching the press daily as the specimens dry.

PRESSING

Pressing equipment

Old phone books can function as a plant press if budget and time are scarce resources. Simply place the plants between the pages in the phone book and allow for labels to stick out for easy access. Load multiple books with plants and tie them together with

rope. The pressings may take additional time to dry.

The main piece of equipment is a plant press (Figure 5). You can construct your own press or purchase one from a biological supply company. The frame usually consists of two back panels (about 45 cm X 30 cm) made of a lattice of hardwood strips.

The back panels could also be made from plywood panels drilled with holes 2 to 5 cm in diameter. The frame is tightened with two heavy webbing straps (about 2 m long by 4 cm wide) with adjustable fasteners.
You will need many flimsies (newsprint) cut in sheets of about 45 cm X 60 cm.
Roll-ends are available from some printers. Tabloid-size newspapers are a cheaper alternative. Sheets of corrugated cardboard (45 cm X 30 cm) are also needed to layer between plants in the press. Felt blotting paper (45 cm X 30 cm) and soft foam sheets (45 cm X 30 cm X 2 cm) are optional. Felt is good for speeding up drying of damp specimens and foam is useful for bulky branches or stems.

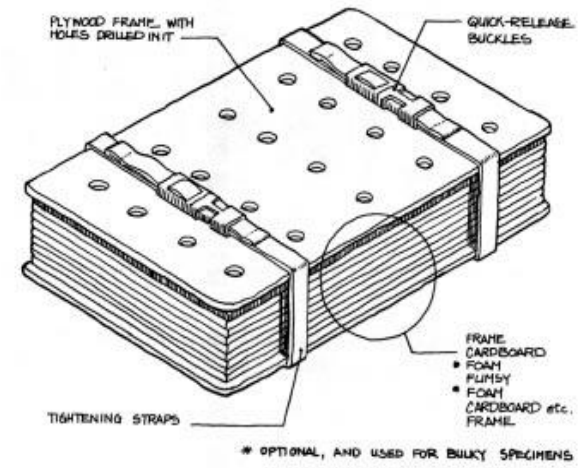

Figure 5. A plant press showing arrangement of parts (BC Ministry of Forests 1996).

Pressing technique

The ideal place to press plant specimens is indoors on a large table. However, a picnic table, the back of a station wagon, the tailgate of a truck, or a flat, hard surface is adequate as long as it is out of the wind and rain. The following suggestions will ensure high quality, pressed specimens.

Basic techniques

· Separate the frame parts. Make a separate stack for each part if you have plenty of room and it is not windy. Otherwise arrange the materials in the order they will be used: back panel, cardboard, newsprint, blotter (for damp plants, put on both sides of paper), foam (for large branches put on both sides of paper), cardboard, paper, etc.
· Fold a large number of the newsprint sheets in half to form 45 cm X 30 cm folders (flimsies).

· Lay the straps at one end of the table (both in the same direction). Place one back panel on top of the straps, and place two cardboard separator sheets on the panel.
· Place a folded newsprint sheet on another cardboard sheet (alternate the sides of the newsprint openings within the press to prevent a large bulge on one side). · Place plants to be pressed on the right half of the newsprint folder (see Figure 6).

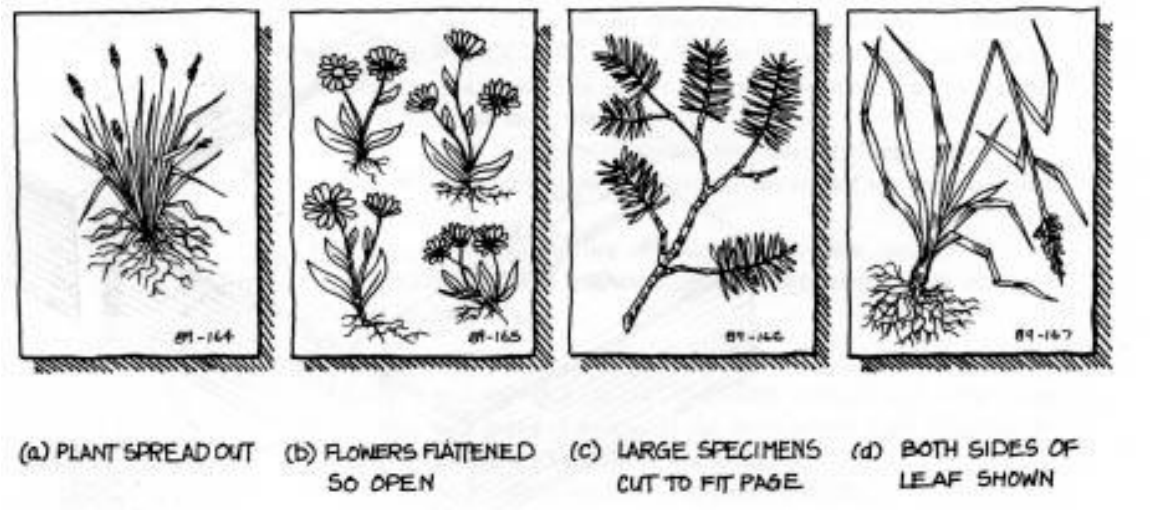

Figure 6. Arrangement of specimens on newsprint folder (BC Ministry of Forests 1996).

·Arrange the plants carefully with a minimum of overlap.
· Open some flowers to show both the top and underside to illustrate the arrangement of floral parts and the presence or absence of involucre bracts. Open the flower and press it down with your thumb.
· Squash large fruits on the page or slice them in half to speed up the drying process.
· Place dry, loose seeds or fruits in sealed packets. Write the collection number on the outside of the packet. (See Figure 7 for folding seed packets.)

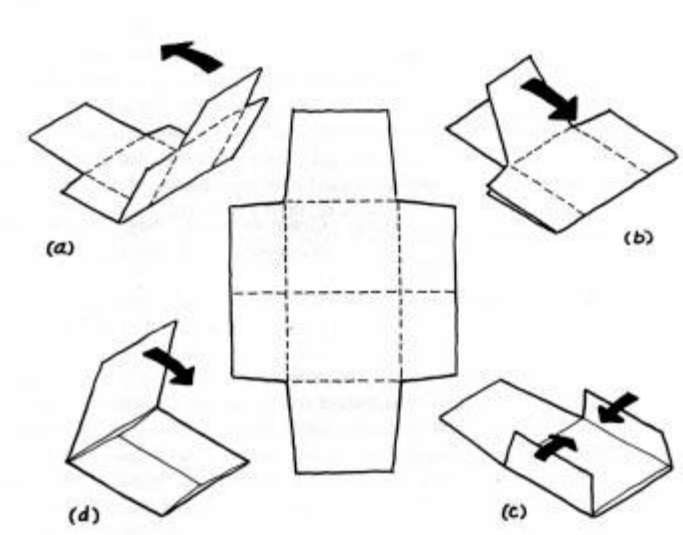

Figure 7. Folding packets for seeds/fragments (BC Ministry of Forests 1996).

· Turn over some leaves or part of a single large leaf to show the underside (fern fronds as well).
· When the sheet is full, close the folder, lift the cardboard separator and the newsprint folder and place them on the press.
· Up to three sheets of specimens may be placed together without a cardboard separator if you use blotting paper between them (if you do not have blotting paper place a cardboard separator between each specimen). The number of sheets depends on the thickness and moisture content of the plants.
· Plants can be re-arranged easily by opening the press after two or three hours. The plants will be limp but still flexible.
· Check and change damp newsprint daily and remove specimens as they become dry.
· Cinch press daily (as plants dry the press will become loose).
· When the press is full, place two cardboard separators and the other back panel on top. Tighten the straps as much as possible. You can kneel on the press to achieve the desired tension. Make sure the pressure is even. The straps must be tightened again after 8 to 12 hours to take up the slack as the plants dry and shrink. Keep tightening the straps until the drying is finished.

For herbaceous plants

· Place sheets of plants with high moisture content singly between cardboard separators, and check daily to see if the newsprint needs changing to facilitate drying.

For trees and shrubs

· Bend or cut stems of larger plants to fit the sheet, or place them on separate sheets. Designate the parts a, b, c, etc., but use the same collection number.
· Place foam sheets top and bottom, or a small roll of paper on top of or alongside bulky or thorny plants to distribute the pressure evenly.

For aquatic specimens

The delicate structures of many aquatic species require special care and attention. Some aquatic plants do not have structural tissues to give them rigidity and they collapse when removed from the water. Fragile stems tend to stick to newsprint or break off the plants with excessive handling.

They need to be floated directly onto a sheet of thin mounting paper and arranged while the sheet is slowly withdrawn from the water.
· Partially fill a large sink, bathtub, or photographic developing tray with cool water. If you do not have a container, use the lake or pond where the collection was made.
· Float the plant in the water.
· Slide a herbarium sheet into the water under the plant. Check with the paper supplier to ensure that the paper you are using will not change shape when wet.
· Arrange the specimens in the water. Untangle feathery stems. Carefully lift up the sheet (with the specimens), letting the excess water run off.

· Place the sheet aside to drip dry before pressing. An old window screen makes a good support while the sheet dries.
· Some bulky parts like *Typha* (cattail) fruits, *Nuphar* (water lily) flowers, and *Cicuta maculata* (water-hemlock) roots need to be sliced longitudinally to make them flat enough to press.

NOTE: All parts of *Cicuta maculata*, water-hemlock, are poisonous. Wash your hands and knives after preparing them.

Drying

Drying is a crucial step in preserving collected plant material. To ensure that a specimen retains its colour and does not become brittle or scorched, the moisture must be removed rapidly, while using only a moderate heat. Good air circulation will speed up the process. Make sure the corrugated cardboard still has air spaces in between and is not crushed flat with use.

· During warm, dry weather, tie the press onto the roof-rack if you are traveling by car. The air will flow through the lattice panels and the corrugated separators when the vehicle is moving.
· Place the press inside a well-ventilated vehicle parked in a sunny spot.
· Plants will dry reasonably well in a heated room in a week if you change the papers regularly. Open the press periodically and check the specimens to ensure that they don't become too dry, or begin to mildew.
· A specimen is considered dry when it does not feel cool to the touch when the press has been open for a few minutes.
· Many plants will shed seeds during the drying process. Package the seeds and mark the collection number on the package.
· Cones can be air dried in their paper collection bags.

Adapted from:

British Columbia Ministry of Forests. 1996. Techniques and procedures for collecting, preserving, processing, and storing botanical specimens. Res. Br., B.C. Min. For., Victoria, B.C. Work. Pap. 18/1996.