

## **Special Management Practices for the Intervale Areas**

The following management practices for intervale areas are based on information found in Plant Community Composition, Rare Plant Species and Disturbance at an Intervale Site on the Meander River, Hants Co., Nova Scotia (Porter 1994).

### **Management Guidelines**

- i) Activities which are seriously disruptive (such as tree harvesting and recreational vehicle traffic) should be prohibited in intervale areas, especially if the intervalles are small, isolated and/or unlikely to naturally restock rare species.
- ii) Signs informing the public of a) the sensitivity of the site, and b) the prohibition of recreational vehicles on the site, should be posted in highly visible areas.
- iii) When designing reserve areas for intervalles or developing management strategies, decisions should be made on a site-by-site basis because each area will have different complicating factors to consider (overall size, proximity to agricultural areas, species composition and likelihood of contamination by nuisance plants, etc.).
- iv) Natural disturbances and processes should be considered, both in the present and future contexts, before deciding on management procedures. For example, disturbances which could alter canopy cover may have serious detrimental effects on intervale plant species. Likewise, the natural meandering of a river via bank erosion (as well as the resulting alteration of rare plant habitat) should be considered.
- v) Whenever possible, local conservation groups or interested members of the community should be brought into the project to secure the assistance of local landowners or communities in preserving intervalles and their rare species.

### **Background Information**

The term “intervale” appears to be uncommon in the scientific literature. Webster’s

dictionary defines an intervalle as “a tract of low ground between hills, or along the banks of a stream, usually alluvial land, enriched by the overflowings of the river, or by fertilizing deposits of earth from the adjacent hills”. Stanley (1970, cited in Porter 1994) further describes an intervalle as land composed of alluvial deposits left by large brooks and rivers that are swollen by spring meltwater or spring and autumn rain. Generally speaking, intervalles are synonymous with floodplains or bottomlands (R. Milton, Pers. Communication).

Perhaps the most distinctive feature of intervalles in Nova Scotia is their tendency to support plant communities and species assemblages that are rare or unique with regard to the surrounding area (Porter 1994). For example, the habitat at the Meander River Intervale (MRI) in Hants County, NS, contains several plant species characteristic of the Alleghenian Element, which is associated with deciduous forests far to the south (Porter 1994). Intervalles in gypsum areas, in particular, play host to many uncommon plant species, possibly because of the more basic soils (Porter 1994).

Intervalles may be well suited to support rare species because of the degree of disturbance they encounter (Porter 1994). In most terrestrial habitats, common plant species are able to exclude rarer species by outcompeting them for resources. In unstable or disrupted habitats, however, common plants are often unable to flourish, and rare plants may be present in greater numbers because interspecific competition is decreased (Porter 1994). Indications of local habitat stability can be obtained by examining the species distribution in a given area: for example, locating a common weed next to a rare species indicates that the habitat they occupy is unstable (Porter 1994).

There is evidence that the life cycles of predominant species in disturbed habitats are closely related to the frequency of the disturbance (Porter 1994). Disturbances at the MRI were primarily winter or early spring phenomena, such as flooding and ice scouring (Porter 1994). Since the vast majority of plant species (and all of the rare species) at the intervalle were perennials (which reproduce from rootstocks that are dormant in winter), such disturbances would not affect their viability (Porter 1994). By the time they started growing in April or May, the ice had already melted and the floodwaters retreated (Porter 1994).

The basic structure of floodplains and bottomlands is generally a flat surface with slight variations in elevation associated with differences in soil, drainage conditions and plant species (Hosner and Minckler 1963 cited in Porter 1994). This heterogeneity is important in controlling vegetative development and distribution (Porter 1994). Though small (appx. 12 ha), the Meander River Intervale was found to be highly heterogeneous, with areas of open, mature hardwood in the floodplain, a distinct strip of softwoods lining the back of the floodplain, and plentiful growth of early successional stage flora along the riverbank (Porter 1994). Many of the tree and plant species found in the intervale were associated with disturbed environments, while others were commonly found in more stable areas (Porter 1994). For example, understory trees such as chokecherry (*Prunus virginiana*) and hawthorn (*Crataegus* sp.) were found in highly disturbed habitats, while ironwood (*Ostrya virginiana*) was associated with American elm (*Ulmus americana*) and sugar maple (*Acer saccharum*) in stable open areas near riverbanks (Porter 1994). This reflects the varying degrees of disturbance at the site, and the presence of several microhabitats which support distinct species assemblages (Porter 1994).

Porter (1994) noticed several similarities between species distribution at the MRI and Stanley's (1970) study of northern Nova Scotia intervale areas. Stanley (1970, cited in Porter 1994) reported balsam poplar (*Populus balsamifera*), speckled alder (*Alnus rugosa*), and willows (*Salix* spp.) in the pioneer stages, followed by American elm, sugar maple, ironwood and white ash (*Fraxinus americana*). At Meander River, balsam poplar, sugar maple and American elm were also important as seedlings in the herbaceous layer (Porter 1994). Sugar maple and American elm are shade-tolerant species, and likely represent the persistent stage of forest development at MRI (Porter 1994). Sugar maple and white ash are thought to be the more likely dominant species in the future, however, due to the low reproductive rate of balsam poplar and the spread of disease in American elms (Porter 1994). Overall, Porter felt that the MRI is typical of intervale forests in Nova Scotia, and slight differences between sites are most likely due to stand age or disease.

The majority (120 of 146) of herbaceous plant species found at MRI were perennials, with much lower numbers of annuals, and very few rosette-forming perennials (Porter 1994). It

should be noted that many tree and herb species observed in the intervale were not present in the field quadrats or seedbank samples. This may reflect timing or types of species' life cycles, the lack of sexual reproduction of some species, or the sampling methods themselves (Porter 1994).

Six rare species were located in the MRI, five of which are members of the Alleghenian Element (Porter 1994). These included maidenhair fern (*Adiantum pedatum*), bottlebrush grass (*Hystrix patula*), Canada lily (*Lilium canadense*), blue vervain (*Verbena hastata*), blue cohosh (*Caulophyllum thalictroides*), and horse gentian (*Triosteum aurantiacum*). Porter felt it likely that more rare species were present in the MRI, but that her methods were not able to detect them. She stated that future surveys may consider searching exclusively for rare plants to determine their presence and distribution.

Several types of human disturbances could negatively impact intervale areas; particularly where sites are small or isolated. These disturbances include tree harvesting, recreational vehicle traffic, hunting/fishing/trapping, agriculture, gypsum mining (which results in increased siltation), food-related industries (tapping of maple trees or fiddlehead harvesting), swimming, and scientific research (Porter 1994). Porter (1994) asserts that, at least on the Meander River Intervale, recreational vehicle traffic and forest harvests should be prohibited, although most of the other potential disturbances such as hunting or fishing are acceptable as long as individuals are aware of the sensitivity of the site. Since many intervale areas are either privately owned (or are abutted by private land), Porter also advocates enlisting the assistance of local conservation groups or members of the community to act as liaisons in acquiring the assistance of landowners.

Table 1: Rare species in Nova Scotia which are indicative of the Alleghenian Element (Roland and Smith 1969).

<b>Common Name(s)</b>	<b>Latin Name</b>
Silvery Spleenwort	<i>Athyrium thelypteroides</i>
Maidenhair Fern	<i>Adiantum pedatum</i>
Nodding Fescue	<i>Festuca obtusa</i>
Slender Mannagrass	<i>Glyceria melicaria</i>
Bottle-brush Grass	<i>Hystrix patula</i>
Sedge	<i>Carex torta</i>
Plantainleaf Sedge	<i>Carex plantaginea</i>
Small Bellwort	<i>Uvularia sessifolia</i>
Wild Leek	<i>Allium tricoccum</i>
Trout Lily	<i>Erythronium americanum</i>
Solomon's Seal	<i>Polygonatum pubescens</i>
Wake-robin, Red or Purple trillium	<i>Trillium erectum</i>
Tearthumb, Smartweed	<i>Polygonum arifolium</i>
Ironwood, Hophornbeam	<i>Ostrya virginiana</i>
Round-lobed Hepatica	<i>Hepatica americana</i>
Blue Cohosh	<i>Caulophyllum thalictroides</i>
Bloodroot	<i>Sanguinaria canadensis</i>
Dutchman's Breeches	<i>Dicentra cucullaria</i>
Crinkleroot, Pepperwort	<i>Dentaria diphylla</i>
Foamflower	<i>Tiarella cordifolia</i>
Pointed-leaf Tick Trefoil	<i>Desmodium glutinosum</i>
Snakeroot	<i>Sanicula gregaria</i>
Horse Gentain, Feverwort, Wild	<i>Triosteum aurantiacum</i>
Coffee	
Canada lily	<i>Lilium canadense</i>

### References Cited

Porter, S.L. 1994. Plant community composition, rare plant species and disturbance at an intervale site on the Meander River, Hants Co., Nova Scotia. MSc. Thesis, Acadia University, Wolfville. 101p.

Roland, A.E. and Smith, E.C. 1969. The Flora of Nova Scotia. The Nova Scotia Museum, Halifax. 748p.