Great Plains Floodplain Forest

Macrogroup M028

Forêts alluviales des Grandes Plaines

Temperate Flooded & Swamp Forest

D011 Eastern North American-Great Plains Flooded & Swamp Forest

M028 Great Plains Floodplain Forest

M029 Central Hardwood Floodplain Forest

M503 Central Hardwood Swamp Forest

M504 Laurentian-Acadian-North Atlantic Coastal Flooded & Swamp Forest

Concept

M028 describes the Canadian expression of North American Great Plains floodplain forests and woodlands. This vegetation occurs on river floodplains throughout the Parkland and Great Plains Grassland CNVC vegetation zones in southern Alberta, Saskatchewan and Manitoba. In Canada, floodplain forests are dominated by broad-leaved cold-deciduous tree species, including eastern cottonwood (*Populus deltoides*), Manitoba maple (*Acer negundo*) and red ash (*Fraxinus pennsylvanica*), with other species locally important. Dense understory vegetation comprises broad-leaved shrubs, forbs and graminoids. Common species include red-osier dogwood (*Cornus stolonifera*), willows (*Salix* spp.), cranberry viburnum (*Viburnum opulus*), saskatoon (*Amelanchier alnifolia*), chokecherry (*Prunus virginiana*), wolf-willow (*Elaeagnus commutata*), silver buffaloberry (*Shepherdia argentea*), bluejoint reedgrass (*Calamagrostis canadensis*), slender wildrye (*Elymus trachycaulus*), fowl bluegrass (*Poa palustris*), Canada goldenrod (*Solidago canadensis*), star-flowered false Solomon's seal (*Maianthemum stellatum*), wild licorice (*Glycyrrhiza lepidota*), poison ivy (*Toxicodendron radicans*), stinging nettle (*Urtica dioica*), Maryland sanicle (*Sanicula marilandica*) and American cow parsnip (*Heracleum maximum*).

M028 occurs in a dry to subhumid climate on sites that are characterized by extra moisture as a result of high water tables, run-off from valley slopes and/or stream overflow. Sediment and dissolved materials carried by inflowing water can make floodplain sites relatively nutrient rich. Soils are usually Regosols, lacking horizon development because of ongoing deposition of alluvium.

Eastern cottonwood (*Populus deltoides*) stands on the floodplain of the Red Deer River. Older stands are in the foreground and background, with a younger even-aged cohort in the mid-ground on the inside of the river bend. Dinosaur Provincial Park, Alberta.
Source: L. Allen

Balsam poplar (*Populus balsamifera*) stand with a dense broad-leaved shrub understory dominated by red-osier dogwood (*Cornus stolonifera*).
Source: J. Thorpe

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Vegetation

Physiognomy and Structure

M028 includes forests and woodlands on riparian sites. Canopy structure is irregular, comprising broad-leaved, cold-deciduous tree species. Mature canopy height reaches approximately 20 m. Dense understory vegetation is characteristic of these stands, including lush shrub and herb layers. Shrub layers comprise broad-leaved, cold-deciduous species; herb layers are dominated by forbs, but also include a variety of shade tolerant grasses and sedges. Within-stand species richness is typically high, but floristic composition is variable across the Canadian range.

Floristics

Floodplain forests vary in floristic composition depending on regional species distributions and local site properties. *Populus deltoides* (see Comments section) occurs on the floodplains of major rivers, particularly in the southern part of the Canadian range. In southern Alberta, it may be replaced on these sites by *P. angustifolia*. These species are most abundant on the lowest floodplain terraces, which are most frequently flooded. *P. balsamifera* becomes more common in the northern part of the range. *Acer negundo* is common throughout the range, on sites varying from major floodplains to narrow coulees. In Saskatchewan and Manitoba, *A. negundo* is accompanied on these sites by *Fraxinus pennsylvanica*. *Ulmus americana* forms floodplain stands in eastern Saskatchewan and Manitoba, although many of these have succumbed to Dutch Elm Disease. *Tilia americana*, *Salix amygdaloides* and *Quercus macrocarpa* also occur on riparian sites in Manitoba.

Common shrub species throughout the range include *Cornus stolonifera*, *Salix* spp. (especially *S. bebbiana, S. discolor, S. exigua, S. petiolaris* and *S. famelica*), *Viburnum opulus* (see Comments section), *Amelanchier alnifolia*, *Prunus virginiana*, *Elaeagnus commutata*, *Shepherdia argentea*, *Rubus idaeus* and *Ribes* spp.

A wide variety of herb species includes *Calamagrostis canadensis*, *Elymus trachycaulus*, *Poa palustris*, *Carex* spp., *Solidago canadensis*, *Maianthemum stellatum*, *Glycyrrhiza lepidota*, *Toxicodendron radicans* (see Comments section), *Urtica dioica*, *Equisetum* spp., *Anemone* spp., *Apocynum* spp., *Galium* spp., *Sanicula marilandica* and *Heracleum maximum*.

Dynamics

Because of their moisture status and proximity to streams, floodplain forests and woodlands are less subject to wildfire than other prairie vegetation types. However, disturbance by stream-flooding, which can remove established plants and deposit a new layer of silt for establishment of young plants, is common in these stands. This disturbance may be necessary for establishment of *Populus deltoides*, and elimination of flooding as a result of upstream dam construction is considered a threat to *P. deltoides* communities. If *Acer negundo* and/or *Fraxinus pennsylvanica* are present, they may replace *P. deltoides* through secondary succession in the prolonged absence of disturbance. Stands of *Populus* spp. can also be altered by beaver-felling, which is concentrated in areas close to water; these stands are often converted to shrublands.

In some areas, floodplain forests and woodlands are grazed by livestock. Prolonged heavy grazing eliminates the taller shrubs and herbs, creating a lower, more open understory, which may be invaded by exotic plant species. Because of moisture availability and frequent disturbance by flooding, these stands are highly susceptible to invasion and understories are often dominated by exotic herbs, including *Bromus inermis*, *Poa pratensis*, *Elymus repens*, *Cirsium arvense*, *Sonchus arvensis*, *Melilotus* spp. and others. The dense sod of exotic grasses can impede establishment of tree seedlings. Invasions by the exotic tall shrubs or small trees, *Elaeagnus angustifolia* and *Rhamnus cathartica,* have altered floodplain forests in some areas.

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Environment

Climate

In Canada, M028 occurs in the dry and subhumid continental temperate climates of southern Alberta, Saskatchewan and Manitoba. Winters are cold and summers are warm; mean annual temperatures average approximately 3˚C, with extreme minimum temperatures below -40˚C throughout the range. Growing degree days above 5˚C (GDD) vary from about 1300 to 1860, with annual precipitation between approximately 300 to 500 mm. The warmest and driest climatic conditions occur at low elevations in southeastern Alberta and southwestern Saskatchewan. Somewhat cooler and moister climates occur in the Cypress Hills and to the west, north and east of this core area. Floodplain forests are able to develop in areas where the climate would be too dry for tree growth because of moisture inputs to these sites from stream overflow as well as runoff from adjacent valley slopes.

Physiography, Geology, Topography and Soils

M028 primarily occupies portions of the Alberta and Saskatchewan Plains, subdivisions of the Interior Plains physiographic region. This area is underlain by level Mesozoic and Tertiary sedimentary rocks. Elevations are <1000 mASL, except for the Cypress Hills, which reach 1290 mASL. M028 occurs on the floodplains of large and small permanent streams. These sites are characterized by extra moisture as a result of high water tables, run-off from valley slopes and/or stream overflow. Sediment and dissolved materials carried by inflowing water can make floodplain sites relatively nutrient rich. Soils are usually Regosols, lacking horizon development because of ongoing deposition of alluvium.

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Distribution and Geographic Range

In Canada, M028 occurs in southern Alberta, Saskatchewan and Manitoba. The Canadian range is the northern portion of the global range of Great Plains floodplain forests and woodlands, which extends southward to Texas.

Related Concepts

USNVC M028 [Great Plains Floodplain Forest] describes the rangewide characteristics of Great Plains floodplain forests and woodlands in North America. This factsheet describes the Canadian expression of this vegetation, which includes conditions treated (at least in part) in USNVC Group G147 [Great Plains Cottonwood – Green Ash Floodplain Forest].

Comments

Populus deltoides here refers to subspecies *monilifera* (plains cottonwood, peuplier deltoïde de l'Ouest).

Toxicodendron radicans here refers to variety r*ydbergii* (Ryberg's poison ivy, sumac de Rydberg).

Viburnum opulus here refers to subspecies *trilobum* (cranberry viburnum, viorne obier).

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Source Information

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Information Sources (data):
Concept Authors: Ken Baldwin, Jeff Thorpe, Lorna Allen, USNVC
Description Authors: Jeff Thorpe, Ken Baldwin, Lorna Allen
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The information contained in this factsheet is based on data and expert knowledge that is current to the date of description. As new information becomes available, the factsheet will be updated.

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