Ecological site F146XY011ME
Floodplain

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Ecological site concept

The floodplain ecological site includes floodplains, banks, terraces, sand and cobble bars, and all other land surfaces associated with major river and stream deposits. Flood frequency and intensity are the primary drivers of plant community distribution within this complex of soils and vegetation. Where seasonal flooding deposits or drought expose sands and cobbles along the river's edge, herbs, sedges, and grasses predominate. Shrub communities, dominated by speckled alder, redosier dogwood, and willows appear to thrive in more stabilized areas receiving moderate to high amounts of disturbance, such as ice scour and moderate flooding. The most stabilized banks and floodplains are dominated by silver maple, with some of the medium and smaller streams dominated by balsam poplar forests. These forests flood regularly, but are not as intensely disturbed as the shrub communities on this site. Floodplain terraces, which flood rarely, are typically dominated by sugar maple, yellow birch, green ash, and basswood.
Soils are consistently deep, but otherwise extremely variable within this riverine system. Silt loams predominate, with occasional lenses of coarser sands, gravels, and cobbles deposited during high-energy flood events. Oxbows and backwater sloughs diversify the soils even further, resulting in a broad range of textures and drainage classes. Where soils are well or moderately well-drained, this site is considered prime farmland and is mostly under cultivation.
Not all of these soils and associated plant communities will be present in all areas where this site occurs, and further study is required to determine which communities consistently occur together, and under what circumstances.
The natural processes of scouring and deposition along waterways may be subdued in areas where dams regulate flow, or where banks are armored by man-made structures, thus reducing disturbance and favoring those communities adapted to more stable surfaces.

Table 1. Dominant plant species

Tree	(1) *Acer saccharinum* (2) *Populus balsamifera*
Shrub	(1) *Alnus incana* (2) *Cornus sericea*
Herbaceous	(1) *Calamagrostis canadensis*

Physiographic features

This site occurs on the banks, floodplains, terraces and other surfaces associated with large rivers and streams. Slopes are gentle and elevations range from near sea level up to 1750 feet.
This site represents a riverine complex of various topographic features which are deposited and maintained by large amounts of flowing water. Nearest the channel, stream banks can be steep and stabilized, or slope gently into the water, especially where sands, gravels, or cobbles are exposed. Natural levies sometimes form along the banks, which often affect the species composition of the floodplain. The active floodplain is a flat area where floodwaters dissipate energy as they overflow their banks, depositing a thin layer of sediment along the way. At the banks and active floodplains, the water table is most often within 36 inches of the soil surface. Further away from

the channel, floodplains often border elevated steps and stream terraces, which flood less frequently than the active floodplain and have a deeper water table. Each of these fluvial surfaces may support a distinct plant community.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Stream terrace (3) Flood-plain step
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Rare to frequent
Ponding frequency	None
Elevation	3–533 m
Slope	0–5%
Water table depth	0 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of this site is characterized by cold, snowy winters, and cool summers. Annual precipitation ranges from 34 to 51 inches. Precipitation is nearly equally distributed throughout the year, with slightly more moisture falling in June-October. During winter months, and sometimes fall and spring, cold winds from the north bring severe weather events. The effects of a relatively short growing season are somewhat mitigated by long summer days associated with the high latitudes of the region. Occasionally high winds, heavy snow load, microbursts, or freezing rain events damage vegetation over small portions of the landscape.

Table 3. Representative climatic features

Frost-free period (average)	100 days
Freeze-free period (average)	129 days
Precipitation total (average)	1,016 mm

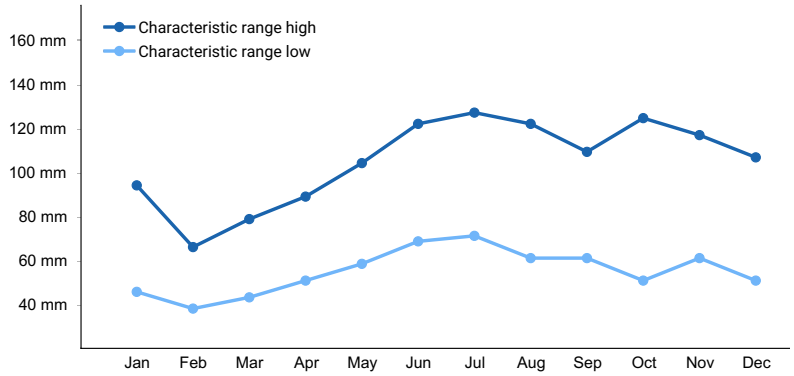

Figure 1. Monthly precipitation range

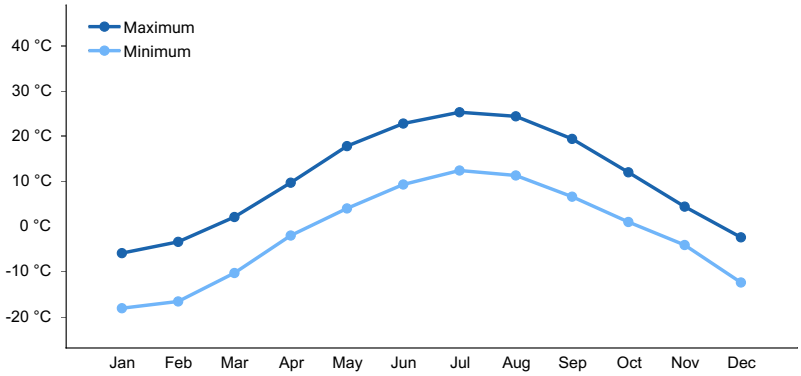

Figure 2. Monthly average minimum and maximum temperature

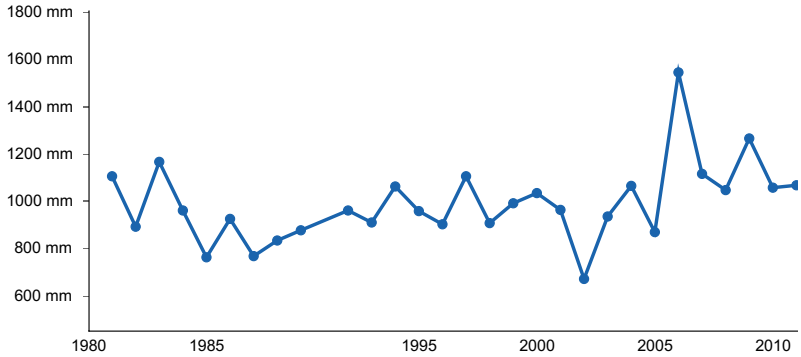

Figure 3. Annual precipitation pattern

Climate stations used

- (1) ALLAGASH [USC00170200], Saint Francis, ME
- (2) BRIDGEWATER [USC00170833], Bridgewater, ME
- (3) FT KENT [USC00172878], Fort Kent, ME
- (4) HOULTON 5N [USC00173944], Houlton, ME
- (5) PRESQUE ISLE [USC00176937], Presque Isle, ME
- (6) HOULTON INTL AP [USW00014609], Houlton, ME
- (7) CARIBOU MUNI AP [USW00014607], Caribou, ME

Influencing water features

The effects of hydrology on this ecological site require further study. In general, this site occurs along the banks of large and medium sized perennial rivers that historically flooded regularly, as evidenced by the existence of layered floodplain deposits. However, the regulation of flow by dams, and the armoring of banks in some places, has reduced the impact of flooding on these sites.

Soil features

The soils of this site are deep but otherwise highly variable, as is common in alluvial settings. The dominant soil textures are silt loams, with occasional sand and gravel lenses. Typically there are very few rock fragments on the soil surface and throughout the profile, but along stream banks or older deposits there may be pockets with significant amounts of rounded rock. This site is mostly poorly and somewhat poorly drained soils, with some higher areas that are moderately well to well drained. The soil temperature regime is frigid, and the soil moisture regime is aquic or udic.

Additional study is required to identify whether consistent patterns exist between fluvial surfaces and soils and plants that occur on them.

Table 4. Representative soil features

Parent material	(1) Alluvium–slate

Surface texture	(1) Silt loam (2) Mucky silt loam (3) Very gravelly silt loam
Family particle size	(1) Loamy
Drainage class	Very poorly drained to well drained
Soil depth	152 cm
Surface fragment cover <=3"	0–4%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	17.02–39.88 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	3.6–6.5
Subsurface fragment volume <=3" (Depth not specified)	0–50%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

The floodplains site is a riparian complex, consisting of several distinct soils and plant communities that predictably occur on fluvial surfaces found along major rivers. Stream banks, point bars, and other fluvial surfaces closest to the water are the most dynamic component in the complex as erosion and deposition regularly re-arranges the location and specific soil properties of these surfaces. Herbaceous species tend to dominate these frequently-disturbed areas. Floodplains and natural levees are typically not as frequently disturbed or as wet as stream banks, and therefore support more woody vegetation. Shrubs, such as redosier dogwood and speckled alder, dominate floodplains in areas with intermediate levels of disturbance, including mostly ice scour and flooding. Trees tend to dominate on floodplains where disturbances are less frequent and soils are more stable, with silver maple common along larger streams and balsam poplar common along medium sized streams. Upper terraces receive the least amount of flooding and disturbance, and tend to support more upland species such as sugar maple, yellow birch, and green ash.

The proportion of each component in the riparian ecological site complex varies with disturbance. Areas with lower intensity and frequency of disturbance have a greater proportion of silver maple, while areas with greater disturbance tend to support more herb and shrub communities.

The construction of dams and bank armoring structures tend to reduce the frequency of disturbance on floodplains, resulting in a greater proportion of forested communities following the construction of these structures. High intensity floods are likely to occur infrequently in these systems, however, their effects are not currently understood.

State and transition model

Other references

Gawler, S. and A. Cutko. 2010. Natural Landscapes of Maine: A Guide to Natural Communities and Ecosystems. Maine Natural Areas Program, Maine Department of Conservation, Augusta, Maine.

Contributors

Jamin Johanson

Acknowledgments

Nick Butler and Carl Bickford provided considerable review of this ecological site concept.

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

17. **Perennial plant reproductive capability:**