

Embryo Dune and *Ammophila breviligulata* Herbaceous Foredune Embryo Dune and American Beachgrass Herbaceous Foredune

Description

Concept: These two early seral herbaceous communities are characterized by large patches of open sand and are strongly dominated by *Ammophila breviligulata*. Embryo dune (1A) occurs in the backshore area above the mean high tide line and the foredune association (1B) typically occurs on the dune ramp and crest of the first dune ridge (primary dune) of a coastal dune system. These communities are found across coastal dune systems in NB; however embryo dunes are not present in all dune complexes.

Vegetation: Both communities are sparsely vegetated and have relatively low species richness. Embryo dunes are characterized by at least 50% bare sand and the following dune-initiating plants: *Cakile edentula*, *Atriplex laciniata*, *Salsola kali*, *Honckenya peploides*, *Artemisia stelleriana*, and *Chenopodium berlandieri* var. *macrocalycium*. *Leymus mollis* and *Ammophila breviligulata* become more prominent near the slope of the first dune ridge of the embryo dune community. The foredune association is characterized by greater than 50% vegetation cover (but usually less than 75%) and is dominated by *Ammophila breviligulata* and *Lathyrus japonicus*. *Cakile edentula* and *Leymus mollis* are less frequent than in 1A and *Atriplex laciniata*, *Salsola kali* and *Honckenya peploides* are no longer present. Foredune vegetation composition and cover can vary considerably with dune height, slope and erosion/accumulation status. *Morella pennsylvanica* and *Rosa virginiana* may be present when 1B occurs on lee slopes of primary dune ridges.



Grants Beach, NB (1A - foreground; 1B - background).



Escuminac Beach, NB (1A - right; 1B - left).

Embryo Dune and *Ammophila breviligulata* Herbaceous Foredune

Description Cont'd

Environment: The conditions of the embryo dune and foredune are harsh, with high salt content due to salt spray and high onshore winds. The substrate is well drained and often dry. Nutrients are provided by decaying Eel grass (*Zostera maritima*), macrophytic algae and seaweed washed in shore by storm waves as well as deposition from sea spray and fog. Minimal soil formation has begun in the foredune association, with plant debris accumulation. These young associations usually occur less than 9 meters above sea level.

Dynamics: These two associations represent the first stages of dune succession for much of Eastern New Brunswick. Vegetation fragments (including eel grass and seaweed) and debris washed in from storm waves allow colonization by dune initiating plants, forming embryo dunes. Embryo dunes are the least stable of dune communities and can be washed away by storm waves. With increased vegetation cover the embryo dune is less likely to be washed away. As dune height increases a shift in vegetation changes and the embryo dune develops into a foredune community. The foredune constitutes the first stage of sand fixation. Foredunes are also susceptible to wash over by storm waves and experience blowouts (windblown depressions), especially where human disturbance is present.

Range: These communities are found across the Maritime Provinces; however the major sand dune systems occur in Eastern New Brunswick and the northern shore of Prince Edward Island. Embryo dunes do not occur in all dune complexes and are absent in areas of actively eroding coastline.

Conservation Status (NatureServe)

Global Conservation Rank:

National Conservation Rank:

Subnational Conservation Rank: NB: S4 (1A), S4 (1B)



Preston Beach, NB (1A).



North Richibucto Dune, NB (1A - right; 1B - left).

Embryo Dune and *Ammophila breviligulata* Herbaceous Foredune**Distribution**

Countries: Canada

Provinces / Territories / States: New Brunswick

The Nature Conservancy / Nature Conservancy of Canada

Ecoregions: Northern Appalachian-Acadian Forest

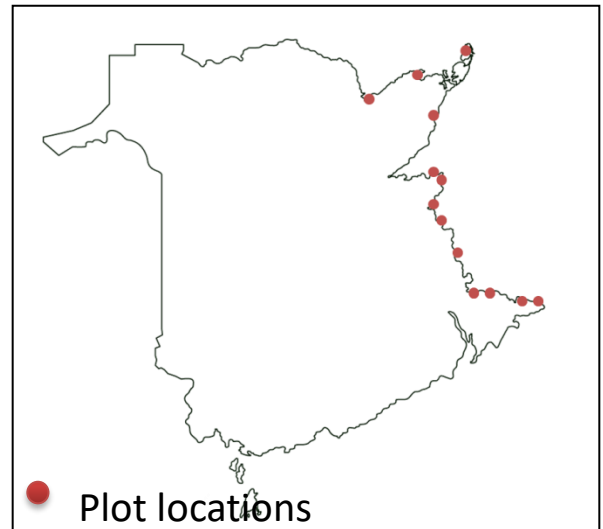
New Brunswick Ecological Land Classification (ecoregions):
Eastern Lowlands

Constituent Provincial / Territorial Types

Provinces / Territories / States: New Brunswick

Ecozones and Ecoregions of Canada: Atlantic Maritime: Maritime Lowlands

Commission for Environmental Cooperation Ecological Regions of North America: Northern Forests



Embryo Dune and *Ammophila breviligulata* Herbaceous Foredune

Vegetation Summary

Species Name*	1A embryo dune		1B foredune	
	%	%	%	%
	Cover	Presence	Cover	Presence
	23 Plots		24 Plots	
Herbaceous vegetation				
<i>Ammophila breviligulata</i>	18.8	87.0	60.0	100.0
<i>Leymus mollis</i>	7.7	56.5	5.8	33.3
<i>Artemisia stelleriana</i>	5.9	60.9	5.5	54.2
<i>Atriplex laciniata</i>	1.5	30.4	-	-
<i>Cakile edentula</i>	1.3	39.1	0.0	4.2
<i>Honckenya peploides</i>	0.8	13.0	-	-
<i>Chenopodium berlandieri</i> var. <i>macrocalycium</i>	0.7	4.3	0.5	8.3
<i>Lathurus japonicus</i>	0.4	13.0	6.8	70.8
<i>Salsola kali</i>	0.3	17.4	-	-
<i>Solidago sempervirens</i>	-	-	0.6	4.2
<i>Atriplex subspicata</i>	-	-	0.0	4.2
<i>Atriplex patula</i>	-	-	0.0	4.2
Herb Stratum (Min–Mean–Max Cover)	10-33-50		40-73-100	

Embryo Dune and *Ammophila breviligulata* Herbaceous Foredune

Site Characteristics*

	1A embryo dune 23 Plots	1B foredune 24 Plots
Elevation Range (min–mean–max meters)	(-1)-3-9	1-5-12
Slope Gradient (% frequency)	gentle (60.9) moderate (39.1)	gentle (54.2) moderate (44.8)
Slope Position (% frequency)	mid (78.3) upper (21.7)	mid (54.2) upper (8.3) crest (12.5)
Exposure (% frequency)	exposed (100.0)	exposed (100.0)
Aspect (% frequency)	south (8.7) east (34.8) west (4.3) north (26.1) missing data (26.1)	south (25.0) east (25.0) west (4.2) north (37.5) missing data (8.2)
Orientation (% frequency)	facing ocean (100.0)	facing ocean (99.8) missing data (0.2)

Embryo Dune and *Ammophila breviligulata* Herbaceous Foredune

Author: S. Robinson. All photos courtesy of S. Robinson, AC CDC.

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.

Ammophila breviligulata Herbaceous Dune Meadow American Beachgrass Herbaceous Dune Meadow

Description

Concept: Typically the second stage of dune succession and the most recognizable dune vegetation type, the *Ammophila breviligulata* dominated dune meadow association usually occurs immediately behind the foredune and shows a greater plant cover and diversity than the foredune association (Fact Sheet 1). Up to 25% of the sand surface may be unvegetated and sand movement and deposition is high. The *Ammophila breviligulata* dune meadow is divided into two sub associations: *Ammophila breviligulata* herbaceous open dune (2A) and *Ammophila breviligulata* herbaceous closed dune (2B). Vegetation cover of 2A is more open, less floristically diverse compared to 2B and usually occurs closer to the beach.

Vegetation: The 2A association is characterized by 75% vegetation cover with patches of loose sand. *Ammophila breviligulata* strongly dominates accompanied by sparse occurrences of *Artemisia stelleriana*, *Oenothera biennis*, *Fragaria virginiana* and a few other species. The 2B association is very similar to 2A, but is denser and has sparse occurrences of several new species. It is dominated by at least 85% coverage by *Ammophila breviligulata*. Frequent associates include *Lathyrus japonicus*, *Solidago sempervirens* and *Festuca rubra*. Several other species not encountered in 2A are present including *Carex silicea*, *Moehringia lateriflora*, *Hieracium* spp., and *Achillea millefolium*. Shrub species such as *Rubus idaeus* ssp. *strigosus*, *Morella pensylvanica*, and *Rosa virginiana* may be present but cover is limited. Typically no bryophytes and lichens are present on the dune meadow habitats as the mobile sand prevents colonization.



Escuminac Beach, NB (2A).



Grants Beach, NB (2A).

Ammophila breviligulata Herbaceous Dune Meadow

Description Cont'd

Environment: The sand of the dune meadow is more stable than previous associations (foredune) and preliminary soil development begins. A humus layer begins to accumulate from decaying plant litter, which traps both water and nutrients. There is more shelter from onshore winds and therefore less salt spray. This association may also occur in stable dunes further inland that have been disturbed through natural or human activities.

Dynamics: The *Ammophila breviligulata* dune meadow association is typically the second stage of succession for New Brunswick coastal dunes. The association may be subject to changes in morphology as sand continues to be blown from the beach. It may still be susceptible to wash over by storm waves particularly where the foredune ridge is low. Dune meadow vegetation is very susceptible to human disturbance, especially trampling, which may result in blowouts. These associations are frequently subject to colonization by non-native plants typical of waste ground, such as *Hieracium* spp., *Linaria vulgaris* and *Taraxacum officinale*, among others.

Range: These communities are commonly found in dune complexes across the Maritime Provinces; however the majority of sand dunes occur in Eastern New Brunswick and the northern shore of Prince Edward Island.



Grande Plaine, Miscou Island, NB (2B).



Grants Beach, NB (2B).

Conservation Status (NatureServe)

Global Conservation Rank:

National Conservation Rank:

Subnational Conservation Rank: NB: S3S4 (2A), S3S4 (2B)

Ammophila breviligulata* Herbaceous Dune Meadow*Distribution**

Countries: Canada

Provinces / Territories / States: New Brunswick

The Nature Conservancy / Nature Conservancy of Canada

Ecoregions: Northern Appalachian-Acadian Forest

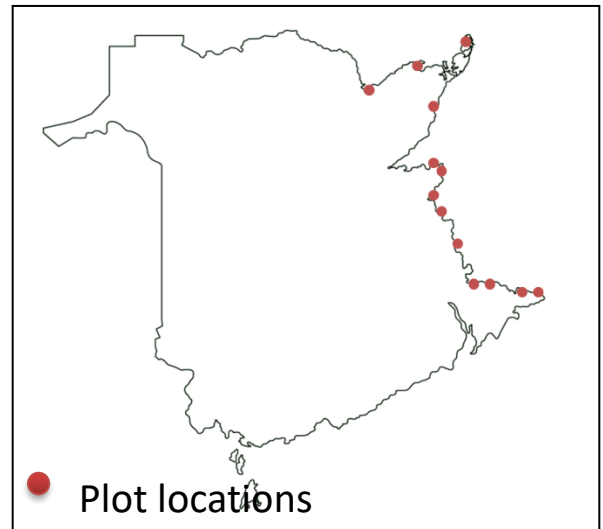
New Brunswick Ecological Land Classification (ecoregions):
Eastern Lowlands

Constituent Provincial / Territorial Types

Provinces / Territories / States: New Brunswick

Ecozones and Ecoregions of Canada: Atlantic Maritime: Maritime Lowlands

Commission for Environmental Cooperation Ecological Regions of North America: Northern Forests



Ammophila breviligulata* Herbaceous Dune Meadow*Vegetation Summary**

Species Name*	2A herbaceous open dune		2B herbaceous closed dune	
	% Cover	% Presence	% Cover	% Presence
	26 Plots		29 Plots	
Trees and/or shrubs				
<i>Rubus idaeus ssp. strigosus</i>	-	-	1.2	6.9
<i>Morella pensylvanica</i>	-	-	0.8	6.9
<i>Rosa virginiana</i>	-	-	0.2	3.4
Shrub Stratum (Min–Mean–Max Cover)	5-12-20			
Herbaceous				
<i>Ammophila breviligulata</i>	79.8	100.0	74.3	100.0
<i>Artemisia stelleriana</i>	1.8	30.8	0.1	3.4
<i>Oenothera biennis</i>	0.1	7.7	0.2	10.3
<i>Vicia cracca</i>	0.4	3.8	-	-
<i>Fragaria virginiana</i>	0.2	3.8	0.4	6.9
<i>Solidago sempervirens</i>	0.1	3.8	1.6	34.5
<i>Leymus mollis</i>	0.0	3.8	-	-
<i>Lathrus japonicus</i>	-	-	6.7	58.6
<i>Festuca rubra</i>	-	-	9.6	27.6
<i>Moehringia lateriflora</i>	-	-	3.4	24.1
<i>Achillea millefolium</i>	-	-	0.4	17.2
<i>Carex silicea</i>	-	-	0.7	13.8
<i>Hieracium spp.</i>	-	-	3.0	10.3
<i>Linaria vulgaris</i>	-	-	0.6	10.3
<i>Lactuca biennis</i>	-	-	0.2	10.3
<i>Maianthemum stellatum</i>	-	-	0.4	6.9
<i>Calystegia sepium</i>	-	-	0.3	3.4
<i>Conyza canadensis</i>	-	-	0.0	3.4
<i>Taraxacum officinale</i>	-	-	0.0	3.4
Herb Stratum (Min–Mean–Max Cover)	70-86-100		80-94-100	

Ammophila breviligulata* Herbaceous Dune Meadow*Site Characteristics**

	2A herbaceous open dune 26 Plots	2B herbaceous closed dune 29 Plots
Elevation Range (min–mean–max meters)	0-6-15	0-4-9
Slope Gradient (% frequency)	level (30.8) gentle (53.8) moderate (15.3)	level (51.7) gentle (41.4) moderate (6.9)
Slope Position (% frequency)	depression (4.3) level (19.3) mid (47.8) upper (30.4) crest (13.0)	depression (3.4) level (30.9) mid (48.3) upper (6.9) crest (10.3)
Exposure (% frequency)	exposed (92.3) moderately exposed (7.7) missing data (7.7)	exposed (55.2) moderately exposed (37.9) missing data (6.9)
Aspect (% frequency)	south (23.1) east (11.5) west (11.5) north (19.2) level (26.9)	south (17.3) east (6.9) west (3.4) north (6.9) level (21.7) missing data (20.7)

Ammophila breviligulata* Herbaceous Dune Meadow*Site Characteristics (cont'd)**

	2A herbaceous open dune 26 Plots	2B herbaceous closed dune 29 Plots
Orientation (% frequency)	facing ocean (23.1) facing inland (42.3) level (34.6)	facing ocean (10.3) facing inland (37.9) level (51.7) missing data (3.4)

***Ammophila breviligulata* Herbaceous Dune Meadow**

Author: S. Robinson. All photos courtesy of S. Robinson, AC CDC.

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***Ammophila breviligulata* / *Cladina* spp. Herbaceous / Lichen Fixed Dune,
Morella pensylvanica / *Cladina* spp. Shrub / Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

**American Beachgrass / Reindeer Lichen Fixed Dune, Bayberry / American
 Beachgrass / Reindeer Lichen Shrub / Herbaceous Fixed Dune, and Bayberry
 Shrub Dune**

Description

Concept: These associations are found on stable dunes further inland from previous associations (foredune and *Ammophila breviligulata* dune meadow (Fact Sheets 1 and 2). Plant species richness is greater due to better water holding capacity and increased nutrient availability of the soil. Vegetation cover reaches 100% as bryophytes and lichens fill the spaces between plants. *Ammophila breviligulata* contributes less cover than previous associations and may appear in isolated patches. Cover by shrub species is more consistent. This sheet describes three associations: *Ammophila breviligulata* - *Cladina* spp. Herbaceous - lichen fixed dune (3A), *Morella pensylvanica* - *Cladina* herbaceous/shrub fixed dune (3B) and *Morella pensylvanica* shrub dune (3C).

Vegetation: All associations typically have complete vegetation cover. The 3A community is characterized by *Ammophila breviligulata* and up to 30% of the ground surface cover with lichens and bryophytes. Associated herbaceous plants other than *Ammophila* are typically *Carex silicea*, *Lathyrus japonicus*, and *Moehringia lateriflora*. Lichen species, especially *Cladina rangiferina*, *Cladina mitis* and *Cladonia cristatella*, are common ground cover associates. Minimal shrub cover is present, mainly consisting of *Morella pensylvanica*, *Rubus idaeus* ssp. *strigosus* and occasionally tree species such as *Picea glauca*. The 3B association is similar to 3A but considerably more shrub cover is present, mostly consisting of *Morella pensylvanica*. *Picea glauca* or *Populus tremuloides* may occur in the shrub stratum. Lichen and bryophyte cover is increased and diversity of lichen species is greater within the ground layer. The 3C association is



Escuminac Beach Provincial Park, NB (3A).



Grants Beach, NB (3B).

***Ammophila breviligulata* - *Cladina* spp. Herbaceous - Lichen Fixed Dune,
Morella pensylvanica - *Cladina* spp. Shrub - Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

Description Cont'd

Vegetation (cont'd): characterized by at least 50% cover of woody shrub species, mostly *Morella pensylvanica*, though *Rubus idaeus* ssp. *strigosus* and *Rosa virginiana* can be associated and occasionally dominates. Few lichens or bryophytes are present as a result of the dense shrub canopy.

Environment: Conditions are much less severe than those closer to shore. There is more shelter from high winds and sand is no longer being deposited. These dunes are usually wider than those nearer the shore and a true soil begins to form as humus layers develop. Decaying vegetation helps to retain soil moisture, but in hot summer months these communities frequently experience drought conditions.

Dynamics: These associations are present in stable fixed dune stages usually 50-100 meters from the shore. With continued stability, this stage may result in the development of forest associations over time.

Range: These communities are found across the Maritime Provinces; however the major sand dune systems occur in Eastern New Brunswick and the northern shore of Prince Edward Island. Most of the dune systems surveyed in New Brunswick supported all three fixed dune community types.



Cape Jourimain National Wildlife Area, NB (3C).

***Ammophila breviligulata* - *Cladina* spp. Herbaceous - Lichen Fixed Dune,
Morella pensylvanica - *Cladina* spp. Shrub - Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

Distribution

Countries: Canada

Provinces / Territories / States: New Brunswick

The Nature Conservancy / Nature Conservancy of Canada

Ecoregions: Northern Appalachian-Acadian Forest

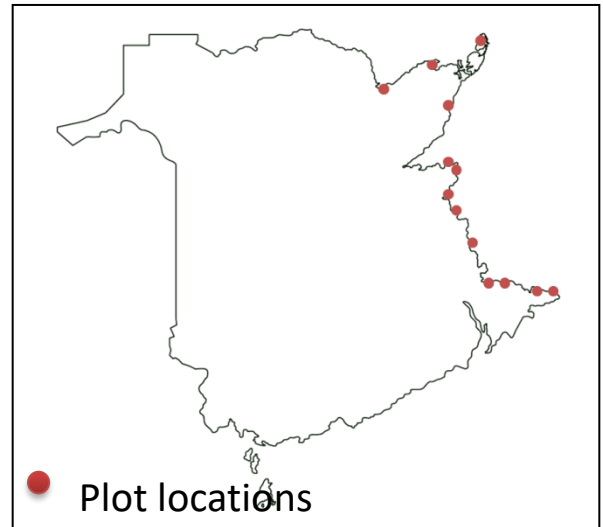
New Brunswick Ecological Land Classification (ecoregions):
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Provinces / Territories / States: New Brunswick

Ecozones and Ecoregions of Canada: Atlantic Maritime: Maritime Lowlands

Commission for Environmental Cooperation Ecological Regions of North America: Northern Forests



Conservation Status (NatureServe)

Global Conservation Rank:

National Conservation Rank:

Subnational Conservation Rank: NB: S3 (3A), S2S3 (3B), S3? (3C)

***Ammophila breviligulata* - *Cladina* spp. Herbaceous - Lichen Fixed Dune,
Morella pensylvanica - *Cladina* spp. Shrub - Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

Vegetation Summary

Species Name*	3A herbaceous/lichen fixed dune		3B herbaceous/shrub fixed dune	
	% Cover	% Presence	% Cover	% Presence
	54 Plots		39 Plots	
Trees and/or shrubs				
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	0.1	5.6	1.6	20.5
<i>Picea glauca</i>	0.1	3.7	1.3	20.5
<i>Morella pensylvanica</i>	0.6	1.9	9.6	71.8
<i>Populus tremuloides</i>	0.1	1.9	0.1	2.6
<i>Vaccinium angustifolium</i>	0.1	1.9	1.6	12.8
<i>Rosa virginiana</i>	0.0	1.9	0.9	15.4
<i>Ribes hirtellum</i>	-	-	0.1	2.6
<i>Amelanchier</i> sp.	-	-	0.1	2.6
Shrub <i>Stratum</i> (Min–Mean–Max Cover)	0-1-5		0-5-20	
Herbs and dwarf shrubs				
<i>Ammophila breviligulata</i>	68.5	100.0	50.5	100.0
<i>Carex silicea</i>	5.3	55.6	4.0	48.7
<i>Lathyrus japonicus</i>	3.5	42.6	1.5	28.2
<i>Achillea millefolium</i>	1.4	35.2	0.7	25.6
<i>Moehringia lateriflora</i>	3.0	33.3	0.9	20.5
<i>Oenothera biennis</i>	0.6	27.8	0.3	23.1
<i>Hieracium</i> spp.	2.5	22.2	3.5	38.5
<i>Linaria vulgaris</i>	1.1	16.7	2.2	25.6
<i>Maianthemum stellatum</i>	1.0	16.7	1.2	23.1
<i>Festuca rubra</i>	3.9	13.0	3.2	25.6
<i>Fragaria virginiana</i>	1.4	13.0	0.9	10.3
<i>Symphyotrichum novi-belgii</i>	0.4	11.1	0.7	15.4
<i>Artemisia stelleriana</i>	0.9	9.3	-	-
<i>Carex tonsa</i>	0.9	9.3	0.5	10.3
<i>Juncus balticus</i> var. <i>littoralis</i>	1.4	7.4	0.3	2.6
<i>Hudsonia tomentosa</i>	0.5	5.6	2.7	15.4
<i>Trifolium arvense</i>	0.7	3.7	0.1	5.1
<i>Trifolium campestre</i>	0.6	3.7	-	-
<i>Juniperus horizontalis</i>	0.6	3.7	0.5	5.1
<i>Danthonia spicata</i>	0.5	1.9	1.5	12.8

***Ammophila breviligulata* - *Cladina* spp. Herbaceous - Lichen Fixed Dune,
Morella pensylvanica - *Cladina* spp. Shrub - Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

Vegetation Summary (cont'd)

Species Name*	3A herbaceous/lichen fixed dune		3B herbaceous/shrub fixed dune	
	% Cover	% Presence	% Cover	% Presence
Herbs and dwarf shrubs				
<i>Solidago sempervirens</i>	0.3	11.1	0.2	10.3
<i>Anaphalis margaritacea</i>	0.3	5.6	0.4	10.3
<i>Sonchus arvensis</i>	0.1	5.6	0.1	5.1
<i>Agrostis</i> sp.	0.1	3.7	-	-
<i>Conyza canadensis</i>	0.0	3.7	-	-
<i>Rumex acetosa</i>	0.0	3.7	0.1	7.7
<i>Lactuca biennis</i>	0.2	1.9	0.1	5.1
<i>Vaccinium vitis-idaea</i>	0.2	1.9	0.8	2.6
<i>Sibbaldiopsis tridentata</i>	0.1	1.9	0.1	5.1
<i>Poa</i> sp.	0.1	1.9	0.3	2.6
<i>Iris</i> sp.	0.1	1.9	-	-
<i>Erigeron strigosus</i>	0.0	1.9	-	-
<i>Solidago canadensis</i>	0.0	1.9	-	-
<i>Solidago puberula</i>	0.0	1.9	0.2	5.1
<i>Vicia cracca</i>	-	-	0.2	12.8
<i>Lechea maritima</i>	-	-	0.3	7.7
<i>Solidago rugosa</i>	-	-	0.2	5.1
<i>Senecio sylvaticus</i>	-	-	0.2	5.1
<i>Spartina pectinata</i>	-	-	0.3	2.6
<i>Empetrum nigrum</i>	-	-	0.2	2.6
<i>Trifolium pratense</i>	-	-	0.1	2.6
<i>Vaccinium macrocarpon</i>	-	-	0.1	2.6
<i>Leucanthemum vulgare</i>	-	-	0.0	2.6
Herb Stratum (Min-Mean-Max Cover)	70-85-100		20-75-100	
Bryophytes and Lichens				
<i>Cladina rangiferina</i>	6.9	70.2	8.7	48.3
<i>Cladina mitis</i>	3.2	59.6	3.8	43.1
<i>Cladonia cristatella</i>	2.6	59.6	1.2	36.2
<i>Moss</i> sp.	1.0	34.0	1.2	24.1

***Ammophila breviligulata* - *Cladina* spp. Herbaceous - Lichen Fixed Dune,
Morella pensylvanica - *Cladina* spp. Shrub - Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

Vegetation Summary (cont'd)

Species Name*	3A herbaceous/lichen fixed dune		3B herbaceous/shrub fixed dune	
	% Cover	% Presence	% Cover	% Presence
<i>Dicranum</i> spp.	1.0	19.1	0.6	13.8
<i>Cladonia gracilis</i> ssp. <i>turbinata</i>	0.7	19.1	0.9	27.6
<i>Cladonia verticillata</i>	0.6	14.9	1.0	13.8
<i>Ptilidium ciliare</i>	0.6	14.9	0.6	12.1
<i>Ploetricium</i> sp.	1.1	7.3	0.2	10.5
<i>Cetraria aculeata</i>	0.2	6.4	0.4	1.7
<i>Cladonia cornuta</i>	0.2	6.4	0.1	3.4
<i>Stereocaulon tomentosum</i>	0.1	6.4	0.2	1.7
<i>Hypogymnia physodes</i>	0.0	4.3	0.3	8.6
<i>Cladonia crispata</i>	0.0	2.1	0.2	1.7
<i>Cladonia phyllophora</i>	0.1	2.1	0.1	1.7
<i>Cladonia stellaris</i>	0.0	2.1	-	-
<i>Cladonia multiformis</i>	0.0	2.1	-	-
<i>Cladonia gracilis</i> ssp. <i>gracilis</i>	0.0	2.1	-	-
<i>Bryoria furcellata</i>	0.0	2.1	-	-
<i>Cladonia maxima</i>	-	-	0.2	5.2
Bryo-Lichen Stratum (Min-Mean-Max Cover)	5-21-75		0-36-70	

***Ammophila breviligulata* - *Cladina* spp. Herbaceous - Lichen Fixed Dune,
Morella pensylvanica - *Cladina* spp. Shrub - Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

Vegetation Summary (cont'd)

Species Name*	3C shrub fixed dune	
	% Cover	% Presence
18 Plots		
Woody Shrubs and Small Trees		
<i>Morella pensylvanica</i>	72.8	100.0
<i>Rubus idaeus ssp. strigosus</i>	5.4	66.7
<i>Rosa virginiana</i>	6.9	33.3
<i>Spiraea alba var. latifolia</i>	6.4	11.1
<i>Picea glauca</i>	0.7	11.1
<i>Populus tremuloides</i>	0.3	5.6
<i>Vaccinium angustifolium</i>	0.2	5.6
Shrub Stratum (Min–Mean–Max Cover)	60-87-100	
Herbs and dwarf shrubs		
<i>Ammophila breviligulata</i>	9.3	72.2
<i>Maianthemum stellatum</i>	2.4	33.3
<i>Linaria vulgaris</i>	2.8	27.8
<i>Symphotrichum novi-belgii</i>	0.7	16.7
<i>Moehringia lateriflora</i>	0.4	16.7
<i>Lathyrus japonicus</i>	0.3	16.7
<i>Senecio sylvaticus</i>	0.4	11.1
<i>Cornus canadensis</i>	0.3	5.6
<i>Achillea millefolium</i>	0.1	5.6
<i>Anaphalis margaritacea</i>	0.1	5.6
<i>Hieracium spp.</i>	0.1	5.6
<i>Agrostis sp.</i>	0.1	5.6
<i>Artemisia stelleriana</i>	0.1	5.6
<i>Carex silicea</i>	0.1	5.6
<i>Poa sp.</i>	0.1	5.6
<i>Solidago puberula</i>	0.1	5.6
Shrub Stratum (Min–Mean–Max Cover)	0-15-55	

***Ammophila breviligulata* - *Cladina* spp. Herbaceous - Lichen Fixed Dune,
Morella pensylvanica - *Cladina* spp. Shrub - Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

Vegetation Summary (cont'd)

Species Name*	3C shrub fixed dune	
	% Cover	% Presence
Bryophytes and Lichens		
<i>Cladonia chorophaea</i>	0.3	5.6
<i>Cladonia rangiferina</i>	0.3	5.6
<i>Dicranum</i> sp.	0.3	5.6
<i>Pleurozium schreberi</i>	0.3	5.6
<i>Cladonia gracilis</i> subsp. <i>turbinata</i>	0.1	5.6
<i>Cladina mitis</i>	0.1	5.6
<i>Ptilidium ciliare</i>	0.1	5.6
Bryo-Lichen Stratum (Min–Mean–Max Cover)	0-1-20	

***Ammophila breviligulata* - *Cladina* spp. Herbaceous - Lichen Fixed Dune,
Morella pensylvanica - *Cladina* spp. Shrub - Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

Site Characteristics

	3A fixed dune 54 Plots	3B fixed dune 39 Plots	3C fixed dune 18 Plots
Elevation Range (min–mean–max meters)	0-5-16	0-5-11	1-4-9
Slope Gradient (% frequency)	level (30.8) gentle (53.8) moderate (15.3)	level (51.7) gentle (41.4) moderate (6.9)	level (23.5) gentle (58.8) moderate (11.8) steep (5.8)
Slope Position (% frequency)	depression (4.3) level (19.3) mid (47.8) upper (30.4) crest (13.0)	depression (3.4) level (30.9) mid (48.3) upper (6.9) crest (10.3)	depression (5.8) level (23.5) mid (52.9) upper (17.6)
Exposure (% frequency)	exposed (92.3) moderately exposed (7.7) missing data (7.7)	exposed (55.2) moderately exposed (37.9) missing data (6.9)	exposed (41.2) moderately exposed (52.9) moderately sheltered (5.8)
Aspect (% frequency)	south (23.1) east (11.5) west (11.5) north (19.2) level (26.9)	south (17.3) east (6.9) west (3.4) north (6.9) level (21.7) missing data (20.7)	south (41.2) east (23.5) west (0.0) north (11.8) level (23.5)
Orientation (% frequency)	facing ocean (23.1) facing inland (42.3) level (34.6)	facing ocean (10.3) facing inland (37.9) level (51.7) missing data (3.4)	facing ocean (23.5) facing inland (52.9) level (23.5)

***Ammophila breviligulata* - *Cladina* spp. Herbaceous - Lichen Fixed Dune,
Morella pensylvanica - *Cladina* spp. Shrub - Herbaceous Fixed Dune, and
Morella pensylvanica Shrub Dune**

Author: S. Robinson. All photos courtesy of S. Robinson, AC CDC.

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.

***Cladina* spp. Fixed Dune, *Hudsonia tomentosa* Dwarf Shrub Fixed Dune and *Arctostaphylos uva-ursi* or *Empetrum nigrum* Dwarf Shrub Fixed Dune
Reindeer Lichen Fixed Dune, Sand-Heather Fixed Dune and Bearberry or Black
Crowberry Dwarf Shrub Fixed Dune**

Description

Concept: Several non-forested late successional fixed dune communities can be observed in Eastern New Brunswick coastal dune systems: the lichen dominated *Cladina* spp. fixed dune (4A), and two sub-shrub dominated communities: *Hudsonia tomentosa* dwarf shrub fixed dune (4B) and *Arctostaphylos uva-ursi* or *Empetrum nigrum* dwarf shrub fixed dune (4C). These associations are found on older dune complexes and are among the least frequently encountered dune vegetation types.

Vegetation: The 4A community is characterized by dominance of lichens in the genus *Cladina* especially *Cladina rangiferina* and *C. mitis*. *Ammophila breviligulata* is always associated and several other species commonly occur in this community including *Moehringia lateriflora* and *Carex silicea*. The 4B community is dominated by *Hudsonia tomentosa*. *Amophila breviligulata* is almost always present and other common associates include *Carex tonsa*, *Carex silicea* and along the Northumberland Coast the globally rare endemic *Lechea maritima* var. *subcylindrica*. Cover of lichens is usually high dominated by *Cladina rangiferina*, *C. mitis* and several *Cladonia* species. The 4C association is similar to 4B except for dominance of *Arctostaphylos uva-ursi* or *Empetrum nigrum*. *Morella pensylvanica* and *Vaccinium angustifolium* may also occur. Most of the same herbaceous species are present as in 4B but less lichen and bryophyte cover is present.

Environment: These communities occur on stable fixed dunes where sand is no longer being deposited. The environmental conditions are similar to other fixed dune communities. The *Cladina* association tends to occur in deflation areas or sheltered hollows protected by dune ridges. 4A and 4B may also be found in small openings surrounded by treed dunes. The dwarf shrub dominated communities (4C) tend to be found on dune ridges and slopes. Soil development seems minimal with some accumulated humus.



Grande Plaine, Miscou Island, NB (4A).



Youghall Beach, NB (4B).

***Cladina* spp. Fixed Dune, *Hudsonia tomentosa* Dwarf Shrub Fixed Dune and *Arctostaphylos uva-ursi* or *Empetrum nigrum* Dwarf Shrub Fixed Dune**

Description Cont'd

Dynamics: Successional status of these communities is not clear but it may represent a later successional state in areas where summer drought or temperatures prevent establishment of larger shrubs and trees. Evidence of fire was observed in one of dune systems surveyed which may also explain its occurrence in that location.

Range: These communities are found only in older dune systems in New Brunswick. The *Cladina* dominated association (4A) and the *Hudsonia tomentosa* association (4B) were found at six of the sixteen dune systems surveyed. *Lechea maritima* var. *subcylindrica* was only found in 4B associations at two locations: dune de Bouctouche and North Richibucto Dune. Communities dominated by *Arctostaphylos uva-ursi* were only found at two locations: Grande Plaines, Miscou Island and Dune de Bouctouche, but also occur on the North Richibucto Dune. Communities dominated by *Empetrum nigrum* were only recorded at Grande Plaine, Miscou Island, though small patches on *E. nigrum* were observed in dune communities elsewhere (but not recorded in plot data). Similar *Hudsonia tomentosa* dominated communities occur in Prince Edward Island. *Empetrum nigrum* communities occur in PEI and Sable Island. *Hudsonia tomentosa*, *Empetrum nigrum* and *Arctostaphylos uva-ursi* communities have been reported on the Magdalen Islands.



Dune de Bouctouche, NB (4C with *Arctostaphylos uva-ursi*).



Grande Plaine, Miscou Island, NB (4C with *Empetrum nigrum*).

Conservation Status (NatureServe)

Global Conservation Rank:

National Conservation Rank:

Subnational Conservation Rank: NB: S2 (4A), S2 (4B), S2 (4C)

***Cladina* spp. Fixed Dune, *Hudsonia tomentosa* Dwarf Shrub Fixed Dune and *Arctostaphylos uva-ursi* or *Empetrum nigrum* Dwarf Shrub Fixed Dune**

Distribution

Countries: Canada

Provinces / Territories / States: New Brunswick

The Nature Conservancy / Nature Conservancy of Canada

Ecoregions: Northern Appalachian-Acadian Forest

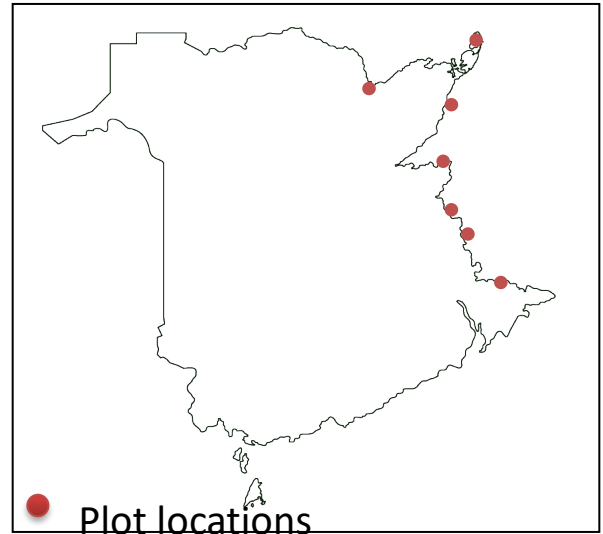
New Brunswick Ecological Land Classification (ecoregions):
Eastern Lowlands

Constituent Provincial / Territorial Types

Provinces / Territories / States: New Brunswick

Ecozones and Ecoregions of Canada: Atlantic Maritime: Maritime Lowlands

Commission for Environmental Cooperation Ecological Regions of North America: Northern Forests



Cladina spp. Fixed Dune, *Hudsonia tomentosa* Dwarf Shrub Fixed Dune and *Arctostaphylos uva-ursi* or *Empetrum nigrum* Dwarf Shrub Fixed Dune

Vegetation Summary

Species Name*	4A lichen fixed dune		4B dwarf shrub fixed dune		4C dwarf shrub fixed dune	
	% Cover	% Presence	% Cover	% Presence	% Cover	% Presence
	14 Plots		31 Plots		5 Plots	
Trees and/or shrubs						
<i>Vaccinium angustifolium</i>	3.3	21.4	0.6	9.7	2.0	20.0
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	0.1	7.1	-	-	-	-
<i>Populus tremuloides</i>	-	-	0.5	9.7	-	-
<i>Morella pensylvanica</i>	-	-	0.4	6.5	6.0	60.0
<i>Picea glauca</i>	-	-	0.2	6.5	-	-
<i>Betula populifolia</i>	-	-	0.1	3.2	-	-
<i>Amelanchier</i> sp.	-	-	0.1	3.2	-	-
Shrub Stratum (Min–Mean–Max Cover)	0-1-5		0-5-20		0-5-20	
Herbs and dwarf shrubs						
<i>Ammophila breviligulata</i>	36.1	92.9	28.7	96.8	7.0	60.0
<i>Carex silicea</i>	5.4	57.1	4.3	41.9	0.4	20.0
<i>Moehringia lateriflora</i>	0.8	35.7	0.2	6.5	-	-
<i>Hieracium</i> spp.	2.9	21.4	1.1	22.6	0.2	20.0
<i>Fragaria virginiana</i>	1.7	21.4	0.6	9.7	1.8	60.0
<i>Maianthemum stellatum</i>	1.1	21.4	0.9	9.7	-	-
<i>Symphotrichum novi-belgii</i>	0.9	21.4	0.0	0.0	-	-
<i>Solidago sempervirens</i>	0.4	21.4	0.0	0.0	-	-
<i>Rumex acetosa</i>	0.8	14.3	0.0	0.0	-	-
<i>Oenothera biennis</i>	0.1	14.3	0.3	12.9	-	-
<i>Hudsonia tomentosa</i>	1.4	7.1	28.3	90.3	7.0	40.0
<i>Trifolium arvense</i>	1.4	7.1	0.0	0.0	-	-
<i>Lathyrus japonicus</i>	0.5	7.1	2.7	48.4	2.0	40.0
<i>Linaria vulgaris</i>	0.5	7.1	0.1	3.2	-	-
<i>Achillea millefolium</i>	0.4	7.1	0.4	12.9	-	-
<i>Lechea maritima</i> var. <i>subcylindrica</i>	0.1	7.1	1.5	25.8	0.6	40.0
<i>Sibbaldiopsis tridentata</i>	0.1	7.1	0.6	6.5	1.6	40.0
<i>Taraxacum officinale</i>	0.1	7.1	0.0	0.0	-	-
<i>Carex tomsa</i>	-	-	3.4	54.8	1.4	40.0
<i>Anaphalis margaritacea</i>	-	-	0.9	16.1	-	-
<i>Festuca rubra</i>	-	-	1.9	9.7	1.4	40.0
<i>Vaccinium vitis-idaea</i>	-	-	1.8	9.7	-	-
<i>Juniperus horizontalis</i>	-	-	0.8	6.5	2.0	20.0
<i>Danthonia spicata</i>	-	-	0.2	6.5	1.4	40.0

Cladina spp. Fixed Dune, *Hudsonia tomentosa* Dwarf Shrub Fixed Dune and *Arctostaphylos uva-ursi* or *Empetrum nigrum* Dwarf Shrub Fixed Dune

Vegetation Summary (cont'd)

Species Name*	4A lichen fixed dune		4B dwarf shrub fixed dune		4C dwarf shrub fixed dune	
	% Cover	% Presence	% Cover	% Presence	% Cover	% Presence
<i>Juniperus communis</i>	-	-	0.2	6.5	-	-
<i>Empetrum nigrum</i>	-	-	0.2	3.2	23.0	60.0
<i>Arctostaphylos uva-ursi</i>	-	-	0.3	3.2	32.0	40.0
<i>Artemisia stelleriana</i>	-	-	0.3	3.2	-	-
<i>Vicia cracca</i>	-	-	0.2	3.2	-	-
<i>Epigaea repens</i>	-	-	0.1	3.2	-	-
<i>Dichanthelium</i> sp.	-	-	-	-	1.0	40.0
Herb Stratum (Min–Mean–Max Cover)	70-85-100		20-75-100		25-61-100	
Bryophytes and lichens						
<i>Cladina mitis</i>	13.2	78.6	6.2	80.6	4.0	20.0
<i>Cladina rangiferina</i>	30.9	78.6	12.8	74.2	10.0	60.0
<i>Dicranum</i> sp.	1.6	42.9	0.3	12.9	-	-
<i>Cladonia chorophaea</i>	0.6	35.7	2.9	38.7	0.4	20.0
<i>Cladina stellaris</i>	2.6	35.7	1.3	12.9	0.4	20.0
<i>Cladonia cristatella</i>	4.6	28.6	3.3	38.7	0.0	20.0
<i>Cladonia gracilis</i> subsp. <i>turbinata</i>	2.7	28.6	0.8	19.4	-	-
<i>Cladonia verticillata</i>	1.0	28.6	2.1	16.1	-	-
<i>Pleurozium schreberi</i>	2.4	28.6	-	-	-	-
<i>Ptilidium ciliare</i>	2.1	21.4	0.4	9.7	-	-
<i>Moss</i> sp.	1.1	14.3	1.1	19.4	-	-
<i>Polytrichum</i> spp.	5.0	14.3	1.1	12.9	-	-
<i>Cetraria islandica</i>	0.7	7.1	0.5	6.5	-	-
<i>Cladonia</i> sp.	0.3	7.1	0.3	6.5	-	-
<i>Cladonia cornuta</i>	0.1	7.1	0.2	3.2	-	-
<i>Cladonia acuminata</i>	4.3	7.1	-	-	-	-
<i>Peltigera malacea</i>	1.1	7.1	-	-	-	-
<i>Cladonia scabriuscula</i>	0.1	7.1	-	-	-	-
<i>Hypogymnia physodes</i>	-	-	3.2	19.4	1.0	40.0
<i>Cetraria aculeata</i>	-	-	1.0	16.1	1.0	40.0
<i>Cladonia furcata</i>	-	-	0.5	6.5	-	-
<i>Bryoria furcellata</i>	-	-	0.4	6.5	-	-
<i>Cladonia phyllophora</i>	-	-	0.3	6.5	-	-
<i>Cladonia maxima</i>	-	-	0.1	3.2	-	-
<i>Cladonia crispata</i>	-	-	0.0	3.2	-	-
<i>Cladonia subulata</i>	-	-	0.0	3.2	-	-
<i>Stereocaulon tomentosa</i>	-	-	0.0	3.2	-	-
Bryo-Lichen Stratum (Min–Mean–Max Cover)	45-72-95		30-69-95		20-43-60	

***Cladina* spp. Fixed Dune, *Hudsonia tomentosa* Dwarf Shrub Fixed Dune and *Arctostaphylos uva-ursi* or *Empetrum nigrum* Dwarf Shrub Fixed Dune**

Site Characteristics

	4A fixed dune 14 Plots	4B fixed dune 31 Plots	4C fixed dune 5 Plots
Elevation Range (min–mean–max meters)	0-4-9	0-4-8	0-2-6
Slope Gradient (% frequency)	level (38.5) gentle (61.5)	level (33.3) gentle (47.6) moderate (14.3) missing (4.8)	level (60.0) gentle (40.0)
Slope Position (% frequency)	depression (0) level (2.2) mid (53.8) upper (15.3) crest (7.7)	depression (4.7) level (28.4) mid (42.8) upper (19.0)	depression (0) level (40.0) mid (40.0) upper (20.0)
Exposure (% frequency)	exposed (53.8) moderately exposed (46.2)	exposed (38.1) moderately exposed (33.3) moderately sheltered (4.7) missing data (23.8)	exposed (40.0) moderately exposed (0) moderately sheltered (0) sheltered (40.0) missing data (20.0)
Aspect (% frequency)	south (7.7) east (15.4) west (15.4) north (23.1) level (38.5)	south (9.5) east (19.0) west (14.3) north (4.8) level (33.3) missing data (19.0)	south (20.0) east (20.0) west (0) north (0) level (60.0)

***Cladina* spp. Fixed Dune, *Hudsonia tomentosa* Dwarf Shrub Fixed Dune and *Arctostaphylos uva-ursi* or *Empetrum nigrum* Dwarf Shrub Fixed Dune**

Site Characteristics (cont'd)

	4A fixed dune 14 Plots	4B fixed dune 31 Plots	4C fixed dune 5 Plots
Orientation (% frequency)	facing ocean (23.1) facing inland (38.5) level (19.2)	facing ocean (23.8) facing inland (33.3) level (33.3) missing data (9.5)	facing ocean (20.0) facing inland (20.0) level (60.0)

***Cladina* spp. Fixed Dune, *Hudsonia tomentosa* Dwarf Shrub Fixed Dune and *Arctostaphylos uva-ursi* or *Empetrum nigrum* Dwarf Shrub Fixed Dune**

Author: S. Robinson. All photos courtesy of S. Robinson, AC CDC.

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.

Picea glauca Forested Fixed Dune White Spruce Forested Fixed Dune

Description

Concept: The white spruce forested fixed dune represents a mature dune community, typically a final stage in dune succession in Eastern New Brunswick. It is characterized by a tree canopy over 10 meters tall with a variable understory and ground level vegetation with a lichen/moss layer. This association can occur where dunes are fully attached to the mainland or on larger island dune complexes in Eastern New Brunswick.

Vegetation: The characteristic species in this association is *Picea glauca*, with a moderately open to closed canopy. Other tree species may be present in an inferior tree canopy including *Populus tremuloides*, *Amelanchier* sp., and *Betula papyrifera*. The understory is variable depending on the canopy cover. A more open community supports a *Morella pensylvanica* and/or *Hudsonia tomentosa* understory. *Ammophila breviligulata* is commonly still present but contributes very sparse cover. Mosses and lichens usually contribute a significant ground layer (up to 80%) mostly accounted for by *Cladina rangiferina* and *Cladina mitis*. The shrub and bryo-lichen stratum may be absent in some forested dunes.

Environment: The *Picea glauca* forested fixed dune community is typically found several hundred meters from shore. Soil is well developed compared to associations closer to shore. Relief is low and dune topography is often not apparent as ridges have become lower and wider with age, due to compaction and spreading.

Dynamics: This association is considered an endpoint of succession for Maritime dune systems. Open patches among forested dunes may support lichen or dwarf shrub dominated associations (see fact sheet 4).



Grande Plaine, Miscou Island, NB.



Youghall Beach, NB.

Picea glauca Forested Fixed Dune

Description (cont'd)

Range: This community type was only observed in three dune systems in New Brunswick. Forested fixed dunes are found typically in older systems in New Brunswick where coastal dunes are fully attached to the mainland, but also occur on Portage Island. Associations with *Empetrum nigrum* are only found at Grande Plaine, Miscou Island. Similar *Picea glauca* forested fixed dune communities have been reported in Prince Edward Island and Nova Scotia.

Conservation Status (NatureServe)

Global Conservation Rank:

National Conservation Rank:

Subnational Conservation Rank: NB: S2S3

Picea glauca Forested Fixed Dune

Distribution

Countries: Canada

Provinces / Territories / States: New Brunswick

The Nature Conservancy / Nature Conservancy of Canada

Ecoregions: Northern Appalachian-Acadian Forest

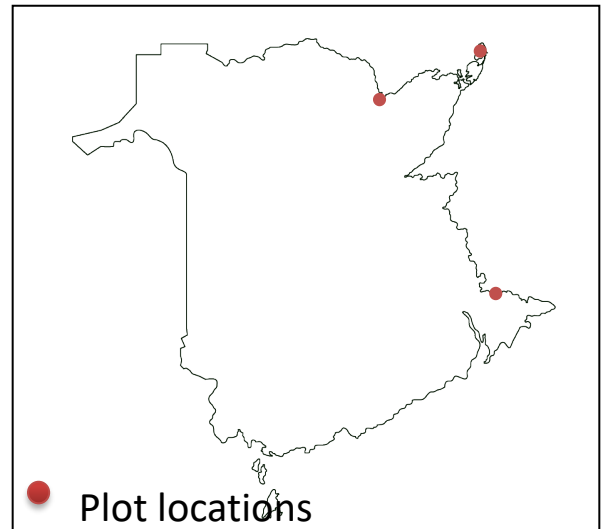
New Brunswick Ecological Land Classification (ecoregions):
Eastern Lowlands

Constituent Provincial / Territorial Types

Provinces / Territories / States: New Brunswick

Ecozones and Ecoregions of Canada: Atlantic Maritime: Maritime Lowlands

Commission for Environmental Cooperation Ecological Regions of North America: Northern Forests



Picea glauca* Forested Fixed Dune*Vegetation Summary**

Species Name*	5 forested fixed dune	
	% Cover	% Presence
21 Plots		
Trees and/or shrubs		
<i>Picea glauca</i>	30.6	100.0
<i>Morella pensylvanica</i>	10.7	57.1
<i>Vaccinium angustifolium</i>	4.8	38.1
<i>Rosa virginiana</i>	2.1	28.6
<i>Alnus incana</i>	1.7	19.0
<i>Populus tremuloides</i>	3.3	14.3
<i>Betula papyrifera</i>	1.2	14.3
<i>Rubus idaeus ssp. strigosus</i>	1.0	14.3
<i>Spiraea alba var. latifolia</i>	1.0	9.5
<i>Amelanchier sp.</i>	0.3	9.5
<i>Larix laricina</i>	0.7	4.8
<i>Myrica gale</i>	0.5	4.8
<i>Ribes hirtellum</i>	0.5	4.8
<i>Salix discolor</i>	0.5	4.8
<i>Viburnum nudum</i>	0.0	4.8
Shrub Stratum (Min–Mean–Max Cover)	15-34-100	
Herbs and dwarf shrubs		
<i>Ammophila breviligulata</i>	5.5	61.9
<i>Hudsonia tomentosa</i>	4.6	42.9
<i>Vaccinium vitis-idaea</i>	5.3	38.1
<i>Hieracium spp.</i>	2.7	33.3
<i>Empetrum nigrum</i>	2.2	23.8
<i>Fragaria virginiana</i>	2.0	23.8
<i>Carex tonsa</i>	1.3	23.8
<i>Arctostaphylos uva-ursi</i>	3.1	19.0
<i>Linnaea borealis</i>	1.5	14.3
<i>Festuca rubra</i>	1.2	14.3
<i>Carex silicea</i>	0.6	14.3
<i>Achillea millefolium</i>	0.6	14.3

Picea glauca* Forested Fixed Dune*Vegetation Summary (cont'd)**

Species Name*	5 forested fixed dune	
	% Cover	% Presence
<i>Juncus balticus</i> var. <i>littoralis</i>	2.1	9.5
<i>Danthonia spicata</i>	1.0	9.5
<i>Sibbaldiopsis tridentata</i>	0.7	9.5
<i>Lechea maritima</i>	0.7	9.5
<i>Cornus canadensis</i>	0.7	9.5
<i>Symphyotrichum novi-belgii</i>	0.5	9.5
<i>Chamerion angustifolium</i>	0.5	9.5
<i>Anaphalis margaritacea</i>	0.3	9.5
<i>Juniperus horizontalis</i>	0.2	4.8
<i>Dichanthelium</i> sp.	0.2	4.8
<i>Moehringia lateriflora</i>	0.2	4.8
<i>Rumex acetosa</i>	0.2	4.8
<i>Dryopteris intermedia</i>	0.2	4.8
<i>Vicia cracca</i>	0.1	9.5
<i>Vaccinium macrocarpon</i>	0.1	4.8
<i>Solidago canadensis</i>	0.0	4.8
<i>Viola</i> sp.	0.0	4.8

5-41-75

Bryophytes and lichens

<i>Cladina mitis</i>	9.8	71.4
<i>Cladonia rangiferina</i>	12.5	66.7
<i>Dicranum</i> sp.	3.2	33.3
<i>Cladina stellaris</i>	1.9	23.8
<i>Cladonia chorophaea</i>	0.9	23.8
<i>Cladonia cristatella</i>	0.6	23.8
<i>Polytrichum</i> sp.	2.1	14.3
<i>Ptilidium ciliare</i>	0.8	14.3
<i>Cladonia multiformis</i>	0.8	14.3
<i>Pleurozium schreberi</i>	1.9	9.5
<i>Moss</i> sp.	1.0	9.5

Picea glauca* Forested Fixed Dune*Vegetation Summary (cont'd)**

Species Name*	5 forested fixed dune	
	% Cover	% Presence
<i>Cladonia turgida</i>	0.7	9.5
<i>Cladonia verticillata</i>	0.2	4.8
<i>Cladonia gracilis subsp. turbinata</i>	0.1	4.8
Bryo-Lichen Stratum (Min–Mean–Max Cover)	0-40-80	

Picea glauca* Forested Fixed Dune*Site Characteristics**

5 forested dune
21 Plots

Elevation Range (min–mean–max meters)

2-5-9

Slope Gradient (% frequency)

level (47.6)
gentle (42.9)
moderate (9.5)

Slope Position (% frequency)

depression (4.6)
level (47.6)
mid (19.0)
upper (28.6)

Exposure (% frequency)

exposed (9.6)
moderately exposed (14.3)
moderately sheltered (33.3)
sheltered (42.9)

Aspect (% frequency)

south (4.9)
east (14.3)
west (0)
north (14.2)
level (66.7)

Orientation (% frequency)

facing ocean (23.8)
facing inland (23.8)
level (52.4)

Picea glauca Forested Fixed Dune

Author: S. Robinson. All photos courtesy of S. Robinson, AC CDC.

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.

***Spartina pectinata* Marsh Lagoon Edge, *Spartina patens* Salt Marsh, and *Spartina alterniflora* Salt Marsh
Fresh Water Cordgrass Marsh Lagoon Edge, Salt-Meadow Cordgrass Salt Marsh, and Saltwater Cordgrass Salt Marsh**

Description

Concept: Salt marsh vegetation is typically located at the back of dunes that do not connect to the mainland (i.e. barriers and sand spits). Various plant communities can be found in the calm waters of coastal lagoons. These salty associations are grouped into three community types: marsh lagoon edge (6A), *Spartina patens* high salt marsh (6B), and *Spartina alterniflora* low salt marsh (6C). Salt marsh vegetation types may occasionally occur in dune slacks or depressions that experience frequent wash over events or tidal influence.

Vegetation: The 6A association is characterized by 40% cover of *Spartina patens*, and includes both dune and salt marsh associated species. Typical dune associate species include *Ammophila breviligulata*, *Moehringia latifolia*, *Achillea millefolium*, *Oenothera biennis*, and salt marsh associates are *Solidago sempervirens*, *Juncus balticus* var. *littoralis*, and *Festuca rubra*. Frequently, this association forms a band between *Ammophila breviligulata* dominated communities and 6B. The 6B community is composed of typical high marsh vegetation with near homogenous cover of *Spartina patens*. This community may also include other salt tolerant species such as *Glaux maritima*, *Solidago sempervirens*, *Limonium carolinianum*, *Plantago maritima*, *Salicornia maritima*, *Triglochin maritima* and *Suaeda* spp. The 6C association is usually found as a narrow strip (frequently less than a meter wide) of vegetation along the landward shore of barrier beaches. Dominated by *Spartina alterniflora*, other species include *Plantago maritima*, *Salicornia maritima*, *Glaux maritima*, *Triglochin maritima* and *Suaeda* spp. A fourth salt marsh association can be found in some dune complexes, occurring between 6B and 6A and characterized by the presence of a near monoculture of *Carex paleacea* or *Juncus balticus* var. *littoralis*.



Dune de Bouctouche, NB (6A - left; 6B - right).



Dune de Bouctouche, NB (6B).

Spartina pectinata Marsh Lagoon Edge, *Spartina patens* Salt Marsh, and *Spartina alterniflora* Salt Marsh

Description Cont'd

Environment: These communities are located at the back of dune systems that are not attached from the mainland and are characteristic communities of depositional coasts where wave action is minimal. These communities experience regular inundation by salt water with 6C experiencing the most frequent, 6B less frequently and 6A experiencing occasional salt water flooding. Soil consists of silt deposited from tidal action. Salt concentrations decrease from 6C to 6A.

Dynamics: Barrier coastal dunes and spits provide the shelter required for salt-marsh development. Nutrients are supplied by seaweed, eelgrass and algae that are washed in from the tides. Salt marsh communities are known as areas of high fluctuation but change occurs much slowly than seen in seaward coastal dune habitats. Succession from 6C to 6A may occur as silt builds up and decreased duration of flooding results.

Range: Salt associated communities typically occur on the landward side of barrier beaches and spits. Occasionally these communities occur in dune slacks that experience frequent wash over events.



Grants Beach, NB (6C).

Conservation Status (NatureServe)

Global Conservation Rank:

National Conservation Rank:

Subnational Conservation Rank: NB:

Spartina pectinata* Marsh Lagoon Edge, *Spartina patens* Salt Marsh, and *Spartina alterniflora* Salt Marsh*Distribution**

Countries: Canada

Provinces / Territories / States: New Brunswick

The Nature Conservancy / Nature Conservancy of Canada

Ecoregions: Northern Appalachian-Acadian Forest

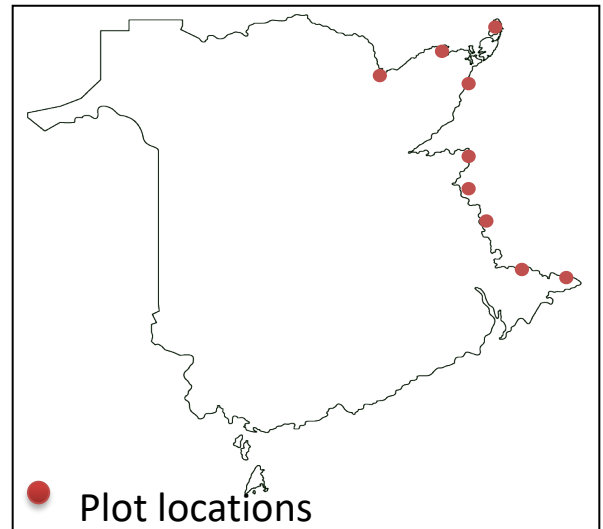
New Brunswick Ecological Land Classification (ecoregions):
Eastern Lowlands

Constituent Provincial / Territorial Types

Provinces / Territories / States: New Brunswick

Ecozones and Ecoregions of Canada: Atlantic Maritime: Maritime Lowlands

Commission for Environmental Cooperation Ecological Regions of North America: Northern Forests



Spartina pectinata Marsh Lagoon Edge, *Spartina patens* Salt Marsh, and *Spartina alterniflora* Salt Marsh

Vegetation Summary

Species Name*	6A lagoon edge		6B high salt marsh		6C low salt marsh	
	%	%	%	%	%	%
	Cover	Presence	Cover	Presence	Cover	Presence
	10 Plots		23 Plots		23 Plots	
Herbaceous vegetation						
<i>Spartina patens</i>	40.0	100.0	75.2	100.0	-	-
<i>Ammophillia breviligulata</i>	13.5	83.3	-	-	-	-
<i>Festuca rubra</i>	10.8	50.0	5.8	22.2	2.5	40.0
<i>Glaux maritima</i>	4.2	33.3	22.5	83.3	23.6	83.3
<i>Limonium carolinianum</i>	3.5	33.3	6.7	33.3	5.3	60.0
<i>Juncus gerardii</i>	3.3	16.7	-	-	-	-
<i>Solidago sempervierens</i>	3.0	66.7	2.6	33.3	1.5	40.0
<i>Triglochin maritima</i>	1.3	33.3	0.2	16.7	0.2	20.0
<i>Salicornia maritima</i>	1.2	33.3	0.8	33.3	0.8	20.0
<i>Plantago maritima</i>	1.0	33.3	2.5	16.6	0.8	20.0
<i>Spartina pectinata</i>	0.8	16.7	-	-	-	-
<i>Carex silicea</i>	0.3	16.7	-	-	-	-
<i>Spartina alterniflora</i>	-	-	3.0	50.0	80.3	100.0
Min-Mean-Max Cover	60-83-100		80-89-100		85-91-100	

Spartina pectinata Marsh Lagoon Edge, *Spartina patens* Salt Marsh, and *Spartina alterniflora* Salt Marsh

Site Characteristics

	6A lagoon edge 10 Plots	6B high salt marsh 23 Plots	6C low salt marsh 23 Plots
Elevation Range (min–mean–max meters)	0-4-9	0-4-8	0-2-6
Slope Gradient (% frequency)	level (38.5) gentle (61.5)	level (33.3) gentle (47.6) moderate (14.3) missing (4.8)	level (60.0) gentle (40.0)
Slope Position (% frequency)	depression (0) level (2.2) mid (53.8) upper (15.3) crest (7.7)	depression (4.7) level (28.4) mid (42.8) upper (19.0)	depression (0) level (40.0) mid (40.0) upper (20.0)
Exposure (% frequency)	exposed (53.8) moderately exposed (46.2)	exposed (38.1) moderately exposed (33.3) moderately sheltered (4.7) missing data (23.8)	exposed (40.0) moderately exposed (0) moderately sheltered (0) sheltered (40.0) missing data (20.0)
Aspect (% frequency)	south (7.7) east (15.4) west (15.4) north (23.1) level (38.5)	south (9.5) east (19.0) west (14.3) north (4.8) level (33.3) missing data (19.0)	south (20.0) east (20.0) west (0) north (0) level (60.0)
Orientation (% frequency)	facing ocean (0) facing inland (60.0) level (40.0)	facing ocean (14.3) facing inland (33.3) level (42.9) missing data (9.5)	facing ocean (20.0) facing inland (20.0) level (60.0)

***Spartina pectinata* Marsh Lagoon Edge, *Spartina patens* Salt Marsh, and *Spartina alterniflora* Salt Marsh**

Author: S. Robinson. All photos courtesy of S. Robinson, AC CDC.

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.

***Juncus balticus* var. *littoralis* / *Spartina pectinata* Herbaceous Brackish to Fresh Slack and *Morella pensylvanica* / *Myrica gale* / *Spiraea alba* var. *latifolia* Shrub Fresh Slack**

Baltic Rush / Freshwater Cord Grass Herbaceous Brackish to Fresh Slack and Northern Bayberry / Sweet Gale / Northern Meadow-Sweet Shrub Fresh Slack

Description

Overview: These associations typically occur in isolated depressions between other dry dune community types (i.e. *Ammophila breviligulata* herbaceous closed dune, Fact Sheet 2). A primarily herbaceous association (*Juncus balticus* var. *littoralis*/*Spartina pectinata* brackish to fresh slack – 7A) and a shrub association (*Morella pensylvanica*/*Myrica gale*/*Spiraea alba* var. *latifolia* fresh slack - 7B) are described here. The herbaceous brackish to fresh slack is characterized by one or several dominant graminoids. The shrub fresh slack is dominated by shrubs with a diverse herbaceous layer. These types of slacks may experience occasional salt spray or overwash as evidenced by salt tolerant vegetation.

Vegetation: Typically dominated by *Juncus balticus* var. *littoralis*, *Spartina pectinata*, *Ammophila breviligulata* and *Festuca rubra*, 7A supports minimal shrub cover. Occasionally, *Juncus balticus* var. *littoralis* or *Spartina pectinata* occurs in a mono-dominant community. In 7B, the shrub canopy usually covers 30 to 60% but may form denser thickets. Shrub species can be varied but consist mainly of *Morella pensylvanica*, *Myrica gale*, and *Spiraea alba* var. *latifolia*, with *Morella pensylvanica* occurring in drier slacks or along slack edges and *Myrica gale* and *Spiraea alba* var. *latifolia* in the wetter slacks. *Alnus incana* may occasionally occur as the dominant shrub canopy species. The herbaceous understory is varied and sometimes sparse depending on the density of the shrub layer. The most common species are those that dominate the herbaceous slack association. Bryophytes and lichens are minimal in herbaceous slacks, where higher bryophyte diversity may be found in shrub slacks.



Dune de Bouctouche, NB (7A with dominant *Spartina pectinata*).



Grande Plaine, Miscou Island, NB (7B).
*Picture was taken October 2009 after leaf fall.

***Juncus balticus* var. *littoralis*/*Spartina pectinata* Herbaceous Brackish to Fresh Slack and *Morella pensylvanica*/*Myrica gale*/*Spiraea alba* var. *latifolia* Shrub Fresh Slack**

Description Cont'd

Vegetation (cont'd): Infrequently, *Sphagnum* moss occurs as a ground cover with *Kalmia polifolia*, and *Andromeda polifolia* and other peatland vegetation (the occurrence of this type of slack may be restricted to Miscou Island and Dune de Bouctouche within NB).

Environment: The herbaceous and shrub fresh slacks are mostly sheltered from salt spray, wind and other coastal stresses. However, this type of slack may develop with some salt spray as evidenced by the presence of salt tolerant species such as *Soildago sempervirens*. A peaty soil may develop if decay is slow and *Sphagnum* spp. are present.

Dynamics: These communities occur where the water table reaches near the surface causing seasonal waterlogging. The water table is usually reached as a result of a blowout (a wind created depression) that may occur as a result from a disturbance of the fixed dune vegetation. The herbaceous fresh slack will likely transition to shrub slack if the water table remains high. If the water table drops it may transition to *Morella pensylvanica* shrub dune (Fact Sheet 3).

Range: Fresh slack occurs in many dune systems in NB mainly in larger dune systems. Shrub communities with *Salix candida* were only observed on Miscou Island. Slacks with moisture regimes supporting significant *Sphagnum* spp. and other peatland vegetation may be restricted to Miscou Island and Dune de Bouctouche.

Conservation Status (NatureServe)

Global Conservation Rank:

National Conservation Rank:

Subnational Conservation Rank: NB: S3S4 (7A), S3 (7B)

***Juncus balticus* var. *littoralis*/*Spartina pectinata* Herbaceous Brackish to Fresh Slack and *Morella pensylvanica*/*Myrica gale*/*Spiraea alba* var. *latifolia* Shrub Fresh Slack**

Distribution

Countries: Canada

Provinces / Territories / States: New Brunswick

The Nature Conservancy / Nature Conservancy of Canada

Ecoregions: Northern Appalachian-Acadian Forest

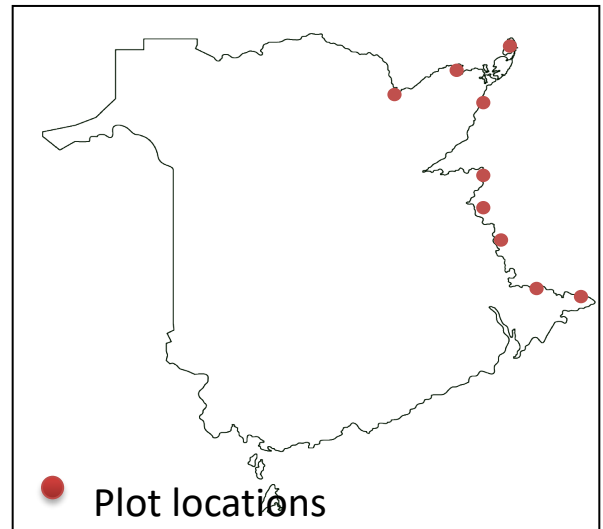
New Brunswick Ecological Land Classification (ecoregions):
Eastern Lowlands

Constituent Provincial / Territorial Types

Provinces / Territories / States: New Brunswick

Ecozones and Ecoregions of Canada: Atlantic Maritime: Maritime Lowlands

Commission for Environmental Cooperation Ecological Regions of North America: Northern Forests



***Juncus balticus* var. *littoralis*/*Spartina pectinata* Herbaceous Brackish to Fresh Slack and *Morella pensylvanica*/*Myrica gale*/*Spiraea alba* var. *latifolia* Shrub Fresh Slack**

Vegetation Summary cont'd

Species Name*	7A herbaceous fresh slack		7B shrub slack	
	%	%	%	%
	Cover	Presence	Cover	Presence
	7 Plots		25 Plots	
Trees and/or shrubs				
<i>Rosa virginiana</i>	1.4	14.3	1.6	12.0
<i>Morella pensylvanica</i>	0.1	14.3	15.0	52.0
<i>Spiraea alba</i> var. <i>latifolia</i>	-	-	9.9	56.0
<i>Myrica gale</i>	-	-	11.1	52.0
<i>Alnus incana</i>	-	-	5.3	24.0
<i>Photinia floribunda</i>	-	-	1.8	24.0
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	-	-	1.0	20.0
<i>Vaccinium angustifolium</i>	-	-	2.0	8.0
<i>Ilex verticillata</i>	-	-	2.0	8.0
<i>Cornus sericea</i>	-	-	1.4	8.0
<i>Populus tremuloides</i>	-	-	0.4	8.0
<i>Kalmia angustifolia</i>	-	-	0.4	8.0
<i>Salix candida</i>	-	-	0.2	8.0
<i>Rhododendron canadense</i>	-	-	1.6	4.0
<i>Salix eriocephala</i>	-	-	1.6	4.0
<i>Salix petiolaris</i>	-	-	0.4	4.0
<i>Amelanchier</i> sp.	-	-	0.4	4.0
<i>Salix discolor</i>	-	-	0.3	4.0
Shrub Stratum (Min–Mean–Max Cover)	0-2-10		30-57-100	
Herbs and dwarf shrubs				
<i>Juncus balticus</i> var. <i>littoralis</i>	30.0	85.7	4.6	44.0
<i>Spartina pectinata</i>	29.7	85.7	6.4	32.0
<i>Ammophila breviligulata</i>	25.0	85.7	14.6	68.0
<i>Festuca rubra</i>	11.4	85.7	3.6	20.0
<i>Solidago sempervirens</i>	3.4	71.4	1.0	20.0
<i>Symphotrichum novi-belgii</i>	1.7	57.1	3.8	56.0
<i>Calystegia sepium</i>	0.6	28.6	0.6	8.0
<i>Agrostis</i> sp.	4.3	14.3	0.1	4.0
<i>Lathyrus japonicus</i>	1.4	14.3	2.0	24.0
<i>Moehringia lateriflora</i>	0.7	14.3	0.4	12.0
<i>Maianthemum stellatum</i>	0.7	14.3	0.0	4.0

***Juncus balticus* var. *littoralis*/*Spartina pectinata* Herbaceous Brackish to Fresh Slack and *Morella pensylvanica*/*Myrica gale*/*Spiraea alba* var. *latifolia* Shrub Fresh Slack**

Site Characteristics

Species Name*	7A herbaceous fresh slack		7B shrub slack	
	% Cover	% Presence	% Cover	% Presence
<i>Vaccinium macrocarpon</i>	0.1	14.3	6.2	24.0
<i>Vicia cracca</i>	0.1	14.3	0.0	4.0
<i>Fragaria virginiana</i>	-	-	0.8	16.0
<i>Andromeda polifolia</i>	-	-	2.0	12.0
<i>Achillea millefolium</i>	-	-	0.6	12.0
<i>Carex silicea</i>	-	-	0.5	12.0
<i>Oenothera biennis</i>	-	-	0.4	12.0
<i>Linaria vulgaris</i>	-	-	0.6	8.0
<i>Viola</i> sp.	-	-	0.2	8.0
<i>Artemisia stelleriana</i>	-	-	0.1	8.0
<i>Leymus mollis</i>	-	-	1.6	4.0
<i>Calamagrostis canadensis</i>	-	-	0.6	4.0
<i>Poa</i> sp.	-	-	0.6	4.0
<i>Hieracium</i> spp.	-	-	0.4	4.0
<i>Solidago canadensis</i>	-	-	0.2	4.0
<i>Sibbaldiopsis tridentata</i>	-	-	0.1	4.0
<i>Spartina patens</i>	-	-	0.1	4.0
<i>Chamerion angustifolium</i>	-	-	0.1	4.0
<i>Anaphalis margaritacea</i>	-	-	0.1	4.0
<i>Vaccinium oxycoccos</i>	-	-	0.1	4.0
Herb Stratum (Min–Mean–Max Cover)	80-86-100		15-55-100	
Bryophytes and lichens				
<i>Polytrichum</i> sp.	0.1	14.3	0.8	8.0
<i>Sphagnum</i> spp.	-	-	1.8	8.0
<i>Pleurozium schreberi</i>	-	-	0.2	4.0
<i>Peltigera malacea</i>	-	-	0.2	4.0
<i>Cladonia verticillata</i>	-	-	0.1	4.0
<i>Cladonia rangiferina</i>	-	-	0.0	4.0
Bryo-Lichen Stratum (Min–Mean–Max Cover)	0-0-1		0-11-65	

***Juncus balticus* var. *littoralis*/*Spartina pectinata* Herbaceous Brackish to Fresh Slack and *Morella pensylvanica*/*Myrica gale*/*Spiraea alba* var. *latifolia* Shrub Fresh Slack**

Site Characteristics

	7A herbaceous fresh slack 7 Plots	7B shrub slack 25 Plots
Elevation Range (min–mean–max meters)	1-3-5	3-6-11
Slope Gradient (% frequency)	level (42.9) gentle (57.1)	level (76.4) gentle (23.6)
Slope Position (% frequency)	depression (57.1) level (42.9)	depression (68.8) level (31.2)
Exposure (% frequency)	exposed (57.1) moderately exposed (42.9)	exposed (21.0) moderately exposed (50.5) moderately sheltered (18.5)
Aspect (% frequency)	south (14.3) east (28.6) west (0) north (14.3) level (42.9)	south (0) east (5.9) west (17.6) north (5.9) level (70.6)
Orientation (% frequency)	facing ocean (14.3) facing inland (42.9) level (42.9)	facing ocean (11.8) facing inland (29.4) level (70.6)

***Juncus balticus* var. *littoralis*/*Spartina pectinata* Herbaceous Brackish to Fresh Slack and *Morella pensylvanica*/*Myrica gale*/*Spiraea alba* var. *latifolia* Shrub Fresh Slack**

Author: S. Robinson. All photos courtesy of S. Robinson, AC CDC.

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.

Populus tremuloides / *Betula papyrifera* / *Acer rubrum* Wet Treed Slack Trembling Aspen / Paper Birch/Red Maple Wet Treed Slack

Description

Concept: This association is similar but differentiated from forested dune (Fact Sheet 5) by occurring in isolated depressions between other dry dune community types (i.e. *Ammophila breviligulata* herbaceous closed dune). It is characterized by a 60% cover of tree species often with a dense and diverse shrub layer. The tree cover is characterized by more deciduous species than other forested dune communities found in this study.

Vegetation: A tree canopy of mainly *Populus tremuloides*, *Betula papyrifera* and *Acer rubrum* is underlain by a thick shrub understory with *Morella pensylvanica*, *Vaccinium angustifolium* and others. Other trees present include *Picea glauca* and *Pinus banksiana*. Herbaceous vegetation is usually limited but when present common associates include: *Fragaria virginiana*, *Vaccinium macrocarpon*, *Symphyotrichum novi-belgii* and *Ammophila breviligulata*. *Sphagnum* spp. may occur as a significant ground cover in wetter slacks.

Environment: The treed dune slacks are sheltered from salt spray, wind and other coastal stresses. If decay is slow, a peaty soil may develop.

Dynamics: These communities occur where the water table reaches near the surface causing seasonal waterlogging. The water table is usually reached as a result of a blowout and may result from a disturbance of the fixed dune vegetation.

Range: Wet treed slacks occur in older dune systems mainly on barrier islands, sand spits and larger dune systems. This vegetation type was observed at four of the dune systems surveyed. Communities with *Toxicodendron rydbergii* (more commonly found in Nova Scotian dunes) were only observed on Dune de Bouctouche.



North Richibucto Dune, NB.



Cape Jourimain National Wildlife Area, NB.
*Picture was taken October 2009 after leaf fall.

Populus tremuloides/Betula papyrifera/Acer rubrum* Wet Treed Slack*Conservation Status (NatureServe)****Global Conservation Rank:****National Conservation Rank:****Subnational Conservation Rank: NB: S2S3**

Dune de Bouctouche, NB.

*Picture was taken October 2009 after leaf fall.

Populus tremuloides/Betula papyrifera/Acer rubrum* Wet Treed Slack*Distribution**

Countries: Canada

Provinces / Territories / States: New Brunswick

The Nature Conservancy / Nature Conservancy of Canada

Ecoregions: Northern Appalachian-Acadian Forest

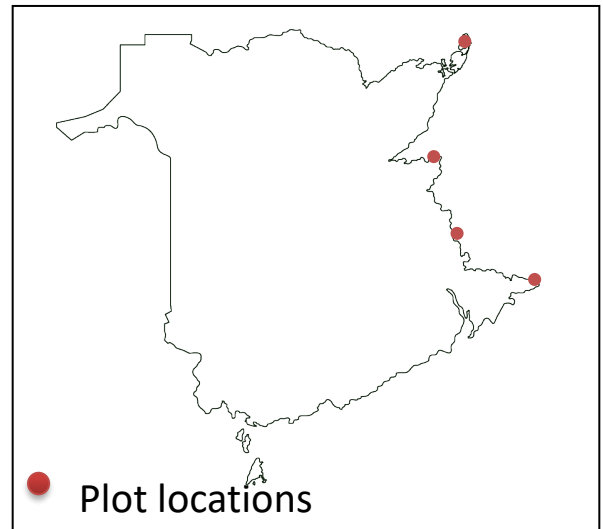
New Brunswick Ecological Land Classification (ecoregions):
Eastern Lowlands

Constituent Provincial / Territorial Types

Provinces / Territories / States: New Brunswick

Ecozones and Ecoregions of Canada: Atlantic Maritime: Maritime Lowlands

Commission for Environmental Cooperation Ecological Regions of North America: Northern Forests



Populus tremuloides/Betula papyrifera/Acer rubrum* Wet Treed Slack*Vegetation Summary**

Species Name*	g wet treed slack	
	% Cover	% Presence
7 Plots		
Trees and/or Shrubs		
<i>Spiraea alba</i> var. <i>latifolia</i>	20.7	85.7
<i>Betula populifolia</i>	16.4	42.9
<i>Morella pensylvanica</i>	15.7	57.1
<i>Populus tremuloides</i>	12.1	71.4
<i>Rhododendron canadense</i>	9.3	28.6
<i>Rosa virginiana</i>	9.3	57.1
<i>Picea glauca</i>	5.7	28.6
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	5.7	42.9
<i>Vaccinium angustifolium</i>	5.3	85.7
<i>Photinia floribunda</i>	5.0	42.9
<i>Pinus banksiana</i>	5.0	14.3
<i>Acer rubrum</i>	3.6	42.9
<i>Viburnum nudum</i>	3.6	28.6
Shrub Stratum (Min–Mean–Max Cover)	40-77-100	
Herbs and Dwarf Shrubs		
<i>Fragaria virginiana</i>	6.7	57.1
<i>Vaccinium macrocarpon</i>	5.7	28.6
<i>Ammophila breviligulata</i>	3.6	28.6
<i>Symphyotrichum novi-belgii</i>	1.7	28.6
<i>Juncus balticus</i> var. <i>littoralis</i>	1.4	14.3
<i>Linaria vulgaris</i>	0.7	14.3
<i>Poa</i> sp.	0.7	14.3
<i>Toxicodendron radicans</i>	0.7	14.3
<i>Lactuca biennis</i>	0.3	28.6
Herb Stratum (Min–Mean–Max Cover)	0-25-70	
Bryophytes and Lichens		
<i>Dicranum</i> spp.	0.3	14.3
Bryo-Lichen Stratum (Min–Mean–Max Cover)	0-1-5	

Populus tremuloides/Betula papyrifera/Acer rubrum* Wet Treed Slack*Site Characteristics**8 wet treed slack
7 Plots**Elevation Range (min–mean–max meters)**

1-4-8

Slope Gradient (% frequency)level (57.1)
gentle (28.6)
moderate (14.3)**Slope Position (% frequency)**depression (42.8)
level (57.1)**Exposure (% frequency)**exposed (0)
moderately exposed (28.6)
moderately sheltered (57.1)
sheltered (14.3)**Aspect (% frequency)**south (14.3)
east (28.6)
west (0)
north (0)
level (57.1)**Orientation (% frequency)**facing ocean (14.3)
facing inland (28.6)
level (57.1)

***Populus tremuloides/Betula papyrifera/Acer rubrum* Wet Treed Slack**

Author: S. Robinson. All photos courtesy of S. Robinson, AC CDC.

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Typha latifolia Fresh Marsh and *Myrica gale* / *Spiraea alba* var. *latifolia* Fresh Shrub Thicket

Broad-Leaf Cattail Fresh Marsh and Sweet Gale / Northern Meadow-Sweet Fresh Shrub Thicket

Description

Overview: This vegetation type is present in sheltered dune slacks characterized by open fresh water. These communities can be divided into two associations: *Typha latifolia* marsh (9A) where areas of open water are fringed by *Typha latifolia* and other emergent vegetation; and *Myrica gale* - *Spiraea alba* var. *latifolia* shrub thicket (9B) where the shrub stratum occurs over open water. These wetlands can be found in older dune complexes when the water table is present at or near the surface year round.

Vegetation: Association 9A is characterized by *Typha latifolia* occurring at the water edge and *Myrica gale* and *Spiraea alba* var. *latifolia* may be present over open water. Dry dune associated species may be present along the dune slope leading to the slack if transition to open water is narrow. Association 9A may be present along with 9B in some slacks or may occur in isolation. Association 9B is characterized by relatively tall shrubs, most commonly *Myrica gale* and *Spiraea alba* var. *latifolia* with minimal ground cover (i.e. bryophytes may be present). In drier areas *Juncus balticus* var. *littoralis*, *Spartina pectinata* occur and typical dry dune species including *Ammophila breviligulata* occur on slack margins. Association 9B frequently occurs adjacent 9A in larger dune slacks.

Environment: The open water dune slacks are sheltered from salt spray, wind and other coastal stresses. The moisture regime of the slack limits vegetation establishment to hydrophyllic vegetation.



Grande Plaine, Miscou Island, NB (9A).



Dune de Bouctouche, NB (9B).

*Picture was taken October 2009 after leaf fall.

Typha latifolia Fresh Marsh and *Myrica gale* / *Spiraea alba* var. *latifolia* Fresh Shrub Thicket

Description Cont'd

Dynamics: These communities can occur where the water table reaches the surface causing permanent waterlogging and surface water. The water table is reached usually as a result of a blowout, a depression caused by the removal of sediment by wind. Successional trajectory reflects fluctuations of the water table and

Range: The fresh open water dune slacks are found in between mature fixed dune types typically in older, larger dune complexes. 9A and 9B were observed at four dune systems in New Brunswick. These associations may occur in the same dune slack or in isolation.



Dune de Bouctouche, NB (9A).

Conservation Status (NatureServe)

Global Conservation Rank:

National Conservation Rank:

Subnational Conservation Rank: NB: S3 (9A), S3 (9B)



Grande Plaine, Miscou Island, NB (9B).

Typha latifolia* Fresh Marsh and *Myrica gale* / *Spiraea alba* var. *latifolia* Fresh Shrub Thicket*Distribution**

Countries: Canada

Provinces / Territories / States: New Brunswick

The Nature Conservancy / Nature Conservancy of Canada

Ecoregions: Northern Appalachian-Acadian Forest

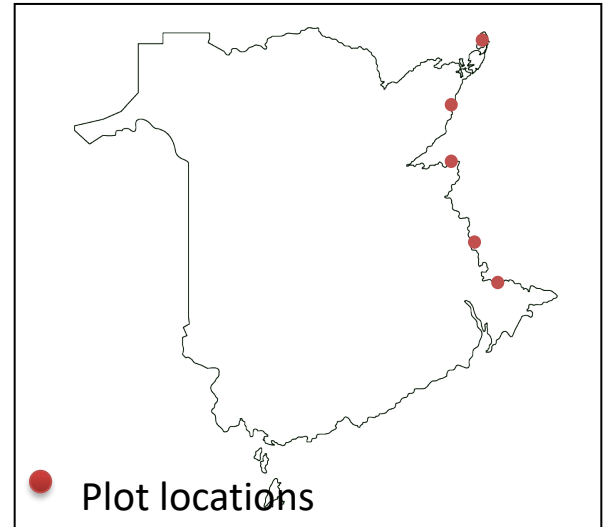
New Brunswick Ecological Land Classification (ecoregions):
Eastern Lowlands

Constituent Provincial / Territorial Types

Provinces / Territories / States: New Brunswick

Ecozones and Ecoregions of Canada: Atlantic Maritime: Maritime Lowlands

Commission for Environmental Cooperation Ecological Regions of North America: Northern Forests



Typha latifolia Fresh Marsh and *Myrica gale* / *Spiraea alba* var. *latifolia* Fresh Shrub Thicket

Vegetation Summary

Species Name*	9A fresh marsh		9B shrub thicket	
	%	%	%	%
	Cover	Presence	Cover	Presence
	7 Plots		4 Plots	
Trees and/or shrubs				
<i>Myrica gale</i>	8.6	42.9	73.8	100.0
<i>Spiraea alba</i> var. <i>latifolia</i>	2.9	14.3	15.0	75.0
<i>Salix petiolaris</i>	0.1	14.3	-	-
<i>Rosa virginiana</i>	-	-	3.8	50.0
<i>Salix candida</i>	-	-	7.5	25.0
<i>Cornus sericea</i>	-	-	2.5	25.0
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	-	-	1.3	25.0
Shrub Stratum (Min–Mean–Max Cover)	0-11-45		90-95-100	
Herbs and dwarf shrubs				
<i>Typha latifolia</i>	23.3	100.0	1.3	25.0
<i>Schoenoplectus pungens</i>	4.3	42.9	-	-
<i>Lathyrus japonicus</i>	2.4	42.9	-	-
<i>Symphotrichum novi-belgii</i>	2.0	42.9	-	-
<i>Spartina pectinata</i>	9.3	28.6	-	-
<i>Ammophila breviligulata</i>	6.4	28.6	-	-
<i>Festuca rubra</i>	4.0	28.6	-	-
<i>Juncus balticus</i> var. <i>littoralis</i>	2.3	28.6	-	-
<i>Artemisia stelleriana</i>	1.1	28.6	-	-
<i>Schoenoplectus acutus</i>	10.0	14.3	-	-
<i>Agrostis</i> sp.	1.4	14.3	-	-
<i>Viola</i> sp.	1.4	14.3	-	-
<i>Calystegia sepium</i>	0.7	14.3	-	-
<i>Vaccinium macrocarpon</i>	0.7	14.3	2.5	25.0
<i>Spartina patens</i>	0.7	14.3	-	-
<i>Achillea millefolium</i>	0.7	14.3	-	-
<i>Rumex orbiculatus</i>	0.4	14.3	-	-
<i>Vicia cracca</i>	-	-	0.5	25.0
Herb Stratum (Min–Mean–Max Cover)	50-68-90		0-8-20	

Typha latifolia Fresh Marsh and *Myrica gale* / *Spiraea alba* var. *latifolia* Fresh Shrub Thicket

Vegetation Summary (cont'd)

Species Name*	9A fresh marsh		9B shrub thicket	
	% Cover	% Presence	% Cover	% Presence
Bryophytes and lichens				
Moss sp.	-	-	9.3	25.0
Bryo-Lichen Stratum (Min–Mean–Max Cover)		-		0-14-30

Typha latifolia Fresh Marsh and *Myrica gale* / *Spiraea alba* var. *latifolia* Fresh Shrub Thicket

Site Characteristics

	9A freshwater marsh 7 Plots	9B shrub thicket 4 Plots
Elevation Range (min–mean–max meters)	1-3-5	3-6-11
Slope Gradient (% frequency)	level (42.9) gentle (57.1)	level (75.0) gentle (25.0)
Slope Position (% frequency)	depression (57.1) level (42.9)	depression (75.0) level (25.0)
Exposure (% frequency)	exposed (57.1) moderately exposed (42.9)	exposed (25.0) moderately exposed (50.0) moderately sheltered (25.0)
Aspect (% frequency)	south (14.3) east (28.6) west (0) north (0) level (57.2)	south (0) east (0) west (25.0) north (0) level (75.0)
Orientation (% frequency)	facing ocean (0) facing inland (42.9) level (57.1)	facing ocean (0) facing inland (25.0) level (75.0)

***Typha latifolia* Fresh Marsh and *Myrica gale* / *Spiraea alba* var. *latifolia* Fresh Shrub Thicket**

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