



Fuel model guide to Alaska vegetation

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In recognition of his leadership and contributions to the art and science of fire behavior and fuel modeling in Alaska, this guidebook is dedicated to the memory of Brad Cella.

With the growing interest and use of LANDFIRE data, GIS mapping, and fire behavior modeling in the United States, state and federal land management agencies have begun to develop local or regional crosswalks that relate an existing vegetation classification to fire behavior fuel models. With a new set of fuel models now available (Scott and Burgan 2005), a crosswalk was needed to match Alaska vegetation to the fuel models.

In early 2007, Brad Cella (National Park Service) organized a meeting of fire behavior, fuel, fire ecology and GIS specialists to develop a standard interagency vegetation crosswalk that could be applied statewide by various disciplines. The interagency group of participants (see below) met in Anchorage (April 2007) and went through all 80+ Level IV classifications within the Viereck and others (1992) Alaska Vegetation Classification. For each Level IV vegetation class, the participants discussed the fuel characteristics, vegetation structure and observed fire behavior. Following that discussion, the participants identified which of fuel model best provided the best fit, using a variety of fire modeling tools to aid the process. Many level IV classes were lumped together into a single class for purposes of identifying a fuel model. In such cases, vegetation characteristics suggested that a distinct vegetation class did not necessarily indicate the need for a separate fuel model. A few vegetation classes needed to be split to accommodate fire behavior at different seral stages or in different seasons. The crosswalk produced by the workshop includes 56 distinct fuel types; it was distributed for review during the summer of 2007.

In December 2007, the group reconvened once again in Anchorage. The participants reviewed the prior crosswalk determinations and made corrections or adjustments as needed. At the same time, the participants completed crosswalks to the 13 original fire behavior fuel models (Albini 1976, Anderson 1982), and to the Canadian fuel models (Forestry Canada Fire Danger Group 1992). The format and layout of a fuel model guidebook was also discussed. On January 22nd, 2008, the Alaska Wildland Fire Coordinating Group officially endorsed the crosswalk between the Viereck and others vegetation classes and the three fuel model sets (table 1). This report is the ultimate product of the workshops: a guidebook to surface fuel models in Alaska. Current versions of this guidebook will be posted at: http://fire.ak.blm.gov/administration/awfcg_committees.php under the Research and Applications Committee.

The following people contributed to the development of the crosswalks and guidebook: Jennifer Allen (NPS, Research Committee), Karen Murphy (FWS, Research Committee), Kent Slaughter (BLM, Research Committee), Gene Long (FWS, Research and Fuels), Kato Howard (BLM, Fuels Committee), Skip Theisen (BLM, Fire Behavior), Brian Sorbel (NPS, GIS Committee), Parker Martyn (BLM, GIS Committee), Jan Passek (FWS, GIS Committee), Peter Butteri (FWS, Ops Committee), Frank Cole (DNR, Fire behavior), John See (DNR, Fire Behavior), John Koltun (Consultant, GIS & modeling), Michael Fleming (SAIC, LANDFIRE), Joe Scott and Erin Noonan-Wright (Systems for Environmental Management, Missoula, MT).

Cover photos courtesy of Mike Fleming, SAIC; and National Park Service.

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Table 1 – Crosswalk from Viereck and others (1992) vegetation class to fuel models.

FUEL TYPE	FBFM40	FBFM13	CFFDRS	Page #
(1) Closed Sitka Spruce-Western Hemlock Forest	TL1	8	C6	6
(2) Closed White Spruce Forest	TU1	10	C3	7
(3) Closed Black Spruce Forest	TU3	9 ADJ	C2	8
(4) Open Western Hemlock-Sitka Spruce Forest	TL1	8	M4	9
(5) Open White Spruce Forest	TU5	10	C7	10
(6) Open Black Spruce Forest	TU4	9 ADJ	C1	11
(7) Open Black Spruce-Tamarack Forest	TU5	10	C1	12
(8) Woodland Sitka Spruce-Pine	TL1	8	M2	13
(9) White Spruce Woodland	TU5	10	C1	14
(10) Black Spruce Woodland with tussock	GR2	1	O1	15
(11) Black Spruce Woodland with lichen-moss	TU4	9 ADJ	C2	16
(12) Closed Red Alder Forest	TL2	8	M2	17
(13) Closed Black Cottonwood-Balsam Poplar Forest	TL2	8	M2	18
(14) Closed Paper Birch-Quaking Aspen Forest	TU1	8	M2	19
(15) Open Paper Birch Forest	TU1	9	M2	20
(16) Open Quaking Aspen Forest	TL2	8	D1	21
(17) Open Balsam Poplar (Black Cottonwood) Forest	TL2	8	M2	22
(18) Woodland Paper Birch-Balsam Poplar	GR1	1	O1A	23
(19) Spruce-Paper Birch-Aspen	TL6	8	M2	24
(20) White Spruce-Paper Birch-Balsam Poplar	TU1	8	M2	25
(21) Dwarf Tree Mountain Hemlock Scrub	SH1	10	M2	26
(22) Dwarf Tree Black Spruce Scrub	TU4	9	C2	27
(23) Closed Tall Alder-Willow Shrub	TU1	6	M2	28
(24) Closed Tall Birch Shrub	SH3	6	M1	29
(25) Tall Shrub Swamp	SH1	1	O1A	30
(26) Open Tall Alder-Willow Shrub	TU1	5	M2	31
(27) Open Tall Birch/Birch-Willow Shrub	SH3	5	M1	32
(28) Closed Low Birch/Birch-Willow/Ericaceous Shrub	SH2	5	M1	33
(29) Closed Low Willow/Alder-Willow Shrub	TU1	6	M2	34
(30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog	GR2	1	O1	35
(31) Open Low Birch-Ericaceous Shrub/Bog	GR3	1	O1	36
(32) Open Low Birch-Willow/Ericaceous Shrub/Bog	GR2	1	O1	37
(33) Open Low Willow/Sweetgale	GR1	1	O1A	38
(34) Open Low Alder/Alder-Willow Shrub	GS1	1	O1	39
(35) Sagebrush-Juniper	SH2	8	O1A	40
(36) Sagebrush-Grass	GS1	2	O1	41
(37) Dwarf Shrub Tundra	GR1	1	O1A	42
(38) Elymus	SH4	8	O1A	43
(39) Grass-Shrub	GR2	1	O1	44
(40) Grass-Herb	GR1	1	O1A	45
(41) Bluejoint Meadow	GR4	3	O1	46
(42) Bluejoint-Shrub/Herb	GR2	1	O1	47
(43) Tussock Tundra	GR3	3	O1	48
(44) Mesic Sedge-Grass-Herb Meadow Tundra	GR2	1	O1	49
(45) Sedge Willow Dryas Tundra	GR1	1	O1A	50
(46) Sedge-Birch Tundra	GR2	1	O1	51
(47) Wet Meadow Tundra	GR1	1	O1A	52
(48) Wet Sedge-Grass Meadow-Marsh	GR1	1	O1A	53
(49) Wet Sedge Meadow-Bog-Shrub	GR1	1	O1A	54
(50) Dry Species - Non Burnable	NB7	99		55
(51) Wet Species - Non Burnable	NB6	99		56
(52) Mesic Forb Herbaceous	GR1	1	O1A	57
(53) Foliose and Fruticose Lichen	GR1	1	O1A	58
(54) Crustose Lichen	NB9	99		59
(55) Aquatic Herbaceous	NB8	98		60
(56) Downed Beetle-killed Spruce	SB1	11	M4	61

Notes:

- The FBFM 13 fuel model “9 ADJ” refers to Norum’s (1982) calibration for Alaska Black Spruce. Rate of spread is 1.2 times that predicted for fuel model 9 (Albini 1976, Anderson 1982), and flame length is that predicted for fuel model 5.
- NB6 is a custom fuel model referring to areas covered by hydric vegetation types that do not carry fire; NB7 refers to upland (dry species) vegetation types that do not carry fire.

Alaska fuel model guidebook

This section of the document is the guidebook to Alaska fuel models. It contains fuel and fire behavior information gleaned from workshop participants, and vegetation characteristics taken from Viereck and others (1992). The fuel type name was taken from the common characteristics of the individual IVth-level classification names in the Viereck and others classification. Up to three illustrative photos are included for each Alaska fuel type, if available. More photos can be added as they become available. The caption of each photo lists the 4th level Viereck vegetation class and the source of the photo, if available.

Next, the most appropriate fuel models identified by the participants are listed. The primary carrier of fire is listed next, followed by any comments regarding fire behavior noted by the participants.

In the next section, a description of vegetation characteristics identified by compiling descriptions from the Viereck and others classification. This section describes the common characteristics of all 4th level classes in the fuel type.

The next section lists the individual 4th-level Viereck and others classes included in the fuel type. See Viereck and others (1992) for a detailed description of vegetation characteristics and distribution of each class.

Finally, the last section lists fuel types of similar characteristics. See the guidebook page in this document for information regarding each fuel type listed here.

(1) Closed Sitka Spruce-Western Hemlock Forest



1A1A. Closed Sitka Spruce Forest (Photo Courtesy of M. Fleming, SAIC)



1A1A. Closed Sitka Spruce Forest (Photo Courtesy of M. Fleming, SAIC)



1A1C. Closed Sitka Spruce Forest – Western Hemlock Forest (Photo Courtesy of J. Koltun, GRS)

Fuel models:

- FBFM40 – TL1
- FBFM13 - 8
- CFFBPS – C6

Primary carrier of fire:

- compact needle litter

Fire behavior comments:

- rarely burns except under extreme drought conditions
- live fuels seldom contribute to fire behavior

Vegetation characteristics:

Overstory is dominated by Sitka spruce and western hemlock. Other species, such as mountain hemlock, western redcedar, Alaska-cedar, sub-alpine fir, and Pacific silver fir are present and may dominate the overstory. Canopy cover ranges from 60-100%. The shrub layer is often well-developed ranging in height from 1 – 1.5 m (3 – 5 ft). Cover may be as high as 70%. *Vaccinium* species are present at many sites. Herbs, ferns, and some moss may be present with less than 30% cover. Hummocks and hollows may be present at some sites.

Viereck vegetation classes:

- 1A1A Closed Sitka Spruce Forest
- 1A1B Closed Western Hemlock Forest
- 1A1C Closed Sitka Spruce-Western Hemlock Forest
- 1A1D Closed Western Hemlock-Sitka Spruce-(Western Redcedar) Forest
- 1A1E Closed Western Hemlock-Alaska-Cedar
- 1A1F Closed Mountain Hemlock Forest
- 1A1G Closed Western Hemlock-Western Redcedar Forest
- 1A1H Closed Silver Fir-Western Hemlock Forest
- 1A1I Closed Subalpine Fir Forest

Similar fuel types:

- (4) Open Western Hemlock-Sitka Spruce Forest

(2) Closed White Spruce Forest



1A1J. Closed White Spruce Forest (Photo Courtesy of Wrangell - St. Elias National Park & Preserve)



1A1J. Closed White Spruce Forest (Photo Courtesy of the National Park Service)



1A1F. Closed White Spruce Forest (Photo Courtesy of Denali National Park & Preserve)

Fuel models:

- FBFM40 – TU1
- FBFM13 - 10
- CFFBPS - C3

Primary carrier of fire:

- feathermoss, litter, duff

Fire behavior comments:

- Riparian areas will have higher fuel moisture compared to lower fuel moisture in upland sites
- Immature stands in both riparian and upland areas will exhibit fire behavior similar to Closed Black Spruce Forest (3), Viereck Class 1A1L, fuel model (TU3)
- Crown initiation is lower, due to high CBH

Vegetation characteristics:

The closed white spruce forest type represents the most productive site in the Alaska taiga. Some scattered paper birch or balsam poplar maybe present. Canopy cover ranges from 60-100%. Shrubs exist as a sparsely developed layer of alders and willows with little cover. Mosses such as the feathermosses are well-developed. Herbs are sparse.

Viereck vegetation classes:

- 1A1J Closed White Spruce Forest

Similar fuel types:

- (3) Closed Black Spruce Forest
- (5) Open White Spruce Forest

(3) Closed Black Spruce Forest



1A1K. Closed Black Spruce Forest (Photo Courtesy of Yukon – Charley Rivers National Preserve)



1A1L. Closed Black Spruce-White Spruce Forest (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



1A1K. Closed Black Spruce Forest (Photo Courtesy of BLM Alaska Fire Service)

Fuel models:

- FBFM40 – TU3
- FBFM13 - 9 (adjusted)
- CFFBPS - C2

Primary carrier of fire:

- feathermosses

Fire behavior comments:

- Norum's equations (TU4) under predicts rate of spread. For this dynamic model, use live herbaceous moisture content as a surrogate for duff moisture code. If this is a mixed spruce floodplain site without feathermosses, this might over predict fire behavior.
- In areas without feathermosses, such as riparian areas, use TU1

Vegetation characteristics:

The overstory is dominated by black spruce with low productivity, high tree density with low volume, and abundant regeneration of black spruce, primarily from layering of lower branches. Tree cover is greater than 60%. White spruce and paper birch may be present. Alder may grow several meters tall and mix with the black spruce. Low shrubs such as rose, Labrador tea (*Ledum palustre*), blueberry (*Vaccinium uliginosum*), cranberry (*V. vitis-idaea*), and willow (*Salix spp.*) are common in the understory.

Feathermosses are usually present. The moss layer varies from patchy to continuous and ranges from 20 – 100 cm (8 – 39 in) thick. *Sphagnum* species exist on wetter sites.

Viereck vegetation classes:

- 1A1K Closed Black Spruce Forest
- 1A1L Closed Black Spruce-White Spruce Forest

Similar fuel types:

- (6) Open Black Spruce Forest
- (7) Open Black Spruce-Tamarack Forest

(4) Open Western Hemlock-Sitka Spruce Forest



1A2A. Open Sitka Spruce Forest (Photo Courtesy Lake Clark National Park & Preserve)

Fuel models:

- FBFM40 – TL1
- FBFM13 - 8
- CFFBPS - M4

Primary carrier of fire:

- Litter
- Litter and shrub mix (open mountain hemlock forest)

Fire behavior comments:

- C7 is another option for a CFFDRS fuel model selection for this group.
- Fire may be infrequent and have more *Vaccinium spp.* in open mountain hemlock forests

Vegetation characteristics:

Overstory is composed of species such as Sitka spruce, mountain hemlock, western hemlock, or mixed conifer forests (Alaska cedar, western hemlock, mountain hemlock, and Sitka spruce, western red cedar, pacific yew), which may dominate the overstory with cover ranging from 35-65%. Open Sitka spruce stands are dominated by alder species ranging in height from 1 – 3.5 m (3 - 12 ft). More commonly, in other stand types, a well-developed shrub layer is present, 1 – 1.5 m (3 – 5 ft) tall and ranging in cover from 20-70% composed of species such as *Vaccinium spp.* (blueberry). Ferns and herbs are present, some with cover ranging 40-80%.

Viereck vegetation classes:

- 1A2A Open Sitka Spruce Forest
- 1A2B Open Western Hemlock-Sitka Spruce Forest
- 1A2C Open Mountain Hemlock Forest
- 1A2D Open Mixed Conifer Forest

Similar fuel types:

- (1) Closed Sitka Spruce-Western Hemlock Forest
- (8) Woodland Sitka Spruce-Pine
- (23) Closed Tall Alder Willow Shrub (Open Sitka Spruce Community)

(5) Open White Spruce Forest



1A2E. Open White Spruce Forest (Photo Courtesy of Yukon – Charley Rivers National Preserve)



1A2E. Open White Spruce Forest (Photo Courtesy of National Park Service)



1A2E. Open White Spruce Forest (Photo Courtesy of National Park Service)

Fuel models:

- FBFM40 – TU5
- FBFM13 - 10
- CFFBPS - C7

Primary carrier of fire:

- Shrub and litter

Fire behavior comments:

- Sites with more deciduous shrubs (alder, willow, and rose) use TU5.
- Sites with feathermosses and ericaceous shrubs, use TU4.

Vegetation characteristics:

Overstory is composed of stands dominated by white spruce, ranging in cover from 25–60%. Black spruce, paper birch, and aspen may be present with little cover. A well-developed shrub layer, 1 – 2 m (3 – 7 ft) tall, is composed of resin birch. Alder and willows may be present on wetter sites; and some low shrubs may be present on lowland sites. Ground cover is composed of herbs or feathermosses (beneath tall shrubs).

Viereck vegetation classes:

- 1A2E Open White Spruce Forest

Similar fuel types:

- (6) Open Black Spruce Forest
- (19) Spruce-Paper Birch-Aspen
- (20) White Spruce-Paper Birch-Balsam Poplar

(6) Open Black Spruce Forest



1A2F. Open Black Spruce Forest (Photo Courtesy of Yukon – Charley Rivers National Preserve)



1A2F. Open Black Spruce Forest (Photo Courtesy of Ducks Unlimited)



1A2G. Open Black Spruce-White Spruce Forest (Photo Courtesy of Yukon – Charley Rivers National Preserve)

Fuel models:

- FBFM40 – TU4
- FBFM13 - 9 (adjusted)
- CFFBPS - C1

Primary carrier of fire:

- feathermosses

Fire behavior comments:

- Dwarf birch/labrador tea understory will have higher fire behavior, than sites with alder/willow understory.
- If site has a lot of sphagnum, it will have lower fire behavior (TU5).

Vegetation characteristics:

Stands are dominated by either black spruce or black/white spruce as co-dominants, ranging in cover from 25–60%. Tree sizes are small (dbh 5 – 10 cm / 1.5 – 4 in). Other species present are paper birch, tamarack, and quaking aspen. A well-developed shrub layer composed of birch, 1 – 2 m (3 – 7 ft) tall, may reside near the tree line. Alder and willows may be present on moist sites. Low shrubs, 10 – 100 cm (4 – 39 in) tall and nearly continuous in cover, are present. The ground layer is dominated by feathermosses. Lichens may be present. Grasses and sedges may be common in younger stands. Herbs are scarce.

Viereck vegetation classes:

- 1A2F Open Black Spruce Forest
- 1A2G Open Black Spruce-White Spruce Forest

Similar fuel types:

- (3) Closed Black Spruce Forest
- (5) Open White Spruce Forest
- (7) Open Black Spruce-Tamarack Forest
- (10) Black Spruce Woodland with tussock
- (11) Black Spruce Woodland with lichen-moss
- (19) Spruce-Paper Birch-Aspen
- (22) Dwarf Tree Black Spruce Scrub

(7) Open Black Spruce-Tamarack Forest



1A2H. Open Black Spruce – Tamarack Forest (Photo Courtesy of Gates of the Arctic National Park & Preserve)



1A2H. Open Black Spruce – Tamarack Forest (Photo Courtesy of Gates of the Arctic National Park & Preserve)

Fuel models:

- FBFM40 – TU5
- FBFM13 - 10
- CFFBPS - C1

Primary carrier of fire:

- Feathermosses and shrub

Fire behavior comments:

- wetter sites have more sphagnum moss

Vegetation characteristics:

These stands are dominated by open (less than 60% cover), small, and stunted black spruce and tamarack. Low shrubs, nearly continuous in cover, 10 – 100 cm (4 – 39 in) tall, are characteristic of this stand type. This type is found on wet lowlands in interior Alaska with shallow active layer above permafrost.

Viereck vegetation classes:

- 1A2H Open Black Spruce-Tamarack Forest

Similar fuel types:

- (6) Open Black Spruce Forest

(8) Woodland Sitka Spruce-Pine

Fuel models:

- FBFM40 – TL1
- FBFM13 - 8
- CFFBPS - M2

Primary carrier of fire:

- Litter and shrub

Fire behavior comments:

- fire is infrequent in this forest type
- Lodgepole pine woodlands are not similar to lodgepole pine woodlands in wetter climates (like Montana)

Vegetation characteristics:

The overstory is dominated by either lodgepole pine or stunted Sitka spruce with cover ranging from 10–25%. Other species that may be present are Alaska-cedar, western redcedar, and mountain hemlock. Shrubs ranging in height from 1 – 2 m (3 – 7 ft) provide little cover or may be absent and rooted on mounds at the bases of trees. Low/dwarf shrubs are common, providing up to 15% cover. Herbs are well represented. Mosses are abundant.

Viereck vegetation classes:

- 1A3A Lodgepole Pine Woodland
- 1A3B Sitka Spruce Woodland

Similar fuel types:

- (4) Open Western Hemlock-Sitka Spruce Forest
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog

(9) White Spruce Woodland



1A3C. White Spruce Woodland (Photo Courtesy of the Fish and Wildlife Service)



1A3C. White Spruce Woodland (Photo Courtesy of National Park Service)

Fuel models:

- FBFM40 – TU5
- FBFM13 - 10
- CFFBPS - C1

Primary carrier of fire:

- Feathermoss and shrub

Fire behavior comments:

- N/A

Vegetation characteristics:

Overstory is dominated by white spruce ranging from 10–25% cover. Paper birch, black spruce, and occasionally some aspen may be present with little cover. Open, low/dwarf shrubs such as resin birch are common and may behave as a carrier of fire. Feathermosses and lichens reside beneath and within the shrub layer. These stands are most common at tree-line.

Viereck vegetation classes:

- 1A3C White Spruce Woodland

Similar fuel types:

- (5) Open White Spruce Forest
- (6) Open Black Spruce Forest
- (31) Open Low Birch-Ericaceous Shrub/Bog
- (37) Dwarf Shrub Tundra

(10) Black Spruce Woodland with tussock



1A3D. Black Spruce Woodland with tussock (Photo Courtesy of the Steese-White Mountains Recreational Area - BLM)



1A3D. Black Spruce Woodland with tussock (Photo Courtesy of BLM Alaska Fire Service)

Fuel models:

- FBFM40 – GR2
- FBFM13 - 1
- CFFBPS - O1

Primary carrier of fire:

- Shrub and tussocks

Fire behavior comments:

- N/A

Vegetation characteristics:

Stands are dominated by black spruce ranging in cover from 10 – 15 %. Paper birch and tamarack may be present with little cover. Tall shrubs consist of scattered clumps of alder, birch, and some willow. Low shrubs are common, composed primarily of *Vaccinium spp.* and dwarf birch. Sedges are common, primarily tussock cotton grass (*Eriophorum vaginatum*) or Bigelow's sedge (*Carex bigelowii*). Mosses and lichens are nearly continuous.

Viereck vegetation classes:

- 1A3D Black Spruce Woodland

Similar fuel types:

- (6) Open Black Spruce Forest
- (11) Black Spruce Woodland with lichen-moss
- (22) Dwarf Tree Black Spruce Scrub
- (30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog
- (31) Open Low Birch-Ericaceous Shrub/Bog

(11) Black Spruce Woodland with lichen-moss



1A3D. Black Spruce Woodland (Photo Courtesy of Ducks Unlimited)



1A3D. Black Spruce Woodland



1A3D. Black Spruce Woodland (Photo Courtesy of Yukon Flats National Wildlife Refuge)

Fuel models:

- FBFM40 – TU4
- FBFM13 - 9 (adjusted)
- CFFBPS - C2

Primary carrier of fire:

- Feathermoss and lichen

Fire behavior comments:

- Includes lichen and feathermoss types. If sphagnum is present, expect lower spread rates and use fuel model TU5.

Vegetation characteristics:

Stands are dominated by black spruce ranging in cover from 10 – 15 %. Paper birch and tamarack may be present with little cover. Tall shrubs consist of scattered clumps of alder, birch, and some willow. Low shrubs are common composed primarily of *Vaccinium* species (blueberry). Herbs range from sparse to dense. Mosses and lichens are nearly continuous.

Viereck vegetation classes:

- 1A3D Black Spruce Woodland
- 1A3E Black Spruce-White Spruce Woodland

Similar fuel types:

- (6) Open Black Spruce Forest
- (22) Dwarf Tree Black Spruce Scrub
- (30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog
- (31) Open Low Birch-Ericaceous Shrub/Bog

(12) Closed Red Alder Forest



1B1A. Closed Red Alder Forest (Photo Courtesy of USDA Forest Service)

Fuel models:

- FBFM40 – TL2
- FBFM13 - 8
- CFFBPS - M2

Primary carrier of fire:

- Leaf litter

Fire behavior comments:

- This type is not common.

Vegetation characteristics:

This stand is dominated by red alder with cover greater than 60%. This type has only been described from the Stinkine area in SE Alaska. Woody plants other than alder are rare. Grasses, sedges, and herbs are present.

Viereck vegetation classes:

- 1B1A Closed Red Alder Forest

Similar fuel types:

- (4) Open Western Hemlock-Sitka Spruce Forest
- (26) Open Tall Willow Alder Shrub

(13) Closed Black Cottonwood-Balsam Poplar Forest



1B1B. Closed Black Cottonwood Forest (Photo Courtesy of M. Fleming, SAIC)



1B1C. Closed Balsam Poplar Forest (Photo Courtesy of Yukon Flats National Wildlife Refuge)



1B1C. Closed Balsam Poplar Forest (Photo Courtesy of Yukon Flats National Wildlife Refuge)

Fuel models:

- FBFM40 – TL2
- FBFM13 - 8
- CFFBPS - M2

Primary carrier of fire:

- Leaf litter

Fire behavior comments:

- In floodplains, this type rarely burns due to heavy silt on litter.

Vegetation characteristics:

Stands are dominated by either black cottonwood or balsam poplar with greater than 60% canopy cover. In young stands, shrubs may be sparse due to the closed canopy. As overstory ages, shrubs such as alder, willow, and rose become more common. Bluejoint is common in the herb layer along with some mosses and lichens when flooding is infrequent. More commonly, mosses and lichens are absent due to high leaf litter and frequent flooding.

Viereck vegetation classes:

- 1B1B Closed Black Cottonwood Forest
- 1B1C Closed Balsam Poplar Forest

Similar fuel types:

- (17) Open Balsam Poplar (Black Cottonwood) Forest
- (19) Spruce-Paper Birch-Aspen
- (23) Closed Tall Alder Willow Shrub

(14) Closed Paper Birch-Quaking Aspen Forest



1B1D. Closed Paper Birch Forest (Photo Courtesy of J. Koltun, GRS)



1B1D. Closed Paper Birch Forest (Photo Courtesy of Yukon – Charley Rivers National Preserve)



1B1E. Closed Quaking Aspen Forest (Photo Courtesy of the National Park Service)

Fuel models:

- FBFM40 – TU1
- FBFM13 - 8
- CFFBPS - M2

Primary carrier of fire:

- Leaf litter and sparse grass

Fire behavior comments:

- Use a dynamic fuel model, dependent on green up.
- Leaf litter and some grass in the understory.
- Use M1 during shoulder seasons.

Vegetation characteristics:

Paper birch, balsam poplar, and/or aspen dominate the overstory with greater than 60% cover. Leaf litter may be heavy. Stands may be associated with white and black spruce. A discontinuous, tall shrub layer several meters tall made up of alder and/or willow is present in most stands. A broken to nearly continuous shrub layer 1 – 2 m (3 - 7 ft) is present when alder is less abundant. Some open, low shrubs are present. Bluejoint and other herb species are common to scattered in the understory. Mosses and lichens are sparse to rare.

Viereck vegetation classes:

- 1B1D Closed Paper Birch Forest
- 1B1E Closed Quaking Aspen Forest
- 1B1F Closed Paper Birch-Quaking Aspen Forest
- 1B1G Closed Quaking Aspen-Balsam Poplar Forest

Similar fuel types:

- (15) Open Paper Birch Forest
- (16) Open Quaking Aspen Forest
- (17) Open Balsam Poplar (Black Cottonwood) Forest
- (19) Spruce-Paper Birch-Aspen
- (20) White Spruce-Paper Birch-Balsam Poplar
- (23) Closed Tall Alder-Willow Shrub
- (26) Open Tall Alder-Willow Shrub

(15) Open Paper Birch Forest



1B2A. Open Paper Birch Forest (Photo Courtesy of Yukon – Charley Rivers National Preserve)

Fuel models:

- FBFM40 – TU1
- FBFM13 - 9
- CFFBPS - M2

Primary carrier of fire:

- Leaf litter and grass

Fire behavior comments:

- Use a dynamic fuel model, dependent on green up.
- Leaf litter and some grass in the understory.
- Use M1 during shoulder seasons.

Vegetation characteristics:

These stands are dominated by paper birch with cover ranging from 25–60%. Scattered white or black spruce may be present. Birch, 1 – 2 m (3 – 7 ft) may be present between trees on moist sites. Alder and willows may be present. Ericaceous shrubs form an open dwarf shrub layer beneath taller shrubs. A nearly continuous layer of feathermosses are present. Drier sites may have some lichen between trees instead of shrubs. Overmature birch stands, occurring on upland slopes, lack spruce understory to replace birch as they die. Understory is composed of low shrubs and herbs such as bluejoint and horsetail.

Viereck vegetation classes:

- 1B2A Open Paper Birch Forest

Similar fuel types:

- (14) Closed Paper Birch-Quaking Aspen Forest
- (18) Woodland Paper Birch-Balsam Poplar

(16) Open Quaking Aspen Forest



1B2B. Open Quaking Aspen Forest (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



1B2B. Open Quaking Aspen Forest (Photo Courtesy of Gates of the Arctic National Park & Preserve)



B2B. Open Quaking Aspen Forest (Photo Courtesy of National Park Service. Silvery hue of aspen is caused by Aspen Leaf Miner.)

Fuel models:

- FBFM40 – TL2
- FBFM13 - 8
- CFFBPS - D1

Primary carrier of fire:

- Leaf litter, grass, shrub, & slope

Fire behavior comments:

- Sites common to very dry, steep, south-facing slopes along rivers in interior and south-central Alaska.

Vegetation characteristics:

These stands are dominated by small aspen trees ranging from 10–60% cover. Prickly rose, 1 – 2 m (3 – 7 ft) may be present. Low buffaloberry shrubs may be present, with kinnikinnick as a ground cover. Herbs are present. Mosses and lichens are present but do not provide significant cover.

Viereck vegetation classes:

- 1B2B Open Quaking Aspen Forest

Similar fuel types:

- (14) Closed Paper Birch-Quaking Aspen Forest
- (19) Spruce-Paper Birch-Balsam Poplar

(17) Open Balsam Poplar (Black Cottonwood) Forest



1B2C. Open Balsam Poplar Forest (Photo Courtesy of J. Koltun, GRS)

Fuel models:

- FBFM40 – TL2
- FBFM13 - 8
- CFFBPS - M2

Primary carrier of fire:

- Leaf litter

Fire behavior comments:

- Uncommon, but when it occurs often found on flood plains and occasionally on slopes

Vegetation characteristics:

These open stands, ranging from 25–60% cover, are dominated by balsam poplar or black cottonwood. Other tree species are usually absent. Variable understory composition exists with a scattered, tall shrub layer of willow and alder. Low shrubs are present. Herbs and common bryophytes are present.

Viereck vegetation classes:

- 1B2C Open Balsam Poplar (Black Cottonwood) Forest

Similar fuel types:

- (14) Closed Black Cottonwood-Balsam Poplar Forest
- (18) Woodland Paper Birch-Balsam Poplar

(18) Woodland Paper Birch-Balsam Poplar



1B3A. Paper Birch Woodland (Photo Courtesy of Kobuk Valley National Preserve)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - OA1

Primary carrier of fire:

- Lichen or grass & leaf litter

Fire behavior comments:

- Uncommon – reported only from Susitna Valley

Vegetation characteristics:

These stands are composed of open grown paper birch and/or balsam poplar with 10–25% cover. Birch is often multi-stemmed and stunted. Alder and willow are tall shrubs in balsam poplar stands. Lichens or herbs (blue joint, fireweed, bluebells, & wintergreen) may be present, especially in the Balsam Poplar Woodland class.

Viereck vegetation classes:

- 1B3A Paper Birch Woodland
- 1B3B Balsam Poplar Woodland
- 1B3C Paper Birch-Balsam Poplar Woodland

Similar fuel types:

- (27) Open Tall Birch/Birch-Willow Shrub

(19) Spruce-Paper Birch-Aspen



1C1D. Closed Quaking Aspen – Spruce Forest (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



1C2A. Open Spruce – Paper Birch Forest (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



1C2B. Open Quaking Aspen – Spruce Forest (Photo Courtesy of Denali National Park & Preserve)

Fuel models:

- FBFM40 – TL6
- FBFM13 - 8
- CFFBPS - M2

Primary carrier of fire:

- leaf litter

Fire behavior comments:

- Use M1 during the shoulder seasons
- Occurs on flood-plain terraces; slopes; uplands; or warm, dry sites

Vegetation characteristics:

These stands are composed of paper birch and/or aspen with white or black spruce or a mixture thereof, with cover greater than 10%. Small quantities of balsam poplar may be present. Moderately dense to scattered tall shrubs of alder and willow along with an intermittent to closed low shrub layer is present. Herbs, mosses, lichens, ferns may be present depending upon dominant stand type. Cover of feathermosses range from dominant to patchy.

Viereck vegetation classes:

- 1C1A Closed Spruce-Paper Birch Forest
- 1C1C Closed Spruce-Paper Birch-Quaking Aspen Forest
- 1C1D Closed Quaking Aspen-Spruce Forest
- 1C2A Open Spruce-Paper Birch Forest
- 1C2B Open Quaking Aspen-Spruce Forest
- 1C3A Spruce-Paper Birch Woodland

Similar fuel types:

- (15) Open Paper Birch Forest
- (16) Open Quaking Aspen Forest
- (20) White Spruce-Paper Birch-Balsam Poplar
- (22) Dwarf Tree Black Spruce Scrub

(20) White Spruce-Paper Birch-Balsam Poplar



1C1B. Closed White Spruce-Paper Birch-Balsam Poplar Forest (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



1C1E. Closed Balsam Poplar-White Spruce Forest (Photo Courtesy of Lake Clark National Park & Preserve)



1C2D. Open Spruce-Balsam Poplar Forest (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)

Fuel models:

- FBFM40 – TU1
- FBFM13 - 8
- CFFBPS - M2

Primary carrier of fire:

- leaf litter & herbaceous plants

Fire behavior comments:

- Use M1 during the shoulder seasons
- Occurs on flood-plains; creek bottoms; areas with low shrubs at tree line; or high elevation streams

Vegetation characteristics:

These stands are dominated by white spruce, paper birch, balsam poplar or black cottonwood or a mixture of these species, with cover greater than 25%. Tall shrubs like alder or willow, often greater than 2 m (7 ft) tall, are present along with lower shrubs. Herbs are present. Ferns and mosses may be present.

Viereck vegetation classes:

- 1C1B Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood) Forest
- 1C1E Closed Balsam Poplar-White Spruce Forest
- 1C2C Open Paper Birch-Balsam Poplar-Spruce Forest
- 1C2D Open Spruce-Balsam Poplar Forest

Similar fuel types:

- (17) Open Balsam Poplar (Black Cottonwood) Forest
- (19) Spruce-Paper Birch-Aspen

(21) Dwarf Tree Mountain Hemlock Scrub



2A1A. Closed Mountain Hemlock Dwarf Tree Scrub
(Photo Courtesy of J. Koltun, GRS)

Fuel models:

- FBFM40 – SH1
- FBFM13 - 10
- CFFBPS - M2

Primary carrier of fire:

- Sparse moss & shrub

Fire behavior comments:

- Low rate of spread
- Occurs in areas highly exposed to wind

Vegetation characteristics:

These stands are dominated by mountain hemlock or sub-alpine fir less than 3 m (10 ft) tall at maturity. Dwarf stands may be only 15 - 30 cm (6 - 12 in) tall, with greater than 25% cover, where exposed to severe wind. Sitka spruce may be present. Tree cover is less than 10% for trees taller than 3 m (10 ft). A sparse low shrub cover along with a well developed dwarf shrub layer is present. Herb cover is low. Mosses are present.

Viereck vegetation classes:

- 2A1A Closed Mountain Hemlock Dwarf Tree Scrub
- 2A1B Closed Subalpine Fir Dwarf Tree Scrub
- 2A2B Open Mountain Hemlock Dwarf Tree Scrub

Similar fuel types:

- (1) Closed Sitka Spruce-Western Hemlock Forest
- (4) Open Western Hemlock-Sitka Spruce Forest
- (37) Dwarf Shrub Tundra

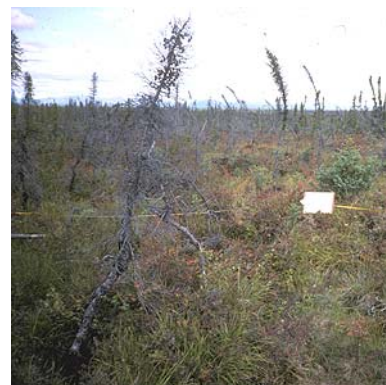
(22) Dwarf Tree Black Spruce Scrub



2A2A. Open Black Spruce Dwarf Tree Scrub (Photo Courtesy of the Steese – White Mountains Recreational Area – BLM)



2A3A. Black Spruce Dwarf Tree Woodland (Photo Courtesy of Ducks Unlimited)



2A3A. Black Spruce Dwarf Tree Woodland (Photo Courtesy of Kobuk Valley National Preserve)

Fuel models:

- FBFM40 – TU4
- FBFM13 - 9
- CFFBPS - C2

Primary carrier of fire:

- Feathermoss & shrub

Fire behavior comments:

- Similar to open and woodland black spruce forests, difference is with tree height

Vegetation characteristics:

Stands are dominated by black spruce, less than 3 m (10 ft), with cover ranging from 10–60% for dwarf trees and less than 10% for trees greater than 3 m (10 ft). Dwarf tamarack and paper birch may be present. A well-developed shrub layer, 1 – 2 m (3 - 7 ft) tall composed of birch, may be present in areas near the tree-line. Alder and willows may be present on moist sites. Low shrubs, nearly continuous in cover, 10 – 100 cm (4 – 39 in) tall, are present. The ground layer is dominated by feathermosses. Lichens may be present. Grasses and sedges may be common in younger stands. Herbs are scarce.

Viereck vegetation classes:

- 2A2A Open Black Spruce Dwarf Tree Scrub
- 2A3A Black Spruce Dwarf Tree Woodland

Similar fuel types:

- (6) Open Black Spruce Forest
- (11) Black Spruce Woodland with lichen-moss
- (30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog
- (32) Open Low Birch-Ericaceous Shrub/Bog

(23) Closed Tall Alder-Willow Shrub



2B1A. Closed Tall Willow Shrub (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



2B1A. Closed Tall Willow Shrub (Photo Courtesy of Yukon – Charley Rivers National Preserve)



2B1A. Closed Tall Alder Shrub (Photo Courtesy of M. Fleming, SAIC)

Fuel models:

- FBFM40 – TU1
- FBFM13 - 6
- CFFBPS - M2

Primary carrier of fire:

- Leaf litter & woody debris

Fire behavior comments:

- N/A

Vegetation characteristics:

Some taller alders and willows, scattered balsam poplar or black cottonwood are present in the overstory. Spruce, paper birch, and cottonwood may be present with cover less than 10%. Shrubs of willow or alder taller than 1.5m (5 ft) are present with 75% or greater cover. Spruce, paper birch, and cottonwood may be present with cover less than 10%. Low shrubs are restricted to openings or maybe be absent altogether. Mosses and some grass (in open stands) may be present.

Viereck vegetation classes:

- 2B1A Closed Tall Willow Shrub
- 2B1B Closed Tall Alder Shrub
- 2B1D Closed Tall Alder-Willow Shrub

Similar fuel types:

- (25) Tall Shrub Swamp
- (26) Open Tall Alder-Willow Shrub
- (29) Closed Low Willow/Alder-Willow Shrub

(24) Closed Tall Birch Shrub



2B1C. Closed Tall Shrub Birch Shrub (Photo Courtesy of the Fish and Wildlife Service)



2B1E. Closed Tall Shrub Birch-Willow Shrub (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



2B1E. Closed Tall Shrub Birch-Willow Shrub (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)

Fuel models:

- FBFM40 – SH3
- FBFM13 - 6
- CFFBPS - M1

Primary carrier of fire:

- shrubs

Fire behavior comments:

- Primarily carrier of fire are shrubs, not grasses

Vegetation characteristics:

A few tall willows or alder or occasional trees may be present. Willows or shrub birches 1.5 m (5 ft) or taller are present with greater than 75% cover. Resin and paper birch or hybrids less than 1.5 m (5 ft) are present. Low shrubs are sparse or absent. Herbs and moss may be present.

Viereck vegetation classes:

- 2B1C Closed Tall Shrub Birch Shrub
- 2B1E Closed Tall Shrub Birch-Willow Shrub

Similar fuel types:

- (24) Closed Tall Birch Shrub
- (27) Open Tall Birch/Birch-Willow Shrub
- (28) Closed Low Birch/Birch-Willow/Ericaceous Shrub
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog

(25) Tall Shrub Swamp

Fuel models:

- FBFM40 – SH1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- Herbaceous, shrub, and leaf litter

Fire behavior comments:

- Standing water is common

Vegetation characteristics:

Scattered trees may be present with less than 10% cover. This type is dominated by alder or willows, 1.5 m (5 ft) or taller with 25-75% cover, in standing water. Some low shrubs may be present. Hydrophobic mosses or a dense herb layer may be present. Lichens are sparse. The substrate is usually hummocky with water in the depressions throughout much of the growing season.

Viereck vegetation classes:

- 2B1F Closed Tall Shrub Swamp
- 2B2F Open Tall Shrub Swamp

Similar fuel types:

- (23) Closed Tall Alder-Willow Shrub
- (34) Open Low Alder/Alder-Willow Shrub

(26) Open Tall Alder-Willow Shrub



2B2A. Open Tall Willow Shrub (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



2B2B. Open Tall Alder Shrub (Photo Courtesy of Cape Krusenstern National Monument)



2B2B. Open Tall Alder Shrub (Photo Courtesy of Ducks Unlimited)

Fuel models:

- FBFM40 – TU1
- FBFM13 - 5
- CFFBPS - M2

Primary carrier of fire:

- Grass and shrub litter

Fire behavior comments:

- Use M1 during the shoulder seasons

Vegetation characteristics:

Scattered white spruce and balsam poplar maybe present with less than 10% cover. The overstory canopy is dominated by alders and/or willows about 1.5 meters (5 ft) high or higher with cover of 25-75% cover. Low shrubs may be absent or common. Herbs, grasses (bluejoint) and mosses may be sparse or dense. Lichens are rare.

Viereck vegetation classes:

- 2B2A Open Tall Willow Shrub
- 2B2B Open Tall Alder Shrub
- 2B2D Open Tall Alder-Willow Shrub

Similar fuel types:

- (23) Closed Tall Alder Willow Shrub
- (25) Tall Shrub Swamp
- (27) Open Tall Birch/Birch-Willow Shrub
- (29) Closed Low Willow/Alder-Willow Shrub
- (33) Open Low Willow/Sweetgale

(27) Open Tall Birch/Birch-Willow Shrub



2B2C. Open Tall Shrub Birch Shrub (Photo Courtesy Wrangell – St. Elias National Park & Preserve)



2B2E. Open Tall Shrub Birch-Willow Shrub (Photo Courtesy of Yukon – Charley Rivers National Preserve)



2B2E. Open Tall Shrub Birch-Willow Shrub (Photo Courtesy of Yukon – Charley Rivers National Preserve)

Fuel models:

- FBFM40 – SH3
- FBFM13 - 5
- CFFBPS - M1

Primary carrier of fire:

- shrub

Fire behavior comments:

- N/A

Vegetation characteristics:

Tree species like spruce may overtop shrub canopy with less than 10% cover. Shrubs are dominated by willows and birch 1.5 m (5 ft) or more with 25-75% cover. Low shrubs may be present. Grasses, mosses, and lichens may be present. This may exist near tree line in the Alaska Range.

Viereck vegetation classes:

- 2B2C Open Tall Shrub Birch Shrub
- 2B2E Open Tall Shrub Birch-Willow Shrub

Similar fuel types:

- (24) Closed Tall Birch Shrub
- (26) Open Tall Willow Alder Shrub
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog

(28) Closed Low Birch/Birch-Willow/Ericaceous Shrub



2C1A. Closed Low Shrub Birch Shrub (Courtesy of Bering Land Bridge National Preserve)



2C1C. Closed Low Shrub Birch-Willow Shrub (Courtesy of Bering Land Bridge National Preserve)



2C1C. Closed Low Shrub Birch-Willow Shrub (Courtesy of Bering Land Bridge National Preserve)

Fuel models:

- FBFM40 – SH2
- FBFM13 - 5
- CFFBPS - M1

Primary carrier of fire:

- shrub

Fire behavior comments:

- N/A

Vegetation characteristics:

Trees provide less than 10% cover. These communities have at least 75% of their cover by shrubs at least 20 cm (8 in) tall, dominated by birch, willow or ericaceous shrubs. Shrubs over 1.5 m (5 ft) provide less than 25% cover. Low shrub canopy is dominated by shrub birch. Some scattered willows may be present in the overstory. Ericaceous shrubs form dense communities. Feathermosses form a continuous mat. Lichens may be common. Herbs are scarce.

Viereck vegetation classes:

- 2C1A Closed Low Shrub Birch Shrub
- 2C1C Closed Low Shrub Birch-Willow Shrub
- 2C1D Closed Low Ericaceous Shrub

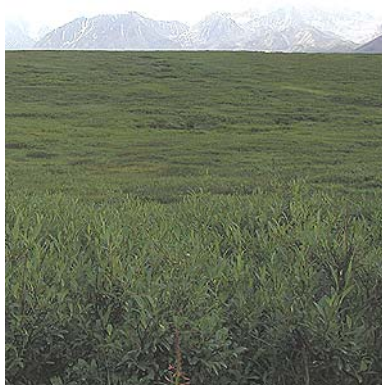
Similar fuel types:

- (24) Closed Tall Birch Shrub
- (29) Closed Low Willow/Alder-Willow Shrub
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog

(29) Closed Low Willow/Alder-Willow Shrub



2C1B. Closed Low Willow Shrub (Photo Courtesy of Kobuk Valley National Preserve)



2C1B. Closed Low Willow Shrub (Photo Courtesy of the Denali National Park & Preserve)



2C1E. Closed Low Alder-Willow Shrub (Photo Courtesy of Noatak National Preserve)

Fuel models:

- FBFM40 – TU1
- FBFM13 - 6
- CFFBPS - M2

Primary carrier of fire:

- grasses

Fire behavior comments:

- The old FBFM40 was SH3
- Use M1 in the shoulder seasons

Vegetation characteristics:

Trees provide less than 10% cover. These communities have at least 75% cover of willow or alders at least 20 cm (8 in) tall. Shrubs 1.5 m (5 ft) tall provide less than 25% cover. Dwarf ericaceous shrubs may be common in the understory. Feathermosses are common. Herbs and grasses are present.

Viereck vegetation classes:

- 2C1B Closed Low Willow Shrub
- 2C1E Closed Low Alder-Willow Shrub

Similar fuel types:

- (23) Closed Tall Alder Willow Shrub
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog
- (34) Open Low Alder/Alder-Willow Shrub

(30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog



2C2A. Open Low Mixed Shrub-Sedge Tussock Tundra
(Photo Courtesy of the National Park Service)



2C2B. Open Low Mixed Shrub-Sedge Tussock Bog
(Photo Courtesy of the Arctic National Wildlife Refuge)



2C2B. Open Low Mixed Shrub-Sedge Tussock Bog
(Photo Courtesy of Gates of the Arctic National Park & Preserve)

Fuel models:

- FBFM40 – GR2
- FBFM13 - 1
- CFFBPS - O1

Primary carrier of fire:

- tussocks

Fire behavior comments:

- Shrub component dampens fire behavior

Vegetation characteristics:

Trees, if present, are usually stunted black spruce with less than 10% cover. These communities have 25% shrub cover and are dominated by tussock-forming sedges. Scattered alders and willows 1 m (3 ft) tall are sometimes present. Low shrubs may be present, with at least 25% cover. Mosses and dwarf shrubs form a mat around the tussocks. Mosses and lichens are scarce to common.

Viereck vegetation classes:

- 2C2A Open Low Mixed Shrub-Sedge Tussock Tundra
- 2C2B Open Low Mixed Shrub-Sedge Tussock Bog

Similar fuel types:

- (10) Black Spruce Woodland with tussock
- (22) Dwarf Tree Black Spruce Scrub
- (31) Open Low Birch-Ericaceous Shrub/Bog
- (43) Tussock Tundra

(31) Open Low Birch-Ericaceous Shrub/Bog



2C2C. Open Low Mesic Shrub Birch-Ericaceous Shrub
(Courtesy of Bering Land Bridge National Preserve)



2C2C. Open Low Mesic Shrub Birch-Ericaceous Shrub
(Courtesy of Yukon – Charley Rivers National Preserve)



2C2D. Open Low Shrub Birch-Ericaceous Shrub Bog
(Courtesy of Gates of the Arctic National Park & Preserve)

Fuel models:

- FBFM40 – GR3
- FBFM13 - 1
- CFFBPS - O1

Primary carrier of fire:

- Grass and dwarf birch

Fire behavior comments:

- N/A

Vegetation characteristics:

Scattered white or black spruce trees provide less than 10% cover. These communities have 25–75% cover of shrubs at least 20 cm (8 in) tall. Tall shrubs provide less than 25% cover. Other ericaceous shrubs may be present. Shrub birch, 0.5 – 1.5 m (2 - 5 ft) tall, forms an overstory layer with the ericaceous shrubs. Herbs are present under or between the taller shrubs. A moss mat is usually present under the shrubs. Lichens are common to abundant. Tussocks and sedges may be present.

Viereck vegetation classes:

- 2C2C Open Low Mesic Shrub Birch-Ericaceous Shrub
- 2C2D Open Low Shrub Birch-Ericaceous Shrub Bog

Similar fuel types:

- (10) Black Spruce Woodland with tussock
- (11) Black Spruce Woodland with lichen-moss
- (22) Dwarf Tree Black Spruce Scrub
- (30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog

(32) Open Low Birch-Willow/Ericaceous Shrub Bog



2C2E. Open Low Ericaceous Shrub Bog (Photo Courtesy of Kobuk Valley National Preserve)



2C2E. Open Low Ericaceous Shrub Bog (Photo Courtesy of Gates of the Arctic National Park & Preserve)



2C2F. Open Low Shrub Birch-Willow Shrub (Photo Courtesy of Gates of the Arctic National Park & Preserve)

Fuel models:

- FBFM40 – GR2
- FBFM13 - 1
- CFFBPS - O1

Primary carrier of fire:

- Grass & shrub

Fire behavior comments:

- Willow dampens fire behavior, even with birch present

Vegetation characteristics:

Trees if present are less than 10% cover. These communities are dominated by birch, willow, or ericaceous shrubs, forming a mat 20-50 cm (8-20 in) thick, with 25-75% cover. There may be an abundance of shrub birch, especially in Open Low Shrub Birch-Willow Shrub communities. Low shrubs are common beneath the taller shrub canopy. Sedges and feathermosses may be present. Lichens may be present on mounds.

Viereck vegetation classes:

- 2C2E Open Low Ericaceous Shrub Bog
- 2C2F Open Low Shrub Birch-Willow Shrub

Similar fuel types:

- (31) Open Low Birch-Ericaceous Shrub/Bog
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog
- (37) Dwarf Shrub Tundra

(33) Open Low Willow/Sweetgale



2C2G. Open Low Willow Shrub (Photo Courtesy of Bering Land Bridge National Preserve)



2C2H. Open Low Willow-Sedge Shrub Tundra (Photo Courtesy of Bering Land Bridge National Preserve)



2C2J. Open Low Sweetgale-Graminoid Bog (Photo Courtesy of Lake Clark National Park & Preserve)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- herbs

Fire behavior comments:

- Willow will dampen fire behavior
- Graminoids will increase fire behavior
- Wet sites dampen fire behavior

Vegetation characteristics:

Trees overtopping shrubs provide less than 10% cover. Scattered birch or spruce may be present. These communities have 25-75% cover of primarily willows or sweetgale at least 20cm (8 in) tall. Shrubs less than 1.5 m (5 ft) provide less than 25% cover. Dwarf shrubs may be present in the understory. Scattered individuals of shrub birch may be present. Forbs and sub-shrubs may be present, sometimes located in the flooded hollows between hummocks. Sedges are often present. Mosses may form patchy to continuous mats. Lichens are scarce. This type is found on terraces, bluffs, dune complexes, moist uplands and slopes, terraces, pond margins, stream banks, drained lake basins, wet stream bottoms and lowland depressions.

Viereck vegetation classes:

- 2C2G Open Low Willow Shrub
- 2C2H Open Low Willow-Sedge Shrub Tundra
- 2C2I Open Low Willow-Graminoid Shrub Bog
- 2C2J Open Low Sweetgale-Graminoid Bog

Similar fuel types:

- (26) Open Tall Alder-Willow Shrub
- (28) Closed Low Birch/Birch-Willow/Ericaceous Shrub
- (29) Closed Low Willow/Alder-Willow Shrub
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog
- (34) Open Low Alder/Alder-Willow Shrub
- (45) Sedge Willow Dryas Tundra
- (49) Wet Sedge Meadow-Bog-Shrub

(34) Open Low Alder/Alder-Willow Shrub



2C2K. Open Low Alder-Willow Shrub (Photo Courtesy of Bering Land Bridge National Preserve)



2C2L. Open Low Alder Shrub (Photo Courtesy of M. Fleming, SAIC)



2C2L. Open Low Alder Shrub (Photo Courtesy of Yukon – Charley Rivers National Preserve)

Fuel models:

- FBFM40 – GS1
- FBFM13 - 1
- CFFBPS - O1

Primary carrier of fire:

- Grass & low shrubs

Fire behavior comments:

- Low shrubs will have more active fire behavior than the tall alder-willow shrubs.

Vegetation characteristics:

Tree canopy cover is less than 10%. These communities have willows and alders with 25-75% cover, at least 20 cm (8 in) tall. Shrubs greater than 1.5 m (5 ft) provide less than 25% cover. Herbs/sedges are present in the understory. A continuous mat of feathermosses or sphagnum is often present. Lichens are present locally.

Viereck vegetation classes:

- 2C2K Open Low Alder-Willow Shrub
- 2C2L Open Low Alder Shrub

Similar fuel types:

- (26) Open Tall Willow Alder Shrub
- (29) Closed Low Willow/Alder-Willow Shrub
- (30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog

(35) Sagebrush-Juniper

Fuel models:

- FBFM40 – SH2
- FBFM13 - 8
- CFFBPS - O1A

Primary carrier of fire:

- juniper

Fire behavior comments:

- These communities are known to exist on steep south-facing bluffs in interior and south central Alaska, but none have been described.

Vegetation characteristics:

Undescribed

Viereck vegetation classes:

- 2C2M Sagebrush-Juniper

Similar fuel types:

- (36) Sagebrush Grass

(36) Sagebrush-Grass



2C2N. Sagebrush-Grass (Photo Courtesy of Gates of the Arctic National Park & Preserve)



2C2N. Sagebrush-Grass (Photo Courtesy of the Kanuti National Wildlife Refuge)



2C2N. Sagebrush-Grass (Photo Courtesy of the Kanuti National Wildlife Refuge)

Fuel models:

- FBFM40 – GS1
- FBFM13 - 2
- CFFBPS - O1

Primary carrier of fire:

- Grass & shrub

Fire behavior comments:

- Grass will increase rate of spread

Vegetation characteristics:

Aspen is present with less than 10% cover. Sagebrush, taller than 20 cm (8 in), is present with 25-75% cover. Shrubs taller than 1.5 m (5 ft) contribute less than 25% cover. Grasses and herbs are present. Mosses are scarce and lichens are scattered.

Viereck vegetation classes:

- 2C2N Sagebrush-Grass

Similar fuel types:

- (35) Sagebrush-Juniper
- (39) Grass-Shrub
- (16) Open Quaking Aspen Forest

(37) Dwarf Shrub Tundra



2D1A. Dryas Dwarf Shrub Tundra (Photo Courtesy of Denali National Park & Preserve)



2D1B. Dryas-Sedge Dwarf Shrub Tundra



2D3A. Willow Dwarf Shrub Tundra (Photo Courtesy of the Arctic National Wildlife Refuge)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- Herbs & low shrubs

Fire behavior comments:

- Low fire behavior

Vegetation characteristics:

Trees are absent or have less than 10% cover. This type is dominated by dryas, fruticose lichens, bearberry, *Vaccinium* species, crowberry, mountain heath, cassiope, or dwarf willows, which form mats a few centimeters (1 in) thick. Other dwarf or ericaceous shrubs may be present. Shrubs taller than 20 cm (8 in) range from 0-25% cover. Patterns, commonly steps or stripes, may be present. Forbs, mosses, and lichens are usually present. Sedges and other herbs, if present, may grow 10 – 30 cm (4 – 12 in) above the mat. Cover ranges from 2–100%. Mosses are commonly intertwined in the mat of ericaceous shrubs, if present. This type occurs primarily in the northern two thirds of Alaska.

Viereck vegetation classes:

- 2D1A Dryas Dwarf Shrub Tundra
- 2D1B Dryas-Sedge Dwarf Shrub Tundra
- 2D1C Dryas-Lichen Dwarf Shrub Tundra
- 2D2A Bearberry Dwarf Shrub Tundra
- 2D2B *Vaccinium* Dwarf Shrub Tundra
- 2D2C Crowberry Dwarf Shrub Tundra
- 2D2D Mountain Heath Dwarf Shrub Tundra
- 2D2E Cassiope Dwarf Shrub Tundra
- 2D3A Willow Dwarf Shrub Tundra

Similar fuel types:

- (30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog
- (31) Open Low Birch-Ericaceous Shrub/Bog
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog

(38) Elymus



3A1A. Elymus (Photo Courtesy of M. Fleming, SAIC)



3A1A. Elymus (Photo Courtesy of M. Fleming, SAIC)



3A1A. Elymus (Photo Courtesy of M. Fleming, SAIC)

Fuel models:

- FBFM40 – SH4
- FBFM13 - 8
- CFFBPS - O1A

Primary carrier of fire:

- grass

Fire behavior comments:

- Grass only burns pre-green up or after cured and has a low moisture of extinction
- High fuel load with this type, but doesn't have the ROS of a grass model.

Vegetation characteristics:

Woody plants are scarce. This type is dominated by Elymus, which grows in dense pure stands, but can mix with other grasses or forbs. Elymus communities range in height from 20 cm (8 in) to over 1 meter (3 ft). Cover ranges from sparse to complete.

Viereck vegetation classes:

- 3A1A Elymus

Similar fuel types:

- (39) Grass-Shrub
- (40) Grass-Herb
- (48) Wet Sedge-Grass Meadow-Marsh

(39) Grass-Shrub



3A1C. Midgrass-Shrub (Photo Courtesy of the National Park Service)



3A1C. Midgrass-Shrub (Photo Courtesy of Yukon – Charley Rivers National Preserve)

Fuel models:

- FBFM40 – GR2
- FBFM13 - 1
- CFFBPS - O1

Primary carrier of fire:

- Short grass

Fire behavior comments:

- N/A

Vegetation characteristics:

Scattered low ericaceous shrubs or willows, may be present with less than 25% cover. Sagebrush may be present on dry slopes. Communities are dominated by either fescue mixed with other grasses and forbs, medium height grasses (30 – 70 cm; 12 – 28 in) tall, or hair-grasses (40 – 80 cm; 16 – 32 in) tall. Feathermosses range from common to absent. Lichens range from sparse to common. Broad-leaved herbs may be present.

Viereck vegetation classes:

- 3A1B Dry Fescue
- 3A1C Midgrass-Shrub
- 3A1E Hair-Grass

Similar fuel types:

- (35) Sagebrush-Juniper
- (36) Sagebrush-Grass
- (38) Elymus
- (40) Grass-Herb
- (41) Bluejoint Meadow
- (42) Bluejoint Shrub Herb

(40) Grass-Herb



3A1D. Midgrass-Herb (Photo Courtesy of Gates of the Arctic National Park & Preserve)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- Short grass & herbs

Fire behavior comments:

- N/A

Vegetation characteristics:

Woody plants are rare or absent. These communities are dominated by middle-height grasses and broad-leaved herbs. Sedges may be present. Feathermosses are common. Plant cover is high.

Viereck vegetation classes:

- 3A1D Midgrass-Herb

Similar fuel types:

- (38) Elymus
- (39) Grass-Shrub
- (44) Mesic Sedge-Grass-Herb Meadow Tundra
- (48) Wet Sedge-Grass Meadow-Marsh

(41) Bluejoint Meadow



3A2A. Bluejoint Meadow (Photo Courtesy of Bering Land Bridge National Preserve)



3A2A. Bluejoint Meadow (Photo Courtesy of BLM Alaska Fire Service)

Fuel models:

- FBFM40 – GR4
- FBFM13 - 3
- CFFBPS - O1

Primary carrier of fire:

- grass

Fire behavior comments:

- This type includes *Calamagrostis* species (reed grass); and post-fire, human disturbance, and beetle kill sites.

Vegetation characteristics:

Woody plants are rare or absent, but a mosaic pattern of bluejoint meadow and tall shrubs like alder may be present. These communities are dominated by bluejoint reedgrass (0.8 - 1.4 m; 32 – 55 in) tall. Cover is usually complete with very dense vegetation. Other grasses and herbs may be present. Mosses are often absent, but feathermosses may be present in more open stands. Wetter sites may have hummocks.

Viereck vegetation classes:

- 3A2A Bluejoint Meadow

Similar fuel types:

- (40) Grass-Herb
- (42) Bluejoint-Shrub/Herb

(42) Bluejoint-Shrub/Herb



3A2B. Bluejoint-Herb (Photo Courtesy of M. Fleming, SAIC)



3A2B. Bluejoint-Herb (Photo Courtesy of Bering Land Bridge National Preserve)



3A2C. Bluejoint-Shrub (Photo Courtesy of Cape Krusenstern National Monument)

Fuel models:

- FBFM40 – GR2
- FBFM13 - 1
- CFFBPS - O1

Primary carrier of fire:

- Grass

Fire behavior comments:

- N/A

Vegetation characteristics:

Shrubs, like alder, may be tall or short with less than 25% cover growing intermixed with bluejoint. Willow and sweetgale may also be present. These types are dominated by equal amounts of bluejoint and herbs and shrubs, usually 0.8 to 1.5 m (32 – 59 in) tall. Sedges and other grasses may be present. Feathermosses may be absent or common; *Sphagnum* species are present in small quantities on wetter sites, which may be hummocky. Lichens are rare.

Viereck vegetation classes:

- 3A2B Bluejoint-Herb
- 3A2C Bluejoint-Shrub

Similar fuel types:

- (38) Elymus
- (40) Grass-Herb
- (41) Bluejoint Meadow

(43) Tussock Tundra



3A2D. Tussock Tundra (Photo Courtesy of Noatak National Preserve)



3A2D. Tussock Tundra (Photo Courtesy of Selawik National Wildlife Refuge)



3A2D. Tussock Tundra (Photo Courtesy of the Arctic National Wildlife Refuge)

Fuel models:

- FBFM40 – GR3
- FBFM13 - 3
- CFFBPS - O1

Primary carrier of fire:

- tussocks

Fire behavior comments:

- N/A

Vegetation characteristics:

Low shrubs often grow between tussocks, usually shorter than the sedges, but sometimes taller. Cover is less than 25%. These communities are dominated by sedges in a tussock growth form, which are commonly 10 – 60 cm (4 – 24 in) tall, spaced 30 – 60 cm (12 – 24 in) apart. Mosses and lichens are common. *Sphagnum* species may be locally abundant, but are often absent.

Viereck vegetation classes:

- 3A2D Tussock Tundra

Similar fuel types:

- (30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog
- (31) Open Low Birch-Ericaceous Shrub/Bog
- (32) Open Low Birch-Willow/Ericaceous Shrub/Bog

(44) Mesic Sedge-Grass-Herb Meadow Tundra



3A2G. Mesic Grass-Herb Meadow Tundra (Photo Courtesy of M. Fleming, SAIC)



3A2G. Mesic Grass-Herb Meadow Tundra (Photo Courtesy of Cape Krusenstern National Monument)



3A2G. Mesic Grass-Herb Meadow Tundra (Photo Courtesy of Cape Krusenstern National Monument)

Fuel models:

- FBFM40 – GR2
- FBFM13 - 1
- CFFBPS - O1

Primary carrier of fire:

- Grass & herb

Fire behavior comments:

- N/A

Vegetation characteristics:

Woody plants are absent, scattered, or common with less than 25% cover. These tundra communities are dominated by a combination of sedges, grasses, and broad-leaved herbs. Lichens and nonsphagnaceous mosses may be sparse to common. Canopy heights are low (under 50 cm; 20 in) and plant cover ranges from variable to complete. This type occurs on alpine slopes & the arctic part of Alaska.

Viereck vegetation classes:

- 3A2E Mesic Sedge-Grass Meadow Tundra
- 3A2F Mesic Sedge-Herb Meadow Tundra
- 3A2G Mesic Grass-Herb Meadow Tundra

Similar fuel types:

- (40) Grass-Herb
- (44) Mesic Sedge-Grass-Herb Meadow Tundra
- (45) Sedge Willow Dryas Tundra
- (47) Wet Meadow Tundra
- (48) Wet Sedge-Grass Meadow-Marsh
- (51) Wet Species - Non Burnable

(45) Sedge Willow Dryas Tundra



3A2H. Sedge Willow Tundra (Photo Courtesy of Yukon – Charley Rivers National Preserve)



3A2J. Sedge Dryas Tundra (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



3A2J. Sedge Dryas Tundra (Photo Courtesy of Cape Krusenstern National Monument)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- Herbs

Fire behavior comments:

- N/A

Vegetation characteristics:

Willows are easily noticed, with cover less than 25%. Other shrubs may be present. Shrubs may be concentrated on low micro relief ridges, hummocks, or solifluction lobes, which are often present. This community is dominated by sedges with dryas or willows. Mosses are common and may form a continuous mat. Nonsphagnaceous mosses are often common, while *Sphagnum* species and lichens are generally rare, but abundant at some sites. Canopy height is 15 – 50 cm (6 – 20 in), while cover ranges from open to complete. This type is common on alpine slopes throughout Alaska, except the southeast.

Viereck vegetation classes:

- 3A2H Sedge-Willow Tundra
- 3A2J Sedge-Dryas Tundra

Similar fuel types:

- (33) Open Low Willow/Sweetgale
- (44) Mesic Sedge-Grass-Herb Meadow Tundra
- (47) Wet Meadow Tundra

(46) Sedge-Birch Tundra



3A2I. *Sedge-Birch Tundra* (Photo Courtesy of Yukon – Charley Rivers National Preserve)



3A2I. *Sedge-Birch Tundra* (Photo Courtesy of Yukon – Charley Rivers National Preserve)

Fuel models:

- FBFM40 – GR2
- FBFM13 - 1
- CFFBPS - O1

Primary carrier of fire:

- Herbs & shrubs

Fire behavior comments:

- N/A

Vegetation characteristics:

Shrub birch comprise less than 25% cover and are often located on hummocks. This type is dominated by sedges with shrub birch. Mosses, including feathermosses and *Sphagnum* species may be common.

Viereck vegetation classes:

- 3A2I Sedge-Birch Tundra

Similar fuel types:

- (30) Open Low Mixed Shrub-Sedge Tussock Tundra/Bog
- (44) Mesic Sedge-Grass-Herb Meadow Tundra
- (47) Wet Meadow Tundra

(47) Wet Meadow Tundra



3A3A. Wet Sedge Meadow Tundra (Photo Courtesy of Bering Land Bridge National Preserve)



3A3A. Wet Sedge Meadow Tundra (Photo Courtesy of Bering Land Bridge National Preserve)



3A3A. Wet Sedge Meadow Tundra (Photo Courtesy of Bering Land Bridge National Preserve)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- Herbs

Fire behavior comments:

- Dependent on water table, otherwise if submerged, will be NB6

Vegetation characteristics:

Woody plants are usually absent, but some prostrate willows may be present. This type is dominated by sedges, grasses, and/or broad-leaved herbs. Mosses and lichens may be absent to common. Cover ranges from open to complete. This type occurs in arctic lowlands, tundra areas, and near the arctic coast.

Viereck vegetation classes:

- 3A3A Wet Sedge Meadow Tundra
- 3A3B Wet Sedge-Grass Meadow Tundra
- 3A3C Wet Sedge-Herb Meadow Tundra

Similar fuel types:

- (44) Mesic Sedge-Grass-Herb Meadow Tundra
- (47) Wet Meadow Tundra
- (48) Wet Sedge-Grass Meadow-Marsh
- (49) Wet Sedge Meadow-Bog-Shrub
- (51) Wet Species - Non Burnable

(48) Wet Sedge-Grass Meadow-Marsh



3A3H. Halophytic Grass Wet Meadow (Photo Courtesy of Bering Land Bridge National Preserve)



3A3D. Fresh Sedge Marsh (Photo Courtesy of M. Fleming, SAIC)



3A3D. Fresh Sedge Marsh (Photo Courtesy of M. Fleming, SAIC)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- grass

Fire behavior comments:

- Dependent on water table, otherwise if submerged, will be fuel model NB6

Vegetation characteristics:

Trees are absent. Low shrubs may be present, but are likely absent. These types are dominated by tall, emergent sedges (ranging in height from 3 – 100 cm; 0.1 – 36 in) tall; grasses growing in deep water; and halophytic (salt-tolerant) grass species such as *Puccinellia* species. Halophytic forbs may be present. Marine algae and aquatic mosses are present at some sites. Lichens are absent. Plant cover ranges from sparse to dense but less than complete because the dominant plants do not have leaves.

Viereck vegetation classes:

- 3A3D Fresh Sedge Marsh
- 3A3E Fresh Grass Marsh
- 3A3H Halophytic Grass Wet Meadow
- 3A3I Halophytic Sedge Wet Meadow

Similar fuel types:

- (33) Open Low Willow/Sweetgale
- (47) Wet Meadow Tundra
- (49) Wet Sedge Meadow-Bog-Shrub

(49) Wet Sedge Meadow-Bog-Shrub



3A3F. Subarctic Lowland Sedge Wet Meadow (Photo Courtesy of Noatak National Preserve)



3A3F. Subarctic Lowland Sedge Wet Meadow (Photo Courtesy of Noatak National Preserve)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- Herbs

Fire behavior comments:

- Dependent on water table, otherwise if submerged, will be fuel model NB6

Vegetation characteristics:

Trees are absent or widely scattered and stunted. Low shrubs range from absent to 25% cover. These freshwater wetland communities are dominated by coarse and tall or slender and low sedges; low peat-forming sedges growing on bog peats; or mosses such as *Sphagnum* species. The sedges are not rooted in a moss mat. Mosses may be common when not dominant. Plant cover is usually complete. Lichens are common to scarce. The soil surface may have hummocks.

Viereck vegetation classes:

- 3A3F Subarctic Lowland Sedge Wet Meadow
- 3A3G Subarctic Lowland Sedge-Shrub Wet Meadow
- 3A3J Subarctic Lowland Sedge-Bog Meadow
- 3A3K Subarctic Lowland Sedge-Moss Bog Meadow

Similar fuel types:

- (33) Open Low Willow/Sweetgale
- (44) Mesic Sedge-Grass-Herb Meadow Tundra
- (47) Wet Meadow Tundra
- (48) Wet Sedge-Grass Meadow-Marsh
- (51) Wet Species - Non Burnable

(50) Dry Species - Non Burnable



3B1C. Alpine Herbs (Photo Courtesy of Wrangell – St. Elias National Park & Preserve)



3B1C. Alpine Herbs (Photo Courtesy of M. Fleming, SAIC)



3C1B. Dry Bryophyte (Moss) (Photo Courtesy of Gates of the Arctic National Park & Preserve)

Fuel models:

- FBFM40 – NB7
- FBFM13 - 99
- CFFBPS - N/A

Primary carrier of fire:

- N/A

Fire behavior comments:

- NB7 custom fuel model is for non-burnable, dry, and sparse vegetation

Vegetation characteristics:

Woody plants range from absent to present. This type has a wide variety of herbs colonizing previously unvegetated landscapes or talus and block fields. These types may also be composed of bryophytes, usually mosses, and include moss mound communities of dead mosses and rock. Lastly, they may be dominated by foliose and fruticose lichens. Vascular plants and scattered grasses may be present to absent. Small patches of mosses may be present. Lichens range from scarce to common, especially crustose lichens. Cover is low and bare ground and rock may be common.

Viereck vegetation classes:

- 3B1A Seral Herbs
- 3B1C Alpine Herbs
- 3C1B Dry Bryophyte (moss)
- 3C2B Foliose and Fruticose Lichen

Similar fuel types:

- (37) Dwarf Shrub Tundra
- (44) Mesic Sedge-Grass-Herb Meadow Tundra
- (51) Wet Species - Non Burnable
- (54) Crustose Lichen

(51) Wet Species - Non Burnable



3B1B. Alpine Herb – Sedge (Photo Courtesy of M. Fleming, SAIC)



3B3A. Fresh Herb Wet Meadow (Photo Courtesy of Kenai National Wildlife Refuge)

Fuel models:

- FBFM40 – NB6
- FBFM13 - 99
- CFFBPS - N/A

Primary carrier of fire:

- N/A

Fire behavior comments:

- NB6 custom fuel model is for non-burnable, wet vegetation

Vegetation characteristics:

Woody plants are absent. These types are varied. Some include a variety of herbs, mosses, and some lichens residing below late-lying snowbanks in mountainous areas. Others are dominated by emergent herbs in deep water. Floating-leaved or submerged aquatic plants may be present along with aquatic mosses. Wet meadows may be dominated by broad-leaved herbs (freshwater or halophytic) or nonwoody plants other than grasses or sedges (freshwater or halophytic), which are scattered to absent. Wet bryophyte communities differ from the others in that they are composed of bryophytes, including mosses and hepatics, with usually 100% cover. Cover for all other communities is likely sparse and much bare ground is present. Lichens and mosses may be present to absent.

Viereck vegetation classes:

- 3B1B Alpine Herb-Sedge (Snowbed)
- 3B3A Fresh Herb Marsh
- 3B3B Subarctic Lowland Herb Wet Meadow
- 3B3C Subarctic Lowland Herb Bog Meadow
- 3B3D Halophytic Herb Wet Meadow
- 3C1A Wet Bryophyte (moss)

Similar fuel types:

- (37) Dwarf Shrub Tundra
- (44) Mesic Sedge-Grass-Herb Meadow Tundra
- (47) Wet Meadow Tundra
- (48) Wet Sedge-Grass Meadow-Marsh
- (49) Wet Sedge Meadow-Bog-Shrub
- (50) Dry Species - Non Burnable

(52) Mesic Forb Herbaceous



3B2B. Fireweed (Photo Courtesy of Denali National Park & Preserve)



3B2D. Ferns (Photo Courtesy of M. Fleming, SAIC)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- Herbs

Fire behavior comments:

- If dried out in the fall, fireweed (3B2B) will burn
- Large Umbel community (3B2C) will burn pre green-up

Vegetation characteristics:

Woody plants are rare to present. These types are dominated by herbs, fireweed, tall herbs in the Umbelliferae family, or a lush growth of ferns with almost complete cover. Sedges, grasses, ferns, and mosses (nonsphagnaceous and feathermosses) are common. Lichens may be present. Occurs at sites with spring snow melt or recently burned areas.

Viereck vegetation classes:

- 3B2A Mixed Herbs
- 3B2B Fireweed
- 3B2C Large Umbel
- 3B2D Ferns

Similar fuel types:

- (38) Elymus
- (42) Bluejoint Shrub Herb

(53) Foliose and Fruticose Lichen



3C2B. Foliose and Fruticose Lichen (Photo Courtesy of Gates of the Arctic National Park & Preserve)



3C2B. Foliose and Fruticose Lichen (Photo Courtesy of Gates of the Arctic National Park & Preserve)

Fuel models:

- FBFM40 – GR1
- FBFM13 - 1
- CFFBPS - O1A

Primary carrier of fire:

- lichen

Fire behavior comments:

- N/A

Vegetation characteristics:

Vascular plants are absent or nearly so. This type is dominated by foliose and fruticose lichens of the *Cladonia*, *Cladina*, and *Stereocaulon* genera. Crustose lichens may be present. Mosses are uncommon.

Viereck vegetation classes:

- 3C2B Foliose and Fruticose Lichen

Similar fuel types:

- (37) Dwarf Shrub Tundra
- (44) Mesic Sedge-Grass-Herb Meadow Tundra
- (54) Crustose Lichen

(54) Crustose Lichen

Fuel models:

- FBFM40 – NB9
- FBFM13 - 99
- CFFBPS - N/A

Primary carrier of fire:

- N/A

Fire behavior comments:

- Rock present

Vegetation characteristics:

Vascular plants are absent or nearly so. This community is dominated by crustose lichens such as *Rhizocarpon*, and *Lecanora* genera. Rock inhabiting foliose lichens are common. Fruticose lichens, mosses, and vascular plants are absent to rare, with sparse plant cover.

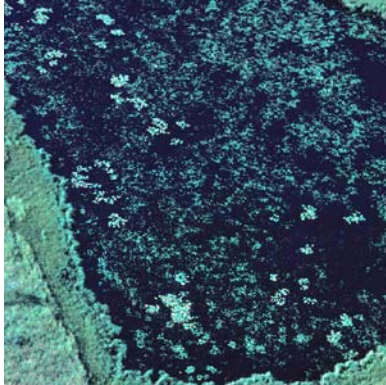
Viereck vegetation classes:

- 3C2A Crustose Lichen

Similar fuel types:

- (37) Dwarf Shrub Tundra
- (53) Foliose and Fruticose Lichen

(55) Aquatic Herbaceous



3D1F. Fresh Pondweed (Photo courtesy of Innoko National Wildlife Refuge)



3D1a. Pondlily (Photo Courtesy of M. Fleming, SAIC)

Fuel models:

- FBFM40 – NB8
- FBFM13 - 98
- CFFBPS - N/A

Primary carrier of fire:

- N/A

Fire behavior comments:

- Water present

Vegetation characteristics:

This type has a number of communities where either fresh or salt water are present at levels to inhibit fire behavior. The freshwater aquatic herbaceous communities include pondlilies, common marestalk, aquatic buttercup, burreed, water milfoil, pondweeds (growing submerged to extending above the surface), water star-wort, and aquatic cyptogams. Communities that reside in brackish water ponds near the sea coast include four-leaf marestalk and brackish pondweed. Aquatic marine herbaceous communities include eelgrass and marine algae. Emergent communities are scattered to absent. Vascular plants may be present.

Viereck vegetation classes:

- 3D1A Pondlily
- 3D1B Common Marestalk
- 3D1C Aquatic Buttercup
- 3D1D Burreed
- 3D1E Water Milfoil
- 3D1F Fresh Pondweed
- 3D1G Water Star-Wort
- 3D1H Aquatic Cryptogam
- 3D2A Four-Leaf Marestalk
- 3D2B Brackish Pondweed
- 3D3A Eelgrass
- 3D3B Marine Algae

Similar fuel types:

- (47) Wet Meadow Tundra
- (48) Wet Sedge-Grass Meadow-Marsh
- (49) Wet Sedge Meadow-Bog-Shrub
- (51) Wet Species - Non Burnable

(56) Downed Beetle-killed Spruce



Downed beetle-killed spruce (Photo Courtesy of the Kenai National Wildlife Refuge – FWS)



Downed beetle-killed spruce (Photo Courtesy of the Kenai National Wildlife Refuge – FWS)



Downed beetle-killed spruce (Photo Courtesy of the Kenai National Wildlife Refuge – FWS)

Fuel models:

- FBFM40 – SB1
- FBFM13 - 11
- CFFBPS - M4

Primary carrier of fire:

- Downed woody fuel

Fire behavior comments:

- If carried by grass, use the bluejoint meadow type (number 41) with GR4; use with a min dead fuel percent of 50% (CFFDRS)

Vegetation characteristics:

Not described

Viereck vegetation classes:

- Not described

Similar fuel types:

- (41) Bluejoint Meadow (when fire is carried by grass)

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Appendix A

AWFCG Endorsed Fuel Model Crosswalk

On January 22nd, 2008, the AWFCG endorsed the attached crosswalk between Alaska vegetation classes and the fuel models developed by Scott and Bergen "40", the NFFL "13", and the Canadian "CFFDRS" models.

Problem Statement: With the growing interest and use of LANDFIRE, GIS mapping and fuels/fire behavior, modeling various land management agencies/owners have developed localized fuels mapping crosswalks. Increased demand for sharing data layers has shown that not all crosswalks can be shared due to differing crosswalk strategies. This causes problems for implementation of projects across ownership boundaries. With the new 40 Fuel Models now available, a crosswalk is needed to match Alaska vegetation to the fuel models.

Goal: To develop a standardized interagency vegetation crosswalk that can be applied statewide by various disciplines.

Background: In early 2007, Brad Cella decided to act upon discussions within various committees about the need for a common vegetation and guidebook to enable Alaskans to better utilize the new Bergen and Scott Fuel Models. He paid for Joe Scott from the Missoula Fire Lab, to travel to Anchorage to meet with fire behavior, fuels, ecology, GIS specialists and LANDFIRE's USGS lead in Alaska. Jennifer Allen, NPS, took the lead on organizing the meetings and administering the subsequent contracts with Joe Scott.

In April, 2007, an interagency group (see below) met in Anchorage and went through all 80+ Level IV classifications within Viereck et al's (1992) Alaska Vegetation Classification. For each of Viereck's vegetation classes we discussed the fuel structure, probable fire behavior and which of the 40 Fuel Models best described the fuels associated with each vegetation class. With Joe Scott's help, we were able to look at the fire behavior predicted for each model and discuss if it match the observed fire behavior for the different vegetation classes. Only a few vegetation classes needed to be split to accommodate fire behavior at different seral stages or seasonality. The crosswalk was distributed for review during the summer of 2007.

In December, 2007, the group reconvened in Anchorage. We revisited all of the prior crosswalk determinations, completed crosswalks to the 13 NFFL, and to the Canadian fuel models, and discussed the format and layout of the guidebook.

Products:

Crosswalk – **Completed two versions** – a “complete” crosswalk of all Level IV classes (see worksheets) and a “condensed” version that lumped the 80 Viereck Level IV classes into 56 classes used in the upcoming Guidebook.

Guidebook – **Completed 2008**. The guidebook includes photos of Alaska vegetation types that fit within the subset of the 40 fuel models used in Alaska. It will includes basic vegetation and fuel descriptions and fire behavior basics.

AWFCG DECISION: The AWFCG endorses the attached crosswalk as the official crosswalk for use in Alaska. The crosswalk will be posted on the AWFCG website with links under the Fuels, Research and GIS committee sections.

(http://fire.ak.blm.gov/administration/awfcg_committees.php)

Crosswalk development group:

Jennifer Allen (NPS, Research Committee), Karen Murphy (FWS, Research Committee), Kent Slaughter (BLM, Research Committee), Gene Long (FWS, Research and Fuels), Kato Howard (BLM, Fuels Committee), Dave Lockwood (USFS, Fuels committee), Skip Theisen (BLM, Fire Behavior), Brian Sorbel (NPS, GIS Committee), Parker Martyn (BLM, GIS Committee), Jan Passek (FWS, GIS Committee), Peter Butteri (FWS, Ops Committee), Frank Cole (DNR, Fire behavior), John See (DNR, Fire Behavior), John Koltun (Consultant, GIS & modeling), Michael Fleming (SAIC, LANDFIRE), Joe Scott and Erin Noonan (Consultants from Missoula Fire Lab). Not all participants attended both meetings.

AWFCG Endorsed Alaska Fuel Model Crosswalk

Guide book group	Viereck Code	Description	Primary Carrier of Fire	Fuel Model		
				40	13	CFFDRS
1	Closed	Sitka Spruce-Western Hemlock Forest	compact needle litter	TL1	8	C6
1	1A1A	Closed Sitka Spruce Forest	compact needle litter	TL1	8	C6
1	1A1B	Closed Western Hemlock Forest	compact needle litter	TL1	8	C6
1	1A1C	Closed Sitka Spruce-Western Hemlock Forest	compact needle litter	TL1	8	C6
1	1A1D	Closed Western Hemlock-Sitka Spruce-(Western Redcedar) Forest	compact needle litter	TL1	8	C6
1	1A1E	Closed Western Hemlock-Alaska-Cedar	compact needle litter	TL1	8	C6
1	1A1F	Closed Mountain Hemlock Forest	compact needle litter	TL1	8	C6
1	1A1G	Closed Western Hemlock-Western Redcedar Forest	compact needle litter	TL1	8	C6
1	1A1H	Closed Silver Fir-Western Hemlock Forest	compact needle litter	TL1	8	C6
1	1A1I	Closed Subalpine Fir Forest	compact needle litter	TL1	8	C6
2	Closed	White Spruce Forest	feather moss, litter, duff	TU1	10	C3
2	1A1J	Closed White Spruce Forest	feather moss, litter, duff	TU1	10	C3
3	Closed	Black Spruce Forest	feather moss	TU3	9 ADJ	C2
3	1A1K	Closed Black Spruce Forest	feather moss	TU3	9 ADJ	C2
3	1A1L	Closed Black Spruce-White Spruce Forest	feather moss	TU3	9 ADJ	C2
4	Open	Western Hemlock-Sitka Spruce Forest	litter	TL1	8	M4
4	1A2A	Open Sitka Spruce Forest	litter	TL1	8	M4
4	1A2B	Open Western Hemlock-Sitka Spruce Forest	litter	TL1	8	M4
4	1A2C	Open Mountain Hemlock Forest	litter	TL1	8	M4
4	1A2D	Open Mixed Conifer Forest	litter	TL1	8	M4
5	Open	White Spruce Forest	shrub & litter	TU5	10	C7
5	1A2E	Open White Spruce Forest	shrub & litter	TU5	10	C7
6	Open	Black Spruce Forest	feather moss	TU4	9 ADJ	C1
6	1A2F	Open Black Spruce Forest	feather moss	TU4	9 ADJ	C1
6	1A2G	Open Black Spruce-White Spruce Forest	feather moss	TU4	9 ADJ	C1
7	Open	Black Spruce-Tamarack Forest	feather moss & shrub	TU5	10	C1
7	1A2H	Open Black Spruce-Tamarack Forest	feather moss & shrub	TU5	10	C1
8	Woodland	Sitka Spruce-Pine	litter & shrub	TL1	8	M2

AWFCG Endorsed Alaska Fuel Model Crosswalk

Guide book group	Viereck Code	Description	Primary Carrier of Fire	Fuel Model		
				40	13	CFFDRS
8	1A3A	Lodgepole Pine Woodland	litter & shrub	TL1	8	M2
8	1A3B	Sitka Spruce Woodland	litter & shrub	TL1	8	M2
9	White Spruce Woodland		feather moss & shrub	TU5	10	C1
9	1A3C	White Spruce Woodland	feather moss & shrub	TU5	10	C1
10	Black Spruce Woodland with tussock		shrub & tussocks	GR2	1	O1
10	1A3D	Black Spruce Woodland	shrub & tussocks	GR2	1	O1
11	Black Spruce Woodland with lichen-moss		feather moss & lichen	TU4	9 ADJ	C2
11	1A3D	Black Spruce Woodland	feather moss & lichen	TU4	9 ADJ	C2
11	1A3E	Black Spruce-White Spruce Woodland	feather moss & lichen	TU4	9 ADJ	C2
12	Closed Red Alder Forest		leaf litter	TL2	8	M2
12	1B1A	Closed Red Alder Forest	leaf litter	TL2	8	M2
13	Closed Black Cottonwood-Balsam Poplar Forest		leaf litter	TL2	8	M2
13	1B1B	Closed Black Cottonwood Forest	leaf litter	TL2	8	M2
13	1B1C	Closed Balsam Poplar Forest	leaf litter	TL2	8	M2
14	Closed Paper Birch-Quaking Aspen Forest		leaf litter & sparse grass	TU1	8	M2
14	1B1D	Closed Paper Birch Forest	leaf litter & sparse grass	TU1	8	M2
14	1B1E	Closed Quaking Aspen Forest	leaf litter & sparse grass	TU1	8	M2
14	1B1F	Closed Paper Birch-Quaking Aspen Forest	leaf litter & sparse grass	TU1	8	M2
14	1B1G	Closed Quaking Aspen-Balsam Poplar Forest	leaf litter & sparse grass	TU1	8	M2
15	Open Paper Birch Forest		leaf litter & grass	TU1	9	M2
15	1B2A	Open Paper Birch Forest	leaf litter & grass	TU1	9	M2
16	Open Quaking Aspen Forest		leaf litter, grass, shrub & slope	TL2	8	D1
16	1B2B	Open Quaking Aspen Forest	leaf litter, grass, shrub & slope	TL2	8	D1
17	Open Balsam Poplar (Black Cottonwood) Forest		leaf litter	TL2	8	M2
17	1B2C	Open Balsam Poplar (Black Cottonwood) Forest	leaf litter	TL2	8	M2
18	Woodland Paper Birch-Balsam Poplar		lichen or grass & leaf litter	GR1	1	O1A
18	1B3A	Paper Birch Woodland	lichen or grass & leaf litter	GR1	1	O1A
18	1B3B	Balsam Poplar Woodland	lichen or grass & leaf litter	GR1	1	O1A
18	1B3C	Paper Birch-Balsam Poplar Woodland	lichen or grass & leaf litter	GR1	1	O1A

AWFCG Endorsed Alaska Fuel Model Crosswalk

Guide book group	Viereck Code	Description	Primary Carrier of Fire	Fuel Model		
				40	13	CFFDRS
19	Spruce-Paper Birch		leaf litter	TL6	8	M2
19	1C1A	Closed Spruce-Paper Birch Forest	leaf litter	TL6	8	M2
19	1C1C	Closed Spruce-Paper Birch-Quaking Aspen Forest	leaf litter	TL6	8	M2
19	1C1D	Closed Quaking Aspen-Spruce Forest	leaf litter	TL6	8	M2
19	1C2A	Open Spruce-Paper Birch Forest	leaf litter	TL6	8	M2
19	1C2B	Open Quaking Aspen-Spruce Forest	leaf litter	TL6	8	M2
19	1C3A	Spruce-Paper Birch Woodland	leaf litter	TL6	8	M2
20	White Spruce - Paper Birch - Balsam Poplar - Spruce		leaf litter & herbaceous plants	TU1	8	M2
20	1C1B	Closed White Spruce-Paper Birch-Balsam Poplar (Black Cottonwood) Forest	leaf litter & herbaceous plants	TU1	8	M2
20	1C1E	Closed Balsam Poplar-White Spruce Forest	leaf litter & herbaceous plants	TU1	8	M2
20	1C2C	Open Paper Birch-Balsam Poplar-Spruce Forest	leaf litter & herbaceous plants	TU1	8	M2
20	1C2D	Open Spruce-Balsam Poplar Forest	leaf litter & herbaceous plants	TU1	8	M2
21	Dwarf Tree Mountain Hemlock Scrub		sparse moss & shrub	SH1	10	M2
21	2A1A	Closed Mountain Hemlock Dwarf Tree Scrub	sparse moss & shrub	SH1	10	M2
21	2A1B	Closed Subalpine Fir Dwarf Tree Scrub	sparse moss & shrub	SH1	10	M2
21	2A2B	Open Mountain Hemlock Dwarf Tree Scrub	sparse moss & shrub	SH1	10	M2
22	Dwarf Tree Black Spruce Scrub		feather moss & shrub	TU4	9	C2
22	2A2A	Open Black Spruce Dwarf Tree Scrub	feather moss & shrub	TU4	9	C2
22	2A3A	Black Spruce Dwarf Tree Woodland	feather moss & shrub	TU4	9	C2
23	Closed Tall Alder Willow Shrub		leaf litter & woody debris	TU1	6	M2
23	2B1A	Closed Tall Willow Shrub	leaf litter & woody debris	TU1	6	M2
23	2B1B	Closed Tall Alder Shrub	leaf litter & woody debris	TU1	6	M2
23	2B1D	Closed Tall Alder-Willow Shrub	leaf litter & woody debris	TU1	6	M2
24	Closed Tall Birch Shrub		shrubs	SH3	6	M1
24	2B1C	Closed Tall Shrub Birch Shrub	shrubs	SH3	6	M1
24	2B1E	Closed Tall Shrub Birch-Willow Shrub	shrubs	SH3	6	M1
25	Tall Shrub Swamp		herbaceous, shrub & leaf litter	SH1	1	O1A
25	2B1F	Closed Tall Shrub Swamp	herbaceous, shrub & leaf litter	SH1	1	O1A

AWFCG Endorsed Alaska Fuel Model Crosswalk

Guide book group	Viereck Code	Description	Primary Carrier of Fire	Fuel Model		
				40	13	CFFDRS
25	2B2F	Open Tall Shrub Swamp	herbaceous, shrub & leaf litter	SH1	1	O1A
26	Open Tall Willow Alder Shrub		grass & shrub litter	TU1	5	M2
26	2B2A	Open Tall Willow Shrub	grass & shrub litter	TU1	5	M2
26	2B2B	Open Tall Alder Shrub	grass & shrub litter	TU1	5	M2
26	2B2D	Open Tall Alder-Willow Shrub	grass & shrub litter	TU1	5	M2
27	Open Tall Birch/Birch-Willow Shrub		shrubs	SH3	5	M1
27	2B2C	Open Tall Shrub Birch Shrub	shrubs	SH3	5	M1
27	2B2E	Open Tall Shrub Birch-Willow Shrub	shrubs	SH3	5	M1
28	Closed Low Birch/Birch-Willow/Ericaceous Shrub		shrub	SH2	5	M1
28	2C1A	Closed Low Shrub Birch Shrub	shrub	SH2	5	M1
28	2C1C	Closed Low Shrub Birch-Willow Shrub	shrub	SH2	5	M1
28	2C1D	Closed Low Ericaceous Shrub	shrub	SH2	5	M1
29	Closed Low Willow/Alder-Willow Shrub		shrub	TU1	6	M2
29	2C1B	Closed Low Willow Shrub	shrub	TU1	6	M2
29	2C1E	Closed Low Alder-Willow Shrub	shrub	TU1	6	M2
30	Open Low Mixed Shrub-Sedge Tussock Tundra/Bog		tussocks	GR2	1	O1
30	2C2A	Open Low Mixed Shrub-Sedge Tussock Tundra	tussocks	GR2	1	O1
30	2C2B	Open Low Mixed Shrub-Sedge Tussock Bog	tussocks	GR2	1	O1
31	Open Low Birch-Ericaceous Shrub/Bog		grass & dwarf birch	GR3	1	O1
31	2C2C	Open Low Mesic Shrub Birch-Ericaceous Shrub	grass & dwarf birch	GR3	1	O1
31	2C2D	Open Low Shrub Birch-Ericaceous Shrub Bog	grass & dwarf birch	GR3	1	O1
32	Open Low Birch-Willow/Ericaceous Shrub/Bog		grass & shrub	GR2	1	O1
32	2C2E	Open Low Ericaceous Shrub Bog	grass & shrub	GR2	1	O1
32	2C2F	Open Low Shrub Birch-Willow Shrub	grass & shrub	GR2	1	O1
33	Open Low Willow/Sweetgale		herbacous	GR1	1	O1A
33	2C2G	Open Low Willow Shrub	herbacous	GR1	1	O1A
33	2C2H	Open Low Willow -Sedge Shrub Tundra	herbacous	GR1	1	O1A
33	2C2I	Open Low Willow-Graminoid Shrub Bog	herbacous	GR1	1	O1A
33	2C2J	Open Low Sweetgale-Graminoid Bog	herbacous	GR1	1	O1A

AWFCG Endorsed Alaska Fuel Model Crosswalk

Guide book group	Viereck Code	Description	Primary Carrier of Fire	Fuel Model		
				40	13	CFFDRS
34		Open Low Alder/Alder-Willow Shrub	grass & low shrubs	GS1	1	O1
34	2C2K	Open Low Alder-Willow Shrub	grass & low shrubs	GS1	1	O1
34	2C2L	Open Low Alder Shrub	grass & low shrubs	GS1	1	O1
35		Sagebrush-Juniper	juniper	SH2	8	O1A
35	2C2M	Sagebrush-Juniper	juniper	SH2	8	O1A
36		Sagebrush-Grass	grass & shrub	GS1	2	O1
36	2C2N	Sagebrush-Grass	grass & shrub	GS1	2	O1
37		Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
37	2D1A	Dryas Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
37	2D1B	Dryas-Sedge Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
37	2D1C	Dryas-Lichen Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
37	2D2A	Bearberry Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
37	2D2B	Vaccinium Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
37	2D2C	Crowberry Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
37	2D2D	Mountain-Heath Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
37	2D2E	Cassiope Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
37	2D3A	Willow Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
38		Elymus	grass	SH4	8	O1A
38	3A1A	Elymus	grass	SH4	8	O1A
39		Grass-Shrub	short grass	GR2	1	O1
39	3A1B	Dry Fescue	short grass	GR2	1	O1
39	3A1C	Midgrass-Shrub	short grass	GR2	1	O1
39	3A1E	Hair-Grass	short grass	GR2	1	O1
40		Grass-Herb	short grass & herbaceous	GR1	1	O1A
40	3A1D	Midgrass-Herb	short grass & herbaceous	GR1	1	O1A
41		Bluejoint Meadow	grass	GR4	3	O1
41	3A2A	Bluejoint Meadow	grass	GR4	3	O1
42		Bluejoint Shrub Herb	grass	GR2	1	O1
42	3A2B	Bluejoint-Herb	grass	GR2	1	O1

AWFCG Endorsed Alaska Fuel Model Crosswalk

Guide book group	Viereck Code	Description	Primary Carrier of Fire	Fuel Model		
				40	13	CFFDRS
42	3A2C	Bluejoint-Shrub	grass	GR2	1	O1
43	Tussock Tundra		tussocks	GR3	3	O1
43	3A2D	Tussock Tundra	tussocks	GR3	3	O1
44	Mesic Sedge-Grass-Herb Meadow Tundra		grass & herb	GR2	1	O1
44	3A2E	Mesic Sedge-Grass Meadow Tundra	grass & herb	GR2	1	O1
44	3A2F	Mesic Sedge-Herb Meadow Tundra	grass & herb	GR2	1	O1
44	3A2G	Mesic Grass-Herb Meadow Tundra	grass & herb	GR2	1	O1
45	Sedge Willow Dryas Tundra		herbaceous	GR1	1	O1A
45	3A2H	Sedge-Willow Tundra	herbaceous	GR1	1	O1A
45	3A2J	Sedge-Dryas Tundra	herbaceous	GR1	1	O1A
46	Sedge-Birch Tundra		herbaceous & shrub	GR2	1	O1
46	3A2I	Sedge-Birch Tundra	herbaceous & shrub	GR2	1	O1
47	Wet Meadow Tundra		herbaceous	GR1	1	O1A
47	3A3A	Wet Sedge Meadow Tundra	herbaceous	GR1	1	O1A
47	3A3B	Wet Sedge-Grass Meadow Tundra	herbaceous	GR1	1	O1A
47	3A3C	Wet Sedge-Herb Meadow Tundra	herbaceous	GR1	1	O1A
48	Wet Sedge-Grass Meadow-Marsh		grass	GR1	1	O1A
48	3A3D	Fresh Sedge Marsh	grass	GR1	1	O1A
48	3A3E	Fresh Grass Marsh	grass	GR1	1	O1A
48	3A3H	Halophytic Grass Wet Meadow	grass	GR1	1	O1A
48	3A3I	Halophytic Sedge Wet Meadow	grass	GR1	1	O1A
49	Wet Sedge Meadow-Bog-Shrub		herbaceous	GR1	1	O1A
49	3A3F	Subarctic Lowland Sedge Wet Meadow	herbaceous	GR1	1	O1A
49	3A3G	Subarctic Lowland Sedge-Shrub Wet Meadow	herbaceous	GR1	1	O1A
49	3A3J	Subarctic Lowland Sedge-Bog Meadow	herbaceous	GR1	1	O1A
49	3A3K	Subarctic Lowland Sedge-Moss Bog Meadow	herbaceous	GR1	1	O1A
50	Dry Species - Non Burnable			NB7*	99	
50	3B1A	Seral Herbs		NB7*	99	
50	3B1C	Alpine Herbs		NB7*	99	

AWFCG Endorsed Alaska Fuel Model Crosswalk

Guide book group	Viereck Code	Description	Primary Carrier of Fire	Fuel Model		
				40	13	CFFDRS
50	3C1B	Dry Bryophyte (MOSS)		NB7*	99	
50	3C2B	Foliose and Fruticose Lichen		NB7*	99	
51	Wet Species - Non Burnable			NB6**	99	
51	3B1B	Alpine Herb-Sedge (Snowbed)		NB6**	99	
51	3B3A	Fresh Herb Marsh		NB6**	99	
51	3B3B	Subarctic Lowland Herb Wet Meadow		NB6**	99	
51	3B3C	Subarctic Lowland Herb Bog Meadow		NB6**	99	
51	3B3D	Halophytic Herb Wet Meadow		NB6**	99	
51	3C1A	Wet Bryophyte (MOSS)		NB6**	99	
52	Mesic Forb Herbaceous			GR1	1	O1A
52	3B2A	Mixed Herbs		GR1	1	O1A
52	3B2B	Fireweed		GR1	1	O1A
52	3B2C	Large Umbel		GR1	1	O1A
52	3B2D	Ferns		GR1	1	O1A
53	Foliose and Fruticose Lichen			GR1	1	O1A
53	3C2B	Foliose and Fruticose Lichen		GR1	1	O1A
54	Crustose Lichen			NB9	99	
54	3C2A	Crustose Lichen		NB9	99	
55	Aquatic Herbaceous			NB8	99	
55	3D1A	Pondlily		NB8	99	
55	3D1B	Common Marestalk		NB8	99	
55	3D1C	Aquatic Buttercup		NB8	99	
55	3D1D	Burreed		NB8	99	
55	3D1E	Water Milfoil		NB8	99	
55	3D1F	Fresh Pondweed		NB8	99	
55	3D1G	Water Star-Wort		NB8	99	
55	3D1H	Aquatic Cryptogam		NB8	99	
55	3D2A	Four-Leaf Marestalk		NB8	99	
55	3D2B	Brackish Pondweed		NB8	99	

AWFCG Endorsed Alaska Fuel Model Crosswalk

Guide book group	Viereck Code	Description	Primary Carrier of Fire	Fuel Model		
				40	13	CFFDRS
55	3D3A	Eelgrass		NB8	99	
55	3D3B	Marine Algae		NB8	99	
56	Downed Beetle-killed spruce		downed woody fuel	SB1	11	M4
56	4A1A	Downed Beetle kill	downed woody fuel	SB1	11	M4

* The NB7 fuel model is a custom model for drier vegetated areas that typically do not burn.

** The NB6 fuel model is a custom model for wet vegetated areas that typically do not burn.

AWFCG Endorsed Alaska Fuel Model Crosswalk - CONDENSED version

Guidebook Group Number	Description	Primary Carrier of Fire	Fuel Model		
			40	13	CFFDR S
1	Closed Sitka Spruce-Western Hemlock Forest	compact needle litter	TL1	8	C6
2	Closed White Spruce Forest	feather moss, litter, duff	TU1	10	C3
3	Closed Black Spruce Forest	feather moss	TU3	9 ADJ	C2
4	Open Western Hemlock-Sitka Spruce Forest	litter	TL1	8	M4
5	Open White Spruce Forest	shrub & litter	TU5	10	C7
6	Open Black Spruce Forest	feather moss	TU4	9 ADJ	C1
7	Open Black Spruce-Tamarack Forest	feather moss & shrub	TU5	10	C1
8	Woodland Sitka Spruce-Pine	litter & shrub	TL1	8	M2
9	White Spruce Woodland	feather moss & shrub	TU5	10	C1
10	Black Spruce Woodland with tussock	shrub & tussocks	GR2	1	O1
11	Black Spruce Woodland with lichen-moss	feather moss & lichen	TU4	9 ADJ	C2
12	Closed Red Alder Forest	leaf litter	TL2	8	M2
13	Closed Black Cottonwood-Balsam Poplar Forest	leaf litter	TL2	8	M2
14	Closed Paper Birch-Quaking Aspen Forest	leaf litter & sparse grass	TU1	8	M2
15	Open Paper Birch Forest	leaf litter & grass	TU1	9	M2
16	Open Quaking Aspen Forest	leaf litter, grass, shrub & slope	TL2	8	D1
17	Open Balsam Poplar (Black Cottonwood) Forest	leaf litter	TL2	8	M2
18	Woodland Paper Birch-Balsam Poplar	lichen or grass & leaf litter	GR1	1	O1A
19	Spruce-Paper Birch	leaf litter	TL6	8	M2
20	White Spruce - Paper Birch - Balsam Poplar - Spruce	leaf litter & herbaceous plants	TU1	8	M2
21	Dwarf Tree Mountain Hemlock Scrub	sparse moss & shrub	SH1	10	M2
22	Dwarf Tree Black Spruce Scrub	feather moss & shrub	TU4	9	C2
23	Closed Tall Alder Willow Shrub	leaf litter & woody debris	TU1	6	M2
24	Closed Tall Birch Shrub	shrubs	SH3	6	M1
25	Tall Shrub Swamp	herbaceous, shrub & leaf litter	SH1	1	O1A
26	Open Tall Willow Alder Shrub	grass & shrub litter	TU1	5	M2
27	Open Tall Birch/Birch-Willow Shrub	shrubs	SH3	5	M1
28	Closed Low Birch/Birch-Willow/Ericaceous Shrub	shrub	SH2	5	M1

AWFCG Endorsed Alaska Fuel Model Crosswalk - CONDENSED version

Guidebook Group Number	Description	Primary Carrier of Fire	Fuel Model		
			40	13	CFDR S
29	Closed Low Willow/Alder-Willow Shrub	grasses	TU1	6	M2
30	Open Low Mixed Shrub-Sedge Tussock Tundra/Bog	tussocks	GR2	1	O1
31	Open Low Birch-Ericaceous Shrub/Bog	grass & dwarf birch	GR3	1	O1
32	Open Low Birch-Willow/Ericaceous Shrub/Bog	grass & shrub	GR2	1	O1
33	Open Low Willow/Sweetgale	herbaceous	GR1	1	O1A
34	Open Low Alder/Alder-Willow Shrub	grass & low shrubs	GS1	1	O1
35	Sagebrush-Juniper	juniper	SH2	8	O1A
36	Sagebrush-Grass	grass & shrub	GS1	2	O1
37	Dwarf Shrub Tundra	herbaceous & low shrub	GR1	1	O1A
38	Elymus	grass	SH4	8	O1A
39	Grass-Shrub	short grass	GR2	1	O1
40	Grass-Herb	short grass & herbaceous	GR1	1	O1A
41	Bluejoint Meadow	grass	GR4	3	O1
42	Bluejoint Shrub Herb	grass	GR2	1	O1
43	Tussock Tundra	tussocks	GR3	3	O1
44	Mesic Sedge-Grass-Herb Meadow Tundra	grass & herb	GR2	1	O1
45	Sedge Willow Dryas Tundra	herbaceous	GR1	1	O1A
46	Sedge-Birch Tundra	herbaceous & shrub	GR2	1	O1
47	Wet Meadow Tundra	herbaceous	GR1	1	O1A
48	Wet Sedge-Grass Meadow-Marsh	grass	GR1	1	O1A
49	Wet Sedge Meadow-Bog-Shrub	herbaceous	GR1	1	O1A
50	Dry Species - Non Burnable		NB7	99	
51	Wet Species - Non Burnable		NB6	99	
52	Mesic Forb Herbaceous		GR1	1	O1A
53	Foliose and Fruticose Lichen		GR1	1	O1A
54	Crustose Lichen		NB9	99	
55	Aquatic Herbaceous		NB8	99	
56	Downed Beetle-killed spruce	downed woody fuel	SB1	11	M4

* The NB7 fuel model is a custom model for drier vegetated areas that typically do not burn.

** The NB6 fuel model is a custom model for wet vegetated areas that typically do not burn.



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