APPENDIX B - Habitat descriptions

I- Wet Sedge Meadow Tundra

Represented by plot(s): S2L1V05, S5L2V16
Alaska Vegetation Classification (Viereck et al. 1992) equivalent: III.A.3.a Wet Sedge Meadow Tundra
National Vegetation Classification (USNVC 2016) equivalent: Group 617 North American Arctic & Subarctic Wet Meadow

Wet Sedge Meadow Tundra develops as a large patch type across concave topography in Arctic lowlands or as a small patch type in the troughs or low centers of polygonal tundra. This habitat type is dominated or codominated by the sedges, *Carex aquatilis, Eriophorum angustifolium,* and *Carex chordorrhiza.* Wet site mosses in the *Sphagnum, Scorpidium*, *Drepanocladus, Limprichtia,* and *Hamatocaulis* genera may be important. Lichens and woody plants are generally absent but dwarf willows can be important in more mature sites with microtopographic highs. Sites are underlain by continious, ice-rich permafrost and subsequently are poorly-drained. Soils are thick organics overlying fine-grained silt loam.

Figure 1: Vegetation plot S5L2V16 – Wet Sedge Meadow Tundra habitat along the Colville River, Alaska.

II- Tussock Tundra

Represented by plot(s): S1L1V01
Alaska Vegetation Classification (Viereck et al. 1992) equivalent: III.A.2.d Tussock Tundra
National Vegetation Classification (USNVC 2016) equivalent: Group 371 North American Arctic & Subarctic Tussock Tundra

Tussock tundra is dominated by the tussock-forming sedges *Eriophorum vaginatum* and *Carex bigelowii*. The cottongrass, *Eriophorum vaginatum* is the predominant tussock-former on older landscapes and acidic substrates (and was most common on the Colville). Tussock formation may transition to the sedge, *Carex bigelowii* across younger landscapes, disturbance-prone landforms and circumneutral substrates. *Carex bigelowii* tussock tundra is considered a more productive and type relative to mature *Eriophorum vaginatum* tussock tundra (Boucher et al. 2016). Mature tussocks may be more than 0.5 m tall and spaced up to 0.6 m apart. Dwarf and low shrubs such as *Betula nana, Ledum palustre* ssp. *decumbens*, *Vaccinium vitis-idaea,* and *Cassiope tetragona* occupy the intertussock areas but their growth does not overtop the tussocks nor does it exceed 25% cover, respectively. The presence of continuous, ice-rich permafrost renders sites cold and poorly-drained. Shallow organics in the intertussock hollows are underlain by silty mineral soils. This is a widespread, late-seral type that develops across the muted topography of the Brooks Range Foothills.

Figure 2: Vegetation plot S1L1V01 - Tussock tundra habitat along the Colville River, Alaska.

III- Shrub-Tussock Tundra

Represented by plot(s): S1L2V02, S2L2V06, S3L3V08, S3L2V09
Alaska Vegetation Classification (Viereck et al. 1992) equivalent: II.C.2.f Open Low Shrub Birch-Willow Shrub or II.C.2.h Open Low Willow-Sedge Shrub Tundra
National Vegetation Classification (USNVC 2016) equivalent: Group 827 North American Arctic & Subarctic Low Willow Tundra or Group 371 North American Arctic & Subarctic Tussock Tundra or Group 829 North American Arctic & Subarctic Moist Tundra

Shrub-Tussock Tundra is a low (0.2-1.5 m tall) shrub type where cover ranges from 25-75% and sedges and mosses dominate the understory. Common low shrub species are *Salix pulchra, Betula nana,* and *Ledum palustre* ssp*. decumbens* with the participation of *Betula nana* decreasing in the high arctic. Dwarf (less than 20 cm tall) shrub cover is variable but commonly includes *Vaccinium vitis-idea, Cassiope tetragona*, and *Dryas integrifolia*. Where tussocked, the sedges *Eriophorum vaginatum* and *Carex bigelowii* have a strong presence and the forb, *Rubus chamaemorus* indicates the type (Boucher et al. 2016). Feathermosses such as *Hylocomium splendens, Pleurozium schreberi, Tomentypnum nitens, and Aulacomnium palustre* may form a near-continuous mat. Low shrub cover appears to increase in tussock tundra with increasing slope, with the participation of dwarf shrubs increasing in the subalpine. The presence of continuous, ice-rich permafrost renders sites cold and poorly-drained. Shallow organics in the intertussock hollows are underlain by silty mineral soils. This is a widespread type that is considered successionally intermediate between wet sedge meadow and mature tussock tundra habitats. A moist variant, characteristic of polygonal tundra has similar species composition, but with minimal tussock development.

Figure 3: Vegetation plot S3L3V08 – Shrub-Tussock Tundra habitat along the Colville River, Alaska.

IV- Low Willow Shrub

Represented by plot(s): S1L3V03, S2L1V04, S3L1V10
Alaska Vegetation Classification (Viereck et al. 1992) equivalent: II.C.1.b Closed Low Willow Shrub or II.C.2.g Open Low Willow Shrub
National Vegetation Classification (USNVC 2016) equivalent: Group 827 North American Arctic & Subarctic Low Willow Tundra

Low Willow Shrub is a variable type dominated by low (0.2-1.5m tall) shrubs in the *Salix* genus. Low shrub cover exceeds 25% may be dominated or codominated *Salix richardsonii*, *S. pulchra,* and *S. glauca*, and *S. arbusculoides.* Associated shrubs that occur frequently at low cover include *S. reticulata, Betula nana,* and *Vaccinium uliginosum*. Understory herbaceous species typically have low cover and may include *Equisetum arvense, Petasites frigidus, Arctagrostis latifolia, Carex bigelowii,* and *Poa arctica*. *Hylocomium splendens* is the most common moss; lichens are not well-represented. This is a relatively common type developing in water tracks, along beaded streams, on mesic to moist side slopes and ridges in the Brooks Range foothills, and in high-centered polygonal tundra of the Arctic Coastal Plain. Sites are underlain by permafrost but due to topography are relatively well-drained. Soils are shallow organics overlying fine-grained loam.

Figure 4: Vegetation plot S2L1V04 - Low-willow shrub habitat along the Colville River, Alaska.

V- Tall Willow Shrub

Represented by plot(s): S2L3V07, S4L2V12, S4L1V13
Alaska Vegetation Classification (Viereck et al. 1992) equivalent: II.B.2.a Open Tall Willow Shrub
National Vegetation Classification (USNVC 2016) equivalent: Group 368 North American Arctic & Subarctic Tall Willow Tundra

Tall Willow Shrub is a tall (<1.5 m tall) shrub type where shrub cover exceeds 25% cover. In the Arctic this type is characteristic of active floodplains. *Salix alaxensis* is the dominant shrub; common associates are *Salix arbusculoides*, *Salix glauca*, *Salix niphoclada*, *Salix pulchra*, and *Salix richardsonii*. Dwarf shrubs include *Arctostaphylos* and *Dryas integrifolia*. In the herbaceous layer *Bromus inermis* ssp. *pumpellianus, Hedysarum alpinum,* and *Eurybia sibirica* have high constancy and can be considered indicator species for the type. Mosses and lichens are uncommon in the ground layer. Due to frequent flooding, soils consist of sorted sand, gravel, or cobble and pedogenesis is minimal. Permafrost is present at depth but is not a formative element.

Figure 5: Vegetation plot S2L3V07 - Tall-willow shrub habitat along the Colville River, Alaska.

VI- Tall Alder-Willow Shrub

Represented by plot(s): S4L3V11, S5L1V14, S5L3V15
Alaska Vegetation Classification (Viereck et al. 1992) equivalent: II.B.1.d. Closed Tall Alder-Willow Shrub
National Vegetation Classification (USNVC 2016) equivalent: Group 357 Western Boreal Mesic Alder - Willow Shrubland

Tall Alder-Willow Shrub is a tall (<1.5 m tall) shrub type where shrub cover exceeds 25% cover. In the Arctic this type is characteristic of riparian sites not prone to flooding. Here *Alnus viridis* ssp*. fruticosa* may dominate or codominate with *Salix pulchra*. Willows such as *Salix glauca*, *Salix richardsonii, Salix barclayi,* or *Salix commutata* may be codominant but have low constancy. Other shrub associates include *Vaccinium uliginosum, Empetrum nigrum, Betula nana* or *Betula glandulosa, Vaccinium vitis-idaea*, and *Ledum palustre* ssp. *decumbens.* Understory herbaceous species include *Calamagrostis canadensis, Equisetum arvense, Rubus arcticus, Chamerion angustifolium* ssp. *angustifolium,* and *Sanguisorba canadensis*. This group occurs at low to mid elevations in broad valleys, on mountain sideslopes, and in avalanche zones. Soils are predominantly mineral and are developed from hillslope colluvium, glacial deposits, or residual substrates. Permafrost is present at depth but is not a formative element.

Figure 6: Vegetation plot S4L3V11 – Tall-alder-willow shrub habitat along the Colville River, Alaska.

REFERENCES

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