APPENDIX C

APPENDIX C

Supporting Information

ALASKA NATURAL HERITAGE PROGRAM -RARE VASCULAR PLANT TRACKING LIST, (April 2008) *(http://aknhp.uaa.alaska.edu/botany/)* *(refer to link for updated list)*

Abies amabilis G5 S3
Agoseris aurantiaca G5 S1S2
Agoseris glauca G5 S2
Agrostis clavata G4G5 S1S2
Agrostis thurberiana G5 S2
Allium victorialis G5 S1
Alyssum obovatum G5? S2S3
Ambrosia chamissonis G4G5 S1S2
Antennaria densifolia G3 S2
Antennaria dioica G5 S2S3
Aphragmus eschscholtzianus G3 S3
Apocynum androsaemifolium G5 S2S3
Arabidopsis salsuginea G4G5 SP
Arenaria longipedunculata G3Q S3
Arnica diversifolia G5 S1
Arnica lessingii ssp. norbergii G5T2Q S2
Arnica lonchophylla G4 S1S2
Arnica mollis G5 S1
Artemisia aleutica G1 S1
Artemisia arctica ssp. beringensis G5T3? S2S3
Artemisia dracunculus G5 S1S2
Artemisia globularia var. lutea G4T1T2 S1S2
Artemisia michauxiana G4G5 SP
Artemisia rupestris ssp. woodii G3?T2 SP
Artemisia senjavinensis G3 S2S3
Artemisia stelleriana G4? S1
Artemisia tanacetifolia G4? S2
Artemisia tilesii ssp. unalaschcensis G5T3Q S3
Artemisia unalaskensis var. aleutica GNRT2T3Q S2S3
Asplenium trichomanes G5 S1
Asplenium trichomanes-ramosum G4 S3
Astragalus agrestis G5 SP
Astragalus robbinsii ssp. harringtonii G5T3 S3
Astragalus williamsii G4 S2S3
Betula papyrifera var. commutata G5T5 S2
Blysmopsis rufa G5 S1
Boechera calderi G4? S1
Boechera drepanoloba G4? S1?
Boechera lemmonii G5 S1
Boechera lyallii G5 S1

Bolboschoenus maritimus G5 S2?
Boschniakia hookeri G5 SP
Botrychium alaskense G2G3 S2S3
Botrychium ascendens G2G3 S2
Botrychium lineare G1 S1
Botrychium montanum G3 S1
Botrychium pedunculosum G2G3 S1
Botrychium robustum G4G5 S1S2
Botrychium spathulatum G3 S1
Botrychium tunux G1 S2
Botrychium virginianum G5 S2
Botrychium yaaxudakeit G2 S2
Brasenia schreberi G5 S1
Campanula aurita G4 S3S4
Campanula scouleri G5 S1
Cardamine angulata G5 S3
Carex adelostoma G4 S1
Carex atherodes G5 S3
Carex athrostachya G5 S1S2
Carex atratiformis G5 S2
Carex bebbii G5 S1
Carex brunnescens ssp. alaskana G5T3T4 S2S4
Carex crawfordii G5 S3
Carex deflexa G5 S1S2
Carex deweyana G5 S2?
Carex eburnea G5 S3
Carex echinata ssp. echinata G5T5 S1S2
Carex glareosa ssp. pribylovensis G4G5T2T3 S2S3
Carex heleonastes G4 S2S3
Carex holostoma G4? S3
Carex hoodii G5 S1
Carex interior G5 S1
Carex lapponica G4G5Q S2
Carex laxa G5? S1S2
Carex leptalea ssp. pacifica G5T4T5 S1S2
Carex parryana G4 S1
Carex phaeocephala G4 S3
Carex praegracilis G5 S1
Carex preslii G4 S1
Carex sabulosa G5 S1
Carex sartwellii var. sartwellii G4G5T4T5 S1
Carex sprengelii G5? S1
Carex stipata G5 S1
Carex sychnocephala G4 S1
Carex tahoensis G3G4Q S1
Carex xerantica G5 S1S2
Cassiope lycopodioides var. cristapilosa G4T2 S1
Castilleja hyetophila G4G5 S2S4
Castilleja parviflora G5? S2S4

Catabrosa aquatica G5 S1
Cerastium aleuticum G3 S3
Cerastium maximum G4 S3
Cerastium regelii G4 S3
Ceratophyllum demersum G5 S1
Chamaerhodos erecta ssp. nuttallii G5T4 S1S2
Chenopodium salinum G5 S1
Chimaphila umbellata ssp. occidentalis G5T5 S3
Chrysosplenium rosendahlii G3? S1S2
Cicuta bulbifera G5 S2
Cirsium edule G4 S1
Cirsium foliosum G5 SR
Cirsium kamtschaticum G3? S2S3
Claytonia arctica G3 S1
Claytonia ogilviensis G1 SP
Cochlearia sessilifolia G1G2Q S1S2
Corispermum ochotense G3G4 S3
Crassula aquatica G5 S3
Crataegus douglasii var. douglasii G5T4 S1S2
Cryptantha shackletteana G1Q S1
Cryptogramma stelleri G5 S2S3
Cypripedium montanum G4 S1
Cypripedium parviflorum G5 S2S3
Dactylorhiza aristata var. kodiakensis G4T2T3 S2S3
Danthonia spicata G5 S1
Douglasia alaskana G3 S3
Douglasia arctica G3 S2S3
Douglasia beringensis G2 S2
Douglasia gormanii G4 S3
Draba aleutica G2 S2
Draba densifolia G5 S1
Draba incerta G5 S2S3
Draba kamtschatica G3Q S2?
Draba lonchocarpa var. thompsonii G5T3T4Q S1
Draba micropetala G4 S1S2
Draba murrayi G2 S2
Draba ogilviensis G2 S2
Draba pauciflora G4 S1
Draba paysonii G5 SR
Draba praealta G5 SR
Draba ruaxes G3 S3
Draba subcapitata G4 S1
Dulichium arundinaceum G5 S1
Eleocharis kamtschatica G4 S2S3
Eleocharis nitida G3G4 S1
Eleocharis quinqueflora G5 S1
Elymus calderi G3G4 S2S3
Epilobium leptophyllum G5 SP
Erigeron acris ssp. kamtschaticus G5T4T5 S1

Erigeron glacialis G4G5 S2S3
Erigeron muirii G2 S2
Erigeron ochroleucus G5 S1S2
Erigeron porsildii G3G4 S3
Erigeron yukonensis G2G4 S1
Eriogonum flavum var. aquilinum G5T2 S2
Eriophorum viridicarinatum G5 S2
Erysimum asperum var. angustatum G5T2 S1S2
Festuca edlundiae G3G4 S1
Festuca lenensis G4G5 S3
Festuca minutiflora G5 S1
Festuca occidentalis G5 S1
Filipendula kamtschatica G3G4 SR
Galium kamtschaticum G5 S2
Gaultheria miqueliana G3G4 S1
Gentianella auriculata G4G5 S1
Gentianella propinqua ssp. aleutica G5T2T4 S2S4
Gentianopsis detonsa ssp. detonsa G3G5T3T5 S1
Geum aleppicum var. strictum G5T5 S1S2
Geum pentapetala G3G4 S2S3
Geum schofieldii G2Q SP
Glehnia littoralis ssp. leiocarpa G5T5 S3
Glyceria leptostachya G3 S2
Glyceria pulchella G5 S2S3
Glyceria striata var. stricta G5T5Q S2
Hymenophyllum wrightii G4? S2S3
Isoetes occidentalis G4G5 S1S2
Isolepis cernua G5 S1
Juncus articulatus G5 S1
Juncus nodosus G5 S2
Juncus tenuis G5 S2S3
Juniperus horizontalis G5 S1S2
Koeleria asiatica G4 S2S3
Koeleria macrantha G5 S1
Lactuca biennis G5 S1S2
Lathyrus ochroleucus G4G5 S1
Lathyrus venosus var. intonsus G5T5 S1
Lewisia pygmaea G5 SP
Ligusticum calderi G3 S1
Limosella aquatica G5 S3
Listera convallarioides G5 S2
Lobelia dortmanna G4G5 S1
Lonicera involucrata G4G5 S2
Lupinus kuschei G3 S2
Lupinus lepidus G5 S1?
Luzula comosa G4G5 S1
Lycopodiella inundata G5 S3
Lycopus americanus G5 S1
Lycopus uniflorus G5 S3

Maianthemum racemosum G5 S2
Maianthemum stellatum G5 S2
Malaxis paludosa G4 S3
Melica subulata G5 S1
Mertensia drummondii G2 S2
Mertensia eastwoodiae G3 S3
Mertensia paniculata var. alaskana G5T3 S3?
Mimulus lewisii G5 S2
Mimulus tilingii G5 S1
Minuartia yukonensis G4? S3
Mitella nuda G5 S2
Mitella trifida G5 S2
Monotropa uniflora G5 S1S2
Montia bostockii G3 S3
Myriophyllum farwellii G5 S1
Myriophyllum verticillatum G5 S3
Najas flexilis G5 S1S2
Ophioglossum pusillum G5 SH
Orobanche fasciculata G4 S1S2
Orobanche uniflora G5 S2
Oxytropis arctica var. barnebyana G4?T2Q S2
Oxytropis huddelsonii G3 S2S3
Oxytropis kobukensis G2 S2
Oxytropis kokrinensis G3 S3
Oxytropis tananensis G2G3Q S2S3
Packera moresbiensis G3 S2S3
Papaver alboroseum G3G4 S3
Papaver gorodkovii G3 S2S3
Papaver nudicaule ssp. americanum G4G5T4T5 S3
Papaver walpolei G3 S3
Parasenecio auriculata G2 S2
Parrya nauruaq G2 S2
Pedicularis groenlandica G4G5 S1S2
Pedicularis hirsuta G5? S1
Pedicularis macrodonta G4Q S3
Penstemon serrulatus G4 S1
Phacelia franklinii G5 S2S3
Phacelia mollis G2G3 S2S3
Phacelia sericea G5 S2
Phalaris arundinacea G5 S3SE
Phippsia concinna G4 S1
Phlox hoodii G5 S2
Phyllodoce empetriformis G5 S1S2
Phyllospadix serrulatus G4 S2
Physaria calderi G3G4 S2
Physocarpus capitatus G5 S2S3
Picris hieracioides G5 S1S2
Pinus contorta var. latifolia G5T5 S3
Piperia unalascensis G5 S2

Plagiobothrys orientalis G3G4 S3
Plantago major var. pilgeri G5TUQ S2S3
Platanthera gracilis G3G5Q S2?
Platanthera orbiculata G5 S2
Platanthera tipuloides var. behringiana G4G5T2? S2?
Pleuropogon sabinei G4G5 S1
Poa hartzii ssp. alaskana G3G4T1 S1
Poa laxiflora G3G4 S2S3
Poa leptocoma G5 S2
Poa macrantha G5T5 S1
Poa occidentalis G4 SR
Poa porsildii G3 S2S3
Poa secunda ssp. juncifolia G5TNR S1
Poa secunda ssp. secunda G5TNR S1
Podistera yukonensis G2 S1
Polygonum boreale G3G4 S2S4
Polygonum hydropiperoides G5 S1
Polygonum minimum G5 S1
Polypodium sibiricum G5? S2
Polystichum aleuticum G1 S1
Polystichum kruckebergii G4 S1
Polystichum microchlamys G4? S1
Polystichum setigerum G2G3 S2S3
Potamogeton obtusifolius G5 S2S3
Potamogeton robbinsii G5 S1S2
Potamogeton subsibiricus G3 S3
Potentilla drummondii G5 S2
Potentilla fragiformis G4 S1S2
Potentilla rubricaulis G4 S2?
Potentilla stipularis G5 S1
Primula cuneifolia ssp. cuneifolia
Primula tschuktschorum G2G3 S2S3
Puccinellia angustata G4Q S3S4
Puccinellia arctica G2Q S1
Puccinellia vaginata G4 S1?
Puccinellia vahliana G4 S2S3
Puccinellia wrightii G3G4 S2S3
Ranunculus auricomus G5 S2
Ranunculus gelidus var. shumaginensis G4T1Q S1
Ranunculus glacialis var. 1 (cf. var. glacialis) G4T2 S2
Ranunculus glacialis var. chamissonis G4T3T4 S2
Ranunculus kamchaticus G4G5 S2S3
Ranunculus pacificus G3 S3
Ranunculus sabinei G4 S1
Ranunculus turneri G2G3 S2
Romanzoffia unalaschcensis G3 S3
Rorippa curvisiliqua G5 S1
Rorippa nasturtium-aquaticum GNR S1S2
Rorippa obtusa G5 S1

Rosa woodsii var. woodsii G5T5 S1S2
Rumex beringensis G3 S3
Rumex graminifolius G4? S1
Rumex krausei G2 S2
Rumex paucifolius G5 SP
Rumex utahensis G5 SP
Salix athabascensis G4G5 S2S3
Salix candida G5 S3
Salix hookeriana G5 S2
Salix nummularia G5 SH
Salix planifolia ssp. planifolia G5T5 S1
Salix prolixa G5 S1
Salix setchelliana G4 S3
Satureja douglasii G4 S1
Saussurea americana G5 S3
Saussurea sp. 1 (cf. triangulata) G1 S1
Saxifraga adscendens ssp. oregonensis G5T4T5 S2S3
Saxifraga aizoides G5 S1
Saxifraga aleutica G2G3 S2S3
Saxifraga nudicaulis G3G4Q S2S3
Saxifraga occidentalis G5 S1
Saxifraga rivularis ssp. arctolitoralis G5T2T3 S2S3
Saxifraga taylorii G3 SP
Schizachne purpurascens G5 S2
Schoenoplectus pungens G5 S1
Schoenoplectus subterminalis G4G5 S1
Scolochloa festucacea G5 S1
Sedum divergens G5? S1
Sedum lanceolatum G5 S1S2
Sedum oreganum G5 S1S2
Senecio cannabifolius G4? S1S2
Sidalcea hendersonii G3 S1
Silene uralensis ssp. ogilviensis G4T1 S1?
Sisyrinchium montanum G5 S1
Smelowskia johnsonii G1 S1
Smelowskia media G2G3 S2S3
Smelowskia pyriformis G2 S2
Sphenopholis intermedia G5 S1
Spiraea douglasii G5 S3
Stachys emersonii G5 S1
Stellaria alaskana G3 S3
Stellaria dicranoides G3 S3
Stellaria ruscifolia ssp. aleutica G4T3 S3
Stellaria umbellata G5 S2S3
Suaeda occidentalis G5 S1
Symphoricarpos albus ssp. laevigatus G5T5 S2
Symphyotrichum falcatum var. falcatum G5T4T5 S1S2
Symphyotrichum pygmaeum G2G4 S2
Symphyotrichum yukonense G3 S3

Tanacetum bipinnatum ssp. huronense G5T4T5 S3?
Taraxacum carneocoloratum G3Q S3
Taxus brevifolia G4G5 S2
Thalictrum minus GNR S2S3
Thalictrum occidentale G5 S1
Thlaspi arcticum G3 S3
Thuja plicata G5 S3
Tiarella trifoliata var. laciniata G5T5? S1S2
Townsendia hookeri G5 S1
Trichophorum pumilum var. rollandii G5 S1
Trifolium wormskjoldii G5 S1
Trisetum sibiricum ssp. litorale G5T4Q S2
Trollius riederianus G4G5 S1
Utricularia ochroleuca G4? S1?
Veronica grandiflora G3 S3
Vicia americana G5 S2
Viola selkirkii G5? S3
Viola sempervirens G5 S1
Zannichellia palustris G5 S3

ALASKA INVASIVE SPECIES WORKING GROUP (AISWG)

http://www.uaf.edu/ces/pests/aiswg/

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

System	M - Marine							
Subsystem	1 - Subtidal				2 - Intertidal			
Class	RB – Rock Bottom	UB – Unconsolidated Bottom	AB – Aquatic Bed	RF – Reef	AB – Aquatic Bed	RF – Reef	RS – Rocky Shore	US – Unconsolidated Shore
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud	1 Algal 3 Rooted Vascular	1 Coral 3 Worm	1 Algal 3 Rooted Vascular	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

System	E - Estuarine												
Subsystem	1 - Subtidal				2 - Intertidal								
Class	RB – Rock Bottom	UB – Unconsolidated Bottom	AB – Aquatic Bed	RF – Reef	AB – Aquatic Bed	RF – Reef	SB – Streambed	RS – Rocky Shore	US – Unconsolidated Shore	EM – Emergent	SS – Scrub-Shrub	FO – Forested
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular	2 Mollusk 3 Worm	1 Algal 3 Rooted Vascular 4 Floating Vascular	2 Mollusk 3 Worm	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Non-persistent 5 *Phragmites australis*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen

System	R - Riverine						
Subsystem	1 - Tidal	2 – Lower Perennial	3 – Upper Perennial	4* - Intermittent	5** – Unknown Perennial		
Class	RB – Rock Bottom	UB – Unconsolidated Bottom	SB*** – Streambed	AB – Aquatic Bed	RS – Rocky Shore	US – Unconsolidated Shore	EM – Emergent
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent

* **Intermittent** is limited to the **Streambed** Class
** **Unknown Perennial** is limited to **Unconsolidated Bottom**
*** **Streambed** is limited to **Tidal** and **Intermittent** Subsystems

Classification of Wetlands and Deepwater Habitats of the United States, Cowardin *et al.* 1979

Legend for the Cowardin Classification and NWI mapping.

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

System	L - Lacustrine									
Subsystem	1 - Limnetic			2 - Littoral						
Class	RB – Rock Bottom	UB – Unconsolidated Bottom	AB – Aquatic Bed	RB – Rock Bottom	UB – Unconsolidated Bottom	AB – Aquatic Bed	RS – Rocky Shore	US – Unconsolidated Shore	EM – Emergent	
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

System	P - Palustrine							
Class	RB – Rock Bottom	UB – Unconsolidated Bottom	AB – Aquatic Bed	US – Unconsolidated Shore	ML – Moss-Lichen	EM – Emergent	SS – Scrub-Shrub	FO – Forested
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent 5 *Phragmites australis*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen

MODIFIERS

In order to more adequately describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

Water Regime			Special Modifiers	Water Chemistry			Soil
Nontidal	**Saltwater Tidal**	**Freshwater Tidal**		**Coastal Halinity**	**Inline Salinity**	**pH Modifiers for all Fresh Water**	
A Temporarily Flooded	L Subtidal	S Temporarily Flooded-Tidal	b Beaver	1 Hyperhaline	7 Hypersaline	a Acid	g Organic
B Saturated	M Irregularly Exposed	R Seasonally Flooded-Tidal	d Partly Drained/Ditched	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral
C Seasonally Flooded	N Regularly Flooded	T Semipermanently Flooded-Tidal	f Farmed	3 Mixohaline (Brackish)	9 Mixosaline	l Alkaline	
E Seasonally Flooded/ Saturated	P Irregularly Flooded	V Permanently Flooded-Tidal	h Diked/Impounded	4 Polyhaline	0 Fresh		
F Semipermanently Flooded			r Artificial	5 Mesohaline			
G Intermittently Exposed			s Spoil	6 Oligohaline			
H Permanently Flooded			x Excavated	0 Fresh			
J Intermittently Flooded							
K Artificially Flooded							

Legend for the Cowardin Classification and NWI mapping (continued).

For a copy of the Habitat Classification (above) and the Alaska Vegetation Classification and associated spreadsheet "codes" refer to the Alaska Share Point Site>Ecological Sciences>Wetlands>Job Aids

NWI: Wetlands and Deep Water Habitats

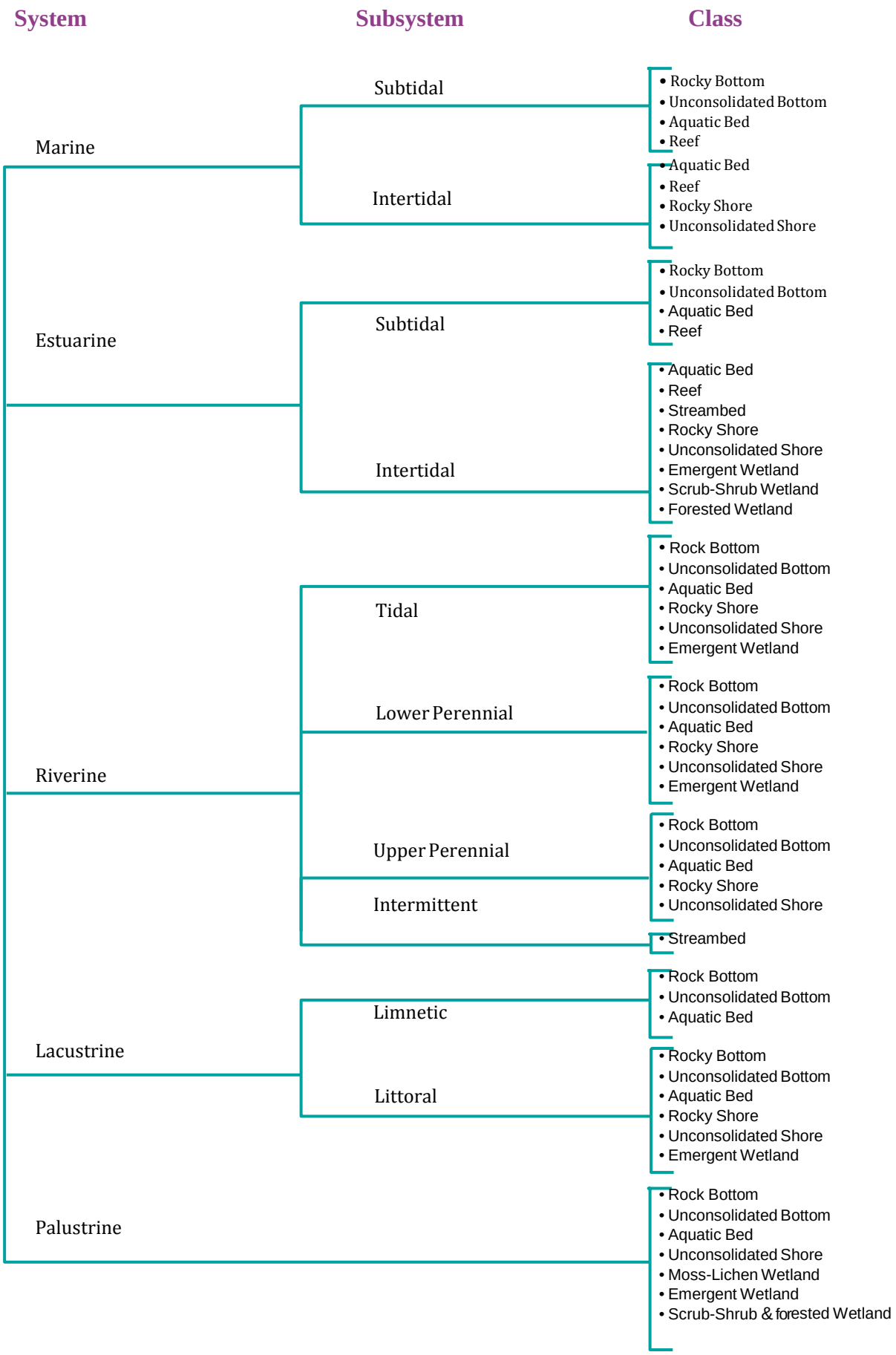

Table 1. Summary of delineative criteria for broad level classification (adapted from Rosgen 1994). Courtesy of Catena Veriag.

Stream Type	General Description	Entrenchment Ratio	W/D Ratio	Sinuosity	Slope	Landform/Soils/Features
Aa+	Very steep, deeply entrenched, debris transport streams.	<1.4	<12	1.0 to 1.1	>0.10	Very high relief. Erosional, bedrock or depositional features; debris flow potential. Deeply entrenched. Vertical steps with deep scour pools and waterfalls.
A	Steep, entrenched, cascading step-pools. High-energy debris transport assoc. with depositional soils. Very stable if channel dominated by bedrock or boulders.	<1.4	<12	1.0 to 1.2	0.04 to 0.10	High relief. Erosional or depositional and bedrock forms. Entrenched and confined with cascading reaches. Frequently-spaced, deep pools in assoc. step-pool bed morphology.
B	Moderately entrenched, moderate-gradient, riffle-dominated channel with infrequently spaced pools. Very stable plan and profile. Stable banks.	1.4 to 2.2	>12	>1.2	0.02 to 0.039	Moderate relief, colluvial deposition and/or residual soils. Moderate entrenchment and W/D ratio. Narrow, gently sloping valleys. Rapids predominate with occasional pools.
C	Low-gradient, meandering, alluvial riffle-pool, channels with point-bars. Broad, well-defined floodplains.	>2.2	>12	<1.4	<0.02	Broad valleys with terraces in assoc. with floodplains alluvial soils. Slight entrenchment with well-defined meanders. Riffle/pool bed morphology.
D	Braided channel with longitudinal and transverse bars. Very wide channels with eroding banks.	n/a	>40	n/a	<0.04	Broad valleys with alluvial and colluvial fans. Glacial debris and depositional features. Active lateral adjustment with abundant sediment supply.
DA	Multiple channels, narrow and deep with expansive, vegetated floodplain and wetlands. Very gentle relief, highly variable sinuosity. Stable stream banks.	>4.0	<40	variable	<0.005	Broad, low-gradient valleys with fine alluvium and/or lacustrine soil. Multiple-channel geologic-control creating fine deposition with well-vegetated, laterally-stable bars. Broad floodplains and wetlands.
E	Low-gradient, meandering, riffle/pool stream with low W/D ratio and little deposition. Very efficient and stable. High meander width ratio.	>2.2	<12	>1.5	<0.02	Broad valley/meadows. Alluvial materials with floodplain. Highly sinuous with stable, well-vegetated banks. Riffle/pool morphology, very low W/D ratio.
F	Entrenched, meandering riffle/pool channel, of low gradient, with high width/depth ratio.	<1.4	<12	1.4	<0.02	Entrenched in highly weathered material. Low-gradient, with high W/D ratio. Meandering, laterally unstable with high bank erosion. Riffle/pool bed.
G	Entrenched, "gully" step-pool channel, on moderate gradients, with low width/depth ratio.	<1.4	<12	>1.2	0.02 to 0.039	Narrow valley, or deeply incised in alluvial or colluvial material (i.e., fans or deltas). Unstable, with grade control problems and high rates of bank erosion. Gully, step-pool bed.

ROSGEN stream classification. A full description and other documentation can be found on the Alaska Share Point Site along with field cards.

Key to HGM Classes[1] for AFWA

1a. Wetland is under the influence of tidal action……2

2a. The wetland is inundated at high tide frequently (daily). If not directly observed, indicators can include the absence of woody species, predominance of herbaceous species, and bare soil…**Tidal Fringe** (not evaluated); *Marine Subtidal; Intertidal.*

2b. Tidal forces cause the wetland to be flooded with surface water during most years. Plant species present are tolerant of brackish as well as fresh salinity conditions. Organic material within the soil profile increases in higher elevation areas where flooding is less frequent and are isolated from wave action. The wetland rarely dries for any significant time unless impacted by disturbance. Drift logs and growth of trees often mark the upper boundary of annual flooding particularly in the transition to non-tidal wetland (riverine) or upland……**Estuarine Tidal Fringe**; *Estuarine Subtidal; Intertidal*

1b. Wetland is not under the influence of tidal action…….3

3a. Wetland area is adjacent to lakes where elevation of the lake water maintains the water table in the adjacent wetland. Water source is surface flow usually controlled by lake water fluctuations, groundwater discharge and precipitation. Water loss is by water returning to the lake after flooding, by saturation surface flow and by evapotranspiration. Organic matter accumulates in areas protected by shoreline erosion……**Lacustrine Fringe**; *Limnetic/Littoral*

3b. Wetland is not influenced by lake water…….4

4a. Wetland is within the floodplain and riparian corridor associated with a stream channel. Dominant water sources are overbank flow from the channel or subsurface hydraulic connections between the channel and wetland. Other sources of water can include groundwater discharge, overland flow from adjacent uplands and tributaries and precipitation. Soils are normally gravels, sands, silts with low organics. Organics can accumulate in abandoned channels, oxbows, and sloughs that are protected from stream erosion…..**Riverine**; *Riverine nonperennial, upper and lower.*

4b. Wetland is not within the floodplain and riparian corridor ……..5

5a. Wetland is located on toeslopes, footslopes, terraces and broad plains. Dominant source of water input is from precipitation. Water movement is normally vertical. Impervious layers (loamy mantle) such as glacial till or permafrost are present from near the surface to approximately 40 inches deep. Water table is usually perched. Slopes are 0.1% to 20% (i.e., in the interior 20% is the upper limit; in south central, the upper limit may be as high as 24%)…..6

6a. Soil consists of organic material that is generally greater than 8 inches thick (20 cm) (i.e. in the interior, the lower limit of organic material may be 5 inches because of permafrost). The microrelief and elevation of the wetland is controlled by the vertical accumulation of organic material. In some areas, the wetland may begin as a depression-wetland, concave, but due to organic matter accumulation (i.e., cold temperatures, saturation) the wetland may become raised or convex. Water loss is by saturation overland flow and seepage to underlying groundwater….**Flats, organic**; *Palustrine*

6b. Soil has less than 8 inches (i.e., 5 inches in the interior) thick of organic material over alluvium or outwash deposits. Wetland is common on relic lake bottoms or old terraces and interfluves with poor vertical drainage and low lateral drainage….**Flats, mineral**; *Palustrine*

5b. Wetland is located on toeslopes, footslopes, terraces and broad plains. Dominant source of water input is from upslope and groundwater discharge and interflow. Water flow is downslope unidirectional rather than vertical. Slopes are 0.1% to 20% (i.e., in the interior 20% is the upper limit; in southcentral,